Food for Every Mouth: Nutrition, Agriculture, and Public Health in Puerto Rico, 1920s-1960s

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Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy under the Executive Committee of the Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2016
ABSTRACT

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During the middle decades of the twentieth century, Puerto Rico was transformed from an agrarian, mostly rural, and marginal U.S. colony into an industrialized, urbanized, and politically reorganized territory. For local administrators and public health experts, this transition necessitated confronting widespread mortality from infectious diseases and malnutrition as well as curbing population growth. This dissertation investigates the creation of knowledge about nutrition in Puerto Rico and its incorporation into political and public health practices during this transformative period. For this, it explores how nutrition sciences served to articulate debates about rural poverty and labor as well as how these notions informed distinct public health, welfare, and development interventions. It also analyzes the interaction between this activity on the island and global scientific debates and how local political economy and geopolitical priorities shaped approaches to the nutrition issue.

This dissertation first examines how nutrition became a public health concern during the interwar years through the work of biochemists, home economists, agronomists, and social workers. It then explores how these experts incorporated their assessments as part of rural hygiene programs during the Depression and of food policies during World War II. Finally, it analyzes the role of nutrition sciences in the implementation of child feeding programs, food enrichment regulations, dietary supplementation projects, and consumer education campaigns during the postwar years. It also traces the deployment of Puerto Rican nutrition experts as part of international public health and development programs. Throughout these decades, scientific innovations, conceptualizations of poverty, anxieties about overpopulation, and political economy priorities interacted in the articulation of nutrition ideas and their policy implications.
By analyzing these dynamics, the dissertation illustrates how nutrition expertise traveled and was reconfigured across scientific, governmental, and political spaces. During the 1930s and 1940s nutrition, agriculture, and public health experts advocated for a reconnection between the island’s food supply and local agricultural production as the fundamental strategy to improve Puerto Ricans’ diets and reform rural society. By the postwar years, these plans to promote agricultural diversification and greater food self-sufficiency became increasingly incongruous with the structural shifts provoked by the new development strategy of industrialization and modernization. Food technologies and innovations provided instruments for health policy makers to gradually adapt their agendas to these changes while recasting nutrition problems as technical issues to be fixed through the dissemination of new products, standards, and infrastructures.

The dissertation emphasizes the multiple geographical, disciplinary, and institutional exchanges that shaped how nutrition knowledge was conceived, translated, and generalized in health policy and political debates on the island. To do this, it draws upon archival evidence from government, philanthropic, and academic institutions at local, federal, and international settings. With this framework, the dissertation aims to situate Puerto Rico’s case within international health historiography by focusing on how the local emergence and circulation of nutrition ideas and practices related to global networks of medical and public health expertise. It also aims to contribute to the historiography of development and decolonization and the history of science and technology. Instead of explaining science and public health in Puerto Rico as the “good” effects of United States colonialism or as the transplantation of its biomedical traditions and technologies, this dissertation explores how the interaction between international, colonial, and local structures of power shaped the creation of nutrition knowledge, its political usages, and policy applications.
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Acronyms

American Child Health Association (ACHA)
Agricultural Experiment Station (AES)
Agricultural Marketing Administration (AMA)
Estado Libre Asociado (ELA)
Federal Emergency Relief Administration (FERA)
Farm Security Administration (FSA)
Federal Surplus Commodities Corporation (FSCC)
Federal Surplus Relief Corporation (FSRC)
Food and Agriculture Organization (FAO)
Food Stamps Program (FSP)
General Supplies Administration (GSA)
League of Nations (LoN)
Office of Price Administration (OPA)
Popular Democratic Party (PPD)
Puerto Rico Home Economics Association (PRHA)
Puerto Rico Emergency Relief Administration (PRERA)
Puerto Rico Nutrition Committee (PRNC)
Puerto Rico Reconstruction Administration (PRRA)
Rockefeller Foundation (RF)
School of Tropical Medicine (STM)
University of Puerto Rico (UPR)
War Food Administration (WFA)
War Emergency Program (WEP)
Work Projects Administration (WPA)
Nutritional Assistance Program (NAP)
Archives

Archivo Central Universidad de Puerto Rico, Río Piedras (ACUPR)
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Biblioteca Conrado Asenjo, UPR Recinto de Ciencias Médicas, Colecciones Especiales (RCM)
Food and Agriculture Organization of the United Nations Archives (FAOA)
Health Sciences Archives and Special Collections, Columbia University (CU-HSL)
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Rare and Manuscript Collections, Cornell University (CU-RMC)
Rockefeller Archive Center (RAC)
University of Chicago Library, Special Collections Research Center (UC-SC)
Acknowledgments

It has been a long journey. Along the way, I have been fortunate to encounter marvelous guides, kind helpers, and wonderful fellow travelers that have made the road easier and edifying. My trajectory throughout these years has also been facilitated by the continuous support of those who put me at the starting line and helped me to move along. This dissertation is the end product of that journey and a reflection of both my personal and academic experiences. Conceiving, researching, and writing it required drawing from the resources, guidance, and wisdom graciously offered by many in Puerto Rico, the United States, and beyond.

The vision of the Center for the History and Ethics of Public Health and the tenacity with which faculty, staff, and students pursue it have shaped my work in multiple ways. The Center’s mission to promote the place of history in public life has informed my research and given me tools to place it in conversation with both historiographical questions and public health concerns. As a native Puerto Rican daily immersed in debates about the roots and implications of the island’s current socioeconomic crisis, this perspective has become even more vital. One of the most fortunate events during my time as a student at the History Center was the arrival of Kavita Sivaramakrishnan as new faculty in the Fall of 2010. Kavita not only became my dissertation’s director but a trusted advisor in all matters. I will be forever grateful of the time and effort she dedicated to this project from start to finish as well as to my development as a scholar. Her kind but incisive critiques turned this dissertation into something I could only dream of.

My dissertation committee—including David Rosner, James Colgrove, Samuel Roberts, and Ismael García Colón—provided insights and guidance throughout the process of writing and revising. David Rosner has guided me through this program and motivated me to put my work into broader social and political contexts. Since my days as a student in his course James
Colgrove has been a model and source of inspiration. Ismael García’s help and encouragement was fundamental for the completion of all the stages of this dissertation. At the History Department, Samuel Roberts and Pablo Piccato kindly offered their time and expertise at crucial moments. At Mailman, Ana Abraido-Lanza and the IMSD program provided important opportunities for professional development and interdisciplinary engagement.

Together with the guidance received from Columbia’s faculty, this dissertation was made possible by the financial support of the Rockefeller Archive Center, the National Science Foundation, and the Ford Foundation. I also benefited from the collaboration of Puerto Rican food historian Cruz M. Ortíz Cuadra who read the dissertation proposal and provided feedback throughout the research and writing process. Thanks also to José Rigau who offered valuable suggestions about how to research Puerto Rico’s medical history, sent information on relevant books, and shared stories about his experiences as a public health official on the island.

My arrival at Columbia was preceded by two happy and enriching years at SUNY Albany. I am thankful for the support received from faculty at the Departments of History and of Latin American, Caribbean, and US Latino Studies. Among these Susan Gauss, Kendra Smith-Howard, and Iris Berger’s advice was instrumental for the early articulation of my research interests and agenda. Friends and colleagues at Albany—including Guillermo Flores, Arinka Abad, Adriana Hernández, Jacqueline Villarrubia, Roberto Vélez, Sara Romero, Santiago Guerrero, Amy Savage, and Jesús Alonso Regalado among others—also shaped my work in important ways (while facilitating much needed leisure activities).

My undergraduate years at the Universidad de Puerto Rico en Cayey lay the foundations for these endeavors. Faculty from both the Natural Sciences and Humanities divisions contributed to the development of my interdisciplinary proclivities. My interest for science,
medicine, and public health was aptly cultivated by Carlos Ricart, Marcos Echegaray, Luis Pérez, Mayra Pagán, and Glorivee Rosario. Luis and Mayra Mattei, Alexis Tirado, José Rosado, David Lizardi, and the late Hugo Vissepó encouraged me to pursue my calling to exchange the laboratory for the historical archive. Special thanks to Luis Mattei who put me in the path that led to this doctorate.

This dissertation research was greatly facilitated by the work of many archivists and librarians. At the UPR Central Archive Joely Alvarado embodies the spirit of service and dedication in face of uncertainty and precariousness. She hunted down lost records, provided research advice, made copies, and suggested lunch places. At the Conrado Asenjo Library of the UPR Medical Sciences campus Carmen Santos helped me navigate newly catalogued documents related to nutrition research and education. Dax Collazo’s assistance at the Luis Muñoz Marín Foundation allowed me to find important documents in their archival collections. Lee Hiltzik at the Rockefeller Archive Center and Stephen Novak at Columbia’s Health Sciences Library identified collections related to nutrition research programs at the School of Tropical Medicine. At the Food and Agriculture Organization Archives in Rome, Fabio Ciccarello located records that allowed me to trace Puerto Rican nutrition experts’ global networks.

Many thanks are also in order to staff at Columbia. At the Health Sciences Library Lilly Hernández helped me check out countless books and shared many stories. Ramón Acosta expertly processed and delivered many obscure Inter-library Loan requests. Eugene Robinson kindly fulfilled our multiple requests for extensions in due dates. The late Sheila King, who provided support retrieving materials and was always interested in discussing them, reminded us of the importance of librarians in research and academic life. At Mailman, Nitanya Nedd and Yasmin Davis went above and beyond to help with logistics, finances, and many other things.
The Center for Puerto Rican Studies at Hunter College provided invaluable support as I finished researching and writing this dissertation. Working in a project about youth community engagement focused on East Harlem and other Puerto Rican neighborhoods has provided perspective on the trans-Atlantic and trans-generational effects of the dislocations provoked by the processes of the mid-twentieth century. I have also learned much about the many ways Puerto Ricans de acá afuera have struggled and succeeded to transcend adversity. At Centro I have been lucky to work with amazing colleagues including Rachel Shulman, Julia Solomons, Noraliz Ruiz, Harry Franqui-Rivera, Julio Ortiz-Luquis, and Imani Nuñez. Special thanks to Centro’s Director Edwin Meléndez for giving me the opportunity to join this team.

This journey would not have been as enjoyable (if at all possible) without all the fellow travelers I have met along the way. At Mailman Raziel Valiño, Emily Vasquez, Matthew Kelly, Akua Gyamerah, Ronna Popkin, Kathleen Bachynski, Claire Eddington, Ijeoma Eboh, Mariana Martins, and Dave Johns have been trusted colleagues and friends. At the History Department Kyoungjin Bae, Maria John, Sarah Cook, and J.T. Roane enriched this project with their brilliance and friendship. Fellow Puerto Ricans Xiomaris Cotto, Melissa Fuster, and Myriam Villalobos accompanied me throughout different portions of the road. My good friend, extended family member, and co-conspirator Verónica Rodríguez has filled these past seven years with adventure, laughter, banal and profound conversations, and discounted food and drinks. In the process we might have made our mothers proud.

This dissertation would not have been possible without the help of my beloved family who, without having a clear idea what I was doing all this time, have unconditionally supported me. My cousin Brenda Rivera and Manuel Lepiani helped me move, fed me, and looked after me from across the Hudson River. My dear husband Matt Peppe proofread when I insisted enough
but always offered unsolicited encouragement and reminded me what is important. My sister Carmen González rescued me countless times as I attempted in vain to find my way in San Juan’s impossible traffic. My brother Pedro J. González—who has served as research assistant, chauffeur, and travel guide—always kept me in check. My loving mother Carmen Rivera carefully packed and mailed samples of Puerto Rico’s “traditional foodstuffs” and provided comprehensive updates on the welfare of all our pets. Finally, this dissertation is dedicated to my father Pedro González who, like interwar nutrition scientist Henry Sherman, has always recognized that “agriculture is not only an economic activity, it is a vital regime.”
Introduction

Too Many Mouths to Feed

There was a sentiment of cautious optimism among Puerto Rican nutrition experts during the mid-1950s. The industrialization and modernization policies implemented during the previous years were gradually beginning to increase wages as more people were employed at the newly established factories or abandoned the island for the United States. This higher purchasing power, in general, allowed people to increase their intake of proteins from meat and dairy products. However, for nutrition professionals like home economist Esther Seijo, these changes were a double-edged sword. Writing for the journal *Children*, Seijo emphasized the need for well-planned education programs to ensure that these transformations produced lasting nutrition

Image 11: “Protective Foods for Puerto Rico. For your Health Eat One of Each Group Every Day.”
improvements. For specialists like her, while rising incomes increased purchasing power, addressing the qualitative deficiencies of a diet lacking “protective foods” and based on high-carbohydrate, low protein, and mostly imported products necessitated expert guidance and monitoring. As an example of these efforts, Seijo described the Department of Health’s nutrition education and community outreach program to the journal’s readership.

Part of this renewed nutrition campaign, the poster “Protective Foods for Puerto Rico” encouraged people to replace a portion of “what almost all of us eat”—rice, beans, viandas (starchy crops), salted cod, sugar, lard, and coffee—with “what we should eat”—milk, meat, fish, eggs, green and yellow vegetables and fresh local fruits.”¹ For Seijo, ensuring that positive public health changes resulted from rising living standards and higher industrial wages required the qualitative improvement of Puerto Ricans’ diet. Her efforts toward this objective at the Department of Health and the University of Puerto Rico (UPR) called the attention of the Pan American Health Organization and the Food and Agriculture Organization (FAO) of the United Nations. During the next decade Seijo worked with both these agencies as part of their nutrition programs and rural development initiatives. Her expertise was also sought by nutritional biochemist Conrado Asenjo who invited her in 1968 to collaborate in the establishment of a new graduate program in Health and Nutrition at the UPR School of Medicine.²

By the late 1960s, however, studies by Asenjo and his colleagues were beginning to uncover the paradoxical public health effects of the socioeconomic transformations unleashed by rapid industrialization and urbanization. While the rapidity and scale of these changes impressed international observers, for local populations these processes were fraught with contradictions. Although industrial jobs offered higher salaries, the abrupt decline of agriculture produced a

² Asenjo to Seijo de Zayas, March 14 1968. RCM. Fondo Conrado Asenjo, Sección Nutrición, caja 2, serie Correspondencia, Noviembre-Enero 1969
mass of displaced laborers that the island’s new export-oriented economy could not absorb and who became part of the rising wave of North-bound migrants. For Asenjo, the contradictory effects of this rapid advent of industrial modernity were also reflected in a lack of “national policies” to make “available foods to satisfy the nutritional needs of the people”. Asenjo and colleagues linked these failures to their discovery of an emerging obesity problem coexisting with nutrient deficiencies, in this case among families with higher incomes. In short, “higher economic standards and greater food availability” had not necessarily translated into improvements in “the nutritional status of the people.”

Thus, despite experts’ early hopes of modernization and its effects over nutritional health, Puerto Ricans’ bodies continued to reflect the persistent precariousness of the island’s sociopolitical state.

Focusing on the nutrition practices and outcomes associated with Puerto Rico’s industrialization and modernization projects provides a unique vantage point to explore the relationship between scientific expertise, development frameworks, and public health interventions during the mid-twentieth century. The island’s transformations throughout these decades were shaped by its role as a nexus of expertise and technologies’ flows fostered by its geographical location and its sociopolitical condition as a Spanish-speaking U.S. territory. As part of the colonial possessions traded after the Spanish-American War, Puerto Rico has played an important role in the historical trajectory of public health in the U.S. during the twentieth century. From the development of tropical medicine practices, the refinement of immigrant medical inspection techniques, and the deployment of contraceptive technologies and population control schemes, the island has been central for the circulation of the expertise that constituted

global health projects and interventions.\textsuperscript{4} Similarly, given the island’s importance for U.S. geopolitical agendas during World War II (WWII) and its aftermath, these experiences informed the emergence of the postwar international development machinery and the role that public health, food aid, and population sciences played in it.\textsuperscript{5}

Against this backdrop, this dissertation explores nutrition sciences and practices in mid-twentieth century Puerto Rico, a context where colonial relations, development regimes, and globalizing forces acted simultaneously. It examines how the emergence, implications, and reconfigurations of nutrition ideas placed the island in regional and global networks of knowledge and techniques. For this, the dissertation focuses on the disciplinary, institutional, and political exchanges that shaped the ways in which nutrition expertise was created and locally applied. During this period, notions about Puerto Ricans’ nutritional status interacted with anxieties about overpopulation as well as with emerging critiques to the monocrops agriculture economy and colonial relation with the U.S. These critiques reached their climax during the 1930s as the effects of the Depression acutely manifested the extent of the island’s chronic poverty. The new nutrition science, and its focus on quality of diet instead of quantity of


foodstuffs, provided health, welfare, and agriculture professionals a compelling language to articulate these concerns and propose reforms to the island’s economic and political structures.

As part of these debates about Puerto Rico’s agrarian economy, the Depression fostered reformulations of the role of biomedicine and public health in rural reconstruction and development. Similar to other Latin American contexts, Puerto Rican public health experts engaged in these interventions embraced preventive eugenics’ flexible interpretations of heredity as an alternative to the deterministic postulates of tropical medicine, which “constructed a non-white” and inherently flawed race. They also drew from new nutrition knowledge and international rural hygiene campaigns promoting public health as a response to “the problem of agrarian decline”. In Puerto Rico, these practices fostered the recast of earlier medical assessments deployed in efforts to uplift the rural poor and cultivate a healthier, whiter, and more productive society. Nutrition scientific activities, public health concerns, eugenic anxieties, and political economy debates interacted as part of a renewed attention to the problems of Puerto Rican rural society. Through these activities, local medical scientists and health professionals provided key insights for emerging policy and political projects crafted in response to the crisis of the Depression.

These exchanges were channeled through education and research institutions, government bureaucracies, relief agencies, and philanthropic organizations. Key among these were the School of Tropical Medicine (STM), the Department of Home Economics of the UPR, the Agricultural Experiment Station, the Agricultural Extension Service, the Departments of

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6 Briggs, Reproducing Empire: Race, Sex, Science and U.S. Imperialism in Puerto Rico. 100.
Health, Education, and Agriculture, the Rockefeller Foundation, as well as various New Deal agencies and war emergency programs. Through these spaces biochemists, home economists, agronomists, social workers, and physicians drew from and contributed to articulate arguments for reform to the island’s agricultural economy. These arguments coalesced during the 1930s, were consolidated and reconfigured during the 1940s, and fully institutionalized during the postwar years when the Popular Democratic Party (PPD) became the dominant political movement. The significance of nutrition ideas for these agendas is reflected in this party’s slogan: *pan, tierra y libertad* (bread, land, and liberty). Notions of nourishment and health were crucial discursive tools employed by this party’s leadership to capture the imagination of poor Puerto Ricans, secure political hegemony, and indigenize the technologies of development. Its authority was consolidated upon the promise of redress for the deprivation Puerto Ricans had suffered at the hands of landowners and neglectful U.S. administrators during many decades.

As this dissertation shows, nutrition became a particularly powerful language to articulate these political and public health concerns with the socioeconomic problems of rural Puerto Rico. In nutrition experts’ analyses, discussions of the possibilities of improving the quality of Puerto Ricans’ diets through agricultural diversification coexisted with arguments for the need to lower fertility rates by promoting contraception and distributing birth control. Prevalent beliefs about overpopulation were based on Malthusian theories pointing to an impending imbalance between population and resources. For many U.S. and local experts working as part of New Deal agencies, the island’s natural resources, particularly arable land, were stretched to the limit by the pressures of population growth. Although these notions were disputed by contemporary observers such as economist Thomas C. Blaisdell who argued that “the data on which the
conclusion that Porto Rico is overpopulated is based are inconclusive”, overpopulation anxieties guided public health and nutrition interventions in Puerto Rico throughout this period.9

As part of these interventions, Puerto Rican experts returning to the island from training at U.S. institutions combined notions about the superiority of Western diets based on animal products with emerging knowledge about food chemical composition and nutritional content. For this, they drew upon multiple and contested representations of the nature, extent, and manifestations of the problems of nutrition and food supply in Puerto Rico. These included measures of dietary adequacy based on surveys, questionnaires, and observations of eating habits, cooking practices, and domestic arrangements; figures of agricultural production and food imports; clinical assessments drawn from anthropometry and physical examinations; and biochemical information obtained at the laboratory from nutrient measurement techniques, animal models, and human serological analyses. According to biochemists, rural laborers’ low productivity was explained by the consumption of a diet deficient in essential vitamins, minerals, and good quality proteins, as shown by laboratory studies of local “traditional” foodstuffs. For physicians and public health experts, this “monotonous diet”—based on high-carbohydrate and imported products like polished rice, dried beans, and starchy crops—also underlined widespread mortality from infectious diseases. For education and social welfare workers, malnutrition and poor health were both signs and causes of rural society’s poverty and decay.

These bodies of biochemical, public health, agricultural, and sociological knowledge produced images of weak and vulnerable bodies, rural decline, and disorganized domestic spaces. Nutrition’s multidisciplinary research focused on poverty as deficits of income, education, arable land, and “protective” foods. Therefore, solving Puerto Rico’s food and

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nutrition problems required the reformation of rural society’s domestic, social, and agricultural organizations. In the tradition of preventive eugenics, nutrition practices emerged as new pedagogical projects “contributing to and complementing a broader racial and social uplift project” pursued through biomedicine, vocational training, birth control, and hygiene. During the crises provoked by natural disasters, the Great Depression, and WWII local experts also linked notions about dietary inadequacy, overpopulation, and poverty to discussions about rural reconstruction, agricultural diversification, and land reform. As part of these projects, the establishment of food aid and feeding programs, especially for infants and school children, connected nutrition agendas on the island to U.S. agricultural surplus disposal policies.

These interventions also contributed to make rural poverty legible for U.S. administrators, federal agencies, and philanthropies providing funding and distributing surplus commodities and work relief. Local experts translated the conditions in rural households, public health units, and classrooms into the language of rural hygiene. They provided data, information, and images that local administrators used to justify their programs and articulate compelling claims for more resources from federal agencies. Through these activities, rural areas were revisited throughout the following decades to investigate the nutrition effects of Puerto Rico’s socioeconomic transformations.

Attempts to cultivate a modern and productive rural society were refashioned throughout these decades as the goals and objectives of nutrition scientists, welfare professionals, policy makers, and politicians informed and contested each other. While arguing that there were “too many mouths to feed”, nutrition experts emphasized the increased vulnerability to disease and diminished productivity of laboring bodies weakened as a result of diets lacking essential

nutrients. These concerns were at the heart of political projects and policy agendas that emerged during the 1930s and shaped the institutionalization of the PPD during the early 1940s. During the critical moments of the Depression and WWII, discussions about the relationship between issues of food consumption and its health manifestations and of food production and its political economy foundations informed the party’s ideology. The PPD drew from the experiences and networks created by public health and welfare experts to incorporate nutrition programs and technological imaginaries to its discourses and practices. These processes were central to the articulation of the party’s rhetoric, the implementation of its agendas, and the terms in which poor Puerto Ricans understood their relationship with the new government.

PPD government officials deployed nutrition and public health knowledge as part of the transition from the rural reconstruction projects of the interwar years to the industrial development schemes of the 1950s and 1960s. The new policies proposed on the basis of nutrition and agriculture expertise reflected this shift in development agendas. These local transformations were informed by global changes in public health practices and development paradigms marked by the techno-centric campaigns and targeted interventions of the postwar period. In this context, Puerto Rican policy makers articulated new plans to modernize and diversify agriculture while nutrition experts continued to encourage people to improve their diets by incorporating locally-produced “protective foods.” However, the demographic, ecological, and economic changes fostered by export-oriented industrialization became increasingly incompatible with nutrition projects based on dietary improvement through agricultural diversification and higher local production and consumption of “protective foods.” Increasing access to manufacture jobs became the new strategy to improve the public’s health and raise standards of living.
Under the new economic policies, efforts to expand food crops’ agriculture were reorganized and transformed according to the labor and land needs of the industrialization program.¹¹ Meanwhile, innovations in pharmaceutical technologies to add synthetic vitamins to foodstuffs and enhancements in food processing techniques allowed the expansion of enrichment and supplementary feeding programs. This juncture facilitated a significant shift in public health approaches to the problem of nutrition in Puerto Rico. Food enrichment technologies and dietary supplements became alternative mechanisms to improve people’s nutrition as part of the new public health projects implemented by the PPD government under its founder and first locally-elected governor Luis Muñoz Marín. The design of campaigns to promote the benefits of powdered skim milk and the passage of legislation to require the enrichment of all rice imported and sold on the island are examples of these new efforts.¹²

The implementation of these policies during late 1940s and early 1950s framed the local and international promotion of the Commonwealth (Estado Libre Asociado-ELA) status, proclaimed in 1952, as Puerto Rico’s own decolonization path. Public health expertise was a central aspect of Puerto Ricans’ transformation into citizens of a modern colony and subjects of this new development model. The significance of nutrition ideas and practices for these transitions reflects how in Puerto Rico, as in other Latin American settings, food was an important tool for populist governments and a critical conveyor of political messages.¹³ Through food distribution programs, child feeding services, and nutrition education campaigns public


health and welfare experts mediated the implementation of these socio-political changes in local communities, particularly in rural areas. Poor Puerto Ricans, in turn, deployed nutrition political ideas to claim membership in the government’s health and welfare projects while presenting these as part of the materialization of the PPD’s promise of social justice. They appropriated this discourse to claim access to nutrition services and, more broadly, for their right to food and health. As anthropologist Julian Steward and colleagues argued, health and welfare programs in Puerto Rico “have a political as well as therapeutic significance.”

These processes had a particular significance for both Puerto Rican officials and U.S. agents in the emerging international context. As scholars have noted, “the peculiarity of the Puerto Rican experience resides less with the actual path followed by its economy”, which it shares with many other regions, “than with the absolute magnitude of the changes undergone.”

The government’s aggressive recruitment of U.S.-based manufacture industries increased migration and urbanization, producing dramatic demographic and ecological changes in the island’s rural landscapes. This strategy to create higher-paying factory jobs shifted from a focus on labor-intensive light industries during the 1950s to capital-intensive petrochemicals and pharmaceuticals during the 1960s. Throughout these years, this model’s success in rising incomes and promoting material improvements served local and federal officials to legitimize the Commonwealth as a new non-colonial status. As part of these efforts, government officials in both Washington and San Juan recruited Puerto Rican nutrition, agriculture, and social welfare experts to staff international assistance and Technical Assistance (TA) programs.

14 Julian Steward et al., The People of Puerto Rico: A Study in Social Anthropology (Champaign: University of Illinois Press, 1956). 482
The Puerto Rican experience in nutrition and public health also called the attention of international organizations like the FAO. Discussions about the importance of nutrition and extension education for rural development and public health became important aspects of the decolonization debates taking place throughout the world during this period. In this context, Puerto Rico offered important assets for the establishment of nutrition and agriculture education programs as part of international development projects. These new platforms provided local and federal governments the opportunity to promote their respective political agendas as the Cold War intensified in the Caribbean. Showcasing Puerto Rico’s advances in public health and nutrition became an important element of these strategies.

Nutrition and agriculture expertise was also incorporated to “alternative” development projects focused on the promotion of “small-scale” change and local self-sufficiency by relying on communities’ own expertise. While internationally the idea of “community development” became a path to promote “development without modernization”, for Puerto Rican policy makers these agendas served to promote the incorporation of isolated populations to the industrialization trend. During the late 1950s and 1960s, community development became another language to articulate anxieties about rural poverty and offered new mechanisms to intervene with residents of “isolated communities”. As part of these initiatives, the lack of local production and consumption of “protective” foods remained a central concern for nutrition and agriculture experts staffing a new government agency dedicated to attend the problems of these “isolated communities”. While measures to improve nutrition through small farming were promoted by community development workers, these initiatives ultimately failed in the context of the structural changes resulting from industrialization, migration, and urbanization. These

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demographic, ecological, and cultural transformations consolidated the alienation of Puerto Ricans’ diet from the local agriculture.

By the late 1960s, the contradictory effects of these socioeconomic changes were becoming visible. New dietary surveys showed that rising incomes had led to an increase in the intake of animal protein, cereals other than rice, fruits and vegetables, as well as to a decline in the consumption of starchy and root crops. However, “most of the expanded high protein food demand was supplied by imports.”18 Meanwhile, nutrition studies found “an elevated prevalence of obesity in adults,” among which 28 and 12 percent of the women and men respectively were above 20 percent overweight.19 As researchers noted after analyzing these findings, “higher economic standards and greater food availability” alone do not “necessarily improve the nutritional status of the people.”20 For these experts, these findings also pointed to the flaws of abandoning plans to improve people’s diet through agricultural diversification and local food production. Thus, Puerto Rico underwent one of the earliest experiences of what public health experts today call the “nutrition transition”, or the rapid transformation of a region dominated by high rates of infectious diseases to one with an increasing burden of obesity and diet-related conditions due to overconsumption, the other side of the malnutrition coin.21

Nutrition Science and Public Health: Local Realities and Global Processes

When the U.S. army occupied Puerto Rico on July of 1898, military officials presented the lack of sanitation, scant medical care and public health infrastructure, and widespread illiteracy as proof of the island’s need for intervention. They considered these appalling health

18 Carro-Figueroa, “Agricultural Decline and Food Import Dependency in Puerto Rico: A Historical Perspective on the Outcomes of Postwar Farm and Food Policies.” 84
20 Nutritional Status of the Puerto Rican Population: Master Sample Survey. 6
and sanitary conditions as the result of centuries of Spanish neglect which had fostered “a lethargic and apathetic” populace.\textsuperscript{22} As Trujillo Pagán demonstrates, U.S. colonial administrators built upon this image to construct their benevolent colonialism discourse. Rescuing rural populations from their disease-ridden environments and “regenerating the labor of men” through medical and sanitarian interventions served the U.S. colonial regime to both “develop the island’s productive capacity” and claim to “represent the public interest.”\textsuperscript{23} While these interventions answered to the political and economic agendas of the new colonial regime, they drew from existing notions about the social, racial, and medical state of rural populations.

For nineteenth century liberal elites the bodies of rural peasants were “both symbol and myth of Puerto Rico as a sick nation”.\textsuperscript{24} During the last decades of Spanish control—marked by political upheaval and the tensions of a post-slavery society—Puerto Rican physicians argued that the health of individual and social bodies required “altering the personal and sexual habits” of the rural poor as well as “curtailing their racial heterogeneity.”\textsuperscript{25} Laboratory medicine contributed to this discourse by unveiling the figure of the parasite haunting peasants already considered suspicious due to their proximity to the “members of the “African race”.\textsuperscript{26} This image of the racially unintelligible \textit{jíbaro} (rural dweller), weakened by energy-sucking parasites and incapable of fully utilizing his labor, was appropriated by U.S. medical authorities during the early twentieth century.

Historians have analyzed how eugenic ideologies shaped Puerto Rican elites’ notions of modernity and public health practices during the last decades of Spanish colonialism and the first

\textsuperscript{23} Nicole Trujillo-Pagán, \textit{Modern Colonization by Medical Intervention: U.S. Medicine in Puerto Rico} (Boston: Brill, 2013). 5
\textsuperscript{24} Ibid. 9-10
\textsuperscript{26} Trigo, "Anemia, Witches, and Vampires: Figures to Govern the Colony." 87
years of U.S. intervention. Interwar public health professionals also put their “faith in the application of biology and medicine” to cultivate a healthier society and counter U.S. authorities’ racial beliefs. As part of their struggle for a better conception of their society, public health officials like Antonio Fernós Isern emphasized that “although Puerto Rico was a tropical island” there were no “jungles, primeval forests, aboriginal natives and primitive superstitions to hinder” public health work. By separating the island from tropical medicine’s racial and ecological imaginaries, Puerto Rican public health officials claimed membership in an international community of civilized, modern, and expert-driven societies. Reviewing the work of Australian public health physician Raphael Cilento, Fernós Isern reiterated that “we do not discuss the possibility of white establishments in the tropics” as we are “evidence in favor of the contention that the white man breeds so rapidly in tropical climates that excessive population results”.

Thus, although the influence of U.S. medicine eroded the status that local health professionals had achieved during the last years of Spanish rule, Puerto Rican physicians such as Fernós Isern contributed to “reshape and redefine the meanings” of the new colonial condition by challenging the racialism of tropical medicine. This challenge was framed in the language of preventive eugenics. In contrast to the “hard” Mendelian eugenics dominant in Britain and the U.S., preventive eugenics was informed by neo-Lamarckian ideologies and aimed to improve

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28 Stern, Eugenic Nation: Faults and Frontiers of Better Breeding in Modern America. 6


31 Trujillo-Pagán, Modern Colonization, op. cit. (note 11), 31
society by removing “social and behavioral factors considered damaging to people’s hereditary health”.³² Puerto Rican professionals such as teachers and public health experts promoted this “vision for regeneration, social uplift, and progress” based on race, class, and gender ideologies. These professionals “were optimistic that they could regenerate and whiten the Puerto Rican national body” by promoting birth control and teaching hygiene and sanitation.³³

As this dissertation shows, these projects to transform Puerto Rico’s rural society through public health provision, nutrition education, and agricultural modernization were articulated in different ways throughout these decades. These interventions constituted the network of expertise that informed the emergent PPD discourse during the late 1930s, gave local meaning to its political ideology during the early 1940s, and mediated its consolidation after WWII. The dissertation locates these scientific, policy, and political practices as part of the colonial, developmental, and globalizing forces that shaped the island’s sociohistorical trajectory during this period. Through these processes, nutrition experts drew from and adapted tropical medicine paradigms, modernization development schemes, and global scientific trends.

The insights provided by studies of “postcolonial technoscience”, emphasizing the importance of place for the study of science’s practices and outcomes, are particularly useful to analyze these processes in Puerto Rico’s unique context. This approach allows for “discerning ambivalence and hybridity” by approaching the “colonial” as a process and a category instead of a period in the history of public health.³⁴ According to Anderson, this process is characterized by the circulation of metaphors and practices as well as by a network of people, technologies, and ideas that link the colony with the metropolis and other colonies. In this approach “context”

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³³ Del Moral, Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952. 19
³⁴ Anderson, Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines.
implies a particular “view from elsewhere” that “requires a multiplication of the sites of technoscience” in order to “reveal and acknowledge hidden geographical notations and power relations, and further study the mechanisms and forms of travel between sites”\textsuperscript{35}

The study of the travels and reconfigurations of nutrition technoscience in colonial contexts has offered historians an opportunity to “put science to work”. Michael Worboys originally introduced the concept “colonial malnutrition” to refer to the renewed public health attention to this phenomenon by British officials in African territories during the interwar years. Worboys argues that this issue was not a subject of systematic enquiry before the 1920s when experimentation with the biochemistry of foods promoted nutrition as a subject of “imperial importance” that was included in the world political agenda by the mid-1930s\textsuperscript{36}. Drawing from Worboys’ analysis, Arnold argues that in colonial India malnutrition and diet became highly contested arenas, both at the scientific and policy levels. The implications of nutrition knowledge, however, varied according to changing local circumstances, from legitimizing British administration to indicting colonial rule, and were entangled with ideas about climates and racial prejudices\textsuperscript{37}. These studies utilize the case of nutrition to emphasize the complexities, reconfigurations, and contestations of decolonization processes which, as Frederick Cooper argues for French and British Africa, were marked by “changing definitions of the possible.”\textsuperscript{38}

Works by James Vernon and Nick Cullather bridge the chronological divide between analyses of the colonial logics of early-twentieth century tropical medicine in Asia and the labor struggles underlying decolonization processes in Africa. Focusing on the case of nutrition and

\textsuperscript{35} "Introduction: Postcolonial Technoscience," \textit{Social Studies of Science} 32, no. 5-6 (2002). 183-84
\textsuperscript{38} Frederick Cooper, \textit{Decolonization and African Society: The Labor Question in French and British Africa} (Cambridge: Cambridge University Press, 1996). 1
agriculture, Cullather traces the emergence and consolidation of the expertise that constituted the role of food aid and agricultural technologies as diplomatic tools for the U.S. during the postwar era. Awareness of the “world food problem” and its significance for the international order of the period ensured that “Asians ceased to be colonial subjects only to become development subjects, mobilized, sterilized, and enlightened by foreign experts” through a variety of techno-scientific efforts.39 Similarly, Vernon’s analysis of the scientific, geopolitical, and cultural dynamics at play in the creation and transformation of nutrition knowledge emphasize the interaction between metropolitan debates and colonial anxieties over the meaning and management of hunger. Vernon demonstrates that the crafting of the expertise that redefined hunger as malnutrition in Britain and the West was closely linked to trans-colonial and trans-imperial exchanges of expertise and technologies.40

Drawing from these insights, this dissertation illustrates an example of how contexts and political relations shaped the local outcomes of global biomedical knowledge and public health technologies. It investigates how global science, medicine, and public health trends contributed to the articulation of local power relations and political economies in mid-twentieth century Puerto Rico. The island’s circumstances—both at the center and the fringes of United States’ agendas—offers a singular opportunity to study how scientific knowledge travels and is coproduced across geographical and institutional sites. This perspective also reveals the contingencies and complexities of the relationship between scientific expertise and policy making. As a result of its position in Latin America and the Caribbean, Puerto Rico is a unique context to draw insights about how science and technology have historically served to both challenge and legitimize sociopolitical structures in the region. It also offers new opportunities to


expand the history of science by uncovering the connections between scientific activity in Puerto Rico and the Caribbean and transnational networks of knowledge and practices.\textsuperscript{41}

With this framework, the dissertation also expands the historiography of public health and medicine in Puerto Rico. Historians of the international health have documented how racialized notions of hygiene and civilization framed public health and medical projects in Puerto Rico and the broader Caribbean.\textsuperscript{42} In the case of Puerto Rico’s historiography, most existing studies focus on the period between the late nineteenth and early twentieth centuries and understand public health interventions as instruments for the colonial administration of the island.\textsuperscript{43} This approach is largely a critical reaction to earlier accounts of science and medicine as vehicles of “the good effects of colonialism”.\textsuperscript{44} However, this more recent historiographical focus tends to limit the role of local knowledge and actors in both scientific production and policy or to explain these as the result of expertise and technologies’ transmission from U.S. metropolitan centers to colonial peripheries. Also, most studies remain limited to the early twentieth century and generally do not account for how the relationship between local governing elites, scientific institutions, and the public influenced the design and outcome of public health projects after the 1920s.

\textsuperscript{41} Mariola Espinosa, "Globalizing the History of Disease, Medicine, and Public Health in Latin America," \textit{Isis} 104, no. 4 (2013).
\textsuperscript{44} Briggs, \textit{Reproducing Empire: Race, Sex, Science and U.S. Imperialism in Puerto Rico}. 1
Mirroring the ubiquity of overpopulation theories in Puerto Rico between the 1920s and 1960s, existing historical studies of public health and medicine on the island during the mid-twentieth century have focused on analyzing the political, colonial, racial, and gender dynamics underlying population control and contraception interventions.45 As Laura Briggs notes, while the population question was new to the development establishment in the post-war period, “the language of overpopulation had dominated the political and public health landscape in Puerto Rico” since the interwar years.46 Similarly, Briggs notes that Puerto Rico’s role in the expansion and showcasing of U.S. economic agendas throughout this period was a prototype for future globalization dynamics. Puerto Ricans’ labor migration experience, particularly after WWII, gave rise to the formation of new “imagined solidarities” in the U.S. that lay the foundations for future inter-ethnic dynamics. As Eileen Suárez argues in her study of notions of masculinity and domesticity in the articulation of the PPD projects, working class Puerto Ricans formed new “transnational encounters” as they entered global labor migratory circuits pushed by the dislocations caused by industrialization in the island’s rural regions.47

This dissertation applies these conceptual frames to understand the scientific and political articulations of nutrition knowledge and practices in mid-twentieth century Puerto Rico. In this sociohistorical context, nutrition technoscience was produced and circulated through geographical, disciplinary, and institutional linkages. Nutrition emerged as a field with multiple disciplinary links, practiced at many institutional settings, and reproduced through a variety of scientific and lay print media. In these multiple sites, nutrition ideas, practices, and objects drew

46 Briggs, Reproducing Empire: Race, Sex, Science and U.S. Imperialism in Puerto Rico. 8
47 Eileen Suárez Findlay, We are Left Without a Father Here: Masculinity, Domesticity, and Migration in Postwar Puerto Rico (Durham: Duke University Press, 2014). 12
from and were crucially incorporated into dominant political discourses. Thus, ideas about nutrition influenced a broad range of agendas from public health interventions—such as the control of infectious diseases and infant mortality—plans to curb overpopulation, proposals to rehabilitate the island’s agriculture, and arguments for reforms to the U.S. colonial regime.

Public Health, Society, and Economy in Puerto Rico (1920s-1960s)

Public health activities in Puerto Rico during the first decades of the twentieth century focused on identifying and controlling “the causative agents” that explained “the population’s lethargy and obvious ill health.” The early work of U.S. military physician Bailey Ashford reflected prevalent concerns with the relationship between rural populations’ poor health and their low productivity. Shortly after arriving in Puerto Rico, Ashford was struck by the prevalence of anemia among the people he treated. Motivated by these observations, he pursued systematic studies to identify the causative agent of Puerto Ricans’ anemic state. These studies led to the discovery of widespread “infestation by an intestinal parasite later designated as *Necator americanus*”, or New World hookworm. The successful identification of this parasite allowed Ashford to further experiment with various therapies to treat the infection. Based on these experiences he claimed that hookworm, “the scourge of the agricultural laborer in tropical and subtropical countries”, “could be treated and exterminated in a comparatively short time.”

Based on these discoveries, the colonial government established a Commission for the Study and Treatment of Anemia in Puerto Rico to conduct an extensive survey of the spread of hookworm infestation throughout the island. The commission employed “Ashford’s therapeutic approach” “based on the individual purging of the victims of hookworm”. Conducted between 1904 and 1905, these campaigns focused on “those living in the coffee-growing mountainous...”

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48 Ramirez de Arellano, "The Politics of Medical Education in Puerto Rico." 5
49 Ibid. 6
interior” where they established “59 anemia stations and reported the successful treatment of 250,000 persons, a quarter of the island’s population.”50 Patients attending these stations or dispensaries received clinical examinations, “submitted fecal samples for microscopic examination”, and “received a brief lecture on hookworm” where the use and construction of latrines “was vigorously promoted.”51 The success of these campaigns together with Ashford’s discoveries were publicized in the island and abroad. The Commission’s findings and work were particularly influential in the establishment of the Rockefeller Sanitary Commission in the southern United States.52 They also contributed to the implementation of similar hookworm-control campaigns in other U.S. colonial possessions such as Guam and the Philippines.53

The strategies and therapies employed by Ashford and his Puerto Rican colleagues to control and treat hookworm on the island became topics of debate in the world of tropical medicine.54 The activity of the Rockefeller Foundation in other settings further disseminated the hookworm control knowledge and practices refined by the Anemia Commission in Puerto Rico. The notoriety of the Commission’s work fostered Ashford’s interest in establishing an institution for the study of the “diseases of hot countries” on the island, where he lived for most of the rest of his life.55 In his campaign to promote Puerto Rico as a site for biomedical research, Ashford and his Puerto Rican colleagues appealed to colonial authorities’ anxieties with the low productivity of local labor. In 1912, these appeals led the Insular Commissioner of Sanitation to

50 Ibid. 7
51 Amador, "Redeeming the Tropics: Public Health and National Identity in Cuba, Puerto Rico, and Brazil." 133
54 Palmer, Launching Global Health: The Caribbean Odyssey of the Rockefeller Foundation.
55 Ramírez de Arellano, "The Politics of Medical Education in Puerto Rico." 8
establish an Institute of Tropical Medicine and Hygiene in San Juan which became “a center of international exchange of publications and research findings”.

By the early 1920s, the postwar circumstances brought to light “the hemispheric role” of the island, especially “as Pan-Americanism became a goal for those preoccupied with promoting inter-American cooperation”. In this context, local public health experts and officials from the recently created UPR advocated for the establishment of a more expansive medical training institution. For this, they argued for the need to affiliate with a U.S. higher education institution that could make Puerto Rico the scientific “meeting place” of “Anglo-Saxon and Latin” people. Columbia University emerged as the preferred sponsor. Meanwhile, the political conditions on the island were propitious as the new colonial governor Horace M. Towner, a veteran legislator with experience in health-related debates, supported the project.

Negotiations between the government of Puerto Rico and Columbia’s College of Physicians and Surgeons began in 1923. While Puerto Rican legislators and representatives “envisioned the creation of an undergraduate institution to train the physicians needed in an expanding health care system”, Columbia only endorsed a plan to offer “courses of advanced instruction and research in tropical medicine”. Despite these limitations, the Puerto Rican government accepted Columbia’s plan and “committed to providing the bulk of the funding” while the university pledged to provide “its name, its advice, and its administration.” When the “School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University” was inaugurated in 1926 it was advertised by Columbia as an “overseas laboratory”

56 Amador, "Redeeming the Tropics: Public Health and National Identity in Cuba, Puerto Rico, and Brazil.” 150
57 Ibid. 151-152
58 Ramírez de Arellano, "The Politics of Medical Education in Puerto Rico." 18
dedicated to give U.S. medical graduates “access to a population whose disease problems were not readily available in New York”.\textsuperscript{61} Under the tenure of its first Director Robert Lambert, all of the school’s professors were recruited from Columbia faculty leaving for Puerto Ricans “over a dozen of annually appointed clinical professorships or basic science instructorships.”\textsuperscript{62}

The local political struggles provoked by the unresolved colonial condition of the island framed these public health and scientific processes. During this period, Puerto Rico remained an unincorporated territory of the United States. The Jones Act, passed by Congress in 1917, substituted the 1900 Foraker Act as the island’s organic document. While this act extended U.S. citizenship to all individuals born in Puerto Rico, it was not accompanied by efforts to change the island’s colonial status. Given its geopolitical and economic value, “it was not on the path to independence like Cuba; it would not be incorporated like Hawaii; it would remain a colony”.\textsuperscript{63} The Jones Act also reorganized the local government and created the positions of Commissioners of Health, Instruction, Labor, and Agriculture and Commerce. It created an elective bicameral legislature composed of a 19-member Senate and a 39-member Chamber of Representatives. Voting rights remained limited to male citizens who also elected a Resident Commissioner to be the spokesperson of the island in the federal Congress. The extension of the citizenship to Puerto Ricans also made them eligible for military service as the U.S. entered the Great War. The political debates, conflicts, and reconfigurations provoked by the dispositions of the Jones Act shaped the island’s society during the following years.

The Puerto Rico of the interwar decades was a predominantly rural and young society shaped by the vagaries of agricultural exports industries. By 1935 the census estimated a total of 1,723,534 inhabitants from which 563,616 lived on urban areas and 1,159,918 in rural regions.

\textsuperscript{61} Ibid, 24-27
\textsuperscript{62} Amador, "Redeeming the Tropics: Public Health and National Identity in Cuba, Puerto Rico, and Brazil." 159
\textsuperscript{63} Del Moral, \textit{Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952}. 7
Of the total rural population 38,796 were infants of less than one year and 481,136 children from 2 to 13 years of age. Although land concentration in the tobacco and coffee regions of the interior was not as extensive as in the coastal planes where sugar cane was cultivated, the living conditions of most rural dwellers was similarly determined by their situation as agregados, or landless agricultural workers. In the central eastern region of the island, tobacco production expanded dramatically from 1900 to 1920 “transforming the livelihoods of small landowners and landless workers” who depended almost exclusively on it for wages. For the years 1938 and 1939 wages for male workers in cigarette factories averaged forty-three cents per hour and those in tobacco cultivation around six cents per hour. Throughout the island, some calculated that while the average weekly cost of an adequate diet per person was $3.19 per week, the average wage was approximately $3.00 per week. Accounting for other expenditures, such as clothing and housing, most landless families stood well below acceptable conditions of living.

The crisis of the Depression brought these “poorer classes, especially the rural peasants or jíbaros”, to the center of professional and political discussions. Muñoz Marín and his generation of professionals and intellectuals “came face to face with a segment of the population that had been traditionally considered wretched, sickly, aloof, and morally suspect”. Together with these long-standing concerns, anxieties with overpopulation and rural society’s high fertility rates framed this new attention to Puerto Rico’s public health and social problems. The interwar generation of professionals and scientists who staffed New Deal relief and reconstruction

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agencies channeled these anxieties by applying their expertise in medicine, public health, agriculture, and social work to address the effects of Puerto Rico’s chronic poverty.

The effects of the Depression over this society also provoked increased mobilization from nationalist groups and labor movements. Dockworkers, laborers in the needle trades, and tobacco and sugar workers struck for better wages. Consumers organized boycotts against gasoline and electric power companies and denounced increases in the price of basic necessities. Nationalist leader Pedro Albizu Campos channeled this upsurge in labor unrest and became one of its main public supporters. This unrest culminated with the drafting of the 1936 Tydings Bill proposing a plebiscite on Puerto Rico’s independence.69 Muñoz Marín, together with top figures like Fernós Isern, founded the PPD in 1938 after leaving the Liberal Party over disagreements about its official stance on the Tydings Bill. Although initially a pro-independence movement, leaders gradually embraced a middle ground ideology that advocated for “a plan of development in concert with the United States”.70 In the 1940 elections, Muñoz Marín negotiated its way to the leadership of the Senate while the following year Roosevelt appointed New Dealer Rexford Tugwell as Governor. Tugwell saw in Puerto Rico an opportunity to put in practice his public administration philosophy together with Muñoz and the PPD. The “agrarian question,” or the concentration of the island’s arable land by monocrops corporations, was a central rhetorical element in this party’s discourse.

Thus, as one of their first initiatives, the Tugwell- Muñoz Marín government promoted the enforcement of a 500-acre limitation in land ownership.71 Part of a general project for

69 José Trías Monge, Puerto Rico: The Trials of the Oldest Colony in the World (New Haven: Yale University Press, 1997). 94-95. Senator Millard Tydings was also the main author of the Bill for the Philippines’ independence.
70 Briggs, Reproducing Empire: Race, Sex, Science and U.S. Imperialism in Puerto Rico.112
71 María Elena Rodríguez Castro, "Foro de 1940: Las pasiones y los intereses se dan la mano," in Del Nacionalismo al Populismo: Cultura y Política en Puerto Rico, ed. Silvia Alvarez-Curbelo and María Elena Rodríguez Castro (Río Piedras, PR: Ediciones Huracán, 1993).
agrarian reform, the Land Law provided for the expropriation of surplus land its redistribution among landless workers. Title V of the Law attempted to provide individual plots to agregado families, who had tax-free usufruct rights over them.\textsuperscript{72} War time shortages of imported foodstuffs increased the need to make land available to promote subsistence farming and housing construction.\textsuperscript{73} Ismael García-Colón argues that these interventions lay the foundations for the profound changes in Puerto Rican society experienced during the following years.\textsuperscript{74} According to declarations by Fernós Isern at the 1944 Conference of the Anglo-American Caribbean Commission, with this land reform they hoped to eradicate poverty and dispossession through “the stimulation of an expanded and more balanced economy.”\textsuperscript{75}

The public health discourse of the 1930s influenced the planning and implementation of these reforms. This land redistribution strategy, as well as future development policies based on it, were attempts at reshaping Puerto Rico’s rural landscapes and preparing its populations, individually and collectively, for industrial waged labor. Fernós Isern and his generation of public health experts contributed to devise cures for rural populations’ social and physical ills. The land reform project was accompanied by other policies to modernize rural Puerto Rico, including the creation of the Puerto Rico Industrial Development Corporation (PRIDCO) in 1942 to exploit the island’s natural resources, test channels for marketing, distribution, and exportation of local products, and establish and operate government-owned industries to manufacture or distribute those goods.\textsuperscript{76} Three years later, the government created the Puerto Rico Agricultural Corporation (PRACO) to “expand agricultural activities, improve the fishing industry, and

\textsuperscript{73} “Extensión agrícola amplia su programa 4-H.” \textit{El Mundo}, 18 enero 1942.
\textsuperscript{74} García-Colón, \textit{Land Reform in Puerto Rico: Modernizing the Colonial State}.
\textsuperscript{75} Antonio Fernós Isern, "Postwar Planning in Puerto Rico," (San Juan: Insular Procurement Office, 1944). 11
develop installations to for the sale of local products.”77 By the late 1940s, as these modernizing policies were reconfigured as strategies to transform “an agricultural and rural-based society into an urban and industrial one”, PRACO was subordinated to PRIDCO in the allocation of both funding and personnel.78

These socioeconomic reform projects were tied to new efforts to address Puerto Rico’s centenary colonial dilemma. Stressing how Puerto Ricans’ racial stock made them capable not only of embracing democracy but also of serving as an example to the island’s former colonial ruler under Franco’s dictatorship, the now Resident Commissioner Fernós Isern wondered if:

“…fifty years of guidance by the United States are not enough to prepare us for democracy? Is democracy so difficult a subject or procedure or philosophy to learn? If it is, how can we expect peoples who have never known democracy, who have never been prepared for democracy, to embrace it? Yet, we are doing just that. We are telling the people of Spain—people of the same ancestral stock as Puerto Ricans—that the world will not accept them into the family of nations until they adopt democracy in their government.”79

At this time Fernós Isern was in Washington promoting projects to give Puerto Ricans a greater degree of local autonomy. One of the first reforms approved by the U.S. government was the passage of the Elective Governor Act, which led Muñoz Marín to become Puerto Rico’s first elected governor in 1948. In 1950, Congress passed Public Law 600 to establish mechanisms to provide Puerto Rico with its own constitution.80 Once the resulting Constitution of the ELA (translated as Commonwealth) was revised and approved by Congress, it was officially proclaimed in 1952. Under the Constitution, Puerto Rico’s government was granted some degree of local administrative autonomy but the island remained under the sovereignty of the Congress.

The PPD, as the Commonwealth’s advocate, and its allies in the U.S. presented it as the end of colonialism without the socioeconomic consequences of full independence. Many scholars, however, have argued that the inauguration of the ELA legalized and consolidated Puerto Rico’s colonial status, effectively turning the island into a modern colony.81

The promotion of the Commonwealth as Puerto Rico’s own kind of decolonization framed the implementation of a new economic development and modernization model aimed at increasing industrial manufacture production on the island.82 This economic development strategy, named Operation Bootstrap, was based on offering tax breaks, land and utilities subsidies, and a low-cost labor force to U.S. industries establishing plants on the island. Many of the industries established during these initial years were garment factories employing a mostly female labor force.83 Thus, Puerto Ricans were simultaneously transformed into citizens of a modern colony and subjects of an emerging development regime facilitated by the island’s position as “the best of both worlds for those fractions of the U.S. capital looking to expand internationally after WWII.”84 Government-incentivized migration to U.S. urban centers paralleled this phase of Operation Bootstrap.85

During the 1960s and the 1970s, the government reorganized its industrializing strategy to attract corporations willing to make a more “capital-intensive” investment and to employ skilled or semi-skilled workers. The industries attracted to the island during this period included electronics, oil refineries, subsidiaries of companies such as General Electric, Westinghouse, and

82 Dietz, Historia Económica de Puerto Rico.
IBM, du Pont, as well as pharmaceuticals. As a result of the socioeconomic changes promoted by these industrialization policies, by 1967 the World Bank classified Puerto Rico as a “developed nation,” “the first Latin American state to be officially given that designation.” In this context, while policymakers’ plans to diversify agriculture failed to materialize into, as researchers noted in 1966, “national food policies” that could foster the type of dietary and public health improvements nutrition experts had advocated for during the previous decades.

Overview of Sections and Chapters

This dissertation examines the emergence, circulation, and applications of nutrition knowledge and its role in the transformations the island experienced during the mid-twentieth century. It also explores how the interaction between colonial, international, and local structures of power shaped the articulation of nutrition knowledge, its political usages, and policy applications. This analysis further demonstrates the island’s role as a testing ground for the expertise that transformed other colonial subjects into developmental subjects later in the century. For this, the dissertation is divided in three parts. Part I discusses the sociohistorical factors shaping Puerto Ricans’ diet and food preferences and the emergence of nutrition as a public health concern. Chapter One draws from food studies and nutrition history literature to discuss how agricultural changes, political economy, and patterns of colonization shaped Puerto Rico’s diet and food system. Chapter Two analyzes how issues of diet and nutrition entered the purview of medical and public health experts during the interwar years by exploring biochemistry research at the STM. Chapter Three expands this analysis by focusing on how the

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work of home economists and social workers at the UPR, the public education system, and the Agricultural Extension Service defined the sociological foundations of the nutrition problem.

Part I also locates the creation and circulation of expertise about the problems of nutrition and food supply in Puerto Rico as part of regional and global networks of nutrition knowledge and practices as well as debates about its role in public health and rural development. For this, Chapter Two traces how scientists from Department of Chemistry of the STM adapted international nutrition knowledge to produce new insights about the biochemical composition and nutritional qualities of Puerto Rico’s “traditional” diet. Applying new biochemical methods and animal models, biochemists at the STM provided new explanations for rural people’s notorious lethargy and ill health. Chapter Three considers the work of home economists and social workers and how these professionals drew from long-standing preoccupations with the racial, health, and domestic characteristics of the island’s poor while applying new social nutrition and rural development approaches. This new attention to the “problems of rural life” was a global phenomenon fostered by the effects of the Depression over agricultural societies across colonies and nation-states.

Focusing on the policy and political responses to these moments of crisis in Puerto Rico, Part II explores how nutrition experts incorporated their assessments as part of rural hygiene programs during the Depression and of food policies during World War II. For this, Chapter Four examines how nutrition and public health experts attempted to address the island’s deficient diet and low consumption of “protective foods” through the work of New Deal agencies during the 1930s. Chapter Four also maps how concerns with nutritional deficiencies in Asian and African colonial laboratories as well as British possessions in the Caribbean influenced the network of scientists and institutions involved with nutrition in Puerto Rico, the different
disciplines associated with this field, and the instances of collaboration and contestation between them. As part of these efforts, local and U.S. officials emphasized the links between the problem of nutrition, people’s reliance on imported foods, and the utilization of most arable land for the cultivation of monocrops like sugar cane, tobacco, and coffee. As part of rural reconstruction projects to promote a more diversified economy, health and welfare experts also produced new knowledge about the sociological manifestations of the nutrition problem through dietary surveys, home visits, and medical examinations.

These insights informed the local and federal government’s response to the WWII emergency. Given the island’s strategic position in the Caribbean and the effects of German submarine attacks over importation and maritime trade, increasing local food production became an urgent need. Thus, Chapter Five examines the formulation and implementation of wartime food policies and the emergence of a new impetus to study the possibilities of local agricultural products to contribute to improve people’s diet. For this, the chapter analyzes the scientific activity at Puerto Rico’s Agricultural Experiment Station (AES), the professional and institutional collaboration between agricultural scientists and nutritionists, and their outreach programs promoting new agriculture technologies and the consumption of local foods among small farmers and the general public. These efforts drew from broader activities to set nutrition standards for military and civilian populations in the context of the war emergency, such as the establishment of the Recommended Dietary Allowances (RDAs) in the U.S. and the creation of specialized committees to administer supplies’ distribution and rationing measures.

Through these moments of crisis, nutrition and food experts established the biological, agricultural, and sociological basis of the nutrition problem and informed arguments in favor of agricultural diversification and land reform. These images entered the political rhetoric of what
became the PPD during the late 1930s and the implementation of its platform and plans during the 1940s. Therefore Part III, explores the interaction between nutrition ideas and political agendas in the implementation of child feeding programs throughout these decades and of public health and development strategies during the postwar years. Chapter Six explores the relationship between science and politics in the planning and implementation of milk stations and school meals programs. Through this discussion, the chapter analyzes the interaction between nutrition and child hygiene practices as part of the work of the Departments of Health and Education. The chapter also pays particular attention to child nutrition interventions’ in the context of the population control movement’s discourse and activism. Finally, it analyzes how Puerto Ricans’ appropriated nutrition’s political discourses to frame their claims for entitlements and participation in the welfare and public health system of the new PPD government.

Building on this analysis of the politics of nutrition, Chapter Seven examines the debates and implementation of legislation to require the enrichment of all rice imported to Puerto Rico and the promotion of the sale and consumption of dairy by-products such as powdered skim milk to serve as dietary supplements. The chapter analyzes the professional debates around food technologies and their public health role and how these reflected the relationships of power and expertise between disciplines and institutions within the field. It traces how the rice enrichment and skim milk projects in Puerto Rico were part of the global travel and coproduction of postwar nutrition practices and technologies. While highlighting these links, the chapter emphasizes how Puerto Rico’s scientific, political, and cultural contexts shaped their manifestations and outcomes. By examining the work of the Puerto Rico Food Policy Commission, Chapter Seven also examines the articulation of measures to modernize the island’s food distribution and sale
systems according to the changes fostered by industrialization and to teach consumers and food sellers to navigate these standardized and sanitized food marketplaces.

This chapter locates these processes as part of emerging local, regional, and international development schemes. It examines how nutrition expertise served the PPD government to draw from the Puerto Rican experience in the fields of nutrition, public health, and agriculture during the previous decades to bolster the island’s image as a “showcase of development” during the 1950s and of democracy during the 1960s. Therefore, this chapter also examine the deployment of Puerto Rican experts as part of international technical assistance and nutrition education agendas of the U.S. Point IV program and the Food and Agriculture Organization of the United Nations. Bringing it back to the island, the chapter finally analyzes the local articulation of the international community development movement as a new mechanism to promote rural development through nutrition and agricultural expertise.
Part I

Malnutrition in the Tropics: Nutrition, Biochemistry, and Home Economics

This section examines how nutrition became a public health concern during the interwar years through the work of biochemists, home economists, agronomists, and social workers. Chapter One considers the ways in which the circumstances of the 1920s and 1930s affected the markets for Puerto Rico’s export commodities (sugar cane products, tobacco, and coffee) and how these changes shaped the living conditions throughout the island’s agricultural regions. These changes directly affected people’s diet by altering the amount and type of food people obtained from cultivating the land as well as their ability to purchase imported products. In this context, public health and welfare experts became increasingly concerned with the relationship between these socioeconomic and political factors and the island’s nutrition problem.

Chapter Two shows that, as nutrition knowledge about food’s chemical components expanded during this period, the poor quality of Puerto Rico’s “traditional diet”—based on root crops, polished rice and dried beans—emerged as a cause of rural people’s low productivity and vulnerability to infectious diseases. During the 1930s, biochemical studies conducted at the Puerto Rico School of Tropical Medicine created a growing body of expertise about this diet’s nutritive qualities and the potential of other native products to supplement its vitamin and mineral deficiencies. As Chapter Three demonstrates, this knowledge informed contemporary education and social welfare efforts to teach the poor how to maximize the nutritional efficiency of their diets by choosing foodstuffs of better quality. Home economists, social workers, and agronomists employed by health, education, and agricultural extension agencies canvassed the countryside to implement these campaigns, measure the social causes and manifestations of the nutrition problem, and propose solutions to it.
Chapter One

Nutrition, Agriculture, and Colonial Political Economy

Poverty affects the health problem in two ways: not only are the masses of the people unable to afford medical treatment, but inadequate nourishment and an unbalanced diet contribute directly to disease.\footnote{Victor S. Clark, \textit{Porto Rico and Its Problems} (New York: Arno Press, 1930). 69}

Whatever the period considered, the diets of the islanders have been poor. Preemption of land for sugar at the expense of food crops, reliance on imported foods which cost more than the common people can afford, lack of education about food values, all have played a role in creating malnutrition.\footnote{Jacques M. May, \textit{The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago}, ed. Donna L. McLellan (New York: Hafner Press, 1973).vii-viii}

Introduction

In early 1970, Puerto Rican nutrition scientist Nelson Fernández of the UPR School of Medicine welcomed French medical geographer Jacques May to Puerto Rico. May was visiting the island as part of his international studies of disease ecology from the perspective of medical geography, a field that had been transformed from a "descriptive science" to "an analytical tool" since it was formalized during the nineteenth century.\footnote{Tim Brown and Graham Moon, "From Siam to New York: Jacques May and the ‘Foundation’ of Medical Geography," \textit{Journal of Historical Geography} 30, no. 4 (2004). 749} Medical geographers investigated "the natural and social-economic peculiarities of territories for the purpose of examining their influence on the state of health of the population."\footnote{A. P. Avtsyn, "The Interrelation between Medical Geography and Geographical Pathology," \textit{Pathologia et Microbiologia} 27 (1964). 943} May’s medical-geographic study of nutrition in the Caribbean included a close examination of the region’s ecological, political, and economic history. A tropical medicine expert, May also drew from his experiences as a colonial surgeon in Indochina during the 1930s and as medical geographer in the U.S. during the postwar years.
With this background and Fernández’s assistance, May sought to answer why “the traditional diet of imported cod, local beans, rice and a rich variety of fruits” failed to “provide adequately balanced intakes”, and why “the populations of the Caribbean islands have continuously suffered from malnutrition.”

That May visited Puerto Rico is not surprising given the “strong connection between medical geography and the United States military.” As Director of the Medical Geography Department of the American Geographical Society in New York, May conducted studies related to other diseases such as cancer. During the 1960s he “embarked on a series of country-by-country” studies of the ecology of malnutrition under contract with the Quartermaster Research and Engineering Command of the U.S. Army. Puerto Rico’s strategic role in the Caribbean Cold War made it a natural subject for such an endeavor. His findings had the potential to provide yet more proof of the benefits of following a model of development in concert with the United States’ geopolitical interests. However, his assessment of the effects of the island’s postwar industrialization and modernization program was ambiguous. While he highlighted the “unprecedented success” of the program in rising incomes, May called attention to the Commonwealth’s lack of food self-sufficiency and its effects over nutrition. This situation, he considered, was “not imposed by underdevelopment” or by ecological factors, but rather the result “deliberate” actions taken during the past decades.

The template for to those “deliberate actions” began to emerge during the late 1920s in the context of a decade of instability in the island’s sugar industry and the general monocrops

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92 May, *The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago*. viii
93 Brown and Moon, "From Siam to New York: Jacques May and the ‘Foundation’ of Medical Geography." 748
95 Brown and Moon, "From Siam to New York: Jacques May and the ‘Foundation’ of Medical Geography." 751
96 May, *The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago*. 283-284
agriculture economy. In 1928, the Brookings Institution sent Victor Clark to investigate these socioeconomic conditions and propose solutions. As part of this inquiry into “the Island’s persistent economic difficulties”, the study included all aspects of life including food consumption, public health, and medical care. Clark and colleagues described the cycle of poverty, poor health, and deficient diets in rural areas as one of the main factors leading to these economic difficulties. They also noted that “large families and extremely low incomes keep hundreds of thousands of people continually on the verge of starvation.” The nature of the relationship between low labor productivity, overpopulation, “inadequate nourishment”, and disease became a central aspect of public health debates during the following decades.

This chapter examines the economic and political processes underlying Puerto Rico’s nutrition and public health transformations during the mid-twentieth century. As the rest of the Caribbean islands, Puerto Rico’s experiences of colonialism and monocrops agriculture have shaped patterns of land use, dietary practices, and nutrition outcomes. The influence of U.S. economic and geopolitical agendas in the region was also central to the islands’ public health and nutrition history. To explore these processes, the chapter locates the dissertation’s approach to the study of nutrition sciences and politics in Puerto Rico as part of historiographical and public health studies of food, diets, and nutrition. It then traces the historical trajectory of the “traditional” diet that was subject of scientific, public health, and political attention during the mid-twentieth century. Finally, it considers the establishment of food relief programs throughout this period in the context of these socio-historical processes.

By tracing this trajectory, this chapter lays the groundwork for the dissertation’s analysis of nutrition scientific and political discourses in Puerto Rico and of their incorporation into food

97 Clark, *Porto Rico and Its Problems*. vii
98 Ibid. 63
policies and development projects during the mid-twentieth century. During this period biochemists, home economists, social workers, physicians, and agronomists approached Puerto Ricans’ food preferences, cooking habits, and dietary practices as timeless and abstract entities that could be studied in the laboratory, depicted through surveys and questionnaires, and altered through education and expert guidance. However, while these expert understandings were shaped by notions about the superiority of middle-class Western diets (based on wheat, meat, and dairy products) these were also crucially incorporated into political arguments calling for reforms to the socioeconomic structures determining people’s relationship to the land. Central to these claims were critiques of the ways in which this relationship shaped people’s diet.

**Food, Nutrition, and Health**

The intersections between nutrition sciences, agriculture, political economy, and public health has been explored by environmental, medical, and social historians. As part of this body of literature, public health and nutrition scholars investigate the relationship between food availability and public health outcomes. These works focus on the ways that sociopolitical forces and environmental factors shape food choices and the spread of diet-related diseases.\(^9\) Generally, these scholars contend that historical transformations in agricultural production and public health practices are key to understanding the contemporary landscape of nutrition and food policies. They also consider the dynamics underlying scientific, academic, and political discussions around the obesity “epidemic” in the United States. Other scholars approach the relationship between nutrition and political economy by analyzing the ways in which race and

class inequities have shaped the U.S. food system. These studies also show the global linkages between food production and consumption patterns and their public health manifestations.

The growth of the field of Food Studies and of the historiographical scholarship on food as part of it has produced a vast literature exploring the sociopolitical processes shaping food production, consumption, availability, and preferences. Social historians explore how technological and cultural changes, commercial interests, urbanization, and agricultural and ecological transformations led to the creation of new “foodways” and the disappearance of others. Among these, Harvey Levenstein’s comprehensive studies of these processes in the United States are considered landmark works. Latin American historians have explored similar topics in the region, emphasizing the role of food policies and nutrition programs in the legitimization of political regimes and the organization of nation-states during the twentieth century. European historians have also analyzed the relationship between political processes, economic change, government regulation, and food habits.

Historians have also focused on food cultures to explore processes of immigration, assimilation, and cultural affirmation throughout the nineteenth and twentieth centuries. For this, they trace the emergence, popularization, and commercialization of ethnic foods or dishes in the

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United States. These studies explore the encounters, conflicts, and negotiation of migration by analyzing the interaction between migrants’ food practices and U.S. eating habits, commercial interests, and government agencies. Considerations of how gender, racial, and class norms dictate patterns of food production, choice, preparation, and consumption in any given society have been central to these analyses. As Hasia Diner emphasizes, “the distribution and consumption of food has been historically determined by age, gender, and class, and its unequal allocations highlight internal group difference.”

These differences have been reflected in both the unequal allocation of food and in its effects over populations’ health. Food scholars have explored these processes by tracing the expansion of regulatory frameworks to organize food production, distribution, and sale as well as to intervene with the public health effects of poor diets. These studies examine the trajectory of food products across space and time and the ways in which technological, economic, and cultural transformations shape their production and consumption. The case of milk stands out as a subject of study in this literature. Of particular interest has been the transformation of milk as an essential food for both children and adults as a result of a complex interaction between agro-economic imperatives, demographic changes, gender and religious ideas, scientific innovation, and public health regulation. As part of these works, historians have investigated the

105 Diner, *Hungering for America: Italian, Irish, and Jewish Foodways in the age of Migration*. 4
implementation of food policies at times of crisis such as the Depression and World War II, and how these contexts influenced government nutrition agendas in the following decades.109

Another area of study explores agricultural commodities’ exchanges and how these shaped people’s eating habits in both colonies and metropolis.110 Among these, Sidney Mintz examined the colonial political economy of food production and consumption by tracing the historical and geographical trajectory of sugar between the Caribbean islands and the Northern metropolises. Through this, Mintz “attempts to put consumption together with production” or “to fit colony to metropolis.”111 Similarly, Andrew Liu argues that British companies’ appropriation of the tea plant from southern China and its cultivation in India during the mid-nineteenth century resulted from particular political, agricultural, and labor conditions making tea plantations “a viable project”. These conditions were “consequence of overseas trade as much as the byproduct of foreign occupation and land appropriation.”112

Also emphasizing the transnational and trans-colonial nature of food habits, historians have considered nutrition and hunger’s political significance.113 Those focusing in the post-WWII decades generally situate concerns about nutrition and hunger as part of Cold War politics.

111 Mintz, Sweetness and Power: The Place of Sugar in Modern History. xvii
112 Liu, "The Birth of a Noble Tea Country: The Geography of Colonial Capital and The Origins of Indian Tea." 74-75
and the spread of development schemes during the 1950s and 1960s. These processes framed the international organization of food relief programs and the deployment of agricultural technologies, such as dams and fertilizers, in the decades after World War II. These studies also consider how “Third World” overpopulation anxieties and Cold War tensions influenced the discourse of both nutrition and agricultural sciences during this period. As part of these processes, scholars have analyzed the conflicts between U.S. government agencies, particularly the USDA and the Children’s Bureau, and UN agencies such as UNICEF and FAO. The nutrition interventions promoted during this period, based on the distribution of milk products and food enrichment technologies, were part of broader trends in international public health approaches marked by “top-down” campaigns and technology-driven interventions. In recent decades, the involvement of new private actors in international health programs has also shaped the design and outcomes of nutrition strategies implemented in poor countries.

Historians of science and medicine have explored the trajectory of understandings about nutrition and the relationship between diet, disease, and public health. Studies of deficiency diseases and famine episodes are an important part of this literature. Others focus on the professionalization and institutionalization of scientific disciplines dedicated to study of nutrition and diet. This literature also explores the emergence and circulation of nutrition knowledge

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117 Anne Effland, "International Programs of the USDA: Cross-Purposes or a Delicate Balance?", *Agricultural History* 87, no. 3 (2013).
and food technologies during the twentieth century. Some of these works trace the transformation of the field during the early decades of the century as a result of the political and scientific responses to the crisis of the Great War. This literature shows how the biochemistry laboratory emerged as the most authoritative site for the production of nutrition knowledge turning the field into one of the most dynamic scientific arenas during the interwar years. Despite the slow pace at which scientists were able to discern the mechanisms behind the action of newly discovered vitamins, professionals like home economists, social workers, and physicians avidly incorporated this new nutrition knowledge to their practices. Concerns with the quality of people’s diet and its relation with labor productivity and vulnerability to disease permeated international and inter-colonial public health debates.

This new perspective redefined the relationship between food and health, from a focus on hunger or lack of food to increasing interest on deficient diets and their manifestation as malnutrition. However, this focus obscured as much as it illuminated. The exact mechanisms through which the new vitamins and minerals being discovered acted in biological processes, particularly in the body’s disease fighting systems, remained largely unknown throughout the interwar years. Despite this gap, historians of food and nutrition have analyzed how this new knowledge fostered the articulation of new ideas about the poor and their health status. Levenstein argues that during the 1920s “the idea that poor people’s inadequate diets were more the result of ignorance of nutritional science than of low income prevailed among dietitians and home economists.”120 Together with social workers, home economists “plied the poor”—

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120 During the 1920s “dietitians” became a term used by home economists who specialized in food.
particularly the new immigrants—“with recipes, menus, and budgets” to teach them the principles of “healthy eating at minimal cost.” These new nutrition campaigns, however, were not only shaped by the knowledge coming from the laboratory. Food processors were quick to recognize the commercial potential of the new emphasis on goods as carriers of “essential elements” to promote their products and increase profits.

In the context of the Depression, this new scientific knowledge was also incorporated into emerging critiques to the economic system and the imbalances in agricultural production and consumption it fostered. It provided scientists and public health officials compelling explanations for the prevalence and effects of diseases among the poor, leading, according to Worboys, to the “discovery of colonial malnutrition.” The techniques employed by nutritional biochemists were crucial for these new interpretations. Among these, the rat growth method became the “gold standard test” in biochemical nutritional research during this period. Using this method, nutrition scientists engaged in an international exchange of knowledge about the activity of vitamins and the effects of deficiencies in the rat and the human. This network of nutrition expertise relied heavily on experimentation in tropical laboratories and with “native” diets “uncontaminated” by modern habits. Studies in the tropical laboratory demonstrated that good nutrition was the universal key to health and productivity, regardless of race or ecology. Instead of explaining

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121 Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America*. 6
122 Ibid. 15-16
123 Worboys, "The Discovery of Colonial Malnutrition between the Wars." Arnold, "The ‘Discovery’ of Malnutrition and Diet in Colonial India."
diseases in the tropics as the result of climate or geography, the colonial laboratory showed that these had the same basis as diseases among populations living in temperate climates.126

This dissertation draws insights from the historiography of nutrition science and public health as well as from social histories of food and agriculture to explore scientific, public health, and medical debates about nutrition in Puerto Rico. The effects of the Depression on the island brought the plight of the rural poor and their lack of adequate food to the center of political and scientific discussions. The 1930s was also a decade of political reconfigurations and natural disasters that increased the visibility of the living conditions and health problems in rural areas. As part of this new attention, nutrition scientists and public health experts articulated new critiques of the effects of monocrops agriculture over patterns of food production, availability, and consumption. This critique found fertile ground in this increasingly politicized context, which gave rise to the most outspoken challenges to the U.S. colonial control of the island.

Nutrition and Colonial Agriculture in Puerto Rico

Food historian Hasia Diner argues that fulfilling “the most fundamental need” of eating to live “never was easy”. For most people throughout history, “food choices depended upon what was available locally” while “basic forms of social organization, and human societies were structured according” to how people “hunted, gathered, farmed, or fished.”127 The case of Puerto Rico demonstrates how the island’s agricultural history shaped people’s diet and fostered an increasingly limited role of “what was available locally” as part of it. This disassociation and the resulting dependence on food imports from the metropolis, either Spain or the U.S., reached its climax during the interwar years. By this time, almost three decades of economic policies designed to facilitate the accumulation of land for the cultivation of monocrops for export,

127 Diner, *Hungering for America: Italian, Irish, and Jewish Foodways in the age of Migration*. 2-3
particularly sugar cane and tobacco, were reflected in what nutrition experts described as a “monotonous diet”, composed mainly of imported products and locally-available but little nutritious starchy crops. These depictions of Puerto Ricans’ health and social problems offered new interpretations of the problems of rural life that, by the end of the 1930s, became powerful political arguments.

As Puerto Rico’s working and rural poor increasingly relied on imports to meet their food needs during the 1920s, the shortages and hunger provoked by the Great War highlighted the need for international cooperation among agricultural scientists and industries. In this context, the International Institute of Agriculture (IIA), the first international agency dedicated to agricultural research to inform national policies, played a leading role. The IIA was created in the late nineteenth century to centralize the collection of agricultural statistics and “to disseminate information on agricultural legislation, scientific advances and national agricultural policies”. However, it was not until the interwar years that these processes articulated into a “growing transnational consensus about the role of agriculture in international relations.”

Responding to the crisis of agricultural economies resulting from the Depression, the IIA joined the League of Nations Health Organization (LoN) in efforts to establish nutrition standards and delineate agricultural reform programs. The particular manifestation of this crisis in colonial agrarian economies put imperial powers at the center of international nutrition debates. In this context, the LoN and the IIA called for the promotion of nutrition and agricultural sciences to address the social and public health problems exacerbated by the Depression.

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129 By the end of WWII, the faith in the potential of nutrition and agricultural science to craft solutions to the food problems of the decolonizing and modernizing world led to the creation of the Food and Agricultural Organization of the United Nations.
While research institutions and organizations like the IIA exchanged emerging knowledge about food and on nutrition during the 1920s, Puerto Rican society was experiencing the effects of a decade of falling agricultural prices and renewed Americanization policies. During this period, public health and welfare workers drew from new understandings of the relationship between food and disease to assess Puerto Ricans’ dietary habits. As part of these debates, nutrition, health, and agriculture experts grappled with ecological, geographical, demographic, and politico-economic factors in their discussions of the relationship between the island’s food supply and the adequacy of people’s diets. Changing political and economic agendas shaped these understandings and their implications for public health and agriculture during the following decades.

Anthropologists and historians have produced a vast body of literature analyzing how the island’s monocrops economy shaped Puerto Rico’s society while inserting the island in global networks of commercial and technological exchange. As part of this literature, Mintz considers the island’s case as a reflection of the role played by Caribbean island-territories as part of transformations in international trade, consumption patterns, and political organizations during the past five centuries.130 For this, Mintz traced the trajectory of sugar cane cultivation from Asia to the Caribbean and the multiple travels of its derivatives until the final refined product reached North American and European consumers. This research served as a foundation for future scholarly work exploring other global networks of food production and consumption.131 Mintz’s investigation of sugar cane’s agricultural, cultural, and political history stemmed from his early studies of this industry and its sociopolitical foundations in Puerto Rico, where began his academic career as an anthropology graduate student. During the early 1950s, he worked as part

130 Mintz, *Sweetness and Power: The Place of Sugar in Modern History.*
131 Andrew Smith, Jeffrey M. Pilcher, and Darra Goldstein, "Food scholarship and food writing," *Food, culture, & society* 13, no. 3 (2010).
of the team of researchers led by Julian Steward and sponsored by the government of Puerto Rico and the Rockefeller Foundation to study the island’s society as it began to be transformed by industrialization and modernization policies.\textsuperscript{132}

As part of this early fieldwork, Mintz became familiar with the social, economic, and geographic organization of the sugar industry on the island and the ways in which it shaped the political project of the PPD. Reflecting on the disconnection he observed between production and consumption Mintz noted “of course, the sugar was not being produced for the Puerto Rican themselves; they consumed only a fraction of the finished product.” While Puerto Rico had been producing sugar cane for four centuries”, refined sugar was destined “for consumers elsewhere, whether in Seville, in Boston, or in some other place.” Thus, the existence of this powerful demand for sweetness elsewhere ensured the funneling of “huge quantities of land, labor, and capital” into “this one curious crop.”\textsuperscript{133}

While this “curious crop” dominated Puerto Rico’s coastal plains at the time of Mintz’s fieldwork, coffee and tobacco cultivation also contributed shape the island’s regional economies and local politics since the nineteenth century. Apart from distinct regional socioeconomic characteristics, these crops were associated with significant differences in patterns of land use and access to it for food crops cultivation. While it already coexisted with the other two main monocrops, coffee cultivation was the main economic activity in Puerto Rico during the late nineteenth century.\textsuperscript{134} After the U.S. took over the island in 1898, North American investment in both sugar cultivation and in tobacco processing “led those industries to rise at the expense of coffee.” Moreover, “the inclusion of Puerto Rico in the U.S. tariff system after 1901 opened an


\textsuperscript{133} Mintz, \textit{Sweetness and Power: The Place of Sugar in Modern History}. xviii-xix

immense market to sugar and tobacco producers” at the expense of their Cuban and Dominican counterparts.135 Without such protection and having lost its access to European markets after the Spanish retreat, coffee cultivation entered a period of decline.

In this context, tobacco farms gradually penetrated the eastern highlands where the climate and geography facilitated the production of a high quality product. This gave tobacco farmers considerable political power which they readily deployed to defend their interests and negotiate the terms of the U.S. colonial regime during the early twentieth century.136 Similarly, sugar cane fields began to dominate the coastal plains while big conglomerates began to control a greater portion of the industry compared to small growers or colonos. These semi-independent growers rented land to cultivate cane which they sold to a nearby sugar central for initial processing. Both big corporations and colonos hired most of the agricultural labor needed at the time of the harvest, or zafra. Throughout the rest of the year, most of this labor force needed to find work elsewhere. This seasonal rhythm of labor and the precariousness it produced became a central theme in nutrition experts’ analysis of the relationship between poverty and malnutrition. In their assessments, poverty and malnutrition in the cane zones were inextricably linked to this economic system that fostered a mass of people without a stable income to purchase adequate foods and with limited access to land to cultivate their own.

Although seasonal labor also affected the purchasing power of agricultural laborers in the coffee and tobacco regions, they had a greatest access to land to cultivate food crops. The island’s central highlands remained isolated in many regions due to the lack of roads and government services. This facilitated some degree of access to unmarked land, either for

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subsistence cultivation or to harvest fruits and other crops. In the tobacco regions, since this crop did not require big tracts of land to yield profitable outputs, farmers also “could dedicate a percentage of the available farmland to food crops for domestic consumption that could then be sold at the local markets.” Apart from this, “tobacco occupied the land for only several months out of the year, freeing well-fertilized land” for food crops cultivation, either for the farmer’s family consumption or for the markets. 137 These regional variations led to important differences in people’s ability to diversify their diets through locally cultivated foodstuffs. In cane growing regions, laborers had “almost no land of their own”, while those “in the coffee and tobacco districts quite generally have an opportunity to raise some food.”138 Regardless of these regional differences, during the first half of the twentieth century rural Puerto Rico was characterized by the precarious relationship that most dwellers had with the land they inhabited and cultivated.

Rural Puerto Rico during the Interwar Years

While the extent to which the arrival of U.S. rule altered existing patterns of landownership is a matter of historiographical debate, people’s access to land for subsistence agriculture became more limited during the first decades of the twentieth century. Recent analyses of the economies and societies of rural Puerto Rico during this period have challenged the interpretation of the new land tax passed by the U.S. colonial government. For example, Ayala and Bergad contend that census data does not support the argument that this tax promoted the “large scale alienation of land, particularly by small scale farmers who were supposedly forced to sell because they did not have the capital to pay the tax.” In their interpretation, “rather than accelerating the concentration of property”, the tax led to the division of large farms, “an

137 Ibid. 39
138 Clark, Porto Rico and Its Problems. 29
increase in the number of property owners, and a decrease in average farm size.”139 These circumstances resulted in the incorporation of idle land “into the rapidly expanding market economy” through the cultivation of cash crops for export.

Moreover, data also shows that “landholders constituted a very small portion of Puerto Rican rural society in the late Spanish colonial period.”140 This was especially the case in the coastal regions, later incorporated to the big sugar producing estates, where rural landlessness was widespread. However, while small landowners were a minority of the island’s population before 1898, the implementation of the U.S. fiscal and economic system facilitated the spread of monocrops agriculture throughout the island. These circumstances limited the profitability of food crops cultivation for local markets, compared to export crops, as well as access to land for subsistence agriculture. According to a study conducted by the Brookings Institution during the late 1920s, this was discouraged by sugar plantation owners due to “the belief that the cultivation of food crops by the laborers encourage the spread of insect pests”.141 Thus, small tobacco farmers and their families, who owned their land and engaged in food crops cultivation after the harvest, and sugar cane colonos, who enjoyed a higher income that allowed them to purchase more foodstuffs, were the minority of the island’s rural population.

Apart from colonos and small farmers, the other group of rural workers affected by changes in agricultural and land policies during the early twentieth century was the so called agregados or resident laborers. While many rural families owned no land during the late nineteenth century, “an undetermined number had usufruct rights over small parcels as agregados, renters, or sharecroppers or in other arrangements that exchanged their labor for land

139 Ayala and Bergad, "Rural Puerto Rico in the Early Twentieth Century Reconsidered: Land and Society, 1899-1915." 70-71
140 Ibid. 72
141 Clark, Porto Rico and Its Problems. 28
use.”\textsuperscript{142} By the 1920s, however, many agricultural laborers throughout the island relied only on their wages to purchase food. As Mintz notes most rural peoples “were not farmers, for whom the production of agricultural commodities was a business; nor were they peasants, tillers of soil they owned or could treat as their as their own, as part of a distinctive way of life.” Instead, “they were agricultural laborers who owned neither the land nor any productive property, and who had to sell their labor to eat.”\textsuperscript{143} This image of the uprooted and weakened peasant portrayed in Mintz’s analysis reflected contemporary discourses about the problems of the rural poor.

A survey of food availability conducted by the Insular Department of Agriculture and Labor in 1924 and quoted in the Brookings study supports Mintz’s observation about rural people’s state. This survey found that approximately 94 percent of the income earned by the 267 families surveyed was spent in food.\textsuperscript{144} In this survey, polished rice and dry beans occupied the first and second place respectively among the food items to which the family dedicated the greatest percent of their income. For the Brooking researchers, this “dominance of imported dry foods, especially polished rice” was one of the “most disturbing aspects” disclosed by their study of rural family budgets.\textsuperscript{145} Thus, by the 1920s the patterns of land use and labor resulting from the island’s monocrops agricultural economy were manifested in a diet composed by foodstuffs that were mainly imported. This was the context encountered by nutrition and public health experts working in rural Puerto Rico during the interwar years.

At the time the School of Tropical Medicine (STM) was established in 1926, public health and welfare professionals were debating the effects of this gradual increase in food imports dependency and decrease in local food crops agriculture over the quality of the people’s

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\item \textsuperscript{142} Ayala and Bergad, "Rural Puerto Rico in the Early Twentieth Century Reconsidered: Land and Society, 1899-1915," 75
\item \textsuperscript{143} Mintz, \textit{Sweetness and Power: The Place of Sugar in Modern History}. xxii-xxiii
\item \textsuperscript{144} Clark, \textit{Porto Rico and Its Problems}. 32
\item \textsuperscript{145} Ibid. 33
\end{itemize}
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diets. During these years, local government and research institutions like the STM hired Puerto Rican experts who trained U.S. universities at a time when medical and welfare professionals were engaged in efforts to reform the eating habits and domestic practices of immigrant populations. Thus, the approaches of this generation of local scientists, social workers, and teachers to the island’s health and nutrition problems were shaped by current U.S. middle class notions of what was adequate, healthy, and nutritious to eat. These new ideas were incorporated into local discourses about the racial, physical, and moral makeup of rural populations while providing standards to assess Puerto Ricans’ health state and dietary habits.

Together with the recast of class, racial, and gendered notions of the problems of rural populations, the application of new nutrition principles in Puerto Rico fostered discussions about the sociopolitical factors underlying people’s monotonous diets and low productivity. By the late 1920s, these discussion included considerations of the effects of the Jones Merchant Marine Act of 1920. The passage of this Act by the U.S. Congress 1920 gave rise to “what was arguably the nation’s most important cabotage law.” Cabotage laws were “government measures used to protect or foster a domestic shipping industry by reserving all or a portion of international sea commerce to ships which fly the national flag.” The 1920 Act “restricted the transport of goods from points within the United States to vessels constructed and registered in the United States and owned by U.S. citizens or companies.” These restrictions ensured the early integration of Puerto Ricans’ food importation system to U.S. mercantile and commercial interests.

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This Act had far reaching consequences for the accessibility and cost of foodstuffs in Puerto Rico. As the land dedicated to agriculture for the local food supply was reduced, leading to a “process of dietary shrinkage and simplification”, the island’s food ecology was increasingly shaped by U.S. mercantile and agro-industrial interests. While Puerto Rico’s reliance on imports to supply a significant proportion of its population’s food needs started, as in the rest of the Caribbean, before the end of the nineteenth century, during the interwar years this dependence reached its highest point. One of the first projects conducted by nutrition biochemists at the STM estimated the effects of this long-standing dependence on food imports for Puerto Ricans’ health and labor productivity. As part of these investigations, experts like Henry Sherman and Donald Cook considered the relationship between this “monotonous” diet lacking “protective” foods and the monocrops agriculture system. In the sociopolitical context of the 1930s, these discussions drew from and contributed to broader proposals to reform the island’s agricultural economy. Nutrition’s public health, political, and economic implications made it a particularly useful vehicle to talk about the problems that afflicted Puerto Rico, to propose solutions for them, and to promote new models to put those plans into practice.

This focus on Puerto Ricans’ diets and nutrition problems coexisted with attempts to control population growth through the promotion of contraception and the distribution of birth control. In the analyses of Puerto Rican nutrition and health experts, anxieties with overpopulation paralleled discussions about the effects of monocrops agriculture, insalubrious housing, poor diets, and limited access to education and medical care. In this context, nutrition

149 Carro-Figueroa, "Agricultural Decline and Food Import Dependency in Puerto Rico: A Historical Perspective on the Outcomes of Postwar Farm and Food Policies." 83
science and practices became part of broader “pedagogical projects” to reform rural society through public health, agricultural diversification, social work, and contraception. Attempts to improve Puerto Rico’s “traditional diet” by extending home economics education and food crops cultivation methods to rural regions became key parts of these pedagogical projects.

Puerto Rico’s “Traditional” Diet

In March of 1944 faculty from the Department of Home Economics of the University of Puerto Rico summarized the findings of dietary surveys conducted during the previous decade as part of new efforts to revise their curriculum. According to the “Plan for Program of Home Economics in the University of Puerto Rico”, the most important findings uncovered by these surveys highlighted that “the very lowest income level, which consists of those depending on casual employment, subsist on black coffee, with one meal a day of starchy vegetables or rice and beans or cornmeal or whatever is the cheapest food at the time.” Families of “those just above this, the laborers, may have some additions such as sugar in the coffee, a little milk if available, two meals instead of one, lard for cooking and codfish occasionally.” The families in the next income level “will have some milk in their coffee, more codfish, and some meat…occasionally.” Finally, “when the level of comfort of liberal living” was attained, the basic diet was retained but it was supplemented by milk, eggs, meat, cheese, and other foods. Regardless of income level, rice and beans formed the backbone of the people’s diet.¹⁵²

These excerpts reflect three main characteristics of nutrition’s scientific and welfare discourses in Puerto Rico during the mid-twentieth century. First, the focus on a set of food items thought to be representative of people’s “traditional” or “basic” diet. Second, the prominence of

¹⁵² “A Plan for Program of Home Economics in the University of Puerto Rico,” March 1944. ACUPR, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder Escuela de Economía Doméstica, Programa de Economía Doméstica, 1944. In Puerto Rico, the term viandas is used to refer to starchy and root crops including green bananas, breadfruit, plantains, yucca, sweet potatoes, dasheens, tanniers, taro, among others.
dietary surveys as the most widely utilized method to assess the nutritional status of a population. Third, the reliance on income levels as a measure of both poverty and nutrition. Surveys determining dietary adequacy utilized estimations of the proportion of the income a family utilized for the purchasing of food as measurements of both nutritional status and poverty level. This method “was by far the greatest producer of alarms” regarding the prevalence of malnutrition among the poor in both the U.S. and Puerto Rico. Apart from the proportion of income dedicated to food purchases, nutrition experts estimated the quantity of known nutrients necessary for good health and calculated the minimum amount of money needed to purchase foods to supply these amounts. Anyone or any family spending less than this was considered to be malnourished. However, the exact mechanisms through which these nutrients acted in the body were unknown while the methods utilized to measure their presence and action remained rudimentary and controversial.153

Despite these uncertainties, by the mid-1920s both international and local observers agreed that one of the most important factors underlying the island’s public health problems was the poor quality of the basic diet. As part of these nutrition discourses, Puerto Ricans’ widespread consumption of white rice and red beans became the subject of many studies and analyses. Similarly, visitors to the island recorded their impressions of people’s preference for these foods in the writings and commentaries. By this time, however, most of the rice and a good proportion of the beans consumed in Puerto Rio were imported. Cruz Ortiz Cuadra argues that this “preference” for polished rice and red beans was the product of “the shrinkage and simplification” of the island’s diet. In his analysis, these processes were directly associated with the “shifting priorities of monocultural latifundia” during the past century.154

153 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 57-58
154 Ortiz Cuadra, Eating Puerto Rico: A History of Food, Culture, and Identity. 38
These processes began during the mid-nineteenth century as a result of the intensification of sugar cane cultivation fostered by the liberalization of commerce in Puerto Rico and the remaining Spanish colonies. During this period, measures were also put in place to facilitate the immigration of individuals from various European regions and to modernize agricultural production. In Puerto Rico, these provisions led to the expansion of the land utilized for sugar cane cultivation mainly in the coastal valleys. These changes affected population’s access to land to cultivate rice, a foodstuff that was a part of the local diet since the sixteenth century. During this period the Spanish imported increasing numbers of African slaves to work in the growing sugar cane fields. It was those enslaved populations, “hailing from the rice cultures of West Africa”, who began to cultivate rice on the island. The preference for this grain was related to several factors. First, rice was a staple in the regions of origin of many of the African groups brought to Puerto Rico. Second, given that it “conserved well and required minimal protection” slave traders used rice as part of rations during the Atlantic passage. Finally, African’s “close connection of agricultural labor during the initial stage of sugar production” gave rise to “the first experiments with rice cultivation on both land that was used for subsistence farming on sugar plantations and in the encampments established by runaway slaves.”

The rice cultivated initially by Africans and later by the criollo farmers in the island’s coastal valleys belonged to the *glaberrima* variety. According to Ortiz Cuadra, this choice was likely related to the location of the first sugar plantations close to the wetlands and marshy areas of Puerto Rico’s northern coast. The *glaberrima* species of rice was more resistant to the saline conditions of this area and to both drought and flooding. Other varieties of rice, like the *sativa*,

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later reached the island and became adapted to the marshlands environment. As the cultivation of these varieties of rice in the coastal valleys of the island increased consistently throughout the seventeenth and eighteenth centuries, it became a part of the daily diet not only in the areas “heavily populated by communities of African origin” but for the general population. Rice’s rise to popularity was due to factors like its capacity to yield grain multiple times a year and its virtue of conserving well for long periods of time. By the end of the eighteenth century, these qualities had “turned rice into one of the most available and dependable foods on the island.”

Apart from the properties of these particular varieties of rice, the process utilized to render the grains edible during this period contributed to increase its quality as a source of nutriment. Before rice could be cooked the grains were husked by beating the rice with a mallet after placing them in a wooden basin. The process locally used in the husking of the seed allowed it to retain the bran which, when applying the nutritional knowledge emerging during the 1920s, made this type of rice more nutritive because it was not subjected “to excessive friction” as when it was husked between millstones. Milling eliminated the rice husk seed “leaving a slightly polished, shiny grain” called “pearled” or “bleached.” This was the husking process utilized by industrial growers and millers in the U.S., which became the principal source of the rice eaten in Puerto Rico since the early twentieth century.

Thus, apart from increasing the island’s reliance on food imports, the increasing expansion of large-scale monocrop agriculture in zones dedicated to basic foodstuffs cultivation also had crucial effects over the type of rice Puerto Ricans consumed. As the land available for cultivation began to diminish during the mid-nineteenth century, “rice faded as a crop of choice on the part of farmers and campesinos.” Meanwhile polished, short grain rice “began to appear in

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157 Ibid. 23
158 Ibid. 24
ever greater quantities in Puerto Rican markets.” The decrease in local cultivation and the growing amounts of imports of the polished, short grain variety led to a “sharp change with respect to the type of rice people preferred to eat and a solidification” of its place within a diet that was becoming increasingly limited due “the non-cultivation of basic foodstuffs.” Through this process, the population became more and more dependent on the import markets for the polished type instead of the “whole grain rice of its agriculture.”

This increase in rice imports coupled with the decrease in local production starting during the mid-nineteenth century also reflected “two fundamental transitions” in the Puerto Rican dietary: its limitation in scope and its simplification. These processes became more defined in the first decades of the twentieth century with the spread of monocrops cultivation throughout most of the arable land. By the late 1920s and throughout the 1930s, public health studies and nutrition surveys described the result of this dietary shrinkage and simplification by emphasizing the “monotonous” nature of the island’s diet characterized by high carbohydrate content and a lack of “protective” foods and “good quality” proteins. Therefore, and despite some nutrition experts’ observations regarding people’s preference for these nutritionally-inferior foodstuffs, the central place that rice and its accompaniment, red beans, occupied in Puerto Rico’s diet was the result of their status as the most reliable and available products.

Puerto Ricans’ preference for red or pink beans during the first decades of the twentieth century resulted from a trajectory similar to that of rice. However, instead of being transplanted by Africans, beans were cultivated and consumed by the indigenous population of the Caribbean before the arrival of the Spaniards. Although the Taino inhabitants of the islands preferred the red *Phaseolus vulgaris* species, the cultivation of this variety stagnated with the arrival of the Spaniards who separated the Indians from their land and preferred other legumes like lentils.

159 Ibid. 35-39
broad beans, and garbanzos. It was again, the enslaved African populations who “played a decisive role in revitalizing” the production of the *Phaseolus* red bean variety. Similar to the rice story, the African groups brought to Puerto Rico possessed knowledge about the cultivation and gathering of legumes, particularly the *Vigna* (black-eyed peas) varieties. According to Ortiz Cuadra, “the blending of insights and information about food and agricultural techniques between the native and African populations must have been decisive in restoring the *Phaseolus vulgaris* and in disseminating the *Vigna* within the island’s agriculture.”

The “adoption and popularity” of the *Phaseolus* beans as a basic food in Puerto Rico’s diet was a product of their “ready adaptability to the agro-ecological environment of the island” as well as the blending of indigenous practices with Africans’ knowledge. Throughout the seventeenth and eighteenth centuries the “fondness for them” gained strength as their botanical properties were further elucidated. For example this variety of beans had a short period of germination, “considerable and exceptionally abundant yields”, and could be harvested twice a year. Their importance in the diet was established by the nineteenth century while the quantities of imported dry beans increased. During the early twentieth century, “enormous quantities of beans reached the shores of Puerto Rico from the United States”. This “dramatic increase in the imports of the *Phaseolus* reinforced the habit” people already had, as with rice, of eating red beans on a daily basis. During this period, local agronomists named it “red kidney bean” and by the 1930s “it was already firmly lodged” as the preferred legume of many Puerto Ricans.

In the dietary of the island’s mostly rural population, the rice and beans dish was complemented with other foodstuffs like salted codfish flakes and starchy tubers. These included

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160 Ibid. 52-52
161 Ibid. 56
162 *Phaseolus* beans fertilize the soil where they are planted. *Phaseolus* roots release nitrogen that aids in the process of photosynthesis in plants cultivated around them. (ibid., 57)
163 Ibid. 66
yuca (cassava or manioc), yautía (tannier), batatas (sweet potatoes), malanga (dasheen), ñame (yam), and panapén (breadfruit). Yellow and green plantains were also an important foodstuff and together with the starchy tubers were known as viandas. Due to their high calorie content and ease of cultivation, viandas became “a central part of meals for a substantial segment of the population. Together with rice and beans, “they helped the poorest Puerto Ricans leave the table satisfied, by increasing the volume of what they ate.”164 Among these, yautía (tannier) was a root crop cultivated by the Taíno populations well before the arrival of Europeans. Different from cassava, yautías were not prominent in the diets of the Spaniards since they did not serve to make bread. However, they remained a staple for both communities of African origin and for rural peasants throughout the Spanish period.

By the late 1920s, nutrition specialists at the STM recognized yautías as an important part of the local diet. Nutritional biochemists Joseph Axtmayer and Donald Cook even considered them of equal importance to rice and beans when measuring rural people’s intake of carbohydrates and calories.165 Sweet potatoes or batatas were also an important source of carbohydrates studied at the School’s Department of Chemistry. Priced for its sweetness, together with other indigenous viandas, batatas served as a “regular subsistence food” that “enabled people to live when other foodstuffs were scarce.”166 Yams (ñame) were other starchy root crops that assumed a prominent place in the Puerto Rican dietary. However, these were not native to the Caribbean but rather entered Puerto Rico “along with the Africans as part of the food they surreptitiously carried with them”.167 As Ortiz Cuadra notes, although it failed to attract the attention of the Spaniards like the cassava and sweet potato did, the similarity of the

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164 Ibid. 121-122
166 Ortiz Cuadra, Eating Puerto Rico: A History of Food, Culture, and Identity. 135, 123
167 Ibid. 137
island’s agro-ecological environment to the West African as well as the application of African knowledge about cultivation and cooking techniques turned yams into an important “complement to the island’s native *viandas*”.

Another important complement to the native *viandas* were the plantains, which became even more prominent during the first decades of the twentieth century as the need for accessible and cheap sources of energy increased among rural populations. Similar to the yams, plantains were introduced to Puerto Rico from the Canary Islands as part of the exchange of food fostered by the Spanish colonization. Like rice, it was incorporated to the rations provided to African slaves in the plantations. From there and although it is not a starchy tuber like the rest of the *viandas*, plantains went to play the same role as cassava, tanniers, yams, and sweet potatoes in the Puerto Rican diet. Plantains were filling foodstuffs and generally remained readily available even as the amount of land available for food cultivation decreased rapidly after the mid-nineteenth century. It also adapted easily to the island’s ecology, its cultivation did not require “an involved process” of experimentation or care, and its cycle of reproduction allowed it to grow wildly throughout the countryside. These characteristics turned plantains into a “basic sustenance” for the rural poor.168

By the early twentieth century, the combination of *viandas* and salted codfish was considered the quintessential dish of Puerto Rico’s rural peasant. While the fact that a fish original to the waters of the North Atlantic was ever a central part of the local diet provoked the bewilderment of visitors and observers during these decades, by this time this foodstuff had become a staple in the Caribbean.169 Similar to other Caribbean islands, the role of this product in Puerto Rico’s food history is a product of the plantation economy and its reliance on slave

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168 Ibid. 138-140
labor, as well as the importance of food imports in an increasingly simplified diet. During the early 1940s, government officials argued that although the consumption of salted codfish was “in part a dietetic habit traceable to early settlers” its persistence in the local diet resulted from the lack of a stable supply of fresh fish for most of the island’s population. According to studies conducted during WWII, the limited capacity of the local fish industry to provide a fresh product was due to a combination of ecological factors—including the nutrient-depleted and deep waters surrounding the island and the coralline topography of the coasts—as well as to the lack of refrigeration which made it “difficult to market the product in the interior of the island.”

Salted codfish began to be consumed in larger quantities in Puerto Rico during the late eighteenth century as Spain relaxed the trade restrictions it imposed in its colonial possessions. While these developments increased the trade with the British and British Americans, who dominated the salted codfish market, the expansion of large scale sugar agriculture and the increase in the importation of slave labor during the early nineteenth century gradually reduced the amount of land dedicated to both growing food crops and raising livestock. In this context, imported salted codfish served as part of the rations of plantation slaves as well as soldiers who were brought to Puerto Rico due to the island’s increasing militarization. During the rest of the century, as a result of “the pressure for land and labor exerted” by large-scale cultivation of sugar and coffee together with “the relentless strength of foreign food markets to import food into the island”, “salted cod began to feature in meals eaten by other sectors of the population” for whom it became a “top nutritional, protein-laden option.”

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170 Memorandum Re Fishing Industry in Puerto Rico. AGPR, fondo Oficina del Gobernador, tarea 96-20, caja 281, folder Fishing Industry. 3
171 Ortiz Cuadra, Eating Puerto Rico: A History of Food, Culture, and Identity. 103
172 Ibid. 104
Thus, by the late nineteenth century “in the households of the poor” salted codfish assumed the place of meat, which by this period “was seldom seen.” However, the role played by this foodstuff was to be transformed once again before nutrition scientists started their studies of Puerto Ricans’ diet at the STM during the late 1920s. While during the nineteenth century codfish acted as a “peripheral food”, occupying the place of meat in the poor’s plate, the decrease in imports and increases in prices provoked by the U.S. economic and political reorganization of the island during the first decades of the twentieth century turned it into a mere condiment. Imports of salted cod decreased even more sharply after 1929 when those Puerto Ricans who depended most on it—the rural and urban poor—“were forced to make do with considerably less of it.”\textsuperscript{173} The transformation of salted codfish from a substitute of meat into a condiment reflected the overall shrinkage and simplification of poor Puerto Ricans’ diet. In this context polished rice, dried beans, and \textit{viandas} served as cheap and readily available foodstuffs that furnished the daily energy needs of most rural Puerto Ricans.

\textbf{“Nothing like Rice and Beans”}

By the time Axtmayer and Cook started their studies into the nutritional qualities and adequacy of Puerto Ricans’ diet, salted codfish was used only sparingly or in “flakes” to add \textit{salazón} (flavor) to meals, particularly to the combination of rice and beans or \textit{viandas}. While visiting the island in early 1930, physician and nutrition researcher E.B. Vedder noted that “the codfish need not be considered a food as it is hardly more than a condiment.”\textsuperscript{174} Some years later Jack Delano, a photographer from the Farm Security Administration (FSA), observed that “when there is enough money available a few pieces of dried codfish are added for flavor” to the popular rice and beans dish. Delano further noted that “every single ingredient is imported from

\textsuperscript{173} Ibid. 111

\textsuperscript{174} E. B. Vedder. “Observations on a visit to Porto Rico.” RAC, RF, RG 1.1, series 243, box 2, folder 27. 7
the continental United States.”175 In this way, photographing rural Puerto Ricans’ meals and commenting on their characteristics contributed to the FSA’s agenda of documenting and imaging poverty during the Depression. (Image 1.1)

As Delano pointed out, during the late 1920s and throughout the 1930s most of the ingredients in the rural poor’s dish were imported. Mennonite Missioner Justus Holsinger, working in Puerto Rico during the early 1940s, also included his impressions of this diet’s components and their nutritional qualities. For this, he told the story of little Antonio Juan who was brought to the mission hospital by his father “a tall, thin, awkward-looking specimen of manhood” who carried “a bundle of rags from which peered the child’s two very scared and sunken eyes”. Antonio, “age two years, was the second youngest child in a family of ten children.” According to Holsinger, “there was very little flesh on Antonio’s body. The ribs could be counted at a distance. In his first day at the hospital, he was fed a glass of milk, a piece of toast, pureed vegetable, and some fruit.” According to the nurses’ account, “the milk and toast were probably the only tastes he recognized and those he did not want.” The “vegetables and fruit were foreign to him…nothing like the rice and beans they had fed him at home.” After a month of nutritional treatments and adequate food, Antonio Juan was transformed into a happy child who looked “clean and lovable.”176

During the mid-1940s, home economists from the UPR argued that the diet responsible for Antonio’s illness was the product of “certain customs and traditions” that affect nutrition, some in favorable ways, “some otherwise.” On the unfavorable side they noted that “there is not

a tradition even among land owners, for raising one’s own food.” While “the war situation, and an educational program have given impetus to more home production, the problem still prevails to considerable degree.” Similarly, “by some strange chance, Puerto Ricans in their food preferences have chosen the nutritionally inferior ones”. These included:

“...the white varieties of starchy vegetables...rather than the yellow which supply vitamin A...Fruits such as plantain and bananas in the green stage rather than ripe when they have developed their fullest vitamin content...Red kidney beans, which are poorest of all beans studied rather than those of higher value...White rice, which has been deprived of almost everything but its starch, instead of whole rice with its full content of iron, thiamine and other essentials. Imported fruits and juices—pear, apple, apricot, whose value is practically nil—when the Island abounds with the richest fruits known.”

Despite what they considered to be a generalized disregard for modern nutrition principles, home economists recognized “favorable sides” in Puerto Rican diet. These included “the use of beans once or twice daily by families of all levels.” While “the quality could be

177 “A Plan for Program of Home Economics in the University of Puerto Rico”
improved but the custom is good.” Also, “the use of café con leche which insures more consistent use of milk by adults as well as children”, “the minor importance placed in desserts in meals, and “the custom of eating oranges, mangos and other fruits when in season.” “For many Puerto Rican children”, they noted, these “took the place of the indiscriminate candy eating of the American child.”

Home economists and social workers combing the Puerto Rican countryside during the 1930s and 1940s studied these dietary habits and attempted to change them through extension education and food relief programs. Agronomists taught agricultural laborers and small farmers how to plant new crops together with their plantains and sweet potatoes. Public health and education officials used the classroom and the lunchroom as part of their attempts to instill among school children the habit of eating fresh green vegetables. As part of these efforts, local agriculture, public health, and nutrition experts debated the role of socioeconomic forces shaping food habits and disease patterns in Puerto Rico, especially among the rural poor and the families of agricultural laborers making the greatest sector of the population. These forces included the historical lack of access to the land to grow food and the increasing presence of imported products from the U.S., either through regular commercial channels of through food relief distribution programs.

Therefore, the economic and political organization of the island, especially of its rural areas, during these centuries shaped what was available to eat. According to local home economists this was manifested in the fact that “on the whole, the chief problem in Puerto Rico is one of generalized malnutrition among the lower income groups who constitute 75 per cent or more of the population.” This resulted from “a marked deficiency of practically all dietary essentials rather than any one, and the results appear in failure to grow, decreased vigor and

178 “A Plan for Program of Home Economics in the University of Puerto Rico”
efficiency and a shortened life span.”¹⁷⁹ For some health officials, the extension to the island of Depression-era commodities distribution program appeared as a relief, albeit short-term, to the generalized malnutrition problem. For other nutrition experts, however, solutions for the chronic deficiencies in people’s diet and its health manifestations required profound structural changes to the organization of rural societies and economies.

**Food Relief and Imports Dependency**

Public health concerns have interacted with the interests of U.S. agricultural industries to shape Puerto Rico’s food ecology throughout the twentieth century. The island was among the biggest recipients of USDA surplus foodstuffs through New Deal relief agencies and child feeding programs like school meals and milk stations. These processes contributed to the incorporation of imported foodstuffs to Puerto Rico’s dietary, such as corned beef, powdered milk, canned fruits and vegetables, and other processed products. These first food aid programs were part of broader strategies to both alleviate hunger and stabilize agricultural prices. For some public health experts, these programs served to alleviate nutritional deficiencies resulting from the widespread consumption of monotonous diets lacking “protective” foods. However, the need for such programs was contested by nutrition experts such E.B. Vedder who in the early 1930s argued that “the distribution of food is a purely temporary expedient” as “the people of Porto Rico have been suffering from both malnutrition and under nutrition, probably always but certainly for the past fifteen or twenty years.”¹⁸⁰

Vedder’s appraisal of food relief programs in Puerto Rico also reflected discussions about the nature of the U.S. government response to the crisis of the Depression. Apart from emphasizing the chronic nature of the nutrition problem on the island, Vedder contended that

¹⁷⁹ A Plan for Program of Home Economics in the University of Puerto Rico
¹⁸⁰ E. B. Vedder. “Observations on a visit to Porto Rico.” 5-6
food relief “in some cases does more harm than good” because although “there was a great deal of work available to laborers” “in the reconstruction of buildings” damaged during the 1932 hurricane, “observers complain that they could get nothing done” so long as the people could depend on programs “distributing free rations.”  

181 Similarly, Harry Hopkins, Administrator of the Federal Emergency Relief Agency opposed the provision of direct assistance while favoring work relief “which would put cash into the pockets of those in need in exchange for work in government-funded projects.” By 1933, the controversies caused by the destruction of crops and livestock while hunger spread throughout the country forced the federal government to revise its relief policies and create programs to distribute surplus pork, milk, cotton, and coal as direct aid to the unemployed. In this way, the Federal Surplus Relief Corporation (FSRC) began distributing goods “through a variety of state and local authorities” including the Puerto Rico Emergency Relief Administration (PRERA). While by 1935 the FSRC was renamed Federal Surplus Commodities Corporation (FSCC) and transferred to the USDA— where “farmers and businessmen who feared it would take away their customers” could control domestic surplus distribution—these programs remained part of New Deal activities in Puerto Rico.  

182 By 1939, the USDA administered the newly created Food Stamps Program (FSP) to stimulate “people to eat what happened to be in surplus.”  

183 Although this program was not extended to Puerto Rico, for policymakers in Washington and San Juan existing food aid programs served to mitigate the effects of unemployment in rural areas and prevent further political radicalization and social turmoil. Moreover, shipping surplus foods as relief to Puerto Rico did not threaten U.S. agricultural business’ interests as the island was not considered part of

183 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 62
the domestic market. These experiences with agricultural commodities distribution beyond the continental U.S. provided a template for food industries looking to take advantage of post-WWII international aid programs. The agendas of U.S. agro-industries were a central aspect of postwar nutrition’s scientific, policy, and political discourses in Puerto Rico. Apart from processed foods, changes in the production and exportation of agricultural commodities (especially rice) shaped patterns of food availability and consumption on the island during these years.

Although the 1939 FSP was not extended to Puerto Rico until the mid-1970s, U.S. agricultural commodities continued to be the backbone of feeding and nutrition services on the island during the following decades. In her study of nutritional assistance programs in Puerto Rico, sociologist Linda Colón Reyes argues that “one of the most utilized mechanisms by the U.S. and local authorities to control the demands and manage the needs of the most vulnerable on the island” has been the extension of welfare services, particularly food aid. Together with the FSP, the inclusion of Puerto Rico as beneficiary of the Temporary Assistance for Needy Families (TANF) and Supplemental Nutritional Assistance Program (SNAP) in 1975 represented the culmination of decades of transferring to the island, “always in an incomplete way”, policies aiming to “reduce the tension resulting from the high levels of inequality, unemployment, and poverty that characterize colonial structures.”184 For those who, then and now, depend on them, nutritional assistance programs “represent the possibility of escaping hunger that many remembered vividly” without creating the conditions needed to escape poverty.185

The extension of these programs to the island represented “the most significant event in the extension of federal social assistance to Puerto Rico” since the New Deal. As a new economic recession hit in the mid-1970s, its timing deepened poor Puerto Ricans’ dependence on

184 Linda Colón Reyes, Sobrevivencia, Pobreza y "Mantengo": La Política Asistencialista Estadounidense en Puerto Rico, el PAN y el TANF (San Juan: Ediciones Callejón, 2011). 39
185 Ibid. 40
federal nutrition assistance to survive periods of crisis by “effectively raised household incomes” across the island.\textsuperscript{186} In the early 1980s, the U.S. government again reformulated the mechanism to distribute nutrition aid to Puerto Rico by substituting the food stamps for the transference of a block grant to the local government to be distributed to beneficiaries as checks for the purchase of foods called the Nutritional Assistance Program (NAP). In 2001, the check system was substituted by the electronic transfer of funds accessed through debit cards. In the midst of Puerto Rico’s current fiscal and economic crisis, the high percentage of participation in the PAN program has been used to explain both people’s lack of mobilization in face of the downturn and as a factor driving the island’s low labor force participation. Echoing Vedder and Hopkins’ views during the 1930s, present day commentators on the island and the U.S. present these circumstances as the unintended consequences of nutritional assistance programs such as NAP.

However, political and economic objectives have guided the organization of food aid programs in Puerto Rico since their origins as part of commodity distribution strategies since the 1930s. The correlation between rural poverty, unemployment, and dependence on nutritional assistance programs continues to this day. Unemployment remains higher in the interior and in small towns where “only the influx of federal funds and an increase in government employment prevented greater hardship for many.”\textsuperscript{187} Currently, the municipalities with the highest percentage of the population enrolled in NAP were all in rural and agricultural zones.\textsuperscript{188} Similar to other territories, this extension of these programs and of U.S. welfare policies in general to Puerto Rico remain conditional, restricted, and incomplete. While “the structural limitations of

\textsuperscript{188} Colón Reyes, \textit{Sobrevivencia, Pobreza y "Mantengo": La Política Asistencialista Estadounidense en Puerto Rico, el PAN y el TANF}.  

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Puerto Rico’s economic and political models enhanced its prospects for receiving federal social welfare resources” “the payment rates for recipients in territories are different from those for recipients on the mainland.” In the case of Puerto Rico, “the federal matching rate is 75 percent rather than a rate based on per capita income” as in the states.  

As food and agriculture scholar have demonstrated, “the FSP and PAN cash outlays have affected not only the diet and nutritional status of the population” “but also, by underwriting the consumption of food and non-food items of the majority, the island’s labor supply, its cost and, ultimately, its agricultural structure” increased food import dependency. However, as this dissertation shows, while public health and nutrition concerns framed the establishment of nutritional assistance programs in the U.S. and their extension to Puerto Rico, these objectives were subordinated to USDA surplus disposal agendas. Public health and nutrition expertise interacted with the imperative of balancing agricultural markets by shifting surplus commodities away from regular markets. The first federal food aid programs extended to Puerto Rico were part of these strategies to disperse the “breadline knee-deep in wheat” that became one of the most visible images of Depression-era U.S., not to supplement deficient or nutrient-poor diets.

Moreover, federal food policies and cash transfers programs like the NAP have affected local agriculture first by becoming “the fulcrum of any economic model devised for Puerto Rico’s development” and second by increasingly disengaging local food consumption “from local agricultural production, as imports and processed foods took over the increased food demand.” Puerto Rico shares these problems with its Caribbean neighbors as well as with

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190 Carro-Figueroa, "Agricultural Decline and Food Import Dependency in Puerto Rico: A Historical Perspective on the Outcomes of Postwar Farm and Food Policies." 84
island territories in other regions. The two major food and nutrition problems Puerto Rico—food insecurity and obesity—are part of life throughout the broader Caribbean where dependency on imports and high shipping costs continue to adversely affect the quality of the food supply available for most people. Recent results from the Caribbean Food and Nutrition Institute surveys show the decline in early childhood undernutrition during the last decade, but it also shows the rapid increase in obesity. According to recent studies “obesity prevalence in all age groups has increased to the point where it is now the most important underling cause of death in the Caribbean.”192 These conditions of food dependency and chronic disease prevalence also affect populations in other former colonial territories such as the Pacific islands. “A life based on imported food, little exercise and remote access to healthcare” and the propagation of a “colonial system of education and the cash economy” have contributed to disproportionately high rates of obesity in many Pacific islands.193

Similar factors helped explain medical geographer Jacques May’s observations regarding the ecology of malnutrition in the Caribbean. For him while “some of the islands changed hands as many as 14 times” “somehow the economic, political and military forces at play eventually neutralized each other and a compromise resulted which is the frame for the ecological study we are presenting to our readers.”194 As Mintz noted Caribbean people “have been caught up in skeins of imperial control, spun in Amsterdam, London, Paris, Madrid, and other North American centers of world power.” As part of these transactions the Caribbean region as a whole has been shaped by “the steady demand overall and for most epochs has been for sugar” and

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194 May, The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago.
other agricultural commodities for export. As the following chapters will show, attempts to intervene with the effects of this historically-precarious system for the local food supply and people’s nutrition were central aspects of the socioeconomic and political transformations the island underwent during the mid-twentieth century.

**Conclusion**

The degree to which the U.S. occupation of the island in 1898 and the extension of economic and fiscal policies altered patterns of landownership has been the subject of historiographical debate in the past decades. These recent interpretations question the idea that the arrival of the U.S. brought about widespread landlessness by showing that this was a defining feature of rural life in Puerto Rico well before 1898. Puerto Rican small farmers also managed to take advantage of the new U.S. system through the cultivation of other crops such as tobacco. However, these new economic and political conditions accelerated the spread of monocrops agriculture over a greater proportion of the island’s available land as a result of the opening of U.S. markets to Puerto Rican tobacco and sugar cane products. The profitability of sugar cane and tobacco cultivation under the U.S. system fostered a decrease in commercial food production and the closing of access to unused land for landless rural people who previously engaged in subsistence farming.

During the 1920s and 1930s, discussions of how the this monocrops economy organized land and labor figure prominently in medical and public health debates in Puerto Rico. By these decades, colonial economic policies were reflected in greater dependence on food imports and in

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195 Mintz, *Sweetness and Power: The Place of Sugar in Modern History*. xvi
196 Ayala and Bergad, "Rural Puerto Rico in the Early Twentieth Century Reconsidered: Land and Society, 1899-1915." 69
198 Carro-Figueroa and Weathers, "Livelihood Strategies of Farmers in Puerto Rico's Central Region."
the simplification of Puerto Ricans’ diet. According to interwar nutrition experts, this “traditional” diet—composed of high carbohydrate foodstuffs like polished rice and starchy crops and lacking fresh green vegetables and dairy products—was directly associated with the high prevalence of infectious diseases such as tuberculosis and hookworm, for which the island was infamous. During these years, the turn to biochemistry in nutrition sciences led to a new focus on the chemical composition of food and the role of these individual components in biological processes. In this approach, diets were assessed according to their chemical components—contrasting with an earlier focus on energy provided by foodstuffs measured as calories—and assessed according to the presence and content of these chemical compounds.

During the Depression, this new knowledge about the biochemical nutrition knowledge offered compelling new insights as part of growing critiques to the prevalent economic system and the imbalances in agricultural production and consumption it fostered. In Puerto Rico, these critiques were articulated in attempts to reform and reconstruct the island’s rural society through agricultural diversification and public health interventions. Simultaneously, the inclusion of Puerto Rico as recipient of surplus commodities distribution programs during the 1930s was the result of both public health and agro-industrial agendas. By the mid-1970s, with the usefulness of these programs to advance U.S. geopolitical interests established, food aid distribution in Puerto Rico was formalized with the inclusion of the island in the FSP and NAP programs. Today, the link between poverty, reliance on food imports and nutritional assistance programs, and high prevalence of diet-related diseases described by nutrition experts during the 1930s and 1940s continue to shape the lives of resident in Puerto Rico’s rural areas.
Chapter Two
Tackling a Formidable Problem: Nutrition and Tropical Medicine

What is a jíbaro...I have been asked to write an article on the diet of those people, not a dissertation on the socioeconomic condition of Puerto Rico; but some relevant factors must be mentioned in order to bring graphically before the mind of the reader why the nutrition of the laboring class presents a formidable problem to the Island.”

The hopeless circle of a class that cannot work well enough to demand adequate pay because it cannot afford food on which to sustain a physique capable of toil, may thus be straightened out by our united efforts into a progressive, upward line.199

Introduction

On January 25, 1942, as Puerto Rico’s government prepared to face wartime food shortages, biochemist Joseph Axtmayer presented to the general public the results of laboratory analyses of the local diet in the newspaper El Mundo.200 Axtmayer felt compelled to detail the purpose, methodology, and findings of nutrition studies carried out in the School of Tropical Medicine (STM) during the past decade in response to what he considered were the misguided food policies recently implemented by the island’s government. “The main motivation to present this summary of some of our laboratory studies”, he noted, “is to call the attention of those in charge of activities related with the purchase and production of food...to the deficiencies characteristic of our diet.” Although their work at the STM established the existence of these


200 Joseph Axtmayer, "Nuestra Dieta, Experimentos Científicos Demuestran que la Habichuela de Soya Tiene Mayor Valor Alimenticio que la Habichuela Colorada," El Mundo, 25 enero 1942. 13
deficiencies, Axtmayer argued that government entities ignored this evidence as well as the expertise of nutrition scientists in their plans to face the food shortages provoked by the war.

In Axtmayer’s opinion those plans were flawed since this government Commission—among whose members he did not see “the name of any nutritionist or dietitian”—had recommended the importation of the “same kinds of foodstuffs which have been consumed in Puerto Rico year after year” such as polished rice, red beans, and salted codfish. According to him, “when studied from the viewpoint of modern food requirements of mankind”, these products were found to be deficient in “various essential factors” necessary for adequate “growth and physical appearance of a laboratory animal, and therefore of man.”201 Indeed, Axtmayer and colleagues dedicated the past decade to measure the nutritional efficacy and growth-promoting qualities of multiple local food products by performing tests in white rats. They claimed that the findings obtained through these methods offered unequivocal evidence about the deficiencies of the Puerto Rican diet. However, government officials failed to consider this evidence in their efforts to ensure the availability of adequate quantities of food during the war.

This chapter examines the emergence and trajectory of these scientific assessments of Puerto Rico’s diet during the decades previous to the war. It considers how this local activity reflected international debates about nutrition, agriculture, public health, and colonial development. For this, it first traces the links between tropical medicine, hookworm control, and the emergence of concerns with and attention to the problem of nutrition in Puerto Rico. It then considers nutrition science as an international and inter-colonial endeavor during the interwar years and locates the work of local scientists as part of this exchange. For Rockefeller Foundation (RF) officials, Puerto Rico’s position at the crossroads of the tropical South and the scientifically-advanced North gave it an ideal position for the creation of knowledge in this new

201 Ibid. 13
field. Thus, the Foundation sponsored the STM nutrition research project during the first half of the 1930s. For local experts, this new nutrition science also offered compelling new paradigms to frame long-standing eugenic anxieties with Puerto Ricans’ low productivity and racial makeup. Thus, the chapter analyzes how these early nutrition studies contributed to shape the island’s emerging role in international nutrition science.

While the biochemical view of nutrition redefined hunger as malnutrition in the West—as opposed to the quantitative lack of food—it promoted a reconsideration of the relation between labor and public health problems in the colonies. As biochemistry assumed a leading role in the study of food and diets in metropolitan laboratories, nutrition scientists turned to the colonies to test the universality of new nutrition principles. Looking to test these universal principles by studying the “natural” diets of tropical and sub-tropical people, nutritional biochemistry also gave colonial administrators a useful tool to increase labor productivity by improving agricultural practices and diets. In this way, “nutrition made possible the discourse of colonial development”. This discourse, emphasizing “the connections between nutrition, racial health, and economic development”, was a crucial foundation for future international agendas that linked agriculture with public health.202

The insights offered by tropical laboratories also shaped interwar nutrition sciences by serving both national and colonial governments in their attempts to adapt welfare, labor, and agricultural policies to the conditions of the Depression.203 As this chapter shows, Puerto Rico’s geopolitical status gave it a unique position in this inter-colonial and transnational exchange of new nutrition knowledge. Concerns about the relationship between diets and labor were a matter of debate on the island since the 1910s in the context of anti-hookworm campaigns led by

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202 Vernon, Hunger: A Modern History. 109
203 Ibid. 104
military physician Bailey K. Ashford. Although Puerto Ricans’ “natural indolence” was discussed by medical experts before the arrival of U.S. troops, hookworm science provided the first biomedical explanation for their lack of energy and productivity. The subsequent discovery of an underlying condition that was not cured by the elimination of hookworm infection led Ashford to reconsider his initial approach to the problem. Ashford eventually associated this chronic condition with the inadequacy of the typical rural diet and its reliance on low-nutrient foodstuffs such as polished rice, dried beans, and starchy crops.

Biochemists at the STM built on these early observations of the link between diet and Puerto Ricans’ chronic debility. Directed by Professor Donald Cook, these initial studies used rat growth experiments and biochemical methodologies to evaluate the nutritional properties of the most common foodstuffs in the Puerto Rican diet. These preliminary findings called the attention of the RF who funded a more extensive project on the nutritional qualities of local foodstuffs. These studies produced qualitative and quantitative data about the nutritional properties of Puerto Rico’s diet. By reducing this diet to its individual elements and creating representative food combinations for use in the laboratory, biochemists at the STM demonstrated that it was deficient in “various essential factors” necessary for adequate growth, development, and resistance to disease. These biochemical measurements of Puerto Ricans’ diet, while based on narrow understandings of food as carriers of isolated nutrients, drew from and contributed to broader conversations about agricultural reform and colonial development.

The Anemia of our Jíbaros

During the first decades of the twentieth century, military officials presented the appalling health and sanitary conditions they encountered as consequence of Spain’s generalized
neglect of its last colonies and lack of competent medical personnel.\textsuperscript{204} Therefore, U.S. public health activities on the island initially focused on the construction of basic sanitation infrastructure and medical dispensaries as well as on the control of infectious diseases such as hookworm, malaria, and bilharzia. The prevention and treatment of tuberculosis was also among the priorities of the newly appointed Board of Health. Hookworm, however, received the most attention and funds during the first decades of the twentieth century.

The organization of the various Anemia Commissions and the establishment of the Anemia Dispensary Services between 1903 and 1909 was for many rural populations their first contact with modern biomedicine. These projects also represented the first long-term interaction between physicians—both U.S. and Puerto Rican—and rural populations. However, despite all the visibility that this work gave Ashford and his team, they soon realized that their attempts to cure afflicted peasants by removing hookworms and preventing their spread were not enough to restore the energy of many. While the hookworm campaigns focused on anemia as an acute condition provoked by extensive worm infestation, Ashford’s experiences in the dispensaries and the fields pointed to a more insidious and lasting condition. Underlying the symptoms that he and his colleagues documented, there was a type of chronic or pernicious anemia that seemed to be a part of daily life for poor rural Puerto Ricans. It is in this context that discussions about diet and nutrition began to assume a central role in public health and medical debates in Puerto Rico.

Recent interpretations of Ashford’s work note that some members of the Puerto Rican medical community emphasized anemia’s link with nutrition and poverty since the early days of the campaign.\textsuperscript{205} However, discoveries about the specific nature of nutritional anemia and other deficiency diseases were barely beginning to circulate and gain acceptance at the time of the

\textsuperscript{204} Ramírez de Arellano, "The Politics of Medical Education in Puerto Rico," 1

\textsuperscript{205} Francisco A. Scarano, "Doctors and Peasants at the Intersection of Empires: The Early Hookworm Campaigns in Puerto Rico," (San Juan, Puerto Rico 2012).
Anemia Commission’s work in Puerto Rico. Nutrition remained a science focused on quantitatively assessing diets by calculating the heat and energy provided by different foodstuffs and their three distinct constituents: proteins, fats, and carbohydrates. This measurement of heat and energy became known as the calorie. These calculations of the calories needed to fuel the human body were based on “the productive capacity of the average male worker” and extrapolated to “women and children of different ages.”

The biochemical model of nutrition came to coexist with this earlier thermodynamic model based on quantifying foodstuffs’ energy content. The calorimeter was the “artifact” used to measure the nutritional adequacy of foods in terms of calories. Originally devised by German nutrition scientist Max Rubner and perfected by Wilbur Atwater at Johns Hopkins, the calorimeter was a chamber where its occupant took measured quantities of foods during rest periods, which alternated with intervals of physical and mental activity. Inside the chamber, there were instruments that measured the movement of heat, air, and matter into and out of the chamber and that calculated labor output in units of thermal energy. Biochemical laboratories in the UK and the U.S., on the other hand, used animal subjects to produce and test a growing body of knowledge about the biological effects of newly discovered food elements. The white rat became the most widely utilized experimental subject since it was docile, easy to handle, and reproduced easily. The development of the rat growth method allowed biochemists to measure the nutritive content of foods and the effects of deficiencies.

Therefore, during the first years of the twentieth century “the range of techniques” that allowed “objective, standardized, and universal ways of defining and measuring hunger” were

206 Vernon, *Hunger: A Modern History*. 85
still in flux. The thermodynamic model understood food as the “fuel” the body needed to “build its productive capacity” and “to generate power and energy”. The limitations of this parading began to be uncovered by biochemical investigations during the late 1910s. This new knowledge gradually challenged the idea that food was made up of only three distinct constituents and demonstrated the links between other components and health. Thus, although the biochemical basis of nutritional conditions such as nutritional anemia were still undefined at the time of the hookworm campaigns, Ashford was beginning to document its prevalence in Puerto Rico and its relationship with dietary factors.

More than forty years after Ashford and Puerto Rican physicians began to connect the prevalence of pernicious anemia in Puerto Rico with people’s inadequate diet, biochemist Conrado Asenjo reflected on the links between the hookworm campaigns and nutrition research. He noted that “nutrition attracted public attention since the first decades of the century as a result of the campaigns waged against the anemia of our jíbaros”. According to Asenjo, “the more Ashford and his colleagues studied the clinical picture of this disease the more they realized that the acute condition observed was not only due to parasitic infestation but also to the extreme undernourishment of the individuals suffering it.” In this way, scientists began to consider a new nutritional explanation for rural Puerto Ricans’ notorious “indolence” and lack of vitality. Addressing this problem, however, required more than building latrines and purging worms.

This recognition was based on observations by members of the Anemia Commission of “undernourished individuals suffering severely from mild infections whereas well-nourished ones could harbor hundreds of worms without evident ill effects.”

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208 Vernon, Hunger: A Modern History. 83
produced a type of acute and intense anemia as the parasites grew on victim’s intestines and fed on his or her blood. However, Ashford and members of the Commission gradually accepted the possibility that “much of the anemia suffered by our peasants is due in part to his poor nutrition”. They eventually “realized that only through the correction of the glaring nutritional deficiencies in the diet could hookworm disease disappear from Puerto Rico.” Based on this observations, Ashford dedicated his late work to investigate the nature and treatment of this pernicious anemia and other conditions with seemingly nutritional origin.

Although Ashford’s early approach to hookworm disease de-emphasized the effects of social factors as the cause of anemia and focused exclusively on the prevention of the spread of the hookworm, he later revised these perspectives. The expansion of knowledge about deficiency diseases and his observations of rural communities’ dietary habits were crucial for Ashford’s reconsideration of his initial focus on hookworm control as the sole strategy to treat anemic patients. The convergence of these factors during the early 1920s fostered a redirection of his later work toward the study of the nutritional factors underlying pernicious anemia. For example, in 1922 Ashford discussed the concept of “food elements” and the new knowledge about vitamins, minerals, and other nutrients while discussing a potential dietary basis for

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212 Fernández, "Nutrition in Puerto Rico." 35
213 Trujillo-Pagán, Modern Colonization by Medical Intervention: U.S. Medicine in Puerto Rico.
214 Bailey K. Ashford, "La Carencia de Ciertos Alimentos como Causa Predisponente del Espru, Pelagra y Beri-beri en Puerto Rico " Boletín de la Asociación Médica de Puerto Rico 15 (1921); "Observations on the Conception that Sprue is a Micosis Superimposed upon a State of Deficiency in Certain Food Elements," American Journal of Tropical Medicine 2 (1922); Sugestiones Para una Rápida Clasificación de las Anemias por Sprue y Deficiencias Nutritivas en los Trópicos. Quinta Reunión de la Sociedad Argentina de Patología Regional del Norte, 7-10 Octubre, 1929 (Buenos Aires: Imprenta de la Universidad, 1930).
tropical sprue on the island.\textsuperscript{215} By the mid-1920s these considerations of diseases’ dietary basis became an important aspect of local medical and public health discourses.

These local conversations were part of global activity leading to new understandings of the relationship between diet and disease. Ashford’s research on sprue reflected the interest of the international “medical world” in this disease, which “greatly increased” during these years “owing in large part to the widespread interest in deficiency diseases”.\textsuperscript{216} Sprue was characterized by a change in the chemical composition of an individual’s intestines that interfered with the absorption of nutrients and eventually led to anemia. During these years Ashford proposed that this was the result of a micosis, or an infection by a fungus of the \textit{Monilia} family, “superimposed” on a “state of nutritional imbalance”. In a 1922 publication, Ashford described his theory about the etiology and symptoms of sprue in Puerto Rico by noting the association between the diet of “the class of agricultural laborers” inhabiting the island’s rural areas and the manifestations of this disease.\textsuperscript{217} According to Ashford, rural laborers’ diet was deficient in food elements like “fresh animal proteins”, “fat-soluble A vitamine”, “certain mineral constituents”, and “B-substances”. He emphasized this diet’s lack of animal proteins and its abundance of “vitamine-less carbohydrates”:

> “Today they live on codfish, rice, beans and...tubers, with such fruits, plantains and other vegetables as can be irregularly obtained. But the alarming tendency at present is toward more and more rice, and an inferior quality of rice at that, polished and imported. The peasant that has plantains now, sells them and buys this grain which, bulk for bulk, and in calorie value, is greater. His chickens, eggs and milk are generally

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\textsuperscript{215} “Observations on the Conception that Sprue is a Micosis Superimposed upon a State of Deficiency in Certain Food Elements.”
\textsuperscript{216} Robert A. Lambert, "Report of the Director of the School of Tropical Medicine to the Special Board of Trustees of the University of Porto Rico for the School of Tropical Medicine, Year 1927-28." RAC, RF, RG 1.1, series 243, box 2, folder 28
\textsuperscript{217} Ashford, "Observations on the Conception that Sprue is a Micosis Superimposed upon a State of Deficiency in Certain Food Elements." 142
sold in the town, but at times are an irregular source of food in his home.”

This particular characteristic of rural Puerto Rican’s diet provided an explanation for Ashford’s observations regarding the prevalence of sprue on the island. While the condition was more prevalent among “well-to-do town dwellers” they did not present the symptoms associated with the infection since their diet contain more animal protein and relied less on polished rice. On the other hand, although the “country laborers” who ate “little meat and an excess of vitamin-less carbohydrates” showed a much smaller prevalence of the fungus, they suffered from the anemic syndrome associated with it. This relationship between rural people’s diet and their anemic state became a topic of discussion among the local medical class throughout the interwar years. Growing awareness of the physiological effects of food elements led public health officials to recognize nutrition’s links with the high morbidity and mortality caused by infectious diseases like tuberculosis and malaria. These debates also brought to light the influence of monocrops agriculture over people’s dietary habits and nutritional health. As Chapter One showed, while Puerto Ricans relied on food imports to varying extents since the past century, the economic and political changes fostered by the U.S. arrival exacerbated the disassociation between people’s diet and local agricultural production.

The advent of the Great Depression compelled scientists at the newly established STM to reckon with these socioeconomic aspects when discussing the problem of nutrition in Puerto Rico. By the time the school was established in 1926, nutrition as a professional and scientific field had undergone significant changes that altered its disciplinary organization and practices. The discovery of vitamins and minerals led to the gradual understanding of malnutrition as a

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218 Ibid, 143-144
chronic condition characterized by persistent deficiencies. While shaped by metropolitan concerns, the work conducted at colonial laboratories like that of the STM was crucial for this international boom in nutrition research. At the same time, international debates about diet, health, and labor fostered by this new nutrition science led to the “discovery of colonial malnutrition”.220 These discoveries, in turn, provided “practical administrative techniques” for national governments by establishing the universality of the relationship between nutrition, public health, and agricultural development.221

Inter-colonial and Transnational Nutrition Science

During the years following the Great War the study of human nutrition was “an exciting area of investigation” that was undergoing significant transformations.222 Late nineteenth century nutrition science was dominated by the “quantitative approach” of physiological chemists giving rise to the calorie as a measure of food’s biological action.223 The transition from relying on calories as metrics of food value to a greater focus on the composition of foodstuffs biochemistry into the most authoritative discipline within the field. The social and political conditions provoked by the war in Europe and the U.S. were crucial drivers of this shift. Food rationing and episodes of scarcity “fostered an international network of nutrition experts and laboratories pushing research in new directions.”224

The new knowledge about human nutrition produced at biochemistry laboratories, in turn, became “essential” for the management of the crises caused by the war and later by the

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220 Worboys, “The Discovery of Colonial Malnutrition between the Wars.”
221 Vernon, “The Ethics of Hunger and the Assembly of Society: The Techno-politics of the School Meal in Modern Britain.” 695
222 Brantley, "Kikuyu-Maasai Nutrition and Colonial Science: The Orr and Gilks Study in Late 1920s Kenya Revisited." 57
224 "The Foreign Policy of the Calorie." 354
Depression. The study of vitamins and their relationship with disease revolutionized the field in and gave clinical and public health significance to this new science. While Elmer V. McCollum’s work at Johns Hopkins was central in this revolution, the gradual elucidation of vitamins and minerals’ properties and physiological effects was the product of the work of many scientists who simultaneously “recognized their vital role in promoting health.”

This new knowledge of nutrition revealed that previous conceptions of a complete diet as “consisting of proteins, fats, carbohydrates, and water plus energy” were incomplete. Thus, the focus of nutrition science moved from measuring the quantities of food required for normal physical functioning to describing “the qualities of particular foodstuffs and their specific physiological effects.” This new approach was facilitated by the “identification of diseases that seemed to be a consequence of specific dietary deficiencies”. These discoveries shifted experts’ attention from episodic events of hunger to its latent and chronic effects. By linking the activity of vitamins, minerals, and amino acids to conditions such as pellagra, rickets, and beriberi, the new science of nutrition achieved the public health and clinical significance that the calorie-centered approach lacked. The tools of biochemical analyses equipped dietary specialists and health officials with new parameters with which to assess populations’ eating habits.

Nevertheless, nutrition scientists and health officials quickly realized that uniform standards and methodologies were needed before this new approach could be effectively applied to policy making. Although McCollum’s laboratory attempted to “set international standards for measuring vitamins, minerals, and amino acids”, the task of establishing parameters of adequate

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225 Barona, "Nutrition and Health: The International Context During the Inter-war Crisis." 88
227 Brantley, "Kikuyu-Maasai Nutrition and Colonial Science: The Orr and Gilks Study in Late 1920s Kenya Revisited." 57
228 Vernon, *Hunger: A Modern History*. 90
229 Kammenga and Cunningham, "Introduction: The Science and Culture of Nutrition, 1840-1940." 5
nutrition was not complete, albeit contingently, until the late 1930s.\textsuperscript{230} The definition, measurement, and diagnosis of malnutrition remained contentious aspects of the new nutrition science well into the 1940s. However, while experts disagreed on how to define malnutrition, they agreed that green vegetables, dairy products, meat, and wheat were foodstuffs of superior nutritional quality given their vitamin, mineral, and “high quality” protein content. These were now identified as “protective” foods, vital to the normal functioning of life processes.

The scientific activity resulting from this reformulation of nutrition also became a channel that linked colonial populations with metropolitan concerns. As Hardy notes, “food and nutrition were not prominent concerns of classical tropical medicine or of colonial administrators in the first decades of the twentieth century”.\textsuperscript{231} This changed by the 1920s when colonial settings emerged as important contexts to test the universal applicability of the new nutrition knowledge. This required overcoming its origins in laboratory animals such as rats and pigs. Despite the usefulness and replicability of animal models, nutrition scientists in Britain and the U.S. eventually recognized that to truly universalize their findings, they needed to experiment with diets in their “natural environments” and “uncontaminated” by modern habits. While “the credibility of all procedures rested on a panoply of devices, instruments, and formulas…that enabled nutritionists on the other side of the globe to run comparable experiments”, questions remained whether results obtained using laboratory animals “were translatable to the less controlled and more diverse world”.\textsuperscript{232} Fortunately for McCollum and other biochemical nutritionists, “the empire provided a particularly attractive site for research.”\textsuperscript{233}

\textsuperscript{230} Cullather, "The Foreign Policy of the Calorie." 354
\textsuperscript{231} Hardy, "Beriberi, Vitamin B1 and World Food Policy, 1925–1970." 62
\textsuperscript{232} Vernon, \textit{Hunger: A Modern History}. 100, 104
\textsuperscript{233} Ibid. 105
In their quest for new research sites, nutrition scientists established laboratories in tropical colonies where they attempted to replicate the dietary practices of local populations. Colonial officials also designed and implemented diet and health surveys among colonial populations, particularly in Asia and Africa. John Boyd Orr and J.L. Gilks, British officials in Kenya, begun one of these studies in 1926 by comparing the diets and health status of the agricultural Kikuyu and the pastoral Maasai. Although originally focused on the diseases of livestock, Orr was eventually “struck by the rich possibilities for comparative nutrition research provided by Britain’s diverse colonial subjects.”\textsuperscript{234} In this way, study became the first instance in which colonial authorities addressed malnutrition “as distinct from famine and hunger”.\textsuperscript{235} To do this, they conducted food supplement experiments in hospitals and prisons, chemical analyses of local foodstuffs, and a survey of diet and disease prevalence.\textsuperscript{236} Brantley argues that this study was “both an extension of the nutrition surveys being conducted in Britain at the time and a break from the prevailing” perspective of tropical medicine by expanding the focus of colonial public health from infectious diseases to issues of agriculture and labor.

Orr and Gilk’s studies were soon followed by similar investigations in other colonial settings. Apart from Africa, India also offered “rich possibilities” to further demonstrate the universality of the new nutrition knowledge and its potential for public health. While the African surveys gathered comparative data about diet, nutrition, and health, research in India was particularly motivated by concerns with specific deficiency diseases, particularly beriberi. Former McCollum’s student Robert McCarrison began his “beriberi inquiry” as early as 1918.

\textsuperscript{234} Ibid. 110
\textsuperscript{235} Brantley, “Kikuyu-Maasai Nutrition and Colonial Science: The Orr and Gilks Study in Late 1920s Kenya Revisited.” 49
\textsuperscript{236} Ibid. 57
under the auspices of the Indian Research Fund Association. As Arnold notes, “to many medical commentators ‘beriberi’ appeared little more than a name attached to a set of symptoms, rather than a discrete entity”, before the knowledge about vitamins was accepted. Apart from India, concerns with the beriberi problem in other settings like Japan, Malaya, Dutch East Indies, Singapore, and U.S.-occupied Philippines fostered studies about the specific mechanisms associated with this disease. The prevalence of beriberi in these regions gave rise to “a dominant view that rice diets were primarily to blame.”

In this context, research South East Asian diets evaluated the “evidence for the white rice, vitamin-deficiency theory of beriberi”. McCarrison established a nutritional research unit at the Pasteur Institute where “instead of focusing on the recognized manifestations” of deficiencies such as beriberi, pellagra, scurvy, and rickets, he tried to understand the effects of sub-clinical deficiencies over vitality and resistance to disease. Similar to Orr and Gilks, McCarrison’s goal was to apply new nutrition knowledge to investigate the relationship between diet, health, and productivity among individuals with distinct dietary habits. To do his, rather than feed laboratory rats on standard diets designed to produce specific deficiencies, he fed them on the actual diets of people in northern and southern India. Based on the growth and development of his rats, McCarrison claimed to have shown that rats fed on a diet of wheat and meat exhibited a “remarkable freedom from disease” while those fed on a diet of rice and vegetables “developed a wide variety of ailments” that, while not recognized as deficiency diseases, appeared as the consequence “of a more general form of malnutrition.”

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237 Hardy, "Beriberi, Vitamin B1 and World Food Policy, 1925–1970." 63
238 Arnold, "British India and the “Beriberi Problem, 1798-1942." 301
239 Ibid. 302
240 Vernon, Hunger: A Modern History. 106
241 "The Ethics of Hunger and the Assembly of Society: The Techno-politics of the School Meal in Modern Britain."
These findings informed nutrition studies conducted during the following decades which went beyond biochemical evaluations and clinical observations to include environmental and sociological aspects of dietary habits. Notable among these was the Nyasaland Nutrition Survey, conducted between 1938 and 1943 in present-day Uganda and framed by the parallel League of Nations’ promotion of rural hygiene and reconstruction as a solution to the crisis of the Depression. Apart from serving as foundations for these future efforts, findings from Orr, Gilks, and McCarrison’s studies fostered an important shift in Western understandings of the health of colonial populations. Instead of “dismissing diseases among colonial people as exotic peculiarities of a tropical environment”, the new biochemical knowledge posed that “they shared the same nutritional bases as deficiency diseases” in Europe. From seeing climates as the culprit of tropical diseases, diet emerged from these studies as the fundamental factor underlying the pathologies of the tropics. When properly fed, “even the scrawniest, sickliest native could become a healthy racial specimen”. Thus, these findings became important administrative tools to pursue colonial or institutional goals in the European colonies. Chief among these goals was maximizing the labor productivity of colonial subjects.

While biochemists and medical experts associated rice diets with beriberi in Asia and the Pacific, the reliance on corn in European regions and the U.S. South paralleled the prevalence of pellagra. For centuries, U.S. and European scientists debated whether this association was due to “spoiled corn” containing a toxic substance, to “too much corn”, or to “little besides corn”. By the early twentieth century, those who favored this latter explanation speculated that the reliance

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244 Ibid. 106
on corn as the backbone of diets that lacked meat, dairy, and fresh vegetables led to a chronic nutritional deficiency that was eventually manifested in pellagra’s clinical signs: dermatitis, diarrhea, and dementia. The prevalence of this set of conditions among institutionalized populations, particularly those in asylums, lent credence to that theory. However, due to the lack of knowledge about the vitamins and their role in deficiency diseases it was not until the late 1910s when Joseph Goldberger finally described the specific deficiency associated with monotonous diets, based on industrially-processed corn, leading to the syndrome known as pellagra. Goldberger successfully treated the symptoms by providing the essential nutrient missing from these diets through brewer’s yeast supplements. As the science of the vitamins became more sophisticated during the following decades, this nutrient was identified as niacin and synthetized in the laboratory.

Apart from explaining the variety of symptoms associated with pellagra, Goldberger’s “inconvenient truth that the root cause” of this disease “was southern poverty” fostered opposition and debate in the context of the segregated U.S. South. Similarly, the expansion of tropical medicine’s scope in colonial settings as a result of new nutrition findings led to new considerations of the relationship between poverty, diet, and health. While Goldberger’s tested his hypothesis about the nature of pellagra in the U.S. South, Ashford described the manifestations of pernicious anemia in Puerto Rico as part of the hookworm campaigns. Although a clear picture of this disease’s relationship with dietary factors was still emerging during the early 1920s, Ashford and other public health experts were beginning to propose and alternative explanation for the prevalence of anemia in Puerto Rico. For example, in 1921 Rafael del Valle Sárraga published the first articles discussing the biochemistry of vitamins and amino

247 Bryan, Asylum Doctor: James Woods Babcock and the Red Plague of Pellagra. xix
acids in a local medical journal. As Director of the Chemical Laboratory of the Department of Health, Del Valle Sárraga explained the beginnings of the new science of nutrition and provided detailed descriptions of the nature of the recent findings and their importance for public health.

Del Valle Sárraga starts both parts of his essay with a quote from McCollum's book *The Newer Knowledge of Nutrition*, which he refers to continuously throughout the articles. He applied ideas from McCollum's work and from other known biochemists like Casimir Funk and V.C. Vaughan to emphasize that according to the new nutrition knowledge a balanced, more varied diet was healthier than a limited or monotonous one. A varied diet was capable of providing the crucial “accessory substances” which role in good nutrition was still being elucidated. Del Valle Sárraga described these recent discoveries as revelations from God and vitamins and amino acids as miraculous substances that bring those with ill health the vitality that “ancient Pharmacology of twenty centuries could not”. Thus, Del Valle Sárraga described the state of a field in the middle of monumental innovations. Writing shortly after the end of the war, he presented biochemistry as the new modern science that finally uncovered “truths” that eluded scientists for centuries and the chemist as “a soldier in science achieving great feats in the peaceful silence of his laboratory but, like in the war, resolving the most serious national problems”.

As part of this effort, Del Valle Sárraga explained how these new nutritional truths served both the chemist and the physician to understand the deficiencies of the Puerto Rican diet. Linking his analysis of the chemistry and functions of vitamins to Ashford’s observations about

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250 del Valle Sárraga, "Ideas Modernas sobre Nuestra Ración Alimenticia I." 221
sprue, he proposed that a nutritional imbalance might have a role “fertilizing the soil in our rural population’s organism for the cultivation of pathogenic fungi described by Ashford”. Moreover, Del Valle Sárraga associated this vulnerability to disease to Puerto Rico’s condition of “agrarian slavery” given that the island was “dedicated almost exclusively to serve the desires of other countries for luxury items like sugar, tobacco and coffee” under both Spanish and U.S. control. This situation, “if left unattended, threatens to decimate the people until turning them through slow degeneration in an inferior and despicable being who would be looked upon with pity by those from other races, who are not superior by any means, but who are better fed”.

Del Valle Sárraga’s writings reflect how the new nutrition science assumed local significance in the context of Puerto Rico. For Puerto Rican urban professionals like him, biochemistry findings showing that “sound nutrition was the universal key to racial health and economic productivity” appeared particularly compelling. Nutrition ideas offered a new language to address concerns with rural Puerto Ricans low vitality and racial heterogeneity. By emphasizing diet’s effects over health and civilization, the new nutrition fostered the recognition of a relationship between factors like what Del Valle Sárraga called “agrarian slavery” and people’s vulnerability to disease, while de-emphasizing the role of race and ecologies. For local nutrition public health experts, breaking people’s reliance on a diet of polished rice, dried beans, and starchy crops emerged as a promising strategy to intervene with the health and social problems of the rural poor. During the following years, nutrition science in Puerto Rico focused on uncovering the biochemical composition of this diet and on finding strategies to diversify it.

251 Ibid. 226
252 Ibid. 229-230
253 Vernon, Hunger: A Modern History. 109
Puerto Ricans’ “Monotonous” Diet

The diet that biochemists at the School of Tropical Medicine set to analyze in the late 1920s by applying the latest innovations and discoveries in nutrition science was shaped by Puerto Rico’s unique colonial history and agricultural economy. As Chapter One showed, throughout the nineteenth century, the utilization of most of the fertile land to cultivate export crops—coffee, tobacco, and sugar cane—led to increasing reliance on imports to fulfill people’s food needs. This trend toward increasing imports and reducing land utilized for food crops cultivation was accentuated during the first decades of the 20th century. Incentives for raw sugar exports fostered the unprecedented expansion of sugar cane cultivation in the coastal areas while eased access to U.S. markets allowed tobacco farmers to increase production in the mountains of the central–eastern region.254

These processes fostered the gradual “shrinkage and simplification” of Puerto Ricans’ diet.255 Food imports figures show that this process was at its peak during the late 1920s. The total value of Puerto Rico’s imports increased from $700,000 in 1901 to $95,000,000 in 1926. From this total value, “the astonishing amount of $33,000,000”, or 35%, represented imported foodstuffs.256 In these circumstances, rural workers dedicated the greatest proportion of the income gained working in agriculture to purchase imported foodstuffs with high energy content such as polished rice, dried beans, and corn meal. Simultaneously, rural people sold whatever foodstuffs they produced in their households or plots—such as eggs and milk—to supplement their income. For example, it was “customary to barter eggs at the store to get coffee and sugar

256 Cook, "Some Aspects of the Food Problem in Puerto Rico." 61
or a larger quantity of less expensive foods”. The result of this was what nutrition experts described as a “monotonous” diet that lacked “protective” foods and “good quality” proteins.

Many visitors and colonial officials in Puerto Rico were struck by the local popularity of rice and beans and the limited consumption of fresh fruits, vegetables, and dairy products. For example, according to physician José Rodríguez Pastor it was “often a real problem for the American teachers who come to Porto Rico, to secure such things as tomatoes and lettuce, which they are used to eat daily at home”. He knew of “two American teachers in a small town of the interior, who made a weekly trip to San Juan for the express purpose of securing fresh vegetables to eat during one or two days of the week”. Although “this town of the interior was in the midst of one of the richest agricultural sections in the Island”, “nobody raised vegetables” since “ever available acre of land was being devoted to tobacco.” For public health officials like Rodriguez Pastor, emerging nutrition science postulates showed decisively that the prevalence of such a monotonous diet and the very low consumption of vegetables and animal protein were directly linked with the notorious lethargy and sickly state of the island’s rural poor.

Helen Valeska Bari, working in Puerto Rico as part of the Children’s Bureau during the early 20th century, was also struck by the local dietary habits. In an interview about her work in Puerto Rico during the mid-1920s, she reminisced about her experience with a local cook she employed at her house. Although Bari was pleased with her service because she was able to “cook meat and vegetables very acceptably”, “after two or three weeks” in the house, the woman said “that she would have to leave.” “At first”, Bari recalled, “she was unwilling to tell me why” she wanted to leave, “but I finally persuaded her and discovered that she was unhappy because

she did not have enough to eat at my house.” It had never occurred to Bari that “a person who could cook meat and vegetables so well would not eat them.” After finding out that the cook was not eating “what we ate”, Bari asked her what she wanted to eat to what she replied rice and beans. The situation was remedied when she “bought her a large sack of rice, a large sack of beans and two pots and told her to cook rice and beans three times as day.” With this new arrangement, Bari concluded, “she was completely satisfied.”

Rodríguez Pastor’s observations and Bari’s interaction with the cook show how by the time the Department of Chemistry of the STM organized its first nutrition research project in 1926, the diet of most Puerto Ricans was considerably limited in variety while its dependence on food imports was at its highest. In the discourse of nutritional biochemists, concerns with the ways in which monocrops agriculture shaped the island’s food system coexisted with two underlying notions. First, there was a widespread belief that the pressure of overpopulation over the island’s natural resources limited the effectiveness of attempts to lessen the dependency on food imports by increasing local food production. Second, and despite this unbalanced population-resources ratio, nutrition scientists believed that their expertise could serve to educate the people on how to choose appropriate foodstuffs to supplement their nutrient-deficient diet. Drawing from the work of the USDA Bureau of Home Economics in the U.S., efforts to teach people how to maximize their limited income by increasing household food production and conservation were central parts of nutrition and rural hygiene work during the 1930s. Chapter Three and Four will examine closely at the planning and implementation of these efforts.

Biochemical investigations conducted at the STM and its Department of Chemistry between 1926 and 1931 served as foundations for the local articulation of practical nutrition

advice for rural people. These first studies were directed by Professor Donald Cook. A native of Montana, Cook obtained his Ph.D. at Columbia University in 1923 under the directorship of renowned biochemist Henry Sherman. Named Associate Professor of Chemistry in 1926, Cook became the first full-time faculty member appointed by Columbia officials for the new STM. He adapted to life in Puerto Rico with relative ease, despite witnessing the destruction of one “West Indian hurricane” in 1928 and “going thru a bit of Hell” when another one hit in 1932. Apart from Cook, Professor of Parasitology George Bachman and Director Earl B. McKinley were the only other permanent Columbia appointees. The rest of the faculty and staff were paid by the University of Puerto Rico.

At the time of Cook’s appointment in 1926 his mentor Henry Sherman was named Visiting Professor. Sherman was one of the leading figures in the new and expanding field of nutritional biochemistry. He collaborated closely with nutrition research at the STM inserting the school in the international network of expertise created around his findings and methods. As Professor and Chair at Columbia’s Department of Chemistry, Sherman published widely on the biochemical properties and physiological functions of newly discovered vitamins as well as their presence if foodstuffs. His methods for the study of nutrition became standard techniques employed at laboratories worldwide. His rat growth model and synthetic diet formulas were also

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260 “Dr. Donald Cook. Description of Porto Rico Hurricane Oct. 1932.” CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence January 1932-1933

261 McKinley to van Beuren, February 4 1931. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence Jan-Dec. 1931

262 Therefore, while Columbia put the name, the local government provided most of the funds for the new school’s facilities and faculty. This arrangement generated tensions between the UPR leadership and Columbia officials during the following years. As the school expanded in both student population and physical structure, the process for the hiring of more faculty and staff produced contention between Columbia administrators and Puerto Rico’s government officials.

widely utilized in studies of dietary factors’ effects over animal biological processes. According to a biographer, Sherman “was one of the first—if not the first—to use statistical methods to evaluate data on animal growth”. He was also “largely responsible for placing the bioassay for many of the vitamins on a quantitative basis” laying “the groundwork for later successes…by others in identifying and synthesizing the vitamins as pure compounds”.

While biochemistry research activity at the STM reflected these broader developments and innovations, Puerto Rico’s particular nutrition and food supply issues gave local meaning to this emerging knowledge. Both Cook and Sherman emphasized the significance of Puerto Rico’s reliance on food imports for the nutrition of the people. As Cook wrote in 1927 “when a country whose chief support rests upon agriculture imports such a vast amount of food” it reflects “a one-sided development of the land.” Sherman on his part noted how “we have had no previous experience of a situation in which agricultural land values are so high while wages are so low.” At the biochemistry laboratory of the STM, Cook, Sherman, and their colleagues attempted to uncover the physiological and health effects of the “one-sided development of the land” fostered by Puerto Rico’s monocrops economy.

The Nutritional Adequacy of Rice and Beans

For Cook and Sherman, biochemical knowledge about Puerto Rico’s nutrition problem brought to light the detrimental effects of a colonial economy that incentivized monocrops cultivation while limiting people’s capacity to engage in food crops agriculture. Simultaneously, as the relationship between diet and vulnerability to infectious diseases became a topic of growing concern, nutrition assumed an increasing visibility as part of the overall research

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265 Cook, "Some Aspects of the Food Problem in Puerto Rico." 61
266 Sherman, "A Glimpse of Social Economics in Porto Rico." 224
activities at the STM. While work related to malaria, tuberculosis, and hookworm made the bulk of the research conducted at the school, experts on these fields emphasized the need to assess the role played by people’s “nutritional handicaps” in the prevalence and manifestations of these infections.\textsuperscript{267} Thus, from its origins in the biochemistry laboratory, knowledge about the deficiencies and public health implications of Puerto Ricans’ diet interacted with the School’s research agendas and with the broader socioeconomic changes Puerto Rico’s society underwent during this period.

While the school’s biochemistry laboratory brought together scientists and students interested in Puerto Rico’s nutrition problem, Sherman’s notoriety and reputation facilitated the insertion of their findings in international scientific exchanges. With his collaboration, Cook and laboratory assistants E.J. Quinn and Trina Rivera published the results of the Department’s early nutrition studies both in local and U.S. scientific journals. Quinn and Rivera worked with Cook and Sherman at Columbia University before joining the school’s technical staff. Rivera had a Bachelor’s in Chemistry from Columbia and worked as an assistant in the biochemistry laboratories while completing courses in nutrition at the Department.\textsuperscript{268}

In its first year, the school’s Department of Chemistry also offered courses titled “Food and Nutrition”, “Methods of Food Investigation”, “Biochemical Methods”, and “Research”. Apart from Cook, the initial staff of the Department included Luis G. Hernández as Instructor in Chemistry and O.W. Barrett as Resident Lecturer. Hernández had a degree in Pharmacological Chemistry from the University of Michigan and Barrett was an expert in tropical food plants and Agricultural Advisor to the Insular Government. By the second year, Rivera is listed in the

\textsuperscript{267} Pablo Morales Otero, Enrique Koppisch, and Joseph Axtmayer, "Influence of Dietary Factors upon the Resistance of the White Rat to Experimental Tuberculosis," \textit{Puerto Rico Journal of Public Health and Tropical Medicine} 9, no. 3 (1934).

\textsuperscript{268} "School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University. Announcement, 1926-1927," (San Juan: University of Puerto Rico and Columbia University, 1926). 19
annual report together with Cook as instructor for the courses “Food and Nutrition” and “Methods of Food Investigation”. “Food and Nutrition” offered students “lectures and demonstrations, with special reference to tropical foods” while “Methods of Food Investigation” provided “special emphasis on biological methods for the vitamins”.269 In 1929, Luz María Dalmau joined Rivera as teaching and research assistant.270 In 1932, Rivera was promoted to Instructor in Chemistry after earning a Doctorate in Chemistry from Columbia.271 Both Rivera and Dalmau played important roles in nutrition research during the following years.

The first nutrition studies conducted at the STM by Cook, Rivera and the staff of the Department of Chemistry applied Sherman’s biochemical methods and animal models to measure the vitamin and mineral content of starchy crops, polished rice, and red kidney beans. Cook was the lead author in all of the papers originating from these investigations which appeared in the Porto Rico Review of Public Health and Tropical Medicine, published by the Department of Health, and in the American Journal of Tropical Medicine. Cook and Quinn introduced one of these early publications by noting that:

“In an island as densely populated as Porto Rico where the larger proportion of the food of the inhabitants is of such nature as might lead to dietary deficiencies unless supplemented by milk and fresh vegetables, it is of interest to learn something concerning the vitamin content of the more common articles of diet native to the island.”272

Some of the experiments involved in these investigations were conducted at Sherman’s laboratory at Columbia since the facilities at the STM were still under construction. The first

269 “School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University. Announcement 1927-1928, Second Session,” (San Juan: University of Puerto Rico and Columbia University, 1927). 20-21
270 “School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University. Announcement, 1926-1927,” (San Juan: University of Puerto Rico and Columbia University, 1929).
271 Bachman to Rappleye, February 18 1932. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence 1932-1933
272 Donald Cook and E.J. Quinn, “The Vitamin B Content of White Yautia, Yellow Yautia and Plantain,” American Journal of Tropical Medicine 8 (1928). 73
completed project was the measurement of the vitamin A and B content of plantains and white and yellow yautías (tannier). Ripe plantains were found to be “excellent sources of vitamin A” “being equal to tomatoes, green peas and yellow sweet potatoes”. Yellow yautías were ranked first in vitamin B content and could be “compared to canned navy beans and spinach”. On the basis of these results which demonstrated that these foodstuffs “were valuable sources of two essential vitamins which are apt to be lacking in the average Porto Rican dietary”, Cook suggested that “their use a supplement to rice, beans, and codfish should be encouraged”.

Together with analysis of the vitamin content of local foods, Cook and his staff conducted experiments to measure the amount of energy, or the caloric value, of both imported and locally-grown foodstuffs. This set of studies was framed by prevalent concerns with the effects of people’s reliance on food imports over labor productivity. Therefore, researchers aimed to quantify the amount of energy provided by the most commonly imported food products—such as polished rice, dried beans, corn meal, and salted codfish—compared to that obtained from locally-grown products. These studies showed that when using “the average of 2,800 Calories per person per day, which allows for sufficient energy to carry on most forms of work”, “the imports furnish almost fifty percent of the total energy requirements of the population.” Polished rice, wheat, and oils made up 72 percent of the energy from imports. Cook concluded that Puerto Rico’s dietary reliance on these products and the small proportion of locally-produced foods was “not only economically unsound, but has considerable bearing on the public health”.

273 Donald Cook, "Vitamin Studies in Porto Rico," Porto Rico Health Review 2 (1926-27); Cook and Quinn, "The Vitamin B Content of White Yautia, Yellow Yautia and Plantain."
274 Cook, "Vitamin Studies in Porto Rico." 23
275 Cook, "Some Aspects of the Food Problem in Puerto Rico."
Cook’s analysis of import figures also showed that even those foods thought to be widely consumed by the population provided minimum amounts of energy. This was the case of salted codfish. While “the writer [Cook] has heard of the great part it plays in the dietary of the Island”, codfish occupied a “relatively unimportant position” when the figures are examined. Moreover, “if calculating the energy for fish the figure is made up not only [of] the salt codfish imported, but all other kinds of dried, smoked, salted, pickled and oil-preserved fish, the total value of the energy from fish amounts to but 3.3 percent”.276 Therefore, although it was once an important foodstuff, by the late 1920s codfish only occupied a marginal role in Puerto Ricans’ diet. Changes in import routes and trade regulations provoked by the transition to U.S. rule reduced shipments of this product to the island. The resulting price increase turned salted codfish into a mere condiment rather than an important foodstuff. However, memories of its previous role remained and these were transmitted to Cook when he embarked in his nutrition investigations.

Another important finding of these early studies from the vantage point of the new nutrition science, was that Puerto Rico’s dependency on imports led to a diet that was “unbalanced” with respect to the carbohydrates, fats and proteins. While it was high in the first, it was low in the latter as well as in calcium and many of the vitamins. While they considered plátanos and yellow yautías to have some nutritional value, overall “this defect is not apt to be corrected by the most common foods now consumed in the island”. Apart from education, they proposed producing and consuming more milk and green vegetables, developing the island’s fisheries, and implementing better models to distribute the fish to the interior as strategies to correct these problems.277

276 Ibid. 65
277 Ibid. 66-67
Although Cook, Rivera, and Quinn found some of the starchy crops to have nutritional value, their studies of the vitamin and mineral content of dried red beans and polished rice showed “conclusively” their lack of adequate nutrients. According to their analysis of import figures, rice and beans made up “47 percent of the energy of imported foods.”278 Scientists working in India, Japan, and the Philippines claimed that polished rice was not an adequate food and that a diet based on it lacked proteins of the “appropriate kind” as well as “adequate amounts” of minerals and of “each of the essential vitamins”.279 According to Cook the variety of rice used in Puerto Rico was also “low in protein”, lacked “an adequate supply of mineral salts”, and was “deficient in the antineuretic factor of vitamin B”. Red beans, on the other hand, although “on the whole good sources of protein and mineral salts”, “in the dried condition” lacked vitamin C and are low in vitamin A “and possibly B”.280

Cook and his research assistants designed a series of experiments to determine whether polished rice and dried red beans “could supplement each other’s deficiencies when mixed” and furnish “all the requirements for growth and rearing of the young”. For this they utilized Sherman’s adapted rat growth methodologies. By the early 1930s, this method was the “gold standard test” for nutritional research. Through it, nutrition scientists engaged in international exchange of knowledge about the physiological activity of newly discovered nutrients and the effects of their deficiencies in the rat and the human. White or albino rats became the most widely utilized test animal due to the docility, ease of manipulation, and fecundity. These factors facilitated the standardization and replication of research and analytical methodologies in biochemical laboratories across the world.

280 Cook, Rivera, and Torres Díaz, "Preliminary Study of a Common Puerto Rican Diet."
Personnel in biochemical laboratories kept a supply of young rats 28 to 29 days old reared under the same conditions. When rats were needed for an experiment, staff chose some for the experimental group and some for the control. Rats on the experimental group received a laboratory diet that was deficient in a particular nutrient such as vitamin A. This diet was then supplemented with different portions of a foodstuff like powdered milk or cod-liver oil to evaluate how efficient was this supplement in curing the induced deficiency. Biochemists developed different types of laboratory diets, each deficient in a particular nutrient. Rats who received the deficient diet alone were used as negative controls. A positive control was sometimes included. The rats in this group received a complete laboratory diet containing optimum proportions of all the known essential nutrients. The average growth of the rats was measured throughout the experimental period (usually 8 weeks, equivalent to 12 years in human time), after which they were killed. Their organs were dissected, their bones x-rayed, and their blood analyzed to examine the effects of the induced nutritional deficiency. Average growth curves were created to represent the difference in weight gain (in grams) between the rats in the experimental groups and the controls.

Applying these methodologies, Cook and his staff measured the growth of two groups of young rats placed in individual cages, one receiving a “standard laboratory diet adequate in all respects” and one a daily diet of “cooked rice and beans” from a restaurant in San Juan during eight weeks. After recording the animals’ weight each week over the experimental period, Cook and his staff concluded that “it is evident that the rats on the standard diet gained a little

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281 Donald Cook and Joseph Axtmayer, "La Vitamina A y su Hallazago en el Achiote," Boletín de la Asociación Médica de Puerto Rico 24 (1932).
282 Sherman and Spohn, "A Critical Investigation and an Application of the Rat-growth Method for the Study of Vitamin B."
283 This standard laboratory diet was developed by Sherman and collaborators at Columbia University and it consisted of 18% purified casein, 68% corn starch, 10% dried brewer’s yeast, and 4% Osborne and Mendel salt mixture. This basic formula produced a diet “optimal for growth of rats” and was adapted according to the conditions of the particular experiment.
over twice the amount of those on the experimental [rice and beans] diet". In other experiments, Cook and assistants tested theoretical observations about potential supplements to compensate for the specific deficiencies of the rice and beans combination. For this, Cook and Rivera placed “seven groups of rats, four weeks old, in individual cages”. They fed all the rats a basal ration of 60 percent boiled rice and 40 percent boiled beans purchased from local restaurants. One of the seven groups received no further supplements and became the control group. After all of the rats started developing “definite symptoms of rickets”, the second and third groups were put on a “trial of cod liver and sunlight” as supplements to the basal ration respectively. One of the remaining four groups received a supplement of boiled white yautía. The fifth group received a supplement of 20 percent boiled yellow yautía, the sixth boiled green plantain, and the seventh boiled ripe plantains.

After calculating growth curves for each of the groups (Image 2.1), Cook and Rivera found that “the cod liver oil group grew almost at the same rate as the normal animals while the sunlight group grew at about half rate”. The white and yellow yautía curves showed “slight improvement over those of plátano although “the white yautía group had more marked rickets” than any other group with a supplemented diet. For them, these results demonstrated that “evidently neither the yautías nor the ripe or green plátanos can be considered as adequate supplements of the deficiencies of rice and beans unless some other food containing vitamin D is added to the diet or sunlight is allowed to act on the individual”.

These initial studies resembled McCarrison’s experiments in India in both the use of rat growth methods and in the underlying assumption about the superiority of animal over vegetable products. McCarrison fed

284 Cook, Rivera, and Torres Diaz, "Preliminary Study of a Common Puerto Rican Diet."254
286 Ibid. 20
rats with the diets of distinct groups and “mapped a marked decline in their vitality as the northern diet of wheat and meat gave way to one based on rice and vegetables in the south.”\textsuperscript{287} Similarly, Cook and Rivera measured the nutritional qualities of the rice and beans mixture and found that it was associated with limited or abnormal growth in rats, even when supplemented by starchy crops. For them these experiments proved that Puerto Ricans’ laboring capacity could only be increased if this deficient, rice-based, diet was supplemented with foodstuffs of better nutritional quality, particularly animal proteins and green vegetables.

Image 2.1: Growth curves of seven groups of rats receiving the experimental diets compared to a group on an adequate diet.

The studies in Puerto Rico also reflect the growing “pathologization” of rice diets and the reconfiguration of racialized understandings of colonial population’s health and productivity. By

\textsuperscript{287}Vernon, "The Ethics of Hunger and the Assembly of Society: The Techno-politics of the School Meal in Modern Britain." 704
uncovering the universal “nutritional basis” of illness, the new nutrition science shifted colonial public health attention from climate to diets as the underlying factor of many “tropical” illnesses. Simultaneously, ideas about the superiority of Western diets based of animal proteins led to re-articulations of racialized explanations for the low productivity of certain colonial populations. These notions about the superiority of animal products framed Cook’s discussion of findings regarding the vitamin and mineral content of starchy crops. Ripe plantain, for example, appeared to have a high vitamin A content leading Cook to suggest that its consumption be further encouraged. However, from the perspective of the new nutrition science these were tentative palliatives for the profound deficiencies of Puerto Rican’s diet and their public health implications. The only effective solution to attend these problems was the increase in local production and consumption of animal protein, milk, and green vegetables.

These assessments of Puerto Rico’s nutrition and food problems during the 1920s and 1930s acknowledged how the widespread consumption of polished rice and dried beans was the result of monocrops agriculture As nutrition knowledge expanded and was refined during this period, the poor quality of this diet emerged as the fundamental cause of Puerto Rican’s low productivity and high vulnerability to prevalent infectious diseases such as hookworm anemia, tuberculosis, and malaria. While biochemistry offered the knowledge needed to teach rural people how to maximize the efficiency of their diet, Cook collaborators argued that more investigations were needed before a complete picture of Puerto Rico’s nutrition problem could emerge. However, as the Depression wore on, the funds required for more extensive studies were in short supply. In this context Cook, Sherman, and Lambert reached out to the Rockefeller Foundation to request its support for this new project. Columbia’s affiliation and the School’s location were key factors in the success of their request.
Puerto Rico’s Tropical Nutrition Studies

Apart from assessing the nutrition problem in Puerto Rico, the STM was ideally located to play a major role as part of the new scientific attention to food and nutrition in the tropics. The early studies directed by Cook during the late 1920s were part of an emerging subfield often called “tropical nutrition.” By establishing the relationship between diet, disease, and productivity biochemistry could offer “a nutritional solution to “the labor problem in tropical and sub-tropical climates.”288 Puerto Rican chemist Del Valle Sárraga recognized early on the importance of the new nutrition knowledge as part of these efforts. In a 1925 letter to Pedro Gutiérrez Igaravídez from the Anemia Commission he wrote about the need for more research on the biochemistry of nutrition in the “torrid zones”. According to Del Valle Sárraga there was “little done to this day in the torrid and tropical zone, except in the Philippines and India, in the study of the normal physiology of digestion and nutrition”.289 He further wondered if “is it not to be expected that those investigators situated in tropical countries…contribute a grain of sand to the common task of worldwide scientific cooperation?”290

Del Valle Sárraga’s concerns were shared by Cook, Sherman, and other Columbia University officials. Cook and Sherman presented early findings about the chemical composition and nutritional properties of Puerto Rico’s foodstuffs as preliminary conclusions that had to be further tested an expanded. They also emphasized the Puerto Rico school’s potential to contribute important insights to the particular problems of nutrition in the tropics. Similarly, Columbia officials noted that “nutrition in the tropics, where a large proportion of the world’s population lives and from which in the future may come a still greater proportion of the world’s food supply, has been one of the most neglected fields of biological research.” “One reason for

288 Hunger: A Modern History. 95-96
289 del Valle Sárraga, "Ideas Modernas sobre Nuestra Ración Alimenticia II." 294
290 Ibid. 300

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this”, they explained, “has been the lack of proper facilities for study in the regions where of necessity the investigation would have to be carried out.” Thus, the establishment of the STM in Puerto Rico “under Columbia’s scientific direction, and the development of a nutrition laboratory under Professor Sherman, a leader in this field, bring an opportunity for assisting research in a relatively neglected subject.”

Apart from Sherman, other well-known biochemists pointed to the STM location and its staff’s previous research experience as factors that made the Department of Chemistry an ideal place to contribute to tropical nutrition. Army physician and nutrition researcher Edward B. Vedder was among those who were convinced of this institution’s potential after giving several lectures at the STM in January of 1930. Apart from delivering these lectures, Vedder went in a 2-day trip “of 300 miles across the island and around the East end” accompanied by Dr. George Payne of the Rockefeller Foundation. At the time Payne worked as supervisor of the public health units of the Department of Health. The purpose of this trip was to assess the sanitary conditions of the island and “to study the nutritional problem”.

Vedder’s visit coincided with the appointment of Theodore Roosevelt, Jr. as the new Governor of Puerto Rico. Roosevelt’s appointment fostered an increased attention from U.S. government agencies and philanthropies to the public health and nutrition problems on the island. The activity of the American Child Health Association (ACHA) in Puerto Rico was particularly influential, especially its assessments of the nutrition problem among infants and children. Led by Samuel Crumbine, the ACHA conducted an island-wide study of the health and

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291 Historical Record, Columbia University Nutrition Studies, 1930-1935. RAC, RF, RG 1.1, series 200, box 80, folder 958
social conditions in Puerto Rico “as the may affect children”.293 On the basis of these assessments, the ACHA recommended the appropriation of emergency relief funds to provide food aid to poor nursing mothers and families.

However, after studying the conditions on the island, Vedder was skeptical of Crumbine and colleagues’ conclusion that people in Puerto Rico were starving and in need of emergency measures. Vedder’s reaction with “regard to the question of nutrition” was “that there is no starvation in Porto Rico.” Referring to the ACHA study, Vedder asserted that “recent reports have created the impression that there is an acute food shortage as a result of which many people are practically starving”.294 The real problem, in his opinion, was that “for many years, the general population of Porto Rico—that is the working classes—has subsisted on a diet that is inadequate and lacks variety. Probably at no time within the last thirty years have the working classes had a suitable diet.” Moreover, “there is no local supply of vegetables and fruits at a reasonable price, there is but little milk consumed in the island and but little meat.”

In his lectures at the STM, Vedder discussed the recent discoveries about essential vitamins and minerals in light of his knowledge about the nutrition problem in Puerto Rico and his assessments of the local diet. In the first lecture he offered a lengthy description of the current knowledge about the chemistry and physiological role of the vitamins.296 In the second, he discussed his experiences in beriberi research in the Philippines during the previous decade and

294 E. B. Vedder. “Observations on a visit to Porto Rico.” RAC, RF, RG 1.1, series 243, box 2, folder 27. 5
295 Memorandum by Dr. Howard in Re Col. E.B. Vedder, February 2 1930. RAC, RF, RG 1.1 series 243, box 1, folder 11
connected his findings with those obtained by McCarrison in India. Throughout these discussions, Vedder brought these recent discoveries in nutrition science and deficiency diseases to the Puerto Rico’s context. In his view, Puerto Rico was ideally situated for the systematic study nutrition in the tropics because, while scientifically connected to the U.S., its main problems resembled that of the tropical regions where he and his colleagues worked during the past years, namely a monotonous and rice-based diet.

Earl B. McKinley, appointed as the new Director of the STM, was of a similar opinion. He believed that the main problem in Puerto Rico was related to the inadequacy of the food available. Referring to the findings of the studies recently completed by Cook and the STM chemistry staff, McKinley argued that there was a need for more laboratory and field nutrition research “to ascertain the caloric and vitamin value” of all foods consumed by Puerto Ricans. Cook’s findings to date were considered to be preliminary conclusions upon which to build a solid research plan to study the problem of nutrition in Puerto Rico. However, the STM lacked the funds to conduct such an expansive research. Thus, Cook, Sherman, and McKinley submitted to the RF a proposal “for a project to study the nutritional conditions in Porto Rico.” Apart from contributing to solve the most important public health problems in Puerto Rico, these studies’ findings were to expand knowledge about tropical nutrition in general. As McKinley argued “this type of research and the results of investigations here on nutrition may not only be practical benefit to this island but possibly to other tropical countries.”

298 Memorandum by Dr. Heiser re Dr. Earl B. McKinley and Porto Rico, September 16 1930. RAC, RF, RG 1.1 series 243, box 1, folder 18
299 H.T. Clarke to William Darrach, May 23 1930. RAC, RF, RG 1.1, series 200, box 80, folder 958
300 “Five year project for nutritional studies in Porto Rico,” (Preliminary draft) RAC, RF, R.G. 1.1, series 200, box 80, folder 958
Several RF officials shared this view. For example, in his letter to William Darrach, Dean of Columbia’s College of Physicians and Surgeons, Frederick Russell noted that:

“Individually and collectively we feel very strongly that such a study should, if possible, be undertaken in Porto Rico. After several visits, I am convinced that the future health of the Island depends to a very large degree on the control of malaria, hookworm and tuberculosis. Therefore, perhaps the most important contribution which could be made toward solving those problems would be in attempting to improve the underlying malnutrition both for adults and children.”\(^{301}\)

According to the proposal sent to the RF, these nutrition studies were to be conducted in close collaboration with biochemist Joseph Axtmayer. Axtmayer worked at the Department of Chemistry of the UPR campus in Río Piedras since 1927 after obtaining his doctorate at Columbia where he was Sherman’s student. While at Columbia he collaborated with Sherman in the design of a method to study the vitamin B molecular complex, its physiological role in diseases like beriberi and pellagra, and its presence in whole wheat and milk powder. After moving to the Department of Chemistry of the UPR he expanded his vitamin B complex studies by analyzing its presence in the polished rice and red kidney beans mixture.\(^{302}\)

Axtmayer’s appointment to the STM was part of a life-long career in Puerto Rico. He learned Spanish, married a Puerto Rican, “and always considered himself a native”.\(^{303}\) Together with Cook, Axtmayer trained the first generation of Puerto Rican nutrition scientists graduating from the School of Tropical Medicine. He remained involved with Puerto Rico’s nutrition and public health issues for the rest of his professional career and, as the excerpts in the introduction show, became closely involved with the island’s public affairs. He published widely in scientific and popular journals and collaborated with experts from fields like agronomy, social work, and

\(^{301}\) Darrach to Russell, May 28 1930. RAC, RF, RG 1.1, series 200, box 80, folder 958


\(^{303}\) Asenjo, "Nutritional Research in Puerto Rico: Past, Present, and Future." 37
home economics. Axtmayer drew from his personal experiences on the island as well as from his authority as a nutritional biochemist to discuss the relation between the nutrition problem and Puerto Rico’s socio-economic situation. These credentials also gave visibility to his later critiques of what he considered to be the shortcomings of the government plans to attend it.

However, Axtmayer’s initial recruitment to the STM occurred in the midst of controversy. The terms proposed by the school’s leadership for his appointment provoked “tense moments” between Columbia officials and members of the UPR Board of Trustees. McKinley suggested that while his salary at the STM would be covered by the RF grant, Axtmayer would retain “his deanship at the University” where he would return once the project was over. To McKinley’s surprise, the Board of Trustees “refused to agree” to this arrangement. These tensions reflected once again the general attitude of Columbia officials toward their Puerto Rican venture. The UPR was still expected to subsidize most of the costs not covered by RF grant. The Board only agreed to Axtmayer’s transfer to the STM after McKinley offered to keep him at the school as an Associate Professor once the RF funds expired.

With the terms of Axtmayer’s recruitment established, on November of 1930 the Rockefeller Foundation’s Division of Medical Sciences awarded a grant to Columbia University for a study entitled “Nutritional Studies of the Foodstuffs used in the Porto Rican Dietary.” Cook and Axtmayer were the principal investigators while Sherman offered advice in the analysis of biochemical data and the publication of results. Overall, these studies applied the rat growth method, the vitamin B complex measurement technique, and Sherman’s standard laboratory diet to study the nutritional qualities of Puerto Rico’s traditional foodstuffs. These results were to

304 McKinley to Sherman, February 1 1931. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence January-December 1931
305 Axtmayer and Cook 1932; Axtmayer and Silva 1932; Cook and Axtmayer 1934; Cook et al. 1940–41. With this method investigators placed albino rats, raised under equal conditions until the time of the experiment, in different
be used to “reinforce the native diet” by promoting the incorporation of foods of better nutritional quality “into the universal rice and beans dish”. Cook, Axtmayer, and their technical staff published numerous papers based on these results in both local and U.S. scientific journals. Some of these findings called the attention of scientists abroad for both their potential public health and commercial implications.

In the annual report sent to the RF, Cook detailed the most important results of studies conducted during the year. The discovery of the high vitamin A content of the *achiote* (annatto) seed, typically used in the Puerto Rican dietary as food seasoning and colorant, was one of the most discussed results. This finding occurred as part of studies measuring the vitamin A, B, and D content in various fruits and vegetables such as green plantains, *calabaza* (squash), *mamey*, mango, *garbanzos* (chick peas), avocado, guava paste, and ripe coconut meat, ripe plantain, and pigeon peas (Images 2.2 and 2.3). The purpose of these extensive studies was to “ascertain the absolute quantities” of essential vitamins and minerals present in these foodstuffs. The annatto discovery demonstrated the utility of this approach since, “besides the

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scientific interest in finding a seed so high in vitamin A, its universal use in the flavoring and coloring of rice, soups, meats and gravies may be of some significance nutritionally.”311

Cook and Axtmayer published their findings about the vitamin A content of annatto in scientific journals on the island and the U.S., both in Spanish and English.312 They considered that this discovery had multiple applications, particularly the potential of annatto seed extracts as

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311 D.H. Cook. “Report from the Department of Chemistry of the School of Tropical Medicine for the first year’s work under the Nutrition Research Grant from the Rockefeller Foundation,” 1932, p. 1-2. RAC, RF, RG 1.1, series 200, box 80, folder 958
312 Donald Cook and Joseph Axtmayer, "A New Plant Source of Vitamin A Activity," Science 75, no. 1933 (1932); "La Vitamina A y su Hallazago en el Achiote."
a vitamin A supplement. Sherman had already described a potential link between the consumption of a diet high in vitamin A and increased longevity in rats.\textsuperscript{313} Thus, Cook and Axtmayer wondered if maybe “one day in the future we will hear in the radio an announcement proclaiming the health benefits of annatto as a new source of vitamin A and advising people to buy a sample of this seed’s extract using the slogan “Drink bottled sun from Puerto Rico and you will enjoy good health.”\textsuperscript{314} The commercial implications of these health benefits were not lost to U.S. pharmaceuticals and food industries. Upon learning about the annatto discoveries, representatives from various companies wrote to officials at both Columbia University and the STM requesting information about these experiments and any published data.

For example, C.C. Milkes of the Chicago food distribution company The Temper wrote to Columbia’s “Medical Department” in September 1932 asking whether the “findings relative to the nature and properties of the achiote seed, as commented on in a recent issue of the Brooklyn Daily Eagle, are available in any published form.”\textsuperscript{315} Similarly, C.J. Chapin of the Producers and Traders Company wrote inquiring if there were “monographs available for distribution” that could help them “to take steps to develop this subject” of extracting vitamin A from annatto, “having complete facilities” and “close connection with two pharmaceutical firms.”\textsuperscript{316} For Cook and Axtmayer, this interest was yet another sign of the broader importance of their project as well as proof of its potential to offer solutions to the nutrition problems of the tropical world.

\textsuperscript{313} Henry C. Sherman, "Nutritional Improvement in Health and Longevity," \textit{The Scientific Monthly} 43, no. 2 (1936).
\textsuperscript{314} Axtmayer and Cook, "Nutrition Studies of Foodstuffs Used in the Puerto Rican Dietary I: The Vitamin A Content of White and Yellow Yams." 103
\textsuperscript{315} Milkes to Columbia University, September 26 1932. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence 1932-1933
\textsuperscript{316} C.J. Chapind to Columbia University, September 26 1932. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence 1932-1933
Laboratory Rats and Country People

Given the interest elicited by the annatto discovery, Cook expanded their project’s scope from ascertaining the biochemical properties of individual foodstuffs to examining the nutritional value of popular food combinations. These studies were conducted in lieu of broader dietary surveys. In the initial proposal to the RF, Cook and Sherman planned to divide the project in two parts: biochemical investigations of the vitamin and mineral content of native foodstuffs and field investigations of people’s eating habits and nutritional status. However, this last part was not considered feasible by officers in the Division of Medical Sciences given that, “they seem to be more sociological than chemical,” and could be carried out “as well or better by people who have had sociological training.” Additionally, this “would have necessitated a larger staff and an increased budget”, something to which the RF would not provide at the time.

In these circumstances, Cook and Axtmayer designed several studies to obtain a more complete nutritional picture of local dietary habits and their relation with deficiency diseases without leaving the laboratory. During the first year, Cook and Rivera undertook “a preliminary study of the efficacy of the native legume, gandules [pigeon peas], in hemoglobin formation in experimental animals suffering from nutritional anemia.” During the second year, they included a more systematic investigation of “typical” Puerto Rican food combinations. According to Cook, “in trying to determine the relative state of nutrition of a people, we lack definitive comparative data.” Moreover, “with certain food habits established in a country” and

317 Lambert to McKinley, September 18 1930. RAC, RF, RG 1.1, series 200, box 80, folder 958
due to “certain economic conditions, one cannot change the dietary to any great extent…nor would it be wise to do so till is sure in what respects the dietary is deficient.”

Thus, Cook and Axtmayer settled for evaluating “the chemical composition and nutritive values of typical diets consumed daily by three large groups of people living in Puerto Rico.” “In order to have a basis of comparison,” Cook studied a “continental diet” by weighing and measuring his own food intake for a period of nine weeks. This “diet which was not chosen from any economic considerations was believed to be adequate in most respects since it had maintained an individual in good health for six years”. He considered it to be representative of the diets “used by natives of the United States, who although residing in Puerto Rico for some length of time, continue the same type of diet used when on the continent”. This analysis, Cook noted “in itself was an interesting study yielding data on calorie intake, vitamin A, and mineral content of the diet of a continental in the tropics.”

But in order to make the study of more value to further their knowledge of conditions in Puerto Rico, “it was necessary to test a Puertorrican diet under similar conditions for comparison.” Cook obtained a version of this diet from “one of the numerous little cafés in San Juan and its suburbs that cater to families by sending out meals.” According to Cook, this diet was “used by a large group of families who buy their food already prepared from caterers” such as restaurants, hotels or private homes. Cook emphasized that this was truly representative of this

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320 D.H. Cook. “Report from the Department of Chemistry of the School of Tropical Medicine for the second year’s work under the Nutrition Research Grant from the Rockefeller Foundation,” 1933, p. 4. RAC, RF, RG 1.1, series 200, box 80, folder 958
322 D.H. Cook. “Report from the Department of Chemistry of the School of Tropical Medicine for the second year’s work” 4-5
323 Ibid
diet since the caterer supplying it “did not know that it was to be used for experimental purposes” and “it was delivered at a home and then brought to the laboratory”.324

Together with the “continental diet” and the “caterer’s diet” Cook, Axtmayer, and assistant Luz Dalmau studied the jíbaro or country family diet composed of the food consumed by poor rural families. These diet included “his range of food stuffs: polished rice, red kidney beans, pork, onion, chick peas, salted cod fish, olive oil, annatto seeds, lard, salt, garlic, black pepper, sweet potatoes, tomatoes, and pigeon peas.”325 Cook and Axtmayer obtained information about the composition of the country family diet and the weekly amounts consumed from a survey conducted by the Insular Department of Education. Chapter Three and Four will discuss in detail the design and implementation of this and similar dietary studies in rural Puerto Rico during the 1930s. These surveys gathered data about multiple aspects of rural life on the island. Among this, home economists and social workers collected information about the foodstuffs utilized as well as the amount and frequency. Based on this information, Cook, Axtmayer, and Dalmau purchased at a local market the products considered to be part of the country family diet and prepared a specific quantity weekly in the laboratory.326

The price of each meal was calculated as 85 cents for the continental diet, 15 cents for the caterer’s, and 8 cents for that of the country family. Different from the last one, both the continental and caterer’s diet contained bread, potatoes, butter, and eggs. In order to determine the nutritional qualities of these diets, “aliquot weights or volumes of the various dishes of foods” in each “were thoroughly mixed and ground until a completely homogeneous paste was obtained”. Samples from this past were taken daily “for total moisture and vitamin A

324 Cook, Axtmayer, and Dalmau, "Nutrition Studies of Foodstuffs Used in the Puerto Rican Dietary VII: A Comparative Study of the Nutritive Value of Three Diets of Frequent Use in Puerto Rico." 5
325 Axtmayer, "Puerto Rico’s Vicious Circle: A Study of the Island’s Diet."
326 Cook, Axtmayer, and Dalmau, "Nutrition Studies of Foodstuffs Used in the Puerto Rican Dietary VII: A Comparative Study of the Nutritive Value of Three Diets of Frequent Use in Puerto Rico." 5
determination” while “the major part was fed to rats, either as the sole source of food or supplemented with lettuce, milk, cod-liver oil, yeast, casein and egg-albumin, alone or combined, in order to determine the nutritive value of the diet and its deficiencies”.327

Image 2.4 (top): Young albino rats after receiving (1) bread and water, (2) bread and milk diluted with water, (3) bread and whole milk, and (4) a complete diet during eight weeks

Image 2.5 (bottom): Young albino rats after receiving: (1) rice and red beans, (2) rice and chickpeas, (3) rice and soybeans, and (4) a complete diet during eight weeks. *El Mundo*, 25 January 1942

327 Ibid. 4
Through this process, Cook and Axtmayer combined individual foodstuffs to create emblematic versions of diets consumed by people living in Puerto Rico. This strategy drew from contemporary efforts by biochemists to devise simplified representations of tropical people’s diets for use in the biochemical laboratory. In nutrition experiments, however, representative combinations of “Northern”, “Western”, or “continental” foodstuffs—such as meat, wheat, and dairy products—remained as the default template of an appropriate diet. The absence of these foodstuffs in the diets of tropical peoples, or in the simplified versions created in the laboratory, made these diets deficient even before experiments were conducted. Thus, the analyses of biochemical findings were the product of both data about nutritional content and prejudices about the superiority of animal and wheat-based diets.

In Puerto Rico, Cook and Axtmayer used the guidelines of the Association of Agricultural Chemists and Sherman’s methodologies to determine the protein, vitamin A, and mineral content of the combinations of foods representing the continental, caterer, and country family diets. These analyses showed that the protein content of the caterer diet was the highest of the three, “being even higher than the 1 gram of protein per kilogram of body-weight agreed upon as necessary for adequate daily intake” by the Technical Commission of the Health Committee of the LoN. However, these analyses also showed that the quality of the proteins supplied by these diets, “with the exception of the Continental Diet, probably is not good”. Moreover, “although the Continental Diet shows the lowest weight of protein, its quality is undoubtedly superior to either of the two”.328 The presence of meat and other products of animal origin in the continental diet was proof of the superiority of its proteins, regardless of the actual content measured through the experiments.

328 Ibid. 9
Similarly, the carbohydrate content was found to be “lowest in the case of the Continental Diet and greatest in the Country Family Diet”. This was “to be expected, since the major portions of the Caterer and Country Family Diets consist of rice, beans, and yams”. The calcium values were found to be low in the local diets—not surprising once again because, “with the exception of the Continental Diet, none contained milk”. The quantity of phosphorous in both the Continental and Caterer’s diets seemed “to be adequate when compared to the accepted standard…while the analyses of the Country Family Diet gives values below this standard”. In the case of iron, they were surprised to find in the three diets values above the “dietary standard of 12 milligrams”. This, however, did not necessarily mean that the three diets were “adequate in iron, since only a part of the iron present in foodstuffs has nutritional significance.” Finally, vitamin A analyses showed that both the Caterer and Country Family Diets have low content of this nutrient “and are undoubtedly low in the other vitamins also”.

For Cook and Axtmayer, these findings offered a complete scientific description of the Puerto Rican diet and demonstrated conclusively the need to incorporate foodstuffs of better nutritional quality. Although the RF grant officially ended in 1935, New Deal agencies provided supplementary funding to continue the studies throughout the rest of the decade when more experiments were conducted to further show “the effect of relying on a diet deficient” in essential factors. Four groups of albino rats were selected for an 8-week experiment which corresponded “to 4 years and half, approximately, in the life of a human”. The first group of rats received a diet of 2/3 parts of cooked white rice and 1/3 parts of red stewed red beans; the second group received another diet of 2/3 parts of rice and 1/3 parts of stewed chickpeas; the third group received a diet of 2/3 parts of rice and 1/3 parts of soybeans; and the fourth group received a

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329 Ibid. 9
330 Ibid. 12
standard “complete” laboratory diet. According to Axtmayer, “the graph and photography of the rats demonstrates palpably that the first three diets are deficient and that the mixture of rice and soybeans is better than the mixtures of rice and red beans or chickpeas.”

As part of these later studies, Cook and Axtmayer performed biochemical analyses of other not widely consumed products to test their potential to supplement the local diet. Oil obtained from West Indian shark livers was among these new products. Biochemist Conrado Asenjo participated in this new research while taking short courses in the chemistry of food and nutrition at the STM. At that time, Asenjo was a Chemical Engineering student at the Rensselaer Polytechnic Institute in Troy, New York. According to his accounts of these early experiences, “it was with Axtmayer and Cook that the writer, still a junior in college, was initiated in nutritional research”. Asenjo’s trajectory is exemplary of an emerging generation of urban professionals who came of age during the interwar years.

The socioeconomic conditions on the island during this period—marked by the rise and fall of an economy based on monocrops agriculture—fostered an unprecedented interaction between this new group of professionals and the rural poor. Simultaneously, the local and international effects of the Great War shaped Asenjo’s interest in nutrition science and in its importance for Puerto Rico’s society. In 1918, his father was appointed Chief Enforcement Officer of the U.S. War Food Commission organized to regulate the distribution and sale of foodstuffs during the emergency. In this position, he was in charge of traveling the island inspecting grocery stores and food stands to ensure compliance with the Commission’s regulations. As Asenjo later recalled in an autobiographical essay, it was while accompanying his father in some of these trips that he witnessed for the first time “a Puerto Rico with thatched

331 Axtmayer, "Nuestra Dieta, Experimentos Científicos Demuestran que la Habichuela de Soya Tiene Mayor Valor Alimenticio que la Habichuela Colorada."
332 Asenjo, "Nutritional Research in Puerto Rico: Past, Present, and Future." 37
huts, cargo horses, rivers without bridges, ox carts”, and “barefoot jíbaros”. These were the images that Asenjo’s generation of local professionals associated with rural life in Puerto Rico as they were recruited to staff relief and reconstruction agencies during the Depression.

Asenjo’s childhood trips to the countryside served him as a point of reference in this recollection of his trajectory as a nutrition scientist. In one of these first trips he brought home “a chick, very tender still”, who became his “favorite play mate”. The chick was named “Pepito the Philosopher” because “he was found every morning standing in one leg with one eye open and the other close, in what seemed to be a state of profound meditation”. Since corn was scarce during the war, Asenjo and his family fed Pepito with polished rice. “One day”, he remembered, “we found Pepito laying with his legs up showing a great lack of coordination in his movements”. Despite all the treatments that Asenjo’s mother and the cook gave the chick, six days “after the first clinical signs began” Pepito died. Years later, “while going over a book in college”, Asenjo recalled “I came across a photograph that brought to my mind the memory of my dear Pepito”. The photo was of a chick suffering from vitamin B₁ deficiency provoked by an exclusive diet of polished rice. Asenjo realized that if they had known this in 1918, they would have saved Pepito by feeding him with “yeast, rice polishing or some other source of vitamin B₁”. Unbeknownst to him at the time, this was Asenjo’s “first experience with the vitamins”.

The imaginaries of rural life depicted in Asenjo’s accounts were central to discussions about and interventions with the problems of nutrition and food supply on the island during the following decades. As Asenjo noted, while the international revolution in nutrition sciences influenced his early professional trajectory, local circumstances gave particular significance to this new knowledge and its relation with the island’s health and social problems. While visiting

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333 “Mi Experiencia con las Vitaminas: Un Cuentecito,” Buhiti 1, no. 3 (1971). 11
334 Ibid. 13
Puerto Rico during the summer of 1932, he had his first experience with biochemical research when Cook and Axtmayer recruited him to assist in the investigation of the vitamin A content of the livers of “two West Indian sharks caught in the waters along the northern shore of Puerto Rico”. Asenjo carried out the first part of these studies while he was still a college student and published initial findings in the journal *Science*.335

Building on these preliminary findings and together with Dalmau and Axtmayer, Asenjo conducted “a closer evaluation of the vitamin A potency of the oil taken from native sharks”. According to them, while there was literature regarding “the oil of sharks from temperate and northern climates”, “scarce anything is known about the vitamin A content of oils from sharks of tropical origins”.336 The results of these experiments demonstrated the high vitamin A content “of the oil from sharks caught on the northern coast of Puerto Rico” when compared to “sharks from temperate and northern climates”.337 With these experience and publication record at hand, Asenjo left the STM and went to the University of Wisconsin at Madison to obtain a doctorate degree in Phytochemistry and Biochemistry.

After returning to Puerto Rico during the late 1930s, Asenjo was appointed to the faculty of the Department of Chemistry of the STM where he quickly rose in rank. Meanwhile, Cook fell sick and, after more than 10 years in Puerto Rico, returned to New York. After Cook’s departure, Asenjo was named “acting head” of the Department of Chemistry. From this position, he became the most important nutrition researcher in Puerto Rico. During the following decades he collaborated with nutrition scientists from Latin American and international organizations such as the *Instituto de Nutrición de Centroamerica y Panamá* (INCAP), the Pan-American Sanitary

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335 “Preliminary Note on the Occurrence of Vitamin A in the Oil of West Indian Sharks,” *Science* 78, no. 2030 (1933).
337 Ibid. 158
Bureau (PASB), and later with the Food and Agriculture Administration (FAO). During his first years as faculty of the STM, he oversaw the compilation of Cook and Axtmayer’s work as part of the Tropical Nutrition Studies and its publication by the PASB in 1942 with the title *Manual de Bromatología*. The internationalization of Puerto Rico’s nutrition science through the work of these organizations will be discussed in Chapter Seven.

**Conclusion**

Changes in the nutrition science’s approaches and methodologies were both consequence and response to the crises provoked by international conflicts and economic depression during the interwar years. The Great War and its aftermath facilitated the institutional and scientific exchanges that led to increasing emphases on the role of biochemical processes in nutrition and health. While the calorie-centered thermodynamic model focused on food value in terms of energy inputs and outputs, biochemical discoveries shifted scientists’ interests from quantity to quality. Biochemistry provided new tools with which to explore the role of foods’ essential elements, later termed vitamins and minerals, in maintaining health, preventing deficiency diseases, and strengthening the body’s defense mechanisms. This new view of nutrition also fostered new public health understandings of the relationship between diets, disease, and labor in both national and colonial settings.

These new perspectives on the relationship between diet, labor, and public health were particularly significant in colonial settings, especially after the onset of the Depression. For tropical medicine, generally focused on infectious disease treatment and control, new nutrition discoveries promoted conversations that brought to light the effects of sociocultural conditions in the health of colonial peoples. These new conversations also drew from nutrition research

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conducted in colonial laboratories applying biochemical techniques to evaluate the properties of local diets. These studies not only described the biochemical properties of colonial people’s diets but demonstrated that that the deficiency diseases uncovered in the tropics had the same biological basis as those in the West.

Nutrition scientists at the Puerto Rico School of Tropical Medicine located their biochemical research agendas as part of this international and intercolonial activity. In collaboration with Columbia faculty and the with the financial support institutions like the RF, Cook, Axtmayer, and the staff of the Department of Chemistry set to elucidate the nutritional potential and shortcomings of “the native diet”. For nutritional biochemists working in Puerto Rico, the frequency of consumption of polished rice, red kidney beans, and starchy crops and the lack of meat, dairy products, and green vegetables in the local diet began to explain the generalized apathy and indolence that observers had for a long time perceived among rural populations. This diet’s lack of essential food elements also offered clues as to the factors leading to the high prevalence of conditions like anemia and tuberculosis. For Axtmayer, the findings of his laboratory proved “why the nutrition of the laboring class presents a formidable problem to the Island”.

However, in the context of the economic and political crises of the 1930s, the potential of nutritional biochemistry to contribute to alleviate Puerto Rico’s nutrition problem depended on the collaboration of experts from multiple backgrounds. Cook and Sherman were aware of this since 1930 when they proposed to conduct dietary field investigations to obtain sociological data about the island’s nutrition problem. Although the Division of Medical Sciences of the RF did not fund this part of their proposal, Cook and Axtmayer recognized the limitations of their findings without this social perspective. This was one of the main objectives of the expanding

field of home economics. Aided by social workers and agronomists, home economists became the female face of the new nutrition science. Their focus on social nutrition or “the social meanings of food and poverty as the cause of malnutrition” was “central to the politics of the 1930s and 1940s.”\textsuperscript{340} The work of these experts and its role in nutrition research and rural development projects in Puerto Rico is the subject of the next chapter.

\textsuperscript{340} Vernon, \textit{Hunger: A Modern History}. 119
Chapter Three

From the Laboratory to the Field: Home Economics and Social Work

Along the paths that lead to the peasant’s home where furniture is minimal and food is meager riding a mare is an agent of the Service. She has plans in her mind previously delineated; She has the desire to turn them wealthy amidst their poverty ...

The vegetables of the garden that were always wasted are now preserved in cans; and from Monday to Sunday there is to eat in the table nutritive foods. 341

Introduction

Although the biochemistry laboratory at the School of Tropical Medicine became the main space for the production of nutrition expertise in Puerto Rico, the importance of this activity for public health and welfare was shaped by the work of individuals like the Extension Agent in the poem above. Despite its foundation in experimental science, the translation of nutrition’s technical calculations into public health strategies and interventions lay outside the purview of the biochemist. Joseph Axtmayer recognized this and called for “social service and public health workers to promote the benefits of a more judicious selection and combination of

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341 Carlos Rechani Agrait, "La Agente de Demostración " El Heraldo de Extensión 1, no. 5 (1939).
Thus, other kinds of expertise were required to bring to the public the findings of the biochemical laboratory, translate them into interventions, engage with the rural poor, and provide a sociocultural understanding of the problem of nutrition in the island.

Thus, while biochemists led the experimental study of food during the interwar years, the popularity of nutrition research and the emergence of nutrition as a public health problem were crucially shaped the involvement of experts in education and social work. As the previous chapter showed, innovations in nutrition sciences in general and in biochemistry research in particular were the result of social and scientific transformations fostered by the Great War. Similarly, food rationing and shortages brought to light need to “do more with less”. The field of home economics was especially equipped to bring this expertise to both households and public health agencies. Home economics training in the U.S. combined new nutrition knowledge with the “traditional” areas of female expertise such as household administration and cooking techniques. As Nancy Tomes notes, as “public health science grew more sophisticated” becoming “increasingly the province of those with advanced scientific degrees” “home economists worked to strengthen their position in the research university” by specializing in nutrition a “promising field in which to do independent research and find well-paid positions.”

This chapter focuses on the work of home economists in Puerto Rico and how they defined the island’s nutrition and food problems in collaboration with social work and education professionals. Receiving specialized training in the U.S. during the late 1920s and 1930s and later staffing many of the major welfare and education agencies on the island, the mostly female

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experts embodied the empire as a “moving metropolis”. As other scientists and professionals during this period, home economists benefited from already established links between Puerto Rico’s government and academic institutions in the U.S. to gain access to and support for graduate and specialized education. There, they became part of a field focused on manifold aspects of household conditions including “décor, flow of air and sunshine, size of cupboards, cooking equipment and utensils, the conditions of clothes, family eating habits” and hygienic practices. Food and nutrition were central to this “obsessive cataloguing of household conditions and practices.” As the chapter shows, Puerto Rican home economists moved back and forth between the U.S. and the island, adapting and negotiating these practices but also reifying their basis on the superiority of U.S. middle-class notions of domestic values and dietary habits.

These home economics practices offered key tools to promote good nutrition as part of broader projects for social reform, rural reconstruction, and population control. The subject was incorporated into public school’s curriculums on the island since the beginning of the century and deployed as part of efforts to reform domestic life and bring it closer to an idealized American model. Teaching school girls and literate homemakers new and sophisticated ways to prepare local products and dishes, especially viandas or starchy crops, by incorporating new techniques to preserve nutritional value, maintain hygienic conditions, and increase foods’ aesthetics figured prominently in domestic science literature during this period. Apart from teaching school girls nutrition, scientific cooking, and home beautification home economists gradually entered other institutional arenas finding employment in school lunchrooms, hospitals, and public health units. While the implementation of renewed Americanization agendas framed

345 Vernon, Hunger: A Modern History. 85-86
home economics education during the 1920s, the field provided this growing class of Puerto Rican professionals with an opportunity to craft their own reform agendas and to refine the role of nutrition knowledge as part of those.

The expansion of the island’s public health and education systems also created new spaces for the creation of sociological knowledge about nutrition in Puerto Rico. The growth of the field of home economics paralleled increasing opportunities for local training and professionalization of other female fields such as social work. During the 1930s, social workers and home economists collaborated in the study of the problems of rural life in general and in nutrition in particular. As educators, home economists adapted U.S. middle class notions about domesticity, cooking, and eating as well as social work and extension education methods to Puerto Rico’s social and food ecologies. Through these experiences, this generation of professionals crafted new agendas to address the “problems of rural life” and the role of vocational education, nutrition science, social work, and public health in solving them.

While the effectiveness of extension education to promote “intelligent change of practices in the home” remained limited by political controversies and budgetary constraints, the ideas of social nutrition allowed home economists and social workers to craft a particular discourse about the problems of rural life in Puerto Rico.347 Local concerns about overpopulation, dependency on food imports, and rural poverty framed the work of these social nutrition workers. Social nutrition professionals also gathered evidence about the health and sociological manifestations of malnutrition and deficient diets. In the context of the decade’s sociopolitical turmoil, these interventions served local and federal officials to generate support and loyalty for the U.S. regime on the island. Thus, through their scientific, educational, and

public health work home economists and social workers located the attention to the island’s nutrition and food supply problems at the center of locally-devised rural development projects and emerging political movements.

**Domestic Sciences and Nutrition Education**

Home economics emerged as a separate academic and professional field in land-grant colleges during the 1870s. Its expansion resulted from the decline of servitude during the late nineteenth and early twentieth century and the “growing belief that domestic work was vitally important and that it could be studied scientifically”. By 1908, when the American Home Economics Association was founded, practitioners portrayed their field as a “middle road” between Progressive Era reform work and social sciences.348 Despite these early advances, it was the growing popularity of nutrition science during the interwar years what consolidated home economics as an academic field and led to the full professionalization of its practitioners.

Home economics training and practice during the early twentieth century was also directly linked to the women’s suffrage movement and wartime food conservation campaigns. Women’s claims for full citizenship and political participation were entwined with home economists’ emphases on their ability to scientifically administer the household and their unique capabilities to ensure the well-being of the family, especially during times of emergency. This new view of housework promoted by home economics was part of a movement toward professionalization that was shaping other female dominated fields—such as education, social work, and nursing—which paralleled the expansion of the suffrage movement. Moreover, for both home economists and suffragists the advent of the Great War and the need to respond to the

food emergency further highlighted the crucial role housewives played in ensuring U.S. society’s stability and promoting national defense efforts.

However, as Helen Veit notes, home economists’ opportunities for professionalization remained limited during this period. Although some women managed to find teaching positions and a few found related jobs in industry, for most of them college training in domestic science “led back home after all”. While housewives remained unpaid, officials at the U.S. Food Administration during the war emphasized the importance of domestic work conducted by middle-class women for national security while highlighting its foundations on scientific principles. Through the work of its Committee on Home Economics, the Food Administration presented a vision of the housewife that “celebrated women’s competence, yet it offered them an ultimately limited role”.

In spite of these limitations, home economists together with teachers and social workers became central agents of early twentieth century modernizing efforts and reformist movements. The passage of the Smith–Lever Act in 1914 and of the Smith–Hughes Act in 1917 increased the prominence of home economists in professional, policy, and academic arenas. The Smith Lever Act provided for the creation of the federal Cooperative Extension Service (CES) as part of the U.S. Department of Agriculture. This new agency was charged with sending “men and women trained in agriculture and home economics to rural areas” where they visited communities and homes to educate people about farming techniques as well as sanitary and scientific food preparation. Each state organized a local Agricultural Extension Service to hire and coordinate extension agents responsible for disseminating the principles of scientific agriculture and homemaking. With this model, the CES and its state agencies significantly influenced the

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349 Ibid. 88
350 Ibid. 100
trajectory of nutrition education programs and the role of home economists in the implementation of these during the interwar years.

Similarly, the passage of the Smith-Hughes Act in 1917 further expanded the ranks of home economists and their presence in welfare, agriculture, and education agencies. This Act provided federal funds to land-grant colleges to aide in the training of teachers in vocational fields, including home economics, commerce, and agriculture. The resources for vocational education made available through the Smith-Hughes Act fostered an increase in the demand for home economics teachers to staff public schools, agricultural extension agencies, universities, and other public and private institutions. Thus, as a result of the passage of these legislations the number of school girls and housewives exposed to domestic science classes expanded at all levels, from elementary school to college and extension education.

The prominence of professional home economists in U.S. society was also a product of the growing popularity of the 4-H Clubs program for rural youth. Through this program, rural children and youth were encouraged “to be of service to their communities” by using their “Head, Heart, Hand, and Health” to apply basic principles of domestic and agricultural sciences. As Carmen Harris notes, 4-H Clubs were established during the Progressive era “to promote farm life” and “to strengthen connections between rural Americans” and land-grant colleges. When the 1914 Smith Lever Act created the CES, “it unified oversight of programs in cooperative extension, which provided agricultural and home economics instruction to farm men and women”, the 4-H Clubs among these. The extension education model of the 4-H program

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354 Ibid.
placed children at the center of rural reform and renewal processes.\textsuperscript{355} The implementation of the 4-H model of youth extension education well as the role of home economics and nutrition education followed the racially segregated mold of U.S. society.\textsuperscript{356} African American communities lagged behind in the establishment of extension programs and, where these existed, they were underfunded and lacked resources. By 1917, only seventy-three African American agricultural and home demonstration agents were employed in the entire U.S. South.\textsuperscript{357}

The functioning of 4-H Clubs during the first half of the twentieth century also reflected the emergence and maturation of a particular set of ideas about rural development. The implementation of these ideas was crucial for the emergence of the practices that constituted the “technicist strain” of development after WWII.\textsuperscript{358} While these postwar development ideologies were predicated upon the expansion of urbanization and industrialization, and therefore seemingly incompatible with attempts to uplift rural living, nutrition knowledge was instrumental for the articulation and legitimization of both strains of development. Through ideas about food and their relation with public health and the economy, nutrition knowledge provided a rationale for the changes in agricultural technologies and patterns of land utilization that lay at the heart of both rural and “technicist” development models. Chapters 4 and 7 trace the trajectory of these ideas and their implementation to solve the problem of nutrition as part of transformations of rural areas’ social and natural landscapes.

Home economics contributed to the consolidation of this expertise about rural societies and their health and nutrition problems. Together with the institutional changes fostered by


\textsuperscript{357} Harris, "States' Rights, Federal Bureaucrats, and Segregated 4-H Camps in the United States, 1927-1969." 365

\textsuperscript{358} Williams, "Cultivating Modern America: 4-H Clubs and Rural Development in the Twentieth Century."
legislations like the Smith Hughes and Smith-Lever Acts, the prominence of nutrition science for public health and rural development during the interwar years crucially transformed home economics practice. The new conceptualization of foodstuffs as carriers of nutrients essential for the adequate functioning and development of the body gave home economists a chance to expand their influence beyond the household and the classroom. Moreover, the link between nutrient-deficient diets, public health problems, and poverty was increasingly recognized during the 1920s. Thus, improving people’s diets and eating habits emerged as a new tool to remedy many physical and social ills. Hunger and undernourishment, “traditionally the central physical manifestations of poverty appeared ideally suited to scientific remedy”. If the poor “could learn to eat better for less, one of modern society’s most intractable problems” could be conquered.359

This increasing interest in nutrition and its relation with public health and rural development fostered the “true” professionalization of home economics. While leaders in the field strived to establish home economics as a profession “devoted to bringing scientific methods” to the domestic sphere” since the late nineteenth century, new nutrition knowledge provided home economists tools to build legitimacy and authority as scientists.360 The need for professionals to popularize the new nutrition principles created new employment opportunities for women with home economics education. Their experience as teachers of cooking and food conservation techniques facilitated their new role as nutrition educators at public schools and extension agencies. To adapt to these new circumstances, leaders expanded home economics training programs in universities and incorporated coursework in the biochemistry of nutrition to their curriculums. While generally housed within schools of education, this expansion in home economics’ scope offered women scientists one of the few opportunities to engage in research

360 Ibid. 15
and teaching at the university level. For home economists with formal chemistry training the field allowed them to pursue their scientific interests in the area of human nutrition. In this way, home economists in the U.S. “became the key conduits between nutrition laboratories and the American public”.361

The involvement of food industries was crucial for the creation and maintenance of those conduits. Usually part of underfunded and understaffed programs, “professional home economists, who controlled nutrition education in schools and colleges” were “more or less co-opted” by food processors. Many of the most prominent home economists and leaders of the field were current or former employees of food-related industries who were paid to promote their products and to develop “recipes and instructional materials” using these. Others received grants, materials, and awards from industries like Borden and General Mills.362 The processors even became “an indispensable source of funding for the American Home Economics Association’s Journal of Home Economics”.363 This interaction was facilitated by the common Midwest location of many food industries’ headquarters and of the land-grant colleges producing “women with home economics degrees on a far larger scale” than schools in other regions.364 Thus, by the 1920s home economists played an important part in the implementation of education, agricultural, and public health agendas in the United States. The Puerto Rico of this period was a unique context to rework the applications and implications of these multiple roles.

361 Ibid. 18
362 For example, both Henry Sherman and Lydia Roberts received Borden awards throughout their careers. University of Chicago, Department of Press Relations. Faculty Honors, June 6 1938. UC-SC. Archival Biographical Files, Series VII, P-R, folder Roberts, Lydia J.
363 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 15
364 Ibid. 38

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Home Economics and the Establishment of a New “Social Machinery”

Despite the prominence of land-grant colleges in the Midwest, most Puerto Rican home economists active during the interwar years trained in urban universities like Columbia and the University of Chicago. For example, Puerto Rican home economist Rita Lang, who directed nutrition and child feeding programs as part of New Deal and war emergency agencies, obtained a graduate degree in 1934 from Columbia’s Teachers College, recognized as “a leading center of home economics research.” Apart from these institutions’ reputation, existing relationships between urban universities like Columbia and Chicago and Puerto Rican government officials and experts facilitated the entrance of local students like Lang to these programs. However, despite these connections and the opening of the nutrition research program at the STM in 1926, the resources provided by the Smith Hughes and Smith Lever Acts were not extended to Puerto Rico until the mid-1930s. Instead, the role of home economics practice in the trajectory of nutrition ideas on the island was shaped by the expansion of the public education system during the first decades of U.S. rule.

The Department of Education began to include home economics courses as part of its curriculum in 1902. Similar to the rest of the subjects taught in the island’s public schools during these years, most home economics teachers were trained and recruited in the United States. In the same way, the home economics curriculum was modelled after those used in the states and emphasized household management, cooking, and food handling methods as well as vocational skills. By the late 1910s home economics education was an important part of public schools

365 Ibid. 16. Rita R. Lang, "The Effect of the Banana on Calcium Retention" (Master's Thesis, Teachers College, Columbia University, 1934).
366 For example, José Rosario, Associate Professor of Education at the UPR, obtained a Master’s Degree in the Department of Sociology of the University of Chicago in 1931.
curriculums for girls and of professional teacher training at the recently established Normal School, later the University of Puerto Rico. The designation of home economics as a required course for school girls increased the need for teachers with this specialization. As a result, the now School of Education of the UPR adapted the teacher training curriculum to include coursework in this field. Education officials also recognized the need to recruit more personnel to train new home economics teachers and to coordinate their deployment in the island’s public schools. At this time, the School of Education’s home economics faculty consisted of only of three instructors from the United States. The first cohort of home economics teachers trained in Puerto Rico under this revamped program and curriculum graduated in 1918.

The involvement of the U.S. in the Great War and the reorganization of the island’s government fostered by the Jones Act of 1917 led to a reformulation of the role of public education in general and of home economics in particular. During the war years, the home economics curriculum for schools emphasized vocational training to provide girls with skills for the rising textile industry. Home economics faculty at the School of Education also restructured their program to bring it in line with wartime price control and rationing regulations. Apart from vocational and professional training, home economists took part in programs organized by the U.S. War Food Commission and the Red Cross to increase local food production and promote the utilization substitutes for meat, wheat, and other imported products.

The teaching of home economics during these years was incorporated to broader Americanization agendas implemented by U.S. colonial authorities since the beginning of the

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368 Clara M. Brown, "Home Economics at the University of Puerto Rico," *Journal of Home Economics* 33, no. 6 (1941). 374
370 Historia Educación en Economía Doméstica, 1913-1938 (s.f.). ACUPR, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder Escuela de Economía Doméstica, Historia
371 Historia Educación en Economía Doméstica, 1913-1938. ACUPR, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder Escuela de Economía Doméstica, Historia
century. Similar to southern states where racialized notions about African American’s ability to apply scientific agriculture and homemaking led to the segregated implementation of home economics and extension work, efforts to curtail Puerto Rican’s racial heterogeneity and ease their transformation from Spanish to U.S. colonial subjects shaped the content and methodology of home economics education. After the Jones Act of 1917 extended the U.S. citizenship to Puerto Ricans on the island, home economics education—and its notions of food habits, domesticity, and gender roles—assumed a greater role as part of efforts to promote the adoption of American traditions and values. While the goal of assimilation motivated U.S. colonial interventions in Puerto Rico during these decades, Puerto Rican intellectuals and professionals’ long-standing anxieties with the racial makeup of the rural poor also shaped education policies during this period. Local public health and welfare officials drew from preventive eugenics ideology to emphasize the role of interventions with social and domestic environments in the improvement of Puerto Rican society and the attenuation of U.S. officials’ racialized beliefs.

Nutrition and home economics education became important tools in the pursuit of this social regeneration agenda. For this, local experts collaborated with representatives from U.S. academic, government, and philanthropic agents while contesting their racialized conceptions of the island’s population. Among these, Helen Bari from the Children’s Bureau emphasized education’s role in “introducing our social and political machinery” in Puerto Rico. As discussed in Chapter 2, Bari spent many years in Puerto Rico during which she became acquainted with people’s food habits. She also served as liaison for Bureau personnel seeking advice before traveling to the island. Her recommendation to “take and evening gown as the Porto Ricans are
very punctilious and expect people to wear an evening gown even if invited out only for dinner” was particularly appreciated by prospective visitors.\textsuperscript{372}

Drawing from these experiences, Bari argued that while “we know in the States the difficulties of fitting into our social machinery those who come to our shores”, in Puerto Rico “this is rendered more difficult by the fact that the islanders cannot be introduced in small numbers to a system already in operation...the system has to be brought to them and started among a mass of people all unfamiliar with its workings.”\textsuperscript{373} Nutrition and home economics became instruments to bring that system to Puerto Rico and negotiate its applications.

**Negotiating Americanization through Home Economics Education**

Historians of Puerto Rico have debated the role of public education as part of U.S. Americanization efforts.\textsuperscript{374} Aida Negrón de Montilla’s seminal analysis of Americanization in Puerto Rico through public education presents these policies “as a form of cultural assimilation” aiming “to generate support and loyalty for U.S. colonialism” on the island. Montilla explores the multiple ways in which Commissioners of Education “intended to inculcate students with a love of all things American” by teaching of U.S. history, enacting the daily ritual of reciting the pledge of allegiance, and imposing the celebration of holidays and parades.\textsuperscript{375} Building on Montilla’s work, Solsiree del Moral shows how, apart from supplanting Puerto Rican cultural and linguistic heritage, these agendas aimed to “put colonial peoples in the path to racial reconstruction within the broader U.S. imperial project, a project framed by the ideology of

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\textsuperscript{372} Letter to Grace Abbot. March 6, 1922. UC-SC. Edith and Grace Abbot Papers, box 69, folder 3
\textsuperscript{373} Helen Valeska Bari, "Porto Rico--A test," *The Woman Citizen* 16, no. 9 (1925). 10
\textsuperscript{375} Negrón de Montilla, *La Americanización de Puerto Rico y el Sistema de Instrucción Pública, 1900-1930*.
white supremacy”. Del Moral argues, however, that classrooms and schools were also spaces where Puerto Rican officials drew from, adapted, and negotiated Americanization agendas.

In Del Moral’s analysis, public education was one of the main arenas where U.S. Americanization policies and local eugenic regeneration ideologies interacted and informed each other. On the one hand, for the U.S. administration public schools provided ideal mechanisms to transmit the systems and traditions of the new colonial state to the next generation of Puerto Ricans. As she notes, under the banner of benevolent imperialism, the new colonial administrators constructed public schools, brought teachers from the U.S., expanded the training opportunities for Puerto Rican educators, and designed curriculums intended to generate support for the American presence on the island. Ultimately, however, these efforts were only partially successful as local education professionals were able to “mitigate the harsh intentions of U.S. colonialism” by crafting their own ideologies about the problems of the island’s working poor. Puerto Rican education and welfare professionals negotiated the implementation of Americanization policies by recasting eugenic regeneration discourses in their efforts to uplift rural community, homes, and individuals and counter the racialized beliefs of U.S. authorities.

This process of adaptation and negotiation acquired a particular significance during the 1920s. As this decade was the heyday of efforts to assimilate new immigrants in many U.S. states, U.S. authorities in Puerto Rico renewed their Americanization efforts after the Jones Act extended the U.S. citizenship to the island. In this context, colonial officials “were driven by a stronger urgency than ever before” to foster the assimilation of Puerto Rico’s future colonial citizens into U.S. sociocultural models. Thus, the 1920s witnessed the expansion of the scope of Americanization policies carried out by the Department of Education through the island’s

376 Del Moral, Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952. 57
377 Ibid. 21
378 Ibid. 21
public schools. These policies were also a manifestation of a broader understanding of the relationship between race, education, and empire shared by U.S. liberals and progressives who identified themselves as “friends of dependent peoples.”

Home economists belonged to this class of professionals who deployed the tenets of Progressivism as part of efforts to assimilate immigrants by teaching women and homemakers to “eat ‘American’ food” and by promoting changes in their domestic practices. Applying the new knowledge of nutrition professional home economists, teachers, and social workers “attempted to rationalize American eating habits and, in the process, bring new immigrants into a mainstream Anglo-American culture”. The nutrition ideas articulated through home economics education in Puerto Rico during the interwar years were based on this idealized American model of adequate diets and proper cooking methods combined with emerging knowledge about vitamins and minerals, their presence in foods, and their physiological activity. As part of this process, Puerto Rican home economists adapted U.S. curriculums and incorporated home economics education into efforts to transform students into “a healthy, moral, and intelligent community of citizens who could together compose the future Puerto Rican nation.”

The emergence of this first generation of Puerto Rican home economists was part of the expansion of the local professional class in general and of female fields like teaching, nursing, and social work in particular facilitated by the growth of the University of Puerto Rico. The reorganization of the Home Economics Department at the University’s School of Education provided new arenas for U.S. and local teachers to put Americanization and eugenic regeneration principles into practice. These changes were initially led by Elsie Mae Willsey, home economist and teacher graduated from the University of Chicago and with experience at various higher

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379 Ibid. 54
education institutions in Iowa, Kansas, and Washington State. Willsey was already familiar with the conditions in Puerto Rico where she worked as a teacher of home economics in various public schools during the early 1910s.\textsuperscript{382} Under Willsey’s leadership, University officials created a separate program offering a Bachelor’s degree in Education with specialization in home economics and appointed her as its Director in 1920. The curriculum of this new teacher training program included new courses and activities “adding a language that emphasized the scientific character” of home economics as a profession.\textsuperscript{383} The Department granted its first bachelor’s degree in home economics in 1924.\textsuperscript{384}

Between 1924 and 1929, enrollment in the new home economics program at the School of Education went from 22 to 52 students.\textsuperscript{385} Simultaneously, the importance of the new science of nutrition for the expansion of home economics as a profession led many women in this program to specialize in nutrition. This was facilitated in Puerto Rico when the School revised its home economics curriculum to include courses on nutrition and dietetics. By the early 1930s, home economics students at the UPR were also enrolling in nutrition courses at the School of Tropical Medicine and formally training in social science methodology. In the United States, this specialization allowed them for the first time to occupy professional identities other than teaching as dietitians, school cafeteria administrators, or in similar positions at private institutions.\textsuperscript{386} By the late 1920s, home economics graduates in Puerto Rico were also beginning careers in other government agencies, particularly the Department of Health, and at institutions like hospitals and public health units.

\textsuperscript{382} Ortiz Cuadra, "La Economía Doméstica Sobre el Papel: La Enseñanza de las Ciencias del Hogar en las Escuelas Públicas de Puerto Rico entre 1903 y 1931." 34
\textsuperscript{383} Ibid. 35-36
\textsuperscript{384} Brown, "Home Economics at the University of Puerto Rico." 374
\textsuperscript{385} Historia Educación en Economía Doméstica, 1913-1938 (s.f.). ACUPR, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder Economía Doméstica, Escuela de—Historia
\textsuperscript{386} Levine, School Lunch Politics: The Surprising History of America's Favorite Welfare Program.
These changes in the practice and reach of home economics in Puerto Rico had multiple consequences. Similar to the U.S., the close relationship between home economics and the new nutrition science was crucial for these transformations. The increasing scientific and policy attention to the island’s nutrition and food supply problems during this period gave home economists a particularly vital role. Leaders in the field recognized this and were quick to mobilize to strengthen home economists’ professional authority and claims for nutrition expertise. By the mid-1920s, Willsey and her colleagues were actively incorporating the growing corpus of nutrition knowledge in the professional teaching of scientific home management and food preparation methods. In 1927 graduates of the new program at the School of Education formed the Puerto Rico Home Economics Association (PRHA). Affiliated to the American Home Economics Association, the creation of the PRHA reflected and contributed to the recognition of the field’s professional authority and its type of nutrition expertise. The PRHA also provided a new forum to negotiate the application of U.S. home economics education methods and agendas.

**Scientifically Cooking Modern and Nutritious Viandas**

Home economists remained up to date on the results of the nutrition studies currently underway at the School of Tropical Medicine. Making reference to the first biochemical investigations of Puerto Rican foodstuffs, Willsey and Puerto Rican home economist Estrella Moll argued that the nutritive value of local food products “depends on its chemical properties”. For these home economists it was “unexplainable that in countries like ours,

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387 Lillian Colón de Reguero, "Desarrollo de la Escuela de Ecología Familiar y Nutrición de la Universidad de Puerto Rico" (paper presented at the Actos de Conmemoración del Centenario del la Facultad de Educación de la UPR, Río Piedras, PR, 2000). 15
whose traditional foods generally have such a low nutritional value”, those products which are nutritionally superior figure so little in the people’s diet or are cooked in such a way that their nutritive qualities are lost.\textsuperscript{389} In line with the new focus of the home economics education program, achieving good nutrition and health required the maximization of the nutritional qualities of tropical crops through the modernization and rationalization of the ways homemakers cooked and families consumed them.

With this in mind, Willsey embarked on a series of “projects related to cooking and food research” aiming to teach young women and homemakers how to prepare and cook “tasty and nutritious” “tropical vegetables” as part of their daily meals. One of the main objectives of these projects was to educated people to incorporate “tropical vegetables in local culinary practices and “stimulate the use of more vegetables in the people’s diet”.\textsuperscript{390} To accomplish this objective, the Home Economics Department published a series of educational pamphlets providing housewives with advice on how to cook, increase the nutritional value, and add different foodstuffs to popular dishes prepared with \textit{viandas} like plantain, chayote, sweet potato, cassava, yam, tannier, dasheen, and breadfruit. In these bulletins, appearing between 1925 and 1931 with the title \textit{Tropical Foods} Willsey and members of the home economics faculty presented new recipes to prepare these root and starchy vegetables in more attractive and nutritious ways.\textsuperscript{391} These bulletins were to be “printed and distributed among teachers in particular and the public in

\textsuperscript{389} Rosa M. Ordoñez and Elsie Mae Willsey, "El Panapén: Modos de Prepararlo para la Mesa," \textit{Circular de Extensión} Circular Núm. 4 (Reprint 1936). 3
\textsuperscript{390} Angelina Mercader and Elsie Mae Willsey, "El Plátano: Modos de Prepararlo Para la Mesa," \textit{Circular de Extensión} No. 2 (Reprint 1935). 2
The discussion of new nutrition science knowledge and the presentation of this project as one of “discovery” of the best food preparation and cooking methods was also part of attempts by home economists in Puerto Rico to present their profession as a scientific pursuit.

In these publications, Willsey and her Puerto Rican collaborators aimed to “standardize” the “traditional Puerto Rican recipes”, to determine the “food values of tropical vegetables”, and to “discover the best methods of preparing and serving these foods”. They also instructed the literate homemaker and the student of domestic sciences on how to transform these foodstuffs and make them presentable for the table. These dishes were cooked in separate pots, served in plates, and eaten sitting in a clothed table as part of a specific meal. Apart from detailing new methods and recipes to prepare starchy crops, these bulletins also included current economic and agricultural information regarding these products’ growth, distribution, cultivation, season available, and price. With these new strategies, tropical foods like plantains and cassava were transformed into modern and healthy dishes that resembled idealized American model of food preparation, presentation, and consumption.

Other bulletins published during these years show the expansion of home economics’ scope fostered by the incorporation of nutrition science education as part of the field’s agendas for domestic modernization. Building on Willsey’s work, Puerto Rican home economists assumed an increasingly important role in the preparation and publication of bulletins during the following years. Directed to literate, well-off, and mostly urban homemakers, these included topics like “The Porto Rican Layette”, “Menus and Table Decorations for Porto Rican Feast Days”, “Better Homes in Porto Rico”, “Porto Rican Basketry”, “The Possibilities of the Porto

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392 Willsey to Torres, October 14 1926. ACUPR, fondo Organizaciones y sus Funciones, recopilación #89, caja 89-1, folder Economía Doméstica, Correspondencia años 1926-1937
393 Brown, "Home Economics at the University of Puerto Rico." 374
394 Home Economics, Foods 5 (or 6) Experimental Cooking. ACUPR, fondo Organizaciones y sus Funciones, recopilación #89, caja 89-1, folder Economía Doméstica, Correspondencia años 1926-1937
Rican Hat in Millinery”, and “Porto Rican Pillow Lace”. As part of the first cohort of locally-trained Puerto Rican home economists involved in the preparation and publication of these bulletins Maria Teresa Orjasitas became a prominent member of the field who occupied leadership positions as a nutrition educator during the following decades.

Among the new crop of Puerto Rican home economics graduates, Rosa Marina Torres also stood out. During the late 1920s, Willsey selected Torres to work with her in the preparation of one of the new home economics bulletins for use in public schools. Willsey gave her detailed instructions regarding the desired format and content of the publication. The introduction was to set “forth clearly the aim and use of the bulletin” which determined the order and type of illustrations as well as the organization of the chapters and the bibliography which “should be in such detail that all parts will be easily obtained by anyone interested.” Willsey reminded Torres that she was “writing for Porto Rico and materials, processes and conditions must be such as are met with here.” To accomplish this, she instructed Torres to “read everything you can get along the line of your topic” and “to consult every person able to enlarge your reference list or subject matter.” Finally, Torres was to “be absolutely sure” of her English as “many of these bulletins will be put in Spanish” only “after they are perfected in English.”

Similar to contemporary home economics literature in the U.S., these early bulletins served to promote the field’s role in nutrition education while replicating the superiority of middle-class notions of domesticity and food habits. Given the high illiteracy rates on the island the audience of these publications was limited to elite and mostly urban housewives and young women. This was the case with most of the domestic science and nutrition literature published

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395 Willsey to Torres, October 14, 1926
396 Willsey to Torres, October 14, 1926.
during this period in regions with low literacy rates.\textsuperscript{397} Implementing advice of how to preserve foods’ nutritional value through the preparation and cooking methods outlined in these recipes also required the use of appliances and utensils not available in most households. Moreover, since they were intended to be used in the classroom, these bulletins were originally published in English which was the language of instruction during these years.

Despite these practical limitations, the preparation and publication of these bulletins offered a significant opportunity for training and collaboration for the new cohort of Puerto Rican home economists at the UPR during the late 1920s. The utilization of these bulletins as part of home economics education in Puerto Rico’s public schools became another mechanism through which local teachers adapted and negotiated the Americanization agendas of U.S. officials. Their publication also signaled the transformation of home economics in Puerto Rico from an education sub-field to one directed to train a more versatile professional with a diverse set of competencies, chief among these nutrition and dietetics. By 1929 the Home Economics Department at the UPR began offering “the dietetics curriculum” as a new area of specialization for students who until then could only aspire to teaching as a professional outcome.\textsuperscript{398} During the following decade, the expertise of the new home economist included household administration, nutrition science, sanitation techniques, culinary arts, and the care of children and the sick.

The diversification of home economics practice during this period also coincided with the establishment of the first rural public schools. By 1930 there were thirteen public schools throughout rural Puerto Rico. According to a historical account of this period later prepared by faculty from the School of Education, these new rural schools included home economics classroom “equipped with materials and appliances that were in harmony with the living

\textsuperscript{397} Enrique Perdiguero-Gil and Ramón Castejón-Bolea, "Popularizing right food and feeding practices in Spain (1847-1950). The handbooks of domestic economy," \textit{Dynamis} 30 (2010).
\textsuperscript{398} Brown, "Home Economics at the University of Puerto Rico." 375
conditions of the community.” Cooking laboratories “were divided in units, representing the income levels of families in the rural zone.” Given that charcoal was the most commonly used fuel in rural areas, these cooking laboratories included stoves that functioned with this material. By reproducing the conditions found in a typical rural home “cooking lessons were outlined in harmony with the products that rural peasants have available and according to the income of the rural family.” These efforts ensured that this new program met its objective of “improving the living and health conditions of the Puerto Rican jíbaro.” These interactions promoted by this expansion of home economics education produced new knowledge about nutrition problems in the context of rural life that was instrumental for the establishment of relief and reconstruction programs during the Great Depression.

Public Health and Social Nutrition

The need to respond to the sociological and public health effects of the Depression in Puerto Rico’s agricultural economy turned home economics into a key part of welfare programs implemented during the 1930s. During the early part of this decade, an increasing number of Puerto Rican women entered the field and gained experience with the living conditions of rural dwellers. Many of them were subsequently recruited to staff New Deal programs and agencies where they worked together with public health nurses and social workers. These professionals shared similar perspectives on the problems of Puerto Rico’s rural poor and the potential of education, medicine, and nutrition to produce a physically, intellectually, and morally reformed society. As part of this work, home economists’ familiarity with household management practices and nutrition education made them crucial agents of rural hygiene programs implemented during the Depression. This crisis promoted a recast of long-standing efforts by

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399 Historia Educación en Economía Doméstica, 1913-1938 (s.f.). ACUPR, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder Escuela de Economía Doméstica, Historia
Puerto Rican urban elites to morally and physically regenerate rural populations “by altering the personal and sexual habits of the poor as well as curtailing their racial heterogeneity.” Nutrition sciences offered new and compelling instruments in the pursuit of these agendas.

Home economists were particularly positioned to draw from the nutrition work conducted at the STM during the 1930s. As part of the public education system, they successfully claimed expertise translating these findings in the social and domestic arenas. As nutrition science grew increasingly more sophisticated during this decade, the demand for professionals trained in the field increased in the U.S. as in Puerto Rico. The expansion of school lunch programs during the interwar years also gave graduates of home economics programs new employment opportunities as well as platforms to spread the new gospel of nutrition and its importance for public health. In the U.S., home economists at the Children’s Bureau advocated for the incorporation of school meals and milk stations “as part of a comprehensive public health and nutrition program”. This activism was crucial for the eventual involvement of the federal government in their functioning during the 1930s. Similarly, as meal programs in Puerto Rican public schools expanded during the late 1920s, home economists with nutrition training were called upon to work as administrators, menu designers, and cook’s supervisors. As Willsey noted, “more and more” the school lunch program was “coming under the supervision of the teacher of home economics”.

According to José Rodríguez Pastor, Chief of the Bureau of Tuberculosis of the Department of Health, women with training in nutrition science also performed essential functions as part of clinical and public health activities. After visiting various public health institutions in the U.S., where he “was impressed by the excellent work of the nutritionists”,

402 Willsey, "Home Economics in Porto Rico." 529
Rodríguez Pastor was convinced of the crucial role this professional could play on the island given “the enormous importance which the problem of nutrition assumes in Porto Rico”. In his tour of U.S. public health dispensaries, Rodríguez Pastor observed that “the nutritionist is a great help to the physician of the child health clinic” by providing “proper advice to mothers regarding the foods children need, and the ways in which these foods should be supplied.” While “the doctor nor the nurse” could have time to give detailed instructions in these matters, “the nutritionist sits leisurely beside the mother, questions her and gives her full instructions concerning the diet that is best suited to her child, and the correction of the faulty food habits” which provoked the child’s sickness.403

While the cases of malnutrition Rodríguez Pastor encountered in his U.S. tour appeared to him like isolated cases, “in Porto Rico, undernourished children are the rule rather than the exception” due “in part to the general poverty”, “but largely, too, to the lack of knowledge…concerning the most appropriate foods…and the lack of realization of the importance of forming correct food habits in children”. Thus, the nutritionist’s role was crucial for the success of any public health intervention, especially in the case of children’s health. Her training as a teacher and her knowledge of nutrition principles made her the ideal professional to carry out “a well-planned educational campaign” in a “more intensive, more scientific and much more effective” way. Thus, according to Rodríguez Pastor it was the responsibility of “our university, by extending the scope of its courses on nutrition and dietetics”, to “prepare a number of our own young women” to perform this essential public health work.404 While home economists’ expertise in science, education, and domestic life made them ideal candidates to

403 Rodríguez Pastor, "The Nutritionist and Her Work." 616-617
404 Ibid.617-619
become this new professional, the emergence of nutrition as a public health concern during also shaped the trajectory of social work on the island.

During the early 1930s, social workers in Puerto Rico were involved in discussions about the relevance of the nutrition research conducted at the School of Tropical Medicine’s biochemical laboratory for their work. By 1932 social worker Dorothy Bourne wondered “where we stand on the matter of nutrition in Puerto Rico?” and “it if is clearly a problem, how far have we gone toward its solution?”405 This interest in nutrition was also a result of social workers’ close association with home economics education and practice. Similar to home economics, social work on the island was originally based on the models and practices of the profession in the United States. The casework method, for example, was employed widely by social workers in Puerto Rico. Both home economists and social workers benefited from and collaborated in the expansion of public health and education systems in rural areas during this period. Public health units and schools provided female professionals in these fields with new opportunities to exchange methods and perspectives on the problem of nutrition in the social and domestic arenas. As part of these institutions, social workers and home economists also collaborated with nurses, teachers, physicians, and other local professionals. As the Depression heightened, the work of these experts was central to the implementation of emergency relief programs as well as the articulation of plans to reconstruct the island’s economy through agricultural diversification and land reform.

As Chapter Four will show, social workers and home economists collaborated in the functioning of New Deal nutrition programs. This interaction was facilitated by a close relationship going back to the development of both fields on the island. In 1923 the UPR School

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405 Dorothy Bourne. “Where we stand on the Nutrition Question.” NARA-CP. RG 69, PC 37, Entry 10, box 260, folder Puerto Rico Official December 1933
of Education offered its first social work course with the sponsorship of the American Red Cross. A year later, the Department of Health organized two more courses to train “social research agents”. However, it was not until 1929 when the School of Education offered the first credit courses to thirteen students enrolled in its degree program. After graduation, the Department of Education appointed those who successfully completed these courses as social workers at recently established rural public schools. The interest in these initial coursework motivated the School of Education to establish a formal social work curriculum. This curriculum included coursework in the field of rural sociology as well as in public health and nutrition. Students who enrolled in this new concentration received a social work certification together with the teacher credentials. Answering to the growing interest in this field, in 1934 the School created a separate Department of Social Work. The Department’s graduate curriculum for teachers was accredited by the American Association of Social Work Schools during the 1935-1936 academic year.

Apart from public schools, graduates of this new social work program were employed at public health units gradually established throughout rural municipalities during this decade. At these institutions, Puerto Rican social workers aimed to “increase the self-determination” of their clients. According to social worker Ligia Vázquez Rodríguez’s accounts of the profession during these years, this implied fostering “the power to choose among alternatives” and promoting “the fullest possible participation of the client in all plans”. Home economists applied similar principles and perspectives in their work in rural Puerto Rico during the 1930s. Both home economists and social workers aimed to convince rural dwellers that, despite their circumstances, expert guidance could help them make the best of their life conditions. Home economists

406 “La labor del Departamento de Trabajo Social”, 20 de mayo de 1948. ACUPR, fondo Organizaciones y sus Funciones, recopilación especial #73, caja FDO C-1, folder: Escuela Trabajo Social, Varios datos, 1948
407 “La labor del Departamento de Trabajo Social”, 20 de mayo de 1948.
encouraged rural girls and women to plant more foodstuffs for their own consumption, to adapt their cooking methods, and incorporate new ways to prepare traditional foodstuffs in order to make their meals more rational, and therefore, more nutritious.

Despite this emphasis on self-reliance and individual change, social workers and home economists involved in education and health work recognized that socioeconomic circumstances complicated their attempts “to instill self-determination” among the rural poor who “were seldom free to make decisions”. Home economists, for example, discussed how efforts to promote food crops cultivation required changes in patterns of land ownership and use. Social workers also considered “the whole series of questions on diet, nutrition, anemia...and other health problems” in relation to “agriculture, landholding, imports, and exports”. These discussions about the relationship between health, nutrition, and agriculture were central to rural hygiene and reconstruction work in Puerto Rico and internationally during the 1930s. In this context, home economics education drew from social work postulates, especially the principle of self-determination, to promote a more scientific and rational management of the rural home and kitchen. This was the first building block in the regeneration of rural landscapes and societies and the attainment of better nutrition for the people. However, before home economics education and social work could benefit Puerto Rico’s rural society to its fullest extent, their methods and practices had to be adapted to the characteristics and conditions of the island’s countryside.

Nutrition and the Problems of Rural Life

While home economics education was gradually entering Puerto Rico’s countryside through public schooling, the curriculums and materials used to teach this subject did not reflect the living circumstances of most rural women. María Teresa Orcasitas assumed the task of

409 Ibid. 35-36
adapting the home economics curriculum to this reality. Orcasitas, who belonged to one of the first cohorts of home economics graduates from the UPR School of Education, succeeded Willsey as Chair of the Home Economics Department. Before being appointed Chair, Orcasitas obtained an M.A. from Columbia University’s Teachers College. As part of the “Central Committee on Revision of the Home Economics Curriculum for Second Unit Rural Schools” Orcasitas led the Department’s efforts to revise its coursework and adapt it to the needs of rural housewives and school girls. With this objective, the committee commissioned a series of studies to furnish data about “the existing norms” and conditions of living in rural Puerto Rico, particularly as they related to “foods, clothing, health, and household management”.411

This study, entitled Rural Life in Puerto Rico, was conducted between 1932 and 1933 with funds from the Department of Education. Luz M. Ramos, Supervisor of Home Economics and Industrial Work for rural public schools and Dorothy D. Bourne Supervisor of Social Work of the Department of Health co-directed the study’s design and implementation. At that time, Dorothy’s husband James Bourne worked as Administrator of the recently established Puerto Rico Emergency Relief Administration (PRERA) where she directed the Social Service Section. As part of this section, Rita Lang worked with Bourne in the organization of the Nutritional and Home Economics Service Unit. Ramos and Bourne also collaborated with sociologist José Rosario in the design of the study and in the analysis of results. Rosario obtained a Master’s degree in sociology from the University of Chicago with a thesis studying “the historical development of the jíbaro of Puerto Rico,” and systematically describing “his present-day

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411 Ramos and Bourne, "Rural Life in Puerto Rico."
attitudes toward society.” After returning to the island, he was appointed to the faculty of the School of Education where he taught rural sociology.

With Rosario’s guidance and under Ramos and Bourne’s leadership, the Central Committee divided the study in three parts dealing with different aspects and problems of rural life. In the first study, “Standards of Living in Rural Puerto Rico”, home economists and social workers gathered general information about the organization, customs, and housing conditions of rural households. For this, they selected a sample of 150 families “from three different income levels” and representing different crop regions (sugar, tobacco, coffee, fruit, minor crops), different geographical regions (mountain, coastal plain, irrigated sections), different systems of land ownership (large company, small company, large individual, small individual), and local industries. Apart from these criteria, the selected families had previous relations with social workers and “were willing to cooperate with home economics teachers in securing reliable information, that is, families who were interested and intelligent.”

The other two studies “Activities of Women in Rural Puerto Rico” and “Activities of Girl Students in Rural Puerto Rico” were designed to provide first-hand information about the activities of rural mothers in and outside of the home and of girls students outside the school. According to Ramos and Bourne, these investigations “will have their greatest usefulness in pointing out new values and new possibilities for the home economics curriculum in rural schools” while adding to “our picture of the home” and its “social life.” The social worker conducted surveys among the 150 families to gather general demographic data (family composition, civil status) as well as information about economic conditions (income and

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413 Ramos and Bourne, "Rural Life in Puerto Rico." 15

414 Ibid. 10
expenditures), housing (number of rooms, floor space, and sanitary arrangements), and health (diseases, treatment, sanitation and water supply). Thirty families were selected from the sample for an intensive study of expenditures for food (including groceries, dairy and garden products, meat, and fish); rent (usufruct payments, taxes, interest on mortgages, insurance, and major repairs); health (medicine, doctors’ fees, transportation to clinics, and hospitals); clothing, (dresses, underwear, shoes, and suits); recreation (fiestas, rosarios, dances, movies and transportation thereto); “operating expenses” (lighting, fuel, soaps, repairs); and “miscellaneous” (charity, gifts, education, periodicals, books, tobacco).415

As part of this catalogue of household conditions and practices, home economists recorded the daily and weekly income, distribution of expenditures, and the proportion of the income dedicated to food purchases among the thirty families selected for this intensive study. Daily for eight weeks [during March and April of 1933] the home economist “went to the houses and checked the accounts which some responsible member of the family had already written down on slips of paper, and entered the items on the proper forms”. Among these thirty families, ten were classified as “high income level”, which included farmers, merchants, chauffeurs, carpenters, mayordomos (butlers), and boarding-house keepers, ten as “medium income level”, including three farmers, one ox-cart driver and six laborers, and ten as “low level” with seven laborers, one midwife, one janitress, and one dressmaker.” The high and low levels had an average of 6.7 persons to a family while the medium level was “slightly higher” with 6.9.

After analyzing these families’ incomes and expenditures, Ramos and Bourne noted that “the striking thing…is the proportion of income which is used for food.” This was considered “a very definite indication of inadequate income, if we look at food as something that should do

415 Ibid. 17
more than merely keep the body alive." Among families in the higher income group, the median weekly food expenditure of $7.83 represented 46 percent of the total income; for the medium income group it was $3.80 or 66 percent, and for the low income of $1.97 or 106 percent. Families in this income level necessarily bought food on credit and were considered to have a more deficient diet. These investigations reflected similar efforts by home economists in the U.S. to measure nutritional adequacy according to estimations of the quantities of known essential nutrients needed for good health and calculations of the minimum income required to purchase foods supplying these. Those individuals or families spending less than this amount were automatically considered to suffer from malnutrition.

To shed light on the effects of income over nutritional status, another part of these studies investigated the “Food Habits of the Country People” in collaboration with Donald Cook and Joseph Axtmayer from the School of Tropical Medicine. According to Ramos and Bourne “a simple qualitative study of the foods eaten by thirty selected families...was made to find out what foods are eaten by the country people of Puerto Rico and what their meal hours and menus are.” In this study all foods used in cooking were listed, even those used as flavoring such as achiote, tomato, and pepper. Ramos and Bourne analyzed the findings of their qualitative study in light of recent studies about Puerto Rico’s food supply. They noted that:

“The use of rice and beans is universal and it is the main source of energy. There is a sound economic reason for this habit. Although these foods are imported, there is no native product of equal calorie value which can compete in price. The amount of yautía, yuca or any of the starchy vegetables needed to provide the necessary energy value to the body is several times that of rice and beans.”

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416 Ibid. 9
417 Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America.* 57-58
418 Ramos and Bourne, "Rural Life in Puerto Rico." 29
For Ramos and Bourne, it was evident from the data collected “that the diet of the low [income] level is the least satisfactory because animal foods and dairy products appear so seldom.” They found that eggs are not used at all in the low income level but rather it was “customary to barter” them “at the store to get coffee and sugar or a larger quantity of less expensive foods, which seem more filling”. Although the data also showed that the use of eggs in the diet increased with income, the low frequency with which they were consumed across all income levels showed “that the practice is not general”. Similarly, meat was “used sparingly not only because of the fact that it is an expensive item but because of the absence of slaughter houses in the rural districts.” These studies also confirmed the findings obtained by researchers at the STM related to the supply and consumption of fish and fish products. Fresh fish was “not widely consumed” by any of the income groups and bacalao, “was not eaten as frequently as people believe”. Similarly, social workers and home economists found that milk and dairy products were “decidedly luxuries for the medium and the low [income] levels”. The high income level seemed to use them more frequently but, since this was not a quantitative study, they could not “be sure that the quantity consumed is sufficient for health and growth.”

This study also gathered information about the number of meals served daily and the time of the day at which they were eaten, which was found to “vary in a striking manner, according to the differences in income”. For Ramos and Bourne these findings demonstrated the need for better nutrition education given how deficient the rural diet was across all income levels. They made special reference to how far this diet was from biochemist Henry Sherman’s general nutrition guidelines of “a quart of milk a day for each person, liberal servings of fruit or of raw fresh vegetables as in salad, twice or three times a day; a green or yellow vegetable at least every

419 Ibid. 29-30
other day; and an egg every other day.” On the other hand, they also noted that “recent studies of the School of Tropical Medicine” show that *achiote* and parsley are richer in Vitamin A “than any other natural product of vegetable origin which has been reported in literature.” Thus, Ramos and Bourne observed that “as rice and beans apparently constitute the main part of the diet” of all three income levels “we believe it would be wise to try to supplement this diet” with similar local products of less frequent use but of higher nutritional quality.

As part of these studies, home economists and social workers contextualized the findings of nutritional biochemists at the STM according to the social and economic conditions of rural Puerto Rico. By bridging the results of the nutrition laboratory and social science approaches, professionals like Orcasitas, Ramos, and Bourne created new knowledge about “the social meanings and functions of food.” Historian James Vernon argues that as social nutritionists these experts “sought not just to ground nutritional science in social realities but to make it an effective tool of social transformation.” In Puerto Rico, the *Rural Life* studies provided the type of sociological knowledge that Sherman, Cook, and Axtmayer intended to gather as part of the original proposal for the Tropical Nutrition Studies sent to the RF. Home economists and social workers’ training and access to domestic spaces made them ideal agents to obtain information. Thus, the renewed attention to the island’s nutrition problem during the Depression put home economists and social workers at the center of rural reconstruction efforts.

The collaboration between social workers and home economists in the *Rural Life* studies occurred in the context of the encounter between a new generation of mostly urban professionals and rural populations channeled by New Deal agencies. For these professionals, this study’s

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420 Ibid. 30
421 Cook and Axtmayer, "Nutritional Studies of Foodstuffs used in the Puerto Rican Dietary IV: The Extract of Annatto Seed, Bixa orellana, its Preparation and Physiological Properties."
422 Ramos and Bourne, "Rural Life in Puerto Rico." 31
423 Vernon, *Hunger: A Modern History*. 133-134
findings regarding the social and health problems in rural Puerto Rico demonstrated the need to implement new knowledge, theories, and methods in areas like agriculture, nutrition, and social work to reform the poor as well as their natural and social environments. These early encounters also showed that the effectiveness of public health and agricultural reform programs required the extension of nutrition and domestic education beyond the classroom into rural households and communities. The inclusion of Puerto Rico in the provisions of the Smith Hughes and Smith Lever Acts and the renewed attention to the socio-medical conditions of rural areas fostered by the institutionalization of the New Deal on the island provided the conditions for this extension.

Home Economics and the Agricultural Extension Service

The appointment of Theodore Roosevelt Jr. as Governor of Puerto Rico in 1930 had far-reaching effects for the organization and provision of public health services and nutrition programs. Upon Roosevelt’s request, the Federal Board of Vocational Education organized a Commission to visit the island and assess the advisability of extending to Puerto Rico the provisions of the Smith Hughes Act. This Act, in effect in the U.S. since 1917, assigned funds to schools of education in land-grant colleges to train teachers in areas of agriculture, commerce, and home economics. The Commission approved the extension of these provisions to the island and “recommended that funds be especially allocated to the area of home economics” to further help to “improve the living conditions of Puerto Rican families.”

The island’s government created an Insular Board of Vocational Education to coordinate the implementation of the various aspects of this law and designated Willsey to head its Home Economics Office.

The funds for vocational training provided to the University of Puerto Rico through the Act allowed the Home Economics Department to grow and strengthen its curriculum. Student

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424 Ortiz Cuadra, "La Economía Doméstica Sobre el Papel: La Enseñanza de las Ciencias del Hogar en las Escuelas Públicas de Puerto Rico entre 1903 y 1931." 38
enrollment increased from 181 in 1933 to 231 in 1935.\textsuperscript{425} As a result of this rising enrollment, the School of Education transferred the Home Economics Department to a new and more spacious building. The extension to Puerto Rico of the Smith Lever Act and the subsequent establishment of the Agricultural Extension Service in 1934 further increased the need for home economics training at the University of Puerto Rico. The organization of extension work on the island was the product of a “cooperative agreement” between the government of Puerto Rico and the USDA with the “primary purpose of developing and directing a program of objective education in better agrarian and domestic practices for farmers and rural families”.\textsuperscript{426} The Home Demonstration Unit of the Extension Service, staffed by home economists, was the first government institution dedicated to the dissemination of nutrition and domestic sciences among rural communities. It provided these professionals the first institutional channel to directly reach rural households through demonstration work and 4-H Clubs’ activities. It also allowed them to gather nutrition knowledge in relation with rural domestic practices and social organizations.

Home economist and teacher Mary Keown was appointed as Assistant Director of the Extension Service and the first Director of its Home Demonstration Office. Keown had moved to Puerto Rico from Florida where she worked as State Demonstration Agent.\textsuperscript{427} According to Keown, her work at the new Puerto Rico Office was based “on the idea of the demonstration” to teach women and girls “methods to improve the daily lives of households in the rural zone”.\textsuperscript{428} However, her relocation to Puerto Rico and her responsibilities there were not clearly established initially. As she wrote in 1944, “my decision to go to Puerto Rico was made so close to the time

\textsuperscript{425} Report of the Department of Home Economics for the 1935-36 academic year. ACUPR, fondo Organizaciones y sus funciones, recopilación #89, caja 89-1, folder Colegio de Educación—Sección Economía Doméstica
\textsuperscript{426} M.F. Barrus and Mary E. Keown, “El Servicio de Extensión Agrícola en Puerto Rico,” Boletín de Extensión Núm. 1 (1935). 1
\textsuperscript{427} Lydia J. Roberts, "Home Economics in Puerto Rico," Journal of Home Economics 41, no. 10 (1949). 552
\textsuperscript{428} Barrus and Keown, "El Servicio de Extensión Agrícola en Puerto Rico." 15
of leaving my regular work in Florida that little real preparation was made by anyone.” Keown also had little idea about the island’s geographical location and social characteristics. Fortunately for her, “a specialist in agricultural work in Puerto Rico” was visiting Florida before her departure and she “found out from him by what route I could travel from my State to Puerto Rico.” “That’s how ignorant I was of geography” she admitted. Similarly, in their conversation he made her aware that she “being from the South, might not know how to recognize gracefully that no “color line” was defined in education institutions in that Island.”

From these experiences, Keown later concluded that “the only sound preparation for sending me to Puerto Rico…was a rather varied experience in organization and a familiarity with the products of Puerto Rico because of its similarity to Florida in seasons and crops.” Similarly, she “was accustomed also to working with a people where a large proportion had the lowest incomes and education and where the program of work must give practical economic assistance as well as education.”

Drawing from this background, Keown spent a year and a half setting up the home demonstration program in Puerto Rico. In 1935 Maria Teresa Orcasitas Chair of the Home Economics Department was appointed to substitute Keown. While Orcasitas initially held a dual appointment as Chief of the Home Demonstration Office and Department Chair, home economics faculty argued that the time commitments associated with this new position required a separate appointment. School of Education officials agreed and appointed Professor Marie Vestal as Chair of the Home Economics Department. Orcasitas was assigned to work full time as Assistant Director of the Extension Service where she remained for the next decade.

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429 “Experiences in setting up the Home Demonstration Program in Puerto Rico.” by Mary E. Keown. U.S. Extension Service, War Food Administration, 1944. 1 NAL.
430 “Experiences in setting up the Home Demonstration Program in Puerto Rico.” 1
431 Selles Solá to Osuna, October 15, 1935. ACUP, fondo Organizaciones y sus funciones, recopilación especial #73, caja FDO P-1, folder 1935 – Extension, Home Economics
The authority of the new science of nutrition during the interwar years was crucial for the increasing presence of home economists in agricultural extension work. In Puerto Rico, apart from the extension to of the Smith-Hughes and Smith Lever Acts, the establishment of New Deal agencies on the island also offered new employment opportunities for professional women like teachers, nurses, and social workers. Rural hygiene programs in Puerto Rico and internationally relied heavily on the work of these professionals to educate populations on the principles of biomedicine, nutrition, sanitation, and scientific domesticity. Through ideas about food and their relation with public health and the economy, nutrition knowledge provided a rationale for the changes in agricultural technologies and patterns of land utilization that lay at the heart of rural development ideologies.432 The sociopolitical circumstances of rural Puerto Rico during the mid-1930s were particularly conductive to the application of these ideologies through the Extension Service and its nutrition education programs. As the Puerto Rico Extension News reported, it was not until July of 1934 that the Agricultural Extension Service “was able to take Home Economics”, which “had been confined entirely to schools”, “to the farm homes” through the work of the Home Demonstration Office.433

The experience of Southern states informed the approaches of U.S. extension agents sent to Puerto Rico to establish the Service during the mid-1930s. In the South, racial segregation and the unequal distribution of resources to black land-grant colleges marked home economics and agricultural programs in African American communities.434 For Keown, the fact that no such “color line” was defined in Puerto Rico seemed to provoke great cultural shock. However, extension work in Puerto Rico was shaped by similar conditions of neglect and underfunding as those agencies at black land-grant colleges. The central office of the island’s Extension Service

432 Williams, "Cultivating Modern America: 4-H Clubs and Rural Development in the Twentieth Century."
was housed at an improvised building facilitated near the Agricultural Experiment Station in Río Piedras while its home demonstration work was coordinated from an annex of the Home Economics Department. While in official publications like the Boletín de Extension and the Puerto Rico Extension News leaders emphasized the significance of extension education for the betterment of rural families’ standards of living, in correspondence with government officials they continuously called attention to how underfunding limited the effectiveness of their work.

For example, extension leadership in Puerto Rico pointed to how the smaller appropriation of funds the island received, when compared with that of other states with similar population density, limited their capacity to reach families in many of the rural and isolated regions of the island. When Congress enacted the Bankhead-Jones Act on 1935 to increase federal funds for land-grant colleges in the middle of the Depression, these funds were not extended to Puerto Rico and other territories. After lobbying Congress for several years, Puerto Rican officials and Extension leaders managed to obtain some funds for the island under this act but the appropriations were constantly delayed and reduced. Apart from these budgetary constraints, given “the lack of mailing facilities, telephone service and rural roads”, extension agents were required to make personal visits to farms and homes “on foot and by horse.” Throughout the following years, extension leadership and government officials in Puerto Rico continued writing to federal authorities emphasizing the need for more resources to hire more personnel and built local offices to cover all the rural municipalities. They argued that the need “to increase the productivity of the farms and gardens to the greatest practicable extent, and to better home conditions and raise the standard of living” was even more urgent in Puerto Rico.

435 Barrus and Keown, "El Servicio de Extensión Agrícola en Puerto Rico."
436 Memorandum from A. Rodríguez Géigel to Governor Blanton Winship, November 22 1938.
437 Memorandum from A. Rodríguez Géigel to Governor Blanton Winship, November 22 1938. 2. Memorandum from Governor Leahy for the Director of the Budget, September 12 1939. AGPR, Oficina del Gobernador, Tarea 96-20, caja 281, folder 473 (Extension Work)
given, they argued, “the distressed economic and social conditions brought about primarily by the density of the Island’s farm population.”

As extension agents, home economists’ work in nutrition education was framed by these concerns with overpopulation and rural decadence. In this new role, they attempted to adapt protocols, methods, and literature of rural extension education designed for the ecological and socioeconomic characteristics of U.S. agricultural regions to the conditions on the island. Some of the ideas transplanted to Puerto Rico, however, had little relevance for the island’s context. For example, the concept of the “county agent” was not applicable to Puerto Rico’s municipal system. Similarly, some texts were directly translated from USDA bulletins and included in local publications without much consideration of the island’s agricultural and geographic conditions. As the first Director of the Home Demonstration Office, Keown and her colleagues struggled to translate even personnel titles and programs’ names. They held “spirited discussions” about the correct translation of the term “home demonstration”, 4-H Club’s pledge, and certain “canning terms” and about whether they should “call the agents “Agente” or some other title.” Despite these issues, extension education provided opportunities for agricultural and nutrition experts to articulate and implement social reform strategies that drew both from long-standing eugenic regeneration ideologies and new scientific and public health approaches. As Orcasitas emphasized, all demonstration agents “received specialized training in home economics, have had actual experience in homemaking, and possess a knowledge of rural life” on the island.

Through this work, home economists articulated new notions about the problems of nutrition and food supply on the island and inserted these as part of local models of rural

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438 Memorandum from Governor Leahy for the Director of the Budget. September 12, 1939.
439 Experiences in setting up the Home Demonstration Program in Puerto Rico.” 4

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development. As part of these processes, the work of the Home Demonstration Office was particularly recognized by local leaders as “one of the most significant developments in the progress of home economics in Puerto Rico.” According to Extension Director Rodríguez Géigel, in 1938 “approximately 2,388 homes were influenced to make some changes in their home and living conditions as a result of this program.” The Office’s General Program included “providing rural families with adequate food supply to improve health and reduce cash expenditures”, “making rural homes more livable, comfortable and beautiful”, “providing adequate clothing for the family”, “standardizing and marketing of Puerto Rican products to increase cash income of family”, and “development of family and community activities”. Through these activities, demonstration work gave home economists opportunities to put in practice their training and skills, interact with rural communities, and promote nutrition and self-sufficiency through agricultural diversification and food conservation. As Keown noted “achieving an adequate diet” by ensuring a stable supply of food “is the most common issue faced by the rural homemaker” in Puerto Rico. Extension work provided a key mechanism to put in practice nutrition’s pedagogical projects in connection with agricultural and rural development efforts.

**Demonstrating Nutrition Science and Cultivating Rural Development**

Home economists became prominent members of rural reconstruction and development programs created as a response to the effects of the Depression in Puerto Rico. This prominence motivated the Puerto Rico Home Economics Association to escalate its efforts to establish a

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441 Ibid. 229
443 Mary E. Keown, "La Conservación de Frutas y Vegetales en Puerto Rico," (San Juan: Universidad de Puerto Rico, 1935). 2
distinct identity for the profession. The first step in achieving this objective was the designation of the Department of Home Economics as an academic program separate from the School of Education. For this, on April 7, 1936 leaders of the PRHA sent a formal petition to the Commissioner of Education Juan José Osuna requesting the creation of a College of Domestic Science of the University of Puerto Rico. These efforts, however, were unsuccessful. The Commissioner, the Dean of the School, and the University’s Chancellor all agreed that “it was beneficial for the Department to maintain close contact with part of the School of Education with whom it is compelled to work collaboratively.” Although the PRHA failed to obtain academic independence, home economists continued building a distinct professional identity as nutrition experts through their work as extension agents.

Although these attempts at the University failed, home economists’ work at the Extension Service and New Deal agencies during the Depression was a crucial aspect of these and future projects to intervene with Puerto Rico’s rural society. They were ideally located to draw from public health, nutrition, and agricultural sciences in their efforts to create a “more attractive and hygienic home for the rural family”. As Keown explained “men and women who grow up in disorganized and ill-directed homes can hardly do a good job outside of it and can rarely achieve the estimation of their neighbors or other persons”.

The Home Demonstration Office incorporated the teaching of nutrition, hygiene, and food production as part of its rural education campaigns. Sixteen home demonstration agents were deployed throughout the island to “help rural families to develop to the greatest extent and with the greatest benefits”, the “opportunities offered by a rural home in such a way that this home represents an attractive and honorable place

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444 G. Selles Solá a Juan J. Osuna. Solicitud de la Asociación de Economía Doméstica para que se cree el Colegio de Ciencia Doméstica de la Universidad, 7 abril 1936. ACUPR, Caja 89-1 (1924-50): Recopilaciones Especiales (Escuela de Economía Doméstica), Folder- Economía Doméstica Correspondencia de los años 1926-1937
445 Barrus and Keown, “El Servicio de Extensión Agrícola en Puerto Rico.” 21
to live satisfactorily".\textsuperscript{446} (Image 3.1) From individual farmers and homemakers to households and communities, these improvements would propagate throughout all of rural society.

To implement these projects, home demonstration agents were stationed at regional offices located in the towns of Bayamón, Humacao, Ponce, Mayagüez, Utuado, and Arecibo, each representing “different agricultural activities”. While these offices were located far away from many of the municipalities in the regions, demonstration agents were expected to serve all

![Image 3.1: Home Demonstration Personnel in Puerto Rico, January 1935 (Boletín de Extensión)](image)

As the poem introducing the chapter describes and Extension Director Rodríguez Géigel emphasized, demonstration agents traveled throughout the countryside, even on horseback, to teach rural women and girls how to improve their diet and maximize the nutritive content of foodstuffs. Demonstrations were held at community centers, dispensaries, public health units, and

\textsuperscript{446} Ibid. 13-14
\textsuperscript{447} Ibid.
\textsuperscript{448} "El Servicio de Extensión Agrícola sirve a 400,000 personas en 1939," \textit{El Heraldo de Extensión} 2, no. 3 (1940).
and homes. The demonstrations focused on topics such as “Improving the bedroom”, “Meat canning”, “Home industries”, “Home Gardens”, “Vegetable canning”, and “Home decorations”. In these demonstrations, agents had the “duty to take the most up-to-date and reliable information on agriculture and home economics directly to the rural people” and to “interpret this information in such a practical way that it can be” used “immediately by the farm women and their families.” Demonstration agents also held office hours at their respective district offices “so that they may be found for consultation by any person wishing assistance.”

In extension bulletins and pamphlets, agents encouraged rural homemakers interested in “taking advantage of the help of the Home Demonstration Office” in any of these areas to “select a home improvement activity for their own benefit and that of their families”. According to these publications, after consulting with the demonstration agent about her specific need, the rural home maker “promises to make use of the information and suggestions the Agent will happily provide”. Homemakers were then instructed to “take note of their experiences” in the demonstration which they will use to “prove the efficacy” of the techniques learned as well as their “utility for other persons”. Extension publications outlined this basic model for demonstration work while emphasizing that the topics of “the program of home demonstration” was “determined by the needs and desires of the farm people.” In the context of contemporary efforts to increase federal funding for extension education in Puerto Rico, Keown noted that

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449 Carmen Rita Martínez, "El Arreglo del Cuarto Dormitorio," El Heraldo de Extensión 1, no. 5 (1939); "Industrias en el Hogar," El Heraldo de Extensión 2, no. 7 (1940); Rita R. Lang, "Mejoramiento del Interior del Hogar," El Heraldo de Extensión 1, no. 3 (1939); "Trabajos de Demonstraciones en el Hogar en Nuestros Campos," El Heraldo de Extensión 4, no. 5 (1942).

450 Orcasitas, "Development of Home Demonstration Work in Puerto Rico." 229

451 Barrus and Keown, "El Servicio de Extensión Agrícola en Puerto Rico."

452 Orcasitas, "Development of Home Demonstration Work in Puerto Rico." 230
“people’s reaction to this work” and their demand for it showed “that the number of demonstration agents should be considerably increased during the next year”\textsuperscript{453}

The need to expand the Home Demonstration Office was especially emphasized by describing agents’ work in the area of nutrition and food conservation. This was among the aspects that the Office decided to “give special consideration during the first year of work” after “discussing the matter with people who know and are interested in the problems of the island’s rural population”. Demonstration in methods of household food production, preparation, and preservation became the principal strategies deployed by extension agents to teach the principles of nutrition and address the food supply problem. As part of this work, demonstration agents aimed “to foster among our homemakers the interest to provide their families with good foods through their own effort”. First, given that “most of the foodstuffs that the daily rural Puerto Rican diet currently lacks and that are necessary for good health” could be locally cultivated, extension agents promoted vegetable gardening among homemakers and farmers. Second, extension agents taught rural women and girls how to better prepare foodstuffs by demonstrating “adequate cooking methods” that preserve “the nutritive values of foods that are indispensable for health, such as vitamins and minerals”. Finally, agents demonstrated to homemakers methods of preserving surpluses “as an economical way to secure nutritive food for the family.”\textsuperscript{454}

Similar to the U.S., canning was among the food conservation methods most widely taught through extension work in Puerto Rico.\textsuperscript{455} The Extension Service even partnered with the PRERA and the PRRA to establish home canning cooperatives and operate canning centers throughout the island. These projects had the purpose of encouraging “the farming of vegetables

\textsuperscript{453} Barrus and Keown, "El Servicio de Extensión Agrícola en Puerto Rico." 18-19
\textsuperscript{454} Ibid. 19-20
\textsuperscript{455} Engelhardt, "Canning Tomatoes, Growing “Better and More Perfect Women”: The Girls’ Tomato Club Movement."
for home consumption” and teaching methods to “can the excess so that the farmers have a better balanced diet throughout the year.”

Demonstration Office leaders were convinced that household food conservation had a great potential to contribute to the improvement of domestic and community life in rural areas because it diminished spoilage of nutritive but perishable foodstuffs. In her account of her experience as part of a canning cooperative Kewon concluded that “it greatly contributed to improve the diet in the rural zone” while allowing people to “avoid the migration” of the money “that is today used to buy imported canned products.” In order to facilitate home canning, homemakers were also “taught to construct a number of kitchen conveniences, such as stoves, ovens, garbage cans, dustpans, sinks, and cupboards.” Thus, food conservation through canning emerged as an accessible and effective strategy to promote food self-sufficiency and contribute to the local supply of much needed fruits and vegetables.

In the pursuit of these objectives, the Agricultural Extension Service also published bulletins written by Home Economics Department faculty to disseminate cooking methods and new recipes for staple starchy crops. For example, the Circular de Extensión reprinted the complete Tropical Foods series by Willsey and Puerto Rican home economists. Orcasitas also published pamphlets about home improvement and beautification projects with titles like “How to make the living room a more attractive and comfortable place”, “Paintings for the home, compiled suggestions”, and “How to eliminate stains from clothes.” Other publications related to these topics included “Facilitating the cleaning of the rural home”, and “Suggestions for the

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457 Keown, “La Conservación de Frutas y Vegetales en Puerto Rico.” 4
458 Orcasitas, "Development of Home Demonstration Work in Puerto Rico."
manufacture of gloves”. Other demonstration officials’ publications gave advice on how to raise rabbits and chickens as well as how to adequately preserve meat and meat products. The housewife who perfected these techniques would ensure the availability for her family of “a product so essential” for a “scientifically balanced diet”, even in the remotest rural home.

However, although extension agents directed their advice to the rural homemaker “whose supreme aspiration is to create a clean and comfortable house where her husband and family can find rest and respite after a day’s work”, the audience of these recipe manuals and home beautification publications was limited to educated and professional women. Given the still high illiteracy rates the advice they provided through these publications was inaccessible for a significant number of rural housewives. Similar to the early home economics bulletins, implementing much of the advice offered in these extension pamphlets also required the use of appliances and equipment lacking in most rural households and kitchens. Home economists working as extension agents in rural Puerto Rico were well aware of this reality. Keown recognized that “printed material” such as “letters, bulletins, and circulars” were “among the less effective methods” to propagate their messages. The provision of “timely information before groups”, through home demonstration and “meetings for instruction and entertainment” was, according to Keown, better suited to the circumstances in rural Puerto Rico.

The purpose of extension education, through publications and demonstrations, went beyond teaching homemakers and farmers how to apply the scientific principles of nutrition and agriculture to their daily lives. The idea that nutrition and agriculture education could propagate

462 "Conservación de Carnes en el Hogar." 2
463 Alsina, "Facilitando la Limpieza del Hogar Rural." 3
464 “Experiences in setting up the Home Demonstration Program in Puerto Rico.” 8
throughout rural communities by people’s own actions and experiences was central to extension work in the U.S. and Puerto Rico. Homemakers were instructed to compare their “past experiences with the results obtained in the demonstration” and after putting in practice the suggestions offered in the literature. Through this comparison, the homemaker would prove to herself, her family and her community “the value of improving the daily life methods in the rural household”. In this way, “she will inspire in other families of the neighborhood the idea that the same success can be replicated”. According to agents, this is how “the example of the demonstration” and extension education was to be propagated. To the extent that one household improved, “the educational plan would achieve the gradual betterment of the living conditions in the whole community”.

These strategies were also part of contemporary rural hygiene projects implemented through agencies like the PRERA PRRA. These included teaching homemakers how to increase household food-self-sufficiency, cook their meals, and organize domestic spaces as well as training small farmers in the technologies of modern agriculture and methods to maximize production.

The Home Demonstration Office and the Extension Service put in practice this project to cultivate and propagate principles of modern nutrition and agriculture with particular intent through the work of the 4-H Clubs. Established in 1935, the 4-H program in Puerto Rico also offered new mechanisms to promote Americanization agendas as the explicit policies implemented through public schools were gradually abandoned. These efforts acquired new implications in the context of the political turmoil, labor mobilization, and nationalist activism of the 1930s. As Extension Agent Vicente Medina noted, “people lacking food and undernourished of spiritual virtues to strengthen their character in the face of adversity do not have any other escape from their anguish and despair than violent subversion of the social and political

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465 Barrus and Keown, "El Servicio de Extensión Agrícola en Puerto Rico." 14-15
In these circumstances programs such as the 4-H Clubs served local and federal government to promote patriotism and loyalty to the United States among rural populations. However, similar to the Puerto Rican teachers who challenged Americanization efforts and “mitigated its harsh intentions” during the 1920s, the home economists, agronomists, botanists, and veterinarians employed by the Puerto Rico Extension Service inserted local agendas and concerns about rural life to the organization and direction of 4-H Clubs on the island. A crucial part of these efforts was the cultivation of a future rural society composed of physically, racially, and morally reformed citizens who could sustain a more self-sufficient economy.

Similar to the regeneration agendas devised by public school teachers earlier in the century, extension workers highlighted rural Puerto Ricans’ whiteness as well as their potential for reform and through education. As part of these pedagogical projects, 4-H Clubs offered

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466 Vicente Medina, "Nuestro Programa de Administración del Hogar y la Finca," *El Heraldo de Extensión* 1, no. 2 (1939). 2
467 Del Moral, *Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952*. 21
“practical demonstrations in agriculture and home economics” to rural youth between 10 and 21 years of age.⁴⁶⁸ By providing technical instruction in agriculture and domestic work, 4-H Clubs cultivated among rural youth “knowledge and ability in these fields”, “a clear vision of agriculture as a basic industry and of domestic work as a dignified occupation”, and “the value of investigation” which “fostered in them a scientific attitude towards the problems of the farm” and the household. They also learned about “cooperative action” to “increase their successes” and collectively “help to solve rural problems”. Finally, rural youth “developed healthy habits”, learned how “to make the best possible use of their free time”, and how to apply the “methods for the betterment of agricultural and domestic practices” to increase farm incomes, improve the living conditions of their communities, and increase the “attractiveness” of rural life.⁴⁶⁹

According to extension agent Salvador Colón, 4-H Clubs also played a vital role in educating rural youth since the island’s public schools lacked “enough resources to offer a complete education to all our children.” Therefore, in Colón’s view, extension agents involved in the 4-H organization were responsible for filling this gap. Since “the work of the 4-H is immense and cover all phases of human life”, it functioned as “the continuation of public education, but in a broader and more practical sense” because “it prepares the young boy for his duties as a man” and young girls for her duties as a housewife. Moreover, 4-H teachings followed boys and girls “throughout adult life” when they put in practice their education to work for the common good. For boys in particular, 4-H Clubs fostered collaborative work in the improvement of rural life by “cultivating the land more wisely” and “joining a common struggle against social ills”.⁴⁷⁰

Extension literature offered examples of the effectiveness of this approach in cultivating industry

⁴⁶⁹ Colebank and Mayoral Reinat, Clubs 4-H en Puerto Rico, 12. 2-3
and citizenship among youth by telling the stories of boys and girls who successfully learned and apply 4-H models of rural life in their homes and the farms.

Therefore, 4-H Clubs’ leaders aimed to foster community improvement and well-being by cultivating among the next generation of farmers and housewives the skills needed to fulfill both their domestic and social roles. In Colón’s words “when we finally achieve” this goal “we will have men capable of sustaining the country’s economy at higher levels that are more consonant with the epoch of progress we are living now.”471 Home economists and agronomists involved in 4-H work adapted education methods and demonstration topics in formats suitable for youth and emphasized topics related to nutrition, health, and food crops agriculture. Rural boys received “practical education regarding nutrition and health problems” and basic instruction about how to solve these problems through improved farming practices.472 Female 4-H Clubs “developed among rural girls the appreciation of the best ideals of family life” and helped them “acquire the knowledge they will need to improve their life conditions” and that of their families and communities.473 This knowledge was transmitted through “practical work” in nutrition, food conservation, cooking, home improvement and decoration, hygiene, and child care.474

As part of their work with girls and housewives, extension agents organized community and social events such as Demonstration Fairs. The first Fair of the Agricultural Extension Service took place in 1937. The success of this fair led the island’s Legislature to create an Insular Fair Committee and to make available a $20,000 fund to plan a fair annually.475 In these annual fairs, extension agents and participants organized exhibits and competed for cash prizes in

471 Ibid.
472 Programa campamento de verano para niños de los Clubs 4-H de Puerto Rico, 6-14 agosto 1941. AGPR, fondo Oficina del Gobernador, tarea 96-20, caja 281, folder 473 (Extension Work)
473 Barrus and Keown, “El Servicio de Extensión Agrícola en Puerto Rico.”15-16
474 Orcasitas, "Manual de Información para los Clubs 4-H en Puerto Rico."
475 “Plans for 1938 Fair Progress Rapidly,” Puerto Rico Extension News 2, no. 2 (1937). 1
several areas such as best specimens of livestock and best agricultural products displayed. The Home Demonstration Office exhibited examples of participants’ works in home furnishing, needlework and canned goods. Extension Service’s publications emphasized these displays noting how by the second fair as many as “250 4-H girls from the rural zones of Puerto Rico had on display the canned products” like fruits, vegetables, and meat, which they prepared “from produce out of their own home gardens”. Examples of the “attractive work” manufactured by 4-H girl on display at the fair included articles like hand bags, beach sandals, and bags.476

Other events organized at the fairs were the pageants and coronations of the “Queen of Agriculture” and the “Queen of the Flowers”. According to a report of the “Queen of Agriculture” pageant, the winner, a fair-skinned H.M Sylvia I, was accompanied by a “Royal Court” composed of six members of 4-H Clubs “elegantly dressed and symbolizing each one of them the food products most utilized on the island” like plantains, yams, and sweet potatoes.477 Even Director Rodríguez Géigel was involved in the coronation of the “Queen of Agriculture” who was “member of a 4-H Club and daughter of a bona fide farmer” of Mayagüez. According to Rodríguez, she professed “a great love for farm life”, considered that “agriculture should be at the heart of every good Puerto Rican” and “understood that the diversification of production would bring huge benefits to the people”.478

(Image 3.3) The following year the Extension Service organized a ceremony to crown “Her Majesty Matilde II” as the “Queen of the Flowers”. The ceremony “drew a sonorous applause from the crowd” as “H.M Sylvia I, Queen of Agriculture walked with Matilde II to the throne.”479 For extension officials, the popularity of

476 “Home Demonstration Work at the Fair,” Puerto Rico Extension News 2, no. 7 (1938). 2
477 “Reina de la Agricultura,” El Heraldo de Extensión 1, no. 4 (1939). 1
479 “S.M. Matilde II, Reina de las Flores,” El Heraldo de Extensión 2, no. 6 (1940). 3
these events was an example of the potential of home economics and agriculture expertise to reform rural Puerto Rico’s social and domestic spaces.

The National 4-H Camp provided a broader platform to display the effectiveness of Puerto Rico’s extension education efforts. A delegation of Puerto Rican club members had the opportunity to attend the event held in Washington D.C. annually. These visits offered extension officials an invaluable chance to demonstrate Puerto Ricans’ patriotism and loyalty. One of these
visits, described in *El Heraldo de Extensión*, was particularly noteworthy for the Puerto Rican delegation. The article described the encounter of Roberto Ramos, 4-H from Vega Baja, with President Roosevelt as described in a letter he sent to the Service’s office. (Image 3.4) “Today” Roberto wrote, “I had the chance to speak with President Roosevelt when he visited the Camp.” “We were not allowed to go near”, he continued, “but I escaped and decided to go and greet him.” Roberto told him “Mr. President, I am from Puerto Rico”. According to him, the President “was very much surprised” by his greeting “and started to ask me some questions. I answered all of his questions and let him know that my club was named after him.” For Extension leaders, this was a “grateful incident” that showed Puerto Rico’s commitment to 4-H Club values and their importance to cultivate self-reliance, citizenship values, and industry among rural peoples.

_image 3.4: “Roberto Ramos, 4-H Club member from Vega Baja and one of the delegates from Puerto Rico to the National 4-H Clubs Camp in Washington, at the moment when he was holding an interesting conversation with President Franklin D. Roosevelt.” (El Heraldo de Extensión)_

480 “Roberto Ramos Relata sus Impresiones del Campamento Nacional 4-H de Washington,” *El Heraldo de Extensión* 2, no. 6 (1940).
Conclusion

Roberto Ramos’ experience also demonstrated that extension work was not “exclusively vocational, but humanistic and social as well”.\footnote{Reynaldo Nadal, "Objectives in Extension Education," \textit{Puerto Rico Extension News} 4, no. 2 (1939). 2} For home economists and agronomists of the Extension Service education in food preparation and preservation, nutrition, and industry was an element of a broader project to reconstruct rural landscapes. Through extension work—demonstrations, fairs, 4-H Clubs—experts in agriculture and home economics practiced and refined agendas for rural development that were based on increasing food self-sufficiency, reforming domestic life, and diversifying agriculture. Attention to the nutrition problem through home economics education, the promotion of native industries, and dietary improvement was central to these efforts. Despite its unequal share of federal funding for extension education, the Service provided important channels for local experts to promote nutrition and food self-sufficiency as part of broader agendas to rehabilitate rural society.

A set of ideas and discourses about the problems of nutrition, agricultural production, and food supply in Puerto Rico emerged through these processes. The disorganization of the island’s rural landscape appeared as the underlying cause of the population’s malnutrition and health problems. Unhygienic domestic spaces, monotonous diets, and isolated communities produced an environment of instability, poverty, scarcity, and ignorance that led to nutritional deficiencies and diseases. These social and physical ills, however, were not immutable characteristics of Puerto Rico’s rural peoples. Under expert guidance, rural areas had the potential to become productive agricultural economies conducive to good nutrition and health. For this local agents adapted models based on idealized U.S. middle-class notions of domesticity and extension education methods designed for the social and ecological characteristics of U.S. agricultural regions in efforts to cure the social and physical ills of rural populations.
The notions about rural development and its relation with nutrition, public health, and agriculture that emerged from these processes were crucially deployed in both policy and political agendas during the following years. As the next chapters will show, home economists’ conceptualizations of the nutrition problem through their work at education and health institutions and their collaboration with welfare and agriculture professionals during the 1930s were incorporated to the contemporary work of New Deal reconstruction agencies. By the end of the decade, these assessments of the problems of rural life in Puerto Rico became powerful rhetorical devices for emerging political movements and crucially contributed to shape nutrition programs and food policies during WWII and beyond.
Part II

The Political Economy of Malnutrition: Rural Reconstruction, Tropical Agriculture, and Land Reform

This section explores how biochemists, home economists, agronomists, social workers, and public health experts incorporated their assessments of the problem of nutrition in Puerto Rico as part of rural hygiene programs during the Depression and of food policies during World War II. It locates these processes as part of the political and social movements that informed the emergence and consolidation of PPD ideology. Chapter Four examines the attention to the island’s deficient diet, import-dependent food supply, and low consumption of “protective foods” as part of the work of New Deal relief and reconstruction agencies during the 1930s. It also traces how transnational and intercolonial agendas influenced the network of scientists and institutions involved with nutrition in Puerto Rico. As part of these efforts, local and U.S. officials emphasized the links between the problem of nutrition, people’s reliance on imported foods, and the utilization of most arable land for the cultivation of monocrops. These New Deal agencies also produced new knowledge about the sociological manifestations of the nutrition problem through dietary surveys, home visits, and medical examinations.

These insights also informed the local and federal government’s response to the WWII emergency. Given the island’s strategic position in the Caribbean and the effects of German submarine attacks over importation and maritime trade, increasing local food production became an urgent need. Chapter Five examines the articulation and implementation of wartime rationing policies, the emergence of a new impetus to study the possibilities of native crops to contribute to people’s diet, and the implementation of extension programs to increase the production and consumption of local foodstuffs among housewives, small farmers, and the general public.
Chapter Four
“Solving the Medico-social Problem of our People”: Nutrition and Rural Hygiene

The Field Nutritionist should bear in mind that her main purpose in carrying out a nutrition program is to help, with each individual case, in solving in part the complicated medico-social problem of our people.482

Introduction

The socioeconomic context of the 1930s provided a fertile soil for the international dissemination of new nutrition knowledge and its implications for public health. Based on the technical calculation of vitamins, proteins, and minerals, nutrition science provoked global debates “as nutritionists expanded the category of hunger to include not just the starving and undernourished, but the malnourished as well.”483 However, this expanded conceptualization of hunger complicated the task of defining and measuring the effects of deficient diets. Given this lack of precision the term “malnutrition” was used to describe “a host of conditions,” from those who did not eat enough and whose “physique was below “normal” or locally “average” standards”, to those who exhibited symptoms of a specific deficiency disease.484 Thus, while new biochemical discoveries expanded the medical and public health applications of nutrition science, the techniques for identifying and treating malnutrition remained contested throughout the decade. Among these, the establishment of minimum daily requirements of known vitamins and minerals occupied experts’ attention of during this decade.

Apart from these technical debates, the redefinition of hunger as malnutrition fostered new understandings of the relationship between agriculture and public health. While the

482 Puerto Rico Reconstruction Administration Health Division, Working Plan of the Nutritional Unit. Prepared by Rita R. Lang, September 1937. NARA-NYC. Record Group 323, box 5, Entry 36, folder: Health and Sanitation Work, Dietetic Unit. Slightly revised by author for clarity
483 Vernon, Hunger: A Modern History. 158
484 Ibid. 126
measurements of malnutrition were in flux, understandings of the chemical properties and functions of food elements implied that nutritional health required the consumption of an “optimum” diet instead of a “minimum” amount of foodstuffs. According to these notions, an optimum diet was mainly composed of “protective foods” such as green and yellow vegetables, fresh fruits, meat, poultry, and dairy products supplemented by “energy-yielding foods” like wheat, rice, and corn.485 Therefore, the health, vitality, and productivity of populations depended on ensuring a balanced agricultural production and an adequate supply of protective foodstuffs as well as promoting the consumption of a diet according to these new nutrition guidelines.

This expertise also offered new tools to intervene with the problems of rural populations and address the decline of agricultural economies provoked by the worldwide Depression crisis. The need for better agricultural planning to promote the production and consumption of protective foods converged with “the constitution of an international discourse of public health” “that wove previously fragmented experiments in medicine and sanitation…into a more unified set of ideas and practices”.486 This set of ideas and practices became known as rural hygiene. Drawing heavily from the new nutrition knowledge, rural hygiene programs integrated a set of techniques of public health like water and sanitation interventions, construction of health centers, and nutrition education. This approach to the public health problems of rural populations spread across the globe and fostered the creation of transnational networks of medical and scientific expertise that transcended national and colonial frontiers.

This chapter explores the application of knowledge about the problem of nutrition in Puerto Rico in the context of this international activity to jointly address the problems of nutrition, public health, and agrarian decline through rural hygiene and reconstruction. It

485 Barona, "Nutrition and Health: The International Context During the Inter-war Crisis." 91
486 Amrith, Decolonizing International Health: India and Southeast Asia, 1930-1965. 21
investigates how these notions were incorporated into debates about agricultural reform and the island’s historical dependence on food imports. These discussions also informed the functioning of agricultural cooperatives and medical dispensaries; the distribution of food aid, the organization of nutrition education, social work, slum clearance, and sanitation programs; and the promotion of housing reform. Converting rural populations to the principles of biomedicine and convincing them of “the importance of an adequate and nutritive diet” were important parts of these reconstruction activities. These interactions, in turn, were crucial for the emergence of a new relationship between local health experts and the rural poor that became central to the articulation of the PPD discourse by the end of the decade.

The implementation of health and socioeconomic studies, dietary surveys, home demonstrations, and community conferences sponsored by these New Deal agencies also offered rural hygiene workers the opportunity to apply new methods of nutrition research. Through these activities, public health, social work, and agriculture experts depicted the sociological causes and manifestations of the nutrition problem. The results of these inquiries pointed to the island’s food supply problem and people’s increasing reliance on low quality food imports as consequence of a disorganized rural society marked by monocrops agriculture and unchecked population growth. Applying new techniques to measure nutrition, health and welfare experts argued that these circumstances produced an environment of poverty, scarcity, and ignorance that resulted in chronic malnutrition and widespread diseases. These notions of the effects of monocrops

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488 Memo from A. M. de Andino to Miles Fairbank, “Monthly report of the Dietetic Unit Rural Rehabilitation Division”, June 14 1938. NARA-NYC. RG 323, box 5, Entry 26, folder Health and Sanitation, Rural, Dietetic Unit.
agriculture over the local food supply and people’s nutrition became powerful arguments in favor of agricultural diversification and land reform.

While this activity on the island reflected international trends, the application of this knowledge as part of rural rehabilitation plans occurred in the midst of increased political mobilization and turmoil provoked by the local effects of the Great Depression. By fostering attention to biological and sociological basis of malnutrition, rural hygiene work contributed to contemporary discussions about the island’s politico-economic organization. In the context of the political and social struggles of the decade, this attention to the relationship between nutrition, public health, and agriculture led to a recast of notions about the problems of rural Puerto Rico. For this generation of scientists and health workers, public health and science had the potential to both eliminate disease problems and regenerate Puerto Rico’s rural society. By the end of the decade, these notions became powerful rhetorical devices for the new PPD and crucially contributed to shape nutrition interventions and food policies during and after WWII.

Solving the Problem of Nutrition by Marrying Public Health and Agriculture

While the innovations in nutrition knowledge produced by the biochemical laboratory began to be gradually accepted and incorporated into policy discussions during the 1920s, this expertise became even more relevant after the onset of the Great Depression. The economic crisis and its sociopolitical effects contributed to the incorporation of rural public health work to international health agendas and to link colonial and metropolitan preoccupations with population welfare. In these circumstances, nutrition science offered strategies to attend to the problems of rural life through the application of medical technologies and the promotion of scientific agriculture. The public health work conducted by reconstruction agencies in Puerto
Rico reflected these broader trends. Their local manifestations, however, were shaped by the island’s relationship with the U.S. and the crisis of the agricultural economy underlying it.

Issues of nutrition, diet, and food supply were central to the public health activities sponsored by international organizations and philanthropies throughout the 1930s. The League of Nations (LoN) and its Health Organization became particularly involved in the study of the nutrition effects of the Depression.489 As part of this agenda, nutrition sciences “allowed politicians and experts to dream of a rational solution to the problems of malnutrition and food scarcity”.490 Although the U.S. government was not officially involved in the activities of the LoN, the Rockefeller Foundation recognized the League’s Health Organization as a useful channel to advance its sanitary and scientific agendas across the globe.491 By the early 1930s, the Foundation’s collaboration with the LoN was part of international public health interventions facilitated by new and emerging exchanges of ideas and practices that transcended colonial and international frontiers. The new nutrition knowledge, produced by a global network of laboratories and research institutions, figured centrally in these exchanges and provided new expertise and technologies to study people’s health and fitness.

This expertise found a fertile soil for its international propagation during the Depression years. As discussed in Chapter One, the first major research study of nutrition and diet in a colonial setting was conducted by British officials like John Boyd Orr in Kenya during the late 1920s.492 Similarly, British scientists in India, led by Robert McCarrison, compared the physiological characteristics, labor productivity, and nutritional quality of the diets of Northern

492 Brantley, "Kikuyu-Maasai Nutrition and Colonial Science: The Orr and Gilks Study in Late 1920s Kenya Revisited."
and Southern populations. The findings from these early investigations travelled across the international network of biochemistry laboratories working on nutrition during the interwar years. The LoN brought together these scientists “engaged in the study of nutrition in relation to public health” and provided a platform to discuss these issues as international problems “requiring attention from a variety of perspectives.” However, commonly accepted standards and definitions of malnutrition and nutritional health were needed before this attention could be articulated into policies and programs. Therefore, the LoN organized a Technical Sub-Committee on Nutrition and tasked it with developing standards and techniques for measuring malnutrition, establishing general and age-specific nutritional requirements, elaborating specific diets for low-income populations, and coordinating the implementation of dietary surveys in various countries.

The public health implications of these nutrition debates during the Depression led to the intersection of multiple professional and institutional agendas. In 1934, E. Burnett and Wallace Aykroyd published an initial report on the role played by institutions dealing with nutrition issues in the U.S. and Europe. According to the report, addressing the problem of nutrition required collaboration between experts from diverse backgrounds and disciplines. Similarly, discussions of the Sub-Committee’s work among LoN delegates emphasized “the necessity for marrying agriculture and public health in the interests of the latter.” Thus, the LoN published multiple reports throughout the decade addressing various aspects of this relationship. In 1937,

493 Vernon, “The Ethics of Hunger and the Assembly of Society: The Techno-politics of the School Meal in Modern Britain.”
495 Ibid. 36. Vernon, Hunger: A Modern History. 128
497 In 1935 Burnett and Aykroyd published a more detailed report on the existing public health work in nutrition in various countries. E Burnett and W.R. Aykroyd, "Nutrition and Public Health," Quarterly Bulletin of the Health Organization/League of Nations 4 (1935). Their findings were included in another related LoN volume: League of

Throughout these reports, Committee members emphasized the importance of utilizing uniform methodologies to make comparable the findings of different nutrition studies. However, gathering nutrition data as part of population studies remained a difficult process. It required the use of laboratory equipment to measure foodstuffs nutritional content, facilities to perform physiological tests to detect deficiencies, and personnel to gather clinical and sociological data. These resources were not easily available and were expensive to implement on large groups. Therefore, dietary surveys emerged as convenient mechanisms to quantify the magnitude of the Depression’s impact on people’s nutritional status and health. Dietary surveys applied methods to weigh food consumed in households, recorded foodstuff purchases and proportion of income devoted to this, as well as utilized questionnaires to gather data about the composition and frequency of meals. Dietary surveys also included comparisons between the cost of diets across different regions, calculations of food expenditures, and discussions of patterns of agricultural production.\footnote{Barona, The Problem of Nutrition: Experimental Science, Public health, and Economy in Europe, 1914-1945. 52} Thus, although biochemistry offered “abstract knowledge of food values and nutritional requirements”, the social sciences provided the necessary mechanisms to assess “what populations ate” and how that might affect their health status.\footnote{Vernon, Hunger: A Modern History. 129}

These debates about nutrition in relation to public health, agriculture, and labor channeled by the LoN found their way back to colonial territories. On October 1936, the British Prime Minister appointed a committee to study “the present state of knowledge in regards to nutrition
in the Colonial Empire.”

For this, the committee requested information from colonial governors regarding the nutrition and diet of populations in their respective jurisdictions. The responses received were compiled and published in a 1939 report. Summarizing the findings, E.B. Worthington, a British naturalist and member of the International Institute of African Languages and Cultures (IILAC) Diet Committee, lamented “that most colonial people are dependent on a single crop for their main supply of food” which was generally deficient in “proteins, fats, leafy vegetables and fruits.” Thus, Worthington called for more systematic nutrition studies to ascertain the effects of these diets in African health. One of the most famous studies conducted as a result of this call was the Nyasaland Nutrition Survey. While intending to bring together laboratory and social nutrition sciences, the tensions between these perspectives limited the dissemination of this survey’s findings.

Biochemistry and Social Nutrition come together in Nyasaland

Acting on the recommendations of the IILAC, the British Medical Research Council organized a survey of Nyasaland, Uganda by a team of experts including biochemists, physicians, social scientists, agronomists, and naturalists. The Nyasaland Nutrition Survey was implemented in different phases from 1938 to 1943. The survey’s director, Benjamin S. Platt, was an internationally recognized nutritional biochemist whose work had contributed to lay the foundations of this new science. His work related to children’s malnutrition and methodologies for identifying, diagnosing, and treating deficiency diseases became an important part of the growing international network of nutrition expertise. Platt had previously worked in Shanghai.

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502 Ibid. A1
where he collaborated in the discovery that beriberi was caused by a deficiency of thiamine (vitamin B₁), “a vital nutrient removed when rice was polished instead of consumed as brown rice”.505 He also “came with extensive overall knowledge about the nutritional conditions of colonial people” after contributing significantly to the first draft of the Nutrition in the Colonial Empire Report. As part of this work, Platt became aware that “virtually all colonial peoples had problems that could be associated with diet.”506

Platt was joined by anthropologist Audrey Richards who brought the perspective of the social sciences to the survey team. She had experience conducting fieldwork in the region and as part of the IILAC Diet Committee was familiar with the latest findings in nutritional biochemistry. Although her work showed that anthropology and biochemistry could complement each other, at the time the survey was designed and implemented knowledge about the sociological conditions shaping nutrition and diets was subordinated to the laboratory-based understanding of biochemistry. However and despite the preeminence of laboratory science, “nutritionists remained dependent on the social sciences” “to ascertain whether the income of individuals or groups, or the foods they ate” met their physiological needs.507 This sociological perspective on nutrition shared by Richards and other field workers like home economists and social workers “recognized that social and cultural meanings often overlay the actual nutritional value of food”. These experts argued that based on this social nutrition knowledge “researchers and administrators could scientifically plan to end hunger and achieve a world of plenty”.508

The Nyasaland Nutrition Survey was one of the first large-scale attempts to jointly apply the biochemical and sociological perspectives on nutrition. As the director of the project, Platt set

506 Ibid. 9-10
508 Ibid. 134
the tone for the actual implementation of the survey and for the selection of the sites which were intended to “provide some significant contrasts and still be representative of the Nyasaland villages”.509 Similar to Richards, the medical and agricultural officers employed in the survey had vast expertise on the local conditions. At the selected sites team members and their African assistants measured crops, labor patterns, and meals content and timing. They counted villagers’ material possessions and the number of rooms, windows, and beds in their houses. As Brantley demonstrates, nutritionist Jessie Barker’s constant presence in villagers’ households, asking about their meals and recording the weight of food cooked and consumed, made her the most memorable member of the survey team.510

This focus on diet and nutrition in the context of domestic and living spaces was characteristic of rural public health efforts during the 1930s. The refinement of social science and case work methodologies gave nutrition researchers tools to measure malnutrition’s “hold on populations” by focusing on family and community organizations. Field nutritionists—usually trained in home economics, education, or social work—applied the biochemical principles of nutrition in their investigation of the relation between what populations ate, the way they acquired it, and their health status.511 However, collecting and compiling data on household food production, expenditures, and consumption through questionnaires and interviews remained a difficult process. Although dietary surveys were the most convenient mechanisms to gather data about populations’ nutritional status and health, this information was “uncertain at best as the amount of any foods consumed could not be accurately measured.”512 Nonetheless, social

509 Brantley, Feeding Families: African Realities and British Ideas of Nutrition and Development in Early Colonial Africa. 9
510 Ibid. 5
511 Vernon, Hunger: A Modern History. 129
512 Brantley, Feeding Families: African Realities and British Ideas of Nutrition and Development in Early Colonial Africa. 68
scientists showed that biochemistry alone could not to depict a complete picture of the nutritional conditions and dietary habits in the villages studied. Brantley partly adjudicates the limited dissemination of the Nyasaland Survey’s findings to Platt’s unwillingness to recognize the validity of this perspective.

Despite these limitations, the Nyasaland Nutrition Survey was one of the first colonial nutrition projects integrating biochemistry and social sciences to study dietary practices and their relation with health status. Although in this case biochemical studies were more prominently showcased than Richard’s anthropological research, in other settings laboratory nutrition science became a powerful tool to bring attention to the social and public health effects of colonial systems in the context of the Depression. In South East Asia, for example, the social factors underlying public health problems emerged with greater urgency as a result of the transnational and trans-colonial debates between nutritional scientists (primarily biochemists) and rural health officials. Among these, the LoN-sponsored projects to establish guidelines and standards on nutritional health “bolstered the arguments of nationalists and activists across Asia, who used this information to mount a critique of colonial neglect.” Colonial states, in turn, “were often goaded by the spotlight” of the LoN and its renewed interest in nutrition into providing information regarding the health status of the populations under their control.

This new global attention to nutrition in relation to agriculture and health also fostered a renewed attention to the particular disease problems of rural populations. While most rural areas lacked adequate sanitation and medical infrastructures, the effects of the Depression forced states and philanthropic organizations to include public health measures as part of relief and rehabilitation programs. This renewed interest in the public health problems of rural societies

514 Amrith, Decolonizing International Health: India and Southeast Asia, 1930-1965. 11
became known as rural hygiene. Rural hygiene projects included the establishment of water and sanitation infrastructures, construction of health centers and housing, vaccination campaigns, as well as nutrition programs to promote the production and consumption of protective foods. New ideas about the importance of vitamins, minerals, and other food elements for resistance to disease and labor productivity guided these nutrition programs.

These rural hygiene technologies traveled through a transnational network of medical and scientific expertise that informed the transformations in public health practices and scope fostered by the Depression. As part of this network, public health and agricultural experts in Puerto Rico drew from and interacted with these exchanges of rural hygiene and nutrition technologies. In publications and reports they discussed the implications of the debates about nutrients’ minimum requirements for their study of Puerto Ricans’ diet and health.\footnote{Joseph Axtmayer, "Apuntes Sobre nutrición I: Las Vitaminas, Sus Propiedades Fisiológicas, Químicas y Físicas," Revista de Agricultura de Puerto Rico 29 (1937).} Local nutrition experts like Conrado Asenjo located their findings in the context of these contemporary debates. Moreover, they emphasized the links between their work and these international discussions to give authority to their critiques to Puerto Rico’s socioeconomic organization, particularly the ways in which it determined the utilization of the island’s land and labor.\footnote{Donald Cook, "Some Aspects of the Food Problem in Puerto Rico," Porto Rico Review of Public Health and Tropical Medicine 3, no. 2 (1927-28).}

Thus, the work of health, welfare, and agriculture experts on the island during the 1930s was part of a global exchange of rural hygiene and nutrition knowledge. The implications of these new approaches in Puerto Rico, however, were the result of the island’s sociopolitical organizations and the ways in which these shaped the food system. Scientific and policy debates mediated by the LoN emphasized the multidisciplinary nature of the quest for nutrition improvements. While the Nyasaland survey showed the complexities of applying this
multidisciplinary perspective “on the ground”, rural reconstruction programs in Puerto Rico provided a context in which the biochemical, sociological, and agricultural approaches complemented each other. Dietary surveys, small farming programs, and education campaigns became strategies to apply new techniques and gather data about the problem of nutrition. These experiences profoundly influenced the trajectory of local professionals and scientists and were central to the political debates provoked by the crisis of the island’s agricultural economy.517

Crisis of a Vital Regime: Nutritional Dependence and Monoculture in Puerto Rico

As part of these international debates about the relationship between diet, labor, and health, the Depression forced politicians and public health officials in Puerto Rico to face the consequences of long-term mass unemployment and undernourishment.518 The onset of the economic crisis on the island occurred as a growing corpus of nutrition scientific knowledge interacted with increasing policy and political interest in issues of food supply and agricultural modernization. In the sociopolitical context of the 1930s, Puerto Rican public health experts and nutrition scientists understood both the crisis of the island’s agriculture economy and its disease problems as reflections of a decaying rural society. Biochemical, public health, and sociological analyses of the nutrition problem served as indictments of the island’s monocrops economy and provided further proof of the need to curb overpopulation.

This set of ideas linking Puerto Ricans’ nutrition problem to the organization of the island’s agricultural economy was central to the political discourse crafted by the emerging movement that later became the PPD. The party’s discourse presented the history of the island under U.S. rule as the struggle between the poor and dispossessed jíbaro and the American sugar cane emporiums. The sociopolitical conflicts of the 1930s provided ideal conditions for the

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517 Barona, "Nutrition and Health: The International Context During the Inter-war Crisis." 88
518 Berry and Petty, The Nyasaland Survey Papers, 1938-43: Agriculture, Food and Health. 5
alignment between this emerging rhetoric and nutrition’s scientific expertise. Recent interpretations question the extent to which this discourse reflected actual land-owning patterns in rural Puerto Rico after the U.S. arrival. These studies question the emphasis on sugar cane cultivation and absentee landownership as defining features of Puerto Rico’s agricultural economy during this period. Instead, they argue that “the concentration of landownership in a few hands was a legacy of Spanish rule, not the result of the impact of the U.S. occupation on a mass of small property holders”. They also contend that census data do not indicate a steep decline in the number of small farms in Puerto Rico after 1898 but show that the number of farms went from 39,021 in 1899 to 58,371 in 1910. By the beginning of the Depression, the number of small farms stood at 52,371. Although when compared to 1910, the 9 percent decrease “was a significant”, it was “hardly catastrophic reduction.

However, nutrition experts working in Puerto Rico during the 1930s emphasized the relationship between a decline in small landowning and subsistence farming, the spread of monocrops agriculture, and a decrease in the production of food crops—especially the so-called “protective foods”—throughout the island. For home economists, agronomists, biochemists, and public health officials, Puerto Rico’s nutrition problem and monotonous diet were directly related to a “one-sided development” fostered by mono-cropping and absentee landownership. For example, Henry Sherman, Visiting Professor of Chemistry at the School of Tropical Medicine, summarized his impressions about the island’s food supply and the nutritional condition of the people in an essay titled “A Glimpse of Social Economics in Porto Rico.” Here he noted that while “the fertile lands of the coastal plains are practically monopolized by sugar cane, the eastern part of the interior is chiefly devoted to the growing of tobacco, and the western

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520 Ayala and Bernabe, <em>Puerto Rico in the American Century: A History Since 1898</em>. 48
interior is the coffee country,” “the area available for the growing of food for home consumption” had decreased significantly during the previous decades.  

Similarly, in a 1934 essay Pablo Morales Otero, President of the Puerto Rico Medical Association, included Sherman’s impressions as part of his analysis of the island’s most important health problems. Quoting Sherman’s phrase “agriculture is not only an industry, it is a vital regime” Morales associated the “decrease in the number of agrarian farms and small landowners” during the first decades of the twentieth century with the nutritional problems measured “from a biological point of view by scientists” at the STM. These “demonstrated qualitatively and quantitatively the undernourished status in which the majority of Puerto Ricans live diminishing their efficiency and endurance and being, perhaps, the most important predisposing cause for some pathological states such as anemia and uncinariasis.” Thus, using public health arguments Morales Otero joined a growing chorus of intellectuals who during the 1930s “began to denounce the evils resulting from the concentration of landownership and the displacement of the small farmer by large, often North American corporations.”

These emphases on the relationship between nutrition, agriculture, and health contributed to the increasing politicization of these notions throughout the decade. These emerging ideologies drew heavily from continuously expanding knowledge about the biochemistry of nutrition. While international conversations pointed to the need to guide agricultural policies according to these new, and still contested, ideas in Puerto Rico they were gradually incorporated into a discourse that associated the poor health of rural Puerto Ricans with the historical domination of monocrops agriculture. Commentaries about the lack of quality food production in Puerto Rico, such as those by Sherman and Morales Otero, resonated with increasingly

522 Morales Otero, "Nuestros Más Importantes Problemas Sanitarios." 102  
523 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 47
prominent critiques to an agricultural socioeconomic system based on mono-cropping and absentee landownership. As the notion of “protective foods” became one of the central tenets of the new nutrition science, Puerto Ricans’ reliance on imported products and “carbohydrate-dense” foodstuffs as their basic staples manifested a “one-sided development of the land”.

While historians have reassessed the extent to which small landownership in Puerto Rico diminished during the first decades of the twentieth century, evidence shows that the integration of the island into the U.S. trade and fiscal systems had drastic effects over subsistence farming and local food production. Although the majority of the rural population was landless in 1898, many were able to access to underutilized, undercapitalized, or idle plots of land as squatters or sharecroppers. This changed during the early twentieth century, especially in the cane-growing regions of the coastal valleys where “subsistence plots were transferred to sugarcane production” and “food once grown or gathered” “became a commodity to be bought”. Thus, while the data available shows that the number of small farmers remained fairly constant or decreased slightly, the access landless people had to underutilized land diminished considerably as well as the total amount of land dedicated to food crops cultivation.

Nutrition and public health experts discussed these changes in the use of land as one of the factors leading to the low production and consumption of protective foods—fresh vegetables, meat, and dairy products— and the increasing preeminence of viandas or starchy crops in Puerto Ricans’ diet. These crops, which already represented the most widely available and readily obtained foodstuff for rural Puerto Ricans, became even more prominent during the interwar years. By the 1930s viandas were one of the most important elements of rural Puerto Ricans’

524 Cook, “Some Aspects of the Food Problem in Puerto Rico.” 61
525 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 49-50
Analyses conducted by economists of the Agricultural Extension Service showed that *viandas* were the principal locally-grown foodstuff produced through small farming and sold in local markets. For nutrition experts, this prominence of starchy crops and the lack or low consumption of protective foods were signs of the poor quality of the island’s diet and helped explain the malnourished and sickly state of most of the population.

Thus, Puerto Ricans’ dietary simplification and the reliance on high-energy foodstuffs like *viandas* and white rice was correlated with the boom of Puerto Rico’s monocrops economy. During the 1920s, the sugar cane industry recuperated from the crisis caused by lower prices following the end of the Great War. Sugar interests in Puerto Rico, both local and absentee, greatly benefited from increases in the tariff paid by foreign sugar entering the U.S. markets. This competitive advantage allowed producers in Puerto Rico to increase their access to the U.S. market through this decade. This special access gave local sugar producers a temporary buffer from the 1929 economic crash. Growers and producers of other monocrops like tobacco did not have similar protections and suffered great losses. The devastation provoked by two hurricanes, in 1928 and 1932, and decreasing demand from U.S. consumers exacerbated the effects of the market crash over the tobacco industry and the economy of the central highlands.

These hurricanes also exposed the precariousness of the island’s public health, sanitation, and housing infrastructures. The 1932 San Felipe hurricane was particularly devastating. Not even the STM was spared from the destruction produced by the winds and rising tides. Donald Cook sent a lengthy report to the Dean of the College of Physicians and Surgeons detailing the

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527 Elton Brainard Hill and Sol Luis Descartes, "An Economic Background for Agricultural Research in Puerto Rico," (Rio Piedras, PR: Agricultural Experiment Station, 1939).
528 Ayala and Bernabe, *Puerto Rico in the American Century: A History Since 1898*. 96. Sugar producers in the Philippines, who was also under the U.S. tariff system, benefited from these policies as well.
529 Levy, *Puerto Ricans in the Empire: Tobacco Growers and U.S. Colonialism*. 204
extent of the damage and his daunting experience battling the hurricane in his home.\textsuperscript{530} Even when both the School and Cook’s home were damaged, this was far from resembling the effects of the hurricane in rural Puerto Rico where it provoked widespread death and desolation.\textsuperscript{531} This crisis represented the beginnings of one of the most turbulent periods in the island’s history.

**The Politics of Rural Reconstruction**

The economic crisis together with these natural disasters had profound effects over the island’s political structures. Existing political parties were unable to implement a timely and effective response to the “twin forces of hurricanes and economic depression”.\textsuperscript{532} The effects of this failure significantly altered the island’s political landscape forcing each of the major political parties to redefine their agendas and relationships with each other. During the previous decade, these four parties—the Republican Party, the Socialist Party, the Liberal Party, and the Nationalist Party—formed alliances and coalitions to advance their agendas according to the changing realities of the colonial relationship between Puerto Rico and the United States. Generally, both the Republican and Socialist parties supported the incorporation of Puerto Rico as a state of the Union while the Liberal and Nationalist parties advocated for complete independence.

Luis Muñoz Marín, member of the Liberal Party and son of Luis Muñoz Rivera, one of the most important Puerto Rican politicians of the late nineteenth and early twentieth century, returned to the island in 1931 after living for many years in the United States. By this time his father’s Union Party, which had managed to reconcile “the defense of coffee and sugar propertied interests” “with affirmations of Puerto Rican identity and protests against the most

\textsuperscript{530} “Dr. Donald Cook. Description of Porto Rico Hurricane Oct. 1932.” CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 360, folder General Correspondence January 1932-1933


\textsuperscript{532} Ibid. 52
egregious colonial injunctions”, had virtually disappeared after its alliance with the pro-statehood Republican Party broke up. Upon returning to the island Muñoz Marín actively entered local political activity by joining the recently created Liberal Party. As an advocate for Puerto Rico’s independence and drawing from his father’s legacy, Muñoz Marín quickly became one of the Liberal Party’s most vocal and visible members.

Although the Liberal Party lost the 1932 elections to the recently organized Republican-Socialist Coalition, Muñoz Marín succeeded in his bid for the Senate. The Coalition was the result of an alliance between the Republican Party and the Socialist Party brokered by their leaders Rafael Martínez Nadal and Santiago Iglesias Pantín respectively, both statehood supporters. While the Coalition retained control of the Puerto Rican legislature for the rest of the decade, as Senator Muñoz Marín exerted considerable influence over the planning and establishment of New Deal agencies on the island throughout the 1930s and early 1940s. This placed him and his party in direct opposition to the Coalition government, most notably Commissioner of Health Eduardo Garrido, who became “the most formidable critic” of both the independence movement and the establishment of New Deal programs in Puerto Rico. In this political context, the operation of government public health programs often clashed with the organization of rural hygiene and sanitation projects by relief and reconstruction agencies.

This effects of the economic crisis in the island’s agrarian society also fueled nationalist and labor activism. As per capita income fell around 30 percent between 1930 and 1933 “chronic poverty became more acute”. Increasing unemployment worsened these problems as people’s purchasing power continued to decline. General unrest spread throughout the island between

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533 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 61
535 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 96
August 1933 and March 1934 leading to strikes and protests. Dockworkers, laborers in the needle trades, and tobacco and sugar workers struck for better wages. Consumers organized boycotts against gasoline and electric power companies and denounced increases in the price of products such as bread. This mobilization was a prelude to the general strike of sugar workers in January 1934. These struggles put Nationalist leader Pedro Albizu Campos in the spotlight. Although this party failed to garner enough votes in the 1932 elections, Albizu Campos’ support of popular protests and labor activism turn him into one of the decade’s most visible figures.536

Clashes between activists and law enforcement agencies left many dead including the Police Commissioner Francis E. Riggs. This confrontation reached its climax in 1937 when an attempt to prevent a Nationalist march in the southern municipality of Ponce led to twenty-one deaths as the police opened fire on an unarmed group of marchers.537 While “the regime became more impatient and repressive with the believers in independence” it became evident to the U.S. government that more federal intervention was needed to reorganize Puerto Rico’s agricultural economy and alleviate the effects of its collapse.538 The creation of the Federal Emergency Relief Administration (FERA) and the Puerto Rico Emergency Relief Administration (PRERA) in 1933 as a response to this social and economic crisis represented the first significant federal intervention on the island since the organization of the colonial government at the beginning of the century. However, these “relief measures came with authoritarian initiatives.”539 In 1934, ex-army officer Blanton Winship was appointed to substitute Theodore Roosevelt, Jr. as Governor of the island in efforts to tighten surveillance of nationalist and labor groups’ activities and limit their appeal among the rural and urban poor.

536 Ibid. 110
537 Ibid.115-116
538 Trias Monge, *Puerto Rico: The Trials of the Oldest Colony in the World*. 88
539 Ibid.
The establishment of relief and emergency programs on the island became an element of this strategy to counteract the traction gained by nationalist and pro-independence groups as the economic conditions worsened.⁵⁴⁰ These policies “provided the presence of the United States in Puerto Rico with a new and benevolent face, one concerned with improving the well-being of its colonial subjects”.⁵⁴¹ As the first relief agencies organized on the island, the FERA and the PRERA employed Puerto Rican workers, made emergency loans to farmers, distributed food, and established medical facilities such as dispensaries and maternal and child hygiene centers. As pro-independence mobilizations reached their climax by the end of the decade, the U.S. response assumed a more repressive nature while the continuation of funding for these projects came under increasing scrutiny from U.S. politicians and members of Congress.⁵⁴²

While the first emergency measures to alleviate the social and health problems provoked by the Depression were implemented in Puerto Rico, local and federal officials called for more permanent changes to the island’s agrarian economy. Puerto Rican officials’ recognition of the need for long-term interventions to reform rural society paralleled the articulation of the set of agendas, policies, and projects that constituted the New Deal in the United States. The Depression brought to light “the irrationality of the economic system” manifested in in one of the most poignant metaphors of the crisis: a breadline knee-deep in wheat.⁵⁴³ The new knowledge of nutrition, emphasizing the long-term effects of an inadequate diet, evidence the need to intervene with a system that led to the “juxtaposition of hunger and abundance”. Readjusting an economic system producing both malnutrition and food surpluses necessitated profound changes in

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⁵⁴⁰ Ayala and Bernabe, *Puerto Rico in the American Century: A History Since 1898*. Chapter 5
⁵⁴² Notably, Southern Democrat Senator Millard Tydings remained one of the strongest critics of the New Deal in the U.S. and of the increasing federal expenditures Puerto Rico through the PRERA and the PRRA.
agricultural production, both nationally and internationally. Thus, the Depression motivated a renewed scientific and policy attention to the sociopolitical foundations of malnourishment in the U.S., especially among children and youth. In this way, New Deal projects to tackle economic depression, hunger, and malnutrition became part of international discussions about the relationship between of agriculture, nutrition, and public health.

In Puerto Rico, however, nutrition and agricultural experts framed the problem of food supply and its relationship to diet and health in different terms. For these experts, the problem of nutrition on the island was the result of a diet lacking protective foods, which was associated with the use of most of the arable land for monocrops cultivation. In their analyses, overpopulation and the high birth rates among rural families further exacerbated this nutrition and food supply problems. Thus, while in the U.S. efforts were directed toward addressing the imbalance between agricultural production and consumption—due to overproduction and decreasing purchasing power—in Puerto Rico solving the problem of nutrition required the complete reformation of its rural society and economy. A central aspect of this health and social reform agenda required increasing local food production, both through subsistence and commercial farming. Achieving this goal required educating small farmers, housewives, and rural populations in general how to produce and consume more protective foods as well as how to transform their homes into healthy living spaces.

The Agricultural Extension Service, established in 1934, became another important institution through which Puerto Rican nutrition experts, particularly home economists, entered rural households and communities. Nonetheless, the extension of the New Deal to Puerto Rico brought to the island an unparalleled amount of funds and resources. Apart from monetary

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545 Ruis, "Children with Half-Starved Bodies" and the Assessment of Malnutrition in the United States, 1890-1950."
transfers, the scope of work of New Deal agencies fostered one of the most significant encounters to date between health and welfare professionals and rural populations. This contact with the living conditions of the rural poor allowed them to both apply their newly-acquired expertise and create new knowledge about the problem of nutrition. For Puerto Rican reformers like Morales Otero, Rita Lang, Antonio Fernós Isern, and Sol Luis Descartes, the agendas of New Deal reconstruction and rehabilitation agencies fitted their own concerns with the social, economic, and public health consequences of monocrops agriculture.

One of the main goals of New Deal programs in the U.S. was to control agricultural production as a way of stabilizing prices as well as alleviating rural poverty and urban hunger. As part of these policies, the federal government took steps to reduce sugar production in areas supplying the U.S. market in the context of a broader plan being elaborated by the USDA since 1933.546 The plan was finally articulated in the Sugar Act of 1934 which assigned quotas to each sugar-producing region or territory. The Act assigned substantive quotas for Cuba and Hawaii while it left Puerto Rico to face the greatest reduction in production. At the same time, the Act implemented programs to compensate farmers for reducing their production. The funds for these programs were obtained from processing taxes to be imposed on sugar mills and refineries. In the territories such as Puerto Rico, revenue from these taxes became available to finance other agricultural rehabilitation and rural reconstruction projects. In March of 1934, Rexford Tugwell, Assistant Secretary of the USDA, visited the island to study the ways in which the Sugar Act and these wider reform provisions could be implemented.

Tugwell’s report on his experiences on the island led to the creation of a special expert committee that became known as the Puerto Rico Policy Commission. President Roosevelt charged committee members with drawing plans for the agricultural rehabilitation of Puerto Rico

546 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 97
following the stipulations of the Sugar Act. The members of the Commission included the President of the UPR Carlos Chardón, Commissioner of Agriculture Rafael Menéndez Ramos, and agronomist Rafael Fernández García. Although many of these individuals were linked to the island’s political elite, they belonged to a new generation of Puerto Rican professionals who believed in scientific expertise as the most appropriate guide in the development of a plan to replace the “blind development” produced by monocrops agriculture with a more balanced and autonomous economy. As leader of the Commission, Chardón became one of the key promoters of this approach. His training and experience in botanical research influenced the Commission’s focus on modernizing agriculture and improving the lot of small farmers.

Under his leadership, the Commission delineated a plan, known as the Plan Chardón, for Puerto Rico’s economic reconstruction based on the diversification of the island’s agricultural production, the promotion of subsistence and food crops agriculture, the nationalization of certain sugar-producing estates, and the development of new industries. These measures aimed to both reduce sugar overproduction and begin “a controlled agrarian reform” through the relocation of farmers who, having access to more productive lands, “would be able to grow foodstuffs for their own consumption as well as to contribute to the local food production”. The notion that these measures “will be unavailing” “if the appalling increase in population” “cannot be checked, or at least reduced” also informed the articulation of these proposals.

The plan proposed by Chardón and the Commission gave rise to the Puerto Rico Reconstruction Administration, PRRA. Public health and medical services became an important aspect of this agency’s projects for agricultural rehabilitation and rural reconstruction. Together

547 Ibid. 100-102
548 Dietz, Historia Económica de Puerto Rico. 170
549 Report of the Puerto Rico Policy Commission (Chardon Report).” NARA-CP. RG 69, PC 37, Entry 10, box 263, folder Inter-departmental Committee on Puerto Rican Affairs

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with the construction of housing facilities, schools, hospitals and water supply and waste disposal systems designed and implemented by the Engineering Division, the PRRA provided for the organization of a Health Division that hired physicians, sanitary engineers, nurses, social workers, home economists, and nutritionists.\textsuperscript{550} Therefore, the work of the Health Division and its mostly Puerto Rican staff can be understood as a manifestation of contemporary international rural hygiene efforts to reconstruct rural societies and agricultural economies. Addressing the problem of nutrition was central to these efforts.

Food Aid, Social Services, and Rural Relief

As the most significant U.S institutional response to the island’s health and social problems since the 1898 occupation, the work of New Deal agencies affected multiple aspects of life in Puerto Rico. Initially aiming to alleviate the Depression’s most severe effects, these first emergency relief agencies provided funding to the local Department of Health for malaria control, rural sanitation, and dispensaries construction.\textsuperscript{551} As part the early projects, the PRERA also established nutrition and food aid programs through its Social Service Section. Other philanthropic and federal emergency agencies sponsored child feeding services operated as part of the Departments of Health and Education, such as school meals and milk stations. These programs distributed powdered milk and other foods to infants as part of other medical and education services for expectant mothers whose “ignorance” “as to the principles of infant feeding and hygiene” together with “lack of milk of good quality in sufficient amounts” was

\textsuperscript{551} “Health Activities in Puerto Rico with Federal Relief Funds”, by E. Garrido Morales. NARA-CP. RG 69, PC 37, Entry 10, box 261, folder Puerto Rico Medical Care
considered to be among the most important causes of infant mortality.\textsuperscript{552} Chapter 6 examines the establishment of these food relief and nutrition programs for infants and children.

The PRERA also provided food aid to the general population through the Federal Surplus Relief Corporation, established in 1933 for distributing surplus pork, milk, cotton, and coal, to the unemployed (FSRC).\textsuperscript{553} Thus, most of the foodstuffs distributed by the PRERA in Puerto Rico, particularly “supplies of powdered milk in large quantities”, arrived to the island as part of these programs for surplus commodities’ distribution.\textsuperscript{554} While officials saw these products as a welcome relief for the nutrition problem, the mechanisms used to distribute relief foodstuffs on the island provoked many controversies. Problems also arose from attempts to secure products for distribution that were part of the island’s diet but were not administered through the FSRC. This situation even led to the resignation of a PRERA official in charge of securing rice, “a commodity which enters more into the daily meals of the people down here than any other item, except perhaps beans.”\textsuperscript{555} In the midst of the political conflicts between Coalition government officials and PRERA leaders, people’s complaints about the inadequacy of these methods became part of debates about the role of relief and rehabilitation programs.

For example, on December 30, 1933, Josefa Vélez from Cabo Rojo wrote to Resident Commissioner Santiago Iglesias, member of the Socialist Party, complaining that “the president of the Rehabilitation Commission” in this municipality refused to give her the “$1.00 weekly allowance for food products” even when she was a widow with children. For Vélez it seemed “that this lady who is distributing the Commission’s bread has no mercy for the hungry” because

\textsuperscript{552} Health Activities in Puerto Rico with Federal Relief Funds. 18
\textsuperscript{553} Levenstein, \textit{Paradox of Plenty: A Social History of Eating in Modern America}. 54. Lambert, "Want and Plenty: The Federal Surplus Relief Corporation and the AAA." To this day, direct food distribution programs in Puerto Rico are called “la PRERA”.
\textsuperscript{554} Health Activities in Puerto Rico with Federal Relief Funds. 20
\textsuperscript{555} Klopel to Hopkins, June 29 1934. NARA-CP. RG 69, PC 37, Entry 10, box 260, folder Puerto Rico Official June-September 1934.
“there are many people in Cabo Rojo who are constantly suffering from hunger” due to her actions. “I would like you to investigate these cases”, she continued, especially those in schools where children “are full of hunger, misery, and diseases.”\textsuperscript{556} Similarly, on November 18, 1935 Balbino Santiago and Fernando Guzmán from the town of Fajardo addressed a letter to President Roosevelt informing him of the plight of “thousands of humble world war veterans without employment having large families to support” who had “not been attended in the right way by the Porto Rican Relief Administration”. They reported that “countless mothers and fathers” looking for food aid “are turned away empty handed” by “young girls and young men receiving large salaries for doing almost nothing but to look at each other” at the PRERA offices. It was not until “the excellence of a never known investigator” went and investigated the living conditions of “those needed homes” that they received “a ticket for food supply”. Even then, they only received “milk, milk, and more milk, sometimes evaporated milk and other times dried milk, for the last six to seven months”.\textsuperscript{557}

These situations manifested the difficulties of transferring U.S. relief infrastructures—and whatever agricultural products happened to be in surplus—to the island’s context and the conflicting relationship between the needy and these agencies’ “never known investigators”. As the following discussion shows, the research conducted by health and welfare experts employed by the PRERA and the PRRA were central aspects of these agencies work on the island. Although the Fajardo veterans saw these investigations as an unnecessary hindrance, for local officials they were crucial to make the problems of rural life intelligible to U.S. administrators as part of efforts to secure more funding for the island. While these conflicts marked public debates

\textsuperscript{556} Josefa Vélez to Santiago Iglesias, 30 diciembre 1933. NARA-CP. RG 69, PC 37, Entry 10, box 264, folder Puerto Rico, Complaints
\textsuperscript{557} Guzmán and Santiago to President Roosevelt, November 18, 1935. NARA-CP. RG 69, PC 37, Entry 10, box 260, folder 400 Puerto Rico Official, October-December 1935
about the PRERA and its links with the Liberal Party, this agency offered Puerto Rican professionals new tools and resources to devise solutions for the island’s nutrition, public health, and agricultural problems.

These solutions included diversifying people’s diet by incorporating more “protective foods” such as milk, promoting agricultural diversification, modernizing small farming methods, implementing nutrition education programs, and putting in practice a comprehensive plan for population control. For this, local experts and scientists drew from new medical and agricultural technologies in their efforts to physically and morally regenerate the rural poor and their social and domestic environments. This activity in Puerto Rico reflected projects implemented in other colonial and national settings to intervene with the health problems of rural populations. For example, Mexican hygienists’ plan to bring scientific medicine to rural areas according to the promises of the revolution was based on conceptions of “country dwellers as ignorant” “lazy” and in need of encouragement “to adopt middle-class norms of hygiene, behavior, and work.” Similar conceptions about rural poverty together with new nutrition knowledge and anxieties about overpopulation and high fertility rates framed rural hygiene and agricultural reconstruction work in Puerto Rico.

As part of these projects, the PRERA included a Social Service Section, a Home Economics Unit, and a Medical Relief and Health Project. It also organized a Maternal Health Program to promote “that the children of Puerto Rico may be born with a better physical and mental heritage”. Gladys Gaylord, advisor to this program, noted that it was “based on evidence that the greatest per cent of population increase occurs among the physically and mentally unfit, in the lowest economic group and under conditions that will undoubtedly impose a heavy burden.

upon society”. Although “its immediate effect on the annual increase in population is negligible”, Gaylord emphasized that “its ultimate effect is far-reaching”.559 For Gaylord, effective public health work required the incorporation of an expert-driven plan to halt population increase among the working, mostly rural, poor.

Gaylord, executive secretary of the Maternal Health Association of Cleveland, arrived in Puerto Rico in June of 1935 at the invitation of James and Dorothy Bourne to study “the possibilities of starting” population control work in Puerto Rico. Gaylord accepted the invitation and took a leave of absence from her work in Cleveland where she had “an outstandingly successful record” “talking with doctors, social workers, and others interested” in population control.560 Together with Gaylord, the PRERA secured the help of gynecologist José Belaval and George Bachman, director of the STM, to implement a pilot birth control clinic. Belaval coordinated the work of the physicians and social workers who provided the services, the STM offered facilities for clinical work, and the PRERA contributed clerical staff and contraceptive materials. According to the organizers, the interest of the poor people in these services was manifested by the fact that after six months of operation “the clinic had taken care of 104 patients, a work load that was considered “encouraging.”561 Gaylord visited the island on multiple occasions during the mid-1930s to further support these birth control efforts.

These contraception efforts were framed by preoccupations with the relationship between food supply and population growth. PRERA leaders commissioned studies about the acreage of arable land necessary to support the island’s population through food crops agriculture. For this,
the agency consulted with demographers and statisticians who estimated future population growth based on past and present figures. Some of these studies, however, seemed to contradict the widespread notion about the island’s unique problem with overpopulation by concluding that while “the long-range trend is unmistakably toward the increase of population in Puerto Rico” this rate was “comparable to that prevalent in the continental United States.” Nonetheless, according to James Bourne other calculations showed that “Puerto Rico could not support more than 1,000,000 people through agricultural activities.” Based on these estimates, federal officials claimed that “there are a good many more people living on the Island…than food can be raised”, especially if it “Puerto Rico continues to produce sugar and coffee over its chief [land] areas.” Similarly Harry Hopkins, Administrator of the FERA, declared that “the crux of the matter” was that “there is not less than a half a million too many people living in the Island” and population “is now increasing at the rate of thirty to forty thousand a year.”

As these discussions show, population control became a central element of emerging plans for the permanent reconstruction of Puerto Rico’s agricultural economy and rural society. New conceptions of Puerto Ricans’ nutrition problem and its relationship with the island’s public health issues bolstered the population control agenda as part of this work. As Dorothy Bourne declared, while there was no “actual evidence” that Puerto Ricans were “lacking in physical vigor”, “presumptive evidence” that they were was “the amount of anemia found and the low resistance to disease.” The link between “dietary lacks” and the prevalence of tuberculosis in Puerto Rico was “another indication of the importance of an aspect of diet” for health and vigor.

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563 J. Bourne to Fellows, January 23, 1934. NARA-CP. RG 69, PC37, Entry 10, box 264, folder Puerto Rico, Official, Civil Works Administration 1934-1935
564 Baker to Kohn, January 4, 1934. NARA-CP. RG 69, PC37, Entry 10, box 264, folder Puerto Rico, General Correspondence
565 Hopkins to Kingsbury, April 3, 1934. NARA-CP. RG 69, PC37, Entry 10, box 264, folder Puerto Rico, General Correspondence
While in her view this applied to both children and adults “for children there is the additional evidence of the high infant death rate.” These notions about the relationship between overpopulation, infant mortality, and malnutrition articulated through the work of the PRERA lay the foundations for future public health, welfare, and nutrition interventions on the island.

Public Health and Rural Hygiene during the Puerto Rican New Deal

Once the planning of a new reconstruction agency for Puerto Rico started in 1934, medical scientists and public health professionals began to discuss strategies to take advantage of these prospective resources. Initially they offered suggestions to the members of the Puerto Rico Policy Commission in relation to the public health and medical projects that should be included as part of rural reconstruction. A group of STM faculty led by Director E.B. McKinley wrote to members of the Commission with a proposed budget for medical research and for the implementation of public health programs as part of the Plan Chardón. Specifically, these faculty members submitted a list of nine projects to be operated through the STM in connection with the new agency. Among these projects was the continuation of research on the nutritional value of native foodstuffs “with particular reference to their chemical composition, vitamin content, and physiological effects.” This was likely intended as an extension to the Tropical Nutrition Studies since the initial Rockefeller Foundation grant had recently expired. The cost of extending this project for a period of three years was estimated in $25,000. The proposal of the STM was partially successful. From the $110,000 originally requested, the final budget allocated $85,000 for the school’s medical and scientific work in connection with the Plan Chardón.

566 “Where we stand on the Nutrition Question”, by Dorothy Bourne. NARA-CP, RG 69, PC 37, Entry 10, box 260, folder Puerto Rico Official, December 1934, 1
567 “The five projects recommended in the Chardon Plan. Medical, Nutritional and Parasitological Research”, CU-HSL. Office of the Vice-President, Subject Code 130, box 360, folder General Correspondence, 1934
568 Bachman to Rappleye, July 16 1934. CU-HSL. box 360, folder General Correspondence, 1934
Under the leadership of Ernest Gruening in Washington and Chardón on the island, the Puerto Rico Reconstruction Administration (PRRA) implemented some of the public health projects proposed by STM faculty through its Health Division. Organized in January of 1936 this Division followed up on the work conducted by the Social Service Section of the PRERA and recruited many of the same personnel for leadership positions. Gruening and Chardón selected Pablo Morales Otero, Professor of Bacteriology at the STM, to direct the Health Division. In describing the work of his Division, Morales Otero emphasized that its main objective was to “try to correct the existing health conditions in the rural areas of Puerto Rico in so far as it was compatible with the economic program” and to improve “the health, efficiency and well-being of the workers on all projects of the Puerto Rico Reconstruction Administration.”

The public health and medical work of this Division was framed by the same eugenic concerns that guided rural hygiene programs throughout the decade. Many of the same personnel who promoted contraception and population control as part of the PRERA’s relief efforts joined the PRRA. From there they continued to emphasize the importance of population control for the success of this agency’s economic reconstruction and public health improvement plans. As Morales Otero noted “in any health program the principles of sound breeding and heredity have to be considered”. These principles guided the provision of “maternity care” as part of initiatives to protect “the function of motherhood, infant welfare, health and development (physical, mental and moral) of the preschool child, the school child and the adolescent”. For Morales Otero, these were in turn “important factors to be considered as essential in the type of reconstruction program” that the PPRA was conducting.

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570 Memorandum to the Administration of the Puerto Rico Reconstruction Administration, December 1935. NARA-NYC. RG 323, box 5, Entry 36, folder Health and Sanitation, Rural—General Memoranda
To provide these services, the Health Division was organized in various sections and units that resembled the PRERA model. (Image 4.1) By the late 1930s, these included the Camps Medical Section, the Rural Medical Service Section, the Rural Sanitation Section, the Research Cooperation Unit, the Social Service Section, the Vital Statistics Unit, the Survey Unit, and the Nutritional Unit.⁵⁷¹ These subdivisions were intended to work in coordination to “instruct and advise camp workers in matters of hygiene, personal habits and nutrition and to serve in all consultations on medical or health matters that may arise in connection with the work of the Puerto Rico Reconstruction Administration.” Medical attention was also offered to the families of the workers and to the general community although Morales Otero emphasized “that the health program of the PRRA is related exclusively” to the implementation of the agency’s projects.⁵⁷²

Thus, while the Camps Medical Section “effectuated human reconstruction” among the workers in Reconstruction Camps through “training inculcation of social habits, agricultural and industrial skills and…proper sanitation and nutrition”, the Medical Section provided “a means of selecting the workers best qualified to acquire subsistence or agricultural farmsteads of their own”. The Rural Medical Centers Section complemented the work of the Camps Medical Section by establishing centers “to give medical attention to the working population of the PRRA where no resettlement camps were to be established”.⁵⁷³ Twenty of these centers were established to cover fifty-one municipalities. Each medical center consisted of three dispensaries

⁵⁷² Memorandum to the Administration of the Puerto Rico Reconstruction Administration, December 1935. NARA-NYC. RG 323, box 5, Entry 36, folder Health and Sanitation, Rural, General Memoranda
⁵⁷³ Memorandum to the Administration of the Puerto Rico Reconstruction Administration, December 1935. NARA-NYC. RG 323, box 5, Entry 36, folder Health and Sanitation, Rural, General Memoranda
in charge of a physician working full time. A nurse, a medical worker, a clerk, and a janitor are assigned to each dispensary.

While the Camps Medical Section was in charge of the “human reconstruction” of PRRA workers, the Rural Sanitation Section was organized to take charge of the hygienic rehabilitation of their living spaces through the execution of “plans for the proper sanitation of farms and dwellings of workers” to prevent the spread of diseases such as hookworm and malaria. A sanitary engineer was hired “to study and advise in all sanitary engineering problems such as water and sewage disposal, drainage, ventilation, refuse, etc., both in the reconstruction camps and in the resettlement communities in which rural rehabilitation work is being conducted”.574 Each of the camps received periodically the visit of treatment units for hookworm and malaria while vaccination units “against smallpox and typhoid fever” were “assigned on a rotation basis” to each agricultural region where rural rehabilitation projects were established. The Social Service Section also assigned a social worker to each district who was responsible for making

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574 Ibid
periodic visits to each dispensary to “provide for the social, economic and moral improvement of the families of men at Reconstruction Camps.”

Recent analyses of the work of the PRRA describe the agency as “a vast apparatus” staffed by a new generation of reformist scientists and professionals. Although Chardón left his position as local administrator after less than two years due to conflicts between Puerto Rico-based officials and their federal counterparts, his successor Miles H. Fairbank in collaboration with engineer Guillermo Esteves continued the public works agenda of the PRRA. Similar to rural hygiene projects in locales such as India, Mexico, and U.S. southern states, the construction of medical centers or dispensaries in rural areas became one of the most important aspects of this agenda. In Puerto Rico, according to Morales Otero and other medical experts employed by the PRRA, existing public health units were located in urban centers and out of reach of many of the residents of more rural or isolated areas. Where these existed, “the medical care of the indigent…is in the hands of the municipalities” and “this service is very poor and has been discredited for years.” Since it was proven that that “this service could not be given either by the Insular or Municipal Government”, the PRRA “through its work of rural rehabilitation in the Island”, implemented various programs for “medical care, prevention and health education”.

As part of this general public health program, the PRRA embarked in the construction of medical dispensaries and sanitation infrastructures in many parts of rural Puerto Rico. However, the allocation of PRRA funds to the construction of health centers and the implementation of

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575 Memo Chief of the Health Division to Administration of the PRRA, January 24 1936. NARA-NYC. RG 323, box 5, Entry 36, folder Health Section
576 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 102
578 Andino to Fairbank, October 19 1939. NARA-NYC. RG 323, box 5, Entry 36, folder Health and Sanitation, Rural, General Memoranda
public health programs parallel to those offered by the government proved particularly controversial. The argument that existing public health units were out of reach for most rural residents was forcefully contested by officials at the Department of Health, mostly affiliated with the Republican-Socialist Coalition. According to these officials the construction of new facilities and programs represented “a wasteful duplication of services”. Moreover, while Chardón and his successor Miles H. Fairbank officially administered the PRRA in Puerto Rico, Liberal Party Senator Muñoz Marin was the de facto public face of the New Deal. Using his contacts and experience in Washington’s political circles, Muñoz Marin became the main liaison for those interested in a position within the agency or in need of assistance through one of its programs.

The public debate regarding the role of the Department of Health in the administration of the PRRA dispensaries once the agency began to be phased-out reflected once again the political struggle between local New Deal administrators and the Coalition government. According to initial plans, the medical care and sanitation facilities built by the PRRA were to be eventually transferred to the Insular Government and the Department of Health. However, negotiating the details of this transference became a thorny matter which was not fully completed until 1940. As soon as the planning for this transference started Health Division officials strongly voiced their opposition. In a letter to Gruening, Health Division worker Jorge González wondered “what can our jíbaros expect if you cede this precious jewel to a Department whose motto is “Politics, Politics, and more Politics”? ‘I will explain it plainly’, he continued, “it will create automatically 76 dictators (the Mayors) with more than two thousand “assistants” in each barrio” to determine the fate of a program implemented to attend “the acute illness of our peasants”.

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Therefore, González argued, this transference “will turn the PRRA medical centers into political centers” which will be dedicated to nothing more than “physically rehabilitate Politics”.581

The work of the Health Division remained at the center of these political controversies and mutual accusations of partisanship. Apart from disagreement over the construction of rural dispensaries, PRRA health workers’ criticism of the operations of the Department of Health also contributed to the conflicts. For example, according to Morales Otero and other PRRA health officials the statistical data collected by the Department of Health was spotty at best and misleading at worst. Therefore, there was a need for more accurate and updated statistical information regarding the health status of rural populations across the island. To meet this need, the Health Division organized a Unit of Vital Statistics “to carry statistical work of morbidity, mortality and all other matters pertaining medical care” in the regions under PPRA control, and a Survey Unit to manage data obtained from “a series of investigations on the health and socioeconomic conditions in the rural sections of the island”.582 These units were to collaborate in the compilation and analysis of data collected by the various sections of the Health Division particularly the Social Service Section. Directed by social worker Rafael Espino, this Section gathered information on the socio-economic and health status of the population they served as well as analyzed “the sociological side of the problems with which the PRRA is dealing.”583

The implementation of these health and socioeconomic surveys was divided according to the island’s four agricultural regions. These regions included Central Lafayette—a sugar cane plantation and mill situated in the southeastern coast of the island purchased by the PRRA in 1936—and communities located in tobacco, coffee, and fruit-growing zones. These studies,
jointly planned by Morales Otero and Espino had the purpose of providing “material for the study of the rural problems of Puerto Rico” by giving “a picture of the standards of living” of families served by the agency. This picture was intended to provide a reference point to make “future comparisons” and measure progress.584 To ensure the validity of the results, the sampling methodology was carefully planned at the Health Division. According to Morales Otero, “care should be taken to select a definite number of families” that was “typical and representative of the whole region”. This could be done by random selection, “choosing every other house or every two houses, but it should be kept in mind that all sections of the region should be represented.” If the number of families in the region was limited, “a house to house survey can be made which will give a clear picture of conditions in the region.”

Special instructions were given to field nutritionists and social workers conducting the surveys, “so that they will have a clear idea of what they are looking for”. All data to be collected was to “be entered into cards already prepared with all questions and information which visitors should ask from family.” They were instructed to fill the survey cards “in the same house of family after the visitor is sure that the family is telling the truth”, to inform the family “in very simple terms” the purpose of the investigation, and to tell them that “data given will not be held against them”. Information about economic conditions, such as wages and working days, was to be “checked from the employer wherever possible” and “be based on an average of income and expenses from preceding 4 o 5 weeks”. Finally, data was to be tabulated and interpreted and “when information justifies it conclusions should be reached”.585

584 Pérez, Living Conditions among Small Farmers. 1; Morales Otero et al., "Health and Socioeconomic Studies in Puerto Rico I: Health and Socioeconomic Conditions on a Sugar Cane Plantation." 241
585 Memorandum to Dr. Carlos E. Chardón from Pablo Morales Otero, “Forwarding Budget and Plan for Survey Unit in the Puerto Rico Reconstruction Administration.” May 27 1936. NARA-NYC. RG 323, Entry 36, box 5, folder Health Section
Despite this detailed initial planning, the conditions in Puerto Rico’s rural areas complicated the collection this type of information and the implementation of the survey in general. As the implementation of the contemporary Nyasaland Survey also showed, obtaining reliable data from this type of surveys was “notoriously difficult” due to the “hostility, reluctance, or inability of the poor to provide detailed accounts of their weekly budgets and dietary habits.” Apart from these methodological issues, PRRA investigators relied on the cooperation of town’s mayors and local employers to identify eligible families and gather socioeconomic information. The political infighting between PRRA leaders and the Coalition government complicated this process. Thus, the tabulation and analysis of the data was not started until the beginning of 1940 when statistician Manuel A. Pérez “was called upon to resume this work”. Pérez worked at the Vital Statistics Bureau of the Department of Health when he was recruited by the PRRA and later by the Works Project Administration (WPA) to complete the surveys’ work.

The results of the various surveys were published in local public health and medical journals including the Puerto Rico Journal of Public Health and Tropical Medicine and the Boletín de la Médica de Puerto Rico between 1937 and 1941 under the title “Health and Socio-economic Studies”. Apart from the studies in the four agricultural regions, Morales Otero, Pérez and other PRRA personnel published the findings of clinical investigations conducted among agricultural workers and of a second health survey conducted in the Lafayette Area. In 1941, the WPA published Pérez’s work based on the findings of similar surveys conducted among small farmers with the title Living Conditions of Small Farmers. According to Morales Otero, taken together “the facts brought out by the surveys may be considered as truly representative of the

586 Vernon, Hunger: A Modern History. 130  
587 Pérez, Living Conditions among Small Farmers. 1
life conditions of the large group of ill-nourished, poorly clad, ill-housed, and diseased people in this class, which forms the bulk of the population of Puerto Rico.”  

The collection, tabulation, analysis, and final publication of these findings were the result of collaboration between local professionals from multiple disciplinary backgrounds who were part of New Deal reconstruction work on the island. The design and implementation of the surveys provided an unprecedented opportunity for the deployment of hundreds of professionals such as social workers, home economists, agronomists, and nutritionists. These were extensive studies in terms of geographical areas covered, sizes of the samples and scope. The focus of the analyses ranged from the individual farmer, the housewife, the household, the family, the community, and the agricultural region. Designed to gather both sociological and biomedical data about the conditions in the island’s distinct agricultural regions, these surveys produced authoritative knowledge intended to guide plans to reform rural society by attending its health and social problems. Addressing the food and nutrition problem by increasing the variety and quality of the meals consumed by rural people became an important part of these agendas. That was the plan of work of the Division’s Nutritional Unit. Although short lived, the work of the Unit was the product of a decade-long circulation of knowledge and expertise about the problem of nutrition in Puerto Rico. This Unit served nutrition professionals to continue applying new nutrition knowledge as part of the “human reconstruction” work of the PRRA.

Promoting and Economical and Balanced Diet: Nutrition and Rural Reconstruction

As Dorothy Bourne noted in her analysis of the role of social work in nutrition education, “the social worker must turn to the experts on Home Economics constantly for help in making a

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588 Morales Otero et al., "Health and Socioeconomic Studies in Puerto Rico I: Health and Socioeconomic Conditions on a Sugar Cane Plantation." 241. Morales probably borrowed this phrase from President Roosevelt’s second inaugural address in 1937 where he spoke of “one third of the nation as ill-housed, ill-clad, and ill-nourished” (Grey, New Deal Medicine: The Rural Health Programs of the Farm Security Administration. 4)
varied diet attractive and practical to the housewife.” Thus, under her leadership the PRERA organized a “Nutrition and Home Economics Unit” as part of the Social Service Section. This unit was active from 1933 to 1935 when it employed home economists to give conferences and demonstrations throughout the island. Bourne selected Rita Roure Lang to direct the Home Economics Unit. By this time, Lang was among the most renowned Puerto Rican nutrition experts with degrees in both chemistry and home economics. She was also one of the few women and non-physicians enrolled at the STM during the late 1920s were she took graduate courses in “Food and Nutrition” and “Methods of Food Investigation”. During this period, she also served as dietitian at the Presbyterian Hospital in San Juan, collaborated with the American Red Cross as a nutrition expert, and worked at the lunch room of a school in the capital.

While Lang’s training was focused on the biochemical study of nutrition, she was mostly employed to conduct home economics and education work. After earning graduate-level credits at the STM, Lang attended Columbia University’s Teachers College where she obtained a Master’s of Science degree in 1934. As part of the research for her thesis, Lang conducted a series of experiments “to determine whether the addition of banana to a human type dietary” supported the observation that “the addition of fruits and vegetables” had “a definite effects on the retention of calcium…to an extent not accounted for by the increase in calcium intake by the use of such materials.” Lang employed the gold standard of nutritional biochemistry, the rat growth method, to test this hypothesis. Her tests “definitively suggested that the banana played a role in increasing the calcium retention” of the rats in the experimental diets. For Lang, these

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589 “Where we stand on the Nutrition Question” by Dorothy Bourne, 5
590 “School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University. Announcement 1927-1928, Second Session.” 20-21. Robert A. Lambert. Report of the Director of the School of Tropical Medicine to the Special Board of Trustees of the University of Porto Rico for the School of Tropical Medicine, Year 1927-28. 12. RAC, RF, R.G. 1.1, series 243, box 2, folder 28
592 Lang, "The Effect of the Banana on Calcium Retention." 1
findings offered clues on potential strategies to boost the quality of calcium-deficient diets with foodstuffs readily available in rural Puerto Rico.

As Director of the PRERA Nutrition and Home Economics Unit, Lang applied these ideas in the organization of “home visits and conferences” covering topics like “Nutritional value of beef”, “Best ways of cooking vegetables”, “What foods should be eaten daily”, and “Why should not more than one person sleep in the same bed”. PRERA home economists also demonstrated techniques for the preparation of canned and skim milk, the “bathing of a baby 2 years old”, and the arrangement of a “small room for three persons to sleep in.” They collaborated with physicians to provide “dietetic treatments” for diseases like tuberculosis, anemia, and malaria. In October of 1935 PRERA home economists also oversaw the distribution of skim milk “to undernourished children in public schools” in San Juan and Arecibo.” Apart from milk, a total of 423 children in these schools received “prunes, cereals and oleomargarine are also served to children when needed.” The Unit also organized a rural “Home economics School” and taught courses in “Food and Cookery”, “House maids”, “Nursery maids”, and “Laundry” to 100 pupils who were “paid at the rate of $1.00 a week each.”

When President Roosevelt signed into law the creation of the PRRA to replace “all other New Deal activity on the island”, the models, materials, and personnel of the PRERA’s Social Service Section and Nutrition and Home Economics Service were gradually transferred to this new agency. As consultant, Dorothy Bourne collaborated with Chardón and Gruening in the organization of a new “program in Social Service, Health and Education” as part of the PRRA.

594 Second Monthly Report of the Nutritional and Home Economics Service Unit
596 D. Bourne to Chardon, September 19 1935. NARA-CP. RG 69, PC 37, Entry 10, box 260, folder 400 Puerto Rico Official, October-December 1935
However, it was not until 1937 that a separate nutrition division was created. That year, the Nutritional or Dietetic Unit of the PRRA Health Division became “the youngest of all its units”. Its creation paralleled contemporary efforts to collect data about the nutritional status and dietary habits of other colonial and national populations.

By the late 1930s nutrition science was, again, undergoing crucial transformations. Research into the nutritional basis of deficiency diseases among “rice eating” populations in Asia and the Pacific had elucidated the mechanisms and potential preventative measures for conditions such as beriberi. In 1936, R.R. Williams finally synthetized thiamine, the nutrient lost in the process of polishing rice and whose long term deficiency produced the onset of beriberi. In 1937, researchers at the University of Wisconsin in Madison (where Conrado Asenjo was at the time completing his Ph.D.) offered crucial proof that niacin was “Joseph Goldberger’s elusive “pellagra-preventing vitamin.” That same year, the LoN published its landmark report where it presented the results of efforts to study the relationship between nutrition and health and develop ways of ensuring healthy diets on a reduced income. As discussed earlier, the League’s work motivated the organization of the Nyasaland Nutrition Survey the following year.

According to recent analyses of the Nyasaland study, the challenge of reconciling the survey’s multidisciplinary perspectives derailed the final publication of the results, especially as the tensions leading to WWII began and the team’s attention moved elsewhere. The “faith that a universalizing science” of nutrition could provide answers to all problems further complicated the contemporary dissemination of the survey’s findings which were not fully published until

597 Williams, Toward the Conquest of Beriberi, 1886-1965.
598 Bryan, Asylum Doctor: James Woods Babcock and the Red Plague of Pellagra. 78
599 Borowy, "Crisis as Opportunity: International Health Work during the Economic Depression." 33
they were rescued by historians in 1990. In Nyasaland, the anthropological insights offered by Richard’s field work brought to light the limitations of laboratory-based science in understanding nutrition and food habits. In Puerto Rico, however, nutrition surveys during the late 1930s were shaped by an already-established interaction between the biochemical and sociological perspectives. Drawing from a decade of research activity, field nutritionists applied biochemical knowledge about the specific deficiencies of Puerto Ricans’ diet in their assessments of the relationship between the nutrition problem and the socioeconomic factors they measured such as income, number of rooms in household, kitchen appliances, and time of meals.

For this, the Nutritional Unit’s plan of work included “technical, practical and scientific work in nutrition” performed by “highly qualified Dietitians and office staff”. To direct this new Unit Chardón and Morales Otero recruited again Rita Lang, now working at the Home Demonstration Office of the Agricultural Extension Service. Under her leadership, PRRA field nutritionists were deployed throughout the island to continue the clinical, educational, and welfare work they started years before as part of the PRERA. According to Lang, dietitians employed by the Nutritional Unit carried out a broad and varied agenda related to workers’ “general health”, community health, and “family health”. They also acted as “scientific investigators” by “taking part in research work for dietary surveys”. This work was organized by dividing the island in 7 districts, each including between 6 and 11 dispensaries where the field nutritionist coordinated “her visit and work with that of the Doctor, Nurse and Social Worker” to whom she “explained the purpose of the [nutrition] program in details.”

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At the dispensaries, Field Nutritionists recommended dietetic treatments for anemia and tuberculosis patients such as calcium, iron, phosphorous pills and cod-liver oil. Apart from working at the dispensaries, the nutritionist visited patients in their homes to follow up on their treatment, study living conditions, make “the corresponding recommendation as to the diet and sanitary aspect of Nutrition in general” and teach home makers “the principles of dish washing, cleanliness and order.” According to Lang, home visits offered the “Nutrition Field Worker” “splendid opportunities to spread the knowledge of nutrition in all its phases.” The visits to patients were reported to the main San Juan offices in blanks prepared for this purpose.603

During the year the Unit was active, Field Nutritionists also conducted educational work by giving conferences and demonstration at households and institutions like public health units and community centers. The topics presented and materials used were adapted from those developed by the PRERA Home Economics Service. Similar to those, these programs ranged from demonstrating specific cooking techniques and promoting the use of particular foodstuffs to offering broader advice about domestic management and hygiene. Home economists demonstrated “How to prepare meat with vegetables”, “How to prepare powdered skimmed milk”, and “How to recognize good canned food”, as well as gave conferences about “Home and personal hygiene”, “Why should a child not go bare-footed to school”, “How to take care of the home surroundings”, and “Methods of ventilating a house”. Through these conferences and demonstrations, field nutritionists also “taught people the importance of using agricultural products raised by them”, the place of each food article in the daily diet and “the economic and sanitary aspect of nutrition”.604

603 Puerto Rico Reconstruction Administration. Health Division. Working Plan of the Nutritional Unit. 1
604 Puerto Rico Reconstruction Administration. Health Division. Working Plan of the Nutritional Unit. 9
Despite Lang’s enthusiastic promotion of the Nutrition Unit’s work, rural housewives and farmers’ idea of a successful application of this advice was significantly different from that of field nutritionists and home economists. As the previous chapter showed, concerns with people’s nutritional health informed contemporary projects by Extension Agents to transform the rural kitchen into a sanitary and ordered space. This transformation required ending the practice of cooking outdoors or in a separate shed by constructing new houses with interior kitchens. However, rural dwellers had a different understanding of the purposes of these interventions. For example, social worker Rosa Marín and field nutritionist Consuelo Delgado reported to the leadership their frustration with the reception of the agency’s program to construct new housing with “hygienic kitchens” in the Barrio Factor of Arecibo. According to their report:

“Only one house in Factor out of eleven had been occupied. The house belongs to Segundo Pérez and happens to be one of type No. 7, equipped with an interior kitchen and a smoke chimney. The family, nevertheless, were cooking outside with a pot, on three stones for fear of spoiling the white walls, by using the only fuel available to them, kindling. It was explained that the chimney would collect the smoke and carry it out and that they could cook on the cement table.”

As this example shows, the information and resources provided by PRRA nutrition workers had a limited reach among the island’s rural homemakers. For home economics experts having an interior kitchen and using adequate cooking utensils were necessary to maintain the sanitary conditions and nutritional qualities of foodstuffs. However, to the typical rural housewife in 1930s Puerto Rico, accustomed to cooking outside and lacking appliances, measuring cups, scales, and clocks, the conferences, demonstrations, and cooking advice they offered made little sense. Despite the limited reach of their education work, Field Nutritionists’ expertise remained an important tool for the Health Division’s data collection effort.

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605 López Domínguez to Fairbank, February 19 1937. NARA-NYC, RG 323, box 4, Entry 36, folder General Memoranda I
The PRRA Nutrition Surveys

Apart from conducting clinical and educational work, Field Nutritionists were trained to collect and compile data for the Health and Socioeconomic Studies. As part of these studies, the Nutritional Unit coordinated the implementation of one the most comprehensive nutrition surveys implemented by Puerto Rican experts to date. Conducted between 1937 and 1938, field nutritionists filled dietary questionnaires and interviewed housewives and head of households. Through these mechanisms, they recorded in detail the amount and type of food consumed in every meal by 800 families from the coffee, tobacco, fruits, and sugar cane zones. The findings of these questionnaires and interviews showed, once again, the lack of diversity and protective foods in the diets of people throughout all the agricultural regions. Breakfast almost always consisted of black coffee only, sometimes with a little milk. A typical lunch was made of rice and beans or boiled root vegetables with flakes of salted codfish. Whatever “was left from lunch was served at dinner hour.” Among the 800 families studied, 99.6 percent used rice daily, 99 percent used beans, and 93.5 percent used cod fish while only 24.6 percent consumed meat and 60 percent milk.

These nutritional surveys documented great deficiencies in all regions which were associated with monotonous diets that did not provide the minimum calories, proteins, fats, vitamins and minerals requirements. Researchers also recorded the weekly income of PRRA laborers in each agricultural zone. Most families spent more money for food than what they received as weekly income which forced them to buy on credit. According to Lang, this limited income combined with lack of knowledge about “what a balanced diet means or what the nutritive values of the most common foods are,” led to a situation in which people’s “only aim is

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606 Lang, "Health and Socioeconomic Studies in Puerto Rico: Nutritional Studies in the Rural Region of Puerto Rico." 121
to eat whenever they are hungry using whatever vegetables they can get or buy the most economical foods they are able to purchase.”

These results proved the need to reinforce education campaigns to teach home makers how to have an “economical and balanced diet” by preparing “different dishes using the proper foods purchased by them and using the most economical equipment.”

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**NUMBER OF DIFFERENT MENUS FOR BREAKFAST IN THE FOUR ZONES**

<table>
<thead>
<tr>
<th>MENUS</th>
<th>Coffee Zone</th>
<th>Tobacco Zone</th>
<th>Fruit Zone</th>
<th>Sugar-Cane Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black coffee</td>
<td>53</td>
<td>07</td>
<td>62</td>
<td>33</td>
</tr>
<tr>
<td>Black coffee and bread or green bananas, plantain or crackers</td>
<td>82</td>
<td>6</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>Black coffee, codfish and starchy vegetables</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee with milk</td>
<td>6</td>
<td>75</td>
<td>112</td>
<td>38</td>
</tr>
<tr>
<td>Coffee with milk and bread or crackers</td>
<td>32</td>
<td>40</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Coffee with milk, codfish and starchy vegetables</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee with milk, bread or crackers and butter</td>
<td></td>
<td>1</td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>Coffee with milk, bread and cereal</td>
<td></td>
<td>9</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Coffee with milk and cereal</td>
<td></td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Coffee with milk, cereal, bread and butter</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Coffee with milk, bread or crackers, cereal and fruits</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Coffee with milk, ham, potatoes, bread, butter</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Coffee with milk or chocolate and fried bananas</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

* Two families do not take breakfast.
** One family does not take breakfast.


Although for Lang and other officials at the Nutritional Unit these findings demonstrated the importance of their work, when she submitted the proposed budget for the 1938-1939 fiscal year, the Chief of the Rural Rehabilitation Division informed her that no funds were available to

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607 Ibid. 121  
608 Puerto Rico Reconstruction Administration. Health Division. Working Plan of the Nutritional Unit. 1  

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continue the operation of the Unit. Thus, Lang was transferred to the WPA where she directed the Service Project and coordinated the distribution of food products to school lunch rooms and child feeding programs during the war. At the WPA, Lang also collaborated with Manuel A. Pérez in the health and socioeconomic survey of small farmers who, according to Pérez, constituted the second largest group in the island’s rural areas after landless farm laborers.

Therefore, this data was important to create a complete picture of the conditions of living in rural Puerto Rico and to make “pertinent comparisons” between this group and the sample of farm laborers included in the Health and Socioeconomic Studies. Similar to these early studies, the Survey of Small Farmers also included instruments to measure food availability, dietary habits and nutritional status of the families included in the sample. Given the prospects of a new international conflict, the importance of this data was increasingly recognized by this agency’s leadership. By January of 1942, the work of the WPA was a central element of the government’s response to the upcoming emergency, especially as part of efforts to substitute food imports in face of the shortages and transport problems provoked by the war. This strategy relied on increasing food crops cultivation through the promotion of subsistence agriculture. As part of this agenda, the WPA implemented education campaigns among farmers and housewives to promote the consumption and conservation of locally-produced foodstuffs. The health and nutrition surveys conducted during the previous years among agricultural workers and small farmers provided important information for the coordination of these efforts.

In terms of food production, the WPA survey of small farmers showed that “minor crop farms were the most numerous among all farms studied followed by those devoted to tobacco-

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609 Memo from Andino to Lang, June 8 1938. NARA-NYC. RG 323, box 5, Entry 36, folder Health and Sanitation—Dietetic Unit
610 “Asamblea de supervisoras de estaciones de leche”, El Mundo, 18 diciembre 1942.
611 Pérez, Living Conditions among Small Farmers. 2
minor crops and coffee-minor crops. Although subsistence crops were grown in practically all the farms, in nearly three-fourths of them these were responsible for the principal or a substantial part of the annual cash income. This showed “the importance of the small farms as a source of food supply for the island”. On the other hand, in only 109 of the farms in which sugar cane was the principal or an important product, subsistence crops constituting one third of the total annual cash income were cultivated.612 Therefore, sugar cane cultivation appeared to be negatively correlated with commercial food crops cultivation. The data collected also showed that while more than half of the total weekly income of all families was spent on food, in the sugar cane farms the weekly amount was only 42.2 per cent of the total weekly income and in the sugar cane-minor crop farms 44.6 per cent.613 Although Pérez does not elaborate on the relation between these findings, it is not surprising that the families of small farmers in sugar cane areas dedicated a smaller percentage of their income to food purchases since the foodstuffs cultivated were most likely for their own consumption and not for sale.

Regardless of the prominence of subsistence crops farming in the regions studied, according to Pérez, “if the dietary of the small farmers’ families is to be judged by the variety of foods ordinarily consumed by them in the three daily meals, there is no appreciable difference between the kind of food taken by them and by the wage earners’ families”. The data indicated that “the small farmers’ families do take more and better food than the wage earners’ families” and that there was a “large number of families consuming milk from their own cows” among the former than the latter. Also, small farmers were below all other families in the percentage of income spent on food compared to workers in the sugar cane area in Lafayette in 1936 and in 1940 as well as to those in the tobacco, coffee, and fruit regions. However, Pérez emphasized

612 Ibid. 7
613 Ibid. 48
that “this, of course, does not necessarily mean that the [small farmers] families are properly fed”
compared to the farm laborers. Although small farmers were above the wage earners in the
proportion of families consuming rice and beans supplemented by meat, fish, and fresh
vegetables, their consumption of milk and fresh green and yellow vegetables was still considered
below the recommended amounts.614

For Lang and Pérez, these results showed once again the need for both economic
reconstruction and expert-guided inculcation of new dietary practices as part of any effort to
improve rural people’s nutrition and health. In Pérez’s study, while land owning was correlated
with lower fertility, higher life expectancy, and less frequent consumption of rice and beans,
small farmers’ diets were still considered inadequate. In the assessments of rural hygiene and
nutrition experts, Puerto Rico’s monocrops economy reduced the land available for food
production and the type of crops locally available as well as shaped people’s preference for
lower quality foods that lacked necessary nutrients. This new knowledge of the problem of
nutrition in Puerto Rico ultimately confirmed that the reliance on and preference for an
inadequate diet based on low quality foodstuffs resulted from a rural society marked by
monocrops agriculture and overpopulation.

Conclusion

As this chapter has shown, the language of nutrition connected the Puerto Rico’s public
health problems to its agricultural and economic reality. In the context of the Depression, this
link between agricultural decline, malnutrition, and public health received unprecedented
attention throughout the world. The approaches of rural public health workers to these problems
were significantly shaped by the global exchange of nutrition expertise and practices. Knowledge

614 Ibid. 80-81
about the biochemical components of optimal diets and the relation between nutrient deficiencies and disease informed efforts to reform agricultural economies and promote the production and consumption of “protective foods.” These ideas were also central to the medical, public health and nutrition activities of New Deal agencies like the PRERA and the PRRA. Promoting a more diversified agriculture, increasing of food crops cultivation, fostering a more self-sufficient economy, and improving people’s health and nutrition through medicine, education, social work, and population control were among these agencies’ objectives.

The implementation of these projects also gave public health experts the opportunity to produce new data about the problem of nutrition on the island through surveys, home visits, and community conferences. From these new interactions, the hegemony of monocrops agriculture and unchecked population growth emerged as the fundamentals cause of the nutrition and public health problems that afflicted the island. As the following chapters show, these ideas contributed to the articulation of the so called “land question” as a defining feature of Muñoz Marin’s emerging populist discourse.615 These notions of Puerto Rico’s nutrition and food problems in relation to land tenure patterns informed the “techno-agrarian discourse” that became the basis of his political movement.616

The PPD slogan pan, tierra y libertad (bread, land, and liberty) reflects the significance of nutrition ideas for these agendas.617 By 1938, many of the nutrition and public health professionals, both men and women, who staffed relief and reconstruction programs in Puerto

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615 Rodríguez Castro, "Foro de 1940: Las pasiones y los intereses se dan la mano."
617 Córdova, "In His Image and Likeness: The Puerto Rican Jíbaro as Political Icon."
Rico went on to form the initial cadre of supporters as Muñoz Marín organized this new party.\textsuperscript{618} The assessments about the island’s food and nutrition problem emerging from institutions like the School of Tropical Medicine, the Department of Home Economics, and the Agricultural Experiment Station as well as from New Deal agencies and programs informed the agrarian reform rhetoric of this new political movement. The advent of World War II provided the conditions for the consolidation of this party’s discourse and the institutionalization of its economic and social agendas.

\textsuperscript{618} Ayala and Bernabe, \textit{Puerto Rico in the American Century: A History Since 1898}. 102
Chapter Five

Diet and Democracy: Tropical Agriculture and Food Policies during WWII

In poetry, in tradition, and in deed gardens have symbolized peace at all times. But peace no longer exists in our world. And if we do not want to become like the ostrich, hiding its head in the sand of the lost chances, it is our crops that give us the chance to contribute efficiently to the national victory as well as to the post-war adjustment. They supply our home and our communities with abundant health in the form of fresh vegetables, loaded with vitamins.619

Introduction

Concerns with the limitations of Puerto Rico’s food supply reached their climax as international tensions during the late 1930s led to the U.S. involvement in World War II. The advent of the war had contradictory effects over the island’s society and government. While it brought the threat of food shortages and inflation, the war circumstances led to increases in local government revenues and federal spending. Apart from new tax revenue resulting from rising rum exports, as liquor distilleries in the U.S. reduced production, the island benefited from the establishment of wartime programs and the construction of military infrastructure.620 In this context, the war years became a critical period for the creation of scientific expertise about the problems of nutrition and food supply and for the articulation of strategies to solve them. The opening poem, published in an Agricultural Extension service bulletin, conveyed the urgent need to produce more food and to maximize the nutritional potential of local foodstuffs. These agendas brought together biochemists, home economists, public health experts, extension workers, and agricultural scientists in attempts to face the crisis.

This chapter shows that while projects to increase local food production during the 1930s were shaped by the broader rural hygiene agenda, these efforts became vital for both local and

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619 “De las Hortalizas”, *Agricultura Experimental*, vol. 2, no. 6, 1942 (4-5)

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federal responses to the war emergency on the island. Given Puerto Rico’s strategic role in the Caribbean war front, dealing with the island’s reliance on food imports became a matter of national security. The chapter explores the work of scientists from the AES to gather updated data about Puerto Rico’s food social ecology to guide these efforts. By linking these results to the findings of public health and nutrition surveys conducted during the previous years, these new investigations further illuminated the links between deficient diets, imports dependency, and mono-cropping. This discussion also shows how these images informed the articulation and institutionalization of the PPD movement during the 1940s. In this context, food policy plans were shaped by interactions between nutrition expertise, agricultural technologies, and geopolitical priorities at the local, regional, and federal levels.

The victory of the PPD in the 1940 elections and the appointment of Rexford Tugwell as Governor in 1941 allowed for the intersection of these perspectives and their implementation as part of the local government’s response to the food emergency. These responses built on the rhetorical and institutional frameworks lay by the Land Law. This law created the Land Authority and invested it with authority to purchase land from corporations holding more than 500 acres and redistribute plots among heads of households. The culmination of the rural reconstruction movement of the late 1930s in this agrarian reform program created new institutional and policy vehicles for nutrition, welfare, and agriculture professionals to apply their expertise to solve the problems of rural areas. This land reform project also framed new scientific and public health activities regarding nutrition and food supply issues. These local initiatives occurred in conversation with federal efforts to face the food emergency provoked by the war in the U.S. and its possessions.
Among these, the development of the Recommended Dietary Allowances (RDAs) by the National Research Council and the reconfiguration of USDA commodities distribution programs directly shaped nutrition debates in Puerto Rico. Mainly a product of home economists’ work, the RDAs emerged from the need for metrics to guide wartime food and nutrition policies and attempted to bridge the agendas of the USDA with those concerned with the health of military and civilian populations. These new federal nutrition guidelines resulted from a conflictive process whose results had to appeal to a diverse audience of scientists, clinicians, food industry agents, and extension education workers. Drawing from this activity, officials in Puerto Rico’s General Supplies Administration and the local Office of Price Administration created and implemented strategies to increase local production, distribute food aid, and control prices.

However, the work of these agencies was marked by controversies between the government and commercial interests as well as between local officials and federal programs. Similarly, although increasing local food production remained part of these agencies’ work, identifying the food crops that should be promoted led to conflicts between nutrition experts, policy makers, and agricultural scientists. In face of these limitations, nutrition professionals mobilized through alternative mechanisms. Among these, the Puerto Rico Nutrition Committee (PRNC) brought together experts to devise new efforts to intervene with the nutrition problem and to monitor people’s nutritional and health status. The RDAs offered new standards to reassess rural people’s nutritional state and the effects of land redistribution and education campaigns. On the basis of these new guidelines, extension agents and social workers organized new campaigns emphasizing that “people in the countryside can produce all the foods they need to have a good diet.”

The chapter finally traces how the organization of new collaborative research between scientists from the STM and the Agricultural Experiment Station (AES) drew from wartime nutrition rhetoric and its implications for the island’s food supply. As part of this research, biochemists and agricultural scientists investigated the nutritional qualities of tropical fruits and vegetables. Under the leadership of Cook and Axtmayer’s disciple Conrado Asenjo, this research produced important findings that called the attention of the international nutrition community. Asenjo used “chemical, microbiological, and biological methods” to evaluate the potential of foodstuffs native to the island and the Caribbean region but little used by the population to correct the typical diet’s deficiencies. The activity of agricultural scientists and their collaboration with nutritional biochemists from the STM was another manifestation of long-standing concerns with the relationship between public health problems, the vulnerability of the island’s food supply, and rural population’s limited consumption of protective foods.

Wartime increases in government revenue and increased federal spending provided the financial and logistic support needed to implement these agendas. Among these, the establishment and initial operation of the Puerto Rico Agricultural Company (PRACO) was facilitated by these new funds. This agency brought together agriculture and planning experts in efforts to increase the profitability of food crops agriculture through the establishment of commercial retail spaces for local agricultural products. The interaction between these scientific activities, policy discussions, and political debates during the war further probed the relationship between the nutrition problem and the island’s limited capacity to produce “protective” foodstuffs through a more diversified agriculture. By the late 1940s, these agendas were recast as part of the reconfiguration of economic and political projects promoted by the PPD and the new role of food and agricultural policies as part of them.

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622 Asenjo, "Nutritional Research in Puerto Rico: Past, Present, and Future." 45
Agricultural Sciences and Food Social-ecologies

Similar to other colonial settings, the collaboration between private business and government was crucial for the development of agricultural sciences in Puerto Rico. Responding to the needs of sugar and coffee planters, the Spanish government established the first agricultural experiment stations (AES) at Mayaguez and Río Piedras in 1888. These stations closed by 1890 but lay the foundations for future research in tropical agriculture. In 1901, a Congressional appropriation allowed the USDA to reopen the Mayaguez’s station renaming it The Porto Rico Agricultural Experiment Station. The reopening of this experiment station on the islands was part of a broader USDA effort to ascertain research opportunities and survey the agricultural conditions of the U.S. new colonial empire. Since Congress created the new stations in territories whose “legal status” within the U.S. “was still unsettled”, the Mayaguez AES remained under the administration of the USDA not of the local Agricultural Board. In 1910, the insular government reorganized the Insular Experiment Station at the old Río Piedras’ institution. This new experiment station was affiliated with the Department of Agriculture and Labor after its creation in 1917 and incorporated into the UPR system in 1933.

The work of these agricultural research institutions was directly influenced by debates about the island’s export monocrops economy. Apart from explaining the sickly state of the Puerto Rico’s rural poor, nutritional biochemistry research at the STM crucially contributed to debates about the effects of monocrops agriculture over the island’s food supply and public health status. The diversification of agriculture to increase the local production of “protective”

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foods became an important part of rural reconstruction projects during the 1930s. Increasing food crops and subsistence farming were prominent aspects of the Plan Chardón and key objectives of the various projects implemented by the Puerto Rico Reconstruction Administration. These concerns are also reflected in agricultural research activity. While the needs of the sugar and tobacco industries shaped most of the research conducted at both experiment stations during the first decades of the century, their scientific production gradually diversified in the 1930s to include more studies related to food crops agriculture and small farming.

As the Depression heightened and New Deal reconstruction projects shifted the attention of local health and agriculture professionals to these issues, the Department of Agriculture and Commerce and the UPR AES assumed a more active role in the study of issues related to food crops agriculture both in commercial and subsistence farming. During this period these institutions provided financial support to Puerto Rican agricultural scientists interested in issues affecting food crops agriculture and livestock farming. Articles based on this research appeared in the station’s official outlet, the *Bulletin of the Agricultural Experiment Station* and the Department of Agriculture’s *Revista de Agricultura*. These projects’ potential to increase the profitability of food crops agriculture contributed to “the general objective of the Experiment Station” to increase “the income of the rural classes and the Island as a whole” and contribute to the food supply.625

By the late 1930s a decade of attention to Puerto Ricans’ nutritional status and dietary habits had produced a considerable body of knowledge about the state of the island’s food supply and its relation to public health. At this time, the role of nutrition expertise as part of rural reconstruction programs highlighted the links between the island’s nutrition problem and the state of its agrarian economy. As AES economists Sol Luis Descartes, Santiago Diaz Pacheco

625 Hill and Descartes, "An Economic Background for Agricultural Research in Puerto Rico." 55

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and J.P. Nogueras noted in 1941 “the field of food consumption and nutrition has recently acquired momentousness and has become the subject of varied comments”. As part of these inquiries, “students of the economic and social conditions of the Island have repeatedly pointed out that the serious deficiencies in the consumption of protective foods are one of the reasons for high mortality rates, diseases, and even social attitudes”.\(^{626}\) To contribute to this body of knowledge about nutrition and the food supply of Puerto Rico, Descartes and colleagues undertook a series of studies about production and consumption tendencies throughout the island.\(^{627}\)

These studies produced new data about the island’s food ecology and its sociological contexts by collecting “facts related to the consumption the foodstuffs, both locally-produced and imported, and the most important distributing agencies”.\(^{628}\) Moreover, “these findings may prove useful in the fields of nutrition, agricultural production, and marketing” while rendering “information which may be of value in the planning and guiding of public policy and future legislation in the field of nutrition”.\(^{629}\) The first study was conducted in San Juan between May and June of 1937 followed by another in June of 1938 covering 22 cities and towns. The third and final study was conducted in August of 1939 among a sample of families living in rural barrios located in different agricultural regions. These studies offered a detailed picture of Puerto Rico’s food social-ecology at the onset of World War II. These depictions of the food supply and its relation with the nutrition problem from the perspective of agricultural economics emphasized the limited commercial development of food crops agriculture and its reciprocal relationship with

\(^{626}\) Sol Luis Descartes, Santiago Díaz Pacheco, and J.R. Noguera, "Food Consumption Studies in Puerto Rico," (Río Piedras, PR: Agricultural Experiment Station, 1941). 3
\(^{627}\) Sol Luis Descartes and Santiago Díaz Pacheco, "Consumo de Alimentos en la Cidad de San Juan " (Río Piedras, PR 1938). Santiago Díaz Pacheco, "La Distribución de Alimentos en la Zona Urbana de Puerto Rico," (Río Piedras, PR: Estación Experimental Agrícola, 1940); Descartes, Díaz Pacheco, and Noguera, "Food Consumption Studies in Puerto Rico." 1
\(^{628}\) Santiago Díaz Pacheco, "Consumo de Alimentos en la Zona Urbana de Puerto Rico," (Río Piedras, PR 1940).
\(^{629}\) Descartes, Díaz Pacheco, and Noguera, "Food Consumption Studies in Puerto Rico." 3
consumption patterns and people’s eating habits. This data serve them to construct a powerful argument about the relationship between people’s dietary inadequacy, the island’s nutrition and public health problems, and the state of Puerto Rico’s food crops agriculture.

The surveys of rural areas took place shortly after the PRRA Nutrition Unit’s dietary studies and, similar to these, organized sampling of families according to the island’s agricultural regions. While these early studies covered only areas where the PRRA was active, the AES food consumption survey included towns representing the sugar cane, coffee, and tobacco regions not necessarily covered by this agency. In these towns, Diaz Pacheco and his staff conducted interviews with 2,0007 families from which 1,901 were selected for more in-depth analysis. These families totaled 11,869 individuals which represented 14 percent of the population of the 22 towns where the surveys were conducted. Among these, 74 percent lived in sugar cane zones, 13% in coffee regions, and 12 percent in areas dedicated to tobacco cultivation. From these different regions, investigators selected barrios considered to be representative for the food consumption survey. While these barrios were inhabited by 5,313 families according to the 1935 census, only 439 of these were included in the survey given the associated costs. While Diaz Pacheco recognized that this limited the applicability of their findings, they still argued for their usefulness “to indicate the most pronounced general tendencies”.630

For them, clear patterns began to emerge once all the results were analyzed and tabulated. One of the most widely discussed results was related to the consumption of fresh milk and dairy products. This was found to be approximately the same for San Juan and the 22 cities and towns. However, the consumption of canned evaporated milk in San Juan was three times that of the 22 towns. Regardless of the type of milk consumed, for Diaz Pacheco these results confirmed previous findings that pointed to a lower than recommended intake for both rural and urban

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630 Santiago Díaz Pacheco, “Consumo de Alimentos en la Zona Rural de Puerto Rico,” (Rio Piedras, PR 1941). 2
families. Similarly, the families of San Juan consumed 60 percent and 80 percent more beef and poultry respectively that those in the rural barrios. “On the contrary”, the consumption of salted codfish in the 22 towns surveyed was twice that of San Juan while these families consumed more foodstuffs harvested at home plots such as sweet potatoes, tanniers, yams, and cabbage. However, the annual consumption of fresh vegetables among San Juan families, in general, was comparable to that of the populations studied in the 22 towns.631

In order to offer a broad picture of food consumption patterns from the point of view of agricultural economics, AES researchers analyzed their findings on dietary patterns in relation to family income, level of education of the housewife, and agricultural area. Since “these factors have the greatest influence” over the frequency of consumption of certain products, they considered that this information could be a useful guide for the preparation of plans to increase the consumption of protective foodstuffs. Researchers also presented and analyzed their findings about consumption patterns in relation to the agricultural areas where the families studied lived. In the case of families from rural areas, the availability of land for small farming was an important factor in the analysis of consumption patterns. While 70 percent of the families studied in the rural zones had access to land for cultivation, subsistence farming accounted for only 21 percent of the value of foodstuffs consumed annually.632

As expected, the product consumed the most by all families across the three samples was rice followed by beans, coffee, sugar, and sweet potatoes. The consumption of these changed only slightly as the income of families in the 22 towns surveyed increased. The consumption of protective foods among rural families was lower and their diet less diverse than that of the San Juan families studied. The annual consumption of milk and eggs was particularly lower in the

631 Ibid. 3, 5
632 Ibid. 4-9
rural zones compared with urban areas. This was associated mainly “to the limited resources of the families” in rural areas. Among the families surveyed in the 22 towns, the consumption of foodstuffs like chicken, milk, beef, cheese, pork, butter, and eggs increased rapidly in relation with income. The consumption of products like yams, evaporated milk, and margarine increased until certain income level and then decreased. On the other hand, the consumption of foodstuffs like sweet potatoes, salted codfish, and cornmeal decreased as income increased.

The surveys’ findings showed that after income, housewives’ level of education was the factor with the greatest influence in consumption among families in the 22 towns and cities. This included both formal instruction acquired through schooling and informal education obtained through government campaigns. Although they found that “in general, the knowledge that the housewife has regarding the nutritive value of foods increases with the number of years that they have attended school”, it was “important to keep in mind the possibility that some families classified as having a lower level of education might have been instructed in these aspects” by personnel from social agencies. Among the families in the lowest income levels, higher education levels were associated with greater consumption of products like margarine, evaporated milk, tomato sauce, and pork. On the other hand, the consumption of salted codfish, rice, coffee, and beans decreased among families across all income levels as the education of the housewife increased. These findings appear to justify the need for more education campaigns to promote the consumption of the so called “protective foods”.

However, experts did not always agree on what foodstuffs should be produced and promoted. In the AES studies, Diaz Pacheco and colleagues found that the consumption of sweet potatoes and ñames (taro) decreased in all three samples as the instruction of the housewife
increased. According to their analysis, “this seems to indicate that public schools and social agencies are not teaching housewives about the nutritive value of these foodstuffs”. To address this shortcoming, AES personnel considered the possibility of implementing an educational campaign among the most accommodated classes in San Juan to promote the consumption of sweet potatoes. They further recommended that this campaign be extended to the whole island and include the promotion of ñames as a nutritive foodstuff. These recommendations contradicted the findings of biochemists at the STM who argued that most of the roots crops part of Puerto Rico’s diet, especially the white varieties, lacked essential vitamins and other nutrients. As Chapter 2 showed, Axtmayer was quick to point out this discrepancy.

Land Reform and Food Crops Agriculture

Despite these disagreements, the AES studies of Puerto Rico’s food social ecology offered important data for the planning of the government response to the greatest food crisis since the Great Depression: the outbreak of WWII. As Chapter 3 showed, the work of agriculture experts like Carlos Chardón, Santiago Díaz Pacheco and Sol Luis Descartes was central for the implementation of rural reconstruction projects through the PRRA. While the advent of WWII initially shifted resources and attention away from New Deal projects, the appointment of agricultural economist Rexford Tugwell as Governor, and the victory of the PPD in the 1940 elections allowed for the continuation of the agenda initially laid out by the Plan Chardón. As President of the Senate, Muñoz Marín negotiated with the legislators from the main opposition party to pass the legislation necessary to implement this program. Meanwhile, Tugwell’s experience as Assistance Secretary of Agriculture during the 1930s and his strong belief in the

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636 Ibid. 16
637 Axtmayer, "Nuestra Dieta, Experimentos Científicos Demuestran que la Habichuela de Soya Tiene Mayor Valor Alimenticio que la Habichuela Colorada."
New Deal philosophy facilitated the project. In these circumstances, land reform and agricultural diversification became pillars of the reforms promoted by the new Tugwell government.

As one of the first signs of the political transformations ushered by the PPD rise to power, the new government attempted to reform landowning patterns on the island. Under the leadership of Muñoz Marín from the Senate and Tugwell from the governorship, the island’s legislature passed a law to enforce a 500-acre limitation in land ownership. According to public health doctor Antonio Fernós Isern, the previous neglect to enforce this limitation “was one of the principal reasons” for Puerto Rico’s present poverty. With this law the government had the power to purchase land in excess of 500 acres, mostly from sugar corporations, and redistribute it among landless peasants. The introduction of this agrarian reform was framed by Muñoz’s “gospel of social justice,” delivered throughout the countryside during the 1940 campaign. The words *pan, tierra y libertad*, used as part of the party’s emblem, played a critical role in the delivery of its populist discourse and “harnessed a whole host of values, principles, and ideological commitments” with the poorer classes.

The implementation of the Land Law was also framed by the results of scientific and public health activity associating Puerto Rican’s nutrition and disease problems with the island’s monocrops economy. The Law provided for the creation of a Land Authority to coordinate the distribution of plots among heads of families. Initially led by Chardón, this agency “was entrusted with carrying out a program that had three basic features: the creation of small family farms, the distribution of plots for homes (*parcelas*), and the organization of “proportional profit farms”. The plots distribution program, or Title V, “affected the largest number of rural

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638 Fernós Isern, "The Mind of Puerto Rico." 30
640 Córdova, "In His Image and Likeness: The Puerto Rican Jíbaro as Political Icon.", 177
dwellers.” Through this program, the Authority “assisted in the creation of new landowners” by providing individual plots to small farmers who had tax-free usufruct rights over them. Plots were distributed among heads of households using a lottery system. According to estimates, there were around 150,000 families that qualified to receive small plots of up to three acres where they “could build a house and engage in some food production.”

New sources of government revenue facilitated the implementation of this agrarian reform project. For example, the Jones Act of 1917 stated that excise taxes paid by rum exports to the United States be returned to the island’s government. The amount of this return increased considerably after 1941 as Puerto Rican rum substituted much of the products of U.S. distilleries, now engaged in war-related operations, and of liquor imports from Europe. The outbreak of WWII also highlighted even more the need to increase subsistence farming and local food production. By the beginning of this decade, all the three products that were central to Puerto Rican’s diet—rice, beans, and salted codfish—were imported. According to Descartes, the prices of these foodstuffs, which were “consumed in larger quantities by the poorer classes” “have increased more than those of foodstuffs consumed by the middle class and the well-to-do”.

Transport problems, alteration of trade routes and the rationing of fuel and tires put in place in 1942 further affected food transportation and distribution throughout the island. As the threat of food shortages and hunger heightened, these tensions were articulated in debates around the official government’s response to the crisis provoked by the decrease in food imports and its economic, political, and public health consequences.

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641 Ayala and Bernabe, *Puerto Rico in the American Century: A History Since 1898*. 184
644 Ayala and Bernabe, *Puerto Rico in the American Century: A History Since 1898*. 184
645 S.L. Descartes. Puerto Rico's War Depression. ALMM, sección iv, serie 2, cartapacio 484. 6
646 Puerto Rico's War Depression, 11
The increase in the retail prices of food during the early 1940s also pointed to the need to foster a more self-sufficient food supply on the island. Tracking increases in food price and controlling available supplies were among the principal responses of the island’s government as the U.S. entered the war. Already by early 1942, the retail cost index for food products increased appreciably. According to Descartes’ calculations, from February to March of that year there was a 5.6 percent increase in the retail price of the most important foodstuffs. As a result, “the purchasing power of the consumer’s dollar for food” decreased from 66 per cent in February to 66 percent in March.647 While in July of 1939 the price of a pound of rice in San Juan was of 4.4 cents, by June of 1942 the same product was sold for 9 cents. During the same period, the price of red beans increased from 5.5 cents per pound to 10 cents.648 While salted cod had already become a “peripheral food”—serving mostly to add flavor and seasoning to the mixture of rice and beans or starchy crops—an increase in its price from 7.1 cents per pound in July of 1939 to 22 cents in June of 1942 definitively put it out of reach for most Puerto Ricans.649

The increase in the retail price of food in the U.S. was less severe than in Puerto Rico. Descartes noted that the percentage increase in food purchased by workers in large cities was only 2.8 from June 15 to September 15, 1942 while in Puerto Rico the figure during the same period was of 10 percent.650 On the other hand, the magnitude of the increase in prices varied throughout the island and even among stores in the same region. For example, while eggs were sold in a Río Piedras market for 6 cents each in October of 1942, in San Juan and Santurce the price was 7 cents. The Rio Piedras market remained the most important market for local crops

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647 S.L. Descartes. Considerable aumento en los precios al por menor de los alimentos de Febrero a Marzo de 1942. Agricultural Experiment Station. Suplemento No. 3. ALMM, sección IV, serie 2, sub-sección 2, cartapacio 115
648 S.L. Descartes. Retail prices of principal foodstuffs in Puerto Rico. ALMM, sección IV, serie 2, cartapacio 484
650 S.L. Descartes. Puerto Rico's War Depression. ALMM, sección iv, serie 2, cartapacio 484. 11
and products and it was the closest to distributing centers, thus the increase in the prices of foodstuffs was less pronounced there than in other retailers in San Juan and across the island.651

These increases in the price of basic products was a reflection of shortages of these and other essential foodstuffs. By late 1942, Descartes was reporting “actual hunger caused by the complete disappearance of rice from the market”. Apart from provoking food shortages, the “lack of shipping and the lack of an effective control system on Island-bound cargo have caused profound dislocations in the Island’s economy”. A considerable reduction in the cargo tonnage received from January to September 30, 1942, compared with what should have been received at the estimated 1941 rate, also resulted by this time in “an increase in unemployment to nearly 240,000, or 140 per cent over July 1941”.652 Given the island’s geopolitical role in the U.S. defense strategy, the magnitude of this crisis required a coordinated response from local and federal agencies. The island’s government also organized various committees and working groups to plan measures to face the food and nutrition emergency created by the war. However, although official reports depicted an aura of cooperation, the multiplicity of agendas involved in these efforts resulted in tensions over the objectives of these measures and their implementation.

Nutrition Science, War Food Policies, and the Creation of the RDAs

While the PPD government attempted to implement the agrarian reform project, the new war circumstances exacerbated the island’s food problem. Given the turmoil of the late 1930s food shortages and rationing of basic necessities threatened to provoke further sociopolitical instability. As the U.S. involvement in WWII increased the importance of island’s geopolitical position, averting social unrest in Puerto Rico became a priority of local and federal authorities.

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651 S.L. Descartes. Considerable aumento en los precios al por menor de los alimentos de Febrero a Marzo de 1942. Agricultural Experiment Station. Suplemento No. 10. ALMM, sección IV, serie 2, sub-sección 2, cartapacio 115
652 S.L. Descartes. Puerto Rico's War Depression. ALMM, sección iv, serie 2, cartapacio 484. 1
The responses to this new food crisis were articulated through special committees and commissions that brought together nutrition experts and policy makers. As a result of the multiplicity of actors and agendas involved in these processes, however, “the links between science and food policy” were “rarely be straightforward.” These tensions were particularly manifested in the context of Puerto Rico where “the negotiations between scientists, administrators, politicians, and industrial interests” were shaped by the island’s role advancing U.S. wartime priorities.653

Similar to other Western countries, the United States’ response to the food crisis provoked by WWII was mainly articulated by specialized committees and commissions bringing together scientists and policy makers. However, as David Smith shows, “the links between science and food policy” were “rarely straightforward” since they entailed “processes of negotiation between scientists, administrators, politicians, and industrial interests.” Together with the media, the public also exerted indirect influence “as voters and consumers”.654 The work of women experts was central to linking these public, scientific, and policy activities. By the early 1940s, “the culture and language of science” in the U.S. had “shaped women’s professional and rhetorical careers”.655 The need to address the nutritional needs of civilian and military populations during the new war brought home economists and nutritionists to the center stage. Of particular priority was having parameters regarding “how much of each of the known nutrients a person needed to maintain good health.”656 In early 1941 the new Federal Security and the National Research Council (NRC) Food and Nutrition Board (FNB) began to work to

654 Ibid. 101
656 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 65
this end through the creation of a Committee on Dietary Allowances (CDA). The FNB was also tasked with offering advice to government agencies “on the nutritional needs of the armed forces, the civilian population, and overseas populations needing food relief.”

Although during the mid-1930s the LoN Technical Committee on Nutrition attempted to develop dietary standards based on determinations of nutrient quantities necessary to maintain optimum health, the rapid pace at which new nutrition knowledge emerged during this period made this and similar efforts obsolete. On the other hand, a diversity of stakeholders in the U.S.—from government officials, nutrition researchers, medical and welfare associations, and representatives of the food industry—were positioned to influence this process. Thus, an individual with both recognized professional authority and negotiating abilities was needed to lead this work. Home economist Lydia Roberts appeared to meet all these requirements.

By the time the NRC embarked in the project of devising nutrition standards to improve population’s health during the war, Roberts was a senior home economists with ample experience in both academic publishing and public outreach. Before pursuing graduate education, Roberts worked as a public school teacher during the 1910s. This early work fostered her interest in children’s nutrition problems leading her to enroll in the Home Economics program of the University of Chicago. In that same institution she obtained a doctorate degree after conducting clinical research on infant and child feeding during the 1920s. This research’s findings became Roberts’ first major publication entitled *Nutrition Work with Children* which was “the first textbook to address the special nutritional needs of children” earning her “a

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reputation as a leader in the field”. This reputation ensured Roberts’ quick promotion to associate professor and later her appointment as chair of the Home Economics department.

Roberts brought this professional and academic experience to her work as Chair of the CDA. Similar to previous efforts to define international nutritional standards based on continuously changing scientific evidence, CDA members “disagreed widely on what those standards should be or even how they were to be determined”, especially in relation to the most recently described nutrients like niacin and vitamin A. In her role as Chair, Roberts was responsible for obtaining the agreement of both the CDA and the larger FNB as part of the process of devising the new nutrition guidelines. Roberts also needed to convince the broader scientific community, mainly biochemists and physicians, of the legitimacy of the process through which the new standards were to be established by attending and presenting at meetings of scientific and medical societies. Finally, the CDA had to make the agreed-upon standards accessible to both housewives and field nutrition workers who would use them to plan meals and give advice to the public.

In order to gain the support from these diverse audiences for the work of the CDA, Roberts enacted what Jordynn Jack terms the “democratic approach.” This approach entailed seeking the participation, to varying extents, of all the stakeholders involved by “enlisting the efforts of scores of other nutrition specialists”, requesting input from scientists in related fields, attending conferences and meetings to present findings, and organizing workshops to discuss strategies for popular education and outreach. Although this method was intended to promote

660 “Lydia J. Roberts’s Nutrition Research and the Rhetoric of “Democratic” Science.” 112
equal participation for all stakeholders, Roberts weighted more heavily the input of laboratory and clinical researchers. Additionally, the food industry followed closely the work of the committee and quickly mobilized upon suspicion that their products were not given “adequate” representation.662

After various rounds of revisions aiming to reconcile the conflicting scientific evidence about nutrients’ value and biological need, the CDA drew up a final set of standards called the Recommended Dietary Allowances (RDAs) and presented at a National Nutrition Conference in May 1941. However, instead of providing “standards”—the minimum amounts required for good health—Roberts and the FNB “came with “recommended allowances”, amounts that would avoid deficiencies even among people who needed far more than the average requirements of particular nutrients.”663 These new recommendations called for between 2,500 and 4,500 calories for men and 2,100 to 3,000 for women. Under Robert’s leadership, the committee later devised seven “food groups” that provided the necessary caloric and nutrient intake. These “basic seven” included green and yellow vegetables; fruits; potatoes; milk and milk products; meat, poultry, fish, and eggs; wheat products; and butter or margarine. By 1944, “enough new evidence existed” to further revise these RDAs, especially in relation to the necessary intake of thiamine and riboflavin.664 Thus, although they were intended to provide guidelines for nutrition policies during the war, the RDAs remained a tentative instrument for food and health policy.

Devising a Local Response to the Food Crisis

Robert’s experience working with these multiple stakeholders gave her a unique perspective on the relationship between science and policy. Unbeknownst to her at the time, this

662 Levine, School Lunch Politics: The Surprising History of America's Favorite Welfare Program. 63
663 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 66
experience proved particularly useful for her work in Puerto Rico. On the eve of her arrival to the island at the request of the USDA War Food Administration (WFA), the local government was preparing to devise strategies to control the prices of the products that formed the backbone of the island’s diet. Because most of these were imported, many factors influenced their local retail price including costs in U.S. continental markets as well as shipping and distribution charges. In these circumstances, Tugwell considered that “because of the uncertainties of federal control, as well as because of Puerto Rico’s situation” there was a need for local action to study the inflation of basic foodstuffs’ prices and to propose potential strategies to attend the situation. For this, the island’s legislature created the General Commission of Food and Supplies to regulate the distribution of foodstuffs, stabilize prices of basic necessities for the local market, and control inflation. Tugwell appointed Fernós Isern to direct this commission which was also authorized to set prices and quotas for basic foodstuffs as well as to order the rationing of these whenever it determined necessary. It further required stores to display these regulations in a prominent place within their establishments.

While organizations like the Chamber of Commerce and its allies on the legislature staunchly opposed price control and supplies regulation, as one of the first measures the commission declared rice a regulated product and fixed its maximum wholesale and retail price. Apart from controlling the prices of basic necessities, the Commission reinforced existing campaigns promoting local food production through seeds distribution, marketing assistance for farmers, and improvement of distribution mechanisms. The commission's focus, however, remained on averting short-term shortages by securing a reserve of basic food supplies. The need for such measures was even more evident in early 1942 after sharp increases in the prices of

665 Tugwell, Puerto Rican Public Papers, 14-15. Quoted in Ortiz Cuadra, "Alimentación y Política durante la Administración de Rexford G. Tugwell." 371
666 Ibid. 371
almost all food products. In response to this, Tugwell replaced the General Commission of Food and Supplies with a new agency called the General Supplies Administration (GSA) and gave it a broader scope of action. Local merchant Antonio Vicéns was appointed to direct this new agency while Fernós Isern acted as liaison between the GSA and related federal agencies. As part of the Caribbean Emergency Plan and in concert with related U.S. and British authorities, GSA officials also became involved in regional strategies to control the importation, distribution, and sale of foodstuffs during the war.\textsuperscript{667}

Apart from continuing the tasks initiated by the previous commission, the GSA had authority to act as importer, distributor, and wholesaler of foodstuffs considered of basic necessity. It organized the local distribution of imported basic foodstuffs through the creation of six storage facilities throughout the island from where products were disseminated to 14 distributing centers, and finally, to local stores.\textsuperscript{668} The work of the local Office of Price Administration (OPA) was intended to facilitate the enforcement of GSA regulations. However, according to Descartes, by late 1942 there had “been very little success in price control on the Island”. For example, between May 18, when the General Maximum Price Regulation was put into effect by the local OPA, and October 14 the price index for basic products increased 14 per cent. Although Descartes’ calculations showed that part of the increase occurred among uncontrolled foodstuffs, he stressed that “quite a considerable percentage” was due to the increase in the price of products that were regulated by the GSA but not by the federal OPA.\textsuperscript{669} Even when the local OPA established a scale of maximum prices for these foodstuffs,

\textsuperscript{668} Ortiz Cuadra, “Alimentación y Política durante la Administración de Rexford G. Tugwell.” 380
\textsuperscript{669} S.L. Descartes. Puerto Rico's War Depression, 1942. ALMM, sección iv, serie 2, folder 484, p. 12
particularly rice and dried beans, the continuous transportation and distribution problems as well as the emergence of black markets complicated the enforcement of these regulations.

These factors even limited the effectiveness of price control measures for products covered by federal regulation because due to “the acute shortages and scarcities that have developed on the Island… many people are willing to pay high prices to get the greatly desired foodstuffs”. Decartes denounced the limited effectiveness of current government measures to intervene with this growing black market as well as to enforce maximum price regulations. Various factors contributed to the limited compliance with the local OPA rules including the lack of trained personnel to cover all regions of the island and the fact that “there has been very little or no public instruction on what price control means.” Apart from this, since Puerto Ricans’ diet relied on imported products “the price situation of the various foods changed very rapidly”, requiring the constant revision of existing regulations.670

This was, however, an increasingly contentious endeavor. In the U.S., price control regulations provoked resentments between the OPA and local farmers. Levenstein notes that by late 1942 President Roosevelt “tried to mollify farmers resentful over having food prices administered by legions of city-slicker lawyers” by creating the War Food Administration under the direction of Secretary of Agriculture Claude Wickard. While the authority to determine the prices of basic foods still remained within OPA, other functions related to the nation’s wartime food policy response were transferred to this new agency.671 In Puerto Rico, the work of the local OPA office also led to controversies, especially in the context of the infighting between the PPD-led legislature, the opposition parties, and the Chamber of Commerce. Much of this controversy was displayed in the pages of Puerto Rico’s largest daily newspaper, El Mundo, which was

670 Puerto Rico's War Depression, 12
671 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 76
openly critical of the PPD and Tugwell’s administration. Conflicts arising from price control measures and food distribution regulations became a daily headlines topic.

The rice issue was particularly prominent in these discussions. As Ortiz Cuadra notes, U.S. officials quickly recognized the importance of this particular food product in Puerto Rico where “day time thinking, night time dreaming” as well as newspapers, radio, and public conversations all “seem to revolve around that one item.” Measures taken by federal authorities to avert shortages in Puerto Rico in turn provoked controversy in South Carolina where residents “thought that the rice that was rightfully theirs had been diverted to “Puerto Rico” and Canada.” Despite this “diversion”, in January 1942 El Mundo reported of imminent rice shortages on the island due to merchants’ decision to halt importation in protest of the price control measures. Throughout 1942 problems associated to the importation, distribution, and sale of rice continued to make headlines in the newspaper and to worry policy makers. By December representatives of local importers were traveling to Washington to discuss the “problems Puerto Rico faces to secure and distribute of food products”, particularly as it related to rice. El Mundo even reported that the dire situation on the island and the potential for shortages had compelled the government of the Dominican Republic to offer their help by sending rice shipments together with other food products.

The Tugwell administration was compelled to take more forceful steps to assume total control over the importation, sale, and purchase of rice. The GSA negotiated with the Agricultural Marketing Administration (AMA), a bureaucracy within the USDA in charge of

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672 Ortiz Cuadra, “Alimentación y Política durante la Administración de Rexford G. Tugwell.” 361
674 Prácticamente paralizada importación de arroz, El Mundo, 8 enero 1942
675 Entendido entre AMA e importadores de arroz, El Mundo, 14 diciembre 1942
676 República Dominicana ofrece grandes cantidades de alimentos, El Mundo, 3 diciembre 1942
677 Ortiz Cuadra, "Alimentación y Política durante la Administración de Rexford G. Tugwell."
commodities distribution programs during the war, to freeze all rice sales before a quota system went into effect. The agreement also ordered importers to act as wholesalers during wartime while the AMA continued its commodities purchase program. According to this regulation, all retailers selling rice were required to obtain a certificate from the agency. Consumers could purchase a maximum of two pounds of rice per person per week.\footnote{\textit{Distribuirán 16 Millones de Arroz al Mes"}, \textit{El Mundo}, 15 diciembre 1942. \textit{Congelado el Arroz Para Establecer Sistema de Cuotas"}, \textit{El Mundo}, 31 diciembre 1942.} As part of these negotiations, local officials also emphasized the need for federal agencies to relinquish control over food import policies to Puerto Rican agencies. Federal agents’ lack of familiarity with local food habits and with the food distribution system often times created artificial shortages. For example, supplies often stood in San Juan's docks for long periods of time because authorities failed to identify proper transportation methods to distribute to the rural regions of the island. Similarly, many products sent by the AMA were not familiar to most Puerto Rican consumers. Despite the limited local control over these matters, GSA members became the subject of scorn from representatives of commerce, the local press, and the general public.

This motivated GSA members Julio C. Torres y Luis A. Berrios to write a lengthy memorandum to President of the Senate Muñoz Marín complaining of the untenable situation provoked by the neglect of federal agencies such as the AMA in making foodstuffs available to their agency for subsequent distribution among retailers. Torres and Berrios argued that “since several months ago we have been the subject of the most diverse and unwarranted censure from the press, the commerce, and even certain sectors of the Federal government."\footnote{Memorandun Don Julio C. Torres y Luis A. Berrios a Don Luis Muñoz Marín, October 2 1942. ALMM, sección iv, serie 9, sub-serie 457, cartapacio 1, pg. 1} Meanwhile, according to them, Puerto Rico suffered "with more intensity than the United States the problems stemming from the war situation". In spite of this, “the General Supplies Administration alone
has the responsibility for solving not one or two, but all [emphasis original] aspects of the problem of the global emergency”. While in the U.S. there were “hundreds of thousands of employees dedicated to this work” “we only have a personnel composed of the ridiculous amount of 54 employees”. Together with the limitations imposed by this lack of personnel, the negligence of the AMA in managing foodstuffs on the island contributed to thwart the relationship between their agency and the public.

During these years, the AMA coordinated and channeled the distribution of agricultural surplus as food aid in the U.S. and its territories as part of the WFA. In Puerto Rico, authorities negotiated with the AMA the type and amount of foodstuffs that the island needed to meet local demand. By late 1942, however, Torres and Berrios noted that Paul Gordon, the local AMA official, failed to fulfill specifications regarding the “quantity, quality, size, weight, and shipping” of those products essential in the Puerto Rican diet. According to them, the shipments of rice, pork belly, and wheat flour received from the AMA were particularly problematic. The rice “was only suitable to make beer”, the pork belly was “rancid” and had “no mobility in the local market”, while the flour “was of the type used to make cakes and not appropriate for bread-making”. Even when the GSA was not responsible for these mistakes, they were to blame in the perception of the Puerto Rican public. El Mundo even translated and reproduced the report of a Washington Post’s reporter denouncing the food situation in Puerto Rico. According to this report, the situation was compounded by the poor quality of the products sent by the USDA to

680 Memorandum Don Julio C. Torres y Luis A. Berrios a Don Luis Muñoz Marin, October 2 1942, pg. 2
682 Memorandum Don Julio C. Torres y Luis A. Berrios a Don Luis Muñoz Marin, pg. 2-3

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the island. This agency “thought it was appropriate” to send Puerto Ricans “pork belly and lard of inferior quality and flour of the type they ship to Russia.”

In the context of the limitations of responses to the food supplies situation during the war, Puerto Rican nutrition experts worked to create a space to promote their agendas. They were aware of the work being carried out by Roberts and her fellow home economists as part of the NRC. Over the past decade, Puerto Rican nutrition experts had been engaged in the debates leading to the creation of the RDAs as part of their training in U.S. institutions and through their experience in health and welfare projects during the Depression. This background gave them legitimacy and authority in policy and political circles during the war and beyond. Their work as teachers, extension workers, and dietitians in dispensaries, food relief programs, and public schools gave them a unique expertise about the health and nutrition problems of the rural poor. The urgency brought by the war highlighted their role as nutrition experts and highlighted the usefulness of their expertise as part of the local government plan to face the food crisis. Drawing on the visibility they had acquired through their rural hygiene work, Puerto Rican home economists positioned themselves “at the vanguard of the second line of defense by connecting nutrition to a range of military, economic, governmental, patriotic, scientific, and even eugenic discourses” prevalent during the war.

As early as 1940, home economists such as Esther Seijo, Ana Teresa Blanco, and Margarita Marchand took the lead in the gathering of experts from various scientific, academic, and government institutions to form the Puerto Rico Nutrition Committee (PRNC). Apart from experts in nutrition, public health, and agriculture the PRNC included representatives from various government agencies like the Departments of Health and Education. When the GSA was

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683 “Ayuda por Desesperada Crisis de Alimentos,” El Mundo, 16 diciembre 1942.
684 Jack, Science in the Home Front: American Women Scientist in World War II. 102-103
formed in 1942, a member was selected to represent the agency in the PRNC. By bringing together scientists and policy makers, the PRNC attempted to craft a locally-devised response to the food crisis and to plan new studies to assess the effects of the war over the already precarious nutrition situation of the island. The committee’s slogan, “To make Puerto Rico a Happier and Healthier Country”, was included in al PRNC publications and communications. (Image 5.1)

Thus, as one of its first projects the PRNC carried out a survey to gather information related to the effectiveness and scope of existing nutrition programs. This survey showed that there was a “lack of coordination and integration between the works of different agencies”, a
“lack of equipment”, and a need for “trained personnel, illustrative material, and basic data about the nutritive value of Puerto Rican foods and on the nutritional status of the Puerto Ricans”.  

As the preparation for the war food emergency continued, it also became clear for the members of the PRNC that there was a need to better coordinate the activities of the agencies involved in food matters as well as to bring the input of nutrition scientists to the planning of these agencies’ work in Puerto Rico.

Reassessing Puerto Rico’s Nutrition Problem

As Chapter Three showed, home economists working as part of the Extension Service’s Home Demonstration Office were responsible for bringing to rural populations the principles of the new nutrition knowledge during the 1930s. Among these, Esther Seijo became one of the most prominent members of the generation of Puerto Rican nutrition experts trained and professionalized during the Depression years. Seijo obtained a Bachelor’s Degree from the UPR Department of Home Economics in 1935. After graduating from the UPR, she worked as a vocational teacher and later as Instructor in Nutrition and Child Welfare at the Department of Home Economics. In 1937, Seijo began post-graduate work at the University of Chicago where she completed a Masters in Science and later a doctorate degree, both specialized on the chemistry of food and nutrition. In 1941, she was appointed as Specialist in Food and Nutrition of the Agricultural Extension Service and by 1943 promoted to Assistant Director in charge of the Home Demonstration Office.

Esther Seijo belonged to a cohort of Puerto Rican home economists who received post-graduate training at the University of Chicago and who became prominent officials in various

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government agencies on the island. Their training in one of the most important home economics programs in the U.S. and their experiences with health, social, and education work among poor rural and urban communities during the 1930s and 1940s made them crucial figures in discussions about the problem of nutrition on the island. Their relationship with renowned figures in the field allowed them to incorporate the attention to the problems of food and nutrition on the island into broader U.S. and international wartime agendas. Puerto Rican nutrition experts’ experience at institutions like the University of Chicago also brought the island’s nutrition problem to the attention of influential figures in the field like Lydia Roberts.

In 1943 the WFA offered Roberts the opportunity to go to Puerto Rico to study the food and nutrition conditions and make recommendations for their improvement. Roberts accepted the invitation and arrived in Puerto Rico with an established reputation and the experience of playing a leading role on the recent creation of the RDAs. Roberts’ “democratic approach”, honed as part of her NRC nutrition work, proved a useful strategy for her new assignment on the island. While at the time she went to Puerto Rico Roberts was already 61 years old, Roberts became one of the most influential members of the PRNC and one of the closest collaborators of the PPD government in matters of food and nutrition. Once on the island, she also became actively involved in home economics training at the UPR.687 One of her first interventions occurred as part of the Community Nutrition Workshop organized at the University of Puerto Rico in 1943. This Workshop brought together representatives from all the government agencies involved with nutrition work to analyze the nature of the problem and propose solutions. Workshop participants agreed to expand the main objectives of the PRNC to include the improvement of “the nutritional

687 Roberts, “Home Economics in Puerto Rico.”
status of the people of Puerto Rico by initiating, coordinating and extending those activities concerned with the nutrition of the people."

The organization and functioning of the PRNC during the war lay the foundations for future nutrition research and programs on the island. During the 1940s, the committee offered a space for nutrition experts to craft a local response to the war food crisis separate from the GSA and the OPA. These agencies’ work focused on reacting to the consequences of transport problems, shortages, and rationing over an imports-dependent food supply by administering supplies and enforcing price ceilings. On the other hand, members of the PRNC advocated for long-term planning to attend the island’s nutrition problem. This long-term response required the coordination and cooperation between experts from different backgrounds such as economists, sociologists, anthropologists, biochemists, and agricultural scientists. The links and relationships between experts, institutions, and government agencies established through the PRNC shaped the food and nutrition interventions established on the island during the following decades.

One of the first steps in this new strategy to attend Puerto Rico’s nutrition problem was the gathering of updated data about deficiency diseases and dietary patterns in light of the recently established RDAs. During the mid-1940s, experts on the island embarked on a series of clinical, biochemical, and sociological investigations to collect new data about the manifestations of the nutrition problem and the factors associated with it. Simultaneously, the recent organization of resettlement communities according to the provisions of the Land Law of 1941 warranted new inquiries on the effects of this program over agregados health and nutritional status. Similarly, the changes experienced by the island’s society during the past decade required the revision and adaptation of the curriculum used to train social workers and home economists, especially in matters of nutrition and health. The effects of the war over the availability of basic

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688 Coll de Velázquez, de Pérez Diez, and Walker de Martínez, History of the Puerto Rico Nutrition Committee. 1
foodstuffs also raised concerns among nutrition experts about a further deterioration of rural people’s diet.

Ramón Suárez from the Department of Clinical Medicine of the STM took the lead in the organization and implementation of one of these new investigations. According to Suárez, the “ever present problem of an inadequate diet…with its possible unknown biologic effects on the population may now become more acute” “because of the diminishing importations of certain essential foodstufs.” In these circumstances, Suárez’s initial studies focused on investigating the effects of vitamin A deficiency over ocular dark adaptation by examining 267 residents of rural resettlement communities from which 185 “were apparently healthy” and 82 “were patients of two local institutions.” Biophotometric examinations showed that the majority of these individuals “showed poor dark adaptation”, “eight persons showed biophotometric curves that might be considered within normal range”, and “only two were absolutely normal. In a second study Suárez examined the conjunctiva, cornea, and long bones of a sample of 310 hospitalized infants and children. From this study, Suárez emphasized that although “signs of vitamin A deficiency were absent altogether in infants and young children”, physical examinations led to “medical diagnoses such as malnutrition, nutritional edema, nutritional diarrhea, and gastroenteritis” as well as hypoproteinemia and pellagra.

Suárez made sense of these findings utilizing data available from different sources regarding consumption patterns of vitamin A-rich foodstuffs and the relationship between these and rural people’s health. From Descartes and colleagues’ studies, Suárez was particularly

690 Ibid. 76
interested in information about consumption of green and leafy vegetables, eggs, fresh milk, and dairy products. These he considered to be “ridiculously low”. Comparing the per capita consumption of these foodstuffs on the island to that of populations in the North Atlantic states, the Southeast Central states and among “southern Negro families”, Suárez highlighted the “apparent difference between local and continental consumption of foods rich in vitamin A and carotene.” Suárez also discussed clinical findings among his sample subjects in reference to the results from experiments conducted at the STM where rats fed the vitamin A-deficient “country people’s diet” grew less than those on the “continental diet”. His study also seemed to confirm the results obtained by Morales Otero and Pérez in their analyses of physical measurements of agricultural workers in PRRA projects, whose weight and height was considerably “less than a similar group in the continental United States”.

To build on these findings, Suárez organized another study among resettled communities with visiting researcher Una Robinson, invited to the STM by the now Director Pablo Morales Otero to “spend her sabbatical doing research in nutrition.” To assess the nutritional status of resettled populations in relation to changes in their dietary intake, Robinson and Suárez selected a community “located on a good highway in a formerly prosperous citrus fruit district of the Island.” The sample for this study was made of 157 individuals from this community, approximately 30 percent of the residents, 36 of whom were under six years of age. This was the first nutrition study in Puerto Rico to collect dietary information together with “biochemical studies of fasting blood and urine”, and “medical examinations to determine the nutritional

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692 “Studies of the Nutritional Problem of Puerto Rico I: Vitamin A Deficiency in Relation to Dark Adaptation and Ocular Manifestations.” 65-67
693 Ibid. 67-70
694 Morales Otero to Rappleye, January 31 1945. CU-HSL. Office of the Vice-President for Health Sciences, subject code 130, box 361, folder General Correspondence, 1945
Home economists supervised by Esther Seijo recorded dietary intake data at the participants’ homes by weighing and measuring the total quantities of food utilized to prepare daily meals. Nutritionists further weighted the food served on each plate as served to the family members and subtracted the portions left uneaten from that original weight.

Although researchers intended to collect this data for five days, nutritionists ended up visiting the participants’ homes only two times. According to them, this did not limit the validity of the results since “it was evident at the start that the diets of these subjects were so monotonous and of such constant quantity and quality that a five day record would yield but slight differences and would not justify further time being spent on getting additional data.” Meanwhile, “four to six subjects were brought each morning to the laboratory before breakfast” for the medical examinations and the collection of samples. After performing these procedures, laboratory personnel offered participants “a good breakfast consisting of orange or grapefruit, egg, bread, butter, “café con leche” and unlimited sugar.” According to Suárez and Robinson, this breakfast was “undoubtedly better than any these people might have had at home and, together with the pleasant motor trip to a large city, proved to be the incentive responsible for the excellent cooperation received from the group.”

Nutrition experts like Suárez and Seijo saw the land reform program as a potentially successful strategy to improve these nutrition problems by increasing the consumption of protective foods. However, these studies’ findings obtained showed that, so far, the land redistribution and resettlement program had few measurable effects over rural people’s nutritional status and only a “limited effect at improving population’s health and standards of

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696 Ibid. 100-102
Based on the data collected by the nutritionists who visited the homes, Robinson and Suárez concluded that milk consumption was still “conspicuously low”, fresh fruits and vegetables were lacking, and “the average consumption of eggs was so low that it approached zero”. These findings were confirmed by analyzing dietary intake information for each age group in the sample according to the new RDAs. Since Puerto Ricans were considered “of low stature and slight weight”, they argued that the RDAs “were more liberal than necessary” which required adjustments to the allowances these established for each “dietary constituent”. Even after these revisions, the findings obtained showed that the average content of most of these dietary constituents in the subjects’ diet “failed to measure up to the recommendations of either” the NRC or “to a more conservative standard elaborated for Puerto Ricans”.

Apart from vitamin A, calcium deficiency was another serious deficiency uncovered by this new study. This was confirmed by the dietary data. For them, the low amount of milk consumed by children in their sample was one of the most worrisome findings of the dietary study. Although all individuals in the sample consumed less milk than recommended even in the “minimum low cost diets” set up by the USDA, the intake among young children was the lowest among the age groups. The dietary survey also showed that attempts to promote the consumption of yellow tubers (instead of the white varieties) were not successful. Most of the starchy roots consumed by individuals in the sample were white, “thus failing to provide vitamin A at essential levels.”

Although they recognized the economic basis of these problems, Robinson and Suárez considered that the poor nutritional status of this population required that welfare agencies continued efforts to instruct them “in food values and proper choices within their budgets”, in

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697 Ibid. 100  
698 Ibid. 114  
699 Ibid. 104, 132
“planting and tending their gardens” and in the advantages of consuming “new foods such as soybeans and parboiled rice, yellow sweet potato, and green and yellow vegetables”.

While Robinson and Suárez investigated the nutritional status of a sample of residents from a resettled community, biochemists from the STM measured the thiamine, niacin, iron, and riboflavin content of tropical foods in light of the recently created RDAs. Interested in the clinical aspects of nutrition, Robinson and Suárez showed that the average intake of these nutrients in their sample was considerable lower than that recommended by the NRC or the adapted Puerto Rican standards. The establishment of the RDAs also motivated Asenjo from the STM and José Goyco from the AES to study the presence of these nutrients in “some tropical foodstuffs” available in local markets. As discussed in Chapter Two, Asenjo worked at the STM as part of the Rockefeller Foundation Tropical Nutrition project from 1933 to 1937 when he began doctoral training at the University of Wisconsin. After completing his doctorate, Asenjo returned to work at the Biochemistry Department where, similar to his mentors, he studied Puerto Rico’s nutrition problems from a biochemical perspective. His first major projects after returning to the STM were in conversation with contemporary discussions around the new RDAs. Local concerns with the need to increase food self-sufficiency in face of import disruptions provoked by the war also shaped Asenjo’s work during this period.

Together with Goyco Asenjo designed experiments to assess the nutritional content of foodstuffs available in local markets or from street vendors in the San Juan-Río Piedras area. This, they argued, made their sample representative of what was locally available for people to acquire. After performing biochemical analyses, they found that “it would appear difficult to

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700 Ibid. 131
obtain” the recommended allowance of this nutrient from what was available at these local markets.\textsuperscript{702} A bright point for Asenjo and Goyco was that analyses of the niacin content of locally available foodstuffs confirmed Robinson and Suárez’s findings that “the Puerto Rican basic diet, though somewhat deficient in niacin, is not dangerously low in this nutritional factor.” This was, however, dependent on the overall consumption of an adequate amount of calories.”\textsuperscript{703}

Taken together, these wartime studies produced data about nutrition in Puerto Rico on the basis of newly established standards and minimum requirements like the RDAs and the adequate minimum cost diet designed by the Home Economics Bureau of the USDA. In 1946, while Suárez and Asenjo conducted their respective studies, Lydia Roberts began a dietary and sociological survey to collect updated data about the general living conditions on the island. This information was intended to serve as a guide to adapt the Department of Home Economics’ curriculum to the needs of Puerto Rican homes and families.\textsuperscript{704} For this, Roberts and Rosa Luisa Stefani together with home economics students selected 1,045 families from various regions of the island. According to Roberts and Stefani this was a “fact-finding diagnostic study” which results were “intended primarily for Puerto Rican workers concerned with the problem of raising the standard of living in Puerto Rico”.\textsuperscript{705} Analyses performed to test the sample’s validity showed that it was representative of the island’s population as whole and that “the findings reported can be regarded as reasonably typical of Puerto Rican families in general.”\textsuperscript{706}

Similar to the PRRA studies, this survey found that “rice and beans form the backbone of the classic Puerto Rican diet.” Different from those, Roberts’ study also included data from

\textsuperscript{702} Asenjo, García de la Noceda, and Serrano, "Riboflavin Content of Tropical Foods.” 137
\textsuperscript{703} Asenjo et al., "Niacin Content of Tropical Foods." 465
\textsuperscript{704} Lydia J. Roberts and Rosa Luisa Stefani, Patterns of Living in Puerto Rican Families (Rio Piedras: La Editorial de la Universidad de Puerto Rico, 1949).
\textsuperscript{705} Ibid. v
\textsuperscript{706} Ibid. xxii
urban families. An analysis of people’s diets according to both region and income showed that “it is income what largely determines even the use of rice and beans.” In the lowest rural income group, 79.7 percent of the families had rice and beans at least once daily and 14.5 percent had them twice. However, “in the highest income group in the urban zone these food were served at least in 95.5 percent of the homes, and in 57.6 percent they were used in both the noon and evening meals”. When analyzing data related to home food production, which they expected to be of some significance “in a country in which the chief industry is agriculture,” They found that although 66.9% of rural families had fruit trees available, this was on average “a negligible factor in the nutrition of the large majority of the families” especially in urban areas.

According to Roberts and Stefani viandas were the “saving grace” of low income dietaries. Making reference to available biochemical data they noted that although they alone “will not make an adequate diet”, “when eaten in large amounts” they supplied “not only calories but generous amounts of the B vitamins, and also of vitamin C if it is not destroyed or lost in the cooking.” The main difference among the viandas, they emphasized, was “in their vitamin A value” with “the yellow varieties, especially yellow sweet potato” being “rich sources of this, while the white ones almost totally devoid of it.” In their studies Roberts and Stefani found that green plantains and bananas were used “often or very often” by 61.5 percent of all families, followed by white yautía, sweet potatoes, breadfruit, and white ŭame. However, most people still preferred white over yellow varieties across all income groups. The findings regarding consumption of green and yellow vegetables were not satisfactory either. For Roberts and Stefani “the first things that strikes the eye” was that “no green, yellow, and leafy vegetables” were used “often by as many as 50 per cent of the families.” Many of the greens which were considered

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707 Ibid. 160-161
708 Ibid. 193-199
“essential”, such as spinach and broccoli, were never used by 94 to 99 per cent of the families in both rural and urban areas.\textsuperscript{709}

This dietary data together with findings related to housing, education, maternal and child health, and “conditions of living in the home” were published in 1949 as \textit{Patterns of Living in Puerto Rican Families}. For Roberts, who had just arrived in Puerto Rico when the studies were conducted, the experience of local home economists was crucial for the completion of this project. Though their work in the nutrition, health, and social programs of the New Deal, local home economists produced the expertise that served as the foundation for \textit{Patterns of Living}. For Roberts, this body of knowledge showed both the need for nutritional improvement and the potential of her expertise to promote this change. While during her last years at Chicago she co-published articles on chemical methods to detect deficiencies, Roberts’ main interests in the field of human nutrition were related to “its public health and social welfare aspects.”\textsuperscript{710} Therefore, she devoted her career to “interpreting nutrition in terms of human requirements” and to “devise ways and means by which the nutrition knowledge we now have may be improved for human betterment.”\textsuperscript{711} By the mid-1940s, Puerto Rico appeared as an ideal place to test the effectiveness of this approach. Thus, while she was originally scheduled to return to the U.S. at the end of the 1944-1945 academic year, she stayed on the island for the last twenty years of her life.

\textbf{Between Tropical Agriculture and Tropical Medicine}

By the time Lydia Roberts arrived in Puerto Rico in 1944, the war conditions heightened the urgency of promoting a more self-sufficient food supply. Apart from emergency measures to

\begin{footnotesize}
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\item\textsuperscript{709} Ibid. 168-170
\item\textsuperscript{710} S. Brenner and Lydia Roberts, "EFfeets of Vitamin A Depletion in Young Adults," \textit{Archives of Internal Medicine} 71, no. 4 (1943); Lydia J. Roberts and Grace Steininger, "Biophotometer Test as Index of Nutritional Status for Vitamin A," \textit{Archives of Internal Medicine} 64, no. 6 (1939).
\item\textsuperscript{711} Statement of Interests and Recent Activities of Lydia J. Roberts. UC-SC. Archival Biographical Files, Series VII, P-R, folder Roberts, Lydia J.
\end{itemize}
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control prices and manage supplies, these circumstances also contributed to the organization of various scientific projects to investigate issues relevant to local agricultural production, particularly food crops. Thus, studies of the nutritional and commercial potential of local plant and animal products were jointly sponsored by the STM, the insular AES, and the Department of Agriculture (DOA). The war also fostered the creation of a new agency to apply the results of these investigations and make them available to farmers and the general public. The channels of communication between agricultural and nutrition scientists and the public created during the previous decade proved to particularly importance for these new efforts.

The onset of the war particularly affected the already limited availability of fats and oils for local use. For nutrition scientists, the low vitamin A content of most people’s diet was associated with the lack of dairy products and animal fats. Although nutrition science presented animal-based products as the best sources of this nutrient, wartime emergency conditions motivated local experts to explore alternative sources of vitamin A-rich products. Moreover, Puerto Ricans depended almost exclusively on imports to obtain fats and oils, the foodstuffs with the highest content of this nutrient. In this context, the DOA sponsored a new research project focused on studying the quantity and quality of oils obtained from fruits and seeds native to Puerto Rico and the Caribbean region. These studies were to be conducted jointly by Asenjo from the School of Tropical Medicine and botanist José Goyco from the AES.

This inter-institutional collaboration was facilitated by previous engagement between scientists from these institutions. Interest in the nutritional potential of local plant and animal-based products motivated the organization of various research projects both at the STM and at the AES before the war. Articles by Axtmayer, Asenjo, and Cook appearing in publications by
the AES and the DOA reflect this trend. At this time of these studies, Axtmayer worked as Director of the Institute of Nutrition of the STM Department of Chemistry. In this role he replaced Cook as coordinator of the Department’s nutrition program. After Cook left Puerto Rico and the STM in 1943 due to health complications, Asenjo became the new Chair of the Department of Chemistry and together with Axtmayer continued the nutrition research agenda begun 20 years earlier.

The new investigations of the nutritional potential of tropical foodstuffs drew from a vast corpus of knowledge about Puerto Rico’s botany and their agricultural and commercial possibilities. One of the most widely disseminated botanical works about Puerto Rico and the Virgin Islands was the product of investigations conducted during the late 1910s and 1920s by scientists involved with the New York Academy of Sciences and the New York Botanical Garden. Called The Scientific Survey of Porto Rico and the Virgin Islands, these tropical botany investigations had the objective of increasing the Garden’s collections of Caribbean specimens, obtaining “a better knowledge of them by observing the plants growing in their natural habitats”, and “to visit certain parts of the colony hitherto unexplored by botanists.” As director of the New York Botanical Garden, Nathaniel Britton oversaw the work of the survey during the first years. By the end of the enterprise, the Scientific Survey stood as the “first systematic natural history inventory ever made for any of the [Caribbean] islands.”

713 Morales Otero to Rappleye, December 4 1943. HSL-CUMC, Collection Office of the Vice President, Subject Code 130, School of Tropical Medicine, box 361, folder General Correspondence, 1944
714 N.L. Britton and Percy Wilson, Scientific Survey of Puerto Rico and Virgin Islands. Botany 5 and 6 (New York: New York Academy of Sciences, 1932); Inés Sastre-D.J. and Eugenio Santiago-Valentín, "Botanical Explorations of
Asenjo and Goyco drew from Britton’s Scientific Survey and its efforts to establish standards of nomenclature that placed Puerto Rican flora in its Caribbean context. Accordingly, they named the vegetable materials according to the scientific Latin names and the English common names established by the members of the Scientific Survey. These ascribed geographical location through their naming of newly discovered plants. However, Asenjo and Goyco emphasized the newness of their investigations and approaches. Different from Britton and his team, their study was motivated by concerns with Puerto Rico’s nutritionally-deficient and import-dependent diet. As they noted, “since the production of vegetable fats is very limited in Puerto Rico, we have had to depend on imported fats to meet the local need for those products”. This situation created an “industrial and nutritional” problem of great magnitude on the island. Thus, with the STM “as an intermediary”, “a subvention” from the Department of Agriculture and Commerce and the collaboration of the AES, they undertook “a systematic study of the chemical composition of oils and fats derived from native fruits and seeds that might have the possibility of becoming accessible sources of fatty products.”

Apart from financial support, the DOA provided botanical samples of the plants and seeds to be tested. This included for papaya seeds, tropical almond, avocado, guanábana (soursop), toronja (grapefruit) and molinillo among others. They further determined the
“digestibility coefficient” of these oils by feeding laboratory rats with various amounts of the liquid fraction of the oil expressed from avocado, grapefruit, papaya, and soursop. Although laboratory rats were “disgusted” by the soursop seed oil, given “its displeasing smell and taste”, they consumed all other oil rations. Among these, the “digestibility index of the avocado, grapefruit and papaya seed oil turned to be the same as that of butter”.\footnote{Conrado Asenjo and Ana Rosa Freire de Guzmán, "The High Ascorbic Acid Content of the West Indian Cherry," \textit{Science} 103, no. 2669 (1946).}

In the context of these investigations of the nutritional potential of native foodstuffs, Asenjo, Goyco, and other scientists from the AES began in 1945 to study the biochemical characteristics of a little known fruit called \textit{acerola}. These studies led to the discovery of acerola’s high ascorbic acid, or vitamin C, content. In the first published report of these studies appearing in the journal \textit{Science}, Asenjo and collaborator Ana Rosa Freire de Guzmán concluded that “it would seem that the West Indian cherry is one of the richest, if not the richest edible fruit source of ascorbic acid so far described in the literature.”\footnote{Conrado Asenjo and Ana Rosa Freire de Guzmán, "The High Ascorbic Acid Content of the West Indian Cherry," \textit{Science} 103, no. 2669 (1946).} (Image 5.2) Further analyses conducted on \textit{acerolas} harvested at the AES confirmed these observations.\footnote{Conrado Asenjo, "Biological Vitamin C Activity of the Mapighia punicifolia L. pseudo cherry," \textit{Federation Proceedings} 10 (1951); "The Story of the West Indian Cherry," \textit{Boletín del Colegio de Químicos de Puerto Rico} 10 (1953).} When comparing this fruit with other known sources of this nutrient, researchers determined that \textit{acerola} was the richest source of vitamin C, showing that its juice was 50 to 100 times more potent in this compound than orange juice.\footnote{Asenjo and Freire de Guzmán, "The High Ascorbic Acid Content of the West Indian Cherry." Conrado Asenjo and Carlos Moscoso, "Ascorbic Acid Content and Other Characteristics of the West Indian Cherry," \textit{Food Research} 15 (1950). Lydia J. Roberts, "Acerola: Miracle of the Caribbean, Astonishingly High in Vitamin C," \textit{American Journal of Nursing} 57, no. 9 (1957).}
As a result of this discovery, the AES began in 1947 an extensive study of the potential of the West Indian Cherry as a commercial crop through the plantation of 400 trees at the main Río Piedras station. Asenjo collaborated with Carlos Moscoso, scientist from the Department of Plant Breeding to further investigate the chemical properties of samples of this fruit obtained from trees at the Río Piedras facilities of the experimental station. According to Asenjo and Moscoso’s report of these findings although “varieties of the three found so far have not yet been

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723 Asenjo and Moscoso, "Ascorbic Acid Content and Other Characteristics of the West Indian Cherry." Carlos Moscoso, "West Indian cherry: Richest Known Source of Natural Vitamin C," Economic Botany 10, no. 3 (1956).
standardized”, “experiments are now in progress which should permit the selection of outstanding varieties in the near future”.

While Puerto Rican officials attempted to propagate both acerola trees and knowledge about its qualities, U.S. medical and lay media were busy publicizing these new nutrition discoveries. “A West Indian cherry a day keeps scurvy away,” declared The Science News Letter. While food industries began to develop juice blends with acerola and to advertise their nutritional potential, physicians considered the possibilities of this new product as a food for children. For nutrition experts in Puerto Rico like Esther Seijo and Lydia Roberts, acerola’s story highlighted the importance of promoting the production and consumption of local food crops as part of public health nutrition programs. As Asenjo noted, “we believe there should be an extensive campaign promoting the cultivation of acerola trees and encouraging Puerto Rican families to consume this fruit frequently. This would be a low cost alternative to ameliorate the vitamin C deficiency suffered by most of our fellow citizens.” Puerto Rican home economists and nutritionists quickly incorporated this proposal into their agendas.

Salud con Frutas del País: Agricultural Extension and Nutrition Education

The acerola discoveries served to reinforce the Extension Service’s efforts to increase cultivation of both popular and new food crops and to promote their incorporation into Puerto Ricans’ daily diet. By the late 1940s, promoting the superiority of local fruits and vegetables as sources of needed vitamins and minerals became one of the most important aspects of the work.

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724 Asenjo and Moscoso, "Ascorbic Acid Content and Other Characteristics of the West Indian Cherry," 103
of its Home Demonstration Office. As an Extension bulletin noted “you need to eat 10 apples, 52 glasses of watermelon juice, and 163 glasses of pear juice to obtain the vitamin C provided in only one glass of orange juice” from *el país* (from the country). “Ripe papaya, mango, grapefruit, and soursop are all excellent fruits”, they continued. “Acerolas and guavas are even better. Convince yourself: our fruits are superior” (emphasis original).\(^{729}\)

While these campaigns to promote the cultivation and consumption of local food crops had their closest precedent in the rural hygiene programs of the 1930s, the Victory Gardens movement gave extension agents and nutrition workers a new rhetorical and institutional framework to promote these agendas throughout the 1940s. In the U.S. “the war brought a remarkable rise in consumption of fresh vegetables”. The “revival of the WWI program of Victory Gardens proved eminently successful.” By the fall of 1943 “there were twenty million Victory Gardens producing 40 percent of the nation’s vegetables in backyards, in vacant lots, or alongside factories.”\(^{730}\) Similarly, in Britain the Dig for Victory campaign was initiated to encourage the cultivation of vegetables and fruit. A year after its launch, the campaign succeeded in creating a million allotments of local produce.\(^{731}\)

Female workers and nutrition experts in the U.S. played important roles in the implementation of these campaigns as well as in securing people’s acceptance of wartime food rationing through propaganda and renewed extension education efforts. Drawing from “women’s role as family food manager”, the rhetoric used to convince people to avoid food waste and black markets as well as to increase food production and abide by food rationing regulations

\(^{729}\) *Para su Salud*. Home Demonstration Office, Puerto Rico Agricultural Extension Service, USDA, 1942. NAL

\(^{730}\) Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America*. 85

\(^{731}\) Gratzer, *Terrors of the Table: The Curious History of Nutrition*. 13
emphasized the domestic, community, and public aspects of the war effort. In Puerto Rico these campaigns had a particular resonance for nutrition and agriculture experts, policy makers, and politicians who had been calling attention to the ways in which mono-cropping and import-dependency affected people’s diets. The new attention to these issues during the war as the “submarine menace practically isolated Puerto Rico from the mainland” fostered “great strides” “in the local production of food crops, which attained levels never before believed possible.” As part of these initiatives, Puerto Rican extension agents, home economists, and nutrition scientists adapted U.S. programs and campaigns, particularly the Victory Gardens, to address local concerns with nutrition, dietary quality, and food supply.

Even before the war altered import markets, one of the main challenges faced by policy makers and agricultural scientists seeking to promote local production was the limited profitability of food crops agriculture. For nutrition experts, these agendas were intimately tied to their efforts to improve people’s diets through an increased consumption of protective foods. As part of her Master’s thesis, Puerto Rican home economist Ana Teresa Blanco reflected on both issues. Similar to Seijo, Blanco was a prominent home economist who went to receive a degree Master’s Degree in Biological Sciences at the University of Chicago. Her thesis applied contemporary knowledge about nutrition and food sciences to the conditions in Puerto Rico where in 1940 “only 67 percent” of the food needs “was locally produced.” To assess the situation on the island, Blanco summarized available evidence on the nutrition problem in Puerto Rico from biochemical, clinical, dietary, and socioeconomic perspectives. After laying out “what


can be done or is being done about the situation”, Blanco noted that “those who have considered the question do not consider it advisable for the island to be dependent on imports for food.”

Thus, by the mid-1940s devising new strategies to increase the local production of food was one the main objectives of “all agricultural agencies in the island.” Together with the Extension Service, the local Work Projects Administration (WPA) developed plans to increase cultivation of food crops, to bring products to markets, and to make them accessible to consumers while contributing to decrease the unemployment rate by hiring agricultural workers throughout the island. By late 1942, WPA had 9,600 acres of land cultivated with rice, vegetables, root crops, fruits, and legumes. Many of these products were delivered to school lunch rooms and welfare institutions. As part of these programs, the Extension Service revamped its various education and outreach program to appeal to the sense of duty of the farmer and the housewife and their role as part of efforts to increase local food production. Extension agents coordinated the distribution of seeds and fertilizers and explored the potential of new varieties of livestock and poultry. Home economists and social workers organized demonstrations in gardening and “efficient” cooking for housewives. Agents in general adapted the activities of the local 4-H Clubs to incorporate projects related to the food production efforts.

The work by Puerto Rican home economists and nutrition experts such as Blanco and Seijo as part of the Extension Service was a crucial element of nutrition programs on the island during the war and beyond. Extension educators placed these campaigns as part of Puerto Rico’s contribution to the defense of democracy. As part of these campaigns, Seijo created the pamphlet

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735 Ibid. 1, 77
736 Ibid. 78
737 “WPA tiene bajo cultivo 9,600 cuerdas en la Isla.” El Mundo, 31 diciembre 1942.
Dieta y Democracia together with the PRNC and the Puerto Rican 4-H chapter. The pamphlet noted that democracy needs healthy citizens,” encouraged people to “preserve good health with a proper diet,” and offered advice regarding the types of local food products they should eat, how much, and why. The cover showcased the U.S. and 4-H flags next to each other. (Image 5.3) Again, Seijo emphasized the importance of consuming local products for the promotion of both good health and the U.S. war effort. The list of foods recommended for a good nutrition included local fruits such as oranges, toronjas (grapefruit) “that aid in bodily functions” and green and yellow fresh vegetables “that help to build and repair tissues.” Thus, officials like Seijo utilized the vehicles provided by of U.S. institutions and drew from their rhetoric and propaganda to attend local concerns with the problems of nutrition and food supply on the island.

The Extension Service also implemented this joint nutrition and agricultural education program through the monthly publication Carta Mensual. This publication was especially directed to local neighborhood and nutrition leaders who worked in their communities “to improve the diet of their neighbors” because they knew that it was “impossible to achieve wellbeing without enjoying good health.” It also aimed to appeal directly to farmers, housewives, and 4-H members by including separate sections with articles discussing issues of interest to these different audiences. For example, “The Farm” section gave advice to farmers on how to maximize their production of fruits, vegetables, meat, poultry, eggs, and dairy. Similarly, in “The Home”, Esther Seijo called on homemakers to be a part of the food production campaign “not merely by producing more but by learning and practicing proper preparation and

738 Esther Seijo Tizol, Dieta y Democracia (Río Piedras: Universidad de Puerto Rico: Colegio de Agricultura y Artes Mecánicas, Servicio de Extensión Agrícola, 1947).
conservation methods.” These sections were accompanied by humorous drawings to reinforce the messages and connect with rural dwellers. (Figures 5.4) In these drawings, extension personnel gave animals and plants human qualities to increase the appeal of the Service’s message and to foster involvement in the projects to increase local food production.

Together with similar Extension education publications, *Carta Mensual* served to rearticulate existing pedagogical projects of nutrition and agricultural strategies to reform the rural poor through the new institutional exchanges fostered by the war. While these new pedagogical projects drew from the rhetoric of U.S. wartime propaganda and were facilitated by

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740 “La Mujer y Nuestra Campaña,” (San Juan: Servicio de Extensión Agrícola, 1945).
the resources and attention it brought to the island, they allowed for the continuation of locally devised agendas to intervene with the poor and reconstruct rural society. Thus, nutrition and agriculture experts, mostly affiliated with the PPD, combined appeals to rural Puerto Ricans’ “patriotic duty” to produce more food with their decade-long efforts to improve people’s diets through the consumption of more vegetables, fruits, and dairy products

While Extension campaigns focused on promoting subsistence agriculture, these agendas to promote local food production were also central to the creation of the Puerto Rico Agricultural Corporation (PRACO) in 1945. This agency offered a new platform to advance local projects to attend the food and nutrition problems during the war and beyond. According to the text of the law creating the PRACO, there was “great necessity to exploit to the greatest extent the commercial potential of Puerto Rico’s agrarian resources” by introducing “new and better

Image 5.4: “We Cannot Fight but can Produce Food” ("Sección 4-H." Carta Mensual, 11. San Juan: Servicio de Extensión Agrícola, 1945.)
products and agricultural industries of the island”, improving trade mechanisms, developing the fishing industry, creating “effective means to help Puerto Rican farmers”, establishing long term fruits crops, and creating “modern marketing facilities in order to distribute and make available crops harvested for the maximum benefit of the farmers and the community in general.”741 In line with Blanco’s recommendations, PRACO was tasked with creating and implementing plans “so that the foods that can make the best contributions [to people’s nutrition] will become available”. This included plans concentrated “on the establishment of vegetable gardens where vegetable of the higher nutritive values will be grown, an increase in milk production through increasing the number of cows and goats…and care and propagation of fruits trees.”742

Agronomist Thomas Fennel was appointed as General Manager of this new agency. Fennel arrived in Puerto Rico “after working with the problems of scientific agriculture” in the U.S. and the Caribbean.”743 As he observed “at present the Island’s system of marketing local produce—primitive, inefficient and unsanitary—seriously limits the rational development of locally produced foodstuffs”. Similarly, he emphasized that the island “imports a great range of foodstuffs that can be produced locally” such as fruits, vegetables, meats, eggs, and dairy products.744 Together with Fennel, Elmer Ellsworth worked as Chairman of the PRACO Board of Directors. Since 1919, Ellsworth worked in a fruit cannery which, according to him, “was the first to can grapefruit successfully in Puerto Rico or anywhere else”.745 He also established his

741 Exposición de motivos Ley 31, creación PRACO. ALMM, Sección iv, serie 10, sub-serie 22, cartapacio 301
742 Blanco, *Nutrition Studies in Puerto Rico*. 78
743 Affidavit, Thomas Fennell PRACO General manager, February 6 1946. FLMM, Sección iv, serie 9, sub-serie 11, cartapacio 1, p. 1. From 1941 to 1944, Fennel worked as Agricultural Expert to the Haitian Government and President and General Manager of the Haitian-American Agricultural Development Company. Before his work in Haiti, Fennel was a researcher at a U.S. Department of Agriculture’s Field Station in Florida during the early 1930s and later served as Chief of Operations and Assistant to the Director of the Agricultural Research Center of the USDA in Bethesda, Maryland.
744 Affidavit, Thomas Fennell, p. 2-3
745 Affidavit, Elmer Ellsworth, PRACO Chairman, February 6 1946. ALMM, Sección iv, serie 9, sub-serie 11, cartapacio 1, p. 1
own farm in the town of Cidra where, “besides extensive plantings of pineapple and citrus fruits”, he produced “many kinds of vegetables, and small fruits such as strawberries, and potatoes, none of which had ever previously been grown in Puerto Rico commercially”.  

Together with scientists and personnel from related agencies, PRACO organized pilot plants and a plantings program to test the agricultural innovations and methods developed during the previous years. The findings of ongoing AES projects framed PRACO plans to maximize the production and profitability of food crops agriculture on the island. According to Fennel, these findings showed that “fruits such as pineapples, citrus fruits, guavas, and mangoes have possibilities as new crops and a basis for new processing industries”. PRACO aligned efforts to incentivize local production of these crops with new strategies to increase their availability for consumers through the creation of better distribution and sale mechanisms for locally produced foodstuffs. For this, a Marketing Division was created “to encourage farmers in Puerto Rico to grow a larger quantity of foodstuffs than in the past”. To accomplish, the agency established a network of small markets called Plazas PRACO. These markets were intended to be “centers for the sale of vegetables in various towns throughout the island”. Through this mechanism, PRACO aimed to provide rural towns “with a modern and sanitary place where the consumer can purchase fruits and vegetables locally produced…at the lowest possible prices”.

PRACO plans and objectives to diversify production and facilitate the commercial aspects of food crops agriculture were never fully materialized. With the passage of the industrial incentives legislations in the late 1940s, PRACO projects were gradually subordinated to the new

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746 Affidavit, Elmer Ellsworth. p. 1
747 Affidavit, Thomas Fennell PRACO General manager, February 6, 1946. FLMM, Sección iv, serie 9, sub-serie 11, cartapacio 1, p. 3
748 Puerto Rico Agricultural Company Marketing Division, Proposed Plan for Operation. ALMM, Sección iv, serie 2, sub-serie 1, cartapacio 220, 1. This Division was directed by Paul Edwards who had previously served as Executive Director of the War Emergency Program together with Manuel A. Pérez.
749 Edwards to Muñoz Marín, October 17 1946. ALMM, Sección iv, serie 9, sub-serie 11, cartapacio 1
political economy strategy. However, the establishment of this agency reflected the momentum the war circumstances had created for the promotion of food self-sufficiency. Thus, the state of PRACO projects manifested the increasing contradiction and ambiguity that began to characterize the PPD government. While this party reached power by calling for reforms to the island’s structures in order to promote a more locally-minded and self-sufficient economy, an alternative discourse began to emerge as WWII gave rise to a new regional and international order. In these new circumstances the agendas of the PPD and its political economy priorities began to shift. As the following chapter will show, this shift had profound consequences for the articulation of food policies and the implementation of nutrition interventions in Puerto Rico.

Conclusion

This chapter examined the interaction, collaboration, and contestation between different agendas related to the solution of the problem of nutrition in Puerto Rico during the late 1930s and 1940s. The war motivated new scientific, policy, and political efforts to attend to the short-term effects of Puerto Rico’s food imports dependency, to ascertain how it affected people’s nutrition, and to find new strategies to promote long-term solutions. Through food consumption studies agricultural economists interested in increasing the profitability of agriculture depicted Puerto Ricans’ dietary habits and related these to nutrition problems. While the main concern guiding these efforts was promoting the consumption of local crops, regardless of their nutritive value, these studies provided important data for nutrition experts looking to advance their claims for policy interventions that promoted the production of protective foods.

However, in the context of the war emergency, measures to avert food shortages and hunger took precedence over scientific and public health agendas to improve nutrition by

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including more protective foods in people’s diets. While those who worked to prevent food emergencies called for measures to secure shipments of rice and beans and control their prices, nutrition scientists argued for the need to increase the production and consumption of fresh vegetables, meat, and dairy products. In this context, local experts made use of parallel organizations to continue their agendas to improve people’s diets through nutrition education and a more diversified agriculture. As part of these efforts, the work conducted by the PRNC lay the foundations for future agendas. The parallel implementation of agrarian reform programs also gave these experts another opportunity to test the effects of these socioeconomic changes over nutritional health.

The war also motivated new investigations into Puerto Ricans’ nutrition status in light of recent innovations in the field and the establishment of the RDAs. These new studies built on New Deal nutrition investigations while making reference to the potential of recent changes to affect people’s health. These new studies uncovered how wartime food shortages affected people’s access to basic products and discerned limited effects of land reform measures among resettled communities. However, nutrition experts like Ramón Suárez, Esther Seijo, and Ana Blanco argued for the need to continue efforts to promote nutritional improvement through education and social work among the rural poor and by reforming the island’s food supply. For these local professionals, promoting health and fitness through nutrition and agricultural education served to locate the island’s experience as part of U.S. wartime agendas and emphasize people’s capacity to exert the duties of citizenship during the conflict and its aftermath.

Similarly, this impetus to improve nutrition through agricultural diversification and education gave rise to collaborative projects that brought together the concerns of local tropical medicine and tropical agriculture. It also framed the creation of a new government agency
dedicated to increase the profitability of commercial food crops agriculture and the accessibility of local products throughout the island. This synergy between scientific, policy, and political practices directed to improve nutrition through the promotion of food self-sufficiency, however, was short-lived. While the political and bureaucratic discourses remained throughout the following decades, Puerto Ricans never witnessed their full articulation into meaningful alterations to the island’s dependency on food imports.
Part III

“Improving the Lot of the Underserved and the Undernourished”: The Local and Transnational Politics of Food and Nutrition

This section explores the convergence of ideas about nutrition in the implementation of child feeding programs, in debates about the public health applications of new food technologies, and through the deployment of Puerto Rican experts as part of technical assistance and development agencies. During the 1940s, the rising PPD movement harnessed the power of public health and welfare agendas and the professional experience of its practitioners to popularize its political project. For child health specialists, the future society they envisioned during the 1930s and 1940s was now within reach. Therefore Chapter Six explores the interaction between nutrition science, political debates, child health campaigns, eugenic regeneration ideologies, and anxieties about overpopulation in the planning and implementation of milk stations and school meals programs. This chapter also analyzes how Puerto Ricans’ appropriated nutrition’s political discourses to frame their claims for entitlements and participation in the welfare and public health system of the new PPD government.

Building on this analysis of the politics of nutrition, Chapter Seven examines the debates and implementation around legislation to require the enrichment of all rice imported to Puerto Rico, the promotion of the sale and consumption of dairy by-products as nutritional supplements, the implementation of measures to modernize the island’s food distribution system, and campaigns to teach consumers and food sellers to navigate these new modern, standardized, and sanitized food marketplaces. It also traces how these projects reflected global postwar nutrition practices and technologies and how this expertise served local and U.S. governments to promote the island as a “showcase of development” during the 1950s and of democracy during the 1960s.
Chapter Six

Nurturing the Citizens of the Future: Milk Stations, School Meals, and Child Nutrition

Once the child has passed his first year of life, milk, not maternal but from the cow, continues to be the most basic food. Among all known foods, cow’s milk is the one closest to perfection. The development of bones, teeth, and tissues in the child will depend on the nutrition he receives and there is no way to feed him better than with a diet which principal ingredient is cow’s milk.\footnote{Fernós Isern to Paniagua, “Declaración”. November, 24 1944. AGPR. fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.1}

Introduction

The crises provoked by the Depression and WWII in Puerto Rico highlighted the structural foundations of the island’s nutrition and food supply problems. Nutrition experts, agricultural scientists, and government officials engaged in discussions about how the monocrops economy and dependence on food imports affected public health. Simultaneously, the need to address the short term effects of food scarcity became more urgent during these critical moments. The devastation provoked by the combination of natural disasters and economic depression during the early 1930s fostered a renewed attention to these conditions from local professionals and government officials as well as from U.S. authorities and philanthropies. As part of this, the plight of Puerto Rican children poignantly demonstrated the need for immediate intervention in isolated rural areas and urban slums. The provision of cow’s milk and the organization of child feeding programs were responses to these concerns.

This chapter examines infant and child feeding programs by analyzing the biomedical, public health, and political practices shaping their organization and functioning. It pays particular attention to how these initiatives drew from the interaction between eugenic ideologies and nutrition sciences. While ideas about science and medicine’s potential to regenerate the poor motivated the implementation of contemporary rural hygiene programs, the need to avert the
effects of poverty and malnutrition over Puerto Rico’s future citizens made child nutrition programs a particularly vital endeavor. In this context, local experts deployed nutrition arguments together with preventive eugenics’ flexible interpretations of heredity to provide alternatives to the deterministic postulates of tropical medicine.

This chapter shows that the functioning of child feeding programs such as milk stations and school meals was the product of the interaction between these local concerns and U.S. economic and philanthropic agendas. During the Depression, both programs relied heavily on charitable donations and commodities distribution programs for their functioning. Despite this precariousness, these services were incorporated into broader political, policy and professional agendas to uplift the poor and reshape rural Puerto Rico through education, vocational training, and contraception. The attention of Puerto Rican public health and social experts to the problems of children’s malnutrition and infant mortality during the late interwar years was framed by prevalent overpopulation theories and articulated as part of efforts to limit population growth through the distribution of birth control technologies. Thus, the chapter locates the establishment of these child nutrition strategies as part of the pedagogical projects devised by local officials and experts through rural hygiene programs and wartime food policies.

While charitable associations provided funding and the USDA much of the foodstuffs, the expertise of local nutrition and health professionals was crucial for the organization of these programs. Thus, similar to other federal programs extended to the island during this period—such as the Agricultural Extension Service—local professionals and scientists made use of the new resources to put in practice strategies to uplift and redeem the rural poor. By focusing attention on infants and children, programs like milk stations and school meals allowed Puerto

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Rican experts to cement their role in the transformation of rural populations into modern, healthy, and productive citizens. These programs allowed Puerto Rican home economists to establish their authority over child welfare issues while providing a strategic platform to expand their efforts to promote dietary change as part of domestic instruction.

The onset of WWII brought child feeding programs to the center of U.S. and local agendas to devise emergency nutrition and food policy strategies. As Chapter Five showed, nutrition science became a crucial instrument as for the implementation of measures to face the effects of food shortages and rationing. In this context, public health and nutrition experts paid particular attention to the ways in which the war affected the health of children and youth. This heightened awareness of the importance of nutritional health for national defense materialized in increased resources for the expansion and reorganization of child feeding programs in both states and territories. As a result of this expansion, the amount of Puerto Rican rural children participating in relief feeding services increased during the early 1940s. While health and education officials strived to link these feeding programs with current efforts to promote the consumption of local “protective foods”, these initiatives opened the greatest channels yet for the introduction of processed food products imported from the U.S. The expanding reach of emergency feeding programs in Puerto Rico’s countryside throughout this decade also created new contact spaces between rural populations and representatives of the new PPD government.

For public health and nutrition workers, the provision of food relief, contraception education, and nutrition advice became important aspects in their efforts to alleviate the effects of poverty during the Depression and WWII. By the late 1940s, child nutrition and health programs like milk stations and school meals were incorporated to the discourse of the PPD and its focus on rural poverty, agrarian reform, and family welfare. After the war ended, officials
from the local departments of Health, Education, and Agriculture staffing child feeding programs mobilized to transform them into permanent government services. In this context, they deployed the party’s discourse their own professional authority in attempts to rationalize, reorganize, and expand these child nutrition programs. These nutrition and public health agendas were facilitated by the new political environment on the island after the introduction of the Commonwealth, the institutionalization of school feeding services in the U.S., and the role of surplus commodities programs in post-WWII international politics.

The functioning of child feeding programs also drew from the paternalist rhetoric of the PPD and Muñoz Marín who presented himself as the head of the great Puerto Rican family. These factors shaped the practical and symbolic significance of milk stations and school meal services as part of the expanding public health and welfare infrastructures of the PPD government. As the industrialization program took shape during the 1950s, health and welfare experts promoted the importance of these child nutrition programs by linking them to the government’s vital need to cultivate productive industrial laborers. Poor Puerto Ricans, on the other hand, also deployed the PPD discourse about nutrition and feeding to claim access to these programs and articulate their own understandings of their role as part of them.

Child Nutrition and Public Health during the Interwar Years

Concerns with children’s malnutrition motivated an inter-American dialogue about the relationship between diets, health, and appropriate physical development during the interwar years. This dialogue was channeled through the annual Pan American Child Congress where participants, particularly women professionals, focused particularly on relationship between poor nutrition and infant mortality. Issues of nutrition and feeding moved to the forefront of these

753 Suárez Findlay, We are Left Without a Father Here: Masculinity, Domesticity, and Migration in Postwar Puerto Rico.
debates in the context of increasing emphases on the effects of social environments over children’s development. Crowded housing conditions, child labor, poor sanitation, and food scarcity were among the most widely discussed issues. The Pan American Child congresses provided a platform for medical and social experts to advocate for the establishment of child-focused welfare policies in Latin America directed at attending these issues. While the Latin American child specialists who took part in the Pan American Child Congresses utilized eugenic ideologies to frame their claims for state involvement in public health and welfare matters, their broader agenda focused on fostering international cooperation in “safeguarding the health and well-being of children”.  

In the U.S., concerns with the effects of children’s malnutrition rose as more children gained access to public education and entered the gaze of medical and education professionals. While the expansion of public schooling increased the visibility of children’s malnutrition as a public health problem, the Depression heightened concerns over the long-term effects of deficient diets. Although malnutrition’s status as a clinical concept remained malleable and its diagnosis was a highly contested area of medical practice during the 1920s and 1930s, new knowledge about deficiency diseases made subclinical cases more evident. By the late 1930s, the idea that all children were at risk of suffering the long-term effects of nutritional deficiencies was articulated in “a policy of management” “addressed to all children, not solely the malnourished ones.” Similarly, in many Latin American countries the need to address the public health effects of the Depression led to the implementation of measures to address infant mortality and children’s malnutrition. In 1930s Mexico the government embarked in the

755 Ruis, "Children with Half-Starved Bodies" and the Assessment of Malnutrition in the United States, 1890-1950."  
756 Ibid. 380
construction of a “network of urban clinics where mothers were instructed in modern child care techniques”. As adepts of the emerging field of puericulture, Mexican physicians believed that “medical science could provide more than far-reaching health benefits to the Mexican people”, they could also “cure social ills.”

The organization of child welfare services in Puerto Rico was part of this inter-American movement that focused on the health status and living conditions of children. Puerto Rican women and men concerned with the relationship between health and social problems worked “under very eugenic division names” such as the Bureau of Social Medicine and Puericulture of the Department of Health. With funding and personnel from the RF and the Department established health units offering infant hygiene clinics, prenatal and maternity care, educational conferences, and treatment for tuberculosis. Although initially these public health units did not distribute contraception, these projects also included attempts to tackle the “population problem” through maternal education programs. As Chapter Four illustrated, the Social Service Division of the PRERA and its Nutrition and Home Economics Unit established day-care centers, nursery schools, and adult instruction programs that included parental education aimed at “teaching parents their responsibilities with respect to child rearing and family life.” The PRRA followed up on these efforts through its Health Division and Social Work section.

As officials at the Department of Health, physicians Antonio Fernós Isern and José Rodríguez Pastor were part of a growing inter-continental network of medical professionals who saw in scientific child rearing the key to regenerate society at large. They stressed the potential

758 Briggs, Reproducing Empire: Race, Sex, Science and U.S. Imperialism in Puerto Rico.101
760 Ramirez de Arellano and Seipp, Colonialism, Catholicism, and Contraception: A History of Birth Control in Puerto Rico. 33
of public health to both eliminate disease problems and regenerate Puerto Rico’s poor. Although the decentralized way in which the Department collected information about these disease problems often produced misleading data, statistician Manuel A. Pérez emphasized that “many of the factors contributing to our high mortality are of a social and economic character”.

Malaria, for example, was more prevalent in the coasts where the irrigation needs of sugar cane cultivation fostered mosquitoes’ propagation. According to one RF official, although hookworm infestation was widespread “it practically affected 100 percent of the population” in the coffee highlands. Similarly, given the lower resistance of poorly fed bodies, mortality from tuberculosis remained “appalling” everywhere with a death rate of 301 per 100,000 population in the fiscal year 1928-29. The effects of these infectious disease problems over children’s health and the future of Puerto Rican society provoked deep anxieties among medical and welfare professionals during these years. Moreover, prevalent preoccupations with the deficiencies of most Puerto Ricans’ deficient diets heightened concerns with children’s vulnerability to disease.

In this context, the high infant mortality rate attracted special attention. With 146 deaths per 1,000 live births for 1927-28 it was, according to Fernós Isern and Rodriguez Pastor, one of the highest in the continent. In their analysis, this rate was affected by population density and economic condition, by the caretaker’s education and race, as well as by the infant’s social status and sex. In their view, “the ignorance of our masses as to infant hygiene” was particularly evident in the “lack of proper care as to cleanliness and systematic feeding”. The practice of feeding infants “herb teas in dirty bottles” and “mixed or artificial feeding” made from solids

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762 Morales Otero et al., "Health and Socioeconomic Studies in Puerto Rico I: Health and Socioeconomic Conditions on a Sugar Cane Plantation."
763 "Tentative Report of the Committee of the American Child Health Association.” RAC, RF, RG 1.1, series 243, box 1, folder 18, 4-5
like rice with bean gravy contributed to make diarrhea and enteritis the primary cause of infant mortality.\textsuperscript{765} Although the island’s invariable climate and “other diseases that assume gastrointestinal forms” also affected the prevalence of these disorders, Fernós Isern and Rodríguez Pastor argued that “economic and social factors aggravate all the former causes”.\textsuperscript{766}

For Fernós Isern and Rodríguez Pastor, the population issue was among the most important social factors leading to high infant mortality rate and children’s malnutrition in Puerto Rico. Efforts to attend this issue by including birth control in maternal and child health programs implemented through the PRERA and the PRRA faced fierce opposition from the Catholic Church and its allies in the local and federal governments. However, Puerto Rican medical and social welfare professionals continued to call attention to the need to control population growth as part of any sensible public health program, especially in rural areas. On November of 1936 a group of Puerto Rican professionals interested in promoting contraception on the island met at the STM to plan an island-wide birth control project by creating the \textit{Asociación Pro Salud Maternal e Infantil de Puerto Rico} (Maternal and Child Health Association of Puerto Rico). This group’s activism led in April 1937 to the approval of legislations to provide for the creation of a Eugenic Board “to consider compulsory sterilization for medical or moral reasons”, to amend the penal code and allow the dissemination of contraceptive information and technologies, and to authorize the Commissioner of Health to provide maternal health and birth control services through the island’s public health units.\textsuperscript{767}

Thus, concerns over Puerto Rico’s high rates of infant and child mortality heightened during the 1930s as rural areas and populations moved to the center stage of local policy and

\textsuperscript{765} Ibid, 172
\textsuperscript{766} Ibid, 177
\textsuperscript{767} Ramírez de Arellano and Seipp, \textit{Colonialism, Catholicism, and Contraception: A History of Birth Control in Puerto Rico}. 49
professional debates around the island’s political and economic state. Amidst this increasing scrutiny of what were considered the problems of rural life on the island, anxieties over Puerto Ricans’ high fertility rates intertwined with attention to the effects of deficient diets over the health and productivity. The articulation of nutrition as both a public health and economic problem had profound effects in the ways Puerto Rican medical and welfare experts understood the causes and manifestations of rural poverty as well as defined solutions to it. Beyond merely achieving a Malthusian balance between population and resources, improving the quality of Puerto Rico’s human stock and increasing society’s productivity required preventing the long-term effects of deficient diets and insalubrious environments. Applying their professional expertise and scientific authority, public health, nutrition, and social workers strived to rehabilitate physical and social bodies by alleviating the present deficits of poverty while fostering a future generation of workers capable of incorporating themselves productively into society. The organization of nutrition programs for mothers and children provided a particularly powerful instrument to put these plans into practice.

By the 1920s, the provision of cow’s milk was one the most widely utilized strategies to improve children’s nutrition and lower infant mortality. The image of cow’s milk as a natural foodstuff “essential for human development and a feature of civilized nations” gradually emerged during the second half of the nineteenth century. Nonetheless, despite its reputation as ideal food for children, contaminated cow’s milk was recognized since the late nineteenth century as a serious public health threat producing high infant mortality in Europe and North America. Milk was associated with gastrointestinal disorders and could serve as vector for

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768 Aguilar-Rodríguez, “Nutrition and Modernity: Milk Consumption in 1940s and 1950s Mexico.” 37
diseases such as typhoid and bovine tuberculosis. Turning a potentially dangerous product into “nature’s perfect food” was the result of a complex interaction between agro-economic imperatives, demographic changes, gender and religious ideas, scientific innovation, and public health regulation.770

Apart from enacting regulation over the production, distribution, and sale of this and other dairy products, public health authorities promoted safe milk distribution programs as a way to prevent the transmission of diseases to infants. Following the model of France’s *Goutte de Lait* program, individuals concerned with high infant mortality advocated for the construction of milk stations in the United States. By establishing depots ruled by sanitary regulations regarding the production, transport, and serving of cow’s milk, public health authorities aimed to lower infant mortality due to the transmission of cattle diseases and bacterial contamination.771 In Latin America, Uruguay was one of the first countries to establish a similar program in 1908.772 In Uruguay and France the provision of milk “was one of many different activities designed to insure the health of the child”, such as medical attention and “instruction in the hygienic care of infants”, while U.S. stations were mostly funded by charitable agencies and did little beyond distributing milk under sanitary conditions.773

New nutrition discoveries during the interwar years consolidated the image of milk consumption as the preferred solution to children’s malnutrition. Building on its reputation as a natural beverage, nutrition science presented milk as “an important source of animal protein and

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vitamins”. Experiments among school children further established this image of cow’s milk as a nutritious beverage necessary for growth and development. For example, in 1928 British physician John Boyd Orr published findings showing that “there was a clear correlation” between added milk and extra growth in children and that the “increase in the height and weight of children who received an added milk diet was 20% greater than that of children who received no extra milk.”

Rockefeller Foundation’s George Payne, who supervised the functioning of the municipal health units in Puerto Rico, and unit physician Ezequiel Martínez conducted a similar study among children assisting to two schools in Río Piedras. Payne and Martínez’s study aimed to “search for some article of food which might be used in school lunches for the poorer classes to improve the general health and to reduce the evidence of under-nutrition”. For this they compared the weights of children in two experimental groups, one receiving a supplement of whole milk powder and the other bananas. Their study showed that although all children experienced a net loss in weight “the group receiving milk showed a smaller net loss than any other group”. Based on the findings of these and similar studies—as well as the “clever promotional campaigns” of dairy industries who often times sponsored nutrition research—by the late 1920s the link between milk consumption and child nutrition was well established.

In Puerto Rico, however, Fernós Isern and Rodríguez Pastor emphasized that “the prohibitive cost of milk is of greater importance, as far as it concerns the etiology of infant

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774 Aguilar-Rodríguez, "Nutrition and Modernity: Milk Consumption in 1940s and 1950s Mexico."
777 Ibid, 251
mortality in Porto Rico” after the first six months of age. While milk also remained prohibitive for the urban poor in the U.S., where meeting the requirements established by nutrition experts “would make a big dent in family budgets”, in Puerto Rico this problem was linked to the state of the island’s agriculture economy. The relationship between monocrops agriculture and the problem of limited milk supply was emphasized by nutrition scientists such as biochemist Henry Sherman. After visiting the island in 1930 Sherman noted that increasing the availability of milk would be “of great difficulty here, especially with the concentration of land in the hands of large owners interested only in the growing of cash crops.” During the 1930s, these discussions about the milk supply became salient elements of public health agendas that linked the expansion of the monocrops economy with the problem of malnutrition among rural children. Finding strategies to increase vitamin A and calcium intake were an important part of the nutritional research carried out at the STM. Given that what was considered the typical Puerto Rican diet provided low amounts of these nutrients, researchers emphasized the need to increase the consumption of protective foods, especially among children.

Pablo Morales Otero, President of the Puerto Rico Medical Association, also emphasized the relationship between the decrease in the land dedicated to subsistence agriculture, the increasing reliance on imports to satisfy local food needs, and the island’s malnutrition problem. Researchers at the STM calculated that the island imported more than half of its energy needs and that rice and beans made up forty-seven percent of total food imports. As a result of this precarious diet, they argued, “malnutrition was ubiquitous” among both children.

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779 Fernós Isern and Rodríguez Pastor, "A Survey of Infant Mortality in Porto Rico." 175  
780 Levenstein, Paradox of Plenty: A Social History of Eating in Modern America. 59  
782 Morales Otero, "Nuestros Más Importantes Problemas Sanitarios."  
783 Cook, "Some Aspects of the Food Problem in Puerto Rico."
and adults. In this context, the provision of milk for children “took a rank as a public health measure along with the hospitalization of open cases of tuberculosis, the field work against hookworm and malaria, and the laboratory studies of intestinal diseases.”

This image of cow’s milk as both an ideal food for infants and children and a highly nutritious beverage became part of national public health strategies. For example, Mexican policy makers “gave enormous importance to the spread of milk drinking because they believed that it would transform Mexico for the better”. Post-revolutionary governments implemented milk distribution programs with the explicit purpose of lowering infant mortality and raising healthy citizens. As part of these agendas, the introduction and promotion of powdered milk “became one of the main projects designed to increase consumption of animal protein” among vulnerable populations, especially children. Health authorities in Puerto Rico also associated malnutrition and infant mortality with a very low per capita consumption of milk, especially in rural areas where the death of children seemed to be an everyday occurrence at the time Payne and Martínez’s experiments. Addressing this situation became one of the central tasks of relief and reconstruction programs established as part of the Puerto Rican New Deal.

For Puerto Rico’s Hungry Children: Milk Stations during the Depression

Images of the tragic fate of Puerto Rico’s hungry children became the most vivid recollections of a survey tour Theodore Roosevelt Jr. made after being appointed Governor in 1929. According to physician Luis Salivia, as soon as Roosevelt arrived on the island he became “greatly interested in bettering the condition of the inhabitants of our island” especially of

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Roosevelt summarized his initial impressions of the island in various articles appearing in the U.S. press. Among these, *The Literary Digest* published an account of his observations under the title “Porto Rico’s Hungry Children.” “The basis of health is adequate food,” the new Governor wrote, “and this is what the children of Porto Rico have not had, and do not get to-day.” With “hundreds of thousands on starvation diets the results are obvious; in their weak and depleted condition they go down before attacks of any serious disease” As a result, “on the roads time and again I have passed pathetic little groups carrying small home-made coffins.” By sharing these anecdotes with the U.S. public, Roosevelt brought attention to the effects of the Depression in Puerto Rico and presented the malnutrition situation, especially among children, as one of the most dramatic manifestations of the island’s abject poverty.

Similarly, other U.S. observers and medical experts considered children’s malnutrition one of Puerto Rico’s most concerning public health problems. For example in December of 1931 an editorial note in the *American Journal of Public Health* lamented that while “Porto Rico and its distressing health conditions, may seem remote to most of us” “this West Indian island has been part of the United States for a third of a century, and its million and a half inhabitants are as much American citizens as the Mayflower descendants of Massachusetts.” In spite of this, children in this “section of the United States” are “permitted to suffer continuous ill-health when others are favored with skillful attention which serves to reduce death rates and render life longer.” The author presented the lack of adequate food as the biggest factor contributing to this dire situation. The editorial concluded that skillful attention and health care “should be the

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786 Luis A. Salivia, "Some Health Problems Concerning the Children in the Public Schools of Porto Rico" *Medical Journal and Record* 132 (1930). 68
788 ‘Puerto Rico’s Hungry Children’
privilege of every American citizen and particularly of those who are to be the citizens of the future.” The first step redressing this neglect was ensuring an adequate supply of foods.

This renewed attention to the health of Puerto Rico’s future citizens compelled U.S. charitable organizations like the American Relief Administration, the American Red Cross, and the American Child Health Association (ACHA) to pay attention to the living conditions of those who were “suffering more than any other children beneath the American flag.” Among these, the ACHA visited the island in January of 1930 to conduct a systematic inquiry “in respect to the health, nutrition and social relations of the people, especially the children, of Porto Rico”. After the Association submitted its preliminary report, the American Relief Administration (ARA) made available a $100,000 emergency fund for the Departments of Health and Instruction. From these $75,000 was allocated to the Department of Instruction for the purpose of feeding school and pre-school children and $25,000 to the Department of Health. From this portion, $1,000 was “to be used for medicines for babies who attend the clinics in the [public health] units” and $24,000 “was to be used exclusively for the purchase and distribution of milk for infants and mothers” at stations to be established throughout the island.

Even when Payne objected to this limitation of ARA funds exclusively for the purchase of milk—without considering the costs of personnel training, transportation, and operation of the stations—he agreed to head the committee in charge of implementing the proposed infant feeding plan. For this, the Department of Health divided the island into twelve districts, each comprising from five to seven towns. Personnel from the Department trained twelve women

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790 Ibid
792 Payne to Howard, February 18 1930. RAC, RF, RG 1.1 series 243, box 1, folder 18
793 Ibid
“with college education in the principles of infant care with emphasis on infant feeding.” Once trained, these women received the title of Infant Feeding Instructors and were sent to their respective districts to coordinate the distribution of milk. Instructors organized in each town a Young Mother’s Club “composed of ten intelligent, well-to-do mothers” who were responsible for distributing milk, for educating “poorer and more ignorant mothers in matters pertaining to child health,” and for “making visits to the homes to see that milk is properly prepared and fed to the child”. Milk distributed at the stations was only for infants “except in the case of poor nursing mothers, whose milk supply is inadequate because of lack of food”. In these cases milk was provided to the mother, but had to be consumed “in the presence of the instructor or of one of the members of the club”.794

This emphasis on training and supervision of mothers was characteristic of puericulture programs which promoted scientific motherhood and “better baby care”.795 Apart from fulfilling these goals, infant feeding instructors’ work supervising and educating poor mothers had a particular significance in the Puerto Rico of the 1930s. They were part of the emerging professional classes that Del Moral identifies as “intermediate agents” between the colonial state and the working poor.796 These professionals utilized the methods and approaches of their fields to alleviate rural poverty. As Rodríguez Pastor described in a letter to Payne, with over 80 milk stations established throughout the island infant feeding instructors developed a particular relationship with the communities. He reported that in some towns they were known as lecheras

796 Del Moral, Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952.
(milk ladies) and that residents had named one particular Mother’s Club La vaquita del nene (The kid’s cow).797

While instructors had to charge “the equivalent to one-third of the cost of the milk given out,” “they could secure a trust fund from the members of the Club or some charitable society from which to pay for milk for those mothers who were too poor to pay that amount”.798 In order to secure that trust fund, instructors often organized fundraising events. In August of 1930 one of these events took place in the town of Cayey. According to Rodríguez Pastor it was a “big dance” called El baile de los desnutridos (The dance of the malnourished).799 This organization of this event reflects the close relationship that infant feeding instructors developed with local residents and the extent to which malnutrition became a characteristic of these communities. The name chosen exemplifies how children’s sickness and vulnerability became symbols of the poverty and decay of rural communities but also of their potential for cure through the new pedagogical projects devised by local nutrition, agriculture, and public health experts.

As the number of rural public health units increased, milk stations were integrated to other services like prenatal care and screening for tuberculosis. Infants referred to milk stations by the unit physician received eight ounces of milk or milk formula daily for a period of six months.800 Although the utilization of fresh milk whenever it was possible to obtain a safe source and the encouragement of “a better supply of milk throughout the island” were part of the initial planning, local dairies’ production remained limited throughout the decade.801 Therefore, the Department of Health relied on imported milk for its child welfare clinics. After the passage of

797 Rodríguez Pastor to Payne, August 24 1930. RAC, RF. RG 1.1 series243, box 1, folder 18
799 Rodríguez Pastor to Payne, August 24 1930. RAC, RF. RG 1.1 series 243, box 1, folder 18.
section 32 of the Agricultural Adjustment Act (AAA) in 1935, donations of surplus powdered and evaporated milk from the USDA Federal Surplus Commodities Corporation became the primary source of support for the stations. In this way, Puerto Rico became a recipient of surplus donations utilized during the 1930s as a strategy to stabilize agricultural prices.802

The milk stations program also benefited from the establishment of other New Deal agencies. The Federal Emergency Relief Administration and the PRERA assigned $10,000 and $5,000 a month respectively to “enlarge and continue the program of the milk stations”.803 When the PRERA was dissolved, the PRRA continued funding child health and nutrition services.804 The gradual extension to Puerto Rico of the Social Security Act’s maternal and child welfare provisions further helped the local government to support the milk stations program. When the Department of Health submitted “an approved plan for maternal and child-health services administered by the Children’s Bureau,” Puerto Rico became eligible for federal grants totaling $190,000 for the fiscal year of 1941.805 With these additional funds the Department was operating 141 milk stations with a registration of 4,721 infants.806 However, child welfare experts continued to call attention to the needs of children over two years of age and those who did not attend school and thus were not served by any existing program. The advent of WWII fostered the sense of urgency that led to the creation of a nutrition program for this population. It also provided the conditions for its transformation, together with the infant milk stations, in symbol of the emerging PPD project and instrument of its politico-economic agendas.

802 Sarah T. Phillips et al., ”Reflections on One Hundred and Fifty Years of the United States Department of Agriculture,” Agricultural History 87, no. 3 (2013). 355.
803 Nora Romeu de Ramirez, “Milk Stations,” in Memoria del Primer Congreso del Niño de Puerto Rico (San Juan: Negociado de Materiales, Imprenta y Transporte, 1943).
804 Pablo Morales Otero, Nuestros Problemas (San Juan: Biblioteca de Autores Puertorriqueños, 1958). 112
806 Blanco, Nutrition Studies in Puerto Rico. 85-86
Milk Distribution Programs during World War II

On April of 1939, at the request of President Franklin Roosevelt, Secretary of Labor Frances Perkins convened experts on child health and welfare in the White House Conference of Children in a Democracy. This conference set a series of goals related to the health, educational, and nutritional needs of children in the U.S. and its possessions.807 In response to this initiative, the Puerto Rican Legislature approved Law No. 150 to convene child welfare experts in the First Puerto Rico Child Congress. Celebrated on December of 1941, the Congress presented proposals to reach the goals set by the White House Conference.808 As Vice-President of the organizing committee, Fernós Isern emphasized Puerto Rico’s vital need to attend to the needs of children who were “the most tender and delicate part of society and with a greater right to be cared for because it represents the security of its continuation”.809 Consistent with this spirit, Congress’ participants recommended an increase in the number of milk stations in rural areas. These stations would “become in the future infant feeding dispensaries where indigent mothers will receive, apart from milk formula, solid foods to complement the baby’s nutrition”.810 New revenue resulting from increasing rum tax returns together with Social Security funds allowed the government to put some of these recommendations into practice.

As the new war placed Puerto Rico at the center of U.S. national defense strategies in the Caribbean and surrounding areas, local and federal agencies escalated their investments in

807 Children's Bureau, "Conference of Children in a Democracy called by the President," The Child 3, no. 8 (1939).
808 Charles Schottland, "The First Puerto Rican Child Congress-an achievement in Democracy," The Child 6, no. 8 (1942). 192
809 Antonio Fernós Isern, "Informe Sometido por el Comité de Informe y Resoluciones," in Memoria del Primer Congreso del Niño de Puerto Rico (San Juan: Negociado de Materiales, Imprenta y Transporte, 1943).
810 R. Fernández Marchante, "La Morbilidad y Mortalidad en la Infancia y la Niñez," in Memoria del Primer Congreso del Niño de Puerto Rico (San Juan: Negociado de Materiales, Imprenta y Transporte, 1943). 267-268
sanitation, transportation, and defense infrastructure.\textsuperscript{811} The island’s geopolitical and military importance brought once again the plight of Puerto Rican children to the attention of U.S. and local officials. Concerns over nutrition issues during the war also increased the importance of commodities distribution programs, especially in relation to dairy products. Simultaneously, technological developments and changing nutrition policy lay the groundwork for introducing skim milk as a human food. In efforts to capitalize on skim milk’s newfound reputation, the dairy industry lobbied federal agencies to increase the distribution of skim milk and other dairy surpluses through relief feeding programs domestically and internationally as well for military personnel.\textsuperscript{812} In this context, donations of powdered and evaporated milk from the Agricultural Marketing Administration (AMA) of the USDA reached Puerto Ricans through infant and child feeding programs. As the threat of food shortages and transport problems heightened, the USDA used Section 32 funds to also provide assistance directly to schools and child care centers.\textsuperscript{813}

The War Emergency Program (WEP) in Puerto Rico used these donations to establish a child feeding program that included a new milk stations service for preschool children and the construction and operation of new school lunchrooms. This new service was officially described as a “project for the preparation and serving of milk and other foods to pre-school children of poor families and children from eight to ten years of age not attending school and not receiving the benefits of any other feeding program”.\textsuperscript{814} The WEP also provided materials and employed workers to build “sanitary” milk shelters with concrete floors.\textsuperscript{815} Home economist Rita Lang was

\textsuperscript{811} José Bolívar Fresneda, “Las Inversiones y los Programas Militares: Construyendo la Infraestructura y los Recursos Humanos de la Postguerra,” in Puerto Rico en la Segunda Guerra Mundial: Baluarte del Caribe, ed. Jorge Rodríguez Beruff and José Bolívar Fresneda (San Juan: Ediciones Callejón, 2012).

\textsuperscript{812} Smith-Howard, Pure and Modern Milk: An Environmental History since 1900. 77-80

\textsuperscript{813} Waugh, “The Food Distribution Programs of the Agricultural Marketing Administration.”

\textsuperscript{814} Certificación del Proyecto de Estaciones de Leche, Programa de Emergencia de Guerra, January 13 1947. caja 1825, folder 215.1-Programa de Leche

\textsuperscript{815} “Statement on War Emergency Program of the Government of Puerto Rico to the Committee on Insular Affairs” May 10 1944. NARA-CP. RG 69, A1, Entry 1043, box 2, folder Puerto Rico/Statement on WPA. Exhibit XX. 7
appointed as General Supervisor of the new child feeding program while Governor Tugwell’s wife Grace served as Director of its milk stations service (Image 6.1). From this position, she corresponded regularly with health officials regarding the program’s functioning and coordinated fundraising activities for the construction and maintenance of the stations.

As part of these fundraising initiatives, Grace Tugwell requested Fernós Isern, now Commissioner of Health, to write a declaration “emphasizing the importance of milk in children’s daily diet”. In this declaration Fernós Isern described the program’s functioning and highlighted the importance of improving children’s nutrition for Puerto Rico’s struggle to

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816 G. Tugwell to Fernós Isern, November 22 1944. AGPR. fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.1-Programa de Leche
achieve a healthy and productive society. “The child feeding program,” he explained, “distributes milk and other foods to more than 40,000 children between two and seven years of age.” “These are 40,000 homes that ensure their children’s lives; 40,000 citizens of the future who walk towards adult life strengthening their bodies, structuring them with the ingredients necessary to be strong and healthy.” Fernós Isern also emphasized the milk stations program’s importance by placing it among the most essential functions of public health in Puerto Rico. Together with the provision of clean water, sanitation, and hygienic housing, “ensuring people’s nutrition is essential, fundamental, and basic for public health.”

These declarations aided Grace Tugwell in her fundraising campaigns calling the attention of film production companies, local baseball leagues, and even “the men of the First and Second Battalions of the 65th Infantry” regiment who encouraged patrons and members to donate to the program. In July 1943 RKO Radio Pictures Inc. offered to donate part of the profits obtained from the distribution in Puerto Rico of the film “Forever and a Day” to the “Infantile Food Stations.” In correspondence with the Tugwells, RKO manager stressed their commitment with charitable institutions by noting how the proceeds from this movie’s distribution in the U.S. went to the National Foundation for Infantile Paralysis. Once the details of the campaign were clarified, particularly the exact percentage of the profits to be turned to the “milk fund,” a “special screening event” was scheduled at the Fox Miramar Theatre. Invitees to this event included personalities such as the President of the Banco Popular, the Director of the AES, the San Juan District Attorney, the commissioners of Health and Instruction, the Chief of

817 Fernós Isern to Paniagua, “Declaración”, November 24 1944. AGPR, fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.1
818 R. Tugwell to Cabrero, June 26 1945. caja 1825, folder 215.1-Programa de Leche
819 Seckler to G. Tugwell, July 30 1943. caja 1825, folder 215.1-Programa de Leche
the Insular Police, the Chancellor of the UPR, the Director of the STM, the Editor of the *El Mundo*, and the President of the Senate Luis Muñoz Marín.\(^{820}\)

Grace Tugwell’s work promoting the milk stations program was also recognized abroad. While her husband left the governorship amidst growing discontent with his performance—especially regarding the implementation of the Land Law—U.S. media reported that “there is one more thing the Tugwell administration will be remembered for, though it is more the work of Mrs. Tugwell than of the governor.” The *Ogden Standard Examiner* reported that this work was “a private charity to give pre-school children one good meal a day.” The success of this charity, the report continued, was due to Mrs. Tugwell’s initiative who “aided by a group of Puerto Rican women”, “has begged and brow-beaten everyone with money into supporting this endeavor.” Milk and feeding stations “have been set up in many areas and for the first time, Puerto Rican

\(^{820}\) Telegram from Charles O’Day, August 12 1943. caja 1825, folder 215.1-Programa de Leche
youngsters are being taught to like orange juice, cereal and milk when they can get it, in place of
the traditional diet of coffee, saltfish and rice.”821

Thus, by the mid-1940s news of the importance of milk stations in alleviating the plight
of Puerto Rico’s children had traveled as far away from the island as Ogden, Utah. In Puerto
Rico, the popularity of these services led the Department of Health to create a Nutrition Section
under the Bureau of Maternal and Child Health, formerly the Bureau of Social Medicine and
Puericulture, to manage child feeding programs. The growing significance of milk distribution
programs resulted from the local articulation of public health and political agendas utilizing the
financial and institutional resources of U.S. relief agencies. These dynamics were also
manifested in the local trajectory of the quintessential child feeding programs: the school meal.

A Charitable Enterprise: Early School Meal Programs in Puerto Rico

As the previous discussion illustrated, Depression-era measures to stabilize agricultural
prices facilitated the establishment of milk stations as strategies to alleviate children’s
malnutrition in Puerto Rico. Similarly, efforts to subsidize the U.S. agricultural economy by
channeling surpluses out of the market were key for the institutionalization and functioning of
school meal programs on the island. As scholars have noted, school meal programs in the U.S.
and its territories have played different roles and responded to often conflicting agendas, from
fulfilling public health and nutrition objectives to subsidizing agricultural industries. While
virtually all food relief services during the Depression and WWII depended on surplus
commodities for their functioning, Puerto Rico’s long standing reliance on food imports
increased the role of commodities distribution for the organization of school meal programs.

821 New Governor in Puerto Rico, work of Mrs. Tugwell, Ogden Standard Examiner, May 26 1946, 7A.
While public schools in the U.S. provided some type of food since the 1850s through the work of charitable organizations and private individuals, it was not until the early twentieth century that the service was regularized.\footnote{Carmen B. Sayáns, "Food Service in Puerto Rican Public Schools" (Syracuse University, 1952).11} The work of home economists was instrumental for the organization, popularization, and eventual transformation of these local programs into federally-run services. Through the Bureau of Home Economics of the USDA, state cooperative extension agencies, and local departments of education home economists applied new nutrition knowledge to design menus while planning the budgeting and administration of lunch rooms. Through the Children’s Bureau, home economists and social workers lobbied for more federal involvement in child feeding programs like milk stations and school meals. In this way, school meals became another strategy for professional women to attempt to mold the eating habits of immigrants and the rural and urban poor during the Progressive Era.\footnote{Veit, Modern Food, Moral Food: Self-control, Science, and the Rise of Modern American Eating in the Early Twentieth Century.}

In Puerto Rico, the provision of school meals went hand in hand with the expansion of the public education system. As Chapter 3 discussed, education policies during these years were shaped by efforts to foster loyalty toward the U.S. and its institutions among Puerto Rican children, especially after the extension of U.S. citizenship to Puerto Ricans in 1917.\footnote{Del Moral, Negotiating Empire: The Cultural Politics of Schools in Puerto Rico, 1898-1952.} In June of 1925 the Puerto Rican legislature approved a measure to include the provision of meals to children attending public schools in Puerto Rico. These dining rooms offered food to poor school children in the period between the morning and afternoon sessions. Through these dining rooms teachers and school administrators to teach “appropriate” eating habits and hygiene principles. With this measure, the Department of Education also attempted to increase attendance in rural
areas where children who lived too far away from school missed the afternoon session because they had to return home for lunch or went hungry if they stayed.825

However, lunch time meal services in public schools remained in a precarious and tentative state during the early 1930s. The provision of food services for children in schools dining rooms was still a locally organized effort, staffed by teachers or volunteer personnel, and located in improvised buildings. The cook was usually recruited from the local community while students were deployed to help in the serving and cleaning. The dining rooms and kitchens were “equipped with a homebuilt charcoal stove usually having two or three holes.” Cooking utensils were “simple, probably a 5-gallon oil tin and a few large cooking pots.”826 Most of the funds used for the purchase of these utensils as well as the foodstuffs served came from charitable donations, small municipal and insular appropriations, and the contributions of students who were able to pay a cent per meal.827 In these circumstances, few schools provided a steady meal service while the amount of children receiving it remained limited, especially in rural areas.

As the Depression worsened, depictions of the state of Puerto Rican children circulating in the U.S. press emphasized malnutrition’s effects over school attendance and learning ability. Assessments of the nutrition problem among school children also figured prominently as part of the multiple studies and surveys conducted in Puerto Rico during the early 1930s.828 While Crumbine and his colleagues from the ACHA investigated the health and nutrition situation of rural children on the island, Katherine Cook, Chief of the U.S. Department of the Interior’s Division of Special Problems, visited Puerto Rico in 1933 to study the state of public education.

825 Ortiz Cuadra, "La Economía Doméstica Sobre el Papel: La Enseñanza de las Ciencias del Hogar en las Escuelas Públicas de Puerto Rico entre 1903 y 1931." Note 29
827 Memorándum para las Comisiones de Hacienda de la Legislatura sobre los Comedores Escolares, 19 febrero 1946, ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360
828 Clark, Porto Rico and Its Problems.77-78
For Cook, the high percentage of dependent school-age children on the island due to “the rapid population increase”, made public education one of the government’s primary tasks. Among these, the preparation and serving of school lunches while “primarily a relief measure”, was “one of the most important activities of the school system.” Cook’s description of these school meal services included information on the type of meals provided and the number of children served while it emphasized the relief function of the program, especially in the context of “the drastic effects of the hurricane of 1928” and the equally serious storm that followed hit in 1932.829

Despite these emergency conditions, Cook argued that the school lunch program functioned “as an educational, health, and social agency rather than merely an instrument to feed hungry and needy children.” Teachers working in the lunch rooms used this opportunity to also emphasize “the desirability of a varied diet and on the cultivation of a taste for vegetables.”830 However, despite her emphasis of the importance of this feeding service, the amount of children in rural areas who had access to this program remained limited during these years due to still low school attendance rates. While it was estimated that approximately 97 percent of urban children between 5 and 14 years of age were registered in school in 1930, only about 40 percent of those in rural areas were.831 Moreover, as Payne’s comments show, public health officials questioned the effectiveness of relief feeding in solving the nutrition problem and argued that Puerto Rican children needed a better diet not simply more food. As Payne’s RF colleague E.B. Vedder argued in 1930, “with regard to the question of nutrition” “there is no starvation in Porto Rico.”832 In his view, the real problem was the chronic lack of an adequate diet with more animal protein and fresh vegetables.

829 Cook, "Public Education in Puerto Rico." 39
830 Ibid. 39-40
831 Clark, Porto Rico and Its Problems. 77
832 Memorandum by Dr. Howard in Re Colonel E.B. Vedder, February 2 1930. RAC, RF, RG 1.1, series 243, box 1, folder 11.
Puerto Rican public health officials like Fernós Isern and Rodríguez Pastor also emphasized the long-term nature of Puerto Rico’s dietary problems. As the effects of the Depression intensified during the mid-1930s local funds available to support feeding programs decreased considerably, threatening the continuation of the services at many schools. While “the plight of Puerto Rican children” garnered the attention of U.S. government and philanthropic officials during the early 1930s, local political and professional elites also recognized the importance of this service for their particular rural reform agendas. A group of officials formed a group called the Puerto Rico Child Feeding Committee to appeal for public and private contributions to continue funding the school meals program for the benefit “of malnourished children in Puerto Rico.” According to the Commissioner of Education and member of the Committee José Padín 43,489 of the neediest Puerto Rican children “who are suffering from serious malnutrition have received one meal a day during the last year through the feeding stations in the public schools.” According to his report, from 35,000 to 40,000 children were fed daily on the island at 800 school lunch rooms at a cost of $10 a year for each child. The provision of this “nourishing meal a day” for all these school children, which Padín credited with saving them “from sickness and death”, was now threatened by lack of funding.

Apart from these fundraising activities, the Department of Education benefited from federal relief programs. Among these, the PRERA provided funds for child welfare services like school meals. Apart from supporting the general activities of the Department of Education, this agency organized nursery schools for pre-school children where public health nurses, home economists, teachers, and social workers oversaw the provision of food relief. Drawing from their experiences as part of these programs, local nutrition and welfare professionals actively

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lobbied the local government for the regularization of school meal services as part of the education system. By the mid-1930s, they achieved a small victory when the Department of Education designated professional home economists to replace volunteer personnel in the administration and functioning of school meal services. As the government and New Deal agencies built new schools in rural areas and included formal lunch rooms in more of them, home economists began to occupy more positions of authority in the island’s education system. This expansion was also facilitated by a new federal appropriation to channel agricultural surpluses through school meal programs. The Works Projects Administration (WPA) also hired personnel to build and staff new lunch rooms in states and territories.836

In Puerto Rico, the PRRA, the WPA, and other New Deal agencies were directly involved in the functioning of the school lunch program throughout the 1930s. The delegates to the Puerto Rico Child Congress emphasized the need to “improve the conditions” of lunch rooms “to supply the functions that, due to their economic inability, rural heads of families are not able to provide.”837 As the threat of a new war loomed, public health experts argued for the importance of these programs as a part of their long-standing efforts to reform the domestic and social spaces of rural areas. The new funds provided by increasing rum taxes and the government institutions created through the agrarian reform project gave them new tools to incorporate child nutrition services to these agendas. At the same time, the disruption of imports provoked by the war forced Puerto Rican officials to redouble their efforts to maximize food crops agriculture. As part of these initiatives, the Legislature appropriated $10,000 and earmarked 70 percent of the tax on rum “to plant food crops on vacant land rented by the Insular Government” in order to

supply school lunchrooms, where 100,000 children" got “one nourishing meal a day.” Thus, similar to other health and welfare programs in Puerto Rico, the new war inaugurated a period of both feast and famine for those children who benefited from school meal programs.

**War-time School Meals and the National Lunch Act**

While the island’s government implemented these plans, the WEP assumed the administration of the school lunch program together and the new milk stations service on November of 1943. By this time there were 1,624 school lunch rooms employing 4,042 cooks and assistants as well as 153 supervisors. According to the WEP Administrator in Puerto Rico Manuel A. Pérez, the school lunch program was significantly expanded as a result of the “great economic resources” of this agency. With these new funds, education officials renovated existing lunch rooms, improved the menus in the existing ones, and hired more workers. As a result of these expansion, by 1944 there was a total of 171,260 children receiving school meals in public schools and 5,483 in religious schools. Together with those receiving services at the milk and feeding stations, a total of 192,219 infants and children received foods through the WEP. According to a U.S. reporter, this “only decent meal they get all day” represented an effort “to give the coming generation a decent start in life” since “their previous bad diet, forced on them by poverty and ignorance, has been a chief cause of the island’s high disease and death rates.”

For nutrition experts, feeding programs like school meals provided a useful instrument to both increase the intake of essential nutrients and educate children in appropriate food habits.

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838 Carl Hartman, “Food prices soaring: From 150,000 Families Destitute in Puerto Rican Crisis”, *The Boston Globe*; Dec 10 1942. 1
839 Pérez to Figueroa, 15 abril 1944. ALMM, sección iv, serie 2, sub-sección 1, cartapacio 355
840 Peter Edson. “New Governor in Puerto Rico, work of Mrs. Tugwell”, *Ogden Standard Examiner*, May 26 1946. 7A
School lunch rooms during the 1940s provided menus that combined donated foodstuffs and local products, most of them produced through the WEP Garden Project. Teaching children to eat local fruits “with the meal and not between meals” was among the “educational experiences provided for children in the dining room” 841. A typical lunch menu served during the war years included stewed rice with sausages, stewed beans, peppers and spinach salad, crackers, butter, plums, and milk complemented with oranges, bananas, or grapefruits. 842 However, children did not regard all these new foods as high as education and health officials. According

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841 Sayáns, "Food Service in Puerto Rican Public Schools." 28
842 “Menús que se sirven en los comedores escolares del Programa de Emergencia de Guerra.” ALMM, sección iv, serie 2, sub-sección 1, cartapacio 355
to Carmen Sayáns, Supervisor of the School Lunch Program in the town of Corozal children particularly disliked canned vegetables, dehydrated eggs, and reconstituted powdered milk. When asked about why they rejected these products children said “that the skimmed milk used has a peculiar flavor which most of them dislike.” In the case of canned vegetables, the most disliked by students included beets, carrots, string beans, and spinach.

Children disliked dehydrated eggs so much that Paul Edwards, Director of the WEP in Puerto Rico, was compelled to include a story about the methods school lunchroom personnel utilized to convince them to eat this product. In his May 1944 report to the Congress Committee on Insular Affairs, Edwards described how little Efraín Marrero from the town of Manatí came to accept dehydrated eggs. According to Edwards, Efraín “did not take anything done with dehydrated eggs, because he thought that was not egg.” Since workers’ initial efforts to make him change his mind were unsuccessful, they reached out to teacher Angeles Vázquez. In “the problems of the community class” teacher Vázquez discussed “the Nutrition Problems” and “brought about the problems of scarcity of eggs.” After this class, children “came to the conclusion that dehydrated eggs were the same as the other fresh eggs and that they should eat dehydrated eggs at the lunchroom in order to grow healthy and strong”. Efraín was also convinced to eat dehydrated eggs “whenever they are done in the lunchroom.”

As Efrain’s story shows, while experts saw these foods as carriers of much needed nutrients, they were foreign to most rural children. In the case of reconstituted powdered milk, even lunch room workers struggled to store, handle, and prepare it properly. Supervisors and home economics teachers spent considerable time devising new recipes and methods to prepare this and other new products in “an attempt to change undesirable food habits such as the dislike..."

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843 Sayáns, “Food Service in Puerto Rican Public Schools,” 28-32
of those vegetables which have been absent from their diet.” 845 They also devised new tricks to make children eat fresh green vegetables. Edwards described the strategy used when spinach was served for the first time in the lunch room at the Baldorioty School. As expected “most of the children did not eat them.” The next time this vegetable was served the “supervisor took her son Frank to eat at the lunchroom and served him some spinach.” Frank happened to enjoy “very much eating spinach” and “while eating he asked if this was the same food Popeye ate.” His mother promptly replied that it was “and that Popeye was so strong and healthy because he ate spinach.” Other children who overheard “the conversation asked for spinach and after a while almost every child was eating spinach. They wanted to be as strong and healthy as Popeye.” 846

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845 Sayáns, "Food Service in Puerto Rican Public Schools," 32
846 Statement on War Emergency Program of the Government of Puerto Rico, Exhibit No. XVII. 9
While recruiting Popeye’s help to convince children to eat vegetables, local and U.S. officials portrayed the provision of meals for school children as a key part of the government’s response to the war emergency. These circumstances brought new urgency to Puerto Rican public health professionals’ attempts to produce a future generation of productive and healthy citizens through nutrition education, hygiene, and vocational training. At school lunchrooms home economists, social workers and teachers created another space to adapt idealized middle-class notions of appropriate diet and domesticity to the sociological, agricultural, and economic conditions of rural Puerto Rico. Programs like school meals and milk stations also employed local residents and garnered the support of religious and civic organizations. In a political context shaped by the PPD discourse, these programs also became a significant arena of interaction between children, nutrition experts, government officials, and the working poor.

These efforts continued after the war ended and child feeding programs were transferred from the WEP to the Department of Education. The movement to institutionalize school lunch programs in the U.S. through legislation framed this transition on the island. Aware of these conversations, Tugwell wrote to Muñoz Marín on April of 1945 calling for the definitive transference of the administration of school lunch program to the Department. According to Tugwell, if this transference failed to occur before the new congressional legislation was approved “it might be very difficult to obtain Federal funds to match Insular Funds for this purpose.” The new federal appropriation for school lunch programs specifically provided “that the use of such funds in any State or Territory shall be contingent upon the entering into a contract between the federal government and the Director of Education in the State or Territory.” For Tugwell, it was “altogether foolhardy to jeopardize obtaining funds for school lunch
programs because some people want to place the administration of the program in the WEP where it has not earthly reason for being.\textsuperscript{847}

Meanwhile in the U.S., the popularity acquired by the school lunch program during the war, the activism of professionals like home economists and social workers, and the proven effectiveness of food relief services as agricultural subsidies paved the way for the legislation giving rise to the National School Lunch Act. The passage of this Act on June of 1946 effectively transformed what was a locally run program into a permanent federally-funded service.\textsuperscript{848} In Puerto Rico, the legislature passed a bill on April 1946 to reorganize the functioning of the local school lunch program according to the National Act and to match the federal appropriation, which was considerably inferior for territories.\textsuperscript{849} Although nutrition experts and public health officials presented the passage of the National Lunch Act as a victory for children’s welfare advocates, its origins as a mechanism to subsidize agricultural production remained central to the operation of the program. This relation between nutrition programs and agricultural subsidies in the U.S. had a profound impact in Puerto Rico where imports made up a greater proportion of the food supply.

The scientific and policy dynamics leading up to the passage of the National School Lunch Act also reflected the rising allure of technological expertise as a guide in the solution of social and health problems. Its implementation in states and territories was the product of “an optimistic faith in science, education, and reason.”\textsuperscript{850} The Recommended Dietary Allowances (RDAs) became the main technical guideline for the new federal school lunch program.

\textsuperscript{847} Tugwell to Muñoz Marín, April 14 1945. ALMM, sección iv, serie 2, cartapacio 9
\textsuperscript{848} However, federal oversight remained weak and many states maintained a considerable degree of local control. This was manifested in the limited services offered to African American children in Southern states. See Levine, \textit{School Lunch Politics: The Surprising History of America’s Favorite Welfare Program}.
\textsuperscript{849} Sayáns, "Food Service in Puerto Rican Public Schools." 18
\textsuperscript{850} Levine, \textit{School Lunch Politics: The Surprising History of America’s Favorite Welfare Program}. 4
Establishing recommended daily allowances of nutrients necessary for optimum health, the RDAs served as criteria to develop nutrition programs during the war. Despite their multiple revisions, the RDAs remained as the “basis for all future government-subsidized school meals” after the war ended. The RDAs model of the “basic seven” as a guide for school lunch menus was transferred to Puerto Rico where local officials attempted to adapt it to the island’s dietary, sociological, and agricultural realities.

Based on these guidelines, the National Lunch Act included specifications for three types of meals. Corozal Lunch Room Supervisor Carmen Sayáns enrolled in graduate school at Syracuse University where she studied ways to adapt these standards to the Puerto Rican context. In this study Sayáns visited “two school lunch workshops sponsored by the New York State Department of Education” and other schools throughout the state. She studied the possibility of adapting selected methods utilized at these New York schools for use in Puerto Rico’s revamped school lunch program. Thus, as the New Deal offered the 1930s generation of agriculture, nutrition, and social work experts a platform to put in practice new knowledge, theories, and methods, the new funds made available through the National Lunch Act provided professionals such a Sayáns new tools to intervene with the nutrition problem in the context the PPD agendas. However, the implementation of these reconfigured nutrition programs in Puerto Rico occurred at the dawn of profound changes in the island’s socioeconomic makeup. As the following discussion shows, the significance of child feeding programs as part of these transformations was poignantly articulated in the voices of those who came to understand them as the materialization of the PPD promise of providing for the poor.

851 Ibid. 7
852 Sayáns, "Food Service in Puerto Rican Public Schools." 1
Reorganizing Child Nutrition Programs after the War

The expansion of child nutrition programs during the war and their reconfiguration during the late 1940s paralleled the rise and consolidation of the PPD government. The 1940s witnesses the evolution and final institutionalization of this party’s political ideology and economic development strategy. The work of local technical experts, scientists, and health and welfare professionals was crucial for the legitimization and popularization of these agendas. Their experience as part of New Deal relief and reconstruction programs bolstered the party’s rhetorical and practical connection with the rural poor. Debates about the causes and consequences of the problem of nutrition and its relation to the island’s agricultural economy were particularly significant in these processes. Strategies to alleviate malnutrition among children became powerful instruments to promote this party’s politico-economic model for the future of Puerto Rico.

By early 1946, the enrollment at many of Puerto Rico’s school lunch rooms was of 250 children while in others it was a high as 600. According to Sayáns most of these schools offered a Type A lunch “providing one-third to one-half of one day's nutritive requirements” as determined by the RDAs. A Type B lunch was “an incomplete lunch, hot or cold, which is less adequate nutritionally” as it included half the nutritive content of the Type A lunch. Finally, a Type C lunch only included “one-half pint of whole milk as a beverage.” A formal contract between the USDA and local education agencies governed the operation of school lunch rooms receiving federal funds and food products and required the compliance with these regulations.

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853 Memorándum para las Comisiones de Hacienda de la Legislatura sobre los Comedores Escolares, 19 febrero 1946. ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360
854 Education agencies strived to provide a Type A lunch in most schools. This was required to include at least: one-half pint whole milk, two ounces of fresh or processed meat, poultry, cooked or canned fish, or cheese; one-half cup of cooked dry peas, beans or soy beans; four tablespoons of peanut butter or one egg; six ounces of raw, cooked or canned vegetables or fruit; one portion of bread, muffins or other bread made of whole grain or enriched flour; and two teaspoons of butter or fortified margarine. A Type B lunch included at least one-half pint whole milk plus half of all the ingredients included in the Type A lunch. Sayáns, "Food Service in Puerto Rican Public Schools." 15-16
Schools also had to maintain sanitary conditions and have access to adequate facilities for storage, handling, and servicing of food products.

However, soon after the island’s government began operating school lunch rooms according to these guidelines, it became clear that fulfilling the requirements of the federal contract while coping with increasing demand was a difficult endeavor. Moreover, the disproportionately lower appropriation designated to the territories such as Puerto Rico led the island’s government to scramble to secure funds to maintain the program according to federal regulations. Officials from the Department of Education under the direction of Deputy Commissioner H.A. Martín submitted a lengthy report to the local legislature calling for more insular funds to match the federal monies and be able to provide a lunch that meets “the nutritional requirement” of each type of meal. According to a study conducted by the agency, “preparing a menu containing all nutritional requisites” of a Type A lunch required a higher contribution per meal from the local government.855

The local press followed closely the government’s response to maintain the school lunch program amidst budgetary constraints. According to an El Mundo editorial “we are again faced with the threat of reductions in the services offered by school lunch rooms thus denying the help needed by the 22,000 children who currently benefit from this program.” The editorial explained that “if the federal law providing the funds for the foods served is not amended in such a way that Puerto Rico receives a higher proportion than what it currently receives, the available funds will not be enough to cover the school lunch program in its present form.” The editorial reminded readers that “the problem of feeding our children is, before anything, a local problem that should be tackled by ourselves.” Therefore, if these limitations were not addressed favorably

855 Memorándum para las Comisiones de Hacienda de la Legislatura sobre los Comedores Escolares, 19 de febrero de 1946, ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360. 22
for Puerto Rico and the rest of the territories, the editorial argued that the island’s government was obligated to provide funds to continue the services. In this context, Commissioner Mariano Villaronga personally appealed to now Resident Commissioner Fernós Isern “urging him to intervene quickly to achieve the approval” of a pending measure to ensure that Puerto Rico’s federal appropriation be calculated on the same basis as the rest of the states.

In efforts to gather legislative support for the program, Deputy Commissioner Martín argued that ensuring that children develop “strong, fit, and healthy” by providing them a daily “scientifically-proven meal” was an investment that would eventually benefit all Puerto Ricans. “How much would the Government save”, Martín noted, “in the treatment of infectious diseases that these children will surely acquire if they grow up malnourished and weak, ideal candidates for tuberculosis, rickets, anemia and other ailments?” Similarly, “how much would industry, commerce, and agriculture benefit having at their service fit and strong men, yielding the benefit that can only be achieved in conditions of perfect health?” Finally, Martín highlighted the role of the service as part of the school’s academic and socializing mission by emphasizing that “children in excellent health assimilate better the lessons thus reducing greatly the number of failed students”. Similarly, the teacher “related her arithmetic, hygiene, and community problems lessons with the school lunch room by talking to students” about the importance of eating a healthy and well balanced diet as well as teaching them how to plan menus…and set a table.”

Both Martín and Villaronga emphasized the public health, education, and social roles of the school lunch program to call the attention of local officials to the need to increase its funding.

858 Memorándum para las Comisiones de Hacienda de la Legislatura sobre los Comedores Escolares, 19 febrero 1946, ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360. 1
As a “non-profit childcare” service, the WEP milk stations program also became a beneficiary of the National School Lunch Act. Although federal regulations limited the utilization of these benefits for the attention of preschool children, the island’s government assigned matching funds to include those between eight and ten years of age who did not attend school. In order to better administer these resources, in October of 1946 while still Commissioner of Health, Fernós Isern proposed the appointment of a coordinator of child feeding and milk station programs under his immediate supervision. ⁸⁵⁹ According to Nereida Rivera Marini, who succeeded Rita Lang as General Supervisor of the WEP child feeding program, there were at the time 420 milk stations with a daily average attendance of 28,345 children who received “a complete daily breakfast consisting of evaporated milk, cereal, fruits, crackers, and butter”. ⁸⁶⁰

However, Puerto Rico’s unequal inclusion under the provisions of the National Lunch Act also limited the expansion of the milk stations program to meet the increasing demand. Rivera Marini wrote to both the newly appointed governor Jesús T. Piñero and to the Assistant Director of the WEP detailing the financial constrains provoked by a reduction in the AMA contribution from $300,000 to $120,000. At the same time, the contract for food distribution to the milk stations between the WEP and the Department of Education’s Division of School Lunches expired. In these circumstances, the available money only covered the feeding of 20,000 children from two to seven years out of a total enrolment of 40,000. Thus, the program was left without resources to take care of the remaining two to seven year old children in addition to 6,793 children from eight to ten for whom they had to buy additional milk “at a ratio of eight

⁸⁵⁹ Memorandum from Pérez to Piñero, October 30 1946. AGPR. fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.1
⁸⁶⁰ Rivera Marini to Piñero, October 23 1946. caja 1825, folder 215.1
cans of evaporated milk per month per child." An emergency appropriation allowed the program to purchase this additional milk but, according to estimations from the PRNC, this amount “was not enough to cover the expenses of a complete breakfast.”

Due to this lack of funding, administrators considered the possibility of closing several milk stations and were unable to fulfil the many petitions for new ones. In March of 1947 the program suspended its breakfast service and provided only eight ounces of milk per child. As a result, many petitions from individuals, civic organizations, and nutrition experts reached the Governor’s office emphasizing the need for the program and claiming for its continuation. This correspondence reflects the material and political significance that child nutrition programs had acquired for poor communities in both rural and urban areas where it was perceived as an essential part of the island’s public health system and a symbol of the PPD government.

One such petition came from the mayor of the town of Jayuya who noted that “the milk stations have been functioning with very good results in our poorest neighborhoods attending to the malnutrition rampant in our infant population.” Therefore, he continued, “it is of the utmost importance that children continue receiving these services.” The secretary of the Lions Club in Mayagüez also wrote to the Governor arguing that the elimination of the milk stations program “would represent a tough blow to the nutrition of the island’s children.” Similarly, the Secretary of the Sol Naciente Lodge in Aguadilla asked the Governor to “alleviate the desperate situation provoked among hundreds of Puerto Rican households” by the elimination of the milk stations program.

861 Memorandum from Rivera Marini to Marrero, 27 October 1946. caja 1825, folder 215.11
862 Memorandum from the Puerto Rico Nutrition Committee to the Head of the Bureau of Budget, May 12 1947. AGPR. fondo Oficina del Gobernador, tarea 96-20, caja 439, folder 18-2
863 De Jesús Soto to Piñero, May 26 1947. caja 439, folder 18-2
864 Zapata to Piñero, June 12 1947. caja 439, folder 18-2
station in that town. This exacerbated “the situation of misery and hunger that reigns in this zone which, if allowed to persist, could foster the spread of contagious diseases.”

The Department of Health’s infant milk stations program was also facing budgetary constraints. Although these only served infants under two years of age, in November of 1947 the new Commissioner Juan Pons communicating Governor Piñero that the rising demand required a higher appropriation from the insular budget for the purchase of milk. Otherwise, the Department would be obligated to “drastically reduce the number of infants in the stations and possibly their number”. Pons emphasized that community leaders and civic groups continued requesting the opening of more milk stations. Supervisor Marini also noted that her office ‘constantly received a great number of applications for new child feeding stations in poor neighborhoods of the island which, if the financial problem is not resolved, would not be possible to attend’.

Given this situation, members of the PRNC appealed to the Governor and other officials requesting an increase in the government contribution to these programs. In her letter to the Head of the Bureau of Budget, Margarita Marchand attached a synopsis of “convincing experiments showing that the milk stations program improve the nutritional status of the Puerto Rican child.” Here Esther Seijo, at this time Director of the Agricultural Extension Service’s Home Demonstration Office, summarized the findings obtained by British nutritionist Benjamin Platt after examining children in the towns of Cataño and Comerío. Platt visited the island while investigating the nutritional status of children in the British Caribbean between 1944 and 1945 under the sponsorship of the Caribbean Commission. Apart from Puerto Rico, Platt together

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865 Torres to Piñero, June 13 1947. caja 439, folder 18-2
866 Pons to Piñero, November 3 1947. caja 439, folder 18-2
867 Memorandum from Rivera Marini to Marrero, October 27 1946. caja 1825, folder 215.11
868 “Convincing Experiments Show that the Milk Stations Program Improves the Nutritional Status of the Puerto Rican Child.” caja 1825, folder 215.11
with W.J. Vickers visited St. Kitts, Jamaica, Barbados, Trinidad, British Guiana, and Antigua where they focused on the conditions of children at hospitals and other institutional settings. In Puerto Rico, personnel from the Nutrition Division of the Department of Health “accompanied the distinguished visitors” in a tour of all government agencies dealing with nutrition issues “in one way or another” including the STM, the UPR, the Extension Service, the AES, the GSA, and the Río Piedras central market as well as several school lunchrooms and milk stations.870

In her summary, Seijo described Platt’s experiment in Puerto Rico where he applied the methods already practiced in the English colonies. This included “determinations of the symptoms of malnutrition in the tissues, in the skin, in the corners of the mouth, bleeding gums, diseases of the eyes and symptoms related to vitamin deficiencies.” Accompanied by home economist Lydia Roberts, Seijo took Platt to Cataño where there was a milk and child feeding station active for more than a year. The results of Platt’s inquiry “showed definitely that the children examined had suffered from nutritional deficiencies, but not a single latent symptom could be found” at the time of their visit. Those children ‘had been receiving the invaluable benefits of the milk station for about one year.” Seijo and Roberts also took Platt to a barrio between Comerío and Bayamón where there was no milk station. There, he “found all the nutritional symptoms pointed before”. As a result of these findings, “a milk station was organized in this barrio and many children from the area are now receiving its benefits.”871

Similar to efforts by education officials on behalf of the school lunch program Marchand, Seijo, and Roberts offered these results as evidence of the effectiveness of milk and child feeding stations in alleviating malnutrition, improving children’s health, and cultivating a healthy population. Community leaders and concerned citizens also used public health arguments in their

870 “Peritos en Nutrición nos Visitan,” Nutrición al Día, no. 7 (1945). 10
871 “Convincing Experiments Show that the Milk Stations Program Improves the Nutritional Status of the Puerto Rican Child.”
claims for the continuation and expansion of the milk stations and child feeding program. These multiple demands reflected the material and political significance that child feeding programs had acquired during the previous years. Therefore, far from terminating it, the government assigned the WEP milk stations program a higher budget appropriation to match the unequal contribution from the federal government for child feeding services under the National Lunch Act. This designation effectively transformed it from a war emergency nutrition service into a permanent part of the island’s growing health and welfare system.

In this way, by the end of 1947 emergency feeding and school meal services became a permanent part of the government’s child nutrition services, together with the infant milk stations of the Department of Health. The election of Muñoz Marín as Governor the following year led to the final institutionalization of his party’s project to reform Puerto Rican society and increase its productive capacity. In this context, milk stations and school lunch rooms emerged as spaces where child welfare ideas interacted with politics on a daily basis. While attempting to improve the nutrition of Puerto Rico’s future citizens-laborers, these programs provided mechanisms through which administrators, workers, children, and parents lived, negotiated, and practiced the PPD political and economic agendas.

“Because you are our Governor to whom we give our Vote”: Child Nutrition in a New Puerto Rico

As part of the new government’s efforts to construct a new future for Puerto Rico, Rivera Marini presented her agency’s plans to turn the milk stations into Child Care Centers. In her proposal, Rivera Marini emphasized that “the children that are fed in the milk stations belong to the most indigent class on the island.” “Generally,” she elaborated “they are members of big
families who do not receive the necessary attention in their households. They walk the streets alone exposed to accidents, do not receive appropriate education and orientation and, above all, do not receive physical care and security.” In order “to guide them toward the development of better habits and manners, the Milk Stations Program is interested in turning stations, wherever the facilities allow, into Child Care Centers to ensure children’s wellbeing”.

The Department of Health put these plans into practice on a trial basis in the towns of Santurce, Humacao, Bayamón, Salinas, Isabela, and Coamo. The specific objectives of these Child Care Centers were “to provide to the children that attend the milk stations not only with breakfast but also security during the day while their parents are away working”; “to provide recreation, basic orientation in health, education, and good manners”; “to make available the means to train mothers in matters related to child care”; “to foster good relations among neighbors of rural or urban areas where the centers are located; and to help improve children’s health by employing the resources available in each community”. The centers also referred cases of sick children to the public health unit where they received “chest, blood, excreta, and urine examinations as well as the appropriate follow up treatment.”

Similarly, education officials presented the objectives of the new school lunch program in the context of the PPD government political and economic agendas. In this context, Education officials emphasized that “the School Lunch Program has been transformed from a charitable endeavor or an employment project into nutrition, education and community service program.” Emphasizing the particular importance of this project for rural areas, education officials presented the program as a crucial part of the new government’s education and public health

873 “Programa de Alimentación Infantil (Estaciones de leche).” caja 1825, folder 215.11
874 Ibid.
875 Memorándum para las Comisiones de Hacienda de la Legislatura sobre los Comedores Escolares, 19 febrero 1946. ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360
infrastructures. This role intensified as part of the sociopolitical reconfigurations of the following years. This was manifested in the organization of an Insular Committee Pro-School Lunches to gather community support for the operation and maintenance of local school lunch rooms throughout the island. According to committee member Francisco Collazo, a “vital part” of the school’s mission was preserving and improving “children’s health by providing wholesome and nutritious meals and educating on practical knowledge about nutrition and the development of good eating habits.” Furthermore, the lunch room as a nutrition and education center “is an integral part of the school system.” In this way, it is the responsibility of the “mentors of our youth to establish firm basis to give rise in Puerto Rico to a generation of men and women healthier, fitter, and better prepared.”

In this way, education and health officials articulated the functioning and objective of the school lunch program according to the agendas of the new PPD government. These projects were greatly facilitated by the newfound role of agricultural surpluses as part of the U.S. international development and foreign policy agendas during the postwar decades. The international opportunities opened by post-war relief efforts gave the USDA another channel to open new markets for dairy surpluses directly or through international institutions. For example, in the late 1940s the importation of powdered milk from the U.S. appeared “as a viable practical solution to the decline in milk production in Mexico” while UNICEF became the largest purchaser of U.S. surplus dried milk. This new international context also consolidated the political role of relief feeding. In the emerging Cold War international landscape, officials at the USDA “agreed that using the milk surplus for relief made political and economic sense”.

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876 Creación Comité Insular Pro Comedores Escolares, 1948. ALMM, sección iv, serie 2, cartapacio 69
878 Smith-Howard, Pure and Modern Milk: An Environmental History since 1900. 80
surplus commodities transfers to Puerto Rico as part of child feeding programs became a prelude to the role of USDA food aid packages as part of development strategies during the Cold War years.  

On the island, the Puerto Rico Commodities Distribution Project (PRCDP) was created to handle and storage of commodities sent to the island by the USDA. This entity also maintained inventory of the products and distributed them to all schools with lunch programs. During the late 1940s, these U.S. agricultural commodities represented 60 per cent of the total foods served at school lunch rooms. The Department of Education together with local sponsors and farmers secured “the rest of the foods mainly meat, fish, and fresh fruits or vegetables” with special consideration for “the greens.” The PRCDP was also in charge of ensuring the timely delivery of these local products to school lunch rooms. By 1948, this agency distributed imported and local food products to 1,394 school lunch rooms, 417 pre-school milk stations, and 39 infant milk stations. Three years later, there were 1,560 school lunch rooms in operation on the island, 298 of these in the urban zone and 1262 in rural areas. The authorized attendance in these lunch rooms for the 1950-51 fiscal year was of 214,056 resulting in an average daily attendance of 197,367 with approximately 34,962,965 meals served.

Apart from the USDA, other federal agencies were involved in the functioning of the child nutrition programs in Puerto Rico including the Public Health Service, the Social Security Board, the USDA, and the Children’s Bureau. During the fiscal year 1950-51 the Insular Government appropriated the sum of $3,855,199 to match the $2,377,490 in operating funds and

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879 Effland, “International Programs of the USDA: Cross-Purposes or a Delicate Balance?.”
880 Sayáns, “Food Service in Puerto Rican Public Schools.”
881 Manual Informativo del Funcionamiento de los Comedores Escolares en Puerto Rico, División de Programas de Distribución de Alimentos, Administración de Producción y Mercados, Departamento de Agricultura de los Estados Unidos, San Juan, Puerto Rico. ALMM, sección iv, serie 10, sub-serie 23, cartapacio 360,
882 Sayáns, "Food Service in Puerto Rican Public Schools."
the $1,160,830.39 in food donations allocated by the Federal Government. This allocation remained below what the island would receive if the same calculation used to assign funds for the state was applied to the territories.\textsuperscript{883} The Puerto Rican legislature assigned increasingly higher amounts to match this unequal contribution and keep up with the rising enrollment, meet federal regulations, and hire more personnel. With these new funds the Department of Education created a new unit named the School Lunchroom Division to administer the program and coordinate the work of one technical advisor, two assistant supervisors, a nutritionist, and eight area supervisors.

The area supervisors were in charge of advising 81 local school lunch supervisors in technical nutrition and child feeding matters and shared administrative responsibilities with the district superintendents. The local supervisor was also responsible for inspecting the school dining rooms, “approving menus, purchasing food in the local market to supplement the foods received from the Federal Government, inspecting food preparation and service, setting up standards of work, maintaining field records requested by the Division, and training the personnel of the dining room program in her district.” The personnel in the school lunchroom included a manager, a cook, and several cook helpers, depending on the enrollment and need. By the early 1950s almost all schools on the island operated a lunch room, serving a Type A meal in most of them to approximately 46.2 percent of the children enrolled in each school.\textsuperscript{884}

The milk stations program was undergoing similar transformations to expand its scope and reach. Since many of the industries established during the initial years of Operation Bootstrap were garment factories employing a mostly female labor force, the new milk stations

\textsuperscript{883} Ibid. 19. According to Sayáns, these donations were assigned to Puerto Rico from the global assignment of fifty million dollars appropriated by Congress to the USDA for the operation of states and territorial school lunch rooms.

\textsuperscript{884} Ibid. 21-22
also provided child care for mothers who were increasingly working outside the home. In 1948 the program was integrated to the Department of Education’s districts system which administered it jointly with the Department of Health. Supervisors reported that these new stations were popular among children, parents, and neighbors. This is not surprising given that, apart from the help they apparently provided to working mothers, the foods offered such as milk, cereal, crackers, butter, dried or canned fruits, and honey introduced considerable variety to children’s daily diet. According to one administrator:

“Once breakfast is finished, the children stay in the premises of the stations. The majority of them do not return to their homes until the station is closed. If during the afternoon hours one of the supervisors visits the station, the children immediately surround her. This attitude from their part demonstrates that the children enjoy their stay at the station and that they feel happy there.”

However, administrators also reported that parents, children, and local workers often ignored many of the stations’ rules. For example, officials found it difficult to enforce the age eligibility rule which stated that children over ten years old were not eligible to be served at the stations nor were those from eight to ten who were enrolled at school. These children’s feeding was the responsibility of the Department of Instruction. The integration of the milk stations program to this Department’s district system led to a stricter implementation of this age limit. Regardless, many district supervisors reported finding school children eating and drinking at the milk stations.

The rule that “all foods shall be consumed within the premises of the station and that no food item shall be taken to the home” was also often ignored by local workers and parents. Rivera Marini was quick to take action when notice of these infringements reached her in San

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886 “Programa de Alimentación Infantil (Estaciones de leche).” AGPR. fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.11
Juan. In one occasion, after many documented infractions, she decided to terminate the services offered at the Barrio Ceiba Sur station in the Juncos municipality. When the mayor of this town wrote to the Governor demanding that the station be reopened, Rivera Marini prepared a lengthy report detailing the reasons for her decision. According to this report, “seventy of the eighty-nine children receiving services at this station’ did not meet the age eligibility requirements and ‘parents constantly asked workers to provide them with food to take to their homes’.”

Apart from these violations, Rivera Marini reported that the ‘physical condition of the station was malísima (very bad) because when it rains the station floods and the food products cannot be protected’. The district supervisor reported that this situation had not been addressed properly by the station workers whose general performance she judged ‘inefficient’. Although they were given another opportunity to correct these problems and to find eligible children to justify the station’s operation, upon returning a month later the district supervisor found that ‘the worker in charge of opening the facility was late and there were twenty-five children waiting for her’. When she asked them if they were enrolled in school “they all answered in the affirmative which demonstrated that the station workers continued to attend ineligible children.” This compelled the district supervisor to close the station definitively. Rivera Marini finished her report emphasizing that these requirements were in place because “the objective of this program is to help improve the feeding of our island’s indigent children and avoid having in the future a weak and physically-ill population”.

This explanation reflects the extent to which regeneration ideas and notions about Puerto Ricans’ low labor productivity continued to motivate the organization of child nutrition programs. At the same time, the PPD’s message shaped the ways people made sense of the

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887 Memo from Rivera Marini to Muñoz Marín, January 28 1948. caja 439, folder 18-2
888 Ibid
services provided at milk stations. While administrators considered that enforcing the program’s rules was necessary to ensure its effectiveness, people saw it as a symbol of the party’s commitment to the poor and as part of the materialization of its social justice agenda. Therefore, local workers and parents also communicated directly with Muñoz Marín regarding the conditions at particular stations and requesting his assistance to access services.

Letter writing became an important way for Puerto Rico’s working poor to communicate grievances and request help from the party’s leaders. Letters addressed to the Governor demonstrate the ways in which they understood and made sense of the relationship between them and the new representatives of the colonial state. As Del Moral notes in her study about public education during this period, “parents and students had been listening to the promises made by the PPD during the 1940s political campaigns.” Similar to education, nutrition and health care were part of those promises. Milk station workers and beneficiaries also wrote to Muñoz appealing for attention to their concerns and making requests for services. These letters demonstrate how poor Puerto Ricans deployed the political discourse of citizenship and justice promoted by the PPD to make themselves part or call attention to the limitations of programs like milk stations.

On February 13, 1952, Sonia Lara wrote the first of two letters informing the Governor of the situation at the milk station where she worked in the barrio Espanta Sueño of Fajardo. In the first letter, she explained how she “saw one of the other workers at the station, Gloria Fernández, taking half-full cracker containers and all kinds of foods to her house”. “One day I asked her,” Lara continued, “how could she do that, and she answered that if 20 children come to the station to be fed, she wrote 40 in the record and the supervisors do not notice that food is missing”. In her second letter, dated 20 March, Lara informed Muñoz that Fernández was now in charge of

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the station, and that “she has a lover that stays with her the whole day in the station’s kitchen eating from everything and taking food home as well”. In her opinion, Fernández “had a lot of nerve walking in front of the children con el querido (with her lover) and stealing their food.” Lara finished her letter noting that “we are community leaders who are here to watch over everything and because you are our governor to whom we give our vote, we need to let you know the truth so that the children can receive their food”.

While for Lara her work at Fajardo’s milk station gave her ownership of the PPD’s government project, others appealed to its ideological commitment with the poor to communicate grievances. Among these, Juan Gómez wrote to complain to the Governor about the problem his family was having at the infant milk station located in Maunabo’s public health unit. In a letter dated 20 May 1953, Gómez reported that “Miss Preto [sic] norza (nurse) of the [public health] unit in Maunabo refuses to give milk to my wife and child and encourages other station workers to do the same.” “Why is it that you send this milk?” Gómez asked the Governor. “Is it to store it here or to give it to the children?” He reassured Muñoz that he worked, but “I am poor and my earnings are not enough to cover my family’s needs. In any case, I prefer not to eat myself to buy my son’s milk.” Even when he tried to convince the workers to serve his wife “they still refused to give her milk for my son”. He closed his letter telling Muñoz that “I know that you care about the poor, could you see if there is something you can do?” After receiving Gómez’s letter at the Governor’s office, his assistant reassured him that “according to the Governor’s instructions, your communication was directed to the Secretary of Health who will contact you once the case is investigated”.

890 S.L. to Muñoz Marín, February 13 and March 20 1952. caja 1825, folder 215.11. To maintain anonymity, names of workers and parents are pseudonyms.
891 J.G. to Muñoz Marín, May 20 1953. caja 1825, folder 215.11
892 Acevedo Quintana to J.G., June 5 1953. caja 1825, folder 215.11
It is not clear from the records what the results of this investigation were or if Gómez’s problem was ever resolved. However, Lara and Gómez’s letters exemplify how people appropriated the government’s rhetoric to both claim membership in its social projects and to point to their limitations. Their voices demonstrate how these nutrition programs became for the people an intrinsic part of a populist agenda presented as the cure for the historical neglect and misery afflicting rural Puerto Rico.

Conclusion

As this discussion has shown, child nutrition programs were much more than public health strategies to fight malnutrition and diseases among infants and children. They served as sites of both biomedical and political practices and their day to day functioning reflects the importance of these services for the legitimization of the PPD government, its political project, and economic policies. As part of efforts to regenerate society and increase laborers’ productivity, child nutrition programs were instrumental in the transformation of Puerto Ricans into citizens of a modern colony and subjects of the industrial development model instituted by the new government. On the other hand, for the people services like milk stations represented the materialization of the party’s agenda of social justice for the poor. For rural Puerto Ricans, local personnel like milk station workers and school lunch room cooks became the faces of the PPD government. The voices of these workers, parents, and local residents clearly transmit how these programs’ resonance in rural communities was the result of the party’s discourse which they promptly deployed in efforts to call the attention of authorities to their needs and priorities.

This analysis of the functioning of child feeding programs in Puerto Rico demonstrates how eugenic discourses rooted in late nineteenth century modernization efforts framed the application child nutrition ideas during the Depression and WWII. In the socio-political context
of the 1930s these eugenic ideologies were reworked in the language of public health experts who argued that the physical and moral regeneration of the rural poor was contingent on changes to Puerto Rico’s economic structures. High infant and child mortality was presented as the result of the ignorance and indigence bred by the island’s declining monocrops economy. This articulation of child welfare expertise in Puerto Rico was part of a global exchange of medical knowledge, public health strategies, and eugenic ideas as well as international concerns with children’s malnutrition and poverty. In this context, nourishing children’s bodies became a vital component of efforts to reform rural Puerto Rico and cultivate healthy and productive laborers.

Child feeding programs were part of the strategies deployed in the pursuit of these agendas. Devised as relief feeding services and facilitated by USDA surplus programs and New Deal legislations, milk stations and school lunchrooms served as spaces where Puerto Rican public health and medical professionals interacted with poor populations during the 1930s. This interaction was crucial for the emergence of the PPD and its success in the following decades. Under this party’s leadership, child nutrition services after WWII became part of the re-articulations of colonial and developmental governance spearheaded by the inauguration of the ELA and the implementation of Operation Bootstrap.

As the letters by Sonia Lara and Juan Gómez show, child feeding programs were for the people tangible proof of their new government’s commitment with the rural poor. In the words of Arecibo’s mayor, milk stations are “one of the most popular programs of our current government” 893. The success of these programs was the outcome of these programs’ historical trajectory in the singular context of Puerto Rico. Their origins in Depression era relief and reconstruction efforts fostered a particular encounter between health professionals and rural populations, assumed rhetorical significance in the PPD’s populist discourse of the 1940s, and

893 Telegram from Goitia to Muñoz Marín, July 3 1951. caja 439, folder 18-2
served as instruments of its political and economic agendas in the post-WWII years. As the following chapter shows, these initiatives also served the local and U.S., government to legitimize the Commonwealth as Puerto Rico’s decolonization strategy and to tout the island’s development trajectory as a model for the rest of the now “underdeveloped” world to follow.
Chapter Seven

Showcasing Development: The Techno-Politics of Nutrition

The Government of Puerto Rico in its desire to improve the standard of living of every citizen of the Commonwealth has recently created the Commission for Improvement of Isolated Areas under the direction of Dr. Lydia J. Roberts, who is responsible for the pioneer work done at “Doña Elena.” It is estimated that there are some 400 to 500 of these communities throughout the island with a population in the neighborhood of a quarter million inhabitants, or about 10 per cent of the total population of Puerto Rico. This Commission will encourage the establishment of self-help programs in these isolated communities to bring the advantages of modern civilization to them.894

Introduction

By the time Luis Muñoz Marín became Puerto Rico’s first popularly elected Governor in 1948 nutritionists, agricultural scientists, and public health officials agreed that the island’s poverty was at the root of the nutrition problem. They also recognized the need to increase the local production of protective foods as a first step in its solution. However, advocates of the new economic development model saw industrialization as the most effective method to raise standards of living, alleviate poverty, and transform populations into productive citizens. Under this new plan, the PPD government dedicated most of its resources to promote the industrialization agenda of Operation Bootstrap. Simultaneously, party officials led by former Commissioner of Health Fernós Isern embarked on the elaboration of a new “form of non-colonial association” with the U.S. as a middle-ground between independence and full annexation. Fernós Isern “emerged as the ablest defender” of this “new road” that served as both Puerto Rico’s decolonization model and the best strategy to, in Asenjo’s words, “bring the advantages of modern civilization” to all people.895

895 Ayala and Bernabe, Puerto Rico in the American Century: A History Since 1898. 157
While Puerto Rican politicians and policymakers articulated the basis for these socio-political transformations, the field of nutrition science was also undergoing significant shifts. The enhancement of food technologies during this decade fostered the emergence of new strategies to solve malnutrition and increase the consumption of necessary nutrients. As historians have argued, these new technologies allowed both the narrowing of nutrition’s scope and the promotion of targeted solutions to particular dietary deficiencies. While the rural hygienists of the 1930s understood malnutrition as the consequence of monotonous diets, nutrition science during the post-WWII years focused increasingly on nutritional problems as the manifestations of deficiencies in individual nutrients. This recast of malnutrition reflected a broader shift in international public health approaches after WWII marked by the technology-driven and targeted interventions that “engendered much optimism and a great sense of ambition.” In the case of nutrition policy, food technologies and supplementary feeding products offered seemingly efficient and low cost strategies to “broaden public health interventions’ scope”.

This chapter examines how this shift in international public health in general and in nutrition practices in particular interacted with the promotion of industrialization as the new strategy to improve Puerto Ricans’ standards of living. In these circumstances, policy discourses gradually moved from a focus on people’s diets and their relation with the island’s agricultural system to the language of technical interventions and consumer education. The promotion of supplementary feeding, food enrichment, and community development during the post-war years were part of these new “techno-politics of public health”. Nutrition professionals continued to emphasize the need to foster dietary diversification through the production and consumption of

896 Worboys, "The Discovery of Colonial Malnutrition between the Wars."
897 Amrith, Decolonizing International Health: India and Southeast Asia, 1930-1965. 3
local food crops. However, these aspirations became increasingly incompatible with the structural changes provoked by the industrial development model. While nutrition experts believed in this model’s potential to raise living standards, they remained wary of the ways in which these changes further detached people’s diets from local agricultural production.

Despite these concerns, nutrition experts supported new policies to facilitate the importation, distribution, and sale of powdered skim milk as strategy to add “good quality” proteins to the diet of the poor. Another measure required the enrichment with thiamine, niacin and iron of all rice imported and sold in Puerto Rico. Extension workers organized educational campaigns and demonstrations to promote the purchase and use of these products throughout the island. Local officials also took advantage of Puerto Rico’s role in U.S. postwar agendas to internationalize the island’s politico-economic model as well as its public health and technological advances. With the passage of the International Technical Cooperation Act in 1949, the Congress institutionalized the promotion of modernization development as a tool to advance U.S. geopolitical agendas. This act provided for the deployment of technical experts in fields like agriculture, engineering, nutrition, and public health to promote the development of the “underdeveloped” world. Despite their lack of autonomous representation in international organizations, Puerto Rican nutrition experts and government officials utilized the platforms offered by these new programs to engage in regional and global debates.

Among the new international agencies involved in technical assistance programs, the Food and Agriculture Organization (FAO) especially relied on local workers to promote their global agendas for nutrition improvement and rural development. Puerto Rican nutrition and agriculture experts became part of these FAO projects during the 1950s and 1960s. They drew from their experiences promoting nutrition improvement and agriculture diversification during
the New Deal to take part in the new international development agenda. As part of these efforts, national and international organizations like the FAO recognized the potential of fostering development “from the ground up” to promote nutrition improvements in poor regions of the world, many former or current colonial territories. This community development strategy entailed drawing from local experiences rather than relying on bureaucracies and central planning. In Puerto Rico, this project “to achieve small-scale” change was articulated in Muñoz Marin’s call to promote what he dubbed Operation Serenity to balance the effects of rapid modernization and industrialization.

Public health, agriculture, and welfare experts in Puerto Rico put in practice this focus on local change through the Doña Elena Project, “a better-living program in an isolated rural community.” Directed by Lydia Roberts, this project brought a group of home economists, agronomists, teachers, and social workers to an isolated community in the mountains of Puerto Rico to foster among families “the urge to improve their living through their own efforts.” Ultimately, this project and a new government agency based on it had a limited effectiveness achieving their objectives. The community development approach embraced by several international agencies provided Puerto Rican nutrition experts a new language to articulate old concerns with the lack of local production and consumption of protective foods. However, for policymakers this approach did not represent an alternative to modernization development but another strategy to intervene with rural regions through the extension of bureaucracies, standards, and technologies. Moreover, nutrition’s discourses of rural development grew increasingly at odds with political economy priorities to transform the island into a “showcase” of modernization and with the strategic importance of this transformation for U.S. political and economic interests in the Caribbean region.
The Science and Politics of Skim Milk

For home economists and extension workers assessing the nutrition situation in Puerto Rican rural communities during the interwar years, the limited availability of protective foods was among the main causes of prevalent nutritional issues. The persistently low consumption of milk specially worried nutritionists and public health officials. As the previous chapters have shown, health and agriculture experts devised various strategies to secure a stable supply and increase the consumption of fresh milk through the expansion of the local dairy industry and the implementation of nutrition education campaigns. However, although this industry represented the second most important agricultural sector on the island during the 1940s, the possibilities for its expansion were severely constrained after the war.899

In 1948, Arturo Díaz Cataldo Assistant Manager of the PPRACO Dairy Industrial Plant conducted a study showing that “fresh milk production is at its lowest point due to the discontinuation of high producing cattle’s importation, the abnormal amount of rain and its effects in the condition of the grass, the small number of bona fide dairy owners who are really an asset to the community,” and “the fact that most of the plants are owned by speculators who control at will the price paid to farmers for their milk.” Therefore, “the supply of fresh milk is inadequate in some localities,” and considerably out of reach for the average consumer throughout the island. “Due to these facts and many others,” he continued, “the milk situation has been getting more critical every day and is rapidly reaching its climax.”900

According to Díaz Cataldo, these figures demonstrated the limited capacity of the local dairy industry to produce fresh milk at an accessible price “for the great mass of the people”. In

900 Díaz Cataldo to Muñiz, December 13 1948. AGPR, fondo Oficina del Gobernador, tarea 96-20, caja 1825, folder 215.1-Milk Program, 3-4
this context, public health and nutrition experts began to consider alternatives to secure a more affordable and accessible supply of milk products with comparable protein and vitamin content. In his study, Díaz Cataldo used information provided by the departments of Health and Education to ascertain the viability of introducing reconstituted skimmed milk as such a product. He also consulted economists, personnel from the GSA, and dairy owners throughout the island. Among these, Carmen Martínez, Chief Dietitian at the Department of Health, informed that her agency conducted “research work concerning the possibility of using reconstituted skimmed milk with added fat” to substitute fresh milk in all of their hospitals. Under her supervision, staff from the Bayamón District Hospital conducted a test of the viability of this product as a fresh milk substitute among patients in the men’s ward. Hospital personnel were happy to report that none of the men “noticed it was not regular fresh milk and all were enthusiastic in their praise of the new product—even pleaded that they should be given the same kind of milk every day.”

Similarly, Diaz Cataldo referred to the report of Socorro Lacot, Chief of the School Lunch Division of the Department of Education, informing that “in every one of the 183,000 meals served daily” “the children accepted the new product and have enjoyed it.” This experience was replicated at other government institutions where the acceptance of powdered milk, together with the cost-effectiveness when compared to the fresh product, convinced health officials of the advisability of the substitution. For Díaz Cataldo and the representatives of the local dairy industry, this was good news since they could “sell them [government agencies] the milk at a cheaper price” after fortifying it with the vitamin A lacking in the skimmed product. Therefore, although Diaz Cataldo’s study showed that the dairy industry was incapable of

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901 Díaz Cataldo to Muñiz, December 13 1948. caja 1825, folder 215.1-Milk Program 1
902 Díaz Cataldo to Muñiz, December 13 1948. caja 1825, folder 215.1-Milk Program 4
providing affordable fresh milk for the majority of the population, he emphasized that it was capable of processing other products like skimmed milk and sell it at a lower price.

However, despite the work of local industry representatives like Diaz Cataldo, the interests of U.S. dairy producers ended up having the greatest influence over future government programs to introduce and popularize an alternative to fresh milk. By the late 1940s, skim milk in the U.S. had become a suitable alternative to provide essential nutrients to populations in circumstances where the fresh product was scarce or when a safe source could not be secured. Initially a dairy byproduct used as animal feed, skim milk had to “the stigma that it had carried in the mind of the consumers” before it could be successfully marketed in the United States. 903 This occurred when improved drying and packaging technologies transformed skim milk solids into a palatable beverage and increased its storage life. Because it did not have to be refrigerated, powdered skim milk provided a source of high quality protein for U.S. troops during WWII. Postwar mass relief and rehabilitation efforts in Europe, directed by United Nations’ agencies such as the International Children Emergency Fund (UNICEF) and the Relief and Rehabilitation Administration (UNRRA), also relied heavily on cheap supplies of this product for their supplementary feeding programs. 904

With powdered skim milk’s reputation established, its production increased from a 428 million annual average before the war to 559 million after. 905 It did not take long before U.S. dairy industries recognized the possibilities offered by one of the poorest U.S. territories as a consumer of this product. In June of 1949, Bartel Sanna of Sanna Dairy Engineers wrote to

903 Smith-Howard, *Pure and Modern Milk: An Environmental History since 1900*. 76. Before it was successfully marketed as human food, skim milk was discarded after extracting the cream for the manufacture of cheese and butter.
904 Gillespie, "International Organizations and the Problem of Child Health, 1945-1960." During the 1950s, FAO and UNICEF were engaged in initiatives to distribute milk products like powdered and evaporated milk as part of child nutrition programs in Central America and the Caribbean.
905 Ibid. 127
Governor Muñoz Marín informing that he had “taken the privilege of airmailing six sample packages of our Sanalac brand nonfat milk solids” to his office. Sanna explained how to turn the milk solids into a liquid beverage noting the higher solubility and flavor of their product which, he believed, made it “equal to fresh milk.” He also mentioned his visit to the island and his meeting with “Lydia Roberts at the University and with Antonio Vicéns” of the GSA with whom he “spent considerable time going over several aspects of such a product.”906 In his reply to Sanna, Muñoz Marín acknowledged receipt of the samples and emphasized the need for such products. Given that “the price of fresh milk is rather prohibitive for low income families” and “a large number of our population goes without any milk in their diet, nonfat dry milk solids might provide a solution for this deficiency in the Puerto Rican diet.”907

Having identified interested industries in the U.S. and importers on the island, representatives from the PRNC, the Department of Health, and PRACO met throughout 1949 to draw up a plan to allow and facilitate “the sale of powdered skim milk and its derivatives to the people of Puerto Rico.”908 The Department of Health’s Sanitary Code which regulated the production, importation, and distribution of dairy products, required the coloring of powdered skim milk imported or sold on the island in order to prevent its use in fresh milk adulteration. According to Commissioner of Health Juan Pons, allowing its regularized sale and distribution through an amendment to the Code “would put within the reach of our great low income population a type of lower cost milk which, even if incomplete in its nutritional value when

906 Sanna to Muñoz, June 4 1949. caja 1825, folder 215.1-Programa de Leche. Antonio Vicéns directed the General Supplies Administration since its creation in 1942
907 Muñoz to Sanna, June 16 1949. caja 1825, folder 215.1-Programa de Leche
908 Memorandum Leche Desnatada, February 9 1949. caja 1825, folder 215.1-Programa de Leche
compared with fresh milk, provides additional nourishment to those who are now unable to consume this product.”

After studying the projects’ various aspects, especially regarding the sanitary control of skim milk production and sale, health officials concluded in favor of the project. The plan finally submitted to amend the Sanitary Code and allow the “free importation of skim milk” went into effect in August of 1949 as Regulation 14 to rule “the importation, storage, sale, transportation, and consumption of powdered skim milk.” It required that skim milk be sold in small containers with Spanish labeling providing information about the product’s use, and that wholesalers submit reports to the Department of Health detailing sale volumes. Officials also requested extension agents to organize education campaigns to “emphasize the high nutritive value of milk in all forms” and to dispute the “erroneous belief that fat is milk’s best part.”

Although there was opposition from some importers who argued that the canning, labeling, and reporting requirements as well as selling restrictions of Regulation 14 were “commercially absurd and were destined to favor whole powdered milk traffickers,” local and U.S. nutritionists praised the Department of Health for its enactment. In May of 1950 the Nutrition Newsletter, published by the USDA, congratulated the Puerto Rican government for “providing a cheap milk supply for Puerto Rican families,” and for “encouraging people to purchase and use nonfat dry milk through an educational campaign carried out with the cooperation of all agencies within the Committee [PRNC] and of Governor Muñoz Marín.”

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909 Circular Num. 187 Departamento de Salud. February 23 1949. caja 1825, folder 215.1
910 Bigles to Cancio, Julio 26 1949. caja 1825, folder 215.1-Programa de Leche
912 Gómez to Mendoza de Muñoz Marín, September 22 1949. caja 1824, folder 215-Nutrición
product was given prestige,” the newsletter noted, “because these campaigns have been carried out by professionals such as nutritionists, home economists, and extension workers.”

These promotional efforts were carried out as part of an educational plan named “The milk campaign” (Image 7.1). As soon as health officials started to lay out the new skim milk regulations, nutrition experts began to draft plans to promote its virtues among children,

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housewives, civic groups, store keepers, and institutionalized populations. According to an inter-agency group tasked with designing these campaigns, “the program as planned is an educational one, which will reach all groups concerned in the Island.” The plan included “general education” strategies to reach the public and “workers in various fields”—such as doctors, teachers, and “other special workers”—so that they will understand the nature of the product, the purpose of the program, and be ready to give it their approval and backing.” The plan also included strategies to reach “housewives and others who will be consumers of the product” to educate them “as to its nature, economy and methods of use.” Educating the housewife on the benefits of substituting fresh milk with this product was particularly important for planners as her “attitudes and understanding are essential to the acceptance by the persons who should use it.”

All the government agencies involved in this program designated and trained a special group of demonstration workers to implement these campaigns throughout the island. These agencies named prominent home economists and nutritionists such as Lydia Roberts, Esther Seijo, Socorro Lacot, Sarah Rodríguez, Margarita Marchand, and Carmen Martínez as part of the Executive Committee in charge of coordinating the work of the skim milk demonstration agents. However, despite their efforts to promote the nutritional and economic qualities of this product, “The milk campaign” faced difficulties from the beginning. First, the government’s attempt to keep track of the volume of importation, distribution, and purchase of the new product by requiring shop keepers to submit reports on related transactions was resisted by commercial interests. Wholesalers refused to accept and sell skim milk shipments to avoid having to submit such a report. Health officials agreed to temporarily suspend this particular requirement to allow...
“for the normal distribution of the milk.” 915 This temporary suspension eventually became permanent.

The education work conducted among consumers and children attending school lunch rooms and was not yielding the expected results either. In January of 1951 at Muñoz Marin’s request, Executive Secretary Roberto Sánchez Vilella requested Lydia Roberts to call for a special meeting of the PRNC to consider launching new efforts given “the interest of the Governor in propagating the use of skim milk.” The limited acceptance of this product compelled local representatives of the skim milk industry to visit Sánchez Vilella’s office to complain “of the difficulties they are facing to introduce the product on the Island”. 916 Similarly, children attending Corozal’s lunch rooms refused to drink reconstituted powdered skim milk saying that it had “a peculiar flavor” that most of them disliked. 917 Rural housewives were not excited about the product either. Although demonstration agents even attempted to teach housewives how to prepare skim milk as “café con leche”, people’s demand for the product remained lower than experts desired. 918

**Enriched Rice for All**

Despite the difficulties promoting the benefits of skim milk and enforcing the commercial aspects of Regulation 14 among merchants, nutrition and health officials continued devising strategies to incorporate other new food technologies as part of their efforts to improve people’s diet. Among these, the government promoted the enrichment of all wheat flour sold on the island. However, the case of rice enrichment stands out given the amount of scientific and public health dedicated to it. By the postwar years, nutrition scientists in Puerto Rico had produced a

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915 Martínez to Muñoz Marin, September 26 1949. caja 1825, folder 215.1-Milk Program
916 Sánchez Vilella to Roberts, January 18 1951. caja 439, folder 215.1-Milk Program
917 Sayán, "Food Service in Puerto Rican Public Schools," 28
918 “Plans for dry skim milk program”, July 21 1949. caja 1825, folder 215.1-Milk Program
considerable amount of data about the biochemical content of the rice preferred by islanders and its various combination. According to the most recent biochemical studies conducted at the STM, a diet based on polished rice and red kidney beans lacked a great deal of essential micronutrients like riboflavin, niacin, and thiamine.\textsuperscript{919} Apart from studying the nutritive content of the rice consumed on the island, the PRNC launched various campaigns attempting to encourage people to substitute red beans for what were considered more nutritive legumes, such as chickpeas or soybeans.\textsuperscript{920} All these measures, however, were largely unsuccessful prompting health officials to explore other measures to supply the vitamins absent in rice and beans.

This scientific and public health emphasis on Puerto Ricans’ rice and beans diet reflected trends in international nutrition research. In May of 1948, experts met in Washington D.C. for the Fourth International Congress on Tropical Medicine and Malaria. As part of the Congress, the recently organized FAO sponsored a section called “Malnutrition and the Rice Problem” chaired by Wallace Aykroyd. While describing the importance of nutrition for tropical medicine, he noted that in the “the rice-eating regions of the world”— including the Philippines, China, India, Malaya, and Siam—“the general level of health is low in comparison with levels attained in western countries in which wheat is the principal cereal.”\textsuperscript{921} The creation of the International Rice Commission at the FAO was a response to these concerns. The proposal for this Commission was presented at a FAO meeting held in the Philippines in early 1948.\textsuperscript{922} Among the strategies discussed by the new Commission was the “exchange of information between

\textsuperscript{919} Asenjo, García de la Noceda, and Serrano, "Riboflavin Content of Tropical Foods." Asenjo, "Thiamine Content of Tropical Foods." Asenjo et al., "Niacin Content of Tropical Foods."


\textsuperscript{922} Norris E. Dodd. Circular Letter to Member Governments. FAOA. RG 10, Agriculture Division, folder Interdivisional committee (IDC) on the Rice Council
countries on past experiences and new developments” related to “more recently recognized
deficiency states” among rice-eating populations.923 By this time, however, there was a vast body
of literature about the agricultural and public health problems of rice regions from fields like
agronomy, botany, nutrition, and medicine. The FAO Rice Commission aimed to consolidate this
expertise and promote greater efficiency in the production and processing of rice and to consider
ways to increase the grain’s nutritional content through the production of lightly milled,
parboiled, converted, or enriched rice.

In the U.S., food enrichment was a topic widely discussed in scientific and popular media
during WWII. Some argued in favor of enrichment techniques used to replace the vitamins lost
in food processing while others preferred fortification “which involved adding extra-
micronutrients to target known nutritional deficiencies.”924 After the war, pharmaceutical
companies rushed to develop better technologies in efforts to capitalize on the international
opportunities opened by the potential implementation of cereal enrichment as public health
strategies. Nutrition experts in Puerto Rico drew from these international conversations in their
efforts to add nutrients to poor people’s diets. Although beriberi, the main deficiency disease
associated with rice diets, was not as prevalent in Puerto Rico as in Asian regions, rice
enrichment became a central element of the PPD government public health strategies. Biochemists, extension workers, and the GSA were all involved in conversations around the
potential of rice enriched with thiamine, niacin, and iron as a public health tool in the fight
against malnutrition.

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923 International Rice Commission. Suggestions on Activities and Procedures in Furthering More Efficient
Production and Utilization of Rice. FAOA. RG 10, Agriculture Division, folder Inter-divisional committee (IDC) on
the Rice Council. Aykroyd, "Malnutrition and the Rice Problem." 1174
924 Rima D. Apple, "Vitamins Win the War: Nutrition, Commerce, and Patriotism in the United States during the
Second World War," in Food, Science, Policy, and Regulation in the Twentieth Century, ed. David F. Smith and Jim
Phillips (New York: Routledge, 2000). 137
Scientific, commercial, and public health agendas coalesced around the rice enrichment project on the island. It was spearheaded on February 17, 1949 when biochemist Robert Williams wrote to Pablo Morales Otero, now Director of the STM, and to Lydia Roberts to inform them “about the situation with respect to enriched rice in the United States.” He noted that this was now facilitated by better techniques to enrich foodstuffs with synthetic vitamins and enquired “whether Puerto Rico may not be interested in securing the importation of such rice.”925 Williams was a veteran nutritional biochemist who worked in the Philippines during the 1910s investigating the etiology and clinical manifestations of beriberi. Upon his return to the U.S. he embarked in his “real life work,” “the epic hunt for the beriberi factor”, through the identification of the substance deficient in the diets of those suffering from this disease.926 In 1936, this search culminated with the final synthesis of vitamin B₁ or thiamine, one of the nutrients lost in the process of milling and polishing rice.927 From then on, Williams remained involved in the promotion of enriched rice as an effective strategy to prevent beriberi by increasing the dietary intake of thiamine.

This task took him on a tour through the principal rice eating countries in Asia where he publicized the Philippines’ experience using enriched rice on a trial basis. Among the purposes of this tour was “to acquaint public health authorities in each country” with this experience, “to study the forms of rice in use and the modes of its preparation as food”, “to promote the trial of rice enrichment where applicable”, “to evaluate other major food problems”, and “to observe the

925 Williams to Morales Otero, February 17 1949. caja 1825, folder 215.1 Milk Program
political, social, economic and scientific trends." With fellow biochemist Robert Waterman, Williams created the Williams-Waterman Fund for the Combat of Dietary Diseases to promote these agendas throughout the world. The Fund utilized Williams’ thiamine royalties to support researchers and institutions studying formulas and techniques for cereal enrichment. One of its first funded projects explored the possibilities of enriching de-germinated corn meal and grits to increase “the nutritive value of these southern staple foods and prevent pellagra by improving niacin-deficient diets.”

Williams also utilized the recently created FAO as a platform for his international campaign to promote cereal enrichment. In correspondence with officials from the Nutrition Division and the Rice Commission, he emphasized the potential of these new technologies to improve public health. Similarly, in his correspondence with Morales Otero and Roberts, Williams highlighted how “a large scale experiment involving some 80,000 people” in the Philippines proved the benefits of fortified rice which was “favorably received by the Philippine government and the Filipino people.” However, he worried that since “the demand for rice in any form has been so keen and the millers have grown indifferent to its nutritional improvement, there is a danger that the whole undertaking of fortified rice in the United States may be abandoned or postponed indefinitely.”

Although synthetic thiamine was added as part of the enrichment of wheat flour, no regulation existed in the U.S. requiring this measure. Williams reassured Morales Otero that while Hoffman-La Roche, the pharmaceutical laboratory that manufactured synthetic thiamine, had “a commercial interest in the promotion of the use of

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928 Survey tour of rice enrichment, by Robert R. Williams. FAOA. RG 12, sub-group Nutrition Division, Classification Food Technology, folder Rice 1953  
930 Williams to Morales Otero, February 17 1949. caja 1825, folder 215.1-Milk Program  
fortified rice...they assure me that they wish to make no profit from it except as it expands the volume of demand for the vitamins which are concerned [sic] at current competitive market prices."

In his response to Williams, Morales Otero agreed that “as rice is our most popular diet, it would be the most effective means of supplying protective factors to the mass of our people.” He also highlighted the importance of the new technology for enrichment described by Williams, which “does not alter either the appearance or the taste of the grain” as “other forms of enriched rice have been unpopular because of a musty taste and unattractive appearance after cooking.” Although Morales showed certain reserves with regards to potential price increases, he believed that “enrichment of the type you offer will gain government support, since the fundamental philosophy of the party in power is one of improving the lot of the underprivileged, which is, of course, synonymous with the undernourished.” Given that “enrichment of rice will benefit the population greatly, provided, of course, that the consumers’ price is not raised significantly,” Morales Otero promised “to take up the matter with Governor Muñoz.”

Morales Otero finished his letter encouraging Williams to communicate with Conrado Asenjo to discuss the details of the proposed project and arrange a visit to the island. Williams replied favorably to this proposed encounter, noting that he “shall look forward to seeing Dr. Asenjo in New York or at Detroit in the Federation meetings.” However, in spite of Williams’ assurance that enriched rice “was favorably received by the Filipino people” and that “the layman will not be able to distinguish it from ordinary white rice,” Commissioner of Health Juan Pons had doubts regarding the possibility of introducing it to the Puerto Rican consumer. In a

932 Williams to Morales Otero, April 1 1949. caja 1825, folder 215.1-Milk Program
933 Morales Otero to Williams, March 18 1949. caja 1825, folder 215.1-Milk Program
934 Williams to Morales Otero, April 1 1949. caja 1825, folder 215.1. The meeting mentioned in this correspondence is the annual meeting of the Federation of American Societies for Experimental Biology, held at Detroit, Michigan in April 18-22, 1949.
letter to the Sánchez Vilella regarding Williams’ proposal, Pons noted that “having made sincere
efforts to use enriched rice in my own home, even I cannot get used to its grayish appearance and
its taste so markedly different from what we are accustomed to.” Therefore, he continued, “any
legislation requiring the exclusive importation of enriched rice would only be viable if the new
procedures were truly effective in maintaining the general aspect and taste favored by Puerto
Ricans.”

Once it was determined that the rice produced with the new enrichment technology
remained white after the process, Pons decided to endorse the proposal. Although concerns
regarding possible price rises remained, the Governor backed the project and in June of 1949
convened various specialists to form the Comité del Arroz (Rice Committee), appointing Lydia
Roberts as Chair. This committee was tasked with studying the possibility of requiring by law
the enrichment of all rice imported to the island and for making recommendations regarding the
details of the legislation. Most of the members were part of the PRNC whom the Governor
“directed to work in harmony with the people representing the rice interests in Puerto Rico.”
The committee also included representatives from the Departments of Health, Education, and
Agriculture as well as from the GSA, and rice importers and distributors.

As Chair, Roberts updated the Governor regularly on the activities of the various
members of the committee and on the progress made toward the goal of producing final
recommendations. The committee spent almost two years discussing findings from nutrition
studies and negotiating various aspects of the proposed legislation. During this process, conflicts
emerged between government officials and rice importers’ representatives. The main issue of

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935 Pons to Sánchez Vilella, April 19 1949. caja. 1825, folder 215.1
936 Vicéns to Sánchez Vilella, April 19 1949. caja 1825, folder 215.1
937 Muñoz Marín to Roberts, June 2 1949. caja 1824, folder 215.1
938 Muñoz Marín to Williams, June 8 1949. caja 1824, folder 215.1
939 Roberts to Muñoz Marín, September 27 1949. caja 1824, folder 215-Nutrition, Rice enrichment
contention between rice importers, represented by the Chamber of Commerce, and those favoring the project was related to cost increases. According to them “the additional nutritional value that fortified rice would have, as required by the project, does not justify the imposition of this new burden on the consumer.” This price increase was due, they argued, to the higher production cost of enriched rice and, because “Puerto Rico would be the only market where enrichment is required by law,” to the very few millers in the U.S that could supply this rice variety.\footnote{“Alegan medida subirá el costo del arroz aquí en $3, 000,000,” \textit{El Mundo}, 26 Abril 1951.} Import data, however, did not support these claims. By April 1951, Puerto Rico imported 63 per cent of its rice from California and the rest from Louisiana, Arkansas, and Texas. California growers produced enriched parboiled rice while millers in southern states ensured the government that they were “in a position to sell fortified rice.”\footnote{Acevedo a Roberts, April 30 1951. AGPR, Fondo Oficina del Gobernador, Tarea 96-20, caja 1824, folder 215-Nutrition, Rice Enrichment}

Antonio Colorado, representative of the GSA in the Committee on Rice, sent a lengthy response to the editors of \textit{El Mundo} disputing Chamber of Commerce’s claims and emphasizing the public health role of the legislation. Accusing them of inflating prices, Colorado dismissed the impact of the fact that Puerto Rico would be the only market requiring rice enrichment by law noting that the island was the only place where people demanded \textit{arroz brillado} (polished rice) “which, although it does not add but removes nutritional value, increases production cost at a rate of 10 cents for each 100 pounds.” “If we already pay for the rice polishing process,” Colorado noted, “which is perfectly useless and only serves the purpose of satisfying the cook’s aesthetic sensitivity, is it not justified to pay 25 cents to add nutrients to it?” Colorado argued that the goal of “feeding our people better” is a cause worthy enough, and as such any new cost “should be assumed by merchants, not by consumers.”\footnote{Colorado to Vargas, Abril 26 1951. caja 1824, folder 215-Nutrition, Rice enrichment} Colorado also provided Muñoz with a
summary of the results obtained in the Philippines where a trial was conducted to study the viability of an enriched rice program. Here Colorado emphasized that the new costs were “covered with an increase of around 1/10 cents per pound in the sale price of rice which totals 35 cents per person per year.” With this and similar data, Colorado aimed to prove that rice enrichment was a simple and affordable procedure which costs were minimal when compared with its public health benefits.

Therefore, and in spite of the Chamber of Commerce’s opposition, in May 13 1951 the legislature passed the law “to fix and prescribe the nutritional qualities that all rice imported and sold to the public for human consumption in Puerto Rico must possess and the nutritive elements it must contain.” Regulation 22 put into effect the legislation requiring that all rice imported to the island be enriched with thiamine, niacin, and iron. In the Governor’s words, this effort further contributed to the “big strides that have been made during the last ten years in our fight to overcome poverty, disease, and hunger.” Concerns with potential shortages were put to rest when the Vice President of Hoffman-La Roche wrote to Pons to assure him of the availability of enough supplies of enriched rice for Puerto Rico as a result of “the efforts of the rice milling industry” to be “able to sell and advertise only milled white rice which has been fortified.”

Despite Williams’ reassurance that this pharmaceutical company “wished to make no profit” from the widespread use of fortified rice, the passage of Regulation 22 became an important promotional tool for Hoffman-La Roche. In an advertisement describing the company’s advanced food enrichment technology, the company highlighted that “fortified rice made with Roche-type premix meets Puerto Rican legislative requirements that at least 85% of

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946 Hoffman-La Roche Vice President to Pons, January 3 1952. caja 1824, folder 215-Nutrition, Rice Enrichment.
stated [vitamin] values must be retained after a stipulated rinsing test.” Thus, Roche’s enriched rice not only provided adequate levels of individual nutrients, as “recommended by the Food and Nutrition Board of the National Research Council”, but it was also designed to be compatible with “normal kitchen practices” such as washing before cooking. (Image 7.2)

During the following years the government of Puerto Rico implemented the rice enrichment law through the collaboration of the multiple agencies involved. However, similar to the skim milk case, the effectiveness of this new legislation relied on people’s acceptance of this type of rice. This required the elaboration of educational campaigns among homemakers and the general public promoting the benefits of enriched rice. By the time of passage of the rice enrichment law, nutritionists had already recognized the need to develop new nutrition education programs to reflect the socioeconomic changes the island was experiencing. Agricultural experts as well as food importers, distributors, and retailers also realized that there was a need to adapt to these new circumstances by developing improved marketing and sale strategies. For this, the PPD government convened a group of experts in these fields to develop the blueprint for new food policies suitable for a changing Puerto Rican society.

**Nutrition Education for the Modern Food Consumer**

The 1950s was a decade of rapid transformations resulting from the implementation of the new economic development model based on the promotion of industrial manufacture. Similar to other settings, the pursuit of modernization and progress through industrialization, bureaucratization, standardization, commodification, and quantification characterized this model of development. These projects framed the elaboration of new food policies. By 1953, the recently inaugurated Commonwealth government recognized that the PRACO model of distribution and marketing was not yielding the desired increases in production and consumption of local foodstuffs. To propose new strategies the Governor convened a panel of local and international experts on matters related to importation, distribution, sale, and marketing to form the Puerto Rico Food Advisory Commission. The Commission also included representatives

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947 Immerwahr, *Thinking Small: The United States and the Lure of Community Development*. 2

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from commercial, trade, academic, and government agencies with expertise in these areas. To facilitate discussion it was divided in various sub-committees including Consumer Education, Food Products and Processing, and Retail and Wholesale Trade. Experts in marketing and economics, not nutrition specialists or educators, made up the Consumer Education sub-committee. Lansing P. Shield, President of the Grand Union Company, a supermarkets conglomerate in the U.S. Northeast, was appointed as Chair of the Commission.

Maurice Bond, professor of Marketing at Cornell University was among the experts invited to work as part of the Commission. Bond was appointed co-chairman of the sub-committee on Consumer Education together with Cándido Oliveras, Chief of the Economics Division of the Puerto Rico Planning Board. Millard Hansen, new Director of the UPR Social Science Research Center, was also a member of this sub-committee. Hansen played a leading role in the communication with U.S. experts working as part of the Commission and in coordinating their visits to the island. In correspondence with Bond, Hansen emphasized the importance of “teaching the consumer to make price comparisons with careful regard to comparable size, brand, and quality of the product”, as well “the cost of credit” and “the principles of nutrition” “such as calories, vitamins, and so on.” For this, the commission sought the advice of nutrition experts from the Extension Service and the Department of Education to develop campaigns that “encourage aspiration and greater knowledge about better diet.” The diet recommended “of course, should be made up of items which are not only desirable but also available” to all families.

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948 Report of the Puerto Rico Food Policy Commission, January 1954. ACUPR, fondo Informes y Estudios, recopilación Especial #58, caja 2, folder Report of the Puerto Rico Food Policy Commission
949 Hansen to Bond, October 14 1953. CU-RMC. Cooperative Extension Records, box 80, folder 24
950 Hansen to Bond, August 31 1953. CU-RMC. Cooperative Extension Records, box 80, folder 24
As Hansen’s comments show, in the work of the Puerto Rico Food Policy Commission plans to modernize food production, distribution, and sale were compatible with the promotion of good nutrition. Among their final recommendations, the sub-committee on Consumer Education included the establishment of an Education Committee for Food Consumption and Marketing. This new committee would be responsible for “coordinating the several programs on consumer education now sponsored by the Government’s Agriculture, Education and Health Departments, the Extension Service of the University of Puerto Rico and any private agencies with similar objectives.” It would also be responsible for developing a specific program “to educate consumers on nutrition, menu diversification, discriminate buying, foods new to the average Puerto Rican diet, and the public benefits of efficiently operated modern retail food markets.” A representative from the Department of Labor and “a member of the trade appointed by the Governor” and a “full-time Executive Secretary” were also so be part of this new Education Committee.

The results of this commission, however, were the product of an uneasy interaction between commercial, public health, and political agendas in both the U.S. and the island. While local government planners attempted to devise a rational plan to guide new food policies as well as to advance their economic and public health agendas, U.S. commercial interests recognized the potentially profitable opportunity offered by the rapid transformation of Puerto Rico’s eating habits and purchasing power. As the cases of powdered skim milk and enriched rice shows, representatives from food industries in the U.S. successfully appealed to PPD government’s focus on nutrition issues and to the significance of food and feeding in the construction and legitimization of the party’s ideology. As part of the Food Policy Commission, industry

951 Report of the Puerto Rico Food Policy Commission, 3.
952 Ibid, “Committee on Education”, 1
representatives deployed nutrition and health concerns to promote particular recommendations. In principle, the local agricultural industry was to benefit from the changes promoted by these reforms. In practice, however, it was U.S.-based food producers and local importers who benefited the most.

For example, during his time as Chair of the Commission Lansing’s Grand Union Company was one of the most important chain of grocery stores in the Northeast where it was expanding across several states. The Commission’s recommendations discussed at length the need to promote the modernization of food wholesalers and retailers through the establishment of the supermarket model. As Bond told local importer Jaime Ballester in 1953 “I hope you will make a point of talking with some of your friends and competitors in the wholesale food business” about the need for “training schools, conferences, or other in-service training” to promote “desirable standards and practices in retailing food products.” By 1962, Grand Union had purchased many of the new food retail establishments established under this model. In this way, the recommendations of the Commission served as the foundations for the expansion of the supermarket model in Puerto Rico. Through these interventions, the PPD government attempted to diversify Puerto Rican’s diets and reform food production, processing, and sale in line with the priorities of the development and modernization project. While these plans also included measures to modernize local agricultural production, the alluring possibilities offered by new food products and technologies shaped policymakers’ priorities.

However, as the members of the sub-committee on Education noted, the effectiveness in the promotion of a more diversified diet required “food buyers to avail themselves of more

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954 Bond to Ballester, October 8 1953. CU-RMC. Cooperative Extension Records, box 80, folder 24
955 Ortiz Cuadra, "Buena Vida no es Vida Buena: Disquisiciones Muñocistas sobre Nutrición y Consumo." 29
efficient retail stores as they become available and also to make increasing demands that better stores be made available.\textsuperscript{956} The Food Policy Commission assigned the task of developing the programs needed to prepare and aid food buyers to the Agricultural Extension Service. As Chapter 5 showed, the Extension Service was involved in consumer education programs since the previous decade publishing multiple pamphlets and educational materials encouraging home makers and the general public to be a “good food buyer.”\textsuperscript{957} During the war years extension officials placed these campaigns as part of Puerto Rico’s contribution to the defense of democracy. After the war, the Extension Service redoubled its efforts to educate the home maker to save money, “take advantage of in-season products”, and “have a more complete diet”.\textsuperscript{958}

As part of this project, in 1948 the Federal Extension Service assigned home economist Carmen Selenia Sánchez to lead a special project to make “Puerto Ricans better buyers through consumer education.” This campaign was based on an educational strategy to educate about “conservation and nutritional value of foods in season” and of “substitutes for expensive and less available products” as well as to inform the public about labeling and standardization of imported foods and “the value of Puerto Rican produced foods now being commercially processed.”\textsuperscript{959} The Extension Service employed ten special agents to implement this program as part of the new Consumer Education Section. The methods used in these education campaigns included radio programs, conferences, short courses, newspaper articles, home visits, and printed materials on topics such as “Wise Buying”, “Good Buying Practices”, and “Labeling and Standardization of Foods”. Through the Department of Health, special agents also offered short

\textsuperscript{956} Ibid, “Committee on Education”, 1
\textsuperscript{957} Agricultural Extension Service College of Agriculture and Mechanic Arts, ¿Sabe usted? Prueba para un Buen Comprador de Alimentos (Rio Piedras: University of Puerto Rico, 1947). NAL
\textsuperscript{958} Defienda su Dinero Comprando Inteligentemente (Rio Piedras: University of Puerto Rico, 1948). NAL
\textsuperscript{959} Special Progress Report on State Extension R.M.A. Projects: Puerto Rico. CU-RMC. Cooperative Extension Records, box 80, folder 24. 1
courses to “food products salesmen” on the “hygienic manipulation of food products, the whys of sanitation, personal hygiene, classification and selection of food products, salesmanship, and attractive and hygienic reorganization of market place counters”.

The work of Esther Seijo de Zayas, chief of the Home Demonstration Office since 1943, lay the foundations for the consumer education campaigns implemented by the Extension Service during the 1950s. Under Seijo’s direction, special extension agents re-organized the agency’s nutrition education programs to focus on the homemaker as a consumer of purchased foodstuffs. After returning to Puerto Rico in 1952 from a year of graduate study at Cornell University where she obtained a Master’s degree, Selenia Sánchez collaborated with Seijo in the planning and implementing the Consumer Education Program. In the year 1952-1953 consumer education specialists worked preparing campaigns according responding to local surpluses or shortages of certain products. Although they used both fresh and canned foods in these campaigns, special agents continued to emphasize “the consumption of native products” “especially yellow sweet potatoes and tomatoes” as part of their education programs. They also organized “Information Centers” at markets in Santurce, Ponce and Mayaguez where they gave food demonstrations and distributed recipes among consumers and offered short courses to retailers. In this case, a photo was taken before and after the counter space was organized to demonstrate the “improvement of sanitary and attractive conditions” of food market places.

By the mid-1950s these education campaigns assumed a renewed importance. A year after the Food Policy Commission submitted its recommendations to the Governor, the first supermarket opened in San Juan. Utilizing “a series of marketing devices unprecedented in Puerto Rico”, these new venues for food sale appealed to the “nuevo pueblo consumidor” (new

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960 Special Progress Report on State Extension R.M.A. Projects: Puerto Rico. 2
961 Puerto Rico: Extension Service Food Marketing Project. CU-RMC. Cooperative Extension Records, box 80, folder 24. 1
consumer people) emerging from the rapid demographic and socioeconomic changes of the decade. These marketing devices aimed to “close the gap” between Puerto Ricans’ “customary cheap diet items” and “the newer, more costly diet items which should also be eaten.”

Extension education materials encouraged the home maker to “prepare a grocery list”, “read closely everything in the label”, “learn how to discern the qualities and characteristics” of food items, “visit several stores and compare the price and quality of the products”, “ask for discounts when buying in bulk,” and to “make sure you are given what you asked for”.

These nutrition education campaigns were directed to provide Puerto Rican consumers with the information necessary to improve their diets in the new food system. While the earlier emphasis on instructing rural women and girls on methods of household food production and preservation remained part of the Home Demonstration Office’s agenda, the work of the Consumer Education Section focused on food purchasing as a standardized process. This process could be taught by experts as well as mastered and replicated by consumers in the new food ecologies. Central to these new efforts was transforming home makers into buyers knowledgeable of both nutrition science and economic principles and turning food marketplaces into organized and sanitary spaces. Home demonstration agents utilized exhibits, conferences, demonstrations, radio programs, and literature, to promote good nutrition through the “wise buying of different food products”. Teaching home makers to obtain a greater value for their money by buying in bulk, preparing a grocery list, avoiding food waste, and favoring in-season fruits and vegetables became another strategy to improve people’s diet and maximize incomes.

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962 Ortiz Cuadra, “Buena Vida no es Vida Buena: Disquisiciones Muñocistas sobre Nutrición y Consumo.” 29
963 College of Agriculture and Mechanic Arts, Defienda su Dinero Comprando Inteligentemente. NAL
As Seijo argued, “more money spent for worthless foods will not improve diets”. Improvement could be achieved “even with low incomes” by “wise spending on low-cost nutritious foods.”

By 1955, Seijo, now the Director of the Bureau of Nutrition and Dietetics of the Department of Health, already noted that “Puerto Rican food habits have changed over the past decades as processed products or “foreign” plants and seeds have been introduced from continental United States.” In Seijo’s assessment, however, not all these changes were welcomed. In her analysis, old “fads and fallacies” were joined by new undesirable nutrition habits. People now tended “to prefer foods of lower nutritive value, some of them imported at relatively high cost”, to “foods of greater nutritional value of their own land.” Simultaneously, many Puerto Ricans continued to let fruits like “guava, guava, breadfruit, or mamey trees growing in their yards go to waste” because they “still believed these caused appendicitis, were poisonous, or provoked blindness.” Moreover, government programs to increase subsistence and commercial food crops agriculture had yet to produce the desired improvement of people’s diets. The changes required to produce the nutrition changes that Puerto Ricans needed went beyond “an increase in the amount of foods available”. As Seijo argued “the work of producing more must be accompanied by efforts to produce better.”

During the following years, however, the pursuit of these objectives became incongruous with the government’s economic development strategy. The diversification of people’s diets occurred not as a result of producing more and better food but as the consequence of, as Jacques May argued, Puerto Ricans’ increasing capacity to “go to the restaurant” and U.S. agribusiness’ penetration of the island’s food system. In the context of the Cold War, the improvement of

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964 Seijo de Zayas, "Better Nutrition for Puerto Ricans." 63
965 Ibid. 63-64
966 "El Puertorriqueño Puede Alimentarse Mejor a Través de una Mayor y Mejor Producción de Alimentos," Revista de Agricultura de Puerto Rico 42 (1952). 266
Puerto Ricans’ standard of living facilitated by these transformations made their experience a central part of U.S. international development and geopolitical agendas.

**Nutrition and Technical Assistance**

Despite Seijo’s concerns, most observers considered that Puerto Rico’s rapid transformation during the 1950s offered proof of the benefits of a close association with the U.S., as promoted by the architects of the Commonwealth. Similarly, rapidly rising incomes resulting from increases in manufacture employment demonstrated the potential of modernizing development models to promote material progress and improvements in the living standards of poor or “undeveloped” societies. For Seijo and other nutrition experts on the island, however, these changes also called for revamped efforts to cultivate among the people attitudes of “wise spending on low-cost nutritious foods.”\(^967\) These new consumer education programs built on the work of the home demonstration work during the 1930s and 1940s. As the previous section showed, this work was now adapted to the rapid changes in food consumption and availability fostered by the expansion of the industrialization program.

By the mid-1950s, Puerto Rico’s experience with nutrition, extension work, and home economics education also placed the island in the middle of a burgeoning international movement focused on these strategies as tools of the “development apparatus”.\(^968\) The FAO recognized that “home economics can make an important contribution” to raise rural people’s standards of living through the promotion of “personal and household hygiene”, “improvement in actual living conditions” including “cooking and sleeping arrangements”, “good nutrition”,

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\(^967\) “Better Nutrition for Puerto Ricans.” 63

and “appropriate child care.” According to Mona Doss, Regional Nutrition and Home Economics adviser of the FAO, home economics “is concerned with good home management”, “with domestic food production and consumption” including “the cultivation of fruits and vegetables and the rearing of small livestock”, “with the selection, preparation and serving of food”, and “with methods of preservation and storage.” Doss argued that “these are among the means through which the nutrition of the peoples of all countries can be improved.” This was precisely what Puerto Rican home economists were attempting to achieve since the 1930s.

As Doss’ comments suggest, nutrition was critical to an internationalist vision of development during the decades following the Second World War. The passage of the International Technical Cooperation Act in 1949 institutionalized this vision of technical cooperation as a tool of development. The act was based on the so called Point IV of the plan calling for the use of economic and technical assistance in the promotion of “the development of the underdeveloped world”. The results of innovations in processing and preservation technologies during the war facilitated the expansion of food aid programs and their incorporation to this emerging development apparatus. During this period, the USDA contributed agricultural surpluses and personnel under the Mutual Security Acts of the early 1950s and then under the Agricultural Trade and Development Act of 1954, known as “Food for Peace” after 1961. Through these programs, food surpluses and nutrition expertise became “an integral

969 “Role of Home Economics in the Extension Programmes of ‘Underdeveloped’ Countries.” FAOA. RG 12, Sub-group Nutrition Division, Classification Programme, folder Extension Education of Rural Peoples
970 Mona Doss. “The Place of Home Economics in the Development of Rural Extension Programs.” FAOA. RG 12, Sub-group Nutrition Division, Classification Programme, folder Extension Education of Rural Peoples
971 Vernon, Hunger: A Modern History. 151
972 McVety, Enlightened Aid: U.S. Development as Foreign Policy in Ethiopia. 1
973 Effland, "International Programs of the USDA: Cross-Purposes or a Delicate Balance?" 355-356
part” of “mutual assistance programs of technical, military and economic aid to the developing friendly countries”. 974

As many authors have demonstrated, the “banner of development”, which provided “the rationale for western intervention into the social and economic life of emerging nations in Africa, Asia, and Latin America” was based on the flow of information, knowledge, technologies, and expertise from the “developed” to the “underdeveloped world”. 975 Rural development initiatives became an important vehicle for this flow of development assistance. 976 Puerto Rico, however, was both a receptor and a provider of technical assistance. As the previous chapter have shown, Puerto Rico received food aid and nutrition technical expertise from the U.S. since the 1930s. In the international context of the 1950s and 1960s, Puerto Rico’s strategic position ensured its key role in the articulation of the U.S. relationship with Latin America and the Caribbean specifically and with the rest of the now “underdeveloped” world in general.

As part of the Point IV Technical Assistance (TA) plan, Puerto Rico became a training center for social workers, public health experts, home economists, agronomists, and other foreign students in areas related to food and nutrition. Puerto Rican government officials, in turn, recognized these Point IV programs as opportunities to publicize the island’s own development experience. In this way, Puerto Rico’s participation in these programs “represented the greatest government effort to legitimize and internationalize” the Commonwealth’s political and economic projects. Between 1950 and 1954, 1,341 trainees from the Caribbean, Central America, South America, Africa, and Asia arrived on the island to receive training at the University of Puerto Rico and various government agencies. Through these experiences, trainees

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975 Packard, "Visions of Postwar Health and Development and their Impact on Public Health Interventions in the Developing World." 93
and visitors “would become spokespersons of the kind of development they had witnessed in Puerto Rico.”

Similarly, TA programs allowed Puerto Rican officials and nutrition experts to take part of trans-Caribbean conversations around issues of health, development, and decolonization. Puerto Rico was active in these conversation since the WWII years through the participation of Puerto Rican delegates in the various West Indian Conferences. The island’s strategic defense role during the war made the island a key player of U.S.-British relations in the Caribbean during the 1940s as part of the Anglo-American Commission. Once the war ended, this exchange was formally institutionalized through the creation of the Caribbean Commission which included representatives from the region’s colonial territories and metropolitan powers. The promotion of technical cooperation to foster socioeconomic development in the island-colonies was a central aspect of the Commission’s agendas. Several high-ranking government officials such as Fernós Isern represented Puerto Rico in the Caribbean Commission during the years it was active.

Despite its lack of political sovereignty, the Commonwealth government quickly recognized the opportunities offered by TA programs to diplomatically engage with Caribbean colonial and national authorities. In 1953, Muñoz Marín sent delegates to Washington in attempts to obtain concessions from the U.S. government to allow Puerto Rico’s representation in the UN and its specialized agencies. As Resident Commissioner, Fernós Isern played a leading role in these efforts. Despite Fernós Isern’s work, the Governor’s petition was rejected and Puerto Ricans participating in UN and other international agencies’ activities remained part of

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978 Antonio Fernós Isern served as the Puerto Rican delegate to the 1943 West Indian Conference where he promoted the PPD government’s agrarian reform and land distribution program. Fernós Isern, "Postwar Planning in Puerto Rico."
the U.S. delegation. Nevertheless, even when subordinated to U.S. agendas and lacking self-representation, serving as a destination for TA trainees allowed Puerto Rican officials to engage with the rest of the decolonizing world, especially in the Caribbean region, and promote the virtues of the island’s economic and political system.

Nutrition science was an important aspect of the TA programs channeled through Puerto Rico during the 1950s and 1960s. The field’s biomedical, agricultural, and social aspects together with its implications for public health and socioeconomic change gave nutrition experts a newfound prestige as part of international development programs. Puerto Rican nutrition, public health, and agriculture professionals had practiced and refined their skills as part of Depression-era reconstruction programs and during the food emergencies of WWII. Their close relation with U.S. institutions and government agencies also gave them a degree of visibility and social capital. Finally, the years of exchange between the UPR and U.S. academic and philanthropic institutions together with island’s geographical position in the middle of the decolonizing British, French, and Dutch Caribbean made Puerto Rico an ideal place to launch Point IV TA programs in the region. Moreover, Puerto Rico’s expert-led transformation over the previous decades and its manifestations in nutrition and health improvements made the island an ideal showcase of the promises of turning development into foreign policy.

Disseminating the Puerto Rican Experience throughout the Globe

Puerto Rico was a destination for Latin American students looking for training in public health, home economics, and agriculture since the late 1930s. For example, in 1939 students from Venezuela sponsored by that government’s Ministry of Development and Agriculture visited the island to “take courses of home economics at the University” and to observe “closely

981 McVety, Enlightened Aid: U.S. Development as Foreign Policy in Ethiopia. 2
the home demonstration work done by the extension agents.” However, it was not until the creation of the FAO and the implementation of the TA plan that the island was formally incorporated into this international technical cooperation network. During the 1950s, the promotion of interlocked “agricultural education and social services” “to secure the development of contented rural communities” became a key element of the transition toward independence of former British colonies in the Caribbean region. For UN specialized agencies such as the FAO and UNESCO, the organization of extension education initiatives directed to rural women and young people was the first step in the promotion of orderly transitions to independence in these gradually decolonizing territories. As part of this, “teaching nutrition and other aspects of home economics in elementary and secondary schools” was a subject of interest for these agencies.983

However, in the assessment of FAO experts, while home economics was included “for many years in the curricula of schools” in the British West Indies, “there was no special institution for training specialists in this field.” Where there was, the training was “inadequate due to insufficient time, facilities, shortage of well-trained experienced personnel and lack of funds.” The same was true for the Dutch and French Caribbean where authorities recurred to sending students to their respective metropolis for training in nutrition, agriculture, and home economics. In these circumstances, the UPR appeared as an ideal place to organize home economics training programs for Caribbean students. According to the FAO’s Home Economics Advisory Committee “Puerto Rico demonstrates, perhaps as dramatically as any place in the world today, what can be done to improve standards of living when home economists are trained to initiate, promote and sustain programs which are concerned with all aspects of home and

982 “Vienen a Estudiar el Trabajo de Demostración,” El Heraldo de Extensión 1, no. 11 (1939).
983 FAO Home Economics Advisory Committee, Timetable and Agenda. FAOA. RG 12, Sub-group Nutrition Division, Classification Home Economics Section, folder Home Economics Section, FAO Home Economics Advisory Committee, Oct-Nov. 1957. 7
family welfare.” The members of the Committee adjudicated this success “to the fact that the efforts of their best training center, the University of Puerto Rico, are now directed towards serving rural as well as urban people with adequately trained home economists.”

As the observations of the Home Economics Advisory Committee show, despite Puerto Rico’s lack of official representation at the FAO and other UN specialized agencies, Puerto Ricans’ expertise became an important element for their agendas. Although, FAO officials recognized that “language differences, cost and other factors make it difficult for other territories in the region to use the facilities of the University of Puerto Rico”, the lack of similar facilities in the English, French and Dutch speaking territories made Puerto Rico the center of home economics TA training in the Caribbean. The FAO Regional Office in Washington (NARO) and the U.S. International Cooperation Administration (ICA), agency in charge of implementing Point IV programs, jointly coordinated these training programs. FAO regional nutrition officers coordinated their field work and country projects with ICA home economists. Through these agencies, FAO entered in an agreement with the University of Puerto Rico in 1950 to offer “a special in-service summer course for home economics teachers and extension workers” throughout the Latin American region. The UN Bureau of Social Affairs provided twenty fellowships for students in the program.

In the 1950-51 academic year the Department of Home Economics held the first of these special courses. This first course was a six-week workshop “for workers from other Caribbean countries” and taught in collaboration with Margaret Hockin, Chief of the Home Economics Section in the Nutrition Division, and Dora Ibberson, of the British Colonial Development

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984 Review of Home Economics work of FAO, October-November 1957. FAOA. RG 12, Sub-group Nutrition Division, Classification Home Economics Section, folder Home Economics Section, FAO Home Economics Advisory Committee, Oct-Nov. 1957. 8-9
985 FAO Home Economics Advisory Committee, Timetable and Agenda. 7
986 Review of Home Economics work of FAO, October-November 1957. 9
FAO officials described this organization as a key agent in the promotion of rural development in the British Caribbean through agricultural education as well as nutrition and social services among women and youth. The sending governments paid students’ travel expenses, the UPR waved tuition, and the UN gave fellowships to cover the cost of living and necessary supplies. Participants included workers from Jamaica, Trinidad, British Honduras, British Guiana, Barbados, Granada, Dominica, Curacao, and Surinam. Lydia Roberts and Rosa Marina Torres taught these courses and coordinated field trips together with Hockin and selected officials from agencies including Extension, Farmers Home Administration, Insular Education, Food Production and Marketing, School Lunch Program, and the Department of Health.

The UPR continued offering similar courses and seminars during the following academic years. In the summer of 1951 students from British Honduras, St. Lucia, Antigua, St. Kitts, Barbados, and Jamaica attended an “orientation seminar about the work done by Puerto Rican home economists in different government agencies dedicated to improve the ways of living of rural families.” By 1952 this training program for international students had a total of 21 Point IV fellows receiving “basic preparation in basic areas of home economics such as nutrition, food supply and preparation, housing, sewing, and child health.” According to home economics faculty, this broad program had the purpose of giving visiting students “the training they needed to, once they return to their countries, assume leadership roles in activities designed to improve the life of peasant families.” In 1953 this program was expanded to students from Spanish-speaking countries including Argentina, Bolivia, Costa Rica, Colombia, Cuba, Chile, Ecuador,
Honduras, Mexico, Nicaragua, Paraguay, Panamá, Peru, El Salvador, and Venezuela.\textsuperscript{991} That same year, the Department of Home Economics offered a special course sponsored by FAO and the Caribbean Commission attended by 26 students from the British and Dutch islands. The Department coordinated the implementation of a similar course for TA trainees from Latin American countries sponsored by the Organization of American States.\textsuperscript{992}

Wallace Aykroyd, Director of the FAO Nutrition Division, highlighted Puerto Rico’s role in the promotion of nutrition in the Caribbean region where “at the moment we are doing more in the field of home economics than in Latin America.”\textsuperscript{993} By the mid-1950s, Extension Field Director Antonio Pérez García reported that his Division was responsible for 150 trainees sponsored by the Foreign Operations Administration (FOA). As a result of the increasing number of trainees, the island’s government transferred the coordination of the Point IV TA program from the Planning Board to the Governor’s Office. With a budget of $150,000, the office paid a per diem of $2.50 a day to the University for each foreign student receiving training in Puerto Rico.\textsuperscript{994} Similarly, Puerto Rican experts took advantage of the new international attention to nutrition and home economics as part of TA programs. Carmen Selenia Sánchez from the Extension Service’s Consumer Education Section traveled to Montevideo, Uruguay, where she worked for the Inter-American Institute of Agricultural Sciences as a FAO Home Economist.\textsuperscript{995}

Despite all this regional and international work, FAO officials continued to call attention to the need to establish more “training centers for women workers” and to ensure “that home economics, including education in nutrition is adequately included in training programs.”

\textsuperscript{991} Informe Anual, 1952-53.
\textsuperscript{992} Informe Anual, 1953-54.
\textsuperscript{993} Aykroyd to Lewis, June 17 1953. FAOA. RG 12, Sub-group Nutrition Division, Classification Programme, folder Home Economics General (1950-1954)
\textsuperscript{994} John B. Grant Diary. March 9-14 1954. Rockefeller Foundation Records, officers' diaries, RG 12, F-L, John B. Grant Diaries box 141 Reel M Fah 4 Frame 317 (Microform)
\textsuperscript{995} Lewis to Aykroyd, May 30 1953. FAOA. RG 12, Sub-group Nutrition Division, Classification Programme, folder Home economics, general (1950-1954).
FAO Home Economics Advisory Committee highlighted the steps taken by African regions, particularly Ghana where a TA home economist was assigned to guide “training programs for local leaders and for the extension of these programs into more communities”, and Uganda where FAO cooperated with the country’s Department of Community Development “to help in developing the home economics program at their main center for training community development leaders”.996 As part of these efforts to expand training in home economics, nutrition, and rural development, in 1957 the British Colonial Welfare Office together with FAO selected Lydia Roberts as TA home economist to “evaluate women extension education programs” in the Ugandan protectorate.997

Thus, by the late 1950s Puerto Rico’s role in professional home economics and nutrition education had extended beyond Latin American and the Caribbean. Students from African and Asian regions began to participate in seminars and special courses offered at the UPR while Puerto Rican nutrition experts were incorporated to international initiatives. For example, in 1957 Miss Walifa Hady, “a young Egyptian girl” who worked at Egypt’s Ministry of Agriculture received a FAO Home Economics Fellowship for training abroad. As part of this fellowship, Hady studied home economics programs, nutrition education techniques and “methods of working with rural families” at the University of Puerto Rico.998 Similarly, in 1962 Marcel Autret, Senior Nutrition Officer at FAO suggested the appointment of Margarita Pont-Flores (formerly Marchand), Director of the School Lunch Division of Puerto Rico’s Department of Education, as School Feeding Consultant for India. In his recommendation to UNICEF, Autret

996 FAO Home Economics Advisory Committee. 30 October–2 November 1957. The Contribution of Home Economics to Community Development. Provisional Agenda Item 2. FAOA. RG 12, Nutrition Division, Home Economics Section, folder FAO Home Economics Advisory Committee. 2-3
997 Informe Anual, 1955-56.
noted that “since she is perfectly bilingual, English and Spanish, might also be considered later for other FAO assignments”. 999

As these cases illustrate, Puerto Rico’s participation in TA programs was the product of the island’s ambiguous position as simultaneously instrumental and invisible in the agendas of international health and development organizations such as the FAO. While the island’s experience served to showcase the health and welfare benefits of promoting development through technical expertise, Puerto Ricans experts and technicians’ work in these processes was obscured as a result of their incorporation to U.S. delegations and institutions. However, the PPD government worked to take as much advantage as possible of the international opportunities offered by the new post-war order. After the PPD inaugurated the Commonwealth in 1952, which the party leadership presented as Puerto Rico’s decolonization moment, Muñoz Marín denounced the Caribbean Commission as a colonial organization and advocated for the creation of a new regional organism. European metropolitan powers (except France), in the middle of decolonization negotiations with their territories in the region, joined the new Caribbean Organization founded in San Juan in 1960.

Although this organization was active for only four years, Puerto Rican officials managed to “promote Caribbean interests from the perspective of the Puerto Rican government.” 1000 One of the first activities organized by this new regional organization was the First Caribbean Nutrition Seminar in 1961. Held at the headquarters of the Caribbean Organization in San Juan, the seminar was also sponsored by FAO, UNICEF, and WHO. According to the organizers, the seminar grew out of the longstanding “interest in the improvement of nutrition and home

999 UNICEF, Miscellaneous. FAOA. RG 12, Sub-group Nutrition Division, folder UNICEF New York, 2-16 June 1962, Minutes of Meetings. 16
1000 Vélez Rodríguez, Puerto Rico: Política Exterior sin Estado Soberano, 1946-1964. 42
economics in the Caribbean region". It was attended by 80 participants from Bahamas, Bermuda, British Honduras, the British Virgin Islands, and the United States. Experts from the University College of the West Indies, the UPR, and the UN sponsors also took part in the organization of the panels. From the UPR, Nelson Fernández, Socorro Lacot, Ramón Suárez, Conrado Asenjo, Ester Seijo, and Rosa Marina Torres had active roles. Participants elected Seijo as chairman of the seminar while Guillermo Arbona, Secretary of Health, represented the Governor of Puerto Rico who “eagerly awaited the results of their deliberations, since nutrition was of major concern in terms of the island’s future economic growth.” The themes discussed included “Food and Nutrition Problems in the Region”, “Development of Policies and Plans for Food and Nutrition”, “Services and Programs which Contribute to the Solution of Nutrition Problems”, and “Training of Personnel in Nutrition”.

During the following years, Puerto Rican nutrition experts continued to be active as part of international initiatives. Conrado Asenjo worked with the U.S. National Institute of Health and the Instituto de Nutrición de Centroamérica y Panamá (INCAP) in the preparation of the fist Food Composition Table for Latin America. Asenjo was also a founding member and first President of the Sociedad Latinoamericana de Nutrición (SLAN) in 1966 and became actively involved in research collaborations related to protein malnutrition, which became the main focus of international nutrition science during the 1960s and 1970s. Through the SLAN, Asenjo worked to strengthen the “links and exchanges between Latin American nutrition professionals

1002 Ibid. 2
to stimulate the advancement of the field.” 1005 Although it initially struggled to ensure “active participation of all the regions of Latin America”, the SLAN remains active to this day establishing an official publication and organizing yearly congresses.1006 In 1976, members recognized Asenjo’s contributions to the advancement of the field in the region during the Latin American Nutrition Congress held in Venezuela.1007 Thus, Puerto Rican nutrition experts like Asenjo became agents of international development through organizations like SLAN, FAO, and INCAP. At the same time their expertise was incorporated to new local agendas to manage the effects of modernization and to rearticulate strategies of rural development.

Community Development and Local Nutrition Work

By the late 1950s, the industrialization program was producing the changes that the architects of the Operation Bootstrap model of development hoped. Factory labor increased rapidly while agricultural regions lost population to urban areas on the island and the eastern and mid-eastern United States. However, for nutrition experts like Esther Seijo and Conrado Asenjo the contradictory effects of these dramatic changes over nutritional health were also beginning to surface. While many Puerto Ricans enjoyed a higher purchasing power, attempts at increasing the consumption of local vegetables, fruits, and dairy products were not producing the desired results. Moreover, although the new industries establishing on the island gave “employment to thousands of families, whose standards of living has risen accordingly”, there were still many Puerto Ricans living “in the mountains, far away from” work places who “have not profited”

1006 Asenjo a Guzmán, 7 abril 1966. RCM, Fondo Conrado Asenjo, sección Nutrición, serie Correspondencia, caja 2, cartapacio Octubre-Mayo 1949. The SLAN remains active to this day as the main academic for nutrition scientists in the region including experts in food technologies, clinical nutritionists, medical doctors, epidemiologists, and public health researchers.
from these improvements. Bringing the benefits of the new economic model to these communities became the goal of nutrition experts and health officials during the following years.

During the late 1950s, the uneven spread of the benefits of the industrialization program called the attention of Puerto Rican policy makers and public health experts. Many rural regions of the island, especially in the mountainous zone, still lagged behind in terms of unemployment, high prevalence of infectious diseases, low consumption of protective foods, limited health care services, poor sanitation infrastructure, and lack of roads connecting them to the outside world. Addressing these longstanding issues required a different approach suitable for the geographical, ecological, and demographic characteristics of rural regions, whose isolation became both the cause and consequence of their lack of integration into the industrializing society. While the forces driving these new understandings of the problems of rural Puerto Rico were particular to the island, these concerns were global in nature. The state of rural regions throughout the world in face of the socioeconomic changes of these decades led to increased government, academic, and professional interest in the internal dynamics of communities and localities.

During the 1950s and 1960s the U.S. “was in the grip of modernization theory” which promoted “the replacement of a locally rooted world of tradition-bound small communities” for “a cosmopolitan world of industrialized mass societies”. However, David Immerwahr argues that many in foreign and domestic policy-making circles advocated for an alternative vision “designed to achieve small-scale successes”. This alternative vision, dubbed “community development”, “was an effort to shore up small-scale social solidarities”, to encourage local level action, and “to embed politics and economics within the life of the community.” Thus, this was a strategy to foster social change “from the bottom up” by tapping into communities’

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1009 Immerwahr, *Thinking Small: The United States and the Lure of Community Development*. 3-4
resources, expertise, and experiences. By promoting self-help and local initiative, advocates of community development sought to “temper” the urge to modernize.

This quest for the local was “carried into the realm of policymaking and applied to the problem of poverty” through institutions such as the Rockefeller Foundation. By the 1950s, the community development model also became “the primary rural development strategy” promoted by UN specialized agencies, particularly the FAO. This approach linked public health and agriculture interventions to the promotion of “self-improvement” through local level action. Nutrition emerged as the logical field bridging these arenas while home economics and agronomy offered the expertise and technologies most suitable to promote change at the community level. Delegates to the First FAO Latin American Nutrition Conference recognized the value of “thinking small” when dealing “with practical nutrition issues” in countries or regions. Experts meeting in July of 1948 in Montevideo, Uruguay referred to the recommendations of the FAO Permanent Nutrition Advisory Committee emphasizing the advantages of focusing “on relatively small regions to initiate campaigns to elevate nutrition levels.” In this view, “the forceful development and implementation of work plans in a small “demonstration zone” provided “the opportunity to”, “community by community, bring about nutrition improvement for the entire country.”

The local nature of dietary habits and their relationship with agriculture and rural life made “community development” a natural approach for nutrition experts during the 1950s and 1960s. The long-standing focus of home economics and extension education on households and communities gave these fields a central role in the implementation of these agendas. FAO sponsored programs of home economics “within the framework of community development” in

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1010 Ibid. 39, 55
countries of the Far East, the Near East and the Caribbean. The Special Seminars offered in Puerto Rico also included sections on these topics. By 1957, the FAO Home Economics Advisory Committee emphasized that many of the countries assisted by the UN and Specialized Agencies “have either adopted community development as the main instrument of their social policy or have established or sponsored large scale community development projects.”

According to Immerwahr, this “enthusiasm for the grass roots” stood in contrast to the prevailing modernization models based on “top-down” interventions and grand-scale change. In Puerto Rico, while attempts to foster change from the ground up through nutrition and agricultural education were part of rural hygiene projects during the New Deal, by the 1950s the idea of communitarianism entered the lingo of modernization programs. Thus, Puerto Rican experts and policy makers did not pursue community development as an alternative to the high modernism of Operation Bootstrap. Rather, these ideas were incorporated to the discourse of the so-called Operation Serenity, name given by the Governor to efforts to foster “a kind of effective command of human spirit over the economic process.” This new perspective emphasized the need to temper the rapid socioeconomic changes produced by modernization by maintaining and cultivating Puerto Ricans’ spiritual and cultural qualities. For public health official Guillermo Arbona, this “Serenity” could be materialized by keeping a focus on the “community in which the individual dwells and with whose needs he should be aware, and the manner in which those needs may be solved through community effort.” In Arbona’s view, this implied that government

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1012 FAO Home Economics Advisory Committee. 30 October-2 November 1957. The Contribution of Home Economics to Community Development. Provisional Agenda Item 2. FAOA. RG 12, Nutrition Division, Home Economics Section, folder FAO Home Economics Advisory Committee. 2-3

1013 Immerwahr, *Thinking Small: The United States and the Lure of Community Development*, 46

1014 Ortiz Cuadra, "Buena Vida no es Vida Buena: Disquisiciones Muñocistas sobre Nutrición y Consumo." 32
agencies “are merely organized community effort” resulting from “each citizen being technically aware of his own community needs in the several areas of social welfare.”

During these 1950s and 1960s the discourses of Operation Serenity and community development provided health officials on the island new frames to approach the problems of rural life and their relationship with dietary habits and nutrition. John B. Grant, Associate Director of the RF Division of Medicine was among the most forceful advocates of community development as a strategy to foster public health improvements. According to Grant who was involved in public health work in Puerto Rico since 1918, community development “stimulated the people of local communities to initiate action towards self-improvement utilizing technical assistance from private and government sources.” It was also a strategy to promote “group action at the local level” resulting from “a coordinated approach to solving the interrelated problems of the community”. Grant argued that “the significance of Puerto Rico is that probably no other area possesses the degree of potentialities which, if integrated and developed, would demonstrate the value of Community Development.”

For Grant, the existence of several government agencies dedicated to extension education, social services, and public health work made the island an ideal place to the apply the community development approach. As he noted, this community focus had been part of the PPD social welfare work since the previous decade through the implementation of the land distribution program. Grant identified the Division of Community Education (DivEdCo), established by the Department of Education in 1949, as an example of the government agencies

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1015 Arbona and Grant, “Local Community Development Councils, June 18 1956. RAC, RF, RG 1.2, series 243, box 1, folder 4, p. 6-7
1016 John B. Grant. “Puerto Rico’s International Opportunity.” RAC, RF, RG 1.2, series 243, box 1, folder 2, p. 1
1017 John B. Grant. “Puerto Rico’s International Opportunity.”
that aimed “to develop a maximum of Commonwealth self-sufficiency in local communities.”

For this, DivEdCo placed 40 “group organizers” and 6 regional supervisors in the field to implement community education programs related to health, welfare, and agriculture topics throughout 800 barrios.\textsuperscript{1019} With a similar focus, the Department of Health in collaboration with the RF put in practice plans to reform the medical care system by dividing the island in several regions and coordinating the provision of various levels of services in each of these regions.\textsuperscript{1020}

In this model, a health center “combining curative and preventive health care” with social work services was to be established in each region of 30-50,000 population.\textsuperscript{1021}

According to Arbona’s plan, these regional health centers were to be linked to local dispensaries as well as to an insular tertiary care facility in San Juan. In 1954 the Department of Health established a pilot program of this regionalization project in the Bayamón region. Given its early success, this health care regionalization model offered a blueprint for other government services such as nutrition and agriculture programs. Grant encouraged officials at the Department of Agriculture to “undertake an agricultural survey comparable to the health regionalization survey” before it could “indicate specifically where and how” this integration might be possible.\textsuperscript{1022} In this context, while Operation Serenity focused on balancing the effects of rapid modernization, community development emerged as a strategy to intervene with isolated rural regions that were failing to “catch-up” with the rest of the island. Nutrition, home economics, and agriculture education became, once again, the foundations of these new agendas.

\textsuperscript{1019} John B. Grant. “Puerto Rico’s International Opportunity.” RAC, RF, RG 1.2, series 243, box 1, folder 2, p. 2
\textsuperscript{1021} John B. Grant. “Puerto Rico’s International Opportunity.” John B. Grant Diaries, September 21-24, 1954. RAC, RF, Officers' diaries, RG 12, F-L, John B. Grant Reel M Fah 4 Frame 566 (Microform), box 141
\textsuperscript{1022} John B. Grant Diaries, September 21-24 1954. RAC, RF, Officers' diaries, RG 12, F-L, John B. Grant Reel M Fah 4 Frame 566 (Microform) box 141, 3
Bringing the Advantages of Civilization to Isolated Communities

According to Lydia Roberts, now Chair of the Department of Home Economics, “although the general economy of Puerto Rico has risen remarkably in the last few years, the lowest income group, especially in the rural areas, appears to have changed little”. The “sordid living conditions in rural areas is all too evident to anyone who drives through the country.” Similar to FAO home economists, Roberts argued that these problems required nutrition experts “to simplify the approach”, aim for small scale changes, and promote cooperation between all government agencies that “have divisions or programs directly concerned with the problems of family living.”

Therefore, in May of 1956 Roberts presented her “Plan for a Cooperative Program for Improving Rural Living” to implement the community development approach. This new nutrition program “called first for the selection of “a community in a distinctly rural area which has a second unit school, contains at least 200 families, and has little contact with an urban center.” Once a suitable community was identified, land surveyors and sociologists were to “demarcate the limits of the community” and “map the area, marking on it every road, house, store, church, and other significant factor”. At this stage, nutrition, agriculture, and public health experts would “make a study of every aspects of living for each family in the area”—such as housing, land and its use, food, sanitary facilities—and document findings by taking “photographs of pertinent aspects.” Social work and education professionals could “discuss the findings with the families”, and outline the things needed “to raise its living to at least minimum standards of decency and wholesomeness.” All these experts would work together to develop “in the families the urge to improve their living through their own efforts”, particularly in the area of

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1023 “Plan for a Cooperative Program for Improving Rural Living.” RAC, RF, RG 243, series 1.2, box 3, folder 21.1

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food supply and nutrition. After a period of time, personnel were to measure “the results of the coordinated programs by appropriate records and photographs and a re-survey.”

Despite Robert’s detailed planning, John Grant questioned the soundness and viability of her approach. Most importantly, according to Grant “Roberts’s proposal in itself violates some of the fundamental principles of community development.” In his view, the plan relied on central government bureaucracies and top-down measures instead of local cooperation. Grant noted that “if the project were organically linked with the [Health Care] Regional Coordinating Office” the proposal, “while somewhat premature, might provide a pilot-plan for community development, which is after all the eventual goal of regionalization.” Thus, for Grant decentralization was a central element of any community development initiative. For Roberts’ plan to fit the bill, experts and government officials had to work together with local residents and transmit to them the skills they needed to improve their living conditions.

Arbona from the Department of Health shared this view on community development’s role in public health and his assessments of Roberts’ proposal. Arbona and Grant referred to the UN definition of community development as a process based on the “fullest possible reliance upon the community’s initiative”. Based in this definitions, they suggested securing the support of the Governor as well of local municipal councils and mayors before her plan to conduct nutrition work in isolated regions could be put into practice. They also suggested the integration of Robert’s project to the Healthcare Regionalization scheme. For this, Arbona and Grant identified the town of Comerío in the Bayamón region as a suitable location. As part of the pilot regionalization project already in place, this town’s Health Council had “reconstituted itself

1024 “Plan for a Cooperative Program for Improving Rural Living.” 2-4
1025 Memo, May 2 1956. John B. Grant Diaries. RF, RG 243, series 1.2, box 3, folder 21
1026 Arbona and Grant, “Local Community Development Councils, June 18 1956. RAC, RF, RG 1.2, series 243, box 1, folder 4, p. 2-5
as a community development council” with “representations from the individual barrios.”1027 Among these, the community of Doña Elena appeared to be suitable to try Roberts’ plan. (Image 7.3) Doña Elena was “typical of non-metropolitan Puerto Rico”, it had “a new Health Center with 22 beds”, and there was a high degree of “civic consciousness”. The only “drawback” was that it took “a good hour to reach from San Juan” and it was separated from urban centers by “bad roads transversable only by jeep, on foot or horseback” that became “practically impassable” after heavy rains.1028

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1027 Memo, March 9 1957. Lydia Roberts. RAC, RF, RG 243, series 1.2, box 3, folder 23

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Thus, in 1958 the government began the implementation of Roberts’ revised plan called the Doña Elena Project. At the central level, the program was directed by Roberts and Esther Seijo from the Department of Health, Margarita Marchand from Education, and Marta Coll from the local USDA Food Distribution Office. Personnel from the Agricultural Extension Service, the Department of Agriculture, the Economic Development Administration, and the Planning Board also worked in the program. In Comerío, the mayor, municipal council, Schools Superintended, School Lunch Administrator, and community development council also participated in the coordination of activities. At Doña Elena, home economist Carmen Luz Santiago was in charge of the school feeding program, examinations of children, and nutrition education for home makers. Her brother, agronomist Alejandro Santiago, directed the home food production program “and all the innumerable jobs that fall on the man of the community”. 1029 Carmen and Alejandro were later joined by additional extension agents and nutritionists.

While the Project’s original purpose was to demonstrate “the effects of improved nutrition on the physical well-being of the people”, “it soon became concerned with all physical aspects of rural living.” For this, nutrition services and education were integrated to interventions to reform the community as a whole. This included the improvement of housing conditions, the expansion of the school’s classrooms and lunchroom, the provision of electricity, the construction of sanitary facilities in households, and the pavement of roads. At Doña Elena, the results of physical examinations “revealed a number of signs indicative of nutritional lacks” reflected mainly in “the small size of the children”. These examinations showed that “practically all children at Doña Elena fell in the lowest zones for both height and weight” confirming the “general observation” that children in isolated rural areas “are very small for their age and, as a

rule, appear to be thin as well.” Similarly, observations, surveys, and interviews showed that people’s diets were still monotonous and lacked protective foods, especially milk and vegetables.

According to Roberts, while these results “revealed the needs of the people and the difficulties and hardships of their lives” it also “aroused their interest in improving their living.” For Roberts and the PRNC, these results also demonstrated the need for a new

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approach to intervene with these rural populations who, despite all the government action in the area of nutrition and child health, still suffered from a poor nutritional status. Thus, this community development trial project proved that the improvements resulting from industrialization and modernization were not equally distributed across the island. With these findings in hand, Roberts went back to the Governor to propose the extension of this intensive community nutrition program to other isolated regions of the island. “How many more Doña Elenas are in Puerto Rico?”, the Governor reportedly asked Roberts.1032 Thus, at his request, the legislature passed a law to create a Commission to “plan, organize, and supervise the activities and programs necessary to improve the living conditions of those isolated communities in Puerto Rico who have not participated adequately of the island’s economic progress.”1033

Named the Commission for Isolated Communities, this new working group was made up of representatives from the University of Puerto Rico; the Departments of Health, Education, and Agriculture; Public Works; and the Planning Board. At the local level, the work of the Commission was directed by an “Action Group” consisting of the “heads of all agencies that are responsible for various programs for the municipality” including the major, the schools superintendent, and personnel from Public Welfare, Health Units, Agricultural Extension. (Image 7.4) These Action Groups collaborated with local workers and community leaders.1034 To fulfill its duties, the Commission received an appropriation of $600,000 from the insular budget and deployed faculty and students from the Department of Home Economics.1035 Roberts and Seijo were in charge of the planning and coordination of the work conducted initially in five

1032 Roberts, "A Cooperative Nutrition Research Program for Puerto Rico I: Background and General Plan." 20
1033 Informe Anual, 1958-59.
1034 Roberts to Muñoz Marín, July 1 1964. ALMM, sección 5, serie 1, cartapacio 40.
communities. Additional communities were included making a total of 31 municipalities in which programs are under way. By 1964, five others were approved for inclusion.¹⁰³⁶

Roberts emphasized that Commission’s goal was “to carry out the community work with the people” under the direction of persons “with training and experience” and “especially with the ability to inspire the community workers and the people to work together for better living conditions in their community.” By 1964, however, Roberts reported that the program’s effectiveness was limited by lack of appropriate personnel and resources. While new communities were added, no measures were taken to increase funding and appoint new personnel. Commenting on Roberts’ remarks Inés Mendoza, the Governor’s wife, criticized her emphasis on professional training and government experience as the criteria to recruit community workers. In Mendoza’s view “we should not appoint more bureaucrats to be in charge of such a fascinating work.” Rather, “members of the same community should be allowed to be in charge of the responsibilities.” While “technically expert people” could be hired to help, “the community should be allowed to help itself.” “Obviously’, she added, “we have not seen the desired results because there has not been interest or participation of the “real people.” “For Mendoza, although “Dr. Roberts is great she is too old to realize that those behind her have to assume responsibilities if civilization and community culture is to be ensured.”¹⁰³⁷ Indeed, less than a year later Roberts was found dead from a heart attack in her desk at the university.¹⁰³⁸

Despite Mendoza’s critique, Roberts’ vision of community development continued to guide the government’s approach to the nutrition problems of rural areas. Before her sudden death, she took part in another extensive nutrition study implemented throughout the island. As part of the Commission for Isolated Communities, Roberts collaborated in the design and initial

¹⁰³⁶ Roberts to Muñoz Marín, July 1 1964. ALMM, sección 5, serie 1, cartapacio 40
¹⁰³⁷ Ines Mendoza to Governor, September 29 1964. ALMM, sección 5, serie 1, cartapacio 40
¹⁰³⁸ Lydia Roberts, former UC Professor dies, Chicago Tribune, May 29 1965.
implementation of new surveys in cooperation with the U.S. Interdepartmental Committee on Nutrition for National Defense (ICNND) and funding from the National Institutes of Health. The ICNND was established in 1954 to provide updated and comprehensive data about the nutritional status of populations of “developing friendly countries” participating in “mutual assistance programs of technical, military and economic aid”. The Committee gathered nutrition data, coordinated programs, and gave support to military and technical assistance personnel active in countries such as Venezuela, Colombia, Turkey, Philippines, Spain, Libya, and Burma. According to Roberts, the Committee “was anxious to conduct” similar surveys “on civilian populations in Puerto Rico.”

This was facilitated by the appointed of ICNND member Colonel Irvin C. Plough as Director of the U.S. Army Tropical Research Medical Laboratory in Puerto Rico. In 1966, Plough joined Nelson Fernández, Asenjo, and Roberts to carry out these new nutrition studies in many of the regions now designated as “isolated communities”. Conducted throughout the 1960s, these surveys measured the nutrition and health effects of modernization as well as evaluated the effectiveness of the community development programs by gathering dietary, clinical, biochemical and socioeconomic data. Fernández, clinical nutritionist from the recently established School of Medicine, took the lead in the implementation of these surveys and in the publication of the results. The data produced through these surveys provided benchmarks to compare Puerto Ricans’ current nutrition and public health state to that measured in previous studies. These publications also provided future researchers, such as medical geographer

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1039 Schaefer, "Interdepartmental Committee on Nutrition for National Defense." 193
Jacques May, with detailed information to assess the relationship between Puerto Ricans nutrition status, sociological and demographic trends, and the island’s food ecologies.\textsuperscript{1042}

However, despite the prevalent political rhetoric, researchers admitted that the picture disclosed by these surveys was not one of unqualified progress. Although they generally found a “low prevalence of deficiency signs” among rural people, there was “an elevated prevalence of obesity in adults,” among which “28% and 12% of the women and men respectively were above 20% overweight.” There was also “a higher prevalence of deficiency signs among individuals in the upper income groups” with “the highest percentage of protein, vitamin A, thiamine, riboflavin, and niacin deficiencies observed in families with an annual income above $6000.”\textsuperscript{1043} According to Fernández and colleagues, these results demonstrated that higher incomes and greater food availability did not necessarily improve nutritional status if these changes were not accompanied by “the establishment of national food policies”.\textsuperscript{1044} Similarly, socioeconomic data showed that the average annual income level of the families, “although slightly higher in 1967”, was not significantly different than that of 1963. Because of inflation, the mean purchasing power of the dollar of families’ wage earners in these communities decreased by 10 percent.\textsuperscript{1045}

As these surveys’ findings show, both modernization and community development produced contradictory results in rural Puerto Rico. According to Immerwahr, historians of development tend “to treat modernization as the reigning ideology and to regard” seemingly

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\textsuperscript{1042} May, The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago.
\textsuperscript{1044} Nutritional Status of the Puerto Rican Population: Master Sample Survey. 6
\textsuperscript{1045} Fernández et al., "Nutrition Survey of Two Rural Puerto Rican Areas before and after a Community Improvement Program." 1639
\end{flushleft}
alternative models as “back-chatter”. In contrast, Immerwahr argues that those “who bucked in the opposite direction” by advocating for community development wielded more influence in policymaking than what the current historiography affords. However, the case of nutrition work in Puerto Rico shows that community development was also an attractive language for those who sought to promote centralization and technical expertise. For nutrition experts such as Roberts, this approach did not represent an alternative to modernization but rather a different strategy to transform isolated rural regions through the extension of new public health technologies and bureaucracies. These programs’ ultimate failure reflected the growing chasm between experts’ discourses and the political economy priorities of the postwar years.

Conclusion

As this discussion shows, strategies to improve nutrition in Puerto Rico gradually moved from a focus on the relation between diets and the island’s food production system to measures that relied on technical interventions and education campaigns. While the rural hygienists of the 1930s understood malnutrition as the consequence of monotonous diets, nutrition science during the postwar years increasingly focused on this condition as a manifestation of deficiencies in individual nutrients. Innovations in food technologies and a more sophisticated understanding of the biochemistry of nutritional deficiencies facilitated this shift and provided new tools to add individual nutrients to people’s diets. This recast of malnutrition was part of a broader shift in international public health approaches based on new technologies such as DDT to control malaria and mass vaccination against smallpox. In Puerto Rico, this shift coincided with the implementation of an aggressive industrial development program and by the local and

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1046 Immerwahr, Thinking Small: The United States and the Lure of Community Development. 39
1047 Cueto, Cold War, Deadly Fevers: Malaria Eradication in Mexico, 1955-1975.
international promotion of the newly constituted Commonwealth as a form of non-colonial association with the United States.

The organization of supplementary feeding and food enrichment projects on the island reflected these new international “techno-politics of public health.” In Puerto Rico this was manifested in measures to promote and subsidize the importation, distribution, and sale of powdered skim milk to add “good quality” proteins to people’s diets. Similarly, the PPD government recruited nutrition and food experts to pass legislation requiring the enrichment with thiamine, niacin and iron of all rice sold on the island. Representatives from U.S. food industries tapped into the long-standing public health and political significance of nutrition to advance their interests as part of these measures. Together with these interventions, the PPD government created new agencies and infrastructures to standardize, centralize, and modernize food distribution and sale. As part of this project, home economists and extension agents crafted new campaigns to educate Puerto Rican consumers to navigate new food marketplaces and to make purchases informed by considerations of both nutrition and economy.

Puerto Rican nutrition experts’ experience in rural hygiene and reconstruction work during the interwar years gave them instrumental roles in postwar development and international health agendas. As part of these projects, PPD government officials took advantage of the platform offered by TA programs to promote the Commonwealth and its public health and nutrition strategies. In this way, Puerto Rico became a showcase for strategies of both “big” and “small” development models. While modernization and industrialization necessitated central planning and technical intervention, international community development projects emphasized the potential of local level action and indigenous expertise. In Puerto Rico, however, promoting nutrition through community development became a technical assistance at the local level. The
ideas of community development framed the implementation of nutrition education and improvement measures that, while touting the principles of communitarianism and local knowledge, remained the product of the top-down application of expertise.

Thus, modernization through industrialization and community development through local-level action were not opposite but complementary projects. While Operation Serenity addressed the effects of “too much” modernization, community development became a strategy to attend to its blind spots. As the now Secretary of Health Juan Pons declared before the 8th Convention of Social Orientation, although “the changes brought by industrialization will improve some symptoms and worsen others,” Pons concluded that “the sick will notably improve in the balance,” “because we have good physical, economic, and social physicians.”1048 Among the greatest foreseen improvements was the eradication of malnutrition which, according to Pons, “occupies a preponderant place among all the abnormal states affecting Puerto Rico’s inhabitants.”1049

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Conclusion

Going to the Restaurant, Embodying Modernity

The policy, however, does have its dangers. It will work as long as the budget can afford the $36.20 per head that it costs to feed the population “at the restaurant” rather than at home, for this is, in effect, what Puerto Rico is doing: purchasing 60 percent of their beef, all of their wheat and rice, a considerable portion of their milk and eggs, and most of their vegetables and fish abroad is comparable to taking the family to a restaurant to eat every day.\(^{1050}\)

On January of 2014, Puerto Rican Senator Gilberto Rodríguez Valle introduced a bill to create the “Healthy Childhood Program” to be jointly implemented by the Departments of Health, Education, and Family Services. According to this proposal, this project’s goal was to address the problem of childhood obesity in Puerto Rico by compelling parents to promote a good diet in the household through their example of “healthy eating habits”, such as consuming fruits and vegetables, including children in the purchase and preparation of foodstuffs, and educating them on “what is means to have an adequate diet” and about the importance of an adequate weight for health.\(^ {1051}\) Parents who failed to fulfill these duties would be considered to be neglecting or abusing their children according to the definitions established by current laws. In order to put in practice this program, teachers would be responsible for identifying obese or overweight children in their classrooms. Those cases would be referred to the school’s social worker who would be responsible for meeting with the child and his or her parents.

As part of these meetings, personnel from the Department of Health would provide orientation to the parents “about the importance of healthy eating and the consequences of ignoring this for the development of their child.” Children would also be referred to physicians for examination and to determine “if the obesity that the child suffers is a product of poor eating

\(^ {1050}\) May, The Ecology of Malnutrition in the Caribbean: The Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, The Lesser Antilles, and Trinidad and Tobago. 284

\(^ {1051}\) P. del S. 865. Estado Libre Asociado de Puerto Rico. Senado de Puerto Rico. 17\(^ {ma}\) Asamblea, 3\(^ {ra}\) Sesión Legislativa Ordinaria, 8 enero 2014.
or of a pre-existing condition.” In any case, the “Department of Health will create a program of nutrition and exercise for the child that will be implemented by the parents or legal guardians.” The Departments of Health and Education would monitor the child’s progress in the program and, in the case that he or she fails to show improvement in his “condition of obesity” the social worker would refer the case to the Department of Family Services. If, in six months, the “situation persists” the Department would “impose fines of up to $500, which would increase to $800 if still no progress was recorded in the subsequent six-month period. The funds raised through these fines would go to create and maintain the “Healthy Childhood Program”.

When legislative debates began, the proposal was criticized by nutrition and health experts in Puerto Rico and abroad.1052 Called by the media the “Puerto Rico Fat Tax”, nutrition researchers described this project as “unbelievable” and “unfair” while stressing that “obesity can be caused by a multitude of factors, including the environment in a mother's womb, too much or too little sleep and chemicals in the environment.”1053 Similarly, they argued that fining parents of obese children and accusing them of abuse if during a determined period the minor fails to show “progress” in his or her physical condition was an “incorrect” and “superficial” way to approach the situation “which, in many cases is not related to parents’ neglect” but rather a matter of genetics or underlying medical conditions.1054 While the bill was not approved, Senator Rodríguez and other backers defended the need for these measures arguing that since “childhood obesity is a heath issue that can become an economic burden” due to related conditions like heart disease and diabetes, holding parents accountable was “necessary for society.”1055

1055 Ibid.
Currently, Puerto Rico is one of the U.S. jurisdictions with the highest incidence of obesity, diabetes, and other diet-related conditions.\textsuperscript{1056} Recent studies have estimated that around 28 percent of adults and 22 percent of children on the island are obese.\textsuperscript{1057} In this context, both proponents and opponents of the “Puerto Rico Fat Tax” framed the causes and consequences of childhood obesity by focusing on the individual and behavioral factors associated with this problem. Considerations of the relationship between socioeconomic factors and diet-related conditions among both children and the general population was mostly absent from the legislative and public debates around this project. While some experts called attention to the role of environmental factors, there was little engagement with the effects of a food system characterized by the limited accessibility and availability of fresh products. This discourse contrasts with the language of rural hygienists and nutrition experts during the mid-twentieth century, most of whom advocated for initiatives to promote dietary improvement through structural changes in the island’s food supply. Yet, it draws from similar imaginaries of the poor and their need for expert tutelage in matters of nutrition and diet. While Senator Rodríguez’s proposal tasked health, education, and welfare agencies with overseeing children’s weight loss process, nutrition experts stressed obesity’s nature as a biomedical problem disproportionately affecting those whose limited purchasing power constrained their access to healthy foods.

As this dissertation has shown, new conceptualizations of malnutrition as a chronic state with linkages to patterns of agricultural production profoundly influenced local public health and political agendas during the interwar years. In 1934 social worker Dorothy Bourne argued that when discussing the nutrition issue in Puerto Rico “the economic background must be present in

\textsuperscript{1057} Jeremiah R. Garza et al., "Occurrence and Correlates of Overweight and Obesity among Island Puerto Rican Youth," \textit{Ethnicity & Disease} 21, no. 2 (2011).
all our minds.” “Is it better in the long run for Puerto Rico”, she wondered “to buy her food outside the island, admitting that an industrialized agriculture is a necessity, and trying to remedy the present situation by higher wages, and therefore more buying power; or, should effort be made to re-establish agriculture on a more self-supporting basis?” Bourne speculated that “perhaps the solution will lie in the combination of these two remedies.” For this, the social worker was to “work through education of both workers and employers for higher wages” as a part of efforts to raise the standard of living as well as to encourage production and consumption of locally-grown food crops.\textsuperscript{1058} By bridging public health, agriculture, and social welfare expertise, nutrition sciences provided a compelling vocabulary to talk about Puerto Rico’s socioeconomic problems. Nutrition education and research became important elements of public health agendas on the island together with infectious diseases’ control, attention to infant mortality, and the expansion of medical and scientific training.

These discussion were also a reflection of global trends in nutrition science, public health, and rural development. The turn to biochemistry in nutrition sciences led to a new focus on the chemical composition of food and the role of individual components in biological processes. This resulted from the gradual discovery of an increasing number of “essential elements” such as vitamins, minerals, and “good quality” proteins. In this approach, biochemists and medical researchers evaluated foodstuffs quality based on their chemical components (instead of amounts of foodstuffs measured by calorie intake) and assessed dietary adequacy according to the presence and content of these chemical compounds. Concerns with quality of diets and ideas about “protective” foods—which included green and yellow vegetables, meat, and dairy products—became central to this new nutrition science.

\textsuperscript{1058} “Where we stand on the Nutrition Question” by Dorothy Bourne. NARA-CP. RG 69, PC 37, Entry 10, box 260, folder Puerto Rico Official, December 1934. 5
As part of this attention to the biochemical composition of food and its relationship with deficiency diseases, nutrition sciences contributed to debates about public health, labor, and rural reconstruction during the Depression. As Barona notes, nutritional expertise was a key element of the international landscape during the interwar years becoming “an essential factor for the making of citizenship and implying changing relationships between state, society and individuals.”\textsuperscript{1059} In Puerto Rico, considerations of how the island’s monocrops economy organized land and labor figured prominently in education, social work, and public health debates about the problem of nutrition. The resonance of these ideas contributed to the articulation of emerging political arguments for intervention with Puerto Rico’s socioeconomic structures. As part of these interventions, emphases on agricultural diversification and food self-sufficiency became strategies to improve nutrition and reform the island’s rural society and economy. Nutrition and agricultural education were also promoted by New Deal relief and reconstruction. These reform programs aimed to physically and morally regenerate rural people by promoting self-sufficiency through agriculture diversification, population control, and vocational education.

These concerns framed discussions of the negative health repercussions of the island’s monocrops economy. The legitimization and consolidation of the political and economic projects that transformed these circumstances were critically informed by assessment of and interventions with Puerto Ricans’ bodies. As part of this analysis, the dissertation also examined how the creation of knowledge about the malnutrition problem reflected the international circulation and interaction between eugenic ideologies and nutrition knowledge. For those who subscribed to the overpopulation theory, promoting contraception, particularly among the rural poor, would improve nutrition and standards of living as well as improve the quality of the island’s “human

\textsuperscript{1059} Barona, "Nutrition and Health: The International Context During the Inter-war Crisis." 88
stock”. Thus, qualitative evaluations of dietary deficiencies coexisted with emphases on the alleged quantitative imbalance between the amount of mouths to feed and the acreage of arable land available for food crops cultivation.

Nutrition science provided sophisticated tools to measure the public health effects of these socioeconomic conditions and probe the need for particular development interventions. Through biomedical, agrarian, and sociological representations, nutrition sciences offered “objective definitions” of Puerto Ricans’ poverty that contributed to mobilize the island’s intelligentsia around a critique to the colonial political economy. Through their professional authority health and welfare experts lent legitimacy to the PPD project while providing tools to put in practice the party’s agenda “on the ground” and manage the social, domestic, and environmental transformations it entailed. As part of these processes, emphases on the problem of nutrition facilitated the collapse of racial categories and the emphasis of Puerto Ricans’ whiteness and their potential for reform and through education and public health. In this context, attending children’s nutrition needs through programs like milk stations assumed a renewed importance for the cultivation of healthy citizens and the maintenance of civilization. As Ruis argues, malnutrition in children was not simply a medical problem “but a social, cultural, and political one; it provided a useful metaphor for a wide range of issues and an effective platform for the promotion of numerous health-related agendas.”

In this way, nutrition, health, and agriculture experts became key mediators between the Puerto Rican state, as envisioned by the PPD, and its newly enfranchised subjects. Through their work in rural reconstruction and war emergency projects, nutrition and public health experts attempted to address the effects of landlessness, food imports dependency, and seasonal

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1060 Ruis, "Children with Half-Starved Bodies" and the Assessment of Malnutrition in the United States, 1890-1950." 381
agricultural labor. These rural development agendas sought to teach the rural poor to recuperate their dignity and honor by maximizing land’s food production capacity and foodstuffs’ nutritional content. This maximization required teaching the rural poor modern agricultural practices, scientific cooking, and home management methods as well as promoting the benefits of contraception. The advent of WWII heightened the urgency of these agendas while promoting new exchanges between nutrition and agricultural scientists, local government officials, federal relief administrators, and public health experts. For local and federal officials administering war emergency programs, the political stability of the island required ensuring the availability of adequate quantities of essential foodstuffs, particular white rice and dried beans, while fostering the local production and consumption of “protective” foods.

The availability of improved food enrichment techniques and supplementary products after WWII crucially reshaped the “technoscientific imaginaries” of nutrition. The potential of these new technologies to deliver large-scale public health improvements fostered malnutrition’s recast as a biomedical condition and the de-emphasis of its agricultural and sociological basis. In Puerto Rico, this reconstruction of malnutrition converged with the beginnings of an economic development project that prioritized industrial manufacture and labor migration over agricultural expansion and diversification. In this juncture, these scientific innovations facilitated the subordination of strategies to diversify diets and improve nutrition through the expansion of local food production. Measures such as compulsory rice enrichment and dietary supplementation programs characterized the new techno-politics of nutrition in Puerto Rico. The island’s established links within a global network of nutrition practices facilitated the implementation and promotion of these measures. Policymakers continued to draft plans “to promote better nutrition”
through a more diversified agriculture after the inauguration of the Commonwealth in 1952.\textsuperscript{1061} However, the rapid economic and social transformations unleashed by industrialization and modernization policies increasingly limited the viability of these plans and their translation into actual changes in the island’s food system during the following decades.

The eradication of malnutrition was “one plank in the Governor’s campaign platform” during the 1948 elections and he later worked “actively behind various aspects of the government’s nutrition programs”.\textsuperscript{1062} This message further cemented the figure of the party as redresser of the physical injuries and neglect suffered by the Puerto Rican people in the past. Food enrichment and supplementation technologies offered crucial tools to fulfill this promise of “better nutrition for Puerto Ricans” at a larger scale.\textsuperscript{1063} Simultaneous with this shift in nutrition paradigms, the creation of the Puerto Rico Food Policy Commission addressed the need to “provide cheap food for the expanding industrial work force”. The work of this Commission occurred in the midst of a general “revolutionizing” of Puerto Rico’s food marketing system through the expansion of the supermarket model.\textsuperscript{1064} Puerto Ricans in turn drew from these political discourses to frame their claims for services and access to the new Commonwealth’s public health and welfare infrastructures. Letters and communications received by the Governor and other government officials show how people appropriated these images to request governmental attention to their health care needs.

In the midst of tensions stemming from decolonization debates in the Caribbean region during the 1940s and 1950s, U.S. and Puerto Rican officials also took advantage of the growing

\textsuperscript{1062} Roberts, "A Practical Nutrition Program for Puerto Rico." 324
\textsuperscript{1063} Seijo de Zayas, "Better Nutrition for Puerto Ricans."
international interest on food and its relation with political stability to promote the Commonwealth’s political and economic projects. Through the platforms offered by the Point IV program and the FAO, Puerto Rican nutrition and agriculture experts showcased the island’s experience of development and public health improvements under the tutelage of the United States. FAO officials actively sought Puerto Ricans’ expertise as part of their TA and extension education projects. As the FAO Home Economics Advisory Committee noted in 1957 Puerto Rico demonstrated “what can be done to improve standards of living when home economists are trained to initiate, promote and sustain” nutrition and welfare programs.1065

In 1981, Lizette Vicéns de Sánchez brought nutrition experts’ attention back to Doña Elena. As part of her dissertation research, Vicéns de Sánchez revisited the barrio 27 years later “to obtain a comparative descriptive summary” of the changes that occurred in the community” by implementing a Household Food Consumption questionnaire similar to the one used in the original project, and the Three-day Food Record.1066 While “in general”, dietary data showed that people in Doña Elena were “eating a more nutritionally adequate diet that they did in 1958”, “the community assessment showed a pattern of growing dependency…on the outside world” for their food supply. Therefore, while Doña Elena was not an isolated community anymore and undernourishment was no longer a public health concern, attempts to promote dietary improvements through increased consumption of local food crops appeared to have failed. These findings confirmed medical geographer Jacques May’s observations ten years earlier, when he noted that Puerto Rico’s increasing dependence on imports for its basic food necessities was “comparable to taking the family to a restaurant to eat every day.”

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1066 Lizette M. Vicéns de Sanchez, "Doña Elena Twenty-seven Years Later" (Columbia University Teachers College, 1986). 1
Area Harvested in Selected Food Crops (1949-1998)

**Root Crops**

**Rice**
Images C1-C4: “Area Harvested in Selected Food Crops (1949-1998).” C1: Root crops (sweet potatoes, yams, tanniers, cassavas, dasheens); C3: Legumes (dry beans, cowpeas, and pigeon peas); C4: Selected Vegetables (tomatoes, eggplant, onions, lettuce, green beans, cucumbers, peppers, okra, cabbage, squash) Source: USDA Agricultural Census.
Thus, despite the centrality of the “agrarian question” and the relationship between food production, nutrition, and public health for the political consolidation of the PPD government, the resulting policy plans failed to materialize into a reconnection between Puerto Ricans’ diet and local agriculture. According to figures from the USDA Census of Agriculture, the amount of land dedicated for the production of basic food crops declined continuously from the 1950s. (Images C1-C4) While the disruption of import markets pushed local authorities to incentivize local food production during WWII, the conditions created by the postwar development model, together with the constraints imposed by Puerto Rico’s colonial relationship with the U.S., limited the viability of plans to promote dietary improvement through agricultural diversification. Moreover, the preeminence of U.S. commercial legislations and regulations over the Commonwealth’s dispositions and the power of its agri-business sector to influence local and federal agricultural policies profoundly shaped Puerto Rico’s food system.1067

In this context, the nutrition practices facilitated by new enrichment technologies, dietary supplements, and food sale and marketing strategies provided tools to promote public health interventions congruous with the postwar development agenda. As plans to improve the quality of Puerto Ricans’ diets by increasing food self-sufficiency through agricultural diversification failed to materialize, there was “no basis for the economic incorporation of the formerly landless” rural poor “into a new rural economy”. During the second half of the twentieth century, governments used “a large portion of the funds available for agriculture” “to prop up an increasingly uncompetitive sugar industry” or promote other export-oriented mass-produced crops, “rather than invest in the productive upgrading and commercial integration of small

1067 Carro-Figueroa, "Agricultural Decline and Food Import Dependency in Puerto Rico: A Historical Perspective on the Outcomes of Postwar Farm and Food Policies." The dairy industry is an exception to this trend and remains to this day the main agrarian industry on the island. See Durán Novoa, "Cambios Estructurales de la Industria Lechera de Puerto Rico Durante los Años de 1974 a 2005 ".

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farmers or the development and dissemination of new production technologies.” By the mid-1970s, as a new economic crisis hit the island, the inclusion of Puerto Rico in the federal Food Stamps and later the TANF/NAP programs altered, once again, Puerto Ricans food consumption behaviors according to reconfiguration of U.S. agricultural and food policies. Overall, these policies transformed the island’s food system by responding to the “problem of feeding Puerto Rico’s population in ways that further marginalized agricultural development.”

In the midst of Puerto Rico’s current fiscal and economic crisis, the rate of dependence on federal nutritional assistance programs—together with the rate of obesity, diabetes, and other diet-related conditions—is highest among residents of rural areas and former agricultural regions. Public health scholars have proposed that the prevalence of diabetes and other metabolic disorders in populations such as this “reflects the body’s long-term responses to social and cultural chronicities that structure everyday behaviors.” Understanding the global spread of diet-related conditions as a reflection of the “embodiments of modernity” shifts attention to the effects of social and cultural forces such as physical inactivity, over-nutrition, and chronic stress. As part of these discussions, studies of the “nutrition transition”—the growth of dietary related conditions in regions dominated by infectious diseases and undernourishment—attempt to account for the rapid increase in obesity in the developing world.

This dissertation traced the social, political, and economic processes underlying Puerto Rico’s early nutrition transition and how these dynamics informed the ways public health and

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1069 Carro-Figueroa, "Agricultural Decline and Food Import Dependency in Puerto Rico: A Historical Perspective on the Outcomes of Postwar Farm and Food Policies." 84
1070 Setrini, "Cultivating New Development Paths: Food and Agriculture Entrepreneurship in Puerto Rico." 8-10
1071 Colón Reyes, Sobrevivencia, Pobreza y "Mantengo": La Política Asistencialista Estadounidense en Puerto Rico, el PAN y el TANF.
agriculture experts proposed solutions to problems of food supply and nutritional health. According to scholars, the nutrition transition “already occurred throughout the developed world and its occurring in the developing world at an alarming rate.” Thus, Puerto Rico’s experience provides important insights for current discussions about the global interactions between dietary change, increasing obesity, and diabetes as well as the links between these processes and the epidemiological and demographic transitions. Between 1930 and 1960 deaths from tuberculosis in Puerto Rico went from 212.5 per 100,000 to 29.3 and malaria from 54.1 to 0, and infant mortality from 88.3 to 43.7. These successes prompted former Commissioner of Health Juan Pons to declare that “although the entire civilized world showed an accelerating decrease in mortality rates…the progress of Puerto Rico in public health has no parallel in any other country.” However as Asenjo, Fernández, and colleagues uncovered, by the late 1960s Puerto Rico was experiencing its own “nutrition transition” characterized by an emerging obesity problem coexisting with persistent nutritional deficiencies.

In recent years, local agriculture experts and academics have utilized the concept of food insecurity to talk about the different manifestations of the island’s historical dependence on food imports. New movements have emerged seeking to increase public awareness of these issues and re-connect people’s diet with local agricultural production. The current Secretary of Agriculture is one of the most notorious proponents of new strategies to revive the island’s

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agriculture and promote the consumption of local food crops. However, public health experts and officials are conspicuously absent from these discussions. As debates around the “Puerto Rico Fat Tax” show, public health policy activities to attend diet-related conditions conceive these issues as the outcome of modern lifestyles, underlying medical conditions, and genetics. While the government struggles to manage the current fiscal crisis and the public health care system nears collapse under the responsibility of providing care for a chronically-ill population, addressing the sociopolitical factors underlying Puerto Rico’s nutritional problems is now more urgent than ever.

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1077 Myrna Comas Pagán, "Vulnerabilidad de las Cadenas de Suministros, el Cambio Climático y el Desarrollo de Estrategias de Adaptación: El Caso de las Cadenas de Suministros de Alimentos de Puerto Rico" (University of Puerto Rico, 2009).
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