THESIS

"LEARNING WHAT TO EAT": GENDER, ENVIRONMENT, AND THE RISE OF NUTRITIONAL SCIENCE IN TWENTIETH CENTURY AMERICA

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ABSTRACT

"LEARNING WHAT TO EAT": GENDER, ENVIRONMENT, AND THE RISE OF NUTRITIONAL SCIENCE IN TWENTIETH CENTURY AMERICA

This thesis examines the development of nutritional science from the 1910s to 1940s in the United States. Scientists, home economists, dieticians, nurses, advertisers, and magazine columnists in this period taught Americans to value food primarily for its nutritional components—primarily the quantity of calories, protein, vitamins, and minerals in every item of food—instead of other qualities such as taste or personal preference. I argue that most food experts believed nutritional science could help them modernize society by teaching Americans to choose the most economically efficient foods that could optimize the human body for perfect health and labor; this goal formed the ideology of nutrition, or nutritionism, which dominated education campaigns in the early twentieth century. Nutrition advocates believed that food preserved a vital connection between Americans and the natural world, and their simplified version of nutritional science could modernize the connection by making it more rational and efficient. However, advocates' efforts also instilled a number of problematic tensions in the ways Americans came to view their food, as the relentless focus on invisible nutrients encouraged Americans to look for artificial sources of nutrients such as vitamin pills and stripped Americans of the ability to evaluate food themselves and forced them to rely on scientific expertise for guidance. Advocates' educational methods also unintentionally limited the appeal of nutritionism to middle class women because they leveraged middle class concerns about gender—especially questions of household management and childrearing—to demonstrate the importance of

nutrition to a modern society, leading them to ignore the poorer segments of society that could have benefited the most from their knowledge. World War II created an opportunity for advocates to ally with home front defense campaigns to allow the government to extend its control over the natural world by managing the metabolic processes of the human body to create the best soldiers and workers possible, and to help advocates enhance their prestige and expertise as they created the first national nutritional standards and mandated vitamin enrichment programs. I argue that food is a valuable framework for inquiry for environmental and social historians because it reflects how society understands gender and their experiences with the natural world.

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TABLE OF CONTENTS

INTRODUCTION

As with most of my good ideas, the idea for this project began with a scoop of ice cream. Well, it was actually frozen yogurt—pomegranate flavored, with chocolate chips mixed in. I had spent the day reading whatever I could find about the history of food and exercise, and it left me feeling somewhat guilty about my own health. That night I ate a salad for dinner, determined to enforce my sporadic health diet more strenuously, but the hot July evening practically begged for ice cream. Frozen yogurt seemed a suitable compromise since it was loaded with probiotics for improved digestion and had fewer calories than ice cream. The pomegranate flavor's "non-fat energy formula" seemed attractive; the sign was elusive about the contents of this energy formula, but I could always use more energy. The frozen yogurt was good, though a bit too tart for my taste. We sat out on the patio, and as I scraped the cup clean I eyed the General Nutrition Center store nearby. Perhaps I ought to pick up a few supplements while I was committed to improve my diet: vitamin D for stronger bones, maybe, or vitamin C for a healthier immune system. A multivitamin would cover all of that, but should I get a generic multivitamin or one specially formulated for women? The potential to improve mind and body seemed endless; just looking in the store's windows overwhelmed me. Unfortunately, the yogurt's secret formula didn't seem to provide the energy it had promised, and I felt overwhelmed at the prospect of defining a path to perfect health.

The experience left me wondering, how did my relationship to food become so defined by its nutritional content? Though my salad and frozen yogurt were pleasing enough, I didn't eat them because they tasted good; I picked them because their nutrients made them good for me. Years of health classes, magazine articles, and commercial advertisements taught me that food

was the best method to protect my body from disease. Even more, they taught me that I could take concentrated doses of nutrients to make my body's metabolic chemistry even more efficient: omega-3 fatty acid supplements to prevent heart disease, zinc lozenges to reduce the duration of the common cold, and creatine powder to bulk up muscle, just to name a few strategies.[1] However I came to understand food in these terms, it's clear I'm not alone in having such a functional approach to my food. Fortified foods and vitamin supplements are billion dollar industries, and more than half of Americans take some form of dietary supplement daily.[2] Nutritional claims about the health benefits of everything from ice cream to cereal to bottled water are pervasive advertising techniques because they tap into Americans' deep faith in the restorative powers of food and their belief that the invisible properties inside every bite can make them feel better, live longer, and be more productive.

Despite the omnipresence of nutritional themes in today's culture, it is a relatively recent phenomenon. Most vitamins were not discovered until World War I, and the Recommended Daily Allowances that today emblazon the side of every package first appeared only in 1941. Before the twentieth century salad rarely appeared at the table, and milk was not the perfect health food it is today but rather a potentially sickening choice of drink brimming with bacteria and disease.[3] Yet by the end of World War II nutritional science had become an entrenched part of the American food culture. Food products regularly touted their beneficial health properties on their packaging and in advertising campaigns, and many Americans ate foods not because they enjoyed the taste but because scientists said they were "good for you." The government had also

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[1] William S. Harris, "Omega-3 Fatty Acids," in *Encyclopedia of Dietary Supplements*, 2nd ed., ed. Paul M. Coates et al. (New York: Informa Healthcare, 2010), 581; Carolyn S. Chung and Janet C. King, "Zinc," *Encyclopedia of Dietary Supplements*, 873; G. S. Salomons, C. Jakobs, and M. Wyss, "Creatine," *Encyclopedia of Dietary Supplements,* 205.

[2] Charles H. Halsted, "Dietary Supplements and Functional Foods: 2 Sides of a Coin?", *American Journal of Clinical Nutrition* 77, no. 4 (April 2003): 1001S-1002S.

[3] Melanie DuPuis, *Nature's Perfect Food: How Milk Became America's Drink* (New York: New York University Press, 2002), 19-21.

stepped in, mandating enrichment of white bread with key vitamins through the end of the war and constructing international food aid policy around questions of the ideal amount calories and vitamins per person. The American food landscape in 1940s postwar America would look more familiar to individuals today than it did to those who had lived less than fifty years before.

How did the American view of food change in such a short amount of time? How did the concept of scientific eating come to dominate national discussions about food, shaping everything from popular cookbook recipes to American foreign policy? Strangely, it wasn't because most Americans were in real danger of malnourishment in the early twentieth century. In fact, though nutritional deficiencies were a real concern for many poverty-stricken Americans, poor Americans did not become the greatest proponents of nutritional science or its targets. Instead, nutritionists overwhelmingly targeted members of the middle class. The chemists, home economists, nurses, and dieticians who became the science's boosters appreciated the willing audience they found among middle class housewives, who eagerly changed their diets and purchased items like yeast cakes and cod liver oil according to experts' recommendations. The middle class sought the positive health benefits that good nutrition promised to confer in search of greater energy and longevity, but they were also deeply concerned that they too might secretly be malnourished. They feared they suffered from "hidden hunger," a condition that struck those who "satiate[d] themselves with vast quantities of food" but did not eat enough essential nutrients to satisfy the body because their processed food had been stripped of all nutritional value.[4] Homemakers worried their husbands were tired and cranky because they were mildly malnourished, and that their children frequently teetered on the edge of major vitamin deficiency diseases like rickets or pellagra. Nutritional experts legitimized these fears in countless seminars and magazine articles that trumpeted every new discovery, and food companies quickly

[4] "National Nutrition," *Journal of American Medical Association* 116, no. 26 (June 28, 1941): 2854.

reinforced the messages by placing nutritional claims at the center of their advertising campaigns.

Nutritional experts' paradoxical obsession with the middle class diet despite the group's almost nonexistent malnutrition reveals why their science so successfully transformed American food habits and thinking between World War I and the end of World War II. Like other scientists, educators, and policy experts in this period, advocates held a deep faith in the ability of science to catalogue perfectly the natural world and use that knowledge efficiently to manage natural resources. Research at the end of World War I revealed that newly discovered nutrients like vitamins B and D were essential to the body's proper functioning and held the power to cure devastating diseases like pellagra and rickets almost overnight. Indeed, nutrition's powers appeared virtually limitless. This faith formed the foundation of the ideology of nutritionism, an unwavering confidence in the absolute power of science to discover the absolute best foods for human consumption, which revolutionized the American food landscape by the end of World War II.[5] This optimism filtered down to the middle class through nutritionists' educational seminars and magazine articles, convincing them that vitamins and other nutrients were desirable commodities that increasingly existed independently of the foods from which they originated.

The idea of nutritionism prioritized abstract scientific knowledge in favor of the practical wisdom most women had gained through experience for centuries, and transferred the authority to make the correct decisions about food and bodily health to the experts who had mastered this knowledge. This change produced great anxiety for middle class women because they were no

[5] Food activist Michael Pollan most famously popularized the phrase "nutritionism" in his book *In Defense of Food: An Eater's Manifesto* (New York: Penguin Books, 2008), 8. Harvey Levenstein refers to this same viewpoint as the "newer knowledge of nutrition," distinguishing it from the first wave of nutritional science that taught Americans about calories, protein, and fat in the late nineteenth century. Most scholars have adopted Pollan's term for this phenomenon, and this work will follow their lead. See Levenstein, *Revolution at the Table: The Transformation of the American Diet* (New York: Oxford University Press, 1988), 147.

longer certain about which foods they should serve or even if their families were healthy rather than secretly malnourished. The ideology also had material effects, such as reduced importance on taste and a general enthusiasm for vitamins transformed the American dinner table. Nutrition boosters' educational campaigns focused on the middle class during the 1920s and 1930s, and when the nation's entry into World War II gave nutritionists enough influence to create the first Recommended Daily Allowances a large portion of Americans were already firmly committed to the idea of eating scientifically.

Though the middle class was the first group in American society to adopt nutritionism, its members did not embrace it uniformly. The gendered nature of American culture meant that women worked with food much more closely than men who were rarely involved in the selection or preparation of meals; this gender imbalance helped the ideology establish itself so rapidly as the dominant framework for thinking about food. Nutritionism reinforced traditional middle class gender values by upholding homemaking and family care as women's most essential duties, yet it also created new responsibilities for them as the managers of scientific knowledge and familial food resources. In the first decades of the movement to eat scientifically a wide gulf emerged between the way women and men experienced their foods. Men largely maintained a now longstanding middle class approach to food: they assessed it primarily in terms of the way it tasted and largely ignored its potential health properties. Nutrition advocates assumed men still preferred the hearty, fattening foods that actively worsened their health. Meanwhile, women had largely abandoned this relationship and had instead come to view food more and more through the lens of nutritionism, carefully evaluating their food for its nutritional content and weighing it against other factors such as budget and taste. The sharp gender contrasts within the middle class

during this period demonstrate just how far the nutritionist paradigm sought to carry the middle class from nineteenth century foodways, but also the limits of its effect.

Nutrition advocates' efforts to transform Americans' relationship to food was a thoroughly modern development. Scientists and early nutritional experts believed that nutritional deficiencies that in their worst cases developed into devastating diseases like beriberi and pellagra were "man-made diseases" that had rarely plagued pre-industrial societies.[6] Urbanization and industrialization had radically altered the way people acquired their food, as fewer people lived on farms and instead bought their food from stores and deliverymen. The nutritional content of these foods also changed significantly as industrial food production often stripped grains of their essential nutrients. Though pre-industrial societies had often suffered from long famines and droughts, nutritional experts believed that people in the modern world had "lost their instinct for the selection of natural food" and suffered from perpetual, lifelong deficiencies.[7] Without instinct, modern inhabitants needed a guide for proper eating, and nutritional science promised the answer.

Transforming food was just one part of the modernization efforts in the late nineteenth and early twentieth centuries. Experts hoped to revolutionize almost every part of American society and place it under the umbrella of scientific management. Everything from city planning to forestry management to warfare came under scrutiny as modernists searched for ways to streamline human efforts to their greatest capabilities and to improve industrial production. The perspective was relentlessly forward-looking, confident in science's ability to endlessly improve upon systems both large and small and disparaged any wisdom it deemed "unscientific"; that is, any knowledge of the world not gained through formal, deductive reasoning in a carefully

[6] A. J. Carlson, "The Physiologic Life," *Science* 67, no. 1736 (April 6, 1928): 356.

[7] Victor Levine, "Why We Should Be More Interested in Nutrition," *Scientific Monthly* 22, no. 1 (January 1926): 21.

controlled laboratory or field setting. At its most extreme, these modernist sympathies mutated into the high modernist ideology that dominated much of the early twentieth century, resulting in an unwavering and enthusiastic faith in "the possibilities for the comprehensive planning of human settlement and production."[8] Modernists' most impressive accomplishments often occurred when they allied with governments, as with the massive dams and rural electrification projects that characterized 1930s America, but just as often they worked independently to reform society.[9] The latter achievements may have been less notable, but in targeting some of the most mundane elements of life, such as the choices about what to eat for dinner, brought the full force of modernism to bear upon American society.

Home economics developed with just such a purpose, with hopes of "bringing science and art in service of the home."[10] Home economists saw little but chaos in the traditional, unprofessional approach to housekeeping that many women displayed and believed modern science would eliminate wasted effort and resources. At the turn of the century home economists focused mostly on practical applications and opened cooking schools, published magazines, and organized lecture events to instruct directly the American housewife in domestic science. By the end of World War I home economists had professionalized the discipline, forging close connections with universities, government agencies, and industry. Home economists believed their modern approach to the home would engage the housewife's intellect, equip her with the

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[8] James Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), 4.

[9] There are a number of investigations into the way modernists in the first part of the twentieth century sought to impose rational management systems over nature. See, for example, Frieda Knobloch's discussion of scientific forestry in *The Culture of Wilderness: Agriculture as Colonization in the American West* (Chapel Hill: The University of North Carolina Press, 1996), 23-26; Edmund Russell's study of pesticide in *War and Nature: Fighting Humans and Insects with Chemicals from World War I to* Silent Spring (Cambridge: Cambridge University Press, 2001), 5-7; Anne Whiston Spirn's study of landscape architecture in "Constructing Nature: The Legacy of Frederick Law Olmstead," in *Uncommon Ground: Toward Reinventing Nature*, ed. William Cronon (New York: W. W. Norton & Co., 1995), 91-113.

[10] The American Home Economics Association and the Journal of Home Economics, "Announcement," *Journal of Home Economics* 1, no. 1 (February 1909): 1.

"wisest training we can give to fit her for the most responsible position she can hold, that of wife and mother," and ultimately liberate her from the drudgery of housework.[11] Nutritional science and its ability to quantify food value fit neatly into home economists' mission, and by the time chemists discovered the invisible vitamins and minerals lurking in foods they already had the structures necessary to quickly analyze and disseminate such knowledge to the average housewife.[12]

But home economists were not the first modernists to become interested in food. Farmers, scientists, government workers, and agriculture industry officials were searching for ways to improve American food well before it reached the dinner table. The late nineteenth and early twentieth centuries were dedicated to the development of irrigation systems, new management techniques, and a slew of chemical products such as fertilizers and pesticides that promised to boost production significantly. Farmers and scientists also tinkered with plants and livestock themselves, carefully selecting the hardiest breeds that were most resistant to disease and drought. The search for greater productivity of land and labor transformed the landscape and revolutionized American food. The modernists involved in these schemes believed that humans could control the natural world and harness its forces to work in service of human ends; in their more optimistic moments, establishing this control seemed the only way to help the landscape achieve its full potential.[13]

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[11] Esther M. Howland, "The Influence of Domestic Science on Society," *Journal of Home Economics* 1, no. 2 (April 1909): 198.

[12] Laura Shapiro, *Perfection Salad: Women and Cooking at the Turn of the Century* (1986; repr., Berkeley: University of California Press, 2009), 4-8.

[13] For example, agricultural economists Alan Olmstead and Paul Rhode argue that only eight percent of national wheat cultivation in 1919 utilized varieties that existed before 1840; the rest of the nation's acreage was devoted to new strains that resisted hardship and produced better yield. See Olmstead and Rhode, *Creating Abundance: Biological Innovation and American Agricultural Development* (Cambridge: Cambridge University Press, 2008), 389.

The process was never that simple, however. Social and ecological systems were far more diverse than modernists assumed, and their plans to improve major quandaries through central planning relied on radically simplified understanding of these far more complex systems. Farming monocultures depleted soil quality, pesticides poisoned wild animals, and deforestation accelerated erosion and flooding. These unanticipated limitations and consequences forced modernists to alter their plans and ultimately accept an incomplete realization of their vision. Historians have well documented the problematic nature of modernist planning in food production and the hybrid systems that usually resulted. Mark Fiege's *Irrigated Eden* explores how farmers' and hydraulic engineers' attempts to irrigate Idaho created a "new ecological system" where human effort and natural forces deeply influenced each other, while Donald Worster's *Dust Bowl* demonstrates the ecological disaster that resulted from agricultural monoculture in the Plains. Others such as Edmund Russell, Linda Nash, and Nancy Langston have chronicled the myriad effects of chemical usage in agricultural production that occurred after World War I.[14]

Modernist attempts to rationalize American food consumption are less well documented, though they were as ambitious and problematic as their counterparts in agricultural production.[15]

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[14] Mark Fiege, *Irrigated Eden: The Making of an Agricultural Landscape in the American West* (Seattle: University of Washington Press, 1999), 9 (quotation); Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979); Russell, *War and Nature*; Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge* (Berkeley: University of California Press, 2006); Nancy Langston, *Toxic Bodies: Hormone Disruptors and the Legacy of DES* (New Haven: Yale University Press, 2010).

[15] Food consumption is a relatively new area of study in history and in environmental history specifically. Harvey Levenstein's two works *Revolution at the Table* (New York: Oxford University Press, 1988) and *Paradox of Plenty* (New York: Oxford University Press, 1993) remain the standards in the field, though a number of other studies on specific foods have recently appeared to supplement them, such as Melanie DuPuis's *Nature's Perfect Food*, Alissa Hamilton's *Squeezed: What You Don't Know About Orange Juice* (New Haven: Yale University Press, 2009), Aaron Bobrow-Strain's *White Bread: A Social History of the Store-Bought Loaf* (Boston: Beacon Press, 2012); and Nancy Shoemaker's "Whale Meat in American History," *Environmental History* 10, no. 2 (April 2005): 269-294. A 2009 roundtable in *Environmental History* called for greater investigation into the ways food consumption "can provide a flexible, interdisciplinary, and insightful window on relationships among ecologies of place, sensory experience, identity, and food." See Robert N. Chester III and Nicholaas Mink, "Having Our Cake and Eating It Too: Food's Place in Environmental History, A Forum," *Environmental History* 14 (April 2009): 311.

Laura Shapiro's *Perfection Salad* provides one of the most important studies into the development of home economics and its early attempts to make Americans eat scientifically at the turn of the century. Mass consumption and marketing campaigns dominated American food culture in the twentieth century and played a fundamental role in modernization, as historians such as John Soluri, Katherine Parkin, and Melanie DuPuis have demonstrated. Rima Apple's *Vitamania* chronicles the various and conflicting advice about vitamins through the twentieth century and argues that scientific claims were often the most persuasive reasons why Americans chose some food over others. Diana Wylie's study of malnutrition and hunger in twentieth century South Africa demonstrates the close connections between scientific eating and modernity that fueled cultural racism and became a tool for white supremacy. Though it never culminated in such dramatic results in American history, food played a similar role in Indian boardinghouses in the early twentieth century and "became yet another powerful tool of the colonizers," according to Margaret Jacobs. Food also held international political power; Lizzie Collingham's *Taste of War* reveals that food science played a central role in the economic, military, and ideological conflicts in World War II.[16]

Though using science to change American food habits certainly created improvements to national health, it also contained some long-lasting problematic elements. Nutritionism's central

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Food is more frequently a subject for women's and gender historians who use it to examine social expectations and gender roles, as with Jessamyn Neuhaus's *Manly Meals and Mom's Home Cooking: Cookbooks and Gender in Modern America* (Baltimore: The Johns Hopkins University Press, 2003), and the essays in Sherrie A. Inness, ed., *Cooking Lessons: The Politics of Gender and Food* (Lantham, MD: Rowman and Littlefield Publishers, 2001).

[16] Shapiro, *Perfection Salad*; John Soluri, *Banana Cultures: Agriculture, Consumption, and Environmental Change in Honduras and the United States* (Austin: University of Texas Press, 2005), 161-192; Katherine Parkin, *Food Is Love: Food Advertising and Gender Roles in Modern America* (Philadelphia: University of Pennsylvania Press, 2006); DuPuis, *Nature's Perfect Food*; Rima D. Apple, *Vitamania: Vitamins in American Culture* (New Brunswick: Rutgers University Press, 1996); Diana Wiley, *Starving on a Full Stomach: Hunger and the Triumph of Cultural Racism in Modern South Africa* (Charlottesville: University Press of Virginia, 2001), 4; Margaret Jacobs, *White Mother to a Dark Race: Settler Colonialism, Maternalism, and the Removal of Indigenous Children in the American West and Australia, 1880-1940* (Lincoln: University of Nebraska Press, 2009), 246 (quotation); Lizzie Collingham, *The Taste of War: World War II and the Battle for Food* (New York: Penguin Books, 2012).

claim that food promoted good health also carried with it the opposite message: food can undermine health, and nutritional guidance did not always come from reliable sources. While concerns about pesticide residue, genetically modified vegetables, and plastics leaking bisphenol-A (BPA) toxins spoke to anxieties about modern food production in the late twentieth century and created thriving organic markets and "eat local" movements, Americans' fears often reached much deeper. Crusades against cholesterol, salt, sugar, and saturated fats joined the perennial worry over calories and made many Americans truly afraid of what lurked in their food. Consumers regularly read reports about how food secretly made them sick: chocolate potentially lowered bone density, high levels of antioxidants could activate latent cancer cells, carbohydrate-dense diets increased the risk of heart disease, and coffee could cause cancer of the lung and urinary tract, to name just a few articles from one popular magazine.[17] Food choices seemed more important than ever for the average American by the twenty-first century, yet they were also more complicated than ever. No wonder so many today agree with food activist Michael Pollan, who argues that the nutritionist ideology is turning the United States into "a nation of orthorexics: people with an unhealthy obsession with healthy eating," an obsession that paradoxically destroyed good health.[18]

Pollan argues this dark side of scientific eating developed only in the late 1970s, after a Congressional report spawned a firestorm of conflict between the government and food industry

[17] Sydney Spiesel, "Is Chocolate Bad for the Bones? And More," *Slate*, January 30, 2008, http://www.slate.com/articles/health_and_science/medical_examiner/2008/01/your_health_this_week.single.html (accessed May 18, 2012); Emily Anthes, "The Vita Myth: Do Supplements Really Do Any Good?" *Slate*, January 6, 2010, http://www.slate.com/articles/health_and_science/medical_examiner/2010/01/the_vita_myth.single.html (accessed May 18, 2012); Melinda Wenner Moyer, "End the War on Fat: It Could Be Making Us Sicker," *Slate*, March 25, 2010, http://www.slate.com/articles/health_and_science/medical_examiner/2010/03/end_the_war_on_fat.single.html (accessed May 18, 2012); Christie Aschwanden, "Café or Nay?" *Slate*, July 27, 2011, http://www.slate.com/articles/health_and_science/medical_examiner/2011/07/caf_or_nay.single.html (accessed May 18, 2012).

[18] Pollan, *In Defense of Food*, 9. Harvey Levenstein also chronicles this transformation in *Fear of Food: A History of Why We Worry about What We Eat* (Chicago: University of Chicago Press, 2012).

lobbyists, but this thesis argues that tensions were inherent from the start.[19] Chapter 1 describes the discovery of vitamins in the 1910s and the emergence of two groups of experts who sought to control the information. Research scientists initially assumed responsibility for envisioning ways nutritional science could reform society, but their greater media access allowed home economists, nurses, dieticians, and advice columnists to increasingly dominate the public conversation about nutritional science's potential and become the greatest advocates of nutritionism. Scientists' and advocates' differing visions largely competed on the scale of their enthusiasm, as advocates believed that vitamins' miraculous abilities to cure major deficiency diseases within days convinced them there was no limit to what nutritional science could achieve while scientists exercised more restraint in their assessments. This chapter argues that despite these differences both groups shared a common assumption that food and nutrition preserved vital connections between the human body and the natural world and that modern science could improve this relationship by making it more rational and efficient.

Chapter 2 examines the educational campaigns that nutrition boosters launched in the 1920s and 1930s. Advocates integrated nutritional science into the growing home economics discipline, and so nutrition education became an important component of public school classes, home extension programs, public lectures, and cooking demonstration series. Magazine articles and advice columns also sought to modernize the American home. Advocates believed the gospel of nutrition would benefit every American family, but quickly realized that Americans would not change their diets simply because they valued science. Advocates needed to persuade their audience how nutritional science could improve their lives, and their appeals focused primarily on the problems of modernity, most notably how to manage household resources most efficiently, the best way to raise one's children, and methods to incorporate new technology into

[19] Pollan, *In Defense of Food*, 21-24.

the home. The Great Depression helped boosters reach a wider audience as poor and rural women felt the need to stretch every dollar more keenly, but the gospel of nutrition remained largely the same. This chapter argues that Americans only incompletely adopted the nutritionist ideology because advocates intertwined the science with a variety of gender roles, technological innovations, and current events that appealed most strongly to middle class women; paradoxically, advocates' most receptive audience consisted of people who suffered the least from malnutrition.

Despite middle class housewives' surprisingly quick conversion to the nutritionist ideology, experts were unsatisfied with their progress. Chapter 3 argues that World War II provided advocates the opportunity they finally needed to establish scientific eating as the proper way to eat among a broad audience. The war prompted an evaluation of the nation's nutritional health, which seemed startling deficient compared to Nazi Germany's massive war machine. The idea that nutrition could become a tool of war added great prestige to the ideology, and boosters argued that an individual's failure to follow new nutritional guidelines directly undermined the nation's entire war effort. Greater popular and government enthusiasm for nutrition allowed experts to achieve their two greatest accomplishments yet. The first was the creation of federal nutritional guidelines in the year before the war began, establishing national standards that made good nutrition an easily measured value. Their attempts to educate Americans on these standards did not quite progress as planned, however. Their gendered educational methods ensured that nutritionism remained a subject primarily for women through the war, and their rhetoric aligned nutritionism with the conservative evaluation that women's true place remained in the home, not the factory, further limiting it to the middle class. Mandatory enrichment of white flour and bread with key vitamins, their second accomplishment, was more successful at reaching the

American population as a whole, but similarly backfired for nutritionists as it demonstrated to Americans that they could improve their health without even significantly changing their diets. Although nutritionists would continue to address these problems in later decades, the end of World War II marked their most important accomplishments, as their actions had finally entrenched nutritionism in the public consciousness and made it the dialect Americans used to talk about their food.

Ultimately, the nutritionist approach to food in the first part of the twentieth century created a complicated legacy, neither an unqualified good nor an unqualified harm. Nutritionists did improve many elements of the American diet and eliminated painful deficiency diseases virtually overnight. Their efforts resulted in the establishment of daily intake guidelines and nutritional supplements that combat malnutrition worldwide and make my low-fat pomegranate energy frozen yogurt possible. But they also initiated a near-obsessive interest in nutritional science that even today breeds confusion and anxiety and makes what was once a simple decision about what to eat for dinner a complex, nearly unsolvable dilemma. The near-constant barrage of conflicting nutritional claims, such as whether saturated fats really increase harmful cholesterol levels or if they actually lower the risk for heart disease, further complicate the decision about what to eat.[20] Vitamin supplements seem an easy solution—why not just take concentrated doses of certain nutrients to avoid potentially harmful foods altogether?—but no consensus exists for them either: some studies show that multivitamins decrease the risk of stroke and heart disease, while others demonstrate that they increase risk of cancer and death.[21] Perhaps the array of conflicting advice helps explains why Americans today suffer from diet-related illnesses at greater rates than ever, despite the overabundance of information: coronary

[20] Moyer, "End the War on Fat."
[21] Anthes, "The Vita Myth."

heart disease, diabetes, stroke, and cancer constitute four of the top ten causes of death in the United States, and the causes of each have well-established links to diet.[22] Some nutritionists conclude that Americans, for reasons that are not fully understood, are not able to fully access or absorb the nutritional knowledge they need to make healthy choices. Efforts to solve these crises generally further promote the nutritionist ethic: the right food can make you healthy, if you just follow the right rules. In such an atmosphere, it is important to remember that calories, vitamins, and fat were not always the language of food. Indeed, it was only recently that Americans began "learning what to eat" at all.[23]

[22] Pollan, *In Defense of Food*, 10.
[23] Clive M. McCay, "America is Learning What to Eat," *New York Times*, March 28, 1943.

CHAPTER 1

"The Human Body is a Chemical Laboratory": The Origins of Nutritionism

When Dr. Harvey Wiley talked about food, people listened. The chemist had gained a national reputation for his pure food advocacy, which stretched back as far as the 1880s. The unusual experiments he performed only added to his prestige; in 1902 he investigated the toxicity of food preservatives such as borax and formaldehyde by using human subjects, groups of young men that the press enthusiastically deemed Wiley's "poison squads."[1] Wiley used his fame to lobby for the passage of the landmark Pure Food and Drug Act in 1906 and soon thereafter became the first head of the new regulatory commission, though his frequent clashes with the food industry over enforcement of the act soon led him to resign in protest. By the time Wiley stood in front of the Columbia Historical Society in 1916 to speak about "food and efficiency," his status as a food safety giant was already well assured.[2]

But Wiley's speech was not about the dangers of adulteration or the need for federal regulation. Instead, Wiley turned his attention to a newer subject in food. The field of nutritional science had made some stunning advancements in recent years, most importantly in the discovery of vitamins, the invisible food components that were vital to life; the occasion prompted Wiley to consider the importance of food and nutrition to American society. The new scientific knowledge explained why "so many men and women reach[ed] maturity unfit physically, and therefore to a certain degree mentally and morally, to discharge the active duties of citizenship." Malnourished Americans who lived with "a great many painful and even fatal

[1] "Food Law's Anniversary," *New York Times*, June 30, 1908.

[2] Clayton A. Coppin and Jack High, *The Origins of Purity: Harvey Washington Wiley and the Origins of Federal Food Policy* (Ann Arbor: University of Michigan Press, 1999), 55-56; Harvey Levenstein, *Revolution at the Table: The Transformation of the American Diet* (New York: Oxford University Press, 1988), 39-40.

diseases" could not fully contribute to the nation's war preparedness campaign, and they certainly could not serve their country as soldiers and "efficient citizen[s]." The cause, Wiley informed his audience, was the "modern refinement" that stripped vegetables and grains of their nutritional content and produced an overabundance of "sugars, candies, cakes, ice creams, and so on" that seduced Americans away from "fresh, simple foods." Humans were not meant to indulge in such foods, Wiley warned; the body was an "engine" designed for "enormous efficiency" and overly refined foods polluted its "perfect working laboratory."[3]

The malnutrition levels were a true national crisis, Wiley warned, that threatened to "undermine the general constitution and produce a race of weaklings," but there was hope. "The chemist steps forward to solve the problem," Wiley proudly announced, in order to use his knowledge of food and nutrition to reform society. Wiley believed scientists could teach the nation how to eat in a more rational, modern way by educating them about "the elements which are found in his food and the proper method of mingling them so that they shall do most efficient service." Science, "the great promoter of human advancement and necessarily of human efficiency," could discover the exact nutritional requirements for humans and the perfect combination of foods that would "suppl[y] all the wants of the body and ha[ve] little left over." Only with such guidance, Wiley informed his audience, could Americans create a modern diet, one characterized by its "simplicity and completeness."[4]

Wiley phrased his beliefs about food more eloquently than most, but his ideas were certainly not unique. Wiley joined the ranks of innumerable other scientists, home economists, public health workers, and other societal planners who worked to modernize America in the early twentieth century. These experts believed they could use scientific knowledge to better the

[3] Harvey W. Wiley, "Food and Efficiency," *Records of the Columbia Historical Society, Washington, D.C.* 20 (1917): 4-12. The title of this chapter comes from Wiley's speech.

[4] Ibid., 9, 11.

world by making it more efficient and rational; they enacted their plans in nearly every corner of society, from business to agriculture to natural resource usage. Modernists believed in their own capabilities to master the environment and to engineer it for their own purposes, a faith that often bordered on what historian Timothy LeCain labels an "arrogant overconfidence" and what geographer James Scott refers to as the "high modernist" ideology.[5] Technological advancements created opportunities for a greater, more precise control over the environment than Americans had ever witnessed, which convinced many that the modern world inherently stood apart from nature.

However, as Wiley's speech demonstrates, modernists in the early twentieth century still faced an unsettling dilemma about the human body's place in this new world. Industrialization and urbanization, the engines of progress, seemed only to have made the human body sicker.[6] Not only were humans more vulnerable to industrial accidents, toxins, and urban epidemics, but they were also subject to a range of illnesses from mild digestive issues to serious cases of rickets and pellagra. It seemed to many doctors and scientists that the human body was simply unable to keep up with the demands of modern life. Food became an important solution to this array of problems. During the 1910s and 1920s, dietary experts came to believe that food helped Americans maintain a vital connection with the natural world and allowed them endure the hardships of modern life; they also argued that modern scientific knowledge was essential to giving Americans the tool they needed to extract maximum value from their food. Nutritional experts quickly diverged into two camps about the potentially transformative value of nutrition;

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[5] Timothy J. LeCain, *Mass Destruction: The Men and Giant Mines that Wired America and Scarred the Planet* (New Brunswick, NJ: Rutgers University Press, 2009), 18; James Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), 4.

[6] Claudia Clark, *Radium Girls: Women and Industrial Health Reform, 19190-1935* (Chapel Hill: University of North Carolina Press, 1997); Brett Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (Seattle: University of Washington Press, 2010); LeCain, *Mass Destruction*, 68-69; Nancy Langston, *Toxic Bodies: Hormone Disruptors and the Legacy of DES* (New Haven: Yale University Press, 2010).

research experts assessed the field's future conservatively, believing that nutrition could have great potential for the nation but was no magic bullet that solved every problem. Meanwhile, many more experts followed Wiley's example and became boosters who dreamed of the ways nutrition would soon solve every social and personal problem. Both parties, however, agreed that concentrating on the invisible nutrients within food would allow them to make the most of the natural laws driving the human body and play the role of expert mediators between the general public and their food. These ideas formed the foundation for the ideology of nutritionism that came to dominate food experts' thinking in the early twentieth century.

Scientific interest in food stretched back into the nineteenth century. The midcentury experiments of German scientist Justus von Liebig had revealed that every food item contained some ratio of a few essential macronutrients: protein, carbohydrates, fat, minerals, and water.[7] The first nutritional scientists analyzed primarily animal food, and in the 1870s chemist Wilbur Atwater began applying the information to human nutrition. Devotees of Atwater's research believed that this knowledge would radically improve the lives of poor Americans, as the new knowledge seemed to collapse the differences between cheap and expensive food. "The best food" was no longer the food that had "the finest appearance and flavor and [was] sold at the highest price," but was rather the food that "supplie[d] the most nutriment for the least money," according to Atwater.[8] The first wave of human nutritional science promised to make eating a matter of simple addition and subtraction, but the philosophy largely failed to revolutionize American eating habits. At the practical level, nutritional kitchens in Boston, New York City, Philadelphia, and Chicago failed to attract the attention of their urban working class audiences,

[7] Levenstein, *Revolution at the Table*, 46.
[8] Wilbur Atwater, "Pecuniary Economy of Food," *The Century* 35, no. 3 (January 1888): 437.

who had very little interest in "Americanizing" their diets and could not afford the food anyway.[9] Even more troubling for nutritional experts, something still seemed to be missing. Laboratory subjects who ate bland, calorically balanced diets continually failed to thrive.[10] Nor did chemically synthesized proteins and carbohydrates succeed in curing painful and widespread diseases that struck Americans without warning.

These diseases made experts wonder whether why the modern human body was so sick in the late nineteenth and early twentieth centuries. Poor Americans in both urban and rural areas, especially children, suffered from debilitating illnesses that seemed to have no clear cause. The severity of these diseases was often terrifying. Pellagra, for example, was labeled "one of the worst scourges known to man."[11] Women and children from poor corn milling towns were the primary victims, and symptoms progressed through what doctors called the "4 Ds": diarrhea, dermatitis, dementia, and then death. The skin, particularly on the hands, erupted in what at first appeared to be a bad sunburn that peel[ed] and blister[ed], but quickly changed to a dirty brown color and then cracked and peeled into rough scales, not unlike the skin of a baked potato. "Blind staggers" followed, when dizziness and vertigo made stumbling to the bathroom to relieve oneself difficult. Swelling and burning in the mouth, referred to as "beef tongue," was another common symptom.[12] Pellagra outbreaks usually occurred when famines and droughts had already pushed Southern sharecroppers deeper into poverty and forced them to subsist almost entirely on cornmeal for long periods. These events were so common that by the twentieth century pellagra had become an endemic disease; during one year of famine in 1921, for

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[9] Levenstein, *Revolution at the Table*, 50-54.

[10] Eunice Fuller Barnard, "In Food Also, A New Fashion Is Here," *New York Times*, May 4, 1930.

[11] "Plague Threatens 100,000 Victims in the Cotton Belt," *New York Times*, July 25, 1921.

[12] Marie V. Krause and L. Kathleen Mahan, *Food, Nutrition, and Diet Therapy: A Textbook of Nutritional Care*, 7th ed. (Philadelphia: W. B. Saunders Company, 1984), 125; Carleton Ellis and Annie Louis Macleod, *Vital Factors of Foods: Vitamins and Nutrition* (New York: D. Van Nostrand Company, 1922) 243-244, http://hearth.library.cornell.edu/cgi/t/text/text-idx?c=hearth;idno=4304161 (accessed January 31, 2012).

example, Surgeon General Hugh Cumming estimated over 100,000 people in the South would show signs of the disease.[13]

The terror of rickets laid in its propensity to strike children, especially in the winter. Nearly three-fourths of infants suffered from rickets in the early twentieth century, and it was so common that doctors warned parents "that most babies experience[d] a mild degree of it at some period, especially in winter." Restlessness was the first symptom, followed by softening bones that bowed legs, knocked knees together and bulged out the ribcage. Middle- and upper-class children rarely suffered from rickets long enough to develop its worst symptoms, but because the effects were so difficult to detect in their milder forms, rickets became a constant concern for parents at nearly every economic level.[14]

Other diseases were far less common in the United States, but they still attracted significant scientific interest and actually provided scientists with their first clues of the causes. Beriberi was one of the most interesting diseases to researchers, and the first to establish a clear connection to diet. Beriberi was endemic in many parts of Asia and especially among poor sailors. General malaise and pain in the calf muscles were the first symptoms of the disease; tendons weakened and created a burning sensation in swelling arms and legs as the disease progressed. Neurological weakness impaired walking and produced dropped feet and hands too weak to use, confining the patient to bed until death.[15] Kanehiro Takaki, a British-trained doctor in the Japanese Navy, linked beriberi to diet as early as 1884, when he observed that disease outbreaks occurred only among low-ranking sailors who ate primarily rice and did not affect the

[13] "Plague Threatens 100,000 Victims in the Cotton Belt," *New York Times*, July 25, 1921.

[14] Levenstein, *Revolution at the Table,* 149*;* Krause and Mahan, *Food, Nutrition, and Diet Therapy*, 110-112 (quotation).

[15] Krause and Mahan, *Food, Nutrition, and Diet Therapy*, 120-121; David M. Paige et al., *Clinical Nutrition*, 2nd ed. (St. Louis: The C. V. Mosby Company, 1988), 559.

ship's officers who ate Western-style diets.[16] Dutch physician Christiann Eijkman's experiments with chickens confirmed the dietary link and suggested that a diet of unpolished rice, with the husk still intact, instead of the traditional polished rice helped prevent the disease.[17] Though they could not yet identify why certain foods cured beriberi and others did not, by the early twentieth century it was clear that diet played a critical role.

Scurvy research also contained an answer. Scurvy was one of the best-known and oldest deficiency diseases and subject to constant medical inquiry. Doctors, mariners, chemists, and amateur scientists posited numerous theories through the centuries, suggesting everything from poor hygiene to bad air vapors to clogged sweat pores as the cause.[18] Experts occasionally pointed to food as the cause and potential cure, though the practice of consuming citrus juice fell in and out of use during the eighteenth and nineteenth centuries.[19] While prevailing opinion in the early twentieth century held that tainted meat caused scurvy, between 1907 and 1912 Norwegian researchers proved they could induce and cure scurvy at will in guinea pigs by removing or adding fresh fruit and vegetables to their diet. Some foods seemed to contain an inherent ability to cure certain diseases, but it was not tied to any of the known nutrients.[20]

These discoveries prompted scientists to take a closer look at chemical composition of food. In doing so, researchers such as Casimir Funk and Elmer McCollum, Polish and American chemists, challenged prevailing ideas about the causes of illness and disease. The germ theory of disease and the recent discovery of bacteria suggested that sickness was caused by an invasion of

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[16] Yoshinori Itokawa, "Kanehiro Takaki (1849-1920): A Biographical Sketch," *Journal of Nutrition* 105, no. 5 (May 1, 1976): 584.

[17] Kenneth J. Carpenter, *Beriberi, White Rice, and Vitamin B: A Disease, a Cause, and a Cure* (Berkeley: University of California Press, 2000), 41.

[18] Stephen R. Bown, *Scurvy: How a Surgeon, a Mariner, and a Gentleman Solved the Greatest Medical Mystery of the Age of Sail* (New York: Thomas Dunne Books, 2003), 77, 104.

[19] Ibid., 216.

[20] Ibid., 214; Kenneth J. Carpenter, *The History of Scurvy and Vitamin C* (Cambridge: Cambridge University Press, 1986), 147-148.

foreign agents into the body and that eliminating contaminants from the environment would produce health. Historian Linda Nash argues that the germ theory of modern medicine "allowed its adherents to separate and compartmentalize diseased bodies and their environments to an extent that had not been possible in previous decades," creating a utopian vision of the future where humans lived outside the pains of the natural world.[21] But Funk and McCollum pursued the opposite theory: debilitating diseases like scurvy and beriberi might be caused by a *lack* of some element, rather than the unwelcome presence of some harmful germ or bacteria. They began their research with the premise that food contained natural elements whose presence did not just avoid disease but also actively created a healthy constitution.

Funk was the first to discover such an element. He identified a water-soluble nutrient in 1911 that was later named vitamin B. Funk believed the elements were similar to amino acids and were vital to life and so deemed them "vitamines."[22] McCollum discovered a similar fat-soluble element a year later that became known as vitamin A. These nutrients were not actually amino acids, but rather organic compounds that served a variety of purposes within the body: some acted as the precursors to vital enzyme activity, such as the breaking down of carbohydrates and proteins in food for metabolism; others assisted in the copying of genetic information within cells; and still others acted as antioxidants that absorbed extra electrons from molecules to prevent aging-related cell damage. The human body could neither synthesize vitamins naturally nor store them for more than a few days at a time, so an adequate daily diet was the only way to ensure a proper supply. Because of their crucial role in metabolism,

[21] Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge* (Berkeley: University of California Press, 2006), 84.

[22] By 1921 the medical community had largely dropped the "e" from the word. See "Vitamin," *The British Medical Journal* 1, no. 3153 (June 4, 1921): 828. The vitamin that Funk discovered was later named vitamin B_1, or thiamine.

sustained vitamin deficiencies or excesses profoundly disrupted the chemistry of the human body.[23]

The discovery set off a firestorm of interest in the scientific community. In 1915 the Surgeon General commissioned Dr. Joseph Goldberger to discover a diet-based cure for pellagra; by the 1920s Goldberger was confident that a cornmeal-heavy diet created a vitamin B deficiency that led to pellagra.[24] McCollum quickly established himself as the leader of the new wave of research. He demonstrated that a vitamin A deficiency led to deterioration in vision and stunted growth in rats, and in 1916 he proved a direct link between a vitamin B deficiency and beriberi. He also isolated vitamin D and proved it caused rickets in 1922. Other scientists isolated vitamin C in 1928 and discovered its antiscorbutic properties in 1932.[25] Some foods contained higher concentrations of vitamins than others, and McCollum and others soon began emphasizing the importance of certain "protective foods," especially milk and green vegetables, to the diet. Wiley, who by now was decades away from his time as a researcher and government bureaucrat, was unabashedly optimistic about the new research and used his monthly column in *Good Housekeeping* to publicize scientists' discoveries.

Much of this research took place against the background of World War I and its aftermath, which added a new level of urgency to the field of human nutrition. The United States declared war in April 1917 and instituted a national draft soon thereafter, which provided experts the first opportunity to survey American health on a large scale. The results staggered officials. Nearly one third of drafted American men were deemed unfit for active military service, with

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[23] Paige et al., *Clinical Nutrition*, 23-25.

[24] Levenstein, *Revolution at the Table*, 149; "Pellagra in the South," *New York Times*, July 27, 1921; "Diet in the Treatment and Prevention of Pellagra," *The American Journal of Nursing* 24, no. 11 (August 1924): 876. Powerful cotton interests prevented the federal government from formally recognizing pellagra as a nutritional deficiency disease in order to preserve the sharecropping economy, though government officials *de facto* labeled it as such by instructing sufferers in ways to improve their diets during outbreaks. Pellagra traced more specifically to a vitamin B_3, or niacin, deficiency in 1936.

[25] Levenstein, *Revolution at the Table*, 148; Bown, *Scurvy,* 214.

about 40,000 of them rejected for developmental defects.[26] Eye, teeth, and ear problems were the most common health problems, though flat feet and physical underdevelopment were equally alarming. Untreated venereal diseases caused most of the treatable maladies, but malnourishment was a significant contributor.[27] That so many men apparently had no idea of their ailments especially worried officials; as with rickets, it was possible the victims were "sick and didn't know it."[28] This possibility terrified nutritional experts; the prewar focus on deficiency disorders had attuned them to look for obvious symptoms of malnutrition, but the draft revealed that most Americans potentially exhibited far more subtle signs that were easily overlooked.

Even worse, American bodies seemed unable to prevail against their European enemies. Malnutrition, estimated to hinder the growth of anywhere from fifteen to twenty-five percent of American children, was "a reflection on our civilization and a menace to the future welfare of the nation," according to one scientist.[29] Public health in the United States lagged far behind European nations, "where the need for strong and healthy men for armies has turned the attention of governments to the health of school children."[30] For example, Germany's heavy investment in scientific research, "even in times of her greatest poverty," had lifted the nation into prosperity and world power at the beginning of the war.[31] Even after the war's end, experts worried about how future enemies would exploit this newfound resource. Some scientists warned of a war in which enemies bombed the skies to deprive civilians of vitamin D and destroyed fruit supplies to

[26] Taliaferro Clark, "Malnutrition," *Public Health Reports* 36, no. 17 (April 29, 1921): 924.
[27] J. Howard Beard, "Physical Rejection for Military Service: Some Problems of Reconstruction," *Scientific Monthly* 9, no. 1 (July 1919): 6.
[28] Remsen Crawford, "Thousand Rejected in Draft Learn from Doctors How to Get Well," *New York Times*, September 2, 1917.
[29] Beard, "Physical Rejection for Military Service," 10.
[30] "City Boys Stronger, Draft Data Show," *New York Times*, October 8, 1917.
[31] Graham Lusk, "A National Laboratory of Human Nutrition," *Science* 50, no. 1283 (August 1, 1919): 99.

induce "a widespread nutritional plague."[32] Leading forestry conservationist Gifford Pinchot even identified the healthy American body as the nation's greatest natural resource, responsible for "guarding its ideals, [and] controlling its destinies," but all signs implied this resource was dangerously inept.[33]

Experts soon extended their concerns about the national malnutrition crisis into peacetime activities as well. Diet became an important component for national productivity. Malnourished individuals could develop "anti-social tendencies" or become "industrial flotsam" that lived at the edge of society and hindered capitalist enterprise.[34] Even the middle and upper classes seemed to suffer. By 1920 more Americans lived in cities than in rural areas for the first time, and the transition had prompted a number of changes in typical middle-class bodies.[35] Large numbers of city office and shop workers created a market for affordable fast restaurant lunches, contributing to the cafeteria-style restaurant boom in post-war cities. Customers entered large spaces filled with long tables and steam tables brimming with food, its blandness overcome by the sheer variety.[36] Office workers who indulged their appetites with an unending variety of meat, potatoes, pies and cakes at lunch returned to their desks sleepy and foggy by mid-afternoon and confronted indigestion and "other digestive disturbances" in the evening.[37] One expert estimated that almost half of the American public was perpetually constipated, largely due to the

[32] Jane Stafford, "What Plague Will Follow the Next War?", *Science News-Letter* 14, no. 399 (December 1, 1928): 334.

[33] Gifford Pinchot, quoted in William Frederick Bigelow, "The May Day Call to Arms," *Good Housekeeping*, May 1926, 4.

[34] Beard, "Physical Rejection for Military Service," 10.

[35] Melanie DuPuis, *Nature's Perfect Food: How Milk Became America's Drink* (New York: New York University Press, 2002), 107.

[36] Levenstein, *Revolution at the Table*, 185-189.

[37] Caroline King, "Common Sense and Lunches: Their Relationship as Viewed by the Institute," *Good Housekeeping*, September 1923, 70-71.

proliferation of refined foods that eliminated necessary roughage from the diet.[38] Though digestive problems were somewhat of a trendy disease, indicating its victims "were surrounded by so much material abundance that it had become a kind of curse," the level of public and professional concern suggested it was a real problem.[39]

Experts diverged on the potential for nutritional science to solve America's dietary problems. The chemists who performed the research directly were generally among the more cautious in their assessments. H. H. Mitchell, from the agricultural department at the University of Illinois, urged his colleagues to "exert great care in the wording of statements as to the practical significance of vitamines in everyday life."[40] Others called for more research before assigning more power to vitamins than actually existed.[41] A national laboratory was an early favorite in the wake of the war. A national laboratory could research questions, such as the optimal weight of the most efficient laborers, whether a sound diet could induce children to do the same amount of labor as an adult male, and if the current military ration of five hundred grams of meat per day was not "altogether too high for production of the maximum of physical work which can be accomplished by a soldier."[42] Only careful research would provide scientists with the knowledge they needed to determine the most efficient manner to utilize America's human resources.

Scientists also sought what they believed was a more noble application of their research. Many of these scientists were influenced by the eugenics movement and considered the ways

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[38] Victor E. Levine, "The Importance of Nutrition in Child Hygiene," *Scientific Monthly* 28, no. 6 (June 1929): 557; "Americans Saturated with Sugar," *Science News-Letter* 14, no. 402 (December 22, 1928): 391; Walter H. Eddy, "Bran as a Laxative," *Good Housekeeping*, September 1932, 96.

[39] Levenstein, *Revolution at the Table*, 22.

[40] H. H. Mitchell, "The Necessity of Balancing Dietaries with Respect to Vitamines," *Science* 56, no. 1437 (July 14, 1922): 36-37.

[41] "Some Proprietary Vitamin Preparations," *British Medical Journal* 2, no. 3220 (September 16, 1922): 519.

[42] Lusk, "A National Laboratory for Human Nutrition," 98.

scientific eating could further enhance the national character. The eugenics movement specifically targeted women and the home as a key defense against race suicide, as demonstrated by their interest in birth control and motherhood, and so nutrition could have a particularly large influence.[43] Scientists did not oppose other reforming experts, who used their research to improve the lives of others, but many did worry whether improving the living conditions of the very poor, the mentally ill, the degenerate, and the racially undesirable only served to increase their numbers and drain society. For example, a rapidly increasing population could strain the food supply and lead to war. Improving the nutrition of morally and racially degenerate families, even in a matter as simple as curing deficiency diseases, could overwhelm the white families that scientists believed formed the pillar of the nation's strength.[44] In ascribing such power of influence to nutrition scientists betrayed their generally conservative assessment of the discipline, and revealed their more nuanced appraisal of their research. They believed that the doctrine of scientific eating did not necessarily have the significant power to improve the welfare of the middle classes, but it did have great potential to harm the nation by counteracting eugenicists' efforts. If public health workers were to implement scientific nutritional research in their practical reforms, scientists advised them to become "genetically minded, eugenically minded."[45]

Research scientists largely saw their influence decrease during the 1920s. They did succeed in creating national laboratories in the United States and its allied nations after World War I, but their vision for the future of nutritional knowledge would not become the dominant

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[43] Carole R. McCann, *Birth Control Politics in the United States, 1916-1945* (Ithaca: Cornell University Press, 1994), 99-173; Wendy Kline, *Building a Better Race: Gender, Sexuality, and Eugenics from the Turn of the Century to the Baby Boom* (Berkeley: University of California Press, 2001), 2-3.

[44] "The Survival of the Fittest," *Science* 66, no. 1702 (August 12, 1927): 153; Mazyck P. Ravenel, "The Trend of Public Health Work: Is it Eugenic or Dysgenic?" *Scientific Monthly* 23, no. 4 (October 1926): 331-336; Carlson, "The Physiologic Life," 355-360.

[45] "The Survival of the Fittest," 153.

framework.[46] The American Food Commission, headed by Herbert Hoover during the war, was more concerned about food shortages at home and abroad than it was about the latest nutritional research.[47] Although they spoke of implementing "eugenically minded" nutrition campaigns at the national level, they performed their research largely without government support after the war. There was little federal interest for the state of the American body, and once the immediate needs of World War I faded the federal government claimed a small role in shaping the American diet. Nutritional research moved into the hands of food corporations and private foundations like the Carnegie Institute that funded further research.[48] Putting nutrition to work in service of the nation also quickly declined after the war passed, replaced instead by a more optimistic view that focused its interests on the individual. The new group of advocates increasingly shaped the public's understanding of nutrition.

Research scientists disdained the more liberal approach to nutrition that this emerging group of nutritional educators displayed. The optimists generally had less direct experience with nutritional research and had much greater access to the public through media outlets, and generally included home economists, dieticians, public health workers, and advice columnists like Wiley, though important scientists such as Elmer McCollum also became vocal proponents of scientific eating. Reformers' experiences with the Children's and Women's Bureaus had convinced them that science played a central role in their attempts to modernize the American home by targeting subjects such as motherhood and childrearing, and they saw a similar potential for nutrition to improve modern life.[49] Their greater familiarity with practical social reform

[46] "A National Laboratory for the Study of Nutrition," *Science* 48, no. 1252 (December 27, 1918): 651.
[47] Harry Everett Barnard, "America Seeks a Strong Race of Children," *New York Times*, January 12, 1930.
[48] "$700,000 to Study World Food Needs," *New York Times*, February 27, 1921.
[49] See Molly Ladd-Taylor, *Mother-Work: Women, Child Welfare, and the State, 1890-1930* (Urbana: University of Illinois Press, 1994), 2-7; Robyn Muncy, *Creating a Female Dominion in American Reform, 1890-1935* (Oxford: Oxford University Press, 1991), 38-65; Ellen Fitzpatrick, *Endless Crusade: Women Social Scientists and Progressive Reform* (Oxford: Oxford University Press, 1990), xii-xv.

efforts instead of chemistry and biology meant they promoted a simplified version of nutritional science to the public, flattening scientists' careful nuance. These individuals became the ideology's greatest boosters, and their voice became increasingly louder through the 1920s.

The seemingly limitless potential of nutritional science led many boosters to forge a new definition of public health. Whereas most public health reformers defined health as the mere absence of disease, nutritional boosters hoped to maximize every aspect of the human body, from the body's muscles to its digestion to its immune system. Nutritionists referred to this concept as "positive health," and believed good nutrition was essential to spurring optimal growth and development in their patients. Positive health experts believed modern science was capable not only of removing sickness and discomfort from the human body, but that it could also create "something like physical perfection" among the American public. Nurses who had once focused on identifying diseases and could "spot an adenoid child at a distance of half a block" should now turn to creating a "picture in their minds [of] what a child should look like," according to positive health proponents.[50] Proper nutrition and diet were crucial to positive health. Well-fed individuals were more energetic, better focused, and simply enjoyed life more than their only adequately fed counterparts. Simply avoiding disease was no longer a marker of good health; nothing less than perfect bodily physique and full vitality would satisfy the boosters.

Advocates often ascribed to vitamins miraculous powers to cure every ailment, often exceeding or even contradicting more cautious scientific research. Dietary guidance books such as William Henry Porter's *Eating to Live Long* typified advocates' enthusiasm. Porter believed that "ninety per cent of all human ailments, apart from disorders incident to old age, or acute infections, are due to wrong combinations and foolish selection of food," and therefore argued

[50] Caroline Hedger, "Positive Health for Nurses," *The American Journal of Nursing* 23, no. 1 (October 1922): 6-7.

that "health, longevity and happiness of the race would be incalculably enhanced if we were rightly to understand and consistently to follow a regimen calculated to prevent further poisoning."[51] If Americans just maintained the ideal diet, nutritional educators promised that disease and discomfort would virtually disappear and their personal lives would exponentially improve.

The boosters had multiple reasons for such enthusiasm. Despite their lack of direct involvement in nutritional research, an unwavering faith in science fueled their thinking. Nina Simmons informed her fellow nurses in a 1923 issue of *The American Journal of Nursing* that there was "nothing any more striking in all the range of science" than nutrition's ability to cure deficiency diseases and contribute to growth and development.[52] For others, their optimism stemmed at least in part from an association with the food industry. McCollum had spent much of the 1920s decrying Americans' love of over-processed white flour, but after signing on as a nutritional consultant to General Mills in the 1930s he soon became an outspoken advocate of white bread.[53] Many home economists had similar ties with the food industry, creating tensions within the profession about how to best serve the contradictory needs of food companies and consumers.[54]

Advertisers became some of the most influential advocates as they skillfully blended scientific and pseudoscientific claims to sell their products. Grape-Nuts advertisements frequently leveraged the popular belief that vitamin B promoted childhood growth and development by singling out cereal's high concentration of "the essential vitamin-B of the

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[51] William Henry Porter, *Eating to Live Long* (Chicago: Reilly and Lee, 1920), 12-13, http://hearth.library.cornell.edu/cgi/t/text/text-idx?c=hearth;idno=4388743 (accessed February 9, 2012).

[52] Nina Simmonds, "Food Principles and a Balanced Diet," *American Journal of Nursing* 23, no. 7 (April 1923): 543.

[53] Levenstein, *Revolution at the Table*, 155.

[54] Carolyn M. Goldstein, "Part of the Package: Home Economists in the Consumer Products Industries, 1920-1940," in *Rethinking Home Economics: Women and the History of a Profession,* ed. Sarah Stage and Virginia B. Vincenti (Ithaca, NY: Cornell University Press, 1997), 272-273.

wheat."[55] Other products piggybacked on milk's well-known health benefits to establish a nutritious reputation for themselves: for example, a 1923 advertisement for Kellogg's corn flakes urged mothers to "think of the milk children use with Kellogg's corn flakes."[56] Fleischmann's yeast cakes were perhaps the most successful in using nutritional appeals. Facing declining sales as more women bought bread rather than making it at home, Fleischmann's advertising agency launched a "Yeast for Health" campaign that touted the product's many health benefits. Advertisements called the company's yeast cakes "a simple food—rich in this almost magic element" that "assure[d] new stores of health and energy, and [brought] back a vigor unknown for years" simply by eating one to three cakes of yeast per day.[57] The yeast cakes were expensive and tasted terrible, but they nonetheless became one of the most successful advertising campaigns in the 1920s.[58] These claims especially rankled scientists, who favored a more cautious approach to nutrition and believe advertisers deliberately manipulated the public. "You can sell an American almost anything if you insist that it will be good for him," scientist T. Swann Harding wrote in 1928.[59] Before he signed his contract at General Mills, McCollum warned his fellow scientists about "dishonest advertising" that made ordinary Americans skeptical of advice from more reliable sources.[60] Regardless of their questionable scientific foundations, advertisements became one of the primary sources for nutritional education for many Americans, and therefore played a powerful role in shaping the public's understanding of scientific eating.

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[55] Grape Nuts advertisement, *Good Housekeeping*, September 1923, 201.

[56] Kellogg's corn flakes advertisement, *Good Housekeeping*, August 1923, 135.

[57] Fleischmann's Yeast advertisement, *Good Housekeeping*, May 1920, 103; Fleischmann's Yeast advertisement, *Good Housekeeping*, February 1921, 147.

[58] Katherine J. Parkin, *Food is Love: Food Advertising and Gender Roles in Modern America* (Philadelphia: University of Pennsylvania Press, 2006), 161-162; Harvey Levenstein, *Fear of Food: A History of Why We Worry about What We Eat* (Chicago: University of Chicago Press, 2012), 85.

[59] T. Swann Harding, "Diet and Disease," *Scientific Monthly* 26, no. 2 (February 1928): 150.

[60] "Ideals in Food Advertising," *Science News-Letter* 15, no. 413 (March 9, 1929): 148.

Scientists and advocates may have disagreed about the future prospects of nutritional science, but those differences masked just how much both groups agreed about the fundamental nature of food. If pressed, both scientists and nutritionists likely would have agreed with Wiley's 1916 assessment of food's role in the modern world. To nutritional experts, food was above all a resource, simply another component of the natural world whose ultimate purpose was to serve human ends. Scientists and advocates alike recognized that humans could not truly separate themselves from the natural world, but that did not mean their relationship with nature could not be improved. A truly modern society considered the natural world as carefully as it did its industry, with science as its guide. Food was the perfect resource to demonstrate experts' mastery.

Both camps believed firmly in the fundamental value of the natural world to modern human life. Harvey Wiley was one of the most vocal advocates of the "natural" value of food. He believed that "Nature" designed foods to complement perfectly human needs, and he frequently attacked food manufacturers for their industrial processing methods that over-refined foods and stripped them of "what Nature has endowed us with."[61] Food advertisements also employed this method, as with one instant cereal advertisement that proclaimed, "Mother Nature filled [the cereal] full of the natural vitamins, protein, carbohydrates, and minerals that make children grow big and strong."[62] Scientists did not discover how to isolate and synthesize vitamins into pill form until the late 1930s, and so most nutritional scientists emphasized the importance of acquiring their vitamins "naturally"; one Department of Agriculture chemist declared in 1925 "vitamins should be sought in the garden, or in the market, and not in the drug

[61] Harvey W. Wiley, "Food Robbers," *Good Housekeeping*, June 1926, 98.
[62] Three Minute Cereals advertisement, *Good Housekeeping*, November 1930, 214.

store."[63] The natural world promised important benefits for modern humans that could not duplicated anywhere else.

But that did not mean modern science could not improve upon humans' relationship to their food. As Wiley had noted in 1917, such improvements were vital to cure the nutritional crisis and strengthen the "race of weaklings" that was threatening to overtake the nation.[64] Both scientists and nutritionists believed the human body was central to these efforts. They believed strongly in the perfect efficiency of the human body, which encouraged them to invest heavily in scientific research to discover the body's governing rules. Many experts characterized the body as an industrial machine in order to explain this concept to a lay audience. For example, Katharine Fisher, the director of the Good Housekeeping Institute, explained to her readers "the uses of food can be more easily understood if we consider the human body as an engine or a working machine which must be supplied with fuel."[65] Advertisements also made heavy use of the machine metaphor. An advertisement for Postum instant health drink called the heart "the most wonderful machine in the world" in 1925, and in 1930 an iceberg lettuce advertisement considered vitamins "are to other foods what the ignition spark is to the gas engine—they fire the change" towards good health.[66] Powerful, carefully constructed machines were quickly invading every aspect of life, and so industrial body metaphors became an especially persuasive technique for an audience more familiar with industrial life.

Both groups also viewed food primarily as the aggregate of microscopic nutritional elements—such as vitamins, calories, protein and minerals—than as items with an infinite range of their own unique tastes, textures, and palatability. Experts stressed especially the invisibility

[63] Quoted in "Take Your Vitamins in Food," *Scientific Monthly* 21, no. 3 (September 1925): 331-334.
[64] Wiley, "Food and Efficiency," 9.
[65] Katharine Fisher, "Guide Post to Balanced Meals," *Good Housekeeping*, January 1926, 64.
[66] Postum Instant advertisement, *Good Housekeeping*, October 1925, 109; Iceberg Head Lettuce advertisement, *Good Housekeeping*, February 1930, 298.

of these nutrients, and how hard it was even for experts to locate them. Yet these elements were far more important than any other factor in food. Edwin Slosson of the charity Science Service wrote in 1924 that "a blind man could easier find a needle in a haystack" than scientists could locate vitamins, because it was "hard to find something when you can not see it."[67] Lafayette College professor B. W. Kunkel typified this utilitarian approach when he slightly modified the popular wartime to slogan to say that it was "calories [that] would win" the Great War, rather than the food itself.[68] *Good Housekeeping* regularly included articles about how to economize household budgets by considering "real food value, in the form of calories, protein, mineral elements, and vitamins" instead of more expensive foods that the family preferred (as the next chapter will demonstrate, this approach became even more prominent during the Great Depression).[69] This perspective had important consequences for the way Americans understood their food. Though nutritionists and scientists only had the public's best interest in mind, and hoped to they could use their own expertise to help modernize the dinner table, their emphasis on tasteless, invisible components meant that Americans had no way to evaluate food on their own. They could only rely on expert advice to help them make the correct decisions about their food.

Indeed, experts actively promoted the idea that untrained Americans could not make the right decisions about what was in their food. Whether the experts were involved in research or not, they all believed that only rigorous scientific experimentation could provide accurate information about food. Ancient humans must have surely acquired "large store of knowledge regarding these properties of foods," Professor Kunkel acknowledged, but such "unscientific experiences" were unnecessary in the 1920s thanks to "the scientific discoveries which have

[67] Edwin E. Slosson, "The Progress of Science: Vitamins," *Scientific Monthly* 19, no. 3 (September 1924): 329-330.

[68] B. W. Kunkel, "Calories and Vitamines," *Scientific Monthly* 17, no. 4 (October 1923): 361.

[69] Katharine Fisher, "Counting the Cost: What Do We Pay for Real Food Value?" *Good Housekeeping*, April 1926, 74.

added to our knowledge of the true value of foods."[70] Scientists and nutritionists alike flatly dismissed the possibility that any metric besides science could adequately guide modern humans' dietary decisions. Professor Victor Levine of Creighton University believed that "one of the greatest advances in modern nutrition [lied] in a realization of the fact that instinct or appetite is not a guide to proper feeding." Taste invariably led Americans to restricted diets composed of fried foods and sweet desserts—the very diets that had caused the nation's nutritional crisis in the first place. Nor could Americans fall back on traditional wisdom passed down from earlier generations; Levine insisted that this "traditional" knowledge was "fundamentally wrong, being based upon opinion" instead of scientific fact. Levine concluded that there was only place to which Americans could turn for help:

> Instinct will not guide us; food faddists mislead us; politicians and legislators do not understand, are indifferent to questions of public health or are engaged in the profitable pastime of vamping votes for an impending election. Our channel of knowledge is the scientist of the laboratory with his rats and his guinea pigs, the public health worker, the dietitian and the progressive, open-minded clinician at the bedside.[71]

Only rigorous scientific experimentation could provide the right information about food, and only the experts could understand such results. Scientific expertise therefore carried with it the obligation to educate the public, Levine argued, because nobody else could do so.

Food experts had invited themselves to the American dinner table, and they weren't about to leave anytime soon. They had a mission to modernize the human body, and they believed they were the only ones capable of accomplishing the task. Modern society, they believed, had tampered with American food and left Americans in physical pain that ranged anywhere from mild indigestion after lunch to major deficiency disorders that left their bodies weakened and

[70] Kunkel, "Calories and Vitamins," 362.

[71] Levine, "Why We Should Be More Interested in Nutrition," *Scientific Monthly* 22, no. 1 (January 1926): 21, 19, 24 (block quotation).

emaciated. Individuals' pain concerned scientists, but they focused even more on international ramifications of American weakness. World War I convinced many scientists that America lagged far behind in the nutritional arms race, and though American soldiers had prevailed in 1918 they likely would not do so again in the next war without immediate scientific intervention. Nutrition seemed to contain the perfect solution, yet it nonetheless required scientists to approach the subject with care. Vitamins could strengthen the nation, but only after thorough research revealed the exact role they played in human metabolism.

Yet soon a more optimistic mindset eclipsed scientists' guarded assessments. Public health workers, dieticians, nurses, home economists, news columnists, and advertisers latched onto the transformative potential of nutritional science and eagerly set about applying it to a wide variety of social problems in the 1920s. Although they did not directly engage in the research, these advocates admired the modernizing power of science to rationalize the world, and especially humans' connection with nature. Advertisers used nutritional claims to sell their products, while nurses dreamed of one day creating perfect specimens of human health. Home economists promoted nutrition as the perfect way to rationalize the family budget and dieticians promised radically lengthened life spans for every American. All it took was the willingness to follow expert advice.

Scientists' and advocates' visions for nutrition differed mostly in their estimation of how much scientific eating could improve society, rather than protect it from harm, but they shared an underlying agreement about food's inherent place in society. Their vision was thoroughly modern, in that they believed in the power of science to create a rational set of rules and relationships to follow that would allow maximally efficient food consumption. Food experts joined other modernists in seeing the natural world as a resource designed for human benefit and

in their self-confidence about their ability to master such a resource. But they also departed from other modernist ideologies in their assertion that humans would always remain dependent on the natural world, no matter how much the scientific field developed. Stretching this connection to nature too far resulted in the national nutrition crises like the one that had initially spurred experts' research. Americans would always need to eat, but experts believed modern Americans could eat scientifically.

This belief created important tensions within the field of nutrition, especially with regard to the way they believed average Americans were supposed to think of their food. Nutritionists believed science would help Americans make rational, informed decisions about the food they ate, but this science depended on nutrients that were completely imperceptible in daily life. The solution to this problem, nutritionists insisted, was to empower the consumer with the knowledge they needed to evaluate their diets on their own. Experts needed to educate Americans in the gospel of nutrition.

CHAPTER 2

"Something is Happening to Our Kitchens": Nutrition in the Modern Home

In 1925, home economist Mary Collopy set out to define the perfect menu. Every cookbook writer faced the challenge of creating their own standards for evaluating quality meals, and Collopy was no exception. As a member of the home extension programs for Colorado Agricultural College and the University of Wyoming, Collopy primarily designed her meals for the rural housewives who struggled with "a lack of resourcefulness in thinking of new dishes or new ways of serving the old ones." She published booklets with recipes and cooking instructions on subjects such as milk, salads, and sandwiches, but the most valuable volume was her meal preparation guide, *Planning the Family Meal*. Proper planning and foresight were essential tools of the successful housewife, Collopy believed, and with them the housewife would never tire of cooking. She dedicated the pages of *Planning the Family Meal* to the principles of a good menu: breakfast should always include many types of food, and always include a serving of milk. Luncheon fare should be light and delicate to befit the gentle tastes of the housewife and her friends; an ideal lunch included chicken croquettes, breaded chicken patties fried until golden brown, spooned over with creamed potatoes to "provid[e] a gravy" and a simple lettuce salad with lemon juice dressing on the side. Dinner needed to be heartier to satisfy the men returning from a long day of work, and it could also be more elaborate to showcase the wife's skills. Meat played the starring role in every dinner suggestion, but Collopy advised including "one green vegetable and one starchy vegetable" to balance the meal. A roast beef dinner, for example, should include vegetables like browned potatoes and peas or carrots. Salad was another important component, and it too should be fancier; Collopy suggested "perfection salad," sweet

molded gelatin with cabbage and olives suspended inside and a tangy mayonnaise dressing on the side. A meal that followed Collopy's guidelines was guaranteed to impress and nourish the family.[1]

Eight years later, Eleanor Roosevelt also confronted the challenge of defining the perfect menu, but she came to very different conclusions. The nation was in the darkest period of the Depression, with more than fifteen million Americans unemployed and facing economic disaster.[2] While her husband brought relief to millions of out-of-work men, Eleanor focused on supporting their wives. Her 1933 book *It's Up to the Women* gave women a much-needed pep talk about how to weather the crisis best, focusing on practical advice about childcare, household budgeting, and especially meal plans. With the help of the home economics department at Cornell, Roosevelt defined a new set of rules for a good menu.[3] Gone were the salads with exotic ingredients encased in gelatin; Roosevelt's no-frills salads included little more than lettuce or cabbage leaves with an unspecified dressing. Fruit was nearly non-existent, and if one needed it at all then Roosevelt suggested purchasing only cheap options like apples or prunes. Potatoes and onions were daily staples because they were both inexpensive and flexible. Breakfast was a monotonous affair, a repetition of oatmeal, toast, and milk with the occasional addition of sugar. Collopy's cakes and cookies were replaced with simpler options such as prune pudding, whose recipe consisted of boiling prunes and thickening the water with flour into a smooth paste.

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[1] Mary Collopy, *Planning the Family Meal* (Fort Collins, CO: Colorado Agricultural College, 1925), 4-8, http://hdl.handle.net/10217/6625 (accessed January 28, 2012) (quotations); Mary Collopy, *The Meal Preparation Club* (Fort Collins, CO: Colorado Agricultural College, 1929), 13, http://hdl.handle.net/10217/6625 (accessed January 28, 2012); Mary Collopy, *Salad* (Fort Collins, CO: Colorado Agricultural College, 1925), 3, http://hdl.handle.net/10217/23136 (accessed January 28, 2012); Mary Collopy, *Sandwiches*. Fort Collins, CO: Colorado Agricultural College, 1925); http://hdl.handle.net/10217/23137 (accessed January 28, 2012); Carlotta Greer, *School and Home Cooking* (Boston: Allyn and Bacon, 1925), 281, http://hearth.library.cornell.edu/cgi/t/text/text-idx?c=hearth;idno=4170495 (accessed January 28, 2012).

[2] Eric Foner, *The Story of American Freedom* (New York: W. W. Norton & Company, 1998), 195-201.

[3] Kathleen R. Babbitt, "Legitimizing Nutrition Education: The Impact of the Great Depression," in *Rethinking Home Economics: Women and the History of a Profession*, ed. Sarah Stage and Virginia B. Vincenti (Ithaca, NY: Cornell University Press, 1997), 153-155.

Leftovers were the height of economy, so cornmeal mush on Thursday became "fried mush" on Friday. Most striking was the absence of meat: four days' menus were completely vegetarian, and the meats Roosevelt did include were inexpensive cuts like ground beef and liver. Roosevelt personally vouched for the recipes, assuring her readers they were recipes "we ourselves have used in the White House." When a family gathered over creamed spaghetti and carrots in 1933 they might have longed for Collopy's sumptuous recipes that characterized better times, but they could at least envision themselves sharing the same meal that the Roosevelts ate after a day's work of fighting the Great Depression. If even the White House could make do with less, then surely women could make their families do so as well.[4]

Roosevelt's three-bean stews and peanut butter sandwiches were a far cry from Collopy's roast beef and perfection salad, but they had more in common than they seemed. Both women believed the ultimate purpose of food was to nourish the body with the minimal expenditure of time, labor, and resources. "There is a vast difference between meals which 'fill' one and meals which nourish one," Collopy informed her readers in 1925, and Roosevelt entirely agreed.[5] Prosperity might allow for more elaborate, creative meals than the ones a housewife could provide during the Depression, but regardless of the household budget a woman always need to plan meals with "scientific" precision.[6] Every meal Collopy and Roosevelt prepared closely followed the guidelines established by nutritional scientists: Collopy advised a variety of green vegetables instead of starchy potatoes, Roosevelt promoted non-meat foods that still provided plenty of protein, and both stressed that every family member needed to consume one quart of milk per day, regardless of cost. For Collopy and Roosevelt, the true purpose of their cookbooks was to persuade Americans to eat nutritionally.

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[4] Eleanor Roosevelt, *It's Up to the Women* (New York: Frederick A. Stokes Company, 1933), 64-80.
[5] Collopy, *Planning the Family Meal*, 3.
[6] Roosevelt, *It's Up to the Women*, 64.

Beginning in the mid-1920s and continuing through the 1930s, nutrition advocates searched for ways to reform American food habits. While their love of science had convinced them of the value of nutritional science, advocates knew that educating Americans would not be as easy as simply broadcasting the latest discoveries to an already eager audience. Americans first needed to be persuaded of the importance of scientific eating before they would ever consider altering their diets, and so advocates such as Collopy and Roosevelt needed to demonstrate the relevancy of their subject. Educational campaigns in the 1920s and 1930s focused on emphasizing the ways nutritional science could solve the problems Americans faced, whether it was a matter of incorporating creativity and variety into the kitchen in the 1920s or one of economizing limited resources in the 1930s. But such appeals did not convince every American. In their attempts to sell the gospel of nutrition, advocates combined the science with their understanding of what was happening in the kitchen; their appeals to a narrow range of social values, practices, and challenges and inadvertently narrowed the discipline's appeal to one subset of Americans, middle class housewives.[7] Though the Great Depression provided boosters with the opportunity to reach a wider audience they largely maintained their earlier educational methods and further entrenched nutrition in their ideas of modern gender roles, labor, and household resource management. Advocates' actions created important changes in the ways their audience, mostly middle class women, thought about their food and questioned their ability to master the increasingly complex knowledge and practices that nutritional advocates promoted. By the end of the 1930s advocates had succeeded in converting many women to the ideology of scientific eating, but they had also introduced a number of problematic elements, including a

[7] The title of this chapter comes from Katharine Fisher, "Are You Satisfied with your Kitchen?" *Good Housekeeping*, February 1934, 80.

paradoxical obsession with the science among the people who least needed it as well as an increasing anxiety about housewives' inability to understand food.

It didn't take much thought for nutrition advocates to identify women as their primary audience. As early as 1923, nurse Lucy Gillett wrote that the problem of the malnourished child was "so closely related to household management and other family problems that it cannot be handled solely as a nutrition problem."[8] Linking nutrition to household management and family care almost inevitably ensured that nutritionists' educational efforts would target women. Women by large measure controlled what foods appeared at the dinner table, making decisions that affected the entire family, and nutritionists assumed women would naturally be interested in ways to improve on one of their primary obligations.[9] In contrast, nutritionists assumed men were largely apathetic about nutritional science. Men were rarely expected to work in the kitchen, and when they did cook it was because they enjoyed it as a hobby. Nutrition educators believed men paid little attention to the mundane matters of the kitchen such as proper measurement and limiting cost; one male writer told women to suffer their husbands' culinary adventures with a smile and wait until the next day to "build something out of the wreckage" he made of the budget.[10] Most educators believed it was unreasonable to assume that men would suddenly adopt the detailed precision required for scientific eating, especially because men seemed so devoted to unhealthy foods. While women were supposed to enjoy "delicate" foods

[8] L. H. Gillett, "Nutrition in the Public Health Programme," *American Journal of Nursing* 23, no. 6 (March 1923): 458-459.

[9] See for example Sherrie A. Inness, "Introduction," in *Cooking Lessons: The Politics of Gender and Food*, ed. Sherrie A. Inness (Lanham, MD: Rowman & Littlefield Publishers, 2001), xv; Arlene Voski Avakian and Barbara Haber, "Feminist Food Studies: A Brief History," *From Betty Crocker to Feminist Food Studies: Critical Perspectives on Women and Food,* ed. Arlene Voski Avakian and Barbara Haber (Amherst: University of Massachusetts Press, 2005), 1-28.

[10] Byron MacFayden, "When a Man Goes Culinary," *Good Housekeeping*, January 1930, 90.

like salad and cakes, men enjoyed hearty meals of "juicy steak and *French Fried Potatoes*."[11] Though men also drove the nascent gourmet movement that emphasized taste, pleasure, and elegant presentation, nutritionists believed average men enjoyed "simple, homely dishes" and paid little heed to their food.[12] If nutritionists were to change American eating habits, they would have to convince women.

Home economists had already established methods to educate women about domestic science that they utilized in service of nutritionism, but these pathways had their own limitations. By the 1920s home economists had begun establishing university programs that organized seminars and demonstrations, creating informational bulletins like Collopy's *Planning the Family Meal*, and publishing articles in popular women's magazines. Many universities had also established home extension agencies in the 1910s and 1920s to bring domestic science to rural women.[13] Advocates hoped to reach women of all classes, but their methods were problematic because they inherently favored the middle class. *Good Housekeeping*, the venue where Harvey Wiley publicized his monthly columns about food and nutrition, appealed mostly to middle and upper class women; at $3 for an annual subscription, *Good Housekeeping* was too expensive and placed Wiley's guidance out of reach for most poor women.[14] In addition, home economists failed to appreciate the priorities and perspectives of rural women: while home economists and extension agents believed women should devote all their time to careful management of household resources to stretch the family budget, many rural women wanted to continue

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[11] Wesson oil advertisement, *Good Housekeeping*, June 1933, 104; Crisco advertisement, *Good Housekeeping*, January 1932, 109, emphasis in original.

[12] Byron MacFayden, "Dishes fit for Gods—and MEN!", *Good Housekeeping,* March 1933, 81. For a more detailed discussion of gourmet dining in the early twentieth century, see David Strauss, *Setting the Table for Julia Child: Gourmet Dining in America, 1934-1961* (Baltimore: The Johns Hopkins University Press, 2011).

[13] Kathleen R. Babbit, "The Productive Farm Woman and the Extension Home Economist in New York State, 1920-1940," *Agricultural History* 67, no. 2 (Spring 1993): 83.

[14] Mary Ellen Zuckerman, *A History of Popular Women's Magazines in the United States, 1792-1995* (Westport, CT: Greenwood Press, 1998), 133-134.

producing goods for sale, such as baked goods or knitted clothing, in order to supplement the family income.[15] Home economists also believed their discipline could play an instrumental role in the "Americanization" of immigrant families, but their Anglo-Saxon cooking instructions appealed little to first-generation immigrant women.[16] Finally, many women simply did not have the time or resources to devote to the careful study of domestic science that home economists expected, limiting the effectiveness of their efforts through the 1920s.

Thus the nutritional boosters' perspective drifted towards addressing the needs of the audience that was most receptive to their efforts: middle class housewives, who seemed to be facing challenges that begged for experts' assistance. The physical and social landscape of the middle-class kitchen, what Thomas Andrews refers to as the "workscape," was in the process of changes that dramatically reframed housewives' obligations towards their food.[17] Specifically, the decline of domestic servants, an array of new technologies, new standards for childcare and marriage, and the domestic manager ideal all combined to make the kitchen workscape a fundamentally different space than it had been decades before. Home economists believed they were uniquely suited to help women adjust to these changes, and they promoted nutrition especially as a solution. In educating housewives about the practical application of nutrition, educators found themselves simplifying scientific research into a collection of rules and values

[15] Babbit, "Extension Home Economist," 83-86.

[16] Harvey Levenstein, *Revolution at the Table: The Transformation of the American Diet* (New York: Oxford University Press, 1988), 157.

[17] Andrews defines "workscapes" as physical places where human labor meets natural processes and the ever-changing negotiation between the two. As humans interact with their environments through both manual and technological labor they change both the physical landscape as well as their own frameworks for understanding it. Andrews uses the concept to explore the experiences and identities of Colorado mineworkers, but it is also a useful framework to apply to American kitchens because it focuses attention on the ways housework in cities and suburbs is still deeply connected to the natural world. Women renegotiated with the physical world every time they chopped an onion or boiled a potato, and success or failure with one recipe influenced the whole family's opinions of its ingredients. The introduction of new technology and ideologies had the potential to powerfully alter kitchen workscapes. See Thomas Andrews, *Killing for Coal: America's Deadliest Labor War* (Cambridge: Harvard University Press, 2008), 123-125.

for housewives to follow; these simplifications in turn became new pillars of the nutritionist ideology that would reshape women's work in the kitchen.

Housewives and home economists alike saw the servant problem as one of the greatest obstacles for modern housekeeping. Complaints about servants' culinary capabilities, or lack thereof, were a common refrain among middle-class women stretching as far back as the 1880s.[18] The problem became especially acute in the early twentieth century, as immigration restrictions reduced the largest source of servant workers, and domestic service came to be "considered quite unsuitable for American-born girls, even those whose foreign-born mothers were happy and successful at it."[19] Competing opportunities for these women in factories and offices forced housewives to raise their servants' wages to remain competitive, and though the Great Depression eventually increased the pool of women willing to work as servants most families could no longer afford domestic help.[20] Middle-class women increasingly took on the duties of the kitchen, including marketing, cooking, serving, and cleaning. While their mothers had primarily managed servant labor, women of the 1930s had become domestic workers themselves.

Nutrition advocates sought to relieve the confusion and uncertainty that "baffled" housewives assuming responsibility of the kitchen for the first time.[21] They advised housewives to carefully plan out every step of their work in the kitchen days or even a week ahead of time so as to avoid all mistakes and uncertainty. Preplanned menus and shopping lists frequently appeared in the pages of *Good Housekeeping* and sometimes even listed detailed procedures and

[18] Levenstein, *Revolution at the Table*, 60-61.
[19] "Household Employment," *Journal of Home Economics* 23, no. 7 (July 1931): 650.
[20] Ibid., 650; Richard Dennis, *Cities in Modernity: Representations and Productions of Metropolitan Space, 1840-1930* (Cambridge: Cambridge University Press, 2008), 216-217; Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1983), 174-178.
[21] Helen E. Ridley, "That One Square Meal," *Good Housekeeping*, January 1926, 67.

time schedules to that accounted for housewives' actions down to the minute.[22] These planning guides appeared alongside articles about the virtues of a well-balanced diet, which columnists advised were only possible if housewives had "a plan which can be easily followed" for every meal.[23] These guidelines aimed to make this task easier by providing housewives with a handful of rules to follow every day: one pint of milk, "two generous servings of non-starchy vegetables," one serving of fresh fruit, one moderate serving of meat or "meat substitute" such as cheese, and "one egg a day in addition to this." If an uncertain housewife properly followed the science of nutrition, educators guaranteed that meal planning would be an easily solved puzzle instead of an impenetrable mystery.[24]

An ever-increasing number of new appliances and other technologies also changed the kitchen workscape and created another opportunity for advocates to demonstrate the relevance of their subject. Eighty-five percent of nonfarm houses had electricity by the end of the 1920s, paving the way for the variety of "electric servants" that entered the kitchen.[25] Every new appliance promised to significantly improve housewives' lives by saving time and labor. Gas and electric ranges created some of greatest changes, making the kitchen a significantly more pleasant environment. Laramie, Wyoming, housewife Arial Stevens remembered that before electric stoves, her family and friends used kerosene stoves that "smelled dreadfully. But, at least they were not so hot as the coal or wood stoves" that made the kitchen almost unbearable in summer.[26] Clean-burning gas stoves were easier to turn on and off, and the introduction of

[22] Ibid., 134.
[23] Katharine A. Fisher, "Guidepost to Balanced Meals," *Good Housekeeping*, January 1926, 132.
[24] Ibid., 64.
[25] Susan Strasser, *Never Done: A History of American Housework* (New York: Pantheon Books, 1982), 81.
[26] Arial Stevens, interview by Julia Edwards, in Dianna Cosner, ed., *Wyoming Homemakers Treasured Memories* (Cheyenne: Wyoming Extension Homemakers Council, Inc., 1990), 86.

regulators enabled more minute and consistent temperature controls.[27] Women gained greater control over the cooking process itself, allowing them to raise their standards in baking and cooking. Greater control and higher standards also reinforced the need for precision. *Good Housekeeping*, for example, rigorously promoted cooking thermometers and ranges with heat regulators so customers could achieve "uniform results" every time they cooked.[28]

Other appliances had similarly large effects on kitchen labor and food. Mechanical refrigerators automatically controlled temperature to provide a more uniform climate for food storage and prevent spoilage.[29] Housewives could chill foods faster and with greater accuracy, increasing the popularity of molded gelatin desserts and salads. Mechanical refrigerators were not without their drawbacks, as the motors were loud and relied on toxic chemicals that occasionally leaked and killed families, but manufacturers had resolved the largest problems by the late 1920s.[30] Housewives also found single-use appliances appealing. Devotees of the electric mixer bragged about "how easy it [was] to get perfect results" every time and with far less effort, since "the actual mixing… [was] much less tiring" than when done by hand.[31] Electric fruit juicers were another option that performed a common task more "quickly and efficiently" than a housewife could do by hand. Toasters that grilled a sandwich in thirty seconds were useful "when unexpected guests drop[ped] in, or time is limited."[32]

Home economists emphasized the importance of using these new appliances correctly to maximize the nutritional content of every meal. One *Good Housekeeping* article asked readers in

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[27] Merritt Ierley, *The Comforts of Home: The American House and the Evolution of Modern Convenience* (New York: Three Rivers Press, 1998), 244-245.

[28] Sophia Struthers, "And I Learned about Cooking from Her!", *Good Housekeeping*, April 1933, 162. See also Christopher Brooks, "Throw Away your Crystal Ball," *Good Housekeeping*, April 1940, 17.

[29] "Good Refrigeration," *Good Housekeeping*, July 1926, 97.

[30] Arthur J. Donniez, "Getting Good Refrigeration," *Good Housekeeping*, June 1929, 95; "Cay Ice-Box Gas Killed Family of Three," *The New York Times*, July 17, 1929.

[31] Sophia Struthers, "What is 'Best'?" *Good Housekeeping*, May 1933, 98; "Cake Making Made Easy," *Good Housekeeping*, April 1928, 93.

[32] "Kitchen Gadgets," *Good Housekeeping*, August 1934, 88-89.

1925 if they were "losing the valuable minerals in… vegetables through careless cooking?"[33] Another article published by *Good Housekeeping*'s Institute a year later investigated "special devices which will help the housekeeper reduce… waste and give us foods with all their minerals retained" and focused especially on the waterless cooker, a pot with a tightly fitted lid and a stout metal base, occasionally filled with a layer of asbestos for extra protection, that cooked vegetables with very little moisture.[34] New technology might save time for housewives, but nutrition advocates insisted women needed expert guidance in order to use new appliances properly.

Good Housekeeping's monthly Question Box demonstrated that columnists were largely successful in persuading housewives that they needed expert advice about their food. Readers submitted questions about everything from chemical cleaning supplies to child growth and development to the magazine's in-house expert; Harvey Wiley answered questions until his death in 1930, after which Walter Eddy, nutrition professor at Columbia University's Teacher College, assumed the role. Nutritional queries became increasingly popular through the 1920s. One housewife from Ohio asked if cooking tomatoes in aluminum utensils destroyed the minerals, while another worried that pressure cookers destroyed the vitamins in her vegetables. In Massachusetts, a woman wished to use her electric juicer to squeeze enough "orange juice at one time to last for two or three days," but Wiley counseled against it as vitamin C deteriorated rapidly once exposed to air. Eddy faced a similar deluge of questions about the ways technology and food interacted when he took over the Question Box. One reader worried that storing tomato juice in the refrigerator would destroy the vitamin content, another about the effects of pressure cookers on vegetables and meats, and a third asked if "it is unhealthful to use for cooking

[33] Vivian Teeter, "Full Value from Vegetables," *Good Housekeeping*, September 1925, 81.
[34] Harriette Jones, "Waterless Cooking," *Good Housekeeping*, May 1926, 84.

purposes—coffee making, etc.—the water from the hot water faucet."[35] The largely middle class readers of *Good Housekeeping* believed nutrition provided the guide they needed to successfully integrate new tools into the kitchen workscape.

Experts also used new social roles for middle class women as a way to promote scientific eating. During the 1920s the kitchen became a place for women to express their commitment to new ideas about family life and their responsibilities as wives and mothers. Women had long used their cooking as a way to "impress" their husbands, but nutritional educators in the 1920s impressed the need for women to feed their families "nutritionally" as well.[36] Because men were so uninterested in their own eating habits, educators warned women to keep a close watch over their husbands' diets. Advertisements especially emphasized a woman's responsibility for her husband's nutrition.[37] A 1923 advertisement for prunes advised women that their husbands' health "means *everything* to you. It is the very foundation of your home, your happiness, your security."[38] An advertisement for Grape Nuts in 1926 promised that "many a wife has helped her husband to success and fame by giving him the right kind of breakfast" that provided a man with all the nutrients he needed to perform well at work.[39] The consequences for failure were steep. A

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[35] Harvey W. Wiley, "Dr. Wiley's Question Box," *Good Housekeeping*, February 1929, 106; Harvey W. Wiley, "Dr. Wiley's Question Box," *Good Housekeeping*, September 1923, 90; Harvey W. Wiley, "Dr. Wiley's Question Box," *Good* Housekeeping, July 1929, 114; Harvey W. Wiley, "Dr. Wiley's Question Box," *Good Housekeeping*, March 1930, 102 (quotation); Harvey W. Wiley, "Dr. Wiley's Question Box," *Good Housekeeping*, November 1928, 108; Walter H. Eddy, "Dr. Eddy's Question Box," *Good Housekeeping*, March 1934, 96; Walter H. Eddy, "Dr. Eddy's Question Box," *Good Housekeeping*, June 1933, 96; Walter H. Eddy, "Dr. Eddy's Question Box," *Good Housekeeping*, May 1934, 94 (quotation).

[36] Florence Gilberta Barnhill Pexton, interview by Betty Shelden, in Cosner, *Wyoming Homemakers Treasured Memories*, 58; Harriet McIntyre Kobel, interview by Theresa Duncan, in Cosner, *Wyoming Homemakers Treasured Memories*, 230.

[37] Advertising had an influential role in shaping ideal gender norms, but Katherine J. Parkin argues that food advertising was especially central to this process because it was so essential to daily life and food claimed the largest portion of the advertisement market in the early twentieth century. One of the most popular advertising techniques was to encourage women "to identify with the role of homemaker" and see mass-produced food items as a way to help fulfill this gender role. See Parkin, *Food is Love: Food Advertising and Gender Roles in Modern America* (Philadelphia: University of Pennsylvania Press, 2006), 2, 5-6 (quotation).

[38] Sunsweet Prunes advertisement, *Good Housekeeping*, November 1923, 102. Emphasis in original.

[39] Grape Nuts advertisement, *Good Housekeeping*, September 1926, 7.

mid-1920s cookbook detailed the inevitable consequences of a poor breakfast: "Breakfast late—half cooked. Coffee cold. … Missed the train. Late for business. Headache. Lost the contract. Didn't get the raise. … Breakfast—Incompatibility—Divorce!"[40]

Nutrition played an even greater role in new theories of proper childcare. While old models of childhood development believed children would grow into responsible adults as long as their mothers provided a positive role model, newer theories presented the child as "an active entity with special needs requiring special nurture."[41] The concept of "scientific motherhood" that emerged in the 1920s among childcare experts further reinforced the idea that mothers needed to provide their children with exactly the right opportunities and experiences to guarantee ideal growth and development.[42] Food became a tool for mothers ensure their children gained every advantage and grew into strong adults. One *Good Housekeeping* article suggested ways to use nutrition to influence children's height, for example, while another warned that a child's future wellbeing depended almost entirely on the foods they ate before reaching six years of age.[43] Advertising again strongly influenced the connection between nutrition and scientific mothering.[44] "There isn't an intelligent mother in the world who doesn't know that success and happiness depend, in large measure, upon good health," a Grape Nuts advertisement informed *Good Housekeeping* readers in 1923.[45] Sunkist advertisements provided women with "well-known scientific reasons—proved facts" why oranges were an important food for babies,

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[40] Ida Cogswell Bailey Allen, *Mrs. Allen on Cooking, Menus, Service: 2500 Recipes* (Garden City, NY: Doubleday, Page and Company, 1924), 622, http://hearth.library.cornell.edu/cgi/t/text/text-idx?c=hearth;idno=4388595 (accessed February 22, 2012).

[41] Steven Mintz and Susan Kellogg, *Domestic Revolutions: A Social History of American Family Life* (New York: Free Press, 1988), 121.

[42] Molly Ladd-Taylor, *Mother-Work: Women, Child Welfare, and the State, 1890-1930* (Urbana: University of Illinois Press, 1994), 6-7.

[43] Josephine Kenyon, "Can You Influence the Height of Your Child?", *Good Housekeeping*, February 1934, 112; Demetria Taylor, "Meals for the Children," *Good Housekeeping*, March 1931, 88.

[44] Parkin, *Food is Love*, 193-197.

[45] Grape Nuts advertisement, *Good Housekeeping*, September 1923, 201.

necessary to stimulate appetite and protect against scurvy.[46] Mothers who did not ensure the family's good nutrition would soon see their children grow "dull and lazy" and "slow" in school, educators warned.[47] Advertisers, home economists, and medical professionals told women that food was a powerful tool to ensure a good future for their children, but only if mothers could properly utilize it. To do so, they needed to carefully follow the prescriptions of the experts.

Efficient management of household labor and resources rested at the core of home economists' vision for homemakers, and their nutrition education programs often rested on this ideal. Indeed, the very purpose of home economics was to rationalize and professionalize all forms of domestic labor that in ways that were "parallel" to advancements in the male business world.[48] Meal preparation was the largest time-consuming activity for housewives, with the exception of childcare, generally requiring from 15 to 18 hours of labor per week.[49] The kitchen therefore became the primary site for home economists' efficiency crusades. They sought to standardize everything from kitchen layouts to countertop height to measuring cups in order to save time and ingredients.[50] Home economists singled out standardized measurements as "one of the secrets of success in cooking," the only way to truly remove "luck" from the process.[51] By 1930 *Good Housekeeping* had developed a "code of specification" for measuring cups, though cookbooks regularly contained exhortations about standardized measurements through the postwar era.[52]

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[46] Sunkist oranges advertisement, *Good Housekeeping*, May 1928, 288.

[47] Cream of Wheat advertisement, *Good Housekeeping*, November 1923, 192.

[48] Laura Shapiro, *Perfection Salad: Women and Cooking at the Turn of the Century* (1986; repr., Berkeley: University of California Press, 2009), 43; Aaron Bobrow-Strain, *White Bread: A Social History of the Store-Bought Loaf* (Boston: Beacon Press, 2012), 33.

[49] Maud Wilson, "Time Spent in Meal Preparation in Private Households," *Journal of Home Economics* 24, no. 1 (January 1932): 12-13.

[50] "When Every Kitchen is a Model," *Good Housekeeping*, March 1920, 36.

[51] "*Home Comfort" Cook Book* (St. Louis: Wrought Iron Range Company, [1924?]), 26, 31.

[52] Helen Whitson Kendall, "Approved Measuring Cups," *Good Housekeeping*, September 1930, 94.

The science of eating merged easily with the science of cooking. Vitamins became yet another variable that needed to be monitored and maximized to produce an efficient kitchen workscape. Home economists urged modern home managers to plan their meals a week ahead of time, rather than the day of cooking, in order to ensure proper nutrition and to lower costs.[53] They believed nutritionism was closely interwoven with other elements of household management, though interestingly educators rarely used budgetary appeals during the 1920s. One nutritionist wrote in 1923 that proper education about nutrition could cure both physical illness and debt, but they were more concerned that middle class households were ignoring important protective foods in favor of highly processed products that contained little nutritive value.[54] Modern women were the ones who recognized the kitchen's great potential for improving health, nutritionists urged; they were not necessarily the ones who maximized nutritional value for the lowest cost.

The Great Depression put an end to that opinion. Within months of the stock market crash the national income had dropped precipitously and unemployment rates skyrocketed. Members of the upper class saw their wealth disappear overnight, and thousands of farm families lost their homes to bank foreclosures. Average annual income in eight Eastern cities before the Depression had been $1,830, with almost 40 percent of families earning from $1,200 to $2,000 annually; at the lowest point in the Depression the average household income in these cities had dropped to only $1,050, and more than 66 percent of households earned less than $1,200 in 1932.[55] Families in the lowest and lower-middle classes suffered the greatest reductions in household income: a family whose income totaled $500 in 1929 earned only $200 in 1933, and a

[53] Elizabeth D. Paine, "Dinners Planned Early and Cooked Late," *Good Housekeeping*, March 1931, 86.
[54] Gillett, "Nutrition in the Public Health Programme," 458-459; Levenstein, *Revolution at the Table*, 157.
[55] Maurice Leven, *The Income Structure of the United States* (Washington, D.C.: The Brookings Institution, 1938), 166.

family who earned $1,500 before the crash earned only $935 in 1933. Middle class households with larger incomes did not suffer as dramatically, but they still watched nearly thirty percent of their annual income evaporate between 1929 and 1933.[56]

This information greatly distressed nutrition advocates. Early reports by the Children's Bureau suggested "perhaps one-fifth of all pre-school and school children in the country are below par in health" and undernourished.[57] Although the studies tracking American malnutrition were often flawed, based on what diet researchers believed a family could afford at certain income levels rather than on actual food consumption rates, experts and policymakers believed they revealed a serious national emergency.[58] Home economists believed they were uniquely qualified to help Americans combat the nutritional dangers of the Depression. "The extent of undernutrition among American school children and the apparent general indifference to this condition touches not only the personal sympathy but also the professional responsibility of the home economics teacher," Linda Roberts, chair of the University of Chicago home economics department, wrote in 1932.[59] Secretary of Agriculture Arthur Hyde agreed, assuring home economists that "not since the days of the World War has the practical application of home economics research been so forcefully demonstrated."[60]

Budgets became the primary weapon of educators' crusade and yet another method to convince Americans of nutrition's practicality. Home economists published a burst of articles in

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[56] Ibid., 128.

[57] Frances Perkins, "For Child Health: A National Call," *New York Times*, October 1, 1933; Josephine H. Kenyon and Demetria Taylor, "Budget Your Youngsters' Health," *Good Housekeeping*, October 1932, 82.

[58] Harvey Levenstein has examined several types of studies about malnutrition and the Depression and argues that they contain important methodological flaws that call the validity of their findings into question. Levenstein also argues that middle-class American health continued to improve over the course of the Depression. See Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America (New York: Oxford University Press, 1993),* 56-60.

[59] Linda J. Roberts, "Nutrition Needs of the School Child and the Responsibility of the Home Economics Teacher," *Journal of Home Economics* 24, no. 11 (November 1932): 961.

[60] Arthur M. Hyde, "The Producer Considers Consumption," *Journal of Home Economics* 25, no. 3 (February 1933): 95.

early 1930s newspapers and magazines advising housewives about how to stretch every penny. They imagined women were tempted to buy the cheapest goods available, bypassing more expensive yet healthier foods and inadvertently starving their family in the process. Walter Eddy outlined the dangers of such an approach. One medium banana may have supplied an individual with roughly as many calories as one large orange for far less money, but the woman who only fed her family bananas deprived them of vitamin C and calcium. Eddy called upon his readers to "get your pencil and paper" to do the arithmetic and discover that oranges were "actually the cheapest vitamin C producer [he] could buy," despite their higher absolute cost.[61] Eddy hoped women would learn how to perform these budget-saving evaluations themselves, but they acknowledged that "the average family provider has neither time nor opportunity for such study" of nutrition.[62] Luckily, plenty of other nutrition advocates offered guides. In the early years of the Depression newspapers frequently presented dietician-approved menus for a variety of low budgets: one offered tips about how to feed a family of four for $10.42 a week, another promised meat four times a week to families for only $8, and the mayor of Syracuse, New York, ate for a week in April 1932 on only nine cents a day.[63]

The Depression also created opportunities for home economists to bring the nutritionist ideology to poor and rural homes. While nutrition boosters had converted middle class women in the 1920s with values-based appeals and well-reasoned demonstrations of how nutrition could help them master their new responsibilities in the kitchen, these methods had not worked with rural and lower class women. Economic considerations appealed more strongly to the wives of

[61] Walter H. Eddy, "What Price Breakfast Fruits?" *Good Housekeeping*, January 1932, 98, 178.
[62] Walter H. Eddy, "Cutting Food Costs," *Good Housekeeping*, November 1931, 96.
[63] "$10.42 a Week Feeds Four Adults in Test; 3 Gain on Menus Made for Standard Family," *New York Times*, December 11, 1930; "$8 a Week for Food Found Enough for 5," *New York Times,* May 4, 1935; "Syracuse Mayor Eats 9-Cents-a-Day Meals," *New York Times*, April 21, 1932. See also Alice B. Foote, "Home Management House Meals at Seventeen Cents a Day," *Journal of Home Economics* 25, no. 6 (June-July 1933): 479.

farmers and unskilled workers.[64] The Great Depression only strengthened their concern; educators' tightly budgeted menus therefore became an important bridge to help them connect to a new audience. Home extension agents also coordinated with state and local relief organizations to help families maximize meager public assistance and promoted their educational programs in gardening and canning to bridge whatever dietary gap remained. In New York, for example, nutritionists created public canning kitchens and led demonstrations to guide women through the process.[65] Canning demonstrations played a similar role in home extension programs across the nation; one housewife remembered that canning was "one of the main things [she] learned how to do" after joining the Wyoming Extension Homemakers Club in 1931, and another housewife learned how to use a pressure cooker through an Indiana extension class during the Depression.[66]

These programs softened rural women's resistance to home economics and legitimized home economists as the leading experts in practical nutrition, though advocates had not accomplished their goal yet. Home economists believed the working classes appreciated their help with budgeting for true food value, but historian Harvey Levenstein notes that "by no means did the working classes wholly adopt the new middle class food habits." Many working families refused to fully embrace the ideals of nutritionism, most importantly the ideal of wife as full-time homemaker. Experts themselves also largely ignored the poorest groups of Americans who were most in need of nutritional aid, such as Southern sharecroppers and black single mothers living in the ghettoes of northern cities. Because advocates believed the true barrier was a lack of

[64] Levenstein, *Revolution at the Table,* 174-175.
[65] Babbitt, "Legitimizing Nutrition Education,"160-161.
[66] Thelma Outland, interview by Marian Eulberg, in Cosner, *Wyoming Homemakers*, 142 (quotation); Virgie Bowers, interview by Julia Binkley, in Eleanor Arnold, ed., *Feeding Our Families* ([West Lafayette, IL?]: Indiana Extension Homemakers Association, 1985), 37.

education, rather than the inability to actually purchase healthy food, they were blind to the struggles of many Americans who still lived in need of nutritional assistance.[67]

Nutrition advocates also faced the problem of men. Though they had focused their educational efforts almost exclusively on reforming women's understanding of food, advocates did not believe they had completely abandoned men as a potential audience. Some home economists tried to use the Depression as a tool to capture men's interest, believing that hard times would spur more interest in household budgets and, by extension, nutrition. They created a number of classes for public schools that were specifically targeted at boys, stressing the importance of "nutrition fundamentals" as something every man needed to know.[68] But educators' efforts were mostly unsuccessful. The boys who took these classes saw cooking as a skill they might only need in an emergency; one Pennsylvania student wrote that his home economics class had taught him "how to get breakfast if [he] ha[d] to."[69] Even as they agreed on the necessity of reaching out to men, however, home economists still maintained that nutrition was primarily women's work. Home economics for men remained a largely "undeveloped" area through the 1930s.[70]

By the 1930s, nutritionism's boosters had succeeded in introducing their ideology into a large number of American homes. Most middle class housewives, and an increasing number of lower class housewives, believed nutrition played an important role in the successful modern home. Though women were still largely confused about the actual scientific details of nutrition

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[67] Babbitt, "Legitimizing Nutrition Education," 162; Levenstein, *Revolution at the Table*, 176; Levenstein, *Paradox of Plenty*, 60-61.

[68] See for example, Olive Jane McClure, "Home Economics Classes for boys in the Denver Public Schools," *Journal of Home Economics* 23, no. 12 (December 1931): 1120-1122; Anna Green, "Home Economics for Boys," *Journal of Home Economics* 25, no. 9 (November 1933): 775; Zita Friedl Orednick, "Teaching Home Economics to Eighth-Grade Boys," *Journal of Home Economics* 26, no. 3 (March 1934): 157-159.

[69] Green, "Home Economics for Boys," 775.

[70] Elizabeth Lybarger and Alice Donnelly Pressey, "Home Economics: 1914 and 1935," *Journal of Home Economics* 28, no. 1 (January 1936): 3.

and had trouble differentiating the real effects of a nutrient from advertisers' wildly exaggerated health claims, they were quickly becoming accustomed to choosing food on the basis of its nutrients rather than any other metric. This caused significant changes in the ways experts expected women to relate to their food.

Chief among them was the additional work that women needed to undertake to fully understand the discipline. Educators warned women that the field was always progressing, and no matter how much experience they had, there was always more to learn. Some nutrition advocates acknowledged this was a herculean task, one "only a person trained in the science of nutrition can tackle… with success."[71] But the difficulty made a woman's need to master nutritional science no less pressing, as failure to do so reflected poorly on her abilities as a wife and mother. Home economists imagined this caused middle class women much anxiety, especially among new brides. Balancing nutrition, budgets, and personal tastes to create three meals a day that her family wouldn't tire of seemed overwhelming to some, the experts believed, but this problem could be easily solved with their assistance.[72]

Indeed, expert advice was the only place a modern woman ought to turn. She could not trust her instincts, as educators had long insisted that personal tastes and cravings were extremely poor guides of proper nutrition.[73] Nor could she trust traditional sources for guidance; experts warned that previous generations had little experience with modern kitchen management and were therefore a poor source of information for new wives and mothers. Mothers and grandmothers who relied on "rule-of-thumb cookery" could no longer provide "the help which

[71] Eddy, "Cutting Food Costs," 95.

[72] Ridley, "That One Square Meal," 67; Dorothy B. Marsh, "The Bride's First Days in the Kitchen," *Good Housekeeping*, June 1934, 80.

[73] See, for example, C. Hilton Rice, "Some Feeding Problems of Childhood," *Scientific Monthly* 20, no. 4 (April 1925): 379; Victor E. Levine, "Why We Should Be More Interested in Nutrition," *Scientific Monthly* 22, no. 1 (January 1926): 20-21; and Josephine H. Kenyon, "Diet for the Mother-to-Be," *Good Housekeeping*, February 1933, 90.

daughter need[ed] most" by providing her with practical experience in the kitchen.[74] These older generations were beset with superstitions and folk wisdoms that could easily lead the modern woman astray. It was better to trust the experts for advice about proper cooking times, recipes, and nutritional guidelines rather than rely on legends, such as the one about how mixing milk and fish caused toxic food poisoning.[75]

Expert opinion was central to another element of nutritionism: the reliance on scientific experimentation to "prove" objective information about food. Nutrition advocates held scientific knowledge in high esteem, and they sought to implant the same reverence in their audience. Educators automatically dismissed any folk wisdom that could not be scientifically tested in the laboratory and often mocked such wisdom as "out of fashion" and "entirely unnecessary."[76] Educators insisted "practice and skill alone do not today justify approval of a food source… it is the aim of modern nutrition to substitute reason for emotion in the selection of diets and one can not build reasoned judgments without facts."[77] Only experiments could provide such facts, and many advertisements and columns reinforced this belief. References to "new dietetic research" were common in many advertisements, while others commissioned their own experiments.[78] A 1930 advertisement, for example, noted that "a series of tests by unprejudiced authorities" had determined that Heinz rice flakes improved children's health.[79] Nutritionism's preference for scientific experimentation placed food expertise out of most ordinary housewives' reach. In a column about the wide variation of vitamin C in otherwise equal cans of orange juice, for

[74] Dorothy B. Marsh, "In the Cookery of 1933 Science Plays a Practical Part," *Good Housekeeping*, January 1933, 79-80.

[75] J. H. Frandsen, "Some Milk Superstitions," *Journal of Home Economics* 29, no. 4 (Apr 1937): 242.

[76] Walter H. Eddy, "Blood Purifiers Are Out of Fashion," *Good Housekeeping*, March 1934, 93; Harvey W. Wiley, "Dr. Wiley's Question-Box," *Good Housekeeping*, July 1930, 120.

[77] Walter H. Eddy, "Dr. Walter H. Eddy Recommends Sandwiches for Palatability, Economy, and Health," *Good Housekeeping*, August 1932, 99.

[78] Canned pineapple advertisement, *Good Housekeeping*, January 1934, 9.

[79] Heinz rice flakes advertisement, *Good Housekeeping*, July 1930, 176.

example, Eddy described simple laboratory experiments that would determine which product was more valuable. Yet he demurred on telling housewives how to perform the experiments themselves, telling them "you have not the time to learn the technique; you would have little opportunity or time to use it if you had it."[80] The average housewife, trained neither in chemistry nor home economics, could only wait for expert opinion before knowing how to best feed her family.

These new expectations opened up a gulf between young modern housewives and their mothers and grandmothers. Younger cooks sometimes had trouble deciphering their mothers' recipes because "there were no accurate measures at all." Sarah Amstutz, an Indiana housewife, remembered her grandmother's instructions to make piecrust consisted of, "you use three handsful of flour and one handful of lard and a pinch of salt, and water to make a thick dough, with no other measurement than that."[81] Michigan housewife Carolyn Steele had a similarly difficult time learning how to cook from her mother in large measure because there were no recipes with which to practice.[82] Housewives also increasingly turned to experts, rather than their families, to learn how to cook. Indiana housewife Camille Hey learned how to make bread in a home extension course on nutrition; before the class her attempts at homemade bread were disastrous, resulting in dense, thick dough that she threw out and "two hogs got ahold of that dough and went clear around the barn with it [but] it didn't pull apart."[83] Gilberta Pexton credited her participation in the Wyoming Home Extension Program with teaching her how to cook, and she marked that skill as one of her "biggest satisfactions" as a homemaker.[84] In many

[80] Walter H. Eddy, "Vitamins and Red Ink," *Good Housekeeping*, October 1936, 91.
[81] Sarah Amstutz, interview by Ruth Overmyer, in Arnold, *Feeding Our Families*, 90.
[82] Carolyn Steele, interview by author, Auburn Hills, MI, March 23, 2012.
[83] Camille Hey, interview by Eleanor Arnold, in Arnold, *Feeding Our Families*, 88; Florence Gilberta Barnhill Pexton, interview by Betty Shelden, in Cosner, *Wyoming Homemakers*, 51.
[84] Florence Gilberta Barnhill Pexton, interview by Betty Shelden, in Cosner, *Wyoming Homemakers*, 51.

households practical cooking wisdom, gained through years of experience, gave way to precise, scientific knowledge about the nature of food.

Nutrition educators' emphasis on budgets during the Depression also added a new set of expectations for the ways women were to view their food, an increasingly reductionist view that focused only on an item's invisible nutritional properties. The human body metabolized "with equal efficiency codfish or caviar; Hamburg steak or filet mignon; turnip greens or broccoli," so there was no reason not to purchase the cheapest foods available as long as they were of equal nutritional value.[85] Eddy suggested four guidelines for shopping with these methods:

> (1.) Buy calories… A pound of protein such as found in meats, milk, and eggs in abundance yields no more and no less energy than does a pound of starch or sugar… (2.) For keeping your working parts in repair, buy protein… (3.) You will need certain minerals to replace the daily wastage… (4.) Buy vitamins… Since milk, fruits, and vegetables are good sources of these factors, there is no better rule than to devote a fair proportion of your expenditures to these "protective foods."[86]

Americans' expensive food tastes were fine during prosperous times but the family that stubbornly stuck to those tastes during the Depression risked both budget and body. The nutritionist ideology, which ignored matters of taste and held that all foods could be equally compared, was well suited to the Depression's extremely limited budgets. Housewives and home economists who honed their budgeting skills during the Great Depression would soon need to call upon these same skills in service of the nation during World War II.

The nutritionist ideology played a complex role in the 1920s and 1930s. Home economists used it as a tool to convince American women of the importance of domestic science and the modernizing benefits it could provide. In their 1920s educational campaigns, home economists steeped the nutritionist ideology with middle class values and experiences, arguing

[85] Edda Morgan, "Nutrition for the Family, within the Budget," *New York Times*, September 12, 1937.
[86] Eddy, "Cutting Food Costs," *Good Housekeeping*, 94-95.

that the nutritionist's precision could make women better cooks, wives, and mothers. In many ways, these new social roles positioned women as the food experts within their own homes because their status as good wives and mothers depended on a firm command of the latest research and methods to implement it at home. Husbands had no interest in nutritional science, and children were too young to understand it at the ages when they needed its benefits the most. Yet the nutritionist ideology also stripped middle-class women of their ability to become experts in this information, as proper household management emphasized the power of science to objectively determine the "best" foods through experimentation. The kitchen workscape reflected many of these changes, as women implemented the scientific tips they learned in school and at university extension programs instead of the "rule-of-thumb" cookery of their mothers and grandmothers. When women picked up an orange they did so not only because it was a favorite food but also because the fruit was one of the greatest sources of vitamin C available. Many middle-class women were therefore primed to view food in the way Eleanor Roosevelt suggested in *It's Up to the Women*, as abstract elements of the family budget that, with the help of science, could be manipulated to ensure maximal efficiency.

Educators attempted to broaden the appeal of their subject during the 1930s, but did not truly succeed at converting all Americans to scientific eating. Their budgeting crusades won them the interest of many women whose family incomes had suddenly plummeted during the Depression and helped home economists gain entry into traditionally resistant rural households. But many of their methods and values retained their gendered middle-class roots, and men and lower-class women remained skeptical or completely apathetic. Nutrition experts themselves were often blinded to the needs of the very poor, and therefore missed opportunities where their expertise would have the most benefit. To a large extent, nutritionists' focus remained on the

group of Americans that were most accessible to them, middle class women, but who were also paradoxically among the people least in need of their help.

Middle class women remained advocates' greatest allies in the first decades after the discovery of vitamins. For them, the greatest challenge of the Great Depression was maintaining the advances in health they had gained during the 1920s. Eleanor Roosevelt's menus were not as exciting as the ones Mary Collopy created in 1925, but they did provide proof that good nutrition was still attainable if a woman was determined enough. Austere menus disappeared as the economy recovered, but nutritionism had become a powerful force in their kitchens and was not about to disappear. It promised to become even more influential as the nation prepared for war.

CHAPTER 3

"Soldiers in Aprons": Nutrition in World War II

The pages of *Good Housekeeping*'s Research Institute opened with a surprising focus in June 1943. The Institute normally restricted its focus to the business of homemaking, but this issue began with a different topic. "If we have a golden fleece in this realistic day and age, it goes by an unromantic term," Margaret Cousins wrote. The hope for "Security" lay on everyone's minds, as the fear and insecurity of war seemed to place it far out of reach. But Cousins argued that as "intangible as security [was], it [was] rooted in tangible things." A clean house with plump sofa cushions, a turned-down bed waiting at night, a mother waiting for her children's return from school; each one was a sign that all was well and safe at home.[1] The Institute's articles in the June issue provided tips to help the homemaker achieve these tangible markers of security and make her home a refuge from war. One article contained advice about how to fill victory gardens with the leafy vegetables, tomatoes, and salad greens to replace the vitamins made scarce by rationing.[2] Another article suggested a week's worth of menus to cook the vegetables. Monday's dinner menu included poached eggs on toasted cheese buns, cabbage curry, lemon-buttered carrots, radishes, and peanut butter bread pudding for dessert, creating a meal that used no ration points and substituted vitaminized margarine in place of butter.[3] The nation might be deep in war, but *Good Housekeeping* assured women they did not have to live in

[1] Margaret Cousins, "The Shape of Security," *Good Housekeeping*, June 1943, 81.
[2] Jane Giesler, "These Vegetables Now," *Good Housekeeping*, June 1943, 87.
[3] Katharine Fisher, "Rationing Won't Get You Down," *Good Housekeeping*, June 1943, 90.

fear. Security was "a gift that can be given, more indestructible than walls and fortresses—lasting as love. And it is particularly the province of women to give it."[4]

Food's ability to create security transformed it into a "tool of war" during World War II and created opportunities for the greatest advancements yet in nutritionism.[5] Boosters sought ways to link their methods to the needs of a wartime state, amplifying the significance of their subject and broadcasting their message to a larger audience. The National Research Council, established to help experts assist the government in its preparedness campaigns during World War I, created the first government-approved recommended daily allowances for essential nutrients in anticipation of war, and the perceived need for Americans to rapidly improve their diets led to the mandated enrichment of white bread and flour with B-complex vitamins such as thiamine and niacin. These advancements in nutrition paralleled other wartime innovations that "expanded the scale on which people controlled nature," according to Edmund Russell in his study of chemical warfare and pest control.[6] The efforts to improve American nutrition further extend historians' understanding of how war increased human control over nature by creating the opportunity to examine how authorities established control over the internal nature of the human body. Experts' success in developing recommended daily allowances and popularizing enriched foods enhanced their own prestige and authority and finally entrenched nutritionism in the minds of the general public and policymakers. Though mandated enrichment ended after the war, vitamin-fortified foods continued to be exceedingly popular through the Cold War and even into today, while recommended daily allowances fundamentally changed the mechanism by which

[4] Cousins, "The Shape of Security," 81.
[5] "'Folly' to Neglect Diet, M'Nutt Warns," *New York Times*, May 20, 1942.
[6] Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to "Silent Spring"* (Cambridge: Cambridge University Press, 2001), 2.

Americans evaluated both their own eating habits and the postwar standard for international food aid.[7]

Government support for nutrition created several immediate changes to American food habits during World War II. Even though no major deficiencies plagued the middle-class diet at the outset of war, nutritionism's boosters worried that Americans lived constantly on the verge of illness and that serious war shortages could tip them into nutritional deficiencies. This led to grand rhetoric about the centrality of nutrition to the war cause. Nutrition promised not only to feed Americans through the war, but also to make them *better*. Nutritious meals would make the war worker more productive, the soldier stronger, the entire civilian population more committed to freedom and victory. Nutrition advocates integrated themselves into the war work of the entire nation, making the individual American body a matter of national security.

Experts' efforts to achieve greater control over the human body, through the control of food, also created important social ramifications for Americans' middle-class women. Nutritionism promised to help the nation protect its most valuable resource, the human body, and American women were recruited as its managers. During the previous two decades nutrition educators had made middle-class women devotees of the ideology; the war infused their efforts with a new urgency and sought to make them "soldiers in aprons."[8] Only women could ensure the health and productivity of their husbands and children, who in turn served the nation as war workers as soldiers, and only women could prevent shortages of essential wartime supplies. As important as women's work in factories and other wartime industries was, nutritionists believed it could never compare to the work they performed in the kitchen. Advocates' acclaim for

[7] National Research Council, *Dietary Reference Intakes: Guiding Principles for Nutrition Labeling and Fortification* (Washington, D.C.: National Academies Press, 2003), 46.

[8] The title of this chapter comes from Charlotte Ferris, "Nutrition Education for Industrial Workers," *Journal of Home Economics* 34, no. 7 (September 1942): 445.

women's traditional homemaking, what the historian Amy Bentley has deemed the "Wartime Homemaker" ideal, helped advance their own importance and functioned as an important stabilizing counterweight to the greater economic and social responsibilities women acquired from working outside the home. When Margaret Cousins and *Good Housekeeping* encouraged their readers to "tie an apron around your waist and scramble the eggs for breakfast," it was to do more than just build morale at home.[9] It was to demonstrate the significance of nutrition and apply three decades of scientific research in service of the nation.

America had been preparing for war long before Pearl Harbor. The creation of the first peacetime draft in 1940 and the passage of Lend-Lease Act in early 1941 signaled to all that war was likely, if not inevitable. With that knowledge came the need to marshal resources, and home economists were especially eager to lend their expertise. In the year before Pearl Harbor they filled the pages of the *Journal of Home Economics* with exhortations for unity and initiative. They believed they were uniquely qualified to teach ordinary Americans the patriotism, thrift, and good cheer they would need to survive hardship. Well-respected home economist Minnie Cunningham wrote in March 1941 to her peers, "Your country needs you. You are called to act. Your country trained you in its educational institutions to a great profession… You are trained to serve."[10] The *Journal* called for home economists to organize local programs that would teach American women how to stretch budgets, conserve essential resources like rubber and nylon, and maintain familial harmony under stressful conditions in order to produce a strong home front that would win the war.

[9] Cousins, "The Shape of Security," 81.

[10] Minnie Fisher Cunningham, "Place of Home Economists in the Defense Program," *Journal of Home Economics* 33, no. 3 (March 1941): 155.

Food became a cornerstone of this effort. When experts in the Department of Agriculture declared that food was "tool of war," they spoke primarily of the need to boost farm production to feed Americans and their allies abroad.[11] Nutritional scientists and boosters considered food from another perspective. As they reflected upon the lessons of World War I, they concluded that "the war-time food problem does not consist merely in averting starvation for the population at large" but also included the creation of a national diet that safeguarded "the striking power of the army and the efficiency of the working population."[12] They believed the nutritional health of American enemies to be a similarly important factor in the war. American analysts noted that Nazi Germany appeared to have abundant food supplies, but declared that their "efficiency and staying power is likely to decline gradually in a prolonged war" because the nation could only afford to feed its own citizens by starving its occupied areas.[13]

American experts believed Great Britain's experiences provided a useful model for their own management and planning of the nation's nutritional resources. There the Ministry of Food had imposed a strict rationing system based on careful "scientific planning." The Ministry had stimulated domestic production of "protective foods," especially vegetables and milk, and then "sold" those foods to citizens in intensive promotional campaigns. Carrots were a particular success, according to one Ministry of Food adviser: while carrots were an unpopular choice before the war, by 1943 "we have now got people eating more carrots than they did in peacetime, much to everybody's physical advantage." The Ministry also instituted a national programs that distributed milk and cod liver oil to pregnant women, nursing mothers, and children under five

[11] "'Folly' to Neglect Diet, M'Nutt Warns," *New York Times*, May 20, 1942.

[12] Frederick Strauss, "The Food Problem in the German War Economy," *The Quarterly Journal of Economics* 55, no. 3 (May 1941): 364.

[13] Ibid., 400. See also T. Swann Harding, "Food, Agriculture, and the War," *Social Forces* 21, no. 1 (October 1942-May 1943): 98; Lizzie Collingham, *The Taste of War: World War II and the Battle for Food* (New York: Penguin Books, 2012), 1- 14.

years of age. Tight controls on luxuries such as meat and sugar made British diets "rather dull," but they had sustained the population through the most difficult years of the war. The British example proved to American nutritionists "that by proper planning we can have a perfectly balanced diet even under very difficult conditions of supply."[14] Experts hoped the American food supply would not become so precarious as to necessitate such controls, but Britain's experiences assured them that the civilian food supply could remain nutritious even in the face of hardship.

If the United States were to win the war, experts inside and outside the government would have to convince more Americans to eat scientifically. Numerous government agencies, from the Office of War Information to the Department of Agriculture, launched investigations and created committees to tackle the challenge. Most committees were staffed with a mixture of researchers who were experts in nutrition and social scientists and home economists who sought to integrate knowledge about nutrition with everyday American lives. The National Research Council's Committee on Food and Nutrition created its own subcommittee in January 1941 to draft the first national nutritional standards that would define what it meant to eat scientifically. Over the next several months three renowned home economists—Lydia Roberts of the University of Chicago, Hazel Stiebeling of the Bureau of Home Economics, and Helen Mitchell of Battle Creek Sanitarium—produced a list of recommendations for the quantity of calories, protein, vitamins, and minerals an individual should consume daily. Much like the scientists who had discovered vitamins in the 1920s, the subcommittee approached their task with caution. Expert estimates about the necessary levels for each nutrient varied wildly, and the committee had trouble synthesizing scientists' suggestions. Hoping to avoid as much criticism as possible from fellow nutritionists, the subcommittee chose not to establish absolute minimum requirements for health, but instead to publish "recommended allowances" that fell at the higher

[14] J.C. Drummond, "Good Health on War Rations," *New York Times*, March 14, 1943.

end of the range of expert suggestions. The media fanfare that accompanied the "New Dietary Yardstick" trampled on the committee's careful diplomatic nuance, however, and the conservative recommendations were often reported as the absolute threshold between health and malnutrition.[15] Semi-informed enthusiasm once more trumped scientific restraint.

The new recommended allowances reflected nutritionists' greatest concerns heading into war. Adequate protein intake was a major concern; the 1941 intake recommended daily allowances were nearly double what would later become the standards in 2011. The standards were especially high for young men, as nutritionists recommended teenage boys consume one hundred grams of protein a day (contemporary standards recommend teenage males consume only fifty-six grams of protein per day). Experts believed that such high levels of protein were crucial to transforming scrawny, weak American bodies into strong pillars of wartime civilian and military might. Protein's ability to "create a body of well-muscled men" had been proven during World War I and again during the Great Depression, as protein-heavy diets in the military and Civilian Conservation Corps helped military recruits develop sturdy, masculine bodies capable of hard physical labor.[16] Recommendations for daily vitamin A intake were also extremely high: adult men and women were encouraged to consume 1,500 micrograms of vitamin A every day in 1941, while their counterparts in 2011 would be told to consume 900 micrograms each day if they were male and only 700 if they were female (see Table 1). The high recommendations for vitamin A intake stemmed from experts' continuing concerns about Americans' poor vision. Since eye diseases were the second leading cause for disqualification from military service, public health experts assumed they were widely prevalent among the

[15] Harvey Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America* (New York: Oxford University Press, 1993), 22-23, 65-66.

[16] John R. Murlin, "Some Problems of Nutrition in the Army," *Science* 47, no. 1221 (May 24, 1918): 496.

general population as well.[17] Night blindness could be disastrous for the American war effort, rendering the Air Force useless after dark and limiting the effectiveness of civilian air raid drills.[18] Better to establish a high standard, the subcommittee decided, than risk an error that could undermine individual and national health.

With the standards for an adequate diet set, experts turned their attention to educating Americans. This was no small task. A Gallup poll about vitamins, released the day before the attack on Pearl Harbor, revealed that Americans were still confused about the nutritional components that advocates believed were most important for the war effort. Though more than eighty percent of American housewives could explain the difference between calories and vitamins, a full quarter of survey respondents still believed vitamins were a "passing fad." Almost half of the survey respondents reported that they had not heard information about any specific vitamins in recent months, and more than a third could not correctly identify foods that were rich in certain vitamins. Lower-income respondents knew substantially less about vitamins than middle-class and wealthy respondents, and men trailed behind women in their interest on the matter.[19] The survey seemed to affirm nutritional experts' belief that ignorance was the primary cause of poor diets.

Experts responded by launching local and national educational campaigns filled with patriotic appeals to transform the American diet. Community classes were their favorite approach, and forums with titles like "A Square Deal in Every Meal" and "Food + ? = Health"

[17] Rollo H. Britten and George St. J. Perrott, "Causes of Physical Disqualification under the Selective Service Law, Early Indications," *Public Health Reports* 56, no. 19 (May 1941): 1020.

[18] Charles Glen King, "Food and Nutrition as Related to the War," *Science* 97, no. 2510 (February 5, 1943): 130.

[19] George Gallup, "Public Getting Vitamin Conscious, Particularly Women, Poll Reveals," *New York Times*, December 7, 1941.

popped up in cities across America in the first months of the war.[20] Consumer guidance booklets advised women how to become smart consumers and "contribute to victory by intelligently using alternative goods in place of things that are scarce."[21] Many nutrition advocates were also public school teachers, and they often integrated nutrition into their elementary school classes in hopes that students would in turn educate their parents. For example, one elementary school teacher in Decatur, Illinois, had her students write and illustrate their own "Victory Food Books" with directions such as "Eat at Least Two Vegetables Besides Potato. This Helps Keep Eyesight Good" that students took home to show their parents.[22] Experts also sought new ways to elicit interest in nutrition education. They were able to produce and distribute a one-reel technicolor movie entitled *The Proof of the Pudding* to local movie theaters, for example,[23] and devised card games for students and their parents.[24] One widely publicized game was "Vita-Min-Go," sold by Servel Electric Company. Players learned if they ate a true "Victory Diet" by recording their daily food consumption on six colored cards, each of which measured one essential vitamin or mineral. Food items were worth different points based on their nutritional content, and the first to complete the track on each card won the game. "The prize for winning is better health and more vigor," the game advised, while "the penalty for losing is a greater chance of sickness." The

[20] Katherine M. Kohler, "Vitamins—Victuals—Victory!", *Journal of Home Economics* 34, no. 3 (March 1942): 177.

[21] U. S. Office of Price Administration Consumer Division, *The Consumer and the War: A Study Outline* 20468 (Washington, DC: Government Printing Office, January 1942), 14 (quotation); Institute for Consumer Education, *Defense and the Consumer* 54 (Columbia, MO: Public Affairs Committee, 1941).

[22] Mary Boyd, "Victory Food Book," *Journal of Home Economics* 35, no. 9 (November 1943): 573.

[23] Miriam Birdseye, "Aids in Teaching Food and Nutrition," *Journal of Home Economics* 33, no. 6 (June 1941): 392.

[24] Naomi Q. H. Adams, "Nutrition Game," *Journal of Home Economics* 35, no. 5 (May 1943): 289-290.

whole family would enjoy Vita-Min-Go, Servel promised, but it would also be a hit in local bridge clubs.[25]

Many housewives were listening to the message. A 1944 survey of 5,000 housewives suggested women knew more about nutrition in 1942 than they had five years before, and that this knowledge was better distributed than previously. Adults who had "no formal nutrition training but had read and heard talks on the subject" scored roughly as well as college students who had taken a class. The greatest improvement was in regard to vitamins, as housewives learned more about their purpose and the proper methods of cooking food to preserve them.[26] Experts reported that audiences enthusiastically participated in their forums, asking questions like "What is enriched bread?" and "How can I get Johnny to eat cooked cereal if he doesn't like it?"[27] Though experts likely exaggerated housewives' enthusiasm somewhat, women consistently attended nutrition seminars and lectures, which suggest the subject sustained their interest throughout the war.

However entertaining they were, *The Proof of the Pudding* and Vita-Min-Go were particularly successful because they helped nutrition advocates promote their vision of ideal gender roles. Experts hoped their educational campaigns and lectures would come to play an important role in easing larger social concerns about gender by reaffirming the importance of women's traditional homemaking roles during a period of significant social upheaval. Whether out of patriotism or necessity, greater numbers of women were entering the workforce during the war than ever before. An estimated six million women entered the workforce for the first time,

[25] "Vita-Min-Go" Nutrition Game, Servel Inc., circa 1943, Folder 14, Box 30, Defense Council Records, Oregon State Archives. Available online at http://arcweb.sos.state.or.us/pages/exhibits/ww2/services/nutrition.htm (accessed April 18, 2012).

[26] H. F. Kilander, "The Public's Knowledge of Nutrition," *Journal of Home Economics* 36, no. 2 (February 1944): 79.

[27] Kohler, "Vitamins—Victuals—Victory!" 178.

encouraged by government propaganda, and they were joined by many more who had worked outside the home at some point before the war.[28] Women performed new kinds of labor and an increasingly large number of them were married women. The number of women employed in manufacturing increased 141 percent, while the percentage engaged in domestic work declined 20 percent. Women's entry into male-dominated fields provided many with higher wages and greater economic advancement, at least temporarily.[29] At its peak, married women constituted twenty-six percent of the wartime labor market, eventually outnumbering the number of employed single women, though most wives drifted in and out of the market as time and economic necessity dictated. Participation varied greatly by demographics: working-class women were far more likely to work outside the home than their middle- or upper-class counterparts, wives of servicemen were three times more likely to work than women whose husbands were present, and women with young children were far less likely to take new jobs.[30]

Though women's workforce contributions were central to the war, great anxiety nonetheless accompanied the appearance of these "five o' clock mothers."[31] The New York State War Council, for example, issued a report in 1942 that listed twenty-five hazards to health, family, and society that working women potentially caused.[32] Gender expectations for women loosened in confusing ways. Women workers were "urged to demonstrate physical strength, mechanical competence, and resourcefulness for eight hours a day" at work, according to

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[28] Amy Bentley, *Eating for Victory: Food Rationing and the Politics of Domesticity* (Urbana: University of Illinois Press, 1998), 9.

[29] Karen Anderson, *Wartime Women: Sex Roles, Family Relations, and the Status of Women during World War II* (Westport, CT: Greenwood Press, 1981), 6, 32-33; D'Ann Campbell, *Women at War with America: Private Lives in a Patriotic Era* (Cambridge: Harvard University Press, 1984), 72-83. Anderson and Campbell both argue that women's greater economic opportunities and freedom during the war were ultimately short-lived, and they did not set the stage for lasting, significant change.

[30] Anderson, *Wartime Women*, 4-5.

[31] "Five O' Clock Mothers," *Journal of Home Economics* 34, no. 2 (February 1942): 107.

[32] New York State War Council State Committee, *Hazards to Families When Mothers Work and Recommendations for Reducing These Hazards* (Albany: State Committee on Child Care, Development, and Protection, September 1942), 1-4.

historian Karen Anderson, but they were still expected to display a traditional feminine dependency on men at home and in their free time.[33] Ambivalence about women's paid labor prompted many to worry aloud that wartime women were neglecting their essential homemaking duties, an act that potentially threatened the very foundation of American society.

Anxiety about women's nontraditional workforce participation prompted policymakers, the media, advertisers, and home economists to strengthen their commitment to traditional female gender roles, which reinforced the prewar middle class expectation that women fulfilled their most important duties in the home. These concerned groups created what Amy Bentley calls the "Wartime Homemaker" ideal that reinforced prewar middle class values that reinforced the idea that women's most important duties resided in the home.[34] This image portrayed women as a "tremendous force for the home defense of America," capable of making contributions to the war effort that nobody else could.[35] The Wartime Homemaker ideal strongly recalled the vision of republican motherhood that emerged after the Revolutionary War, as both conceptions assigned women responsibility for maintaining the nation's values through homemaking.[36] Wartime Homemakers needed to not only preserve the nation's character but also its health, and so the kitchen became the primary place for women to contribute to the war. By associating homemaking so closely with the war effort, nutritionism's boosters took a stand on debates about gender roles far more than they had in previous decades.

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[33] Anderson, *Wartime Women*, 64. See also a September 1943 *Good Housekeeping* article that instructs readers how to act in public without a male escort by listing several "fundamental" rules designed to keep women from attracting too much attention to themselves. See Florence Howitt, "How to Behave in Public without an Escort," *Good Housekeeping*, September 1943, 40, 160-161.

[34] Bentley, *Eating for Victory*, 30-31. See also Anderson, *Wartime Women*, 75-76.

[35] Florence Kerr, "What Can Women do Today?", *Journal of Home Economics* 33, no. 2 (February 1941): 107.

[36] Mary Beth Norton, "The Evolution of White Women's Experience in Early America," *American Historical Review* 89, no. 3 (June 1984): 616-619.

Rationing and wartime shortages were the biggest changes to the American food landscape during World War II, but home economists believed modern home managers could rise above the challenge with proper nutritional planning. The Office of Price Administration (OPA) imposed rationing programs and price controls early in the war to avoid spiraling prices that could have placed essential items out of the reach of many Americans and discourage the appearance of black markets for food. The OPA enacted rubber conservation programs almost immediately after Pearl Harbor, and other items soon followed. Sugar was rationed in May 1942, followed by coffee, butter, red meat, and canned goods. Most rationed foods fell under the scope of the OPA's new point system. Every month, individuals received a ration booklet with five blue stamps worth ten points each for processed foods, and six red stamps also worth ten points each for meat, fats, and some dairy products. The OPA determined the point value of rationed goods based on both availability and consumer demand, periodically reevaluating the values. This complex system was designed to give consumers more control over purchasing decisions, so if a family did not want to give up high-point items like red meat they could scrimp elsewhere or could save points over a longer time period for special occasions.[37]

Experts anticipated that rationing would create significant anxiety, especially if the war dragged on, but they assured women that careful planning would help them avoid most hardships. Home economists therefore sought to use the war as an opportunity to reaffirm the importance of modern household management and to place nutrition at its center. Experts worried that many families would simply trust the general abundance of food now that the Depression was over to meet their nutritional needs, but experts assured that such a cavalier attitude would lead to waste and shortage during the war. "Wartime calls for meals planned more

[37] Bentley, *Eating for Victory*, 15-16.

carefully than ever for good health," *Good Housekeeping* warned in 1942, in order to meet recommended daily allowances and avoid monotony.[38]

Nutrition advocates created hundreds of seminars and cooking demonstrations to teach women about the basics of nutrition and how it could ease their struggles with rationing. *The New York Times* estimated that 100,000 women in 1942 attended such forums to hear the "gospel of nutrition." Nearly half of those women attended classes sponsored by the New York State Department of Health, while others attended classes funded by the American Red Cross, New York University, and local community centers; a few even paid tuition to private schools.[39] They learned about everything from the definition of a vitamin to the list of foods rich in vitamin A as well as how to practically apply the knowledge to their daily life. Advice columnists, meanwhile, continued to repeat the same nutritional cooking guidelines they had given twenty years earlier, suggesting they were not yet common practice. Thus nearly every article about vegetables mentioned that they should be cooked in as little water as possible and that the proper method of cooking potatoes meant leaving the skins on in order to preserve their vitamins.[40] Such techniques would help women maximize their ration points by protecting food's true value.

Rationing also created the perfect opportunity to broaden the American palate. Nutrition experts strongly disapproved of Americans' stubborn refusal to eat economical and nutritious foods simply because they did not enjoy the taste. Meat shortages attracted the most attention, since meat was the symbol of hearty American meals.[41] Home economists cheerily suggested

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[38] Julia Hoover, "If They Don't Like Milk," *Good Housekeeping*, May 1942, 139; Julia Hoover, "Nutritional Lessons Mean Nothing Unless You Take Them to the Table," *Good Housekeeping*, July 1942, 100.

[39] Beatrice Oppenheim, "Keen Interest Shown in Nutrition," *New York Times*, July 4, 1943.

[40] Clive M. McCay, "America is Learning What to Eat," *New York Times*, March 28, 1943.

[41] Jessamyn Neuhaus argues that meat shortages were never particularly harsh for Americans because the rationed limit for each individual was two and a half pounds per week, not including poultry. In addition, many Americans bought food on the black market or received extra amounts from butchers and grocers because it was "chic" to bypass rationing. See Neuhaus, *Manly Meals and Mom's Home Cooking: Cookbooks and Gender in Modern America* (Baltimore: The Johns Hopkins University Press, 2003), 108.

different ways to cope with shortages based largely on items' nutritional equivalency: *Good Housekeeping* often published recipes for unpopular meats such as liver, heart, tongue, sweetbreads, "as well as brains, tripe, liver sausage, pigs' feet, bacon squares, and oxtails."[42] Non-meat sources of protein, such as beans, cheese, potatoes, cereal grains, and even bread were also advertised as wise substitutes for rationed meat because they were easy on budget points but still provided adequate health.[43] Suggestions such as these embodied the reductionist view of food that characterized the nutritionist ideology during World War II. Nutritionists based suggestions for dealing with wartime shortages on straightforward calculations of easily quantifiable factors, such as the number of vitamins or calories in a food item. They often glossed over less scientific elements of food items, particularly taste, as merely a secondary factor for decision-making. Nutritionists recognized that Americans were reluctant to try new foods such as beef heart, but many believed this hesitation could be overcome with a simple discussion about how "nutritionally they furnish as good protein as muscle meat" but at a cheaper price.[44] Their attempts to deal with the issue of taste were rather half-hearted. One *New York Times* article promised readers that after a housewife learned enough about nutrition "she will find that she will not have to surrender tastiness to obtain nutrition," but offered no specific suggestions for the novice searching to balance good taste and nutrition; instead, the author quickly fell back on extolling the health benefits of nutritious meals over taste.[45]

Nutritionism also provided a way for women to contribute to national productivity without actually entering the workforce themselves. Nutrition educators frequently discussed the

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[42] Jane Giesler, "Don't Forget These Meats," *Good Housekeeping*, February 1943, 86-87.

[43] Charlotte Scripture, "Because of Their Protein You Can Use These in Place of Meat," *Good Housekeeping*, April 1943, 88; Jane Giesler, "M-m-m! I Smell Homemade Bread!" *Good Housekeeping*, September 1943, 83; Katharine Fisher, "Main Dishes for These Times," *Good Housekeeping*, September 1943, 89; Margaret Ball, "There Are Plenty of Potatoes," *Good Housekeeping*, February 1944, 84.

[44] Jane Giesler, "Don't Forget These Meats," *Good Housekeeping*, 86.

[45] McCay, "America is Learning What to Eat."

importance of perfect health to wartime productivity, and they emphasized to women that they were the only ones capable of ensuring their husbands' good health. A malnourished war worker moved more slowly, made more mistakes, and was absent far more than someone who consumed the recommended daily allowances of essential nutrients, advocates warned. Vitamin B_1, or thiamine, deficiencies were especially worrying. It was dubbed the "morale" vitamin after Dr. Russell Wilder's famous 1940 experiments suggested the vitamin's absence produced "an unwillingness to work, sloppiness, and disagreeableness" that at its worst could cause production slowdowns and strikes.[46] Defense workers needed strong muscles, energetic minds, healthy nerves, and good eyesight to win the war, but evidence suggested their diets were startlingly lacking. Studies conducted by the National Research Council concluded that male factory and office workers alike ate poorly, reaching for coffee and doughnuts at breakfast instead of milk and cereal, and they suffered from chronic fatigue as a result.[47]

Despite women's increasingly visible presence in the workforce, these concerns about nutritionally supported production generally centered on men. The National Research Council and other investigators primarily studied the diets of male workers, and the solutions for their troubles were often aimed at their stay-at-home housewives. One article published in the *Journal of Home Economics* chronicled a home economist's attempts to improve the diets of Westinghouse Electric Manufacturing Company employees by "starting an educational campaign among wives and mothers of war workers in our plant."[48] Servel Electric Company also gendered its plan "to keep war workers healthy" by speaking exclusively about the food

[46] Murphy, "Suggests Caution in Use of Vitamins" (quotation); Harvey Levenstein, *Fear of Food: A History of Why We Worry about What We Eat* (Chicago: University of Chicago Press, 2012), 100. There is some evidence that increased thiamine intake slightly improves mood, though not to the extent Wilder's study originally suggested. See David Benton, "Can Function Foods Modify Moods?", *Food Science and Technology Bulletin – Functional Foods* 2 (2006): 50.

[47] Jane Holt, "Food that Combats Fatigue," *New York Times*, October 18, 1942.

[48] Charlotte Ferris, "Nutrition Education for Industrial Workers," *Journal of Home Economics* 34, no. 7 (September 1942): 444.

men needed "to feel good, work well."[49] One Department of Agriculture consumer guide informed "Mrs. America" how to "set the best table in the world" with the right foods to cultivate qualities like "joy, grit, nerve, stamina, strength, [and] assurance," visually represented with images of men and boys engaged in war preparation work.[50] The highly gendered approach towards nutrition that magazines such as *Good Housekeeping* exhibited was explained in part by the demographics of their readership. *Good Housekeeping*'s primary demographic was middle-income white women between the ages of 25 to 45. Most women were married, and a significant portion of the magazine's readers were relatively new homemakers. Women who fit these demographics were among the least likely to work outside the home during World War II. [51]

Nevertheless, the effect of this gendered lens was to promote the notion that the Wartime Homemaker served her nation by serving her husband. Home economists acknowledged that "the homemaker in her kitchen may wish she could go out and get a war job," but they encouraged her to resist that impulse because feeding her family for health and strength *was* a war job; in fact, it was "the most important of them all."[52] They envisioned housewives becoming "soldiers in aprons" who contributed to the war effort from home,[53] and worried that a woman with a defense job risked becoming a "part-time wife" who ultimately harmed the war effort by neglecting her family.[54] Though their principle mission was to help women appreciate the importance of nutrition, advocates' rhetoric simultaneously promoted traditional gender roles as essential to the "stability of the American home."[55]

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[49] Servel, Inc. advertisement, *Good Housekeeping*, December 1942, 5.

[50] Donald E. Montgomery, U. S. Department of Agriculture, *Consumers' Guide* 8, no. 20 (Washington, DC: October 15, 1941), 2-3.

[51] See Mary Ellen Zuckerman, *A History of Popular Women's Magazines in the United States, 1792-1995* (Westport, CT: Greenwood Press, 1998), 133, 196.

[52] "'Folly' to Neglect Diet, M'Nutt Warns," *New York Times*, May 20, 1942.

[53] Ferris, "Nutrition Education for Industrial Workers," 445.

[54] Nabisco Shredded Wheat advertisement, *Good Housekeeping*, July 1942, 74.

[55] "Five O' Clock Mothers," 107.

As important as it was for rationing and production, home economists claimed that nutrition's greatest contribution to the war was to boost home-front morale. Here, nutrition educators joined with others in assigning a special significance to food as a stabilizing force during the war. To home economists, well ordered family meals recalled times of peace and abundance and provided families with a relaxing haven from the hectic world. Norman Rockwell called upon this association in his famous painting "Freedom from Want," creating a cheery science that reinforced food's power to bring families together, and immediately reminded middle-class Americans of their own holiday celebrations.[56] The traditional gender roles on display in "Freedom from Want" may have also comforted middle-class Americans, reminding them that men and women had separate, gender-specific roles: men were at the head of the family as "presiders and presenters" while women were the "coordinators and servers" that kept the family running.[57]

Of course, science was also at play in food's ability to boost the nation's morale. Home economists believed enjoyable meals would sustain the morale of already healthy Americans, but those of questionable health would need more significant nutritional intervention. Chemist Russell Wilder warned Americans in 1941 about the dangers of major, sustained vitamin deficiencies based on the experiences of occupied populations in Europe. Individuals suffering from a vitamin B_1 deficiency became depressed, listless, and subject to "feelings of inferiority." The symptoms were so striking that Wilder proposed that creating B_1 deficiencies was Hitler's

[56] Elizabeth Borgwardt discusses how Rockwell created a series of culturally specific scenes to help middle class Americans connect more strongly to the vague, universalist language in Franklin Rockwell's 1941 "Four Freedoms" speech. She notes that while such an approach spoke deeply to many Americans, Rockwell's paintings were "*so* culturally specific that his rendition was almost incomprehensible even to America's closest allies." See Borgwardt, *A New Deal for the World: America's Vision for Human Rights* (Cambridge: Belknap Press of Harvard University Press, 2005), 47. Amy Bentley also discusses the limited appeal of Rockwell's images, as Rockwell's painting evokes the importance of "appearance, respectability, and decorum" – values that appealed more to the middle-class than to any other group. See Bentley, *Eating for Victory*, 59-61.

[57] Bentley, *Eating for Victory*, 60.

"secret weapon," producing in occupied populations "a state of depression and mental weakness and despair which will make them easier to hold in subjection."[58] Nutrition, especially B_1, the new "morale vitamin," became a critical tool of war. Nutrition advocates believed women needed to protect morale not only by making family meals the most enjoyable part of the day, but also by ensuring they served the foods "that will make spirits sturdy and bodies radiant with health."[59]

Nutritionists tackled holiday eating with renewed energy during World War II. Educators had had little luck in encouraging Americans to make nutrition-based decisions during holidays in previous decades. A 1926 *Good Housekeeping* article admitted it was "easy to take a dietetic holiday during the Christmas season," for example, while columnist Walter Eddy admitted in 1930 that he was under "no illusion that nutritional adequacy is the measure of… success" for even moderately special events such as picnics.[60] The crusade seemed so futile that discussions of nutritional value generally dropped in number in the Thanksgiving and Christmas *Good Housekeeping* issues through the 1920s and 1930s. But experts assumed the general enthusiasm for nutrition was so high in the first year of the war that they tried inroads even into Christmas. *Good Housekeeping* encouraged readers to use the patriotic atmosphere to "crystallize" healthy eating habits "so that the family will be radiantly fine and fit after the Christmas feasting." Christmas dinner should incorporate "Uncle Sam's Food Rules" just as would any meal on any other day.[61] One year later the enthusiasm had ebbed, but the magazine's holiday issues still

[58] Russell M. Wilder, "Hitler's Secret Weapon is Depriving People of Vitamin," *Science News-Letter* 39, no. 15 (April 12, 1941): 231.

[59] Montgomery, *Consumers' Guide*, 15.

[60] Katharine Fisher, "Guide Posts to Balanced Meals," *Good Housekeeping*, January 1926, 64; Walter H. Eddy, "Eat, Drink, and Be Merry," *Good Housekeeping*, October 1930, 102.

[61] "Plan Your Holiday Meals This Way," *Good Housekeeping*, December 1942, 131-132.

contained articles advising women about to avoid serving non-nutritious meals that would harm the family's health.[62]

Nutritionism's boosters were so concerned about the connection between nutrition and morale that they made it the central feature of the Wartime Homemaker ideal. *Good Housekeeping* advised women that it was their job "to see that mealtimes are the bright spots in the day" and never to allow the family to discuss negative topics over dinner. Advocates emphasized that food substitutions were always to be met with good cheer instead of worry.[63] Failure to defend the "family front" had dire consequences. An article about defense jobs in *Good Housekeeping* began with a picture of a father and two children sitting patiently at the dinner table, staring at the empty table and asking each other, "I'm hungry, where's Mom?" The picture was a deeply unsettling image of women who got so carried away with their new defense jobs that they inadvertently ruined "the nation's morale and health."[64]

Advocates also searched for ways the war could help them finally reach a male audience. Their home economics classes in the 1930s had only been marginally successful, convincing boys that cooking and nutrition were important subjects but ones that were largely the domain of women. The American Home Economics Association in 1941 considered ways to extend "to boys and men instruction now offered to girls and women in areas of home economics which aid in maintaining health and physical fitness" in preparation for war.[65] The war did allow educators to successfully generate greater male interest in nutrition, but men focused their attention on issues that were often quite different from the ones nutritionists wanted them to consider.

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[62] Katharine Fisher, "It's Harder to Plan Meals These Times," *Good Housekeeping,* November 1943, 92; Katharine Fisher, "Maybe You're Wasting Food," *Good Housekeeping*, December 1943, 92.

[63] Carl P. Sherwin, "A Q. and A. on Meals," *Good Housekeeping*, March 1942, 81.

[64] Dorothy Marsh, "Join Up… but Don't Let Your Family Down," *Good Housekeeping*, June 1942, 107.

[65] "Adapting Home Economics to National Defense Needs," *Journal of Home Economics* 33, no. 2 (February 1941): 110.

Nutrition became a way for men to improve their bodies for war, but many of them focused on single nutrients within their food. One New Jersey man claimed to have eaten seventy bananas in one week in order to gain enough weight to join the Air Force, for example.[66] Fellow New Jersey resident Howard Ball, a young man during the war, later remembered fixating on carrots during the war because of its vitamin A content:

> I remember, my [friend and I], we were talking about sight, about night sight, and Feinbloom said that if you eat carrots, there was vitamin A in carrots and that would improve your night vision. So, I just scarfed carrots down like nobody's business, because I was a Civil Defense worker. I was going to beat the Japs and Germans right here on Romain Avenue, you know, and so, … the air raid siren blew and I get up and I walk right out and bang my head right into the door. I couldn't see a thing, and I got Feinbloom the next day; I was going to kill him. [laughter] I said, "That didn't help one bit." He said, "Well, they're good for you anyway."[67]

Ball wanted to improve his body's potential so he could better contribute to the war effort, and he knew just enough about nutrition to believe that food could help him improve a single element of his health to become a better Civil Defense worker. Like the Air Force man with his bananas, Ball also believed that overloading on a single item of food was the best way to improve his health. This interest differed substantially from the way nutritionists had successfully encouraged women to view food. But men refused responsibility for managing every aspect of their health through food, instead remaining interested only the isolated elements they believed were important to the war effort. Their willingness to overload on these nutrients was also very different than the way women viewed nutrition, freeing them from the calculations needed to balance intake of all the recommended daily allowances. Ultimately, nutrition educators continued to place the responsibility for maintaining men's health remained on their wives and

[66] "Eats Way into Army," *New York Times*, April 30, 1941.

[67] Howard Lee Ball, interview by Shaun Illingworth and Hanne Ala-Rami, February 29, 2008, Rutgers Oral History Archives, 14, http://oralhistory.rutgers.edu/alphabetical-index/31-interviewees/773-ball-howard-lee (accessed April 16, 2012).

mothers. Even though nutrition advocates successfully raised men's awareness of the benefits of nutrition, men remained highly selective adherents of nutritionism during the war.

The duty of properly managing household nutritional resources therefore fell to women, who needed to commit a sizeable amount of time and energy to the task. Women needed to stay abreast of the latest scientific developments, attending refresher courses as necessary, and creatively apply those lessons to their kitchens. They needed to budget ration points carefully, considering the cheapest options every week as supply and point values changed, but also be willing to risk spending points on new foods. Women could mitigate the risk by having a large store of recipes and advice about how to cook these foods, but maintaining a recipe book also took time. Juggling all these factors took significant effort, one that nutrition advocates labeled absolutely vital to the war effort. A Metropolitan Life Insurance ad labeled this task "a patriotic duty," and *Good Housekeeping* likened women's efforts to a "General… fortifying [their] front line."[68] The result of these messages was an elevation of women's status as homemakers, giving their actions a greater significance than in previous decades, but also a reaffirmation of traditional gender roles, since such actions were solely women's responsibility.[69]

One result of attaching heightened national significance to women's actions was that the consequences of failure became considerably more significant as well. Since ensuring good nutrition for their families had become a "patriotic duty and responsibility," advocates claimed that women who did not do so failed both their family and their country.[70] Government policymakers and nutritionists blamed women for the nation's failure to adapt proper food habits. Mary Barber, a food consultant to the U.S. Army Quartermaster Corps, lamented how many

[68] Katharine Fisher, "March Meals that Fortify the Home Front," *Good Housekeeping*, March 1942, 104.
[69] Bentley, *Eating for Victory*, 5.
[70] Louise Stanley, "Home Canning Up-to-Date," *Good Housekeeping*, April 1942, 95.

soldiers refused to eat vegetables because their mothers were poor cooks, for example.[71] Even when family members were themselves reluctant to try new foods, it was still the mother's responsibility to make them do so.[72] Home economists and other nutrition educators believed it was not a child or husband's fault if they did not enjoy a perfectly nutritious meal, but rather that it was the mother's fault for failing to cook the food properly in the first place. The added pressure of this responsibility widened the gap between the ways middle class women and men were supposed to experience their food.

Given advocates' concern about men's simplistic understanding of nutritionism, and the potentially significant burden of women's new added responsibilities, it is not surprising that experts searched for new methods to improve the national diet in the middle of the war. Part of the reason was what they believed was a mistaken affinity for vitamin pills among the general public. Vitamin supplements of dubious quality had been available since the 1920s, and by the late 1930s scientists had developed methods that successfully extracted the micronutrients for sale. Kroger grocery stores began selling vitamin pills in 1939, and the company soon found itself embroiled in court battles about whether the pills were food or drugs only to be sold by pharmacists. Druggists and grocers fought for control of the nascent vitamin market through World War II, creating large store displays and advertising campaigns to market the products. Druggists controlled about three-quarters of the market through the 1940s, and used their reputation as knowledgeable health care practitioners to advise consumers about the best products for their needs.[73] Most pills were available at a very low cost; vitamin B_1 supplements,

[71] Julia Hoover, "'Sure, I'll Eat Vegetables Fixed *That* Way!'", *Good Housekeeping*, June 1942, 112.

[72] *Good Housekeeping* often published articles on how to "coax" reluctant family members into trying new nutritional foods. See for example, Helen Mitchell, "You Know What the Family Should Eat, but How Are You Going to Make 'em Like It?", October 1942; Katharine Fisher, "Make it Good!", February 1945.

[73] Rima D. Apple, *Vitamania: Vitamins in American Culture* (New Brunswick: Rutgers University Press, 1996), 55-68.

for example, sold for only thirty-seven cents a gram by 1943.[74] By the middle of the war Americans spent roughly $50 million annually on vitamin pills and ingested everything from cod liver oil to yeast tablets to Stams multivitamin tablets. The vitamin pill industry had developed in just a few short years into a lucrative industry, investing in heavy advertising campaigns and building new "vitamin factories" throughout the war.[75] The ability to eat one's daily requirement of vitamins in pill form represented a significant step towards the functionalist, reductionist view of food that nutrition advocates promoted. Vitamin sellers and advertisers encouraged consumers to critically examine their health needs and then buy the proper vitamin remedy, which now existed completely independently of the foods in which they originated.

Nutrition advocates were displeased with the vitamin pill trend. "Man is not made for a diet of pills and capsules," the editor of the *Journal of the American Medical Association* declared in 1943.[76] Artificial pills severed the relationship with nature that nutrition experts believed was essential in maintaining a healthy body. Synthetic vitamins could not be trusted to replace the value of whole foods; the production of synthetic vitamins was still new enough to warrant suspicion, reminding nutritionists of the patent medicines released when vitamins were first discovered. They also worried that Americans would miss the benefits of as-yet undiscovered nutrients by switching to supplements instead. And consumption of B-complex vitamins, including the all-important thiamine, seemed dangerously close to becoming inadequate. Estimated per capita consumption of thiamine in 1942 was 1.96 milligrams, providing just a small cushion against the recommended daily allowances, but these estimates

[74] Ibid., 9.

[75] "Enters Drug Field with Consumer Line," *New York Times*, January 25, 1943; "Ad Drive for Stams Ready," *New York Times*, August 21, 1943; Walker, interview.

[76] Quoted in, "Says Pills are Not Food," *New York Times*, January 14, 1943.

did not account for the amount of thiamine that was wasted or lost in the cooking process.[77] If Americans relied on vitamin pills, nutrition experts worried they could fall below adequate intake levels of these crucial vitamins. While this approach seems admirable, nutritionists had another motive as well. Home economists had forged deep connections with corporations that were threatened by the synthetic vitamin trend. Food and kitchen appliance manufacturers had been instrumental in establishing the field of home economics, lending financial support and prestige, and those ties continued through the mid-twentieth century.[78] Vitamin pills not only siphoned money away from food purchases, but they also made consumers more suspicious of the perceived inadequacies of food products.[79] In truth, nutritionists were not inherently opposed to synthetic vitamins, because their solution to perceived persistent vitamin B deficiencies was the mandatory enrichment of bread flour.

Enrichment seemed the easiest method to rehabilitate the national diet. White bread was by far Americans' favorite, and its steady rise in popularity through the late nineteenth and early twentieth centuries had alternately made white bread a symbol of racial purity, modern technology, and sanitary prosperity, according to political scientist Aaron Bobrow-Strain.[80] Nutrition advocates now sought to connect it the national defense. The milling process for white bread stripped the bran and germ from wheat grains, creating a chewier and aesthetically pleasing but less tasty or nutritious loaf. Because white bread provided up to forty percent of all calories consumed during the war period, it seemed a natural target for nutritional improvement.

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[77] U.S. Department of Agriculture, *Nutritive Value of the Per Capita Food Supply*, 18.

[78] For greater discussion of the ties between home economics and the food industry, see Laura Shapiro, *Perfection Salad: Women and Cooking at the Turn of the Century* (1986, repr., Berkeley: University of California Press, 2009), 182-202.

[79] Harvey Levenstein notes that doctors similarly advised against vitamin pills because they believed Americans would increasingly rely on the vitamin pill industry instead of doctors for guidance. See Levenstein, *Paradox of Plenty*, 21, 69.

[80] Aaron Bobrow-Strain, *White Bread: A Social History of the Store-Bought Loaf* (Boston: Beacon Press, 2012), 6-9.

The best solution would be to encourage Americans to voluntarily consume more wheat bread, but experts were skeptical; a few years earlier Switzerland had imposed heavy taxes on white bread to encourage greater whole wheat consumption, but consumers simply paid more for white bread.[81]

It soon became apparent that voluntary enrichment was not enough, either. Enriched products appeared as early as 1940, but generally carried higher price tags that made them luxury items, not necessities. Nutritionists soon began lobbying the federal government for mandatory enrichment, resulting in the creation of War Food Order Number 1 in January 1943, which required bakers to add iron and B-complex vitamins to white bread through the end of the war.[82] Nineteen states soon followed the federal government's example and passed their own mandatory enrichment laws.[83]

Enrichment finally seemed to give nutritionists the success they had long awaited. They enthusiastically promoted enriched products as vital to the national defense. The Army and Navy are using enriched flour and bread because of the extra health values they offer," *Good Housekeeping* declared in 1942, and told readers "you're in the Army, too! It's your patriotic duty to give your family these health values by using enriched bread and flour."[84] *The Science News-Letter* proclaimed that enriched bread would not only "give modern Americans strength for defense in war" but that it would also "add strength to cope with the problems of modern civilized life which threaten as ominously as war itself."[85] Most importantly, the American public listened to nutritionists' claims; when mandatory enrichment ended in 1946 consumers

[81] Bobrow-Strain, *White Bread*, 123, 113.

[82] Robert R. Williams and E. V. McCollum, "Bread 'Enrichment,'" *Science* 102, no. 2642 (August 17, 1945): 180n2.

[83] "The Enrichment Program—How it Grew," *Journal of Home Economics* 37, no. 7 (September 1945): 403.

[84] Dorothy B. Marsh, "More for Your Money in Enriched Bread and Flour," *Good Housekeeping*, July 1942, 98.

[85] Jane Stafford, "A Bread Revolution," *Science News-Letter* 39, no. 2 (January 11, 1941): 26.

demanded continued enrichment of white bread for no extra cost, and Americans continued to associate closely white bread with better nutrition and health long after the war. Consumer surveys in later decades uniformly revealed that consumers believed industrial white bread was blander and less tasty than other breads, but that they far preferred it to other types of bread because it was more nutritious.[86] When it came to bread, at least, Americans were finally eating scientifically.

They were also adopting the gospel of nutrition in other ways. The nutritionist campaigns of the early war were generally successful, but not nearly to the extent that advocates hoped. Postwar studies suggested that consumption of vital nutrients increased every year of the war, and that estimated consumption was well above the new recommended daily allowances. A 1947 Department of Agriculture report estimated that Americans consumed daily 2,460 micrograms of vitamin A in 1942, for example, while the recommended allowance for adults was only 1,500 micrograms. Estimated protein levels were also well above the recommended allowances.[87] Consumption of foods generally deemed "nutritious" also rose sharply during the war, including soy flour and leafy, green, and yellow vegetables.[88] This was not just due to higher income levels, although money was a contributor. Americans were receptive to home economists' education programs, and they were genuinely interested in vitamins and nutrition. Mary Walker, a teenager in Michigan during the war, remembered paying close attention to the educational

[86] Bobrow-Strain, *White Bread*, 123-125.

[87] U.S. Department of Agriculture, *Nutritive Value of the Per Capita Food Supply, 1909-1945*, miscellaneous publication 616 (Washington, DC: Government Printing Office, January 1947), 18. This study was based on estimates of apparent consumption based on retail reports, and does not divide its study by class, race, or gender. There was likely considerable variation among the reported numbers, but they are useful in establishing estimates.

[88] U.S. Department of Agriculture, *Nutritive Value of the Per Capita Food Supply*, 26-27. See also U.S. Department of Agriculture, *Family Food Consumption in the United States*, miscellaneous publication 550 (Washington, DC: Government Printing Office, 1944), 12-18.

posters about nutrition around the community Victory Garden center, for example.[89] Americans were clearly listening to the nutritionists' advice, but they had not made the radical dietary changes that experts advised.

By the end of the war the ideology of nutrition had also entered into standard government parlance. Officials were beginning to consider the ways food aid could become a foreign policy tool, using postwar agricultural surpluses to "bait or bribe foreign countries," according to activist Wendell Berry.[90] They were also beginning to think about the nutritional content of the food they sent abroad. While discussions about international aid after World War I most commonly measured the amount of food given to Europe by their dollar value, by the 1940s this conversation had transformed to one of calories and vitamins.[91] A government report in 1946 announced that more than 140 million Europeans would have to live on 2,000-calorie diets for the foreseeable future, while another 100 million would scrape by with an average of only 1,500 calories per day.[92] Special reports to the *New York Times* spotlighted young European orphans who "drank American milk, ate American powdered eggs, sipped American cocoa and chocolate, took American vitamin pills" and thanked charitable Americans.[93] Several companies also rushed packages of "high-potency vitamin capsules" to starving European children, in moves designed as much for advertising as for charity.[94] Not only had nutritionists succeeded in

[89] Mary Walker, phone interview by author, Scottsdale, AZ, March 27, 2012.

[90] Berry argues one of the driving forces of the twentieth century's industrialization of agriculture is the United States government's desire to produce enough food "to be used to bait or bribe foreign countries" for foreign political and economic goals. See Berry, *The Unsettling of America: Culture and Agriculture*, 3rd ed. (San Francisco: Sierra Club Books, 1996), 8-11.

[91] See, for example: "Food for the Starving," *New York Times*, December 21, 1919; "Bankers Ask House to Pass Food Bill," *New York Times*, March 2, 1920; "Appalling Picture of Europe's Misery Drawn by Davison," *New York Times*, May 18, 1920; "Ask $20,000,000 for Famine Relief," *New York Times*, December 14, 1921.

[92] "140 Million in Europe to Get Only 2,000 Calories a Day," *New York Times*, February 7, 1946.

[93] "Americans Help Orphans in Russia," *New York Times*, January 27, 1946.

[94] "Vitamins Rushed to Germany," *New York Times*, December 23, 1947; "Gets 7,000,000 Vitamin Tablets," *New York Times*, January 2, 1947.

making nutrition an essential part of the American lexicon, but by the end of World War II they had also exported it abroad.

Nutritionism had finally won the day. The war provided nutritionists with the chance to bring their ideology into nearly every American home and establish it as one of the most meaningful activities housewives could perform in the war. Linking individual food choices with national political goals gave nutritionism far greater social significance because a failure to adhere to the recommended guidelines became an unpatriotic and potentially even treasonous decision. The educational campaigns also associated nutritionism with conservative gender roles that affirmed homemaking as women's greatest contribution, increasing the ideology's appeal among middle class housewives even more. A popular culture more receptive to the nutritionist message allowed experts the opportunity to directly influence the dietary landscape, and the establishment of national nutritional standards and widespread food fortification programs represented nutritionists' greatest accomplishments yet. These programs helped Americans eat more vegetables, drink more milk, and buy more vitamin pills than ever before. Class differences in nutritional status and food consumption habits had narrowed considerably, making postwar Americans the best fed in the nation's history. More importantly, Americans were excited about nutrition. Housewives who had begun the war barely able to define a vitamin ended it with loud calls for continued enrichment of their foods and by donating money to send special vitamin pills overseas.

Though successful, nutritionism also contained highly problematic elements, and advocates' long-awaited success brought these tensions to light. Many Americans did not seem to demonstrate the careful rationality towards their food that nutritionists expected. Americans

unquestionably believed that food was a tool to improve health, but the runaway success of the vitamin pill industry made nutrition advocates worry that Americans preferred easy solutions instead of real dietary reform. Their failure to fully convert men to the gospel of nutrition reinforced their concern. As nutrition advocates faced the postwar era, their inability to resolve these problems loomed large.

It took just three short decades from Casimir Funk's discovery of vitamin B to the time when large vitamin factories mass-produced vitamin pills, but the ways Americans thought about their food had changed radically during the same period. The burst of scientific research into human nutrition during the 1910s and early 1920s produced a group of modernist reformers who eagerly envisioned the ways scientific eating could change the world by making consumption a more rational and efficient activity. And yet nutritionism was highly problematic. Nutrition's advocates believed in the inherent power of science and their confidence led many experts to ignore the limits of scientific research; instead they promoted a simplified version of nutrition that relied on half-truths and pseudoscientific claims about the field's ability to create perfect human bodies that could ensure national military and economic dominance and protect individuals from pain and aging. Science became the only true method of evaluating food, but the emphasis on invisible nutrients made it impossible for most Americans to judge the value of food on their own. Hence, Americans could not possibly demonstrate the careful rationality toward their food that nutritionists expected, as demonstrated by the runaway success of the vitamin pill industry. Nutritionists hoped to solve this dilemma through educational campaigns in the 1920s and 1930s that would teach America what to eat, but their decision to combine science with a variety of middle class social values about gender, consumption, and home economics inhibited the spread of real knowledge beyond middle class housewives. The Great Depression

rectified this dilemma somewhat as nutrition educators found they had to consider the needs of women with limited household budgets, but it also reinforced the reductionist view of food that only valued the nutrients within. Just as it had taken the first world war to convince modernist reformers of the value of nutrition, so too would it take another war to fully persuade the American public. World War II generated the momentum experts needed to cement the place of scientific eating within the national consciousness, yet even in this the conversion was incomplete; despite their best efforts nutritionists' educational campaigns promoted a largely reductionist view of food and never truly appealed to men.

Food served important social roles in first half of the twentieth century, ones that environmental historians have only started consider. The dinner table became a site of reform for early twentieth century modernists, a place where they believed they could impose a rational order that would improve individual lives and strengthen the nation as a whole. The act of choosing what to eat had longstanding connections with how Americans identified themselves according to gender and class, but nutritionists sought to add another layer of symbolism. For them, every bite was a reaffirmation of their commitment to the idea that science held the power to control the natural world and improve human life. Food consumption is a valuable area of study for environmental and social historians looking to investigate the ways Americans conceptualized and experienced their environment on a daily basis. The extent to which food advertising and mass consumerism shaped Americans' conceptions about the natural world, for example, remains a question for further study. So too is how beliefs about the virtues of "natural foods" influenced agricultural production; the father of organic farming, J. I. Rodale, was spurred into action after observing how the simple diets of residents of the Hunza Valley in the

Himalayas correlated with their seemingly nonexistent rates of disease.[95] These questions only hint at the transformations in the nature of American food and thought that occurred in the twentieth century, transformations that mirrored much larger shifts in the ways Americans viewed and experienced their environment during the same time.

For their part, nutritionists continued on with their crusade after 1945. They set about correcting the incomplete implementation of their vision for a modern dinner table with further educational campaigns, the same technique they had used in previous decades. The campaigns that targeted men sought to link good nutrition even more closely with military strength and national defense.[96] They also faced a number of new challenges. Hunger and malnutrition had largely disappeared after the war but returned in the 1960s as a major political battleground, and nutritionists played central roles in the ensuing Congressional reports and documentary investigations.[97] But nutritionists' biggest challenge remained the public's admiration for synthetic nutrients and their affection for reductionist thinking—a mindset that nutritionists themselves had once promoted. In teaching Americans what to eat, nutritionists had trained them to evaluate foods in terms of their quantitative nutritional content, but this also provided food companies with the tools to compete for control of the public's eating habits. Nutrition advocates lost their monopoly to direct the public conversation about nutrition in the face of increasingly powerful food industries that inundated consumers with pseudoscientific advertisements and leveraged their political power to influence federal nutritional guidelines in the 1970s and

[95] Levenstein, *Fear of Food*, 108-110.

[96] Male weight loss campaigns during the 1950s blamed overweight with the "soft, lazy way of life" that destroyed masculinity and made the United States susceptible to Soviet invasion. Jesse Berrett, "Feeding the Organization Man: Diet and Masculinity in Postwar America," *Journal of Social History* 30, no. 4 (Summer 1997): 807.

[97] Levenstein, *Paradox of Plenty*, 144-157.

1980s.[98] By the close of the twentieth century, consumers faced nearly limitless options about how to manage their health through food, including everything from whole fruits and vegetables to multivitamin supplements to enriched foods.

As I worked on this thesis, I thought I had become immune to the nutritional claims that had initially made my non-fat pomegranate energy frozen yogurt attractive, but over the course of my research I realized just how deeply embedded the ideology is in our food culture, and how susceptible I was to it. When I got sick, I reached for orange juice and vitamin C supplements to ward off the worst effects of my cold. During finals week, the university stocked the library with fruit juice energy drinks that were packed with B vitamins and a full serving of fruit and vegetables for students pulling all-nighters before exams. In the last few harried weeks of the semester my fellow graduate students and I considered buying five-hour energy drinks in bulk in hopes that the massive doses of vitamins, anywhere from one hundred and fifty percent to eight thousand percent of the recommended daily allowances, would carry us through to graduation.[99] Though early nutritionists might not recognize the products we consumed, they would easily understand our reasons for eating them.

[98] The first and largest battle between food industry lobbyists and government officials about federal nutritional guidelines occurred after the initial report *Dietary Goals for the United States* from U.S. Senate Select Committee on Nutrition and Human Needs, headed by George McGovern. See Levenstein, *Paradox of Plenty*, 207; Marion Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health* (Berkeley: University of California Press, 2002), 38-42; Michael Pollan, *In Defense of Food: An Eater's Manifesto* (New York: Penguin Books, 2008), 22-25.

[99] "Product Directions," 5-Hour Energy, http://www.5hourenergy.com/healthfacts.asp (accessed May 16, 2012).

Table 1: Recommended Daily Allowances, 1941 and 2011

Age[1]	Calories		Protein (g)		Calcium (mg)		Iron (mg)		Vitamin A (µg)[2]		Thiamin (mg)		Riboflavin (mg)		Niacin (mg)		Vitamin C (mg)	
	1941	2011	1941	2011	1941	2011	1941	2011	1941	2011	1941	2011	1941	2011	1941	2011	1941	2011
Under 1 year	100/ kg	n/a	3-4 /kg	9.1-11	n/a	500	6	6.9	450	400-500	0.4	0.2	0.6	0.3-0.4	4	2-4	30	40-50
1-3 years	1200	1000-1400	40	13	1000	800	7	3	600	300	0.6	0.5	0.9	0.5	6	6	35	14
4-6 years	1600	1400-1600	50	19	1000	800-1100	8	4.1	750	400	0.8	0.6	1.2	0.6	8	8	50	23
7-9 years	2000	1400-1600	60	34	1000	1100	10	4.1	1050	600	1.0	0.9	1.5	0.6	10	8	60	23
10-12 years	2500	1600-2200	70	34	1200	1100	12	5.7-5.9	1350	600	1.2	0.9	1.8	0.9	12	12	75	45
Boys 13-15	3200	2400-2800	85	34-52	1400	1100	15	5.9-7.7	1500	900	1.6	1.2	2.4	0.9-1.3	16	12-16	90	25-45
Girls 13-15	2800	2000	80	34-46	1300	1100	15	5.7-7.9	1500	700	1.4	1.0	2.0	0.9-1.0	14	12-14	80	65
Boys 16-20	3800	2400-2800	100	56	1400	1100	15	7.7	1500	900	2.0	1.2	3.0	1.3	20	16	100	87
Girls 16-20	2400	2000	75	46	1300	1100	15	7.9	1500	700	1.2	1.0	1.8	1.0	12	14	80	65
Adult men	3000	2400-2800	70	56	800	800	12	6	1500	900	1.8	1.2	2.7	1.3	18	16	75	90
Adult women	2500	2000-2400	60	46	800	800	12	8.1	1500	700	1.5	1.1	2.2	1.1	15	14	70	75

[1] 2011 standards for these nutrients are presented in different age groups than the 1941 standards. 2011 standards were condensed to align with 1941 age groups.
[2] 1941 standards originally measured vitamin A in international units (IU); 1941 standards converted to micrograms for ease of comparison. 1 IU = .3 µg.
Sources: "New Dietary Yardstick," *New York Times*, May 26, 1941; U.S. Department of Agriculture, *Dietary Reference Intakes: Recommended Intakes for Individuals* (Washington, D.C.: National Academies Press, 2011), http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=3&tax_subject=256&topic_id=1342&level3_id=5140; U.S. Department of Agriculture and U.S. Department of Health and Human Services, *Dietary Guidelines for Americans 2010* (Washington, D.C.: U.S. Government Printing Office, 2010), http://www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/PolicyDoc/PolicyDoc.pdf; See U.S. Department of Agriculture, *Composition of Foods Raw, Processed, Prepared USDA National Nutrient Database For Standard Reference, Release 20* (Beltsville, MD: Agricultural Research Service, 2008).

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