

# Changing Eating Habits on the Home Front: Lost Lessons from World War II Research

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*Programs intended to improve nutrition often fall short of expectations. One exception, however, occurred during the rationing years of World War II, when U.S. citizens were encouraged to incorporate protein-rich organ meats into their protein-deficient diets. Unfortunately, most of the insights resulting from these efforts remained unpublished or in limited distribution. For the first time, the author synthesizes selected studies from this era according to how the program restructured social norms, changed perceptions of taste, and helped assimilate variety into the U.S. diet. The author discusses the behaviorally driven implications from these “lost lessons” in the context of the empirical contributions they made in defining what makes an unfavorable food acceptable.*

Many programs and campaigns to change eating habits, such as the “Five Fruits and Vegetables a Day,” have met with costly, disappointing, short-term results (see Eldridge et al. 1998). Most recently, even the adoption of healthy or functional foods has been slow because consumers are wary about trying unfamiliar, initially unappealing foods, such as soy (Wansink and Chan 2001). How can healthy functional foods that appear unfamiliar or unappealing be incorporated into mainstream diets and into long-term eating patterns? Recently available World War II research reveals “lost lessons” that can help address this question.

In the years just before and after the U.S. involvement in World War II (1941–45), much domestic meat was being shipped overseas to feed soldiers and allies. There was a resulting concern that a lengthy war would leave the United States protein starved unless a protein substitute could be found (Hoover 1943). The potential solution to this protein shortage lay in what was then called variety meats or organ meats (Guthe and Mead 1943). These consisted of hearts, kidneys, brains, stomachs, intestines, and even the feet, ears, and heads of cows, hogs, sheep, and chickens (Time-Life 1982). The challenge, not surprisingly, was how to encourage depression-era U.S. citizens to incorporate these into their diet (Witkowski 1998). To accomplish this, the Department of Defense enlisted Margaret Mead, Kurt Lewin, and dozens of the brightest, and subsequently most famous, psychologists, sociologists, anthropologists, food scientists, dieticians, and home economists to determine how dietary change could be accomplished.

Because World War II ended four years earlier than was conservatively forecast, many of the resulting recommenda-

tions from more than 200 of these studies were not implemented. Other lessons were lost because the studies quickly became fragmented by limited distribution or government classification. It was not until the electronic Freedom of Information Act was signed into law on October 2, 1996, that many of these mimeographed studies became indexed and available to the public.<sup>1</sup> Although dietary conditions are different, some basic principles that motivated this classified research can be applied today as marketers seek to change lifestyles, food habits, and perceptions of seemingly uncommon but nutritious foods.

In providing a context for this research, I give an overview of the Committee on Food Habits and the philosophy of the two scholars—Margaret Mead and Karl Lewin—behind it. I use the basic idea of reducing consumption barriers prior to providing consumption incentives to frame and integrate selected studies conducted during the war. Last, I discuss the implications these findings have for social science research and for encouraging lifestyle and diet changes.

## World War II and the Committee on Food Habits

In the January 1943 edition of *What's New in Foods and Nutrition*, former President Herbert Hoover addressed the upcoming pressures related to food shortages:

The homemaker controls the food consumption of the people. That problem will loom larger and larger in the United States as the war goes on.... Ships are too scarce to carry much of such supplies from the Southern Hemisphere; our farms are short of labor to care for livestock; and on top of it all we must furnish supplies to the British and Russians. Meats and fats are just as

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<sup>1</sup>Studies can be obtained through written request or by visiting the Army Quartermaster Museum, OQMG USA Quartermaster Center, 1201 22nd Street, Fort Lee, VA 23801-1601, or through the National Research Council of the National Academy of Sciences, 2101 Constitution Ave., NW, Washington, DC 20418. Additional information can be located at [www.foia.state.gov](http://www.foia.state.gov) or by writing the Office of Information Resources Management, A/RPS/IPS (SA-2), Department of State, Washington, DC 20522-6001.

much munitions in this war as are tanks and aeroplanes.... We should not wait for official rationing to begin to conserve. The same spirit in the household that we had in the last war can solve the problem. (Hoover 1943)

This proactive prerationing orientation made a strong distinction between restricted meats (traditional ones such as beef, pork, lamb, and sausage) and nonrestricted meats, including “liver sausage, liver, tongue, hearts, kidneys, sweetbreads, tripe, brains, pork feet, and ox tails” (Willson 1943, p. 38). It also increased the need to help facilitate large-scale changes in consumption behavior (Bentley 1998). Because the physical fitness of the entire population of the country was an important aspect of national security, the question arose as to what could be done to improve the nutritional status of the population.<sup>2</sup>

For this reason, the Committee on Food Habits (1940–47) was established by the National Research Council at the request of the Department of Defense.<sup>3</sup> The purpose of the committee was to identify effective ways of adjusting food habits of the American people (Guthe and Mead 1943). It was to accomplish this through a series of conferences and associated efforts to pool scientific knowledge for the benefit of the government agencies that requested the committee’s assistance and advice (Rizvi 1983).

Because of the need for an integrating framework to understand this research, the prominent anthropologist Margaret Mead was asked to serve as Executive Secretary for the Committee on Food Habits from 1942 to 1945.<sup>4</sup> In this time period, it is estimated that more than 200 studies were directly or indirectly initiated, supported, or endorsed by the Committee on Food Habits (Mead 1945a).<sup>5</sup> Through direct solicitations, interactions with colleagues, and calls for papers, Mead used six basic themes to organize what needed to be understood about food: (1) the problem of food acceptability, (2) food preparation and serving methods, (3) sampling populations for food habit studies, (4) problems in the feeding of army and civilian populations, (5) regional versus national habits and nutrition, and (6) the relation between food consumption habits and nutritional status. These themes were the focus of six conferences that helped generate insights on research methods and on conceptual frame-

works that could help induce long-term changes in eating behavior. Although a wide range of food-related topics was addressed, the topics that are more central to the focus on organ meats are noted in Table 1.

Next to Mead, it is largely recognized that the major contribution from the Committee on Food Habits was made through the influence of Kurt Lewin and his colleagues at the University of Iowa (Rizvi 1983).<sup>6</sup> After becoming a naturalized citizen in 1940, German-born Lewin was quickly given the prerequisite security clearance to consult on a wide spectrum of national problems because of his unique approach to problem solving.<sup>7</sup> Lewin’s basic premise (published posthumously as *Field Theory in Social Science* in 1951) was that all behaviors were determined by a balance of encouraging forces and discouraging forces (barriers and incentives). Whereas most efforts to change eating habits focused exclusively on increasing consumption incentives (eat nutritiously and be patriotic), Lewin believed that the focus instead needed to be on systematically determining what barriers prevented someone from eating organ meats in the first place. By helping reduce the barriers that discouraged the consumption of organ meats, Lewin believed that the preparation and serving habits of the gatekeeping cook could be changed. This jointly held perspective of Mead and Lewin framed the research efforts of the Committee on Food Habits.

## The Importance of Reducing Barriers to Consumption

Before 1942, the focus on changing eating habits had reflected a stimulus–response model of propaganda and nutritional education (Gladston 1941; Sweeny 1942). In contrast, Lewin and Mead believed that consumption barriers first needed to be reduced (disincentives decreased) before people could effectively be encouraged to change their eating habits (Lewin 1943). That is, before giving people nutritional or patriotic reasons they should eat liver, it was important first to remove the reasons they would not. Without removing barriers to consumption, promotional incentives would be wasted (Figure 1).

In reviewing the research sponsored by the Committee on Food Habits, four empirical themes emerge that suggest the fundamental characteristics of an accepted food. To be accepted, a food must be (1) selected, (2) available, (3)

<sup>2</sup>In particular, an appreciable part of the county suffered from malnutrition due to protein deficiencies (Dove 1943). This problem made it important to conduct research and find methods to convert generally unacceptable foods, such as organ meats, into mainstream foods.

<sup>3</sup>The National Research Council was organized by the National Academy of Sciences in 1916 to use the findings from the broad community of science to provide service to the government and to the public. The council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

<sup>4</sup>Mead’s prior work proposes that one way to approach the complexity of food patterns is to study the ways in which good habits are instilled into growing children by their parents. Her studies suggest that foods associated with family experiences tend to be overconsumed or completely rejected for reasons formed during childhood.

<sup>5</sup>Although a significant amount of the money budgeted to the Committee on Food Habits was used to sponsor six conferences, the records do not indicate what level of financial support was received by individual researchers. In addition, there is evidence that there were several studies that were supported or endorsed but were not completed before Mead stepped down as Executive Secretary in 1945 or the committee was disbanded in 1947.

<sup>6</sup>Lewin had a deep influence on students and colleagues who worked closely with him while he was a professor at Stanford (1932), Cornell (1933), University of Iowa (1935–44), and Massachusetts Institute of Technology (1945–47). These include Gordon Allport, Alex Bavelas, Down Cartwright, Morton Deutsch, Leon Festinger, John French Jr., Fritz Heider, Gardner Murphy, John Thibault, and Edward Tolman.

<sup>7</sup>Lewin’s belief that behavior was a purposeful, goal-directed force that was influenced by environmental factors was contrary to prevailing schools of thought (Lewin 1935, 1936, 1938). Although Lewin’s behavioral approach may seem obvious today, most psychologists at that time did not believe in behaviorism but believed instead in psychoanalytic theory. Tolman (1948, p. 4) noted, “In the future history of our psychological era there are two names which, I believe, will stand out above all others: those of Freud and Lewin. Freud will be revered for his first unraveling of the complexities of the individual history, and Lewin for his first envisioning of the dynamic laws according to which individuals behave.”

**Table 1. A Summary of Selected Studies**

Source of Research Study	Study and Original Location
First Session of the Committee on Food Habits: The Problem of Food Acceptability	<ul style="list-style-type: none"> <li>•Campbell (1945), USDA</li> <li>•Howe (1945a), Supreme Headquarters of the Allied Expeditionary Forces</li> </ul>
Second Session of the Committee on Food Habits: Food Preparation and Serving Methods and Their Relation to Food Habits and Nutrition	<ul style="list-style-type: none"> <li>•Bollman (1945), Office of the Quartermaster General</li> <li>•Dickens (1945), Mississippi Experiment Station, Starkville</li> <li>•Fenton (1945), Cornell University</li> </ul>
Third Session of the Committee on Food Habits: Sampling Populations for Food Habit Studies	<ul style="list-style-type: none"> <li>•King (1945), Iowa State University</li> <li>•Roper (1945), New York</li> </ul>
Fourth Session of the Committee on Food Habits: Problems in the Feeding of Army and Civilian Populations	<ul style="list-style-type: none"> <li>•Howe (1945b), Supreme Headquarters of the Allied Expeditionary Forces</li> </ul>
Fifth Session of the Committee on Food Habits: Regional Versus National Food Habits and Nutrition	<ul style="list-style-type: none"> <li>•Cummings (1945), University of California, Los Angeles</li> <li>•Eppright (1945), Iowa State University</li> <li>•Kennedy (1945), University of California, Berkeley</li> <li>•Kuschke (1945), Rhode Island State Experiment Station, Kingston</li> <li>•Leverton (1945), University of Nebraska</li> <li>•Mead (1945a), New York</li> <li>•Moser (1945), University of South Carolina</li> </ul>
Sixth Session of the Committee on Food Habits: The Relation Between Food Consumption Habits and Nutritional Status	<ul style="list-style-type: none"> <li>•Abbott (1945), University of Florida</li> <li>•Darby (1945), Vanderbilt University</li> <li>•Mack (1945), Pennsylvania State University</li> <li>•Mead (1945b), University of Oregon</li> </ul>
Quartermaster Food and Container Institute for the Armed Forces (Chicago)	<ul style="list-style-type: none"> <li>•Dove (1943)</li> <li>•Gelman and Lawrence (1945)</li> </ul>
Office of the Quartermaster General (Washington, DC)	<ul style="list-style-type: none"> <li>•Raub (1943)</li> </ul>
Bulletin of the National Research Council (Washington, DC)	<ul style="list-style-type: none"> <li>•Guthe and Mead (1943)</li> <li>•Lewin (1943)</li> </ul>

familiar, and (4) exactly as expected (i.e., SAFE). In its most basic form, an acceptable food must taste good; must be available; must be familiar; and must look, taste, and feel as expected. These empirical findings helped provide practical recommendations that were desired by the Committee on Food Habits. What they also suggested, however, were larger issues—social norms, perceptions of taste, and assimilation of variety—that influenced human behavior. These three concepts provide the organizing structure for the discussion on reducing barriers to food preparation and acceptance.

### Reducing Barriers to Food Preparation and Acceptance

Gatekeepers control food through different channels (such as the garden, store, and pantry), and they play a central role in regulating consumption and dietary health. Yet it was typically believed that the “man of the house” determined what was eaten on the basis of his preference for the food (Witkowski and Hogan 1999). Lewin’s (1943) contrarian hypothesis was that when food appeared on the table, it was often eaten despite a husband’s preference. This was con-

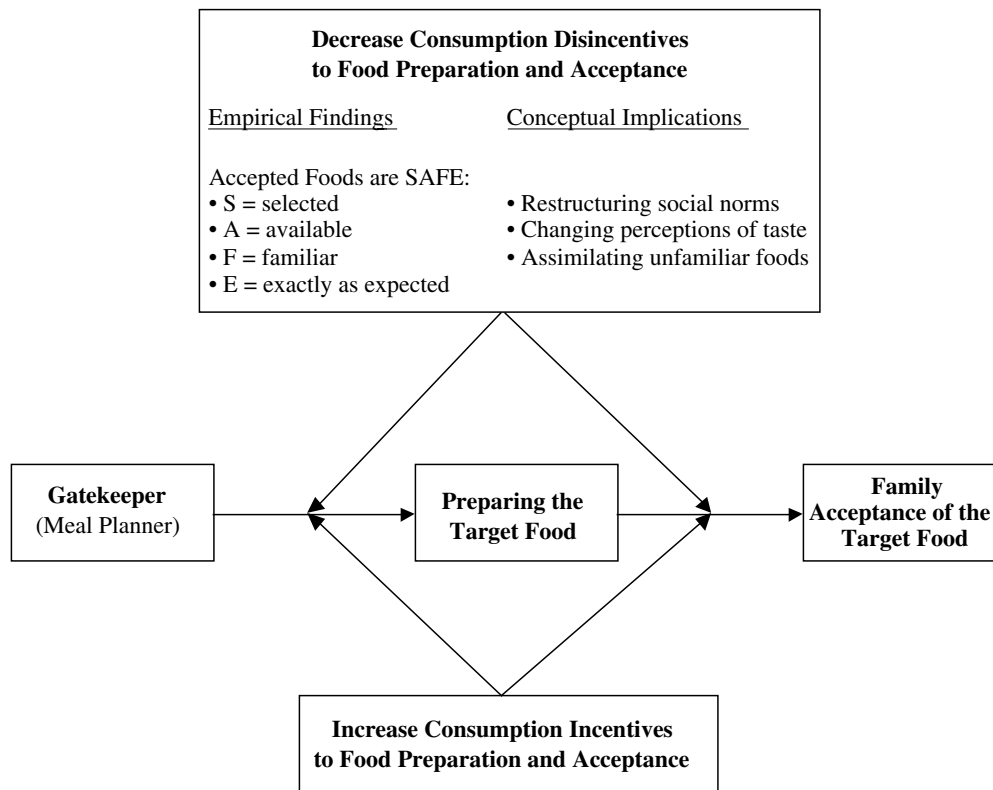
firmed in a national survey that indicated that husbands and children frequently ate what was prepared for them and voiced only strong opposition when the meals became too novel or different (Mead 1943a). This insight provided a useful focus to the challenge of changing food habits. The effort to change food habits should not be broadly aimed at children or husbands. Instead, initial efforts should be confidently aimed at the gatekeeper—the cook—who selects, purchases, prepares, and serves the food.

Interviews and observations of these gatekeepers indicated that key barriers to their buying and preparing organ meats centered around not thinking it was appropriate for them, not thinking it would taste good, and not knowing how to introduce it into meals (Radke and Klisurich 1947). These three areas were addressed in research that focused on restructuring social norms, changing perceptions of taste, and increasing the assimilation of unfamiliar foods.

### Restructuring Social Norms

One factor that inhibited organ meat consumption was that many people perceived organ meats as food that was not appropriate for someone like themselves to eat. Some per-

Figure 1. A Gatekeeper-Focused Framework of Food Acceptance



ceived organ meats as useless parts of livestock to be discarded, and others perceived them as appropriate only for rural families or for lower socioeconomic groups.

In an important study in this area, Kennedy (1945) discovered that people distinctly have categories of food that they perceive as “food for us” versus food that is appropriate for others (such as lutefisk or collards) or for animals (such as peanuts and cottage cheese for swine and corn for cattle). Yet she found that many now common food crops were widely introduced in California in the 1940s because of the Mexicans, Chinese, and Armenians who lived there. Before then, most ethnic groups did not eat foods outside their cultural food patterns unless they were repeatedly exposed to it across various occasions.

Although restructuring social norms is important when encouraging family acceptance at the dinner table, the strongest norm at the dinner table was found to be the example set by role models (Howe 1945a). That is, people’s food choices are influenced to a greater degree when certain foods are eaten by people in their primary reference groups (groups to which the person has strong emotional ties and frequent personal interactions) rather than by subordinate reference groups. For example, families influence food habits and food acceptance to a great degree during childhood (Howe 1945b). Social norms to eat organ meats were dramatically influenced by the mere presence of these foods on the family dinner table.

The power of parents in establishing social norms was noted in observations of eating habits in the South. People

born and raised in the South are more likely to eat foods high in fat content, because many southern families pass the tradition of deep-fried cooking from one generation to the next (Cummings 1945). Just as habits of regional cooking can be generationally transferred, the incorporation of organ meats into a person’s diet may have been part of a multi-generation process (Mead 1945a). Indeed, even though adult consumers were not particularly fond of organ meats, interviews and surveys indicated that they were more likely to incorporate organ meats into their diets as adults if they had been served them as children (Dickens 1945).

Foods also became more of a social norm when they were aligned with the patriotic obligation to “do one’s part for the war effort.” As such, organ meats soon became foods that “patriots” ate, not necessarily foods that “poor people” ate. With this patriotic positioning, there was less of a fear of deaspirational associations (Festinger 1942) and dissonance (Festinger 1957). Note that there was an attribution-related concern that when the war was over, these foods would no longer be eaten, because people believed “I ate them for the war effort” instead of believing “I ate them because they are good for me.” Heider’s (1958) indirect involvement with this project led him to write *The Psychology of Interpersonal Relationships*, which played a central role in the origination and definition of attribution theory.

The war effort helped make organ meats more socially acceptable. Consuming organ meats was one way of showing support for the war effort on the home front. As a result, there was a suspension of grumbling, because to do so



would be to minimize the greater sacrifices being made by others. Although Sherif had initially advanced the theory of social norms in 1936, the establishment of the social norms regarding organ meat consumption and the nearly immediate reversal of them when veterans returned from the war led him to point out subsequently how fragile social norms were (Sherif and Sherif 1956).

### **Changing Perceptions of Taste**

One of the biggest barriers to consumer acceptance of organ meats was the perception that they taste unacceptable. Recall the acronym SAFE (Figure 1). Two factors that influence a food's acceptability are whether it tastes good enough to be selected and whether it is served in a familiar form. Unfortunately, neither the flavor, the appearance, nor the texture was familiar. Masking the taste with sauces, surrounding flavors, and side dishes was one solution, yet studies found three drivers of taste that could be more directly influenced.

#### ***Familiar Preparation Influences Taste***

Food preparation and serving methods can influence the acceptability of unfamiliar, even unpopular, food items. Organ meats, especially liver entrées, were incorporated most successfully into wartime diets by encouraging similar preparation and serving methods to that of regular meats. This was discovered by Bollman (1945), who manipulated the food service in army mess halls in cooperation with the Subsistence Division of the Quartermaster Corps. Bollman conducted the initial studies in this area with common, inexpensive vegetables and found that the soldiers did not eat cabbage that was prepared differently from the ways they expected other vegetables to be prepared. Instead, soldiers were more likely to eat food, whether familiar or unfamiliar, when it was prepared similar to their prior experiences and served in a familiar fashion. This was found to be consistent across both cooked vegetables and organ meats.

An unexpected finding when studying food preparation was that it also had an impact on nutrition. As Bollman (1945) was conducting studies on food acceptance, Fenton (1945) investigated how food preparation influences palatability and vitamin retention. In Fenton's test, vegetables served in five army mess halls were prepared using different proportions of water to vegetables and using different lengths of cooking time. In addition to responses from the soldiers in the mess halls, panels of five to ten judges tasted the food and completed surveys regarding their preference for the food. Longer cooking time resulted in the gradual loss of palatability and vitamins. Again, this was a case in which findings related to vegetables were directly applicable to organ meats. As a result of Fenton's study, various organ meat recipes were designed for optimum palatability and vitamin retention. These recipes and cooking tips were commonly found where organ meats were sold. Using these recipes helped create a familiar taste that increased palatability and retained vitamins.

#### ***Familiar Appearance Influences Taste***

Important work regarding preservatives indicated that making organ meats look familiar (through their cuts, shapes, and packaging) influenced perceptions of taste. This insight

was found in examinations of what made preserved foods most acceptable. At the beginning of World War II, there was a need for canned meats that tasted like fresh meat (Wyman 1999), for powdered milk that reconstituted to taste like fresh whole milk, and for preserved bread that tasted like fresh bread (Gelman and Lawrence 1945). The government pushed food companies to preserve foods to resemble fresh foods. Because they looked and tasted fresh, people then believed that they must be safe and that preservatives were not harmful (Patten 1998).

Because of this work, initial efforts introduced some organ meats as filler in ground beef and sausages. In both ground meat and sausage forms, replacing existing meat with organ meats was accepted, because it did not cause the meat to look different than expected.

#### ***Taste Dominance Within a Taste Portfolio***

Given that one way to introduce unfamiliar foods is to combine them with existing foods, an important question is, What dominates people's evaluations or assessments of a full-plate meal? Do unfamiliar foods drive these evaluations, or do familiar, favorable foods?

To answer this, Peryam and colleagues (1960) altered the favorability (favorable versus unfavorable) and the form (main dish versus side dish) of various hot lunches in Iowa high schools in 1943. The study shows that high favorability for a main dish causes less variation in the evaluation of the meal (regardless of the favorability of the side dishes). Low favorability for the main dish, however, makes side dishes important in people's evaluations of the meal. The implications for organ meats would be to prepare highly palatable main dishes while incorporating organ meats into the side dishes until organ meats became more preferred and widely accepted.

Though related to taste, these studies influenced a broader set of research related to how subjective beliefs and perceptions—not objective reality—influence attitudes and behavior. In studies at the University of Illinois, Fishbein and Ajzen (1975) used examples from this context to show that subjective beliefs influenced attitudes. They extended this to show that these attitudes are combined with social norms to determine whether a person will eat a new or unfamiliar food such as an organ meat (Ajzen and Fishbein 1980).

#### **Assimilating Unfamiliar Foods**

As the availability of restricted meat (beef, pork, and lamb) decreased at the butcher shop, the availability of organ meats increased. This increased availability stimulated perceptions of organ meat acceptability and increased the willingness of gatekeepers to experiment with these meats (Cummings 1945). When first learning how to prepare organ meats, gatekeepers were encouraged to prepare and serve them in the manner consistent with typical expectations for meat (Raub 1943). One of the best ways to present this food was to position it in combination with familiar foods and prepare it in a manner similar to how favored meats were prepared (Willson 1943). Consider the following excerpt from a 1943 article titled "Share the Meat":

There are so many ways to serve the variety meats, along or in combination with other foods, that they will be a boon in supplementing the rationed meats. Every husband will cheer for

steak and kidney pie. Liver may be a problem with the children which can be solved by liver loaf—and so may the lunch-box meal. Baked stuffed hearts are as attractive as they are appetizing. Brains and sweetbreads delight the epicure. Ox tail soup satisfies hearty appetites. (Willson 1943, p. 38)

Early programs for integrating alternative protein sources were nearly always focused on only one type of organ meat. These “all-or-nothing” programs neglected to incorporate variety (Guthe and Mead 1945) and led to low levels of adoption (Gelman and Lawrence 1945). Bollman (1945) was commissioned to understand better unfamiliar food acceptance by investigating the role of variety. In a study of U.S. soldiers, Bollman found that high levels of variety helped increase food acceptance and adoption.

Using pork roast in several army mess halls, Bollman (1945) discovered that the pork roast became objectionable when it was served too often—even when different preparation methods were alternated. Yet when a variety of other foods was served throughout the week, pork roast was rated as much more favorable. To investigate the necessity for variety further, Mead (1945b) investigated flexible adjustment programs—programs that consist of a variety of food alternatives. On the basis of classic animal studies by Festinger (1943), Mead found that programs that offered variety were more successful in achieving long-term change than were programs that offered less variety. Organ meats were then promoted by increasing the variety of options, thereby preventing monotony and a lack of food selection.

The important insight was that gradually introducing unfamiliar foods into the diet helped make the foods more acceptable because they were then viewed as something novel, not as long-term substitutes. Introducing a rotation of variety meats into occasional meals (instead of in every meal) was the most successful approach because of the gradual acclimation it allowed.

Although this research focused on food, it had an unexpected impact on the development of social judgment theory, specifically assimilation–contrast theory (Sherif and Hovland 1961). Although people refused to make dramatic changes in their dietary patterns—such as eating organ meats multiple times each week—they were more amenable to eating them in a less frequent manner that contrasted less with their existing eating patterns. An insistence on an all-or-nothing adoption of a new behavior or belief was found to be less effective than encouraging one that was more moderate.

## Increasing the Incentives to Consume

Whereas the focus on reducing consumption barriers characterized the majority of the research during the war years of the 1940s, attention was also given to increasing the incentives to consume organ meats. Early efforts in this area were directed at understanding the motivation behind food consumption. The key concern was that nutritional knowledge does not dictate behavior. Knowing that a food is nutritionally beneficial did not often lead to long-term adoption (Wansink and Chan 2000, 2001).

To understand this link between nutritional knowledge and behavior better, Mead (1943b) proposed a campaign that asked consumers to be responsible and intelligent in using science to increase their ability to function in society.

Because people were already supportive of war efforts, they were predisposed toward seeing how scientific findings could enhance their welfare. They then perceived the resulting change in their behavior as voluntary rather than forced (Mack 1945).

When focusing on how to better educate and persuade gatekeepers, the most notable studies compared discussions with lectures. In the initial study that sparked many others throughout the war, Lewin (1943) investigated two methods of learning by offering various groups of Iowa housewives pediatric information about the nutritional merits of incorporating an unusual additive into their infant formula. Some of these groups of housewives were informed using a discussion–decision method, whereas others were informed using a lecture method. It was found that the groups informed by the discussion–decision method were three times more likely to consider and adopt infant formula. Given the success of this study, Lewin (1951) then went on to examine these two education methods in the context of organ meat adoption, in which the discussion–decision method tended to generate nearly five times the level of trial as the lecture method.

Although much of this research was focused on gatekeepers, Radke and Caso (1948) showed that it could also be used on a broader level. They tested the effectiveness of the two educational methods among 850 children from Weeks Junior High School in Newton, Mass. Although both methods were initially successful in encouraging children to choose nutritionally adequate lunches, only the discussion–decision method generated lasting results. Radke and Caso concluded that this method encourages long-term change because it involves active behavior and public commitment compared with the passive decisions made by the lecture group (Abbott 1945). Passive decisions have less emphasis on the behavioral reinforcements that bring about long-term change (Frank 1944).

The long-term acceptance of organ meats was facilitated when people who made a personal commitment to eat organ meats were publicly and socially reinforced for their behavior. The government publicly reinforced organ meat consumption through rationing and advertising messages, and societal reinforcement was achieved through organ meat availability at the butcher shop and the support of the war efforts.

The basic approach of requesting people to change their behavior versus helping them conclude this for themselves is now more commonly understood. Reactance theory (Brehm 1966) was one of the related theories that developed as a result of Lewin’s studies in this area. Although Lewin did not live long enough to pass his insights down to Brehm personally, one of Lewin’s protégés, Leon Festinger, did so when he was Brehm’s doctoral adviser. The work on reactance theory eventually led Jack Brehm and one of his students, Robert Wickland, to use the findings of Lewin when eventually addressing issues of attribution theory in group situations (Wickland and Brehm 1976).

## The Impact of “Lost Lessons” on the Social Sciences

Before 1942, many attempts to change food habits were focused on increasing consumption incentives by emphasizing

ing nutritional benefits, patriotism, guilt, or duty. Mead's and Lewin's research perspectives changed this by emphasizing that the barriers to consumption needed to be removed from both the gatekeeper and the family members before consumption incentives would be effective.

Fortunately, the war in Europe and in the Pacific ended before protein shortages became serious. By 1946, most rationing in the United States had been lifted and soldiers were returning home. As a result, many of the findings that had been successfully field-tested a year earlier were now shelved as prosperity returned to the nation.

Other findings, however, successfully generated unexpected nutrition-related benefits for postwar expansion. For example, understanding the negative impact that geographic isolation and dietary homogeneity had on nutrition stimulated programs that dramatically improved the nutrition in places such as rural South Carolina.<sup>8</sup> Similarly, regional studies conducted in California (Kennedy 1945), Tennessee (Darby 1945), Nebraska (Levertson 1945), Oregon (Mead 1945b), Texas (Eppright 1945), and Rhode Island (Kushke 1945) helped expand basic notions of how barriers of geography, mobility, and poverty could be overcome at that time. This work became the foundation of what would later lead to developments in segmentation analysis.

In addition to food-related insights, some of the necessary methodological research that was conducted in the war years provided insights in areas of sampling (Roper 1945), questionnaire design (King 1945), measurement (see Mead 1945c), and panel interviews (Campbell 1945). Some of these methodological insights appear obvious today (e.g., telephone sampling yields a bias toward wealthier households), yet they were important steps that helped the social sciences progress (Sudman and Wansink 2002).

Although many of the findings from these studies were never published in journals or widely distributed, some still affect social science theories directly, indirectly, or anonymously. For some scholars, the insights they gained doing these studies motivated post-World War II studies that either built on these findings or generalized them to broader contexts. Some notable theories of social science, such as social norm theory (Sherif and Sherif 1956), assimilation-contrast theory (Sherif and Hovland 1961), cognitive dissonance theory (Festinger 1957), attribution theory (Heider 1958), reactance theory (Brehm 1966), and the theory of reasoned action (Fishbein and Ajzen 1975), cited subsequent work conducted by the researchers who were associated with the Committee on Food Habits.

The task-specific nature and immediacy of this research during World War II led to many empirical contributions. In reviewing these findings, several important conceptual questions are raised that could be addressed today: How

does reframing or relabeling a product (organ meats versus variety meats or soy versus vegetable protein) influence perceptions of its taste? What is the mechanism through which variety makes a product acceptable, and is the same effect found within meals as across meals? Does the lecture method work best because of personal public commitment, social norm effects, or higher levels of involved processing? After 60 years, these findings still provide rich opportunity for theoretical study, and the implications of such research would have important implications for dietary change (Rozin 1990, 1991).

## Implications for Encouraging Dietary Change

The work of the Committee on Food Habits emphasized the importance of removing barriers to consumption before trying to change food habits. Since then, however, many researchers have ignored this approach and returned to incentive-oriented persuasion. Much research in nutrition education, for example, focuses on increasing awareness and comparing the effectiveness of different message strategies (see Logue 1991). Yet any efforts to increase consumption incentives will be compromised if they are not preceded by efforts to reduce consumption barriers (Nestle et al. 1998).

Consider the problem of weight control and the concern that the long-term maintenance of dietary regimens may be as low as 20% (Klein et al. 1997). Some of the basic insights from 60 years ago—restructuring social norms, changing perceptions of taste, and assimilating unfamiliar food—can be used today by institutions, public policy officials, and individuals to reduce the structural and psychological barriers that interfere with weight control (Brownell 1991; Brownell and Rodin 1994). For example, insights on how to assimilate unfamiliar foods would be useful to health professionals or marketers of nutritious, functional foods who want to help consumers replace less nutritious foods with more nutritious foods. Assuming that the healthy food is widely available,<sup>9</sup> this could include substituting high-fat foods with low-fat foods, substituting sweet snacks with fruit, substituting starches with vegetables, or substituting meat protein with soy protein (Wansink and Ray 1996).

With healthy products, the goals would be to try to make them seem more similar to the product to be replaced on dimensions such as palatability, texture, and flavor (Wansink 1994). The taste of low-fat products can be improved by making their appearance and taste match that of favored products. Along those same lines, taste and packaging can create a sense of familiarity. For example, the brand Tofutti has a wide range of soy-based frozen desserts that look and taste similar to traditional frozen desserts. In this case, consumers perceive soy ice cream as an acceptable

<sup>8</sup>In Moser's (1945) study of rural South Carolina and Nebraska, he found that typical diets in rural South Carolina in 1945 did not provide enough nutrients for children to develop properly. People in South Carolina had poor nutritional habits because of geographic isolation and homogeneous food traditions. In contrast, families in Nebraska had never been geographically isolated and had developed adaptive food habits. Furthermore, heterogeneous ethnic backgrounds created a variety of food habits in Nebraska, leading to versatility in home production, food abundance, and consideration sets.

<sup>9</sup>The importance of availability cannot be overlooked. By increasing the number of available fruits and by reducing prices 50%, almost a threefold increase in salad and fruit purchasing was observed (Jeffery et al. 1994). In the same way, changing the price of low-fat items in vending machines almost doubled their selection (from 26% of purchases to 46% of purchases).



substitute for ice cream because it has a similar appearance, texture, and package.

## Conclusion

Efforts to fully implement a wide-scale program to promote organ meat consumption were interrupted by the end of World War II and by the beginning of unparalleled domestic prosperity. As the war ended, the organ meat research became fragmented because of limited distribution. Although the lost lessons were used to enhance protein-deficient diets during the war, the lessons can be applicable today to public policy efforts, the marketing of nutritional products, and individuals' attempts to change their lifestyle.

The long-term impact of some of these insights was underscored nearly 20 years later in one of Mead's (1964) last writings on the topic, when she noted that this research during the war years stimulated the understanding of nutrition and research in ways that cannot be fairly or fully articulated. The studies may have begun with a focus on domestic welfare and nutrition, but they soon helped reverse malnutrition and starvation in the postwar reconstruction of Germany, France, England, Belgium, Russia, Japan, and the Netherlands. Twenty years after the war, Mead (1964) contended that the behavioral insights that were learned from this research ended up driving food distribution programs and activities for many of the large food aid organizations.

Although some of the studies conducted have recently been made available, the majority of them are only referenced or footnoted in yellowed reports to the Defense Department. It is likely that the best assessment of the full impact of the contributions was lost with the passing of Kurt Lewin in 1947 and of Margaret Mead in 1978.

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