HISTORY AND ANALYSIS OF

FOOD GUIDES IN THE UNITED STATES

by

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ABSTRACT

HISTORY AND ANALYSIS OF
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This work elucidates the development of nutrient-based dietary standards in the United States from the original energy and protein-based standards proposed by Atwater in 1894 to the micronutrient-based Recommended Dietary Allowances revised by the National Research Council in 1989. This qualitative historical research chronicles the development and subsequent revisions of nutrient-based food guides and food guidance models issued in the United States between 1916 and 1991. A literature search of historical food guides, research, and review papers from the fields of nutrition science and education, dietetics, and health science provided primary sources of information for the history. A literature search of Federal legislation and supportive articles in the field of economics and social sciences provided primary as well as secondary sources of information. Interviews with nine expert nutrition educators and authors provided additional primary and secondary sources of information and insight on food

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guidance, nutrition education, and Federal nutrition and food policies. Content analysis and analytical induction of this information was used to provide a comprehensive understanding of the food guides and to generate a theoretical framework for the assumptions, stated and implicit, which underlie the nutrient recommendations and the development and revision of food guides in the United States. An understanding of former food guides can lead to the development of a valid, reliable food guide model and subsequent comprehensive food guidance systems which can direct development of national food and nutrition policies.

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TABLE OF CONTENTS

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Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

LIST OF TABLES

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LIST OF FIGURES

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CHAPTER 1

CHOOSING AN ADEQUATE DIET

Introduction

How do Americans choose what to eat? Are choices made on the basis of tradition or habit? Are choices made on the basis of flavor, aroma, and visual appeal? Is actual food cost or relative convenience of preparation and disposal the basis for choosing foods? Are choices made on the basis of the availability of raw ingredients in the local marketplace? Do food manufacturers and advertisers influence food purchases in target audiences? Does the perceived health value of the food influence food selection? How do food service managers choose which foods to include in the school lunch menus or the congregate meal service menus for the elderly? How do governmental agencies choose which foods to distribute to School Lunch Programs (PL 79-396), the Women Infants and Children Program (Section 17, USC 1766), and the Nutrition Programs for the Elderly (PL 92- 258)? How do nutrition educators choose which individual foods or groups of foods to advise or dissuade in nutrition education curricula? How do elementary school teachers choose a curriculum to use in their classes?

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Nutrition, from the Scientific to the Practical

The science of nutrition, including nutrient requirements and food analyses, has evolved rapidly during the past century, from the kilocalorie and nitrogen-based dietary recommendations proposed by Atwater (1894a; 1895; 1910) to the nutrient-based dietary standards first developed in 1941 and revised every five years by the National Research Council of the National Academy of Sciences (Pett, 1945; Miller, 1968; Hegstead, 1975; Light, 1981; National Research Council [NRC], 1989). Nutrition educators and governmental agencies have developed a variety of food guides and food guidance systems to translate these nutrient requirements and dietary standards into practical, regionally-available food groupings and recommendations (Hill, 1970; Hertzler, 1974; Light, 1981; Haughton, 1987). The purposes of food guides are to assist health and nutrition professionals plan adequate diets for specified population groups and to assist health professionals evaluate the dietary intakes of individuals and larger population groups (Hill, 1970; Hegstead, 1975; Cronin, 1987; Haughton, 1987). A third major purpose of these nutrient-based food guides is to serve as a tool for nutrition educators in teaching individuals how to choose a nutritious and adequate diet. As new guides have been proposed and implemented since 1916, the rationale for the development and content of former guides has been forgotten.

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Objectives and Purpose

This historical research project chronicles the development and revision of food guides and models in the United States and focuses on the following questions:

1. What are the scientific assumptions underlying the nutrition recommendations of each of the food guides?
2. What assumptions, stated and implicit, underlie the development and subsequent modification of the food guides and food guidance models?

The purpose of this research is to broaden the understanding of the development and content of the various food guides proposed and implemented in the United States, to identify their nutritional objectives, political and economic underpinnings and assumptions, and to anticipate the future of national food guides, food guidance systems, and Federal food and nutrition policy.

History illuminates the past, gives perspective and depth to the present, and provides direction for future progress (Means, 1962). Recorded history serves as a measure to judge and perhaps clarify current achievements. Historical research relies on the systematic collection and critical evaluation of data to understand the implications of past events and anticipate or redirect future events and policies.

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Procedure

Data for this historical research has been collected from primary as well as secondary sources. The literature search provided written data of primary as well as secondary sources of information. Primary literature sources included original documents identifying the nutrient content of foods published by Atwater in 1894 and food guides dating from the first nutrient-based food guide developed by the United States Department of Agriculture in 1916 (Hunt), forward to the 1991 "Eating Right Food Pyramid" proposed by nutritionists at the USDA (Sugarman, 1991a). A branching literature review included secondary sources of information, review papers, empirical nutrition research, records of Federal legislation, and articles and chapters in history, agriculture, economics, and social sciences.

Telephone and personal interviews with nine nutrition and nutrition education experts provided additional primary sources of information. Individuals were chosen who had written textbooks, published in professional nutrition journals during the 1980s, or who had been working on the development or evaluation of food guides.

This historical research project will broaden the understanding of the various food guides and models, their development, nutritional objectives, and political and economic underpinnings.

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CHAPTER 2

THE EMPIRICAL TO THE PRACTICAL

Dietary Standards, Dietary Allowances, and Food Guides

Food Folklore in Food Guidance

Man was at first a hunter and gatherer of food who ate whatever palatable animal and plant matter he found in his environment, and relocated whenever necessary to satisfy his appetite. As man learned techniques of animal husbandry, collected and gathered seeds, and developed tools, he learned how to sustain a population in a permanent location. He then consumed what could be produced and preserved in his environment. Cultures and food traditions evolved from these permanent societies (McCollum, 1957).

Dr. E. V. McCollum, an American chemist and one of the early nutrition scientists and educators of the 20th century (Todhunter, 1957; 1979), recounted prescientific food folklore in A History of Nutrition (1957). These earliest dietary recommendations were often taboos, based on fears or religious beliefs. Soldiers in Madagascar could not eat the flesh of the hedgehog. Since this animal coils into a ball when attacked or alarmed as a defensive strategy, these soldiers feared that eating hedgehog would transfer a shrinking or cowardly disposition to anyone eating the flesh

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of this small animal. Such cowardice would incapacitate the soldier and render him incapable of initiating or participating in any offensive action. Other food taboos were based on beliefs in mystical influences. Roots, herbs, fruits, and leaves were often stirred into secret potions. The emetic or cathartic properties of such potions were thought to expel offending evils (McCollum, 1957).

Early Biblical dietary proscriptions included the prohibition of eating animals with cloven hoofs or fishes without fins. These Biblical allusions to food and drink often involved celebrations or implied symbolism (McCollum, 1957). The ancient Greeks observed that some foods possessed medicinal properties. Wise Greek physicians recommended the use of psyllium seed for the relief of constipation. Psyllium is used in contemporary medicine as a laxative and is used also by a food manufacturer as an ingredient in a high-fiber cereal. Cato lauded the use of cabbage as a restorer and preserver of health (McCollum, 1957). Today the American Cancer Society recommends eating cruciferous vegetables such as cabbage to protect against certain types of cancers (National Academy of Sciences [NAS], 1982).

Moderation in food and beverage was advised by Socrates and by Hippocrates, the Father of Medicine. Socrates advised his pupils to eat only when hungry, drink only when thirsty, and to leave the table before completely satisfied.

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Hippocrates taught there was only one "ultimate principle" in food. This single-substance concept remained unchallenged until 1834, when the albuminous materials (proteins) as well as carbon-containing substances (carbohydrates) were identified in foodstuffs (Todhunter, 1957). Hippocrates prescribed a variety of specific dietary restrictions as a component of therapeutic regimens. The Father of Medicine stated that cheese "heated" other foods and therefore caused indigestion. He recommended emesis with the herb hellebore to treat diarrhea; ingestion of a concoction of wheat, lentils, and bread boiled with fish to treat "hot intestines." Linseed, beans, millet, and barley mush were his favorite prescriptions for the treatment of dysentery. Medical historians generally agree that Hippocrates had little understanding of the science of nutrition and the nutritive value of foods (McCollum, 1957, p. 7).

Farmers of antiquity observed that altering livestock feed affected the rate of growth, quantity of milk production, and richness of the milk in their animals. Domestic animals were noted to thrive on green herbage rather than dried forage; grass was superior to straw as a feed. Feeding animals a diet rich in a variety of green vegetation helped assure that livestock would bear healthier young, produce richer milk, and would develop more musculature (McCollum, 1957).

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Early Dietary Standards

Dietary advice and food guidance should be grounded in the science of nutrition. Nutrition is the study of food composition; the nutrients and other substances in foodstuffs; the action, interaction, and balance of these components in relation to health and disease; and the processes by which the organism ingests, digests, absorbs, transports, utilizes, and excretes food substances (Hegarty, 1988, p. 12). The science of nutrition includes the interaction of physiology and dietary requirements, as well as the investigations of the chemical composition of nutrients and foods (Atwater, 1894a; Pett, 1945; Harper, 1985).

Dietary standards are quantitative recommendations based on known requirements for energy (kilocalories) and essential nutrients (Leitch, 1942; Pett, 1945; Hegstead, 1975; Harper, 1985). These standards are based on scientific assessments of the quantity and the quality of nutrients which promote growth and maintain health (Roberts, 1958). Nutrients are classified as macronutrients (carbohydrates, fats, and protein), micronutrients (vitamins and minerals), and water. Carbohydrates, fats, and proteins produce heat and energy when metabolized. This energy is measured in kilocalories. Carbohydrates are the primary source of energy for all cells. Fats are a more concentrated source of energy, yielding more than twice the

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number of kilocalories as proteins and carbohydrates on a per weight basis. Excess kilocalories can be stored as adipose tissue which can then be used during energy deprivation. Adipose tissue also serves as a cushion for the vital internal organs.

Proteins are used primarily as building blocks for cells and enzyme (body-regulating) systems. Proteins can also be used as an energy source during periods of energy deprivation or are deaminated and converted into adipose tissue during periods of excess caloric intake.

Vitamins are essential organic nutrients which are used as chemical catalysts in fundamental functions of the body, including energy production, anabolism (growth), tissue replenishment, and catabolism (tissue depletion). Minerals are inorganic elements which provide a variety of functions, including promoting normal cellular activity, regulating osmotic pressure of body fluids, forming structural integrity of teeth and bones, and regulating enzyme activity (Hunt & Groff, 1990). Vitamins, minerals, and water do not yield any energy when utilized by the body and therefore are not a source of kilocalories.

Hegstead (1975) stated the two primary uses of dietary standards are as (a) tools for planning menus and the food supplies of populations and as (b) guides for evaluating the nutritional adequacy of the food diaries recorded during food consumption surveys. Roberts (1958) stated that

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dietary standards have been used as a yardstick for feeding the army, as a framework for stimulating further nutrition research, and "...as official guides in practically all nutritional enterprises in this country" (p. 907).

Energy Requirements as Dietary Standards

In 1835, the British Parliament passed the Merchant Seaman's Act (Leitch, 1942). This law mandated that lemon juice must be included in the rations of all merchant marine sailors. The compulsory ration was prescribed to prevent scurvy among the merchant seamen. The Royal Navy had successfully added lemon juice to its sailors' rations 30 years earlier (McCollum, 1957). The dietary prescription was based on clinical observations of the "sailors' disease" and the results of the first scientific nutrition experiments reported in Lind's 1753 Treatise on Scurvy. Lind demonstrated that specific foods, including limes and lemons, would cure the skin lesions afflicting sailors who had been consuming limited sea rations (Leitch, 1942). The actual anti-scurvy nutrient, Vitamin C or ascorbic acid, was not identified until 1935, one century after the passage of the British law (Jaffe, 1984). Leitch (1942) credits the Seaman's Act as the first formal dietary standard. However, the Seaman's Act was a recommendation for food intake, that is lemons and limes, rather than a dietary standard established for a known nutrient.

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Harper (1985) credits the Dutch physician Gerrit Jan Mulder with establishing the first *quantitative* dietary standard in 1847. Mulder surveyed eating habits of Dutch soldiers, tabulating the quantity and quality of army rations (Todhunter, 1954). The survey results were generalized to establish nitrogen and energy requirements for adult men performing physical labor and to develop dietary recommendations which would prevent starvation or debility in the general population. Mulder recommended 60 grams of nitrogen-containing foodstuffs daily for a sedentary person and 100 grams of nitrogen-containing foodstuffs for a laborer. Mulder expressed his standard in grams of nitrogen, because the chemical composition of amino acids and proteins had not yet been elucidated at the time of his first survey (Todhunter, 1954). As a professor of chemistry at Utrecht, Mulder calculated the correct formula for the amino acids leucine and glycine (Todhunter, 1954). In 1838, Mulder introduced the term "protein" for these nitrogen-containing compounds which were necessary "for life." Although Mulder's concept of protein composition was imperfect, he did demonstrate that "albuminous substances" (amino acids, the building blocks of proteins) contained 16% nitrogen (Pett, 1945). Mulder and other 19th century investigators believed nitrogen-containing foods fueled muscular activity, and therefore nitrogen requirements differed between persons on the basis of total physical

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activity, or the number of muscles used for any given activity (Leitch, 1942; Harper, 1985). Protein recommendations are no longer correlated with muscular activity, but are age and gender specific (Roberts, 1958; NRC, 1989) and are expressed in grams of protein rather than grams of nitrogen.

In 1892, the British Privy Council commissioned physician Edward Smith to develop a *quantitative* dietary standard for Great Britain (Hegstead, 1975; Harper, 1985). The expressed purposes for Smith's work were to determine energy requirements, recommend minimal food intakes, determine what kind of diet would maintain life at the lowest cost possible and therefore prevent starvation among the unemployed British cotton factory workers (Leitch, 1942). The Council chose Smith because he had conducted extensive studies on respiration, energy consumption, and the effects of different foodstuffs on muscular activity (Leitch, 1942; Todhunter, 1961; Harper, 1985). Smith's standards were based on his dietary surveys of healthy factory workers in the industrialized cities of Great Britain and generalized from his studies of the energy requirement and oxygen consumption patterns of a small group of adults. His dietary standards were expressed in grains of nitrogen (200, or about 80 grams protein) and grains of carbon (4300, which represented about 3000 kilocalories). In his book, A Practical Dietary for Family, Schools, and

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the Working Class, Smith published a variety of menus to translate these recommendations for nitrogen and carbon into meals using the cheapest available foods (Leitch, 1942; Todhunter, 1961). His recommendations represented approximately 50% kilocalories from carbohydrate, 11% from protein, and 40% from fats (Harper, 1985).

During the early part of the 20th century, several other dietary standards were developed in Germany and Great Britain (Leitch, 1942; Todhunter, 1957; Harper, 1985). Voit and Rubner from the University of Munich conducted food consumption surveys of German laborers, then recommended food rations of 3055 kilocalories and 118 grams protein for the average adult male (Harper, 1985, p. 140). This standard was later used to determine rations for the German soldiers during World War I. In 1918, the Inter-Allied Scientific Food Commission contracted Graham Lusk from the Cornell University Medical College to determine kilocalorie and protein recommendations for adults in the United Kingdom. This British dietary standard was used to determine total food requirements for the United Kingdom, France, and Italy. This food requirement estimate was then used to determine American exports of food to these war-torn countries (Leitch, 1942). These more modern European standards were based on improved food consumption survey techniques and the German oxygen-consumption respiratory methodology for determining total energy and protein

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requirements.

In the United States, investigators, including W. O. Atwater (who had trained in Munich) and C. F. Langworthy, also conducted research on energy requirements and protein balance (Atwater, 1894b; Langworthy, 1904; Atwater, 1910; Todhunter, 1957). Commencing in 1887, these early American studies were used to establish kilocalorie and protein requirements which would in turn determine total food recommendations to feed the allied army during World War I and to maintain the working capacity of American laborers supporting the war effort (Leitch, 1942). These early American dietary standards were also used to develop general food recommendations for American children (Hunt, 1916).

After the turn of the 20th century, E. V. McCollum and Langworthy began research on the substances in foods other than the energy-yielding carbohydrates and fats and the muscle-building proteins (Langworthy, 1904a; McCollum, 1918; Todhunter, 1957). McCollum's research on organic body-regulating food components led to his discovery of Vitamins A and B in 1916 (McCollum, 1918; Olsen, 1984). Langworthy's food analyses of mineral ashe led to recommendations to include calcium, iron, and iodine in subsequent food guides (Hunt, 1923). The pace of research on these organic and inorganic micronutrients increased dramatically during the third and fourth decades of the 20th century (McCollum, 1957; Todhunter, 1957; Goodhart and Shills, 1978).

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In 1933, Hazel Stiebeling in the Bureau of Home Economics of the United States Department of Agriculture (USDA) prepared the first modern dietary standard for micronutrients based on Sherman's earlier research and recommendations (Stiebeling, 1933a; Harper, 1985). The 1933 standard included requirements for kilocalories and protein; the minerals calcium, iron, phosphorous, and iodine; and Vitamins A and D. This standard was a significant change from all former dietary standards:

1. Influenced by the work done by Sherman and McCollum on other essential nutrients, Stiebeling included vitamins and minerals in her recommendations.
2. Faced with the huge American agricultural surpluses following World War I, Stiebeling established the standards to correlate agricultural production with nutrient requirements.
3. The standard was designed to maintain health. Former standards had been developed to prevent starvation, feed the army, or maintain the working capacity of adults workers.
4. Stiebeling designed the standards explicitly to *evaluate* diets and menus developed for food distribution programs for the USDA. Former standards were developed to *plan* rather than

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evaluate menus (Stiebeling, 1933a). Stiebeling and Ester Phipard revised this standard in 1939 to include the B vitamins thiamin and riboflavin (Stiebeling, 1939; Federal Security Agency, 1942).

Recommended Dietary Allowances

Current United States dietary standards evolved from an effort in 1940 by the Federal government and the World Health Organization to establish dietary standards for all Americans (Leitch, 1942; Pett, 1945; Roberts, 1958; Harper, 1985). The purpose of these standards was to promote nutritional well-being, thus assuring optimal health for national defense (Roberts, 1958; Hegstead, 1975; Harper, 1985). A Committee on Food and Nutrition, later to become the Food and Nutrition Board, was established as a branch of the National Research Council (NRC) of the National Academy of Sciences (NAS). Henry Sherman, E. V. McCollum, Hazel Stiebeling, and Lydia Roberts sat on the original committee, which reviewed all the available literature on energy and protein requirements as well as the recent research studies on vitamin and mineral requirements (Roberts, 1958). The consensus report provided dietary recommendations for kilocalories, protein, calcium, iron, Vitamin A, thiamin (B_1), Vitamin C, riboflavin (B_2), and nicotinic acid (Leitch, 1942; Roberts, 1958). The report was presented to Franklin Roosevelt in May, 1941 and was published later in the year

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for use at the USDA. The dietary recommendations were distributed in 1943 as the Recommended Dietary Allowances (RDAs) to provide "standards to serve as a goal for good nutrition" (Roberts, 1958).

The Food and Nutrition Board reviews the RDAs every five years to assure scientific validity (Miller, 1968; Harper, 1985). Published in 1989, the Tenth Edition of the RDAs recommends: "...the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy persons" (NRC, 1989).

The 1989 RDAs established standards for kilocalories, protein, seven minerals, and eleven vitamins. In addition to these dietary essential nutrients, "estimated safe and adequate daily dietary intakes" were established for five trace minerals and two vitamins (NRC, 1989). The RDAs remain the dietary standard for the United States and are used for the following purposes:

1. To plan and procure food supplies for population groups.
2. To interpret and evaluate food consumption records.
3. Establish standards for public assistant programs, such as School Lunch; Women, Infant, and Children; and the Older Americans Nutrition programs.

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4. Evaluate the adequacy of food supplies to meet national requirements.
5. To guide the development of new food products by industry and agriculture (Hegstead, 1985).

Food Guides

Ascorbic Acid to Oranges

Americans do not eat vitamins and minerals and Americans do not pour a cup of calcium or a bowl of thiamin for breakfast. People do not peel a gram of ascorbic acid or milliequivalent of potassium as a snack. Children do not pass through the school lunch line, ordering grams of protein or International Units of Vitamin A. Americans eat natural and fabricated foods. Adults pour a cup of coffee and add a container of non-dairy creamer and perhaps some non-nutritive sweetener. Dieters often peel an orange or a banana, or munch on rice cakes. Snackers frequently reach for a doughnut, chips, crackers, peanuts, or occasionally a fortified meal in an instant breakfast bar. Children choose pizza and french fries in the school cafeteria. Foods contain nutrients in highly varying qualities and quantities, with highly variable bioavailable quotients. Because of improved preservation techniques, including freezing, freeze-drying, irradiation, and sterile packaging, the average American faces an ever-increasing basket of food choices (Gussow, 1981). Nutrition educators must translate

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the empirical science of nutrient requirements into practical recommendations for food selections which will lead to a nutritionally adequate and healthful diet. Food guides bridge the gap between empirical nutrient requirements and recommendations for food consumption (Hill, 1970).

Using a foundation of nutrition science and the chemical analyses of foodstuffs, nutrition educators throughout the 20th century have provided guidance on selecting and preparing wholesome and nutritious foods (Hertzler, 1974; Light, 1981; Cronin, 1987; Haughton, 1987). For the early food guides published prior to 1933, foods were arranged into groups according to primary macronutrient contributions (Hunt, 1916; 1921; 1923; 1928; Langworthy, 1916a; Hertzler, 1974). After 1933, micronutrients were also used as the basis for food groupings (Stiebeling, 1933a; Hertzler, 1974; Haughton, 1987). Dietary standards for nutrients were then used to determine portion sizes and numbers of servings of foods within these groups. These food groups, portion sizes, and servings and the accompanying dietary recommendations comprise the food guide, a tool used by nutrition educators to assist Americans in selecting foods which provide the recommended allowances of essential nutrients. A food guidance model is a more general grouping of foods which enables broader application of the food groupings to different cultural and

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ethnic populations. Models also enable planners to adapt specific food recommendations to the foods generally available to specific geographical locations. A food guidance system includes the food guide or guidance model plus the accompanying supportive educational materials used to teach nutrition principles (Hill, 1970; Hegstead, 1975; Haughton, 1987). Food guides are founded in nutrient requirements and dietary standards and their purpose is to provide practical food selection guidance.

Polar Bears and Codfish

Primitive man chose foods on the basis of taste and odor, as well as the sense of satisfaction certain foods provided when eaten (McCollum, 1957). Appealing aroma first enticed ancient people to taste unfamiliar foods. Taste then provided the hedonistic test of palatability and a more reliable evaluation of wholesomeness. Subsequent experiences resulting from the tasting provided the final proof of wholesomeness and acceptability. If discomfort or illness followed, others would be advised to avoid the offending food. Therefore the first food guidance handed down from sage to youth was based on personal experiences and the observations of others (McCollum, 1957).

Eskimos offered such experience-based food guidance to early arctic explorers. The Eskimos cautioned the explorers to avoid eating the livers of polar bears (Chaote, 1972a).

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Prior experience with this organ of the polar bear resulted in illness and occasional death among ancient Eskimos. The Eskimo believed the "spirits" of their ancestors returned to inhabit the livers of special polar bears and some large fish. Eating these delicacies and the ancient Eskimo "spirit" would so anger the gods that illness or death of the offender would result. Many of the first explorers who ignored the advice and ate polar bear liver became ill, and several deaths were recorded (Chaote, 1972a). Australian explorers to the Antarctic did not receive similar warnings from natives in those frigid regions. Olsen (1984) reported severe illnesses, although no deaths, among those explorers dining on polar bear and cod fish livers. Subsequent expeditions to the South Pole found perfect casts of human ears from the skin shed as a result of Vitamin A toxicity induced from eating the livers. Vitamin A is a fat-soluble essential nutrient identified by McCollum during research conducted in the early 20th century (McCollum, 1918; Olsen, 1984). McCollum identified that the oily substance he called fat soluble A would prevent night blindness and certain skin lesions in rats fed a purified diet of carbohydrate and amino acids. Subsequent research on Vitamin A toxicity and the nutrient analysis of polar bear and cod livers indicated the early explorers probably suffered acute Vitamin A toxicity from the highly concentrated quantities present in these cold-water dwelling

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marine mammals and fish. Cod liver oil was used in controlled doses during the 1930s and 1940s as an inexpensive source of Vitamin A and Vitamin D supplementation (De Luca, 1978; Olsen, 1984).

Pine Needles and Lemons

During long voyages, seamen during the 16th and 17th centuries frequently fell ill to a disease characterized by anemia, fatigue, weakening of the connective tissues, and capillary weakness and bleeding throughout the body (Jaffe, 1984). These illnesses frequently led to shipboard death (McCollum, 1957; Jaffe, 1984). The high death rate among British seamen had a significant detrimental effect on the mercantile economy.

Newfoundland Indians offered the first dietary advice and food guidance for the treatment of this disease, which was originally thought to have been a form of venereal disease. In 1535, the Indians advised Jacques Cartier to feed his crew a tea made from evergreen needles and tepid water to cure an epidemic of "sailors' disease." Within two weeks, disease symptoms improved and the sailors cast off (McCollum, 1957).

In 1747, two hundred years after Cartier visited Newfoundland, Dr. James Lind conducted the first clinical experiments in nutrition (McCollum, 1957; Todhunter, 1957). Lind identified that lemon juice cured symptoms of the

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"sailors' disease," scurvy, among individuals consuming a diet devoid of all fresh fruits and vegetables. He demonstrated he could induce disease symptoms by restricting fruits and vegetables from the diet for a period of 60 days, then cure symptoms by adding lemon juice to the diet of his ailing subjects. Other juices, including vinegar and boiled cabbage water, did not ameliorate symptoms. In 1753, Lind published his "Treatise on Scurvy" which demonstrated that scurvy was a dietary deficiency disease (Leitch, 1942; Jaffe, 1984). The addition of lemon juice to the rations was effective in maintaining the health of crews sailing with Captain Lancaster in 1750 and Captain Cook in 1772. Lord Nelson provided lemon juice to his sailors. The resulting physical health of Nelson's sailors may have contributed to his subsequent victory at Trafalgar in 1805 over Napoleon, whose men did suffer from scurvy (McCollum, 1957; Jaffe, 1984).

In 1804, the British Royal Navy ordered lime juice rations for all its sailors. The practice of eating lemons or lime juice resulted in the nickname, "Limeys," for the British sailors. In 1835, Parliament passed the Merchant Seaman's Act which made the provision of lemon or lime juice compulsory in the Merchant Marine Service (Leitch, 1942; Pett, 1945) as well as the Royal Navy.

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The Beginning of Modern Food Guides

The Merchant Seaman's Act of 1835 became the first food guide based on scientific evidence of a dietary deficiency and food requirements. However, it was not until the mid 1930s that work by Szent-Gyorgyi, Haworth, and Hirst identified the crystalline substance, ascorbic acid, in lemon juice, demonstrated the etiology of the dietary deficiency disease scurvy, and elucidated the functions of that vitamin in the human body. Szent-Gyorgyi and Haworth were awarded the Nobel Prize in 1937 for their work with ascorbic acid, commonly referred to as Vitamin C, the anti-scorbutic factor (Jaffe, 1984).

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CHAPTER 3

19TH CENTURY FOOD GUIDES

From Famines to Farming

The Proximate Principles

Food and nutrient requirement investigations during the 19th century focused on recommendations for total energy, expressed in grams (or grains) of carbon, and requirements for nitrogen (and then protein), as expressed in grams (or grains) of nitrogen (Leitch, 1942; Todhunter, 1957; Harper, 1985). Although some investigators indicated that life could not be maintained by these "proximate principles" alone, chemical analysis of foodstuffs was limited to the measurement of carbon, oxygen, and nitrogen (Atwater, 1895; McCollum, 1918).

Energy Requirements to Dietary Recommendations

Mulder's first quantitative dietary standard for nitrogen-containing substances was not translated into a national food guide (Todhunter, 1954). Smith determined kilocalorie requirements for unemployed British cotton workers during the cotton famine of 1862 by using a crude respirator, expressing these requirements in grams of carbon and nitrogen (Todhunter, 1961). Smith translated these

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dietary requirements into a food plan providing half the kilocalories from fat. Fats were a concentrated and inexpensive source of carbon, and thus energy, and were readily available as a food source (Leitch, 1945). Food guides developed from these recommendations used the most economical foodstuffs available at the time, such as mutton fat, beef suet, and white bread with butter. Because milk was an expensive source of nitrogen and energy, Smith recommended using only small amounts during the week. Leitch stated that Smith appreciated the probable nutritional value of greens and other vegetables, but based his dietary recommendations on energy needs and food economy: "What is the least cost per head per week for which food can be purchased in such quantity and quality as will avert starvation diseases from the unemployed population?" (Leitch, 1942, p. 510). Energy needs and economy were the bases of Smith's work.

In 1865, chemistry professor Lyon Playfair from the University of Edinburgh proposed kilocalorie standards similar to those of Smith (Leitch, 1942; Harper, 1985). However, his dietary prescription called for a diet proportionately higher in carbohydrates and lower in fat than Smith's dietary standard. Playfair recommended a diet which provided carbohydrate and fat in a ratio of 10:1. Food guides developed from these prescriptions satisfied the Scottish penchant for oatmeal. The average worker was not

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encouraged to eat the sheep grazing on the Scottish hillsides. Energy requirements and economy, as well as national food preferences and availability of agricultural products, were the foci of Playfair's dietary recommendations (Harper, 1985).

Voit and Max Rubner's German dietary standard recommended slightly higher kilocalorie allowances for the Germans than the British or Scottish dietary standards (Leitch, 1942; Harper; 1985). These recommendations were based on food consumption surveys of employed German laborers. Voit also performed outstanding work in studies of respiration and calorimetry in his laboratory at Munich (Todhunter, 1957). Voit and Rubner prescribed a diet proportionately higher in nitrogen, and thus protein, and lower in carbohydrate than the standards established for the Scottish workers. Food guides developed from these prescriptions included at least eight ounces of sausages, a German favorite. Energy requirements as well as food preferences were focal points in the development of the German food guides (Leitch, 1942).

These 19th century dietary standards and food guides were based on food consumption surveys, the available food supply, economics, and the food habits practiced by the respective population groups.

By the turn of the 20th century, Benedict in England and Lusk at Cornell University Medical School developed and

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perfected the techniques of calorimetry to measure actual energy requirements (Todhunter, 1957). Direct calorimetry enabled 20th century investigators to determine and reproduce precise energy requirements for individuals and population groups (Leitch, 1942; Todhunter, 1957).

Early Nutrition Investigations in the United States

In 1862, President Abraham Lincoln signed into law the Morrill Land Grant Act. This act granted every state a parcel of land commensurate with the number of Congressional representatives. The land parcels were to be sold, and the proceeds used to create colleges which would "teach such branches of learning as related to agriculture and the mechanical arts" (Eddy, 1957). An unstated goal of the Land Grant Act was to shore up the agrarian economy (Berube, 1986). Additionally, The Land Grant Act created a new mission for universities, that of service directly to the community and the nation. The land grant universities provided the background for extensive research in the fields of animal nutrition and foodstuff composition. Information gained from this research could directly help the farmers develop and produce improved livestock and crops. The United States Department of Agriculture was also created as a branch of the Federal government in 1862.

Wilbur Olin Atwater was the first investigator to establish dietary standards for Americans (Todhunter, 1957;

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Harper, 1985). His research on the chemical analysis of foodstuffs and their physiologic effects on the body, as well as the use of direct calorimetry and measured respiration, led to the first comprehensive linkage between dietary standards and recommendations for food selection and meal planning (Atwater, 1891; 1894a; 1895; 1910). Because of his revolutionary research, Atwater is considered the father of food guidance in the United States and a major pioneer in the development of modern nutrition standards (Sherman, 1957; Todhunter, 1957; Pye, 1976).

During the 1870s, Atwater conducted animal research for Wesleyan University in Middleton, Connecticut (Todhunter, 1957). In 1878, the Smithsonian Institute and the United States Commission of Fishes and Fisheries contracted Atwater to conduct research to determine the nutrient composition of fishes and invertebrates (Todhunter, 1957). Atwater later initiated research projects which focused on mammalian nutrition, especially the feed requirements of cattle. While at Middleton, Atwater also conducted research on the quality of amino acids in protein-containing vegetables.

In 1880, the United States Department of Labor contracted with Atwater to conduct food consumption surveys of the healthy adult population in Massachusetts. He also conducted similar food consumption studies in Quebec for the government of Canada (Todhunter, 1957). The War Department and the Navy had conducted the only previous nutrition

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investigations on humans in the United States. The purpose of these military investigations had been to determine the best diet for soldiers and sailors (Leitch, 1942).

In 1887, Congress passed the Hatch Act, establishing agricultural experimental stations with the mission of conducting studies on animal nutrition. Because of his research activities on food composition, dietary consumption surveys, and demonstrated interest in animal nutrition, the United States Department of Agriculture appointed Atwater as the first Director of the Agricultural Experimental Station at Storrs, Connecticut, in 1888. While at Storrs, he expanded the scope of his investigations to human food composition (Atwater, 1891; 1894a; 1894b; 1895; Pye, 1976). Atwater made a crude bomb calorimeter patterned after the German model made by Voit at Munich and determined the kilocalorie values of over 4000 individual foods (Atwater, 1894a; 1895). Atwater gave nutritionists the standard energy value for carbohydrates as four kilocalories per gram, proteins as four kilocalories per gram, and fats as nine kilocalories per gram. These standards are used in contemporary dietary calculations (Todhunter, 1957; NRC, 1989; Hunt & Goff, 1990). Encouraged by the Federal government, Atwater also began research on human nutrient requirements. The establishment of the Agriculture Experiment Stations provided Atwater and other investigators with Federal funding and an opportunity to conduct more

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extensive research on human nutrition and foods which would benefit urban as well as rural Americans. The Agricultural Act of 1894 appropriated $10,000 "to enable the Secretary of Agriculture to investigate and report upon the nutritive value of the various articles and commodities used for human food, with special suggestion of full, wholesome, and edible rations less wasteful and more economical than those in common use" (Atwater, 1894b). Congress later appropriated an additional $10,000 per year through 1900 and $15,000 per year between 1901 and 1904 for human nutrition research (Langworthy, 1904).

In 1894, Atwater began publishing the results from his USDA - supported nutritional research projects. In Farmers' Bulletin No. 23, Foods - Nutritive Value and Costs, he provided general advice for an optimal American diet, recommending a daily intake of 3055 kilocalories, including 118 grams protein, as well as "mineral (ashe) matter" (Atwater, 1894a). A later publication, Food and Diet. Yearbook of the United States Department of Agriculture (Atwater, 1894b) included the first dietary standard published in the United States. His dietary standard prescribed carbohydrates for providing energy and emphasized protein for building muscles. In this 1894 Food and Diet Yearbook, Atwater provided practical information on food costs, preparation, and wastage. He encouraged consumption of dairy products and also urged his readers to choose and

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prepare economical cuts of beef. Atwater was concerned with the potential problem of consuming too much food and stated: "That which we consume in excess of our needs is worse than wasted because of the harm it does to the health" (Atwater, 1894b, p. 45).

Atwater used his position with the USDA by urging farmers to develop foods that were not excessively high in fats and sugars, encouraging the development of plants richer in protein, and advocating the production of livestock with more lean meat than fat tissue. Atwater's standards for kilocalories and protein were similar to those prescribed in Europe. However, Atwater's target population and rationale for his food guidance recommendations differed significantly from those previously developed in Great Britain, the Netherlands, and Scotland to prevent starvation among unemployed workers and those in Germany used to calculate rations to feed the army. Atwater's recommendations were intended to promote health in the general population and to encourage an economical use of agricultural products (Leitch, 1942).

This early prolific research in human nutrition and foods influenced Congress to continue funding human nutrition and food research at the experimental stations within the Land Grant University network (McCollum, 1957). The Agricultural Bill of 1904 continued appropriations originally established in the 1894 Bill. The industrial

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revolution had produced a large number of poverty-stricken families as the machines replaced human labor, creating widespread unemployment. Without access to gardens and livestock, the urban poor followed diets that were limited in quantity, variety, and the quality of foodstuffs and therefore limited in nutrients (Leitch, 1942). The urban family had to earn enough money to purchase all its foods at the local store, often the Company Store, and also had to make decisions concerning which foods to purchase in the marketplace. Atwater suggested that the "cheapest" foods were those which furnished the most nutriment at the least cost. The "best foods" were the most healthful and the cheapest to purchase (Atwater, 1894a). Atwater recommended choosing grains, milk, and locally grown vegetables rather than more expensive meats, fatty desserts, and exotic fruits.

In 1895, Atwater and C. F. Langworthy published the first tables of food composition (Atwater, 1895). Over 4000 foodstuffs were analyzed for carbohydrates, fats, proteins, and mineral (ashe) matter. This basic knowledge of the chemical composition of foodstuffs became the foundation for the future development of food guides. In 1904, Atwater published Principles of Nutrition and the Nutritive Value of Foods. This research review provided the first comprehensive food guidance and dietary recommendations for Americans.

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The First Home Economist

In 1890, Ellen Richards applied this early knowledge of the composition of foodstuffs and energy requirements of man to the art of menu planning (Todhunter, 1957; Hertzler, 1974). Richards completed requirements for her degree in science education by planning three lunch menus for the Massachusetts Exhibit of the Rufner Kitchen at the 1893 Chicago World's Fair. Each meal provided one fourth of Atwater's recommended daily intake of kilocalories and proteins. She chose foods for the menus on the basis of taste, visual appeal, as well as popularity of the food item. Richards continued her study of menu planning at the Massachusetts Institute of Technology, where in 1899 she proposed an association between chronic diseases and excess food (kilocalorie) intake (Richards, 1899). A pioneer teacher of applied science, Ellen Richards founded the American Home Economics Association in 1909 (Todhunter, 1957).

The Science of Nutrition Education

Atwater's early work placed the land grant universities and their experimental stations at the forefront of human nutrition and foods research. Atwater's association with the United States Department of Agriculture made that agency the primary Federal department for funding, guiding, and publishing human nutrition and foods research. The marriage

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between American agriculture and nutrition science had been consummated. Ellen Richard's work in the practical application of nutrition science to menu planning and nutrition education established the link between home economics and agriculture. It also established the field of home economics as the area in higher education which would translate dietary standards into food guides (Todhunter, 1957; Hertzler, 1974). Subsequent home economists would develop and update nutrition education curricula for the schools, dietary information pamphlets for the general population, and meals plans for target population groups (Hill, 1970, Haughton, 1987).

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CHAPTER 4

DEVELOPMENT OF THE FIRST NATIONAL FOOD GUIDES

Feeding Armies and the Children

From Energy Requirements to Micronutrients

Before the turn of the 20th century, nutrition investigators focused on the "Proximate Principles" - the energy (kilocalorie) and nitrogen (protein) requirements of man and the kilocalorie, protein, and mineral ashe content of foodstuffs (Atwater, 1894a; 1895; 1904; 1910; McCollum, 1918). Atwater's successor as Chief of Nutrition Investigations at the USDA Experimental Station in Storrs was C. F. Langworthy (Todhunter, 1957; Hertzler, 1974). Langworthy (1904) defined the work of his department on the investigations of nutrition and the foods of man to include two related branches of research:

> One branch comprises a study of the chemical composition of different food materials, an investigation which is purely analytical but a necessary preliminary to studies in the other branch of the subject, which comprises research into the laws of nutrition. The latter has to do the with physiology, physics and chemistry, the nutrition of man, together with the economic and sociologic application of the fundamental principles of nutrition to the diet (p. 8).

Atwater had researched and published extensively on the first branch of nutrition, that is, the chemical composition of foodstuffs (Atwater, 1894a; 1895; 1904; 1910).

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Langworthy and his contemporary investigators, Elmer V. McCollum and Henry Sherman, turned their attention to research involving human physiology, nutrient requirements, and the composition and function of substances thought to regulate body metabolism (Langworthy, 1904; Sherman, 1911; McCollum, 1918; Todhunter, 1979). These research chemists believed that there were other components in food in addition to the recognized energy-yielding carbohydrates and fats and the muscle-building proteins. They felt that foods also contained mineral ashe residues and other organic, body-regulating substances which were necessary to maintain health and support growth (Sherman, 1911; Langworthy, 1916b; Todhunter, 1957).

The Era of Vitamin Research in the United States

The "Protective Foods."

McCollum focused his investigations on the body-regulating organic substances in foods (McCollum, 1918; Todhunter, 1979). Influenced by Funk, who hypothesized there were "vital hormones" in foods (the "vitamines," which could cure scurvy, pellagra, beriberi, and rickets), McCollum pursued his own investigations on animals and animal rations at the University of Wisconsin's Agriculture Experimental Station. He chose to conduct his research on rats, which matured in a short period of time and cost significantly less to feed and study, instead of the farm animals

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traditionally studied at the agriculture experimental stations. In 1916, he discovered a fat soluble substance which could prevent and cure night blindness, xerophthalmia, and other skin lesions including keratinization of epithelial tissues (Todhunter, 1979). He also identified that whole milk and foods made with raw whole milk products, including cheese and butter, were rich in this substance which he called "fat soluble A" (McCollum, 1918). Two decades later, this substance was named Vitamin A (Olsen, 1984; Hunt & Groff, 1990). Additionally, McCollum observed that a diet rich in leafy green vegetables could also produce similar beneficial effects on rat skin lesions and night blindness, even though these vegetables contained no fat. The conversion of beta carotene, the substance in leafy green and yellow vegetables, to Vitamin A was not elucidated until two decades after McCollum's original work (Olson, 1984). Before leaving the University of Wisconsin to become the Head of the Department of Biochemistry at Johns Hopkins University, McCollum identified a water soluble substance in leafy green plants, "water soluble B," which could alleviate symptoms of cheilosis, stomatitis, and keratinitis in rats fed a marginally depleted diet of purified carbohydrates, fats, proteins, and mineral ashe. By feeding a ration rich in green leafy vegetables, he could cure the skin lesions. Dairy products affected no relief for these particular skin lesions. McCollum referred to the

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water soluble substance as "Vitamin G." This vitamin, classified as one of the B Complex vitamins and renamed "riboflavin," was fully identified in 1932 (Cooperman, 1984). As a result of these investigations on vitamins, McCollum coined the term "*protective foods*" to describe the beneficial qualities of whole milk, other raw dairy products, and the dark green leafy or orange vegetables (McCollum, 1918; Todhunter, 1979). Eating "protective foods" every day would protect individuals from the vision problems and skin lesions characteristic of nutrient deficiencies. After arriving at Johns Hopkins University, McCollum continued research on body-regulating substances and nutrient deficiencies, identifying an antirachitic substance in cod liver oil. He is credited with naming this substance "Vitamin D," although the identification of the colecalciferols by Steenbock was not fully elucidated until the following decade (De Luca, 1978).

"Variety."

Henry Sherman began his career in chemistry at Wesleyan University in Connecticut, studying under W. O. Atwater. Sherman investigated the ashe content of foodstuffs, particularly calcium, phosphorous, sulfur, iodine, and iron. As professor of chemistry at Columbia University, Sherman (1911) wrote the first scientific nutrition textbook in the United States, The Chemistry of Food and Nutrition.

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Convinced that optimal nutrition encompassed more than eating the basic "proximate principles" of carbohydrates, proteins, and fat, Sherman introduced a descriptive parameter into his food guidance recommendations: *variety* (Sherman, 1911). Sherman felt that only a wide range of foods from different sources and adequate in energy, would provide all the known and *undiscovered* dietary essentials.

During the same time period that McCollum and Sherman were conducting research on these body-regulating organic substances at private universities, Langworthy was directing other human nutrition research at the USDA agricultural experimental station at Storrs, particularly focusing on the "mineral ashe" residues calcium and iodine. These federally-funded investigations were directed: "...to achieve a noteworthy significance in scientific, educational, sociological, and economic enquiries. The results of the these inquiries are to be made available to the public" (Langworthy, 1904, p. 6).

Development of The First U. S. Food Guide

C. F. Langworthy.

In 1916, Langworthy presented a summary of the research completed at the Experimental Station to the 1916 meeting of the American Association for the Advancement of Science (Langworthy, 1916b). He also presented a model of a food guide, developed to assist researchers classify foods on the

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basis of nutrient composition. Langworthy's food guide was based on the chemical composition of foodstuffs, as identified by his predecessor W. O. Atwater, as well as the physiologic functions of nutrients within the body. Langworthy classified foods as either contributing building and repair materials or providing body fuel. Using these two major food function classifications, he organized all foods into a five-group model, using nutrients rather than commonly identified foods as the basis for the groupings. The first nutrient group contributed primarily building and repair materials. The next two groups in his model contributed the primary fuel sources for the body. A fourth group was a poor source of fuel, but provided a substantial amount of mineral ashe constituents. The fifth group provided some fuel energy, but contributed more significantly to the palatability of food and pleasure of eating. Langworthy suggested that sugar was as important as a flavor as it was a food (Langworthy, 1916a). Langworthy's nutrition model included the following five nutrient groups: (a) proteins; (b) starches and similar carbohydrates; (c) fat; (d) mineral constituents and vegetable acids; and (e) sugar (Langworthy, 1916b, p. 302).

The guide was based on the macronutrients with only a broad recommendation to include foods rich in mineral ashe constituents. Langworthy did not believe enough scientific evidence was available to make explicit recommendations for

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any of the micronutrients which were currently under investigation:

> It is not claimed that it (the guide) does all that is desirable. A classification which would bring together the foods which are the chief sources of the two unknown constituents, Fat-soluble A and Water-soluble B, would be convenient but does not seem feasible until we have more definite knowledge of these constituents and their relation to those whose uses for the body building and fuel we know more about (1916b p. 299).

Langworthy did not include a specific recommendation for lemons or limes, which had been mandatory in the British sea rations for almost 100 years, nor did he recommend any other antiscorbutic foods. He did not rank any one of his five groups as more important than the others. He felt that economy and the gustatory satisfaction provided by individual foods should determine the specific proportion each category of foods should contribute to the whole diet. Langworthy encouraged the consumption of all animal products, recommending that Congress authorize subsidies to dairy farmers to encourage further growth for the dairy industry (Langworthy, 1904; 1916b). Langworthy's recommendations differed significantly from those of his predecessor, W. O. Atwater. Atwater had stated that Americans ate too many fatty meats and sugars. Atwater had encouraged production and consumption of fewer animal products, less fat, and eating proportionately more protein-containing vegetables and grains (Atwater, 1904; 1910; Todhunter, 1957).

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Langworthy also encouraged the expansion of the agricultural base by emphasizing the selection of foods which could be produced on small farms and in communities throughout the United States. He also recommended that economy of transportation should be used as a criteria for food selection:

> To be complete, the knowledge of markets should also include some understanding of the production and distribution of foodstuffs; such information, for instance, as would lead the housekeeper to purchase locally grown foods, not only because they may be fresher, but because of the difference in their cost of transportation (Langworthy, 1916a, p. 294).

Langworthy recommended choosing a wide variety of foods when economically feasible:

> A fundamental principle is that the diet, considered for any reasonable length of time, must supply a great variety of chemical substances. A varied diet, reasonably varied in amount, is more likely to meet the body's needs than one restricted or unvarying or scant in quantity (1916a, p. 297).

Despite these recommendations, Langworthy implied that the knowledge of foods and nutrition was incomplete, and encouraged continued nutrition and food research.

Agricultural experimental stations, such as the one at Storrs, were affiliated with the Land Grant Universities. One mission of these universities was to provide "service" to the community. Langworthy suggested that "service" in nutrition and food research should assume the form of providing nutrition education for the public. In 1914, the USDA created the Cooperative Extension Service. The mission

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of the Extension Service was to provide "service" and educational programs for rural homemakers (Todhunter, 1957). One year later, in 1915, Langworthy established and became the first Director of the Office of Home Economics in the United States Department of Agriculture, an office that was located at Storrs and directed to implement programs for the Extension Service (Todhunter, 1957).

In 1916, Langworthy enlisted the assistance of Caroline Hunt, one of the first specialists in the new Office of Home Economics, to develop a nutrition teaching guide for homemakers, especially homemakers living in rural areas who might not have access to nutrition and food preparation classes held in the urban areas. Langworthy directed Hunt to follow the same five nutrient-group selection guidelines that he had presented in his 1916 speech, but to present the information in a *simple* form that homemakers could easily understand (Hertzler, 1974).

Caroline Hunt.

Caroline Hunt developed and published the first national food guide in 1916, based on the nutrition knowledge researched at the USDA experimental stations and patterned after Langworthy's five-group nutrient model (Hunt, 1916; Hertzler, 1974; Haughton, 1987). This landmark USDA food guide, Food for Young Children, (see Figure 1).

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Figure 1

FOOD FOR YOUNG CHILDREN

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was developed to assist homemakers in planning and preparing nutritious meals for their young children.

During the first two decades of the 20th century, considerable attention was directed towards the health and welfare of the nation's children (Means, 1962). World War I focused public sympathy and attention on the health of children throughout the world. As young men were screened for recruitment into the United States military service, the poor health status of young American males became obvious. Records indicated that 730,756 of the 2,510,706 young males examined during the first draft call were rejected on physical grounds. Anemia, night blindness, dental caries, and tuberculosis were the most common medical deferments (Means, 1962, p. 112). These health problems were perceived as threats to the welfare of the nation. Malnutrition among school-age children was identified and reported by the New York Association for Improving the Condition of the Poor, a group working under the auspices of the New York Academy of Medicine. In 1916, the Committee on War Time Problems of Childhood was formed to review some of these early health findings and to investigate the nutritional status of children throughout the United States. Herbert Hoover was a member of this Committee. Because of his concerns for child health and welfare issues, Hoover was instrumental in founding the Child Health Organization of America. The Child Health Organization, founded in 1918, promoted

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nutrition, physical education, and hygiene in the schools for all school-aged children (Means, 1962).

Caroline Hunt garnered support in her nutrition education project by focusing on nutrition recommendations and dietary guidance for children. Revising Langworthy's model, Hunt arranged foods into five groups to identify food groups rather than nutrient contributions:

1. Vegetables and fruits;
2. Milk, eggs, cheese, and flesh foods;
3. Cereals and similar starchy foods;
4. Sweets; and
5. Fats.

Hunt stated: "Such a classification of foods is helpful in selecting foods for the family as a whole as well as in making special provision for younger members of the family" (1916, p. 3).

Hunt's food guide provided a pattern for a total diet, specifying groups and quantities of food adequate to feed a child for an entire day and providing guidelines for planning menus for an entire week (see Table 1.) Homemakers could use the recommendations in the guide to plan weekly shopping lists. The guide provided "suggested bills of fare," that is, menus for an entire day. These daily menus encouraged a three-meal food pattern, with the noon "dinner" the most substantial meal of the day. Milk was recommended as the beverage of choice, although Hunt was careful to

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Table 1.

FOOD FOR YOUNG CHILDREN
Caroline Hunt
1916

Office of Home Economics
United States Department of Agriculture

Food Group	Portion/ Serving
Vegetables and Fruits	"Cultivate a liking for them"
Milk, Eggs, Cheese, and Flesh Foods	
Milk	1 1/2 pints daily
Eggs	1 Every other day
Cheese and flesh foods	2 ounces on the days eggs are not offered
Cereals	"There is no danger a child will eat too much of them"
Sugar	An ounce a day
Fats	Serve whole milk and butter on bread

Note: No minimum requirement was included for kilocalories. Hunt assumed "normal" growth would demonstrate adequate energy and protein intake.

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describe milk as a food, not a beverage, in the sense that coffee, tea, and lemonade were beverages. Hunt also recommended using liberal amounts of butter as a source for the food substance which protected children from night blindness. In Hunt's recommendations, vegetable oils should be limited to only small amounts, as these did not provide protection against the deficiency diseases. Supplemental or alternative foods could be added in moderation. Hunt's guide also provided recommendations for "snacks," "sweets," and "children's parties" (Hunt, 1916).

Hunt included recipes for foods within each of the food groups. She encouraged the consumption of whole milk as the primary source of protein and kilocalories for small children. Food for Young Children featured recipes using whole milk in the Milk group section, and also in recipes within the Cereals and Breads group as well as the Vegetable group sections. Milk gravies, celery milk soups, milk toast, and baked custards were highly recommended foods (see Figure 2). Eggs and egg yolks were recommended as excellent sources of iron and other body-building substances (Hunt, 1916).

Hunt also offered advice on feeding children. "Sweets" were encouraged as long as they were not offered between meals or as hard candies which would be difficult for young children to chew (see Figure 3). Hunt recommended variety in the diet whenever the budget permitted. She urged

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Figure 2

FIG. 2.—Start the day right with a good breakfast. The breakfast shown in the illustration consists of milk, cereal mush, baked apple, toast, and butter

FOOD FOR YOUNG CHILDREN

Start the day right with a good breakfast. The breakfast shown in the illustration consists of milk, cereals mush, baked apple, toast, and butter.

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Figure 3

FIG. 4.—Little children need food between meals. Milk is better than candy.

FOOD FOR YOUNG CHILDREN

Little children need food between meals. Milk is better than candy.

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homemakers to "make the child eat slowly and chew food properly" (Hunt, 1916, p. 20). Often a neglected part of a child's diet, vegetables and fruits were to be included on the child's bill of fare at least once daily. When the homemaker could not afford to purchase a variety of vegetables and fruits, Hunt urged mothers to grow a selection of appropriate vegetables in a home garden to assure the availability of these fresh mineral-ashe containing foods. Hunt described an appropriate diet for a child:

> A young child may be well fed if he has plenty of milk, bread, and other cereal food; an egg once a day or its equivalent in flesh foods; a small portion each of carefully prepared fruits and vegetables, and a small amount of sweet foods after his appetite for others is satisfied. If there is too much or too little of any of these, his food is one-sided (1916, p. 20).

Hunt summarized this food guide with a checklist of items the homemaker could use to evaluate her menus. Foods for Young Children served as a tool for planning, preparing, and evaluating total diets for children. Foods for Young Children, published by the Department of Home Economics and the Extension Service within the United States Department of Agriculture, was distributed to rural homemakers throughout the United States (Hertzler, 1974).

In 1917, Hunt and another home economist, Helen Atwater, published a series of bulletins to provide supplemental menus and nutrition information to the Food for Young Children pamphlet (Hunt & Atwater, 1917a; 1917b;

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1917c). This series included an introductory nutrition information pamphlet, What the Body Needs (Hunt & Atwater, 1917a), and five companion pamphlets representing each of the five food groups. The How to Select Foods series (Hunt & Atwater, 1917a; 1917b; 1917c) provided cost comparisons between food items within each group, recommended food substitutions when economy and availability were major determinants of food selection, and offered recipes for preparing economical foods within each of the groups. The USDA also distributed these pamphlets to rural homemakers through the Extension Service. The 1916 pamphlet provided information to mothers on *what* foods to feed their children. The 1917 pamphlets provided nutrition information describing *why* to eat particular foods because of nutrient content (Hunt, 1916; Hunt & Atwater, 1917a; 1917b; 1917c).

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CHAPTER 5

DECADE OF THE 1920s

Variety and the Protective Foods

Early Nutrition Education in the Mass Media

During the same decade that Langworthy and Hunt were developing their five nutrient group and five food group guides and the supporting educational materials for the USDA, E. V. McCollum (1918) wrote The Newer Knowledge of Nutrition. McCollum's book provided a scientific reference for home economists and public health nutritionists so that these professionals could teach families in urban homes and public health settings about good nutrition and eating habits (Todhunter, 1979). Cognizant that the "Great War" in Europe might lead to food shortages and deficiency diseases in vulnerable populations, McCollum hoped the information in his text would: "...greatly assist in making us make use of our food supply in a manner which will avoid mistakes sufficiently serious to become reflected in a lowering of our standard of public health" (McCollum, 1918, p. V).

McCollum advocated choosing diets which provided a great variety of foodstuffs rather than large quantities of food. He wrote there may be differences between the merely adequate (i.e. in kilocalories and protein) and the optimal

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(i.e. providing substances other than carbohydrates, fats, and proteins) in nutrition. He urged all Americans to: "Eat what you want after you have eaten what you should" (McCollum, 1936, p. 722). He felt Americans "should" eat more fresh fruits, leafy green vegetables, and all types of dairy products.

McCollum did not create a new food guide, nor did he organize foods into nutrient-based groups. McCollum did introduce the term "*protective foods*," referring to milk, eggs, and green leafy vegetables as a qualitative parameter for food guidance. His research on food rations demonstrated that there were substances in these foods, particularly fat soluble A and water soluble B and G, which would protect animals from deficiency diseases. Influenced by Atwater's teachings, McCollum also felt that the "staple" diet of fatty meats, boiled potatoes, and white bread consumed by many poor Americans placed them at risk for nutritional diseases because such a monotonous diet lacked these "protective substances." McCollum advocated the liberal use of milk as "the greatest protective food" and urged that "its use must be increased." Emphasizing the importance of the dairy industry in its relationship to public health, McCollum urged financial subsidies for the dairy industry to assure an increase in milk availability and consumption by all Americans (McCollum, 1918, p. 151).

In 1918, after his participation on the Committee on

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War Time Problems of Childhood and the founding of the Child Health Organization, Herbert Hoover was appointed Director of the United States War Food Administration (Means, 1962; Todhunter, 1979). This organization was responsible for feeding the Allies, U. S. civilians, and the U. S. Armed Forces during World War I (Means, 1962). After the publication of The Newer Knowledge of Nutrition, Hoover arranged for McCollum to lecture across the country urging all Americans to adopt a diet including these "protective foods." Hoover and McCollum felt this diet would assure a strong and healthy America (Todhunter, 1979). Whereas the target audience for McCollum's book was a relatively small group of nutrition and health professionals, his lecture audience included large numbers of homemakers eager for dietary advice and nutrition information (Todhunter, 1979).

After a successful lecture tour of homemakers, McCollum began a 20-year association with McCall's Magazine as the magazine's science and nutrition author. His monthly articles provided practical dietary advice and occasionally included menus and recipes. Throughout his association with McCall's, he continued to advocate a diet rich in the "protective foods" (Todhunter, 1979).

"Protective Foods" in Food Guidance

Nutrient research during the second decade of the 20th century elicited interest in the "protective foods" and

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"variety" in food selection as parameters for food guidance. Langworthy recognized the health value of including variety in food selection guidelines, even though he had not emphasized variety in his first guidelines (Langworthy, 1916a; 1918): "A fundamental principle is that the diet...must supply a great variety of chemical substances combined in different ways for the structural needs of the body" (Langworthy, 1916a, p. 315).

By 1918, McCollum included calcium, phosphorus, iron, and iodine in his dietary recommendations. He advised that all adults should consume a "staple" diet of "one quart of milk, a liberal serving of greens or potherbs, and a salad with raw fruits and vegetables daily (McCollum, 1918, p. 82). Sherman recommended that half the kilocalories adults consumed should come from the "protective foods" (Sherman, 1932). Encouraging the consumption of a "variety" of foods for optimal nutrition placed increased demands on the agricultural industry to *produce* a greater variety of foods for the marketplace. Both Atwater (1910) and Langworthy (1916b) advocated stimulating American agriculture to produce a variety of food products through the use of financial subsidies to farmers.

World War I placed great demands on the available food supply and also on the food distribution systems throughout war-torn Europe and the United States. A fear of food shortages prompted concerns for conserving food supplies and

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reducing wastes in all manners possible. Sherman advocated sustainable agriculture policies and food conservation practices to assure an adequate food supply: "The world situation (WWI) demands careful use of food resources for a long time to come. An abundant food supply is necessary for the nutritional well-being of Americans" (Sherman, 1919, p. 15).

Langworthy also was concerned with the war-time food supply:

> At such a time as this, when the food problems are of the greatest importance in connection with the war emergency situation and when we must make every effort to stretch our food supply to meet the military needs and the needs of the civilian population in the United States and Allied Countries, it is well that we should take stock of our knowledge of foods and food values to see what we have and how we can best make use of it (1916b, p. 295).

Encouraging the consumption of a variety of foods during World War I also placed greater demands on health educators and the nutritionists to develop informative food guides to assist homemakers and children in schools select an adequate diet, incorporating as much variety as possible during war-time shortages. Langworthy designated that the home economists within the Department of Agriculture be responsible for nutrition education of the general public: "Home economics is the organized body of knowledge which treats foods and household management in their physical, economic, and social aspects as related to the life and welfare of the individual, the family, and the community"

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(1918, p. 296).

In 1918, Langworthy addressed the Tenth Annual Meeting of the American Home Economics Association. He presented Hunt's 1916 Food for Young Children five food guidance model and encouraged the meeting participants to use the guide in nutrition education projects and menu planning (Langworthy, 1918; Hertzler, 1974).

Revisions of the Food for Young Children Five Group Food Guide

Soon after the end of the war, Langworthy directed Caroline Hunt to develop a more comprehensive food guide. This guide would provide recommendations for what adults, not just children, should eat. The guide would also incorporate the newer concepts of "variety" and include examples of the "protective foods." The guide would also provide food guidance advice on *what* to eat and *how* to maintain optimal health. Langworthy's earlier works (1916b) provided nutrient information to the home economists concerning *why* to eat specific foods and *how* those foods contributed to growth and health. Economy and resource conservation were also to be underlying themes in the Hunt's new food guide.

In 1921, Caroline Hunt completed A Week's Worth of Foods for an Average Family (see Table 2). Using the same five food groups she originally developed for her 1916 Food

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Table 2.

A WEEK'S WORTH OF FOOD FOR AN AVERAGE FAMILY
Caroline Hunt
1921

Office of Home Economics
United States Department of Agriculture

Food Group	Portion
Milk, Meat, and Similar Foods	14 qts milk 10 1/2 lbs meat, fish, poultry, egg, peanuts, cheese Provides 25% needed fuel
Fat and Fat Foods	2 lbs. butter, 1 lb. bacon, 1 lb. nuts, 1 lb. other fats, 1 pint cream Provides 20% needed fuel
Vegetables and Fruits	52 lbs fresh and canned, plus 3 lbs dried. Always use some leafy green vegetables Provides 20% needed fuel
Cereal foods	10 lbs bread 7 1/2 lbs dry cereals Provides 25% needed fuel
Sugar and Other Sweets	3 lbs sugar and candy, 1/2 lb each syrup, molasses, jelly Provides 10% needed fuel

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for Young Children's Guide (Milk; Meat, and Flesh Foods; Cereals and Grains; Fats; Vegetables and Fruits; and Sweets), Hunt calculated total food portions within each group which would feed a family for an entire week. A "family" consisted of two adults plus three children whose ages totaled 20 to 24 years, or four adults (Hunt, 1921). Hunt told the homemaker *what* to eat. Energy (kilocalorie) requirements were the basis for determining the recommended quantities of foods for weekly consumption. Hunt used Atwater's standard of 3000 to 3500 calories daily per adult with proportionately fewer calories for younger children. Hunt assumed that a diet supplying 3000 calories would likely provide all the necessary portions of proteins, ashe, the fat soluble A, and water soluble B, as long as a great variety of foodstuffs was chosen within each of the food groups. Hunt emphasized consuming a "reasonable amount" of fruits and vegetables each day and again encouraged the homemaker to cultivate a backyard garden to assure an adequate supply of the protective foods. The guide introduced the term "vitamines" as necessary regulatory substances in foods. Total food portions for a week's food rations were pictured for each of the food groups (see Figures 4, 5, 6, 7, and 8). Additionally, Hunt provided portion size and serving information for each of the food groups. She calculated serving sizes for each group based on a 100 kilocalorie average portion. The housewife could

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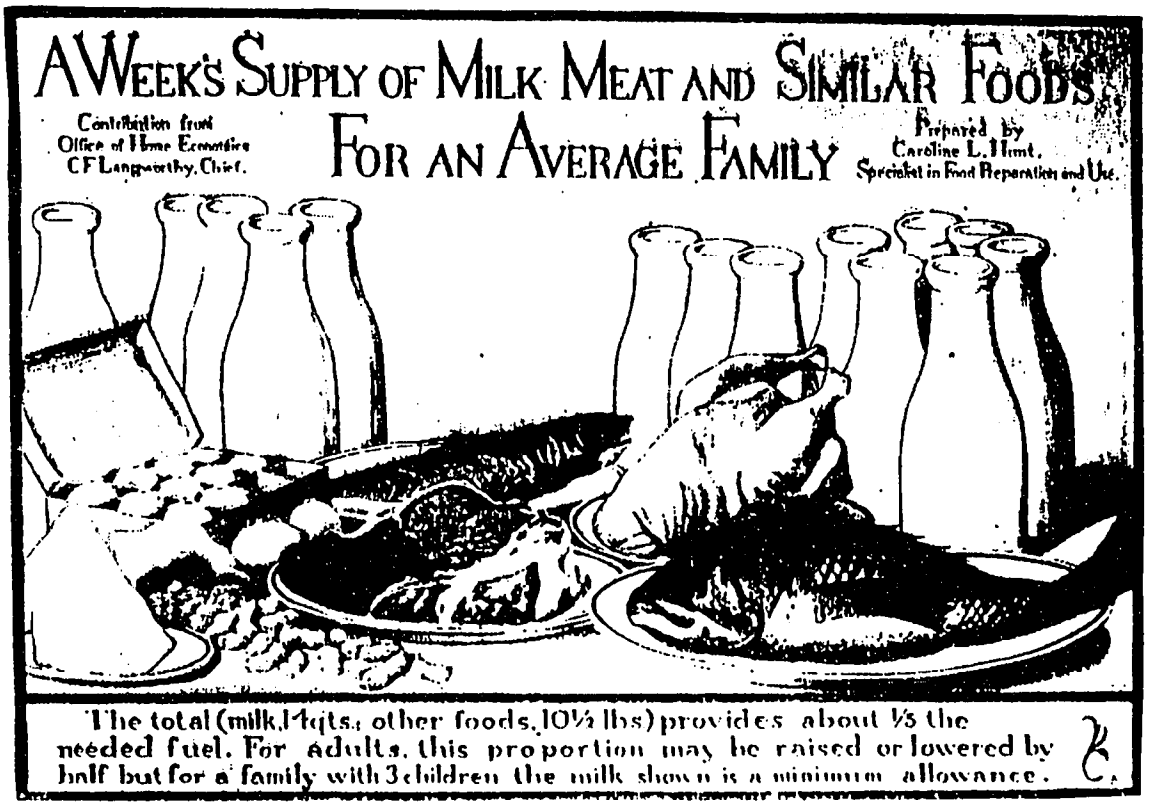
Figure 4



A WEEK'S SUPPLY OF FOOD FOR AN AVERAGE FAMILY

Milk, Meat, and Similar Foods

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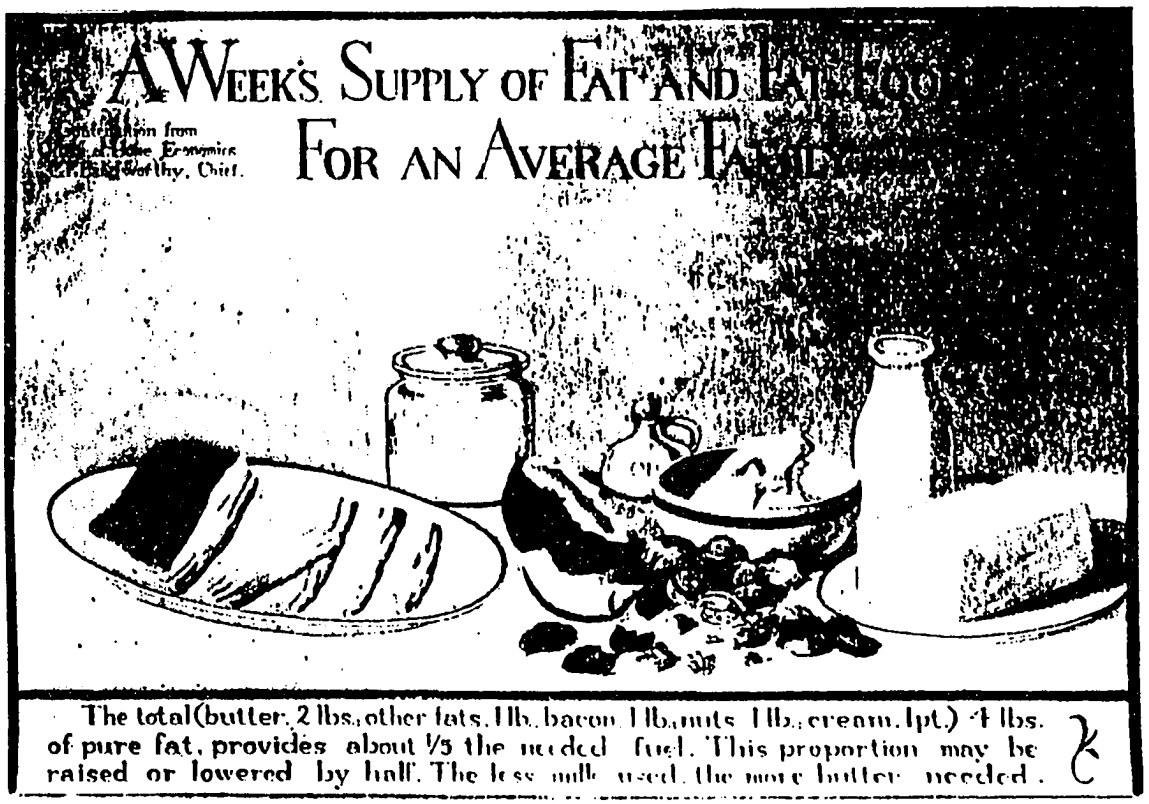
Figure 5



A WEEK'S SUPPLY OF FOOD FOR AN AVERAGE FAMILY

Fat and Fat Foods

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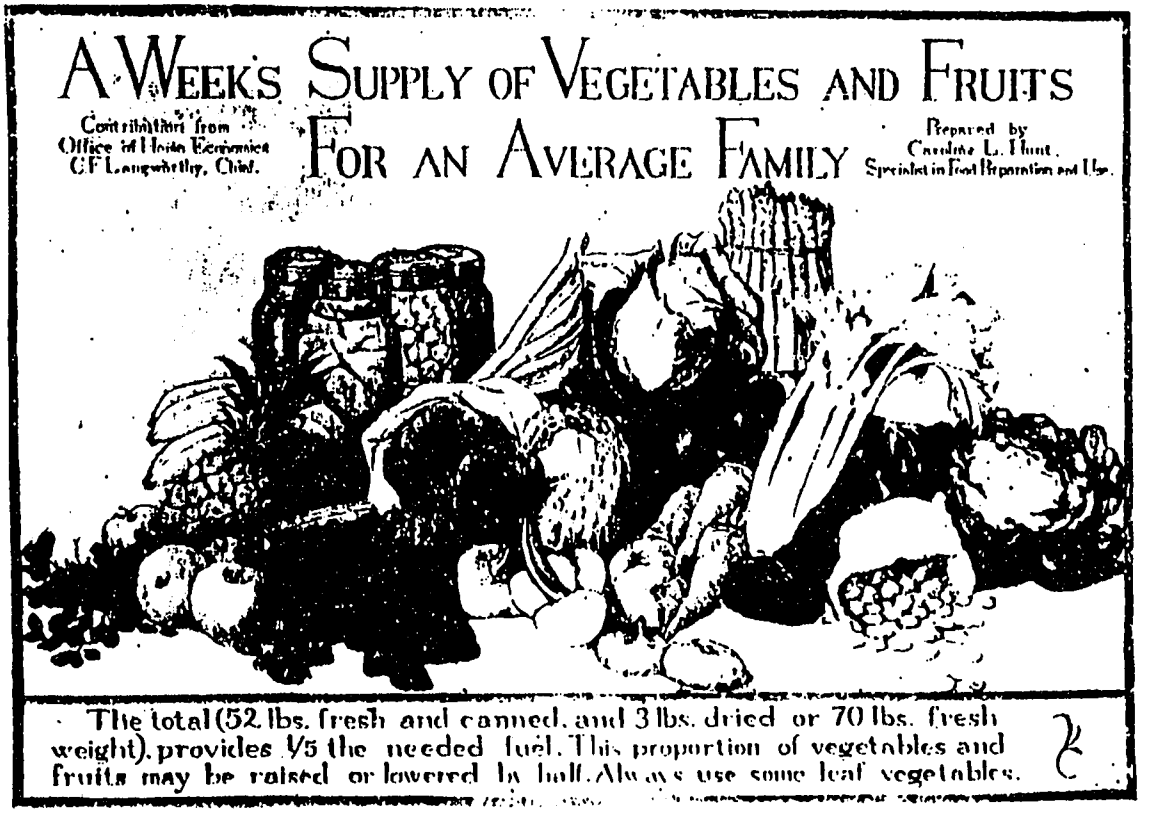
Figure 6



A WEEK'S SUPPLY OF FOOD FOR AN AVERAGE FAMILY

Vegetables and Fruits

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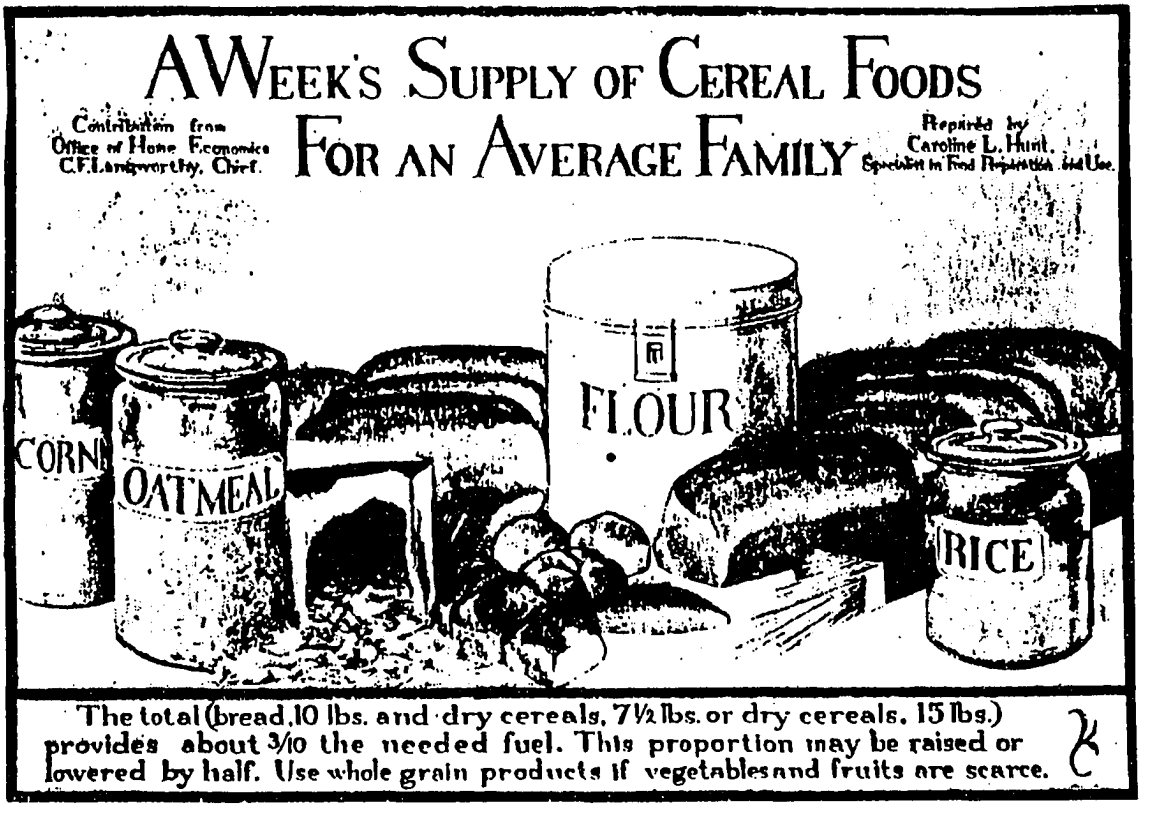
Figure 7



A WEEK'S SUPPLY OF FOOD FOR AN AVERAGE FAMILY

Cereal Foods

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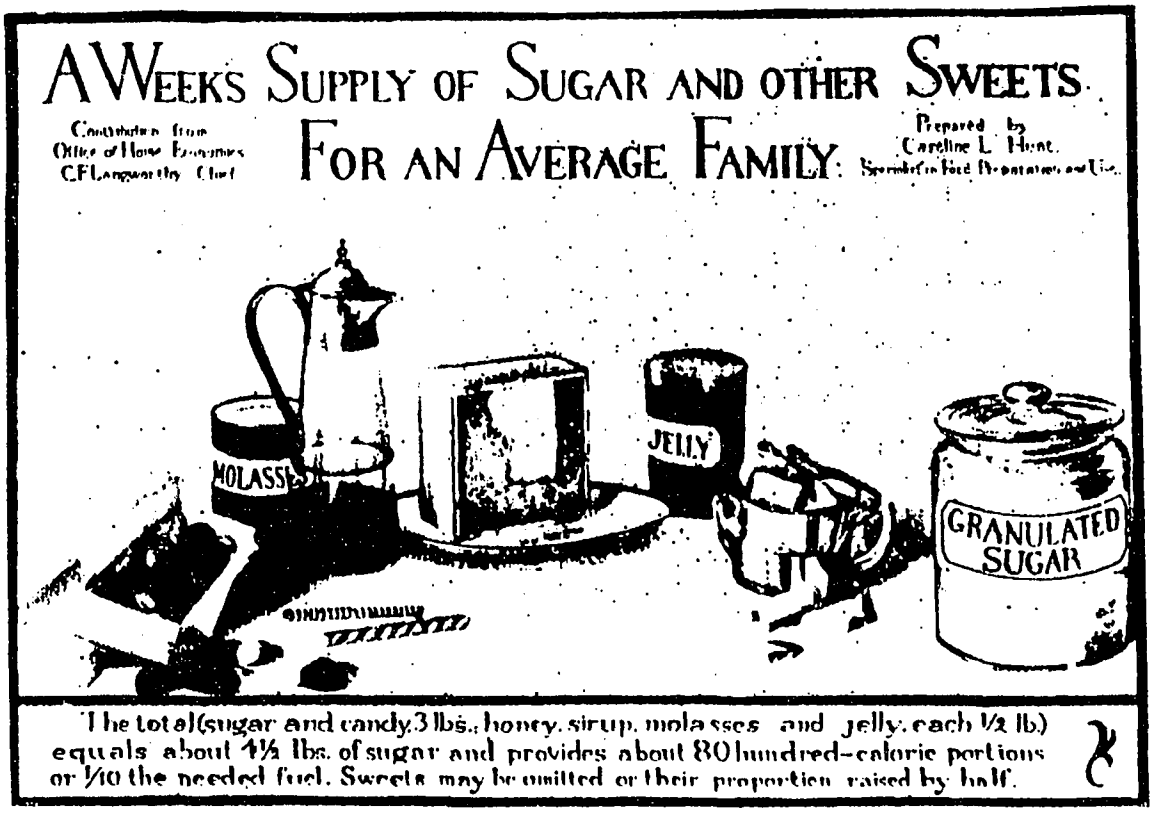
Figure 8



A WEEK'S SUPPLY OF FOOD FOR AN AVERAGE FAMILY

Sugar and Other Sweets

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then plan daily menus as well as weekly shopping lists by interchanging portions of foods between meals. She encouraged homemakers to add variety to their menus by substituting 100 kilocalorie portions within each food group rather than eating the same foods from each food group every day. Protein and kilocalorie content of foods therefore remained important basic concepts of the 1921 food guide. Recipes and preparation instructions were also included for the homemaker (Hunt, 1921).

In 1923, Hunt modified her 1921 food guide:

> The number of different food materials available in most parts of the United States is very great and is constantly increasing as a result of improved methods of agriculture, the invention of new manufacturing processes, the introduction of foreign food plants, and the cultivation of wild varieties. There is no one of these many foods that cannot be introduced into the diet in such a way as to contribute to its wholesomeness or attractiveness (Hill, 1970, p. 1).

Good Proportions in the Diet (Hunt, 1923) provided specific information on nutrients, including Vitamins A and B and the minerals iron, calcium, and iodine. Hunt encouraged planning meals for an entire week, providing sample menus and shopping guides. Energy and kilocalorie content of foods were no longer the primary criteria for food selection. Hunt implied differences in food and nutrient value between the five food groups. Hunt recommended the following food selection portions:

1. Meat and flesh foods should provide 25% of the fuel value of the diet.
2. Cereal foods should provide 25% of the fuel.

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3. Fats and fat foods should provide 20% of the fuel.
4. Fruits and vegetables should provide 20% of the fuel.
5. Sugars should provide 10% of the fuel (1923, p. 7).

Hunt provided guidelines to limit Sugars and Sweets when energy requirements were reduced. She prescribed no limits on Grains and Cereals or Flesh Foods. Nutrient adequacy, wholesomeness of the food supply, attractiveness of the foods, and economy of the meals were the significant concepts addressed in Hunt's guide (Hunt, 1923). The USDA published and distributed this guide in 1923. The target audience included teachers, club leaders, and social service workers. After a 1928 revision, Hunt's Good Proportions in the Diet food guide was distributed to the general public through the Agriculture Extension Service (Hertzler, 1974).

The End of a Decade of Food Guidance

During the 1920s, Caroline Hunt and C. F. Langworthy from the United States Department of Agriculture provided nutrition advice to many homemakers through activities at the Extension Service and distribution of USDA pamphlets. Henry Sherman from Columbia University wrote chemistry and nutrition texts to educate and train nutrition and public health professionals. E. V. McCollum from Johns Hopkins University wrote for nutrition scientists and public health nutritionists. He also disseminated his knowledge to the general public by publishing articles in McCall's Magazine.

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McCollum emphasized the significance of making sound food choices and the importance of general nutrition in relation to personal and national health. In a decade of continuing explosions of scientific discoveries in the field of nutrition and metabolism, Hunt, Sherman, and McCollum pioneered the art of translating nutrient data into practical food guidance and meal planning recommendations.

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CHAPTER 6

THE DECADE OF THE 1930s

Nutrition Information Explosion, Economic Depression

The Age of Vitamins and Minerals

By the early 1930s, Sherman and McCollum incorporated the newer knowledge of vitamin and mineral requirements into practical food recommendations for the general population. Like Hunt's 1928 edition of Good Proportions in the Diet, Sherman (1932) and McCollum (1957) shifted the focus in food guidance from energy requirements to nutrient density, recommending the vitamin and mineral-rich protective foods: milk, leafy green vegetables, and yellow fruits and vegetables, rather than the calorie-dense foods high in fats and sugars. Sherman advised:

> Enrichment of the dietary in Vitamins A, C, B, G (Riboflavin), and calcium is usually beneficial, not merely for protection against actual deficiencies, but also for the promotion or enhancement of vitality - of 'positive' or 'buoyant' or better than average health. Improvement of food habits will bring higher degrees of health with increased efficiency and power to resist disease (1932, p. 528).

Sherman promoted optimal nutrition which would promote the health and maintain the working capacity of Americans, not merely provide freedom from starvation or nutrient deficiencies (Sherman, 1932; Leitch, 1942). Sherman

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defended this shift in focus for food guidance in the 1932 edition of Food and Chemistry:

> It is sometimes asked whether a normal appetite does not indicate, as well as any dietary standard, the amount of food which is desirable for an individual in any given circumstance. Under modern conditions, scientific dietary standards, based on a knowledge of food chemistry and nutritive requirements, constitute the most rational guide to the formation of hygienic and economic habits in the use of food (1932, p. 499).

Sherman published nutrient intake recommendations for the three macronutrients and eleven micronutrients known in 1930 (Sherman, 1932). Carbohydrates, fats and lipids, and protein and amino acids were the energy-yielding macronutrients. Calcium and phosphorous were mineral residuals recovered from the ashes of bones and teeth. Iron and copper were mineral residuals recovered from the ashes of blood, and were identified as substances which could cure anemias. Iodine was a mineral ashe extracted from desiccated thyroid glands. A deficiency of this mineral was associated with the occurrence of simple goiter, a thyroid gland enlargement. As a result of a 1921 controlled experimental trial in Akron, Ohio, with 6,000 school children, investigators determined that simple goiter could easily be prevented by adding iodine to drinking water (Todhunter, 1957). Subsequently, the Federal government recommended fortification of table salt with iodine to prevent goiter (Morgan, 1957). However, the fortification program was voluntary, and the general public needed more

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information concerning the use of iodized salt. By the mid 1930s, Vitamins A, B (thiamin), C (ascorbic acid), D, E, G (later identified as riboflavin and classified as a member of the B complex vitamins), and niacin were identified and their deficiency diseases described (Sherman, 1957; Todhunter, 1957). Night blindness, beriberi, scurvy, rickets, and pellagra could be prevented simply through careful selection of foods rich in the known organic micronutrients.

The Economic Depression of the 1930s

During the sustained economic depression which followed the 1929 Stock Market Crash, many Americans could not afford to purchase a nutritionally balanced diet which would prevent vitamin deficiency diseases (USDA, 1939; Federal Security Agency, 1942; Stiebeling, 1942; Schlossberg, 1978). Pellagra (niacin deficiency) was listed as the cause of death for over 7000 Southerners in 1930 (Stiebeling, 1932). The 1936 Consumer Purchase Study demonstrated that many Americans were at risk for developing deficiency diseases because they could not afford to purchase adequate "protective foods" (USDA, 1939; Schlossberg, 1978). Nutrient-rich whole milk, fresh leafy green vegetables, and citrus fruits were often the more expensive perishables. Low wages and unemployment placed a balanced diet costing $2 per week per family member beyond the budget constraints of

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many families (Stiebeling, 1942).

Sherman recommended a food guide to supplement Hunt's 1928 Good Proportions in the Diet food guide, incorporating the newer knowledge of nutrient recommendations and also addressing the economic crisis brought about by the depression:

> Food should be chosen so that the health and efficiency of the individual shall be served in the highest degree and at the same time it should be used with such regard to the economics of the food supply as a whole that the ideal of optimal nutrition shall be brought within the reach of all (1932, p. 520).

Sherman's food guide was based on an economic determination for food guidance, utilizing the original five food groups proposed by Langworthy (1916a; 1918) and used by Hunt (1916; 1921; 1923; 1928) throughout the 1920s:

> Divide your food money into fifths--
> One fifth, more or less, for fruits and vegetables;
> One fifth, or more, for milk and cheese;
> One fifth, or less, for meats, fish, and poultry;
> One fifth, or more, for breads and cereals;
> One fifth, or less, for fats.
> Whatever the expenditure, it seems wise to observe the two "rules" that:
>
> 1. at least as much should be spent for milk as for meats, fish, and poultry; and
>
> 2. at least as much should be spent for fruits and vegetables as for meats, poultry, and fish (1932, p. 527).

On a $2.00 per person per week 1932 food budget, Sherman's recommendations allowed only $.40 per person per week for each of the food groups. That *was* thrifty menu

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planning. Sherman's "rules" were the first food guides recommending moderation in the consumption of animal products (Sherman, 1932).

Starvation in the Midst of Plenty - The Stiebeling 12 Group Food Guide

During World War I, the United States Food Administration within the Department of Agriculture had urged Americans to conserve foodstuffs (especially grains which could be easily shipped to other countries), farmers to expand the production of agricultural products, and the food industry to process and preserve perishables (USDA, 1939; Federal Security Agency, 1942; Haughton, 1987). American food production and processing capacity continued to expand throughout the 1920s. Agriculture expansion halted following the stock market crash and the draught of the early 1930s. However, Federal policies, including price supports, subsidized credit, crop insurance, rural electrification, and irrigation projects stimulated renewed agricultural expansion (Federal Security Agency, 1942; Schlossberg, 1978). By the mid 1930s, agriculture and food production capabilities expanded to such a degree that agriculture surpluses threatened agricultural economic stability. Despite an abundant supply of foodstuffs, many Americans lacked the ability to pay for the expensive farm products, especially dairy foods, beef, and fresh produce.

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Prices paid to farmers dropped below the cost of food production. Banks foreclosed on the loans of farmers unable to sell their products. Bankrupt farmers reacted by dumping milk on highways and shooting hogs in troughs (Schlossberg, 1978). In Grapes of Wrath, John Steinbeck painted a vivid portrait of the plight of the desperate farmers and poor Americans during the 1930s:

> ...And the first cherries ripen. Cent and a half a pound. Hell, we can't pick 'em for that. Black cherries and red cherries, full and sweet, and the birds eat half of each cherry and the yellowjackets buzz into the holes the birds made. And on the ground the seeds drop and dry with black shreds hanging from them.
>
> The purple prunes soften and sweeten. My God, we can't pick them and dry them and sulfur them. We can't pay wages, no matter what the wages.
>
> And the pears grow yellow and soft. Five dollars a ton. Five dollars for forty fifty-pound boxes; trees pruned and sprayed, orchards cultivated- pick the fruit, put it in boxes, load the trucks, deliver the trucks to the cannery - forty boxes for five dollars. We can't do it. And the yellow fruit falls heavily to the ground and splashes on the ground. The yellowjackets dig into the soft meat, and there is smell of ferment and rot.
>
> ... The little farmers watched debt creep up on them like the tide. They sprayed the trees and sold no crop, they pruned and grafted and could not pick the crop. This little orchard will be part of a great holding next year, for the debt will have choked the owner.
>
> The works of the roots of the vines, of the trees, must be destroyed to keep up the price, and this is the saddest, bitterest thing of all. Carloads of oranges dumped on the ground. The people came for miles to take the fruit, but this could not be. How could they buy oranges at twenty cents a dozen if they could drive out and pick them up? And men with hoses squirt kerosene on the oranges, and they are angry at the crime, angry at the people who have come to take the fruit. A million people hungry, needing the fruit

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> - and kerosene sprayed over the golden mountains.
>
> And the smell of rot fills the country. Dump potatoes in the rivers and place guards along the banks to keep the hungry people from fishing them out. Slaughter the pigs and bury them, and let the putrescence drip down into the earth.
>
> There is crime here that goes beyond denunciation. There is a sorrow that weeping cannot symbolize. There is a failure here that topples all our success. The fertile earth, the straight tree rows, the sturdy trunks, and the ripe fruit. And children dying of pellagra must die because a profit cannot be taken from an orange. And the coroners must fill in the certificates - died of malnutrition - because the food must rot, must be forced to rot.
>
> The people come with nets to fish for potatoes in the river, and the guards hold them back; they come in rattling cars to get the dumped oranges, but the kerosene is sprayed. And they stand listening to the screaming pigs being killed in a ditch and covered with quicklime, watch the mountains of oranges slop down to a putrefying ooze; and in the eyes of the people there is the failure; and in the eyes of the hungry there is a growing wrath. In the souls of the people the grapes of wrath are filling and growing heavy, growing heavy for the vintage (1939, p. 360-363).

The Federal government responded to this agricultural economic catastrophe with agreements to purchase surplus commodity products from the farmers, guaranteeing a steady market and income, and thereby protecting the agricultural sector (Federal Security Agency, 1942; Schlossberg, 1978).

Because of the economic depression and unemployment throughout 1930s, a nutritionally adequate diet was not universally affordable to urban Americans (USDA, 1939; Federal Security Agency, 1942; Morgan, 1957; Schlossberg, 1978; Haughton, 1987). Almost 16 million persons were unemployed with no means of producing their own foodstuffs.

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In 1933, Hazel Stiebeling from the Department of Home Economics in the USDA, developed a food guide acknowledging these severe economic conditions experienced by almost one-third of the population and also reflecting the expanding agricultural surplus being supported by Federal farm policies (Stiebeling, 1933a). Stiebeling's food guide included plans at four cost levels:

1. Economical fair;
2. Low cost good;
3. Moderate cost good; and
4. Expensive good (1933a).

"Diets At Four Levels of Nutrition and Cost" (see Table 3) proposed a guide with 12 food groups: (a) Milk and milk products; (b) Potatoes and sweet potatoes; (c) Mature beans, peas, and nuts; (d) Tomatoes and citrus fruits; (e) Leafy, green, and yellow vegetables; (f) other Vegetables and fruits; (g) Eggs; (h) Lean meat, fish, and poultry; (i) Cereals, flour, and grain; (j) Butter; (k) Other fats; and (l) Sugars.

The "moderate cost good" and "expensive good" plans met Sherman's minimum dietary recommendations for protective foods. The "expensive good" plan included liberal amounts of the protective foods - fresh whole milk products, meats as the protein food, and fresh tomatoes and citrus. The "low cost good" plan included only minimal servings of the

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Table 3.

DIETS AT FOUR LEVELS OF NUTRITIVE CONTENT AND EXPENSE
Hazel Stiebeling
1933

United States Department of Agriculture

Food Group	Portions/ Servings	
	Expensive/ good	Low cost/ fair
Milk	3-4 cups	3-4 cups
Potatoes/ sweet potatoes	1 per day	10-11/week
Mature legumes/ nuts	1 per week	2-3/week
Tomatoes, citrus fruits	1 per day	4-5/week
Leafy, green, yellow vegetables	11-12/week	10-11/week
Other fruits and vegetables	3 per day	2 or 3/day
Eggs	1/day	4/week
Lean meat, fish, poultry	9-10/week	7 or 8/week
Cereal *	As desired	Daily
Bread *	As desired	At every meal
Butter	**	**
Other fats	**	**
Sugars	**	**

* Cereals and breads (flours) were combined as one food group, serving portion recommendations differed between cost level.

** Butter, fats, and sugars were grouped as "desserts" in the food plan. Desserts were recommended "as desired."

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more expensive protective foods. The "economical fair" diet did not meet McCollum's minimum recommendations for protective foods. The levels of complete protein, vitamins, and minerals in the "economical fair" food plan were slightly below the minimum necessary for protection from nutrient deficiencies.

Fruits and vegetables, milk, and fresh meats were perishable and more expensive than the energy-rich fats and concentrated sugar foods which did not contribute protective nutrients to the diet. Therefore, the "economical fair" diet included larger portions of fats, potatoes, dried beans and legumes, breads and cereals, and desserts than the "expensive good" food plans (Stiebeling, 1933a; 1933b; 1939). Thus, with the publication of "Diets at Four Levels of Nutrition and Costs," the United States acknowledged that the poor could only afford a marginal diet (USDA, 1939; Federal Security Agency, 1942; Haughton, 1987).

Later in 1933, Stiebeling published the first minimum dietary standard for nutrients for the United States Department of Agriculture (Stiebeling, 1933b; Leitch, 1942; Harper, 1985). Based on Sherman's *qualitative* "protective food" dietary recommendations, Stiebeling proposed requirements for kilocalories; protein; Vitamins A, B, and C; calcium; iron; and phosphorus. The standards were *quantified* nutrient requirements for individuals in nine age and gender categories. These standards were developed to

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evaluate the nutritional adequacy of the food plans proposed in the 1933 "Diets at Four Levels of Nutrition and Cost Food Guide." In 1939, Stiebeling and Ester Phipard expanded this first set of dietary standards to include the vitamins thiamin and riboflavin (USDA, 1939; Leitch, 1942; Harper, 1985). These 1939 dietary standards and revised food plans were published in Food and Life. 1939 Yearbook of Agriculture (USDA, 1939).

Nutrition and Social Welfare Policies

In 1933, the Federal Surplus Commodities Corporation was established to distribute the growing surpluses of agricultural products which were being purchased to support farm commodity prices (USDA, 1939; Schlossberg, 1978). The Corporation established two basic food assistance programs. The first commodity program distributed stored surplus agricultural products as food packages to needy families. These food packages were originally designed to meet Stiebeling's standard for an "economical fair" food plan. The second commodity program distributed surplus agricultural products to public schools for their lunch programs. In 1935, the Federal Surplus Commodities Corporation was transferred to the Department of Agriculture to recognize a change in emphasis: "...from relief of hunger to the removal of agricultural surpluses and the encouragement of domestic consumption" (Federal Security

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Agency, 1942, p. VI).

Under Public Law 72-320, between 1935 and 1939 the Department of Agriculture distributed three billion pounds of surplus foods to families receiving public assistance. The 1940 dollar value of the agricultural surplus distribution was $158 million (USDA, 1939; Federal Security Agency, 1942). In 1940, Congress enacted a Food Stamp Plan. The subsidized food stamps provided a purchasing bonus based on the income and family size to poor families. Food Stamps also enabled participating families to select and purchase foods at local grocery stores rather than requiring acceptance of commodity foods. The goal of the program was to increase consumption of the nutrient-dense protective foods, among those urban families who could not grow their own produce or purchase adequate amounts because of limited incomes (Federal Security Agency, 1942). The USDA also assumed that the food stamps would stimulate the purchase of agricultural products, thereby aiding the agricultural economy. By the end of its first operating year, the USDA distributed Food Stamps to more than one million poor families (Federal Security Agency, 1942; Schlossberg, 1978).

The Department of Agriculture implemented additional commodity programs during the late 1930s. Under Public Law 72-461, the Federal Surplus Commodities Program directed distribution of commodity foods to public and private school lunch programs. The Penny Milk program was enacted in 1940.

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The USDA contracted milk producers to sell milk to participating schools for one cent per half pint. The Federal government made direct payment to the dairy farmers for the balance of the fair market value of the milk (Obert, 1978; Schlossberg, 1978; Owen, 1986).

These commodity distribution programs were created to support America's influential and rapidly growing agribusiness (Federal Security Agency, 1942). The programs were supposed to reduce hunger and malnutrition among the country's economically disadvantaged citizens (Federal Security Agency, 1942; Schlossberg, 1978; Haughton, 1987). These programs disposed of the agricultural surpluses, supported agribusiness, but did not eliminate hunger. Until the 1940s, the Department of Agriculture had been the largest and most influential agency in the Federal government. World War II redirected Federal agency focus and influence.

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CHAPTER 7

THE WAR YEARS

Enrichment, Rationing, and Food Guidance

The Food and Nutrition Board - Standards and Guides

Hazel Stiebeling's 1935-1937 food consumption surveys identified widespread nutritional inadequacies which aroused a growing national concern for the health of all Americans (Stiebeling, 1941; Hundley, 1957; Morgan, 1957). The publication of the results of the dietary surveys and incidence of pellagra throughout the South in the 1939 Yearbook of Agriculture brought the problems of malnutrition to national attention. Various government agencies and civilian groups began to work together to initiate plans for a broad national nutrition policy supporting comprehensive feeding and nutrition education programs (USDA, 1939; Federal Security Agency, 1942).

By 1941, the rapid expansion of Defense Department activities made it apparent that optimal nutrition was essential for better health and national security. Furthermore, an adequate food supply would be necessary to sustain the morale of all Americans throughout the World War (Stanley, 1942; Stiebeling, 1942; Mitchell, 1943).

In May, 1941, President Franklin Roosevelt convened 900

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civilian and Federal nutrition and science experts to the National Nutrition Conference for Defense "to discuss the problems of nutrition for defense and formulate recommendations for a national program of action" (Federal Security Agency, 1942, p. V). The National Nutrition Program was established during this conference, coordinated through the Office of Defense and Welfare Services within the USDA. Paul McNutt, Director of the Office of Defense and Welfare, appointed M. L. Wilson as Director of the National Nutrition Program (Mitchell, 1943). Wilson established committees to develop nutrition education programs, conduct food consumption surveys, and to encourage further research in the area of nutrient requirements.

At the conclusion of the four-day conference, Dr. Russell Wilder, Chairman of the Food and Nutrition Board (FNB) of the National Research Council (NRC), National Academy of Sciences (NAS), presented the first Recommended Dietary Allowances (RDAs) (Leitch, 1942; Roberts, 1958; Harper, 1985). Dietary allowances were established for the following nutrients: (a) protein; (b) iron; (c) calcium; (d) Vitamin A; (e) Vitamin C; (f) thiamin; (g) riboflavin; and (h) nicotinic acid (niacin). The RDAs included 18 age and gender categories, recognizing that individuals had different nutrient requirements based on age (and therefore size) and gender. The dietary recommendations were based on the earlier work of Sherman and Stiebeling plus a review of

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then contemporary vitamin and mineral research papers. Allowances were also established for kilocalories, assuming a "moderate activity level" for all individuals (Roberts, 1958; Harper, 1985).

The RDAs were developed to plan nutritionally adequate menus for the civilian and military populations in the United States and to evaluate the dietary intakes of target low income population groups (Federal Security Agency, 1942; Roberts, 1958). These recommendations were developed as "goals at which to aim in providing for the nutritional needs of groups of people" (Roberts, 1958, p. 907).

The RDAs were also used as the standards for the "enrichment" of flour, cereals, and bread products with the vitamins thiamin and niacin and the mineral iron (Todhunter, 1957). The Food and Nutrition Board proposed that the enrichment program would alleviate widespread nutrient deficiency diseases, including anemia (iron) and pellagra (niacin). At first this enrichment program was controversial among nutritionists, who felt that individuals should get all the nutrients they need by consuming "natural" rather than "vitamin added" foods (Stewart, 1981). The United States Army and Navy were the first groups to require the use of enriched cereal and grain products in food service facilities. The enrichment program was supported by groups within the food industry, however, and enriched flours and cereals eventually became available to

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the average consumer. When riboflavin became commercially available in 1943, this vitamin was added to flour as a part of the enrichment program (Morgan, 1957; Todhunter, 1957; Stewart, 1981).

The RDAs were also used as a standard for a proposed fortification program for vegetable fats and oils with Vitamin A (and later D). Dairy lobbyists led the opposition in the controversy, since they viewed the fortification as a direct threat to butter sales, profits, and the subsequent erosion of congressional support for dairy subsidies. The controversy over fortification ended in a compromise. Vegetable oil manufacturers could fortify spreads with Vitamins A, but the yellow coloring used to enhance the visual appeal (and imitate the appearance of butter) had to be packaged separately. Throughout the 1940s, consumers could purchase fortified white oleomargarine but had to knead the yellow dye into the spread in their own kitchens (Hill, 1970; Public Voice, 1985).

1941 Food Guides

Committee on Dietary Allowances

Lydia Roberts, Chairman of the Committee on Dietary Allowances of the National Academy of Sciences; Lela Bocher, Chief of the Bureau of Home Economics; and Hazel Stiebeling, USDA, developed a nine-group food guide to implement the newly established RDAs (Federal Security Agency, 1942). The

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food guide (see Table 4) grouped foods into the following categories: (a) Milk; (b) Lean meat, poultry, and fish; (c) Eggs; (d) Vegetables (one green leafy or yellow); (e) Potato; (f) Fruit (one citrus or tomato); (g) Whole grain or "enriched" cereals and bread; (h) Butter or "fortified" oleo; and (i) Sugar and other fats (Federal Security Agency, 1942).

Each food group contributed between 20% and 45% of the nutrients defined in the 1941 RDAs. Planning menus based on the food guide would therefore predictably satisfy nutrient requirements identified in the RDAs:

1. Milk contributed calcium and riboflavin.
2. Lean meat, poultry, fish contributed protein, iron, riboflavin, and niacin equivalents.
3. Eggs contributed iron and protein.
4. Green leafy vegetables and yellow vegetables contributed riboflavin and Vitamin A.
5. Potatoes contributed Vitamin C and energy.
6. Fruit (citrus or tomato) contributed Vitamin C.
7. Whole grain or "enriched" cereals and bread contributed niacin, thiamin, riboflavin, and iron.
8. Butter or "fortified" oleo contributed Vitamin A.
9. Sugar and fats contributed kilocalories (Federal Security Agency (1942).

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Table 4.

RECOMMENDED DIETARY ALLOWANCES
Federal Security Agency
May, 1941

Committee on Dietary Allowances
Food and Nutrition Board
National Academy of Sciences

Food Group	Portions/ Servings
Milk	1 pint for adults, 3 or 4 cups for children
Lean meat, poultry, fish	1 3-ounce serving
Eggs	3 to 4 per week
Vegetables	2 servings 1 serving = 1/2 cup cooked
Potato	1 or more serving
Fruit	2 servings (1 citrus or tomato) 1 serving = 1/2 cup cooked or 1 whole fruit
Whole grains or "enriched" cereal and bread	At least half of kilocalorie intake
Butter or fortified oleo	100 to 500 kilocalories
Sugar and Fat	To complete kilocalories required to maintain growth for children

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This food guide was the first published guide recommending the "enrichment" of cereals and flours with the nutrients destroyed during the milling process. The guide also recommended selection of margarine "fortified" with Vitamin A. A sample menu based on the new food guide met the new RDAs at a cost of $0.32 per person per day at 1941 Chicago food prices (Federal Security Agency, 1942).

Bureau of Home Economics

The Bureau of Home Economics, the Children's Bureau (in the Department of Labor), the Office of Education, and the Public Health Service also developed a food guide to translate the new RDAs into a practical food guide (Bureau of Home Economics, 1941; Journal Home Economics, 1943) (see Figure 9). Bureau of Home Economics Chief Lela Bocher had been a member of the Committee on Dietary Allowances that developed the RDAs and supervised the development of the RDA guide (Hertzler, 1974). "Eat the Right Foods to Help Keep You Fit" was a 10-group food guide: (a) Milk; (b) Lean meats, poultry, and fish; (c) Eggs; (d) Leafy green or yellow vegetables; (e) Tomatoes, oranges, and grapefruits; (f) Other fruits and vegetables; (g) Cereals and "enriched" breads; (h) Fats; (i) Sweets; and (j) Water (Bureau of Home Economics, 1941).

"Eat the Right Foods to Help Keep You Fit" was similar to the guide developed by the Committee on Dietary

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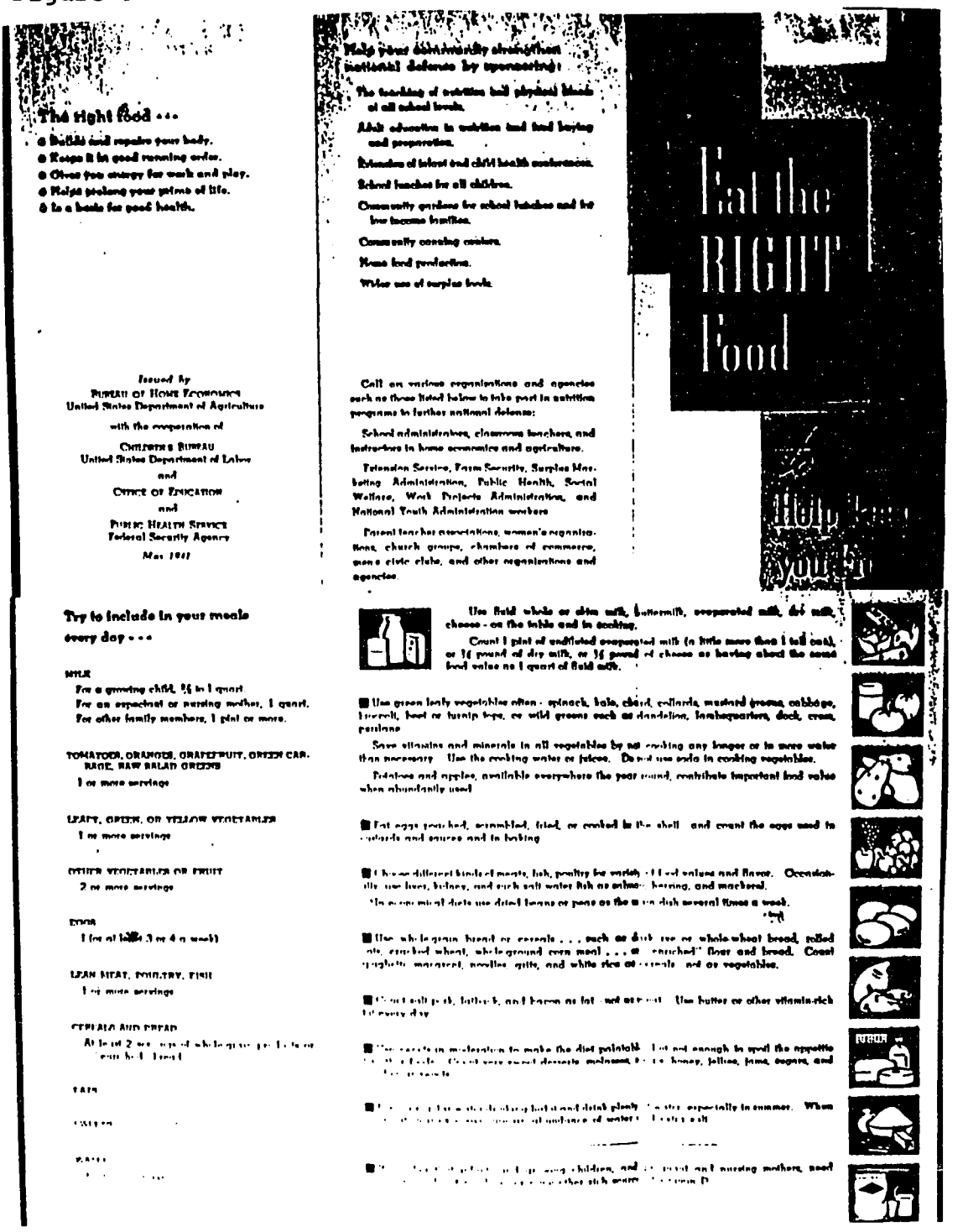
Figure 9



The right food . . .

- Builds and repairs your body.
- Keeps it in good running order.
- Gives you energy for work and play.
- Helps prolong your prime of life.
- Is a basis for good health.

Issued by
BUREAU OF HOME ECONOMICS
United States Department of Agriculture
with the cooperation of
CHILDREN'S BUREAU
United States Department of Labor
and
OFFICE OF EDUCATION
and
PUBLIC HEALTH SERVICE
Federal Security Agency
May 1941

Help your community strengthen national defense by sponsoring:

The teaching of nutrition and physical fitness at all school levels.

Adult education in nutrition and food buying and preparation.

Extension of infant and child health conferences.

School lunches for all children.

Community gardens for school lunches and for low income families.

Community canning centers.

Home food production.

Wider use of surplus foods.

Call on various organizations and agencies such as those listed below to take part in nutrition programs to further national defense:

School administrators, classroom teachers, and instructors in home economics and agriculture.

Extension Service, Farm Security, Surplus Marketing Administration, Public Health, Social Welfare, Work Projects Administration, and National Youth Administration workers

Parent-teacher associations, women's organizations, church groups, chambers of commerce, men's civic clubs, and other organizations and agencies.

Eat the RIGHT Food

Help keep you fit

Try to include in your meals every day . . .

MILK

For a growing child, ½ to 1 quart.
For an expectant or nursing mother, 1 quart.
For other family members, 1 pint or more.

TOMATOES, ORANGES, GRAPEFRUIT, GREEN CABBAGE, RAW SALAD GREENS

1 or more servings

LEAFY, GREEN, OR YELLOW VEGETABLES

1 or more servings

OTHER VEGETABLES OR FRUIT

2 or more servings

EGGS

1 (or at least 3 or 4 a week)

LEAN MEAT, POULTRY, FISH

1 or more servings

CEREALS AND BREAD

At least 2 [illegible]

FATS

[illegible]

SWEETS

[illegible]

Use fluid whole or skim milk, buttermilk, evaporated milk, dry milk, cheese - on the table and in cooking.

Count 1 pint of undiluted evaporated milk (a little more than 1 tall can), or ¼ pound of dry milk, or ¼ pound of cheese as having about the same food value as 1 quart of fluid milk.

Use green leafy vegetables often - spinach, kale, chard, collards, mustard greens, cabbage, broccoli, beet or turnip tops, or wild greens such as dandelion, lambsquarters, dock, cress, purslane.

Save vitamins and minerals in all vegetables by not cooking any longer or in more water than necessary. Use the cooking water or juices. Do not use soda in cooking vegetables.

Potatoes and apples, available everywhere the year round, contribute important food value when abundantly used.

Eat eggs poached, scrambled, fried, or cooked in the shell - and count the eggs used in custards and sauces and in baking.

[illegible] different kinds of meats, fish, poultry for variety of food values and flavor. Occasionally use liver, kidney, and such salt water fish as salmon, herring, and mackerel.

In some regional diets use dried beans or peas as the main dish several times a week.

Use whole-grain bread or cereals . . . such as dark rye or whole-wheat bread, rolled oats, cracked wheat, whole-ground corn meal . . . or "enriched" flour and bread. Count spaghetti, macaroni, noodles, grits, and white rice as cereals and as vegetables.

[illegible] butter, and bacon as fat - not as meat. Use butter or other vitamin-rich fat every day.

[illegible] in moderation to make the diet palatable - but not enough to spoil the appetite [illegible] honey, jellies, jams, sugars, and [illegible]

[illegible] especially in summer. When [illegible] of water [illegible]

[illegible] children, and [illegible] nursing mothers, need [illegible] other rich source [illegible] D.

EAT THE RIGHT FOOD TO HELP KEEP YOU FIT

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Allowances (see Table 5). Sweets was listed as a separate food group rather than the ingredients Fat and Sugar. Water was added as the 10th food group. Animal foods and fresh produce were emphasized by placing these foods at the top of the guide.

National Dairy Council

The National Dairy Council published the third food guide of 1941. "A Guide to Good Eating" (National Dairy Council, 1941) (see Table 6) recommended a seven-group food guide: (a) Milk; (b) Meat, cheese, fish, or legumes; (c) Eggs; (d) Vegetables; (e) Fruits; (f) Cereals and enriched breads; and (g) Butter.

Dr. Lydia Roberts, Chairman of the Committee on Dietary Allowances, served as the scientific consultant for the National Dairy Council project (Hertzler, 1974). Although developed to implement the 1941 RDAs, the "Guide to Good Eating" differed from the other 1941 guides. Cheese was listed in the Meat group. No fats other than Butter were recommended. Milk was listed as a separate food group. Dairy products, therefore, were listed in three of the seven groups of food. The Dairy Council developed posters and brochures to use in a nationwide nutrition education program (Hertzler, 1974). The three food guides developed in 1941, based on the new RDAs and the assumption of agriculture surpluses, were never fully implemented (Hertzler, 1974;

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Table 5.

EAT THE RIGHT FOODS TO HELP KEEP YOU FIT

Bureau of Home Economics
May, 1941

United States Department of Agriculture

Food Group	Portion/ Serving
Milk	1 pint or more
Lean meat, poultry, fish	1 or more
Eggs	1 or at least 4/week
Leafy green or yellow vegetables	1 or more servings
Tomatoes, oranges, grapefruit, raw salad greens	1 serving
Other vegetables or fruits	2 or more servings
Cereals and breads	At least 2 servings of whole grain or "enriched" bread
Fats	Use butter or vitamin-fortified fat daily
Sweets	Use in moderation to make the diet palatable, but not enough to spoil the appetite
Water	6 or more glasses; more with excessive perspiration

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Table 6.

A Guide to Good Eating

National Dairy Council
1941

Food Group	Portion/ Serving
Milk	2 or more cups for adults 3 or 4 for children
Meat, cheese, fish, or legumes	1 or more servings
Eggs	3 to 5 per week
Vegetables	2 or more servings besides potatoes 1 serving = 1/2 cup
Fruit	2 or more servings 1 citrus or tomato 1 serving = 1/2 cup
Cereals and breads	Most should be whole grain or "enriched"
Butter	2 Tablespoons or more

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Haughton, 1987). An international crisis intervened.

1942

A Nation At War

The United States entered World War II in December, 1941.

Beginning in the spring of 1942, the Department of Agriculture sent tons of foodstuffs overseas to feed the Allied troops. Domestic agricultural surpluses were quickly depleted. Food scarcities affected everyone, regardless of income (Morgan, 1957).

The concern for optimal nutrition as a part of national defense heightened in early 1942. Using Stiebeling's 1939 standards and the 1941 RDAs as criteria to measure the nutritional adequacy of diets, officials in the Department of Agriculture estimated that over one-third of American families consumed a diet that would be rated as "poor," that is, supplying less than 80% of the RDAs for all nutrients except protein (Stanley, 1941; 1942; Hundley, 1957). Approximately one third of the males rejected by the Selective Service in 1942 had physical disabilities related to malnutrition (Office of Defense, 1943). In a Vermont health survey, 85% of the children examined showed signs of healed rickets. In New York City, 21% of high school students in low income families consumed less than two thirds of the RDAs for kilocalories and less than one half

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the RDAs for micronutrients (Hundley, 1957).

In 1942, Paul McNutt, Director of the Office of Defense and Welfare Services, USDA, introduced an eight-group food guide (Office of Defense, 1942). U. S. Needs Us Strong - Eat Nutritional Foods (see Figure 10) was developed to promote "full health returns from the Nation's food resources...for victory and when the war is over" (Office of Defense, 1942). Although not stated explicitly, the "U. S. Needs Us Strong" guide derived its scientific basis from the 1941 RDAs (Hertzler, 1974). The eight group food guide was similar to the 1941 guides developed by the Committee on Dietary Recommendations and the Bureau of Home Economics (see Table 7). Each of the food groups provided generous quantities of the nutrients identified in the RDAs. Sugar and Water were omitted as food groups. Sugar was in short supply because of the war, and scarcities therefore would determine consumption of sweets (Trese, 1991). Additional foods could be chosen as taste, budget, and custom permitted. Food groups listed in the 1942 guide were: (a) Milk; (b) Oranges and tomatoes; (c) Green or yellow vegetables; (d) Other fruits and vegetables; (e) Bread and enriched cereals; (f) Meat, fish, and poultry; (g) Eggs; and (h) Butter and spreads (Office of Defense, 1942).

The food guide promoted a foundation diet, recommending minimum servings of milk, citrus fruits, vegetables, and eggs. After selecting from the foundation plan, adding

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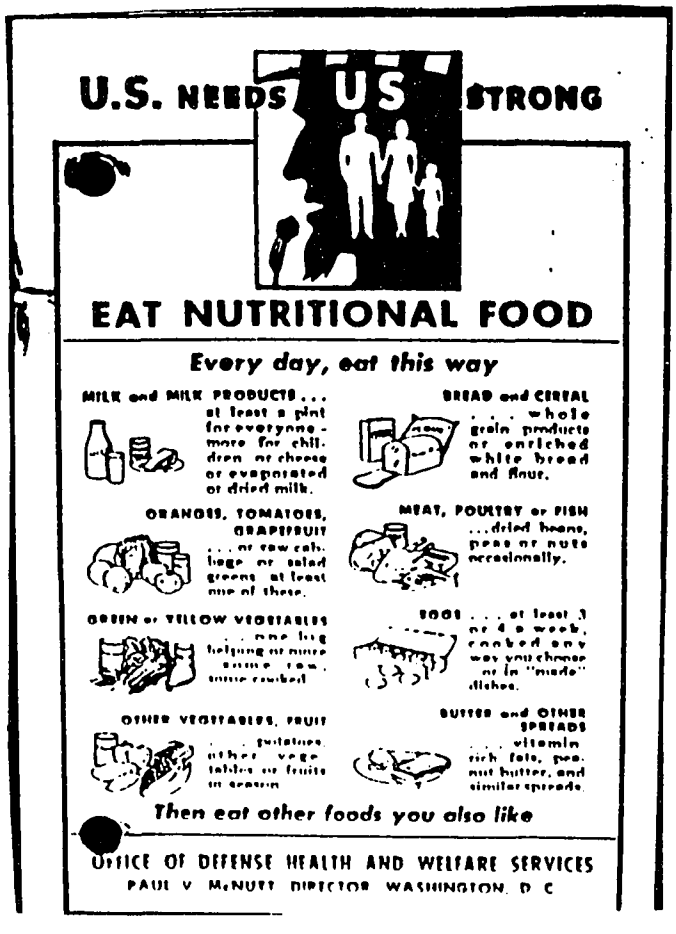
Figure 10



U. S. NEEDS US STRONG

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Table 7.

U. S. NEEDS US STRONG
EAT NUTRITIONAL FOOD

Office of Defense Health and Welfare Services
1942

United States Department of Agriculture

Food Group	Portion/ Serving
Milk and Milk Products	At least one pint
Oranges, tomatoes, grapefruit	At least one
Green or yellow vegetables	One big helping
Other vegetables, fruits	*
Bread and Cereals	*
Meat, poultry or fish dried peas, beans, or nuts occasionally	*
Eggs	At least 3 or 4/week
Butter and other spreads Vitamin-rich fats, peanut butter, and similar spreads	*

Every day, eat this way...
...then eat other foods you also like

* No portion quantity or size designation

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kilocalories from the Fats group, persons could "then eat other foods as you also like" (Office of Health Defense, 1942).

The "U. S. Needs Us Strong" guide satisfied the meal planning needs of families with factory workers and school children by providing suggestions for lunchbox meals. Because of food shortages, the guide provided alternate food selections to substitute for more traditional or favorite foods. Meal planning and preparation suggestions were provided to assist homemakers reduce food waste.

The USDA distributed the new food guides to homes, communities, and industries supplying the war effort. Posters promoting the food guide were displayed in post offices and other Federal offices. M. L. Wilson from the National Nutrition Program adopted USDA's new food guide, organizing state committees to carry the nutrition education program back to local urban communities (Hertzler, 1974).

Directors McMutt and Wilson also solicited national media support for the 1942 National Nutrition Program. The Saturday Evening Post ran a four-week series during June, 1942, promoting the nutrition campaign:

> America must win this war. America *will* win this war. But to win, America must be strong. Strong not only in ships and tanks and planes and guns, but in men and women, boys and girls. We can make America strong by making Americans strong. That means food. ...It means that every American housewife's No. 1 job today is to feed her family well. And it means that every one has a solemn wartime responsibility to know nutritional foods - foods that build health and strength and endurance

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- and to eat the right foods, every day. (National Nutrition Program, 1942a) (see Figure 11).

Wilson also encouraged the food industry to promote the National Nutrition Program by incorporating the guide into advertising campaigns (Office of Defense, 1943). A manufacturer could use the program logos in advertising copy. This would encourage manufacturers to promote nutritious foods, and would place the expense for nutrition education into the budgets of the food manufacturers.

1943

Rationing

The Department of War Food Administration, USDA, continued sending foodstuffs overseas in 1943. Resulting food shortages in the United States prompted the War Food Administration to implement a program of food rationing (Trese, 1991). Families were issued ration coupons based on family size. The homemaker had to surrender these coveted coupons in order to purchase scarce foodstuffs and other products. Sugar and coffee were the first items rationed. Canned vegetables and soups, as well as perishable dairy products, were also rationed. By the end of 1943, fresh meat was rationed at the rate of two pounds per week per person. Fresh fruits and vegetables, the "protective foods," were not rationed because these perishables could not be shipped overseas (Trese, 1991).

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Figure 11

THE SATURDAY EVENING POST June 20, 1942

"Only a healthy nation is a strong nation!

Vol 214, No

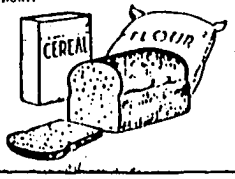
"AND PEOPLE are healthy only if they eat the right foods—the basic wholesome foods that fit every budget and make up a properly balanced diet. The foods you eat will do much to determine the effectiveness of America's war effort. Every day counts—every meal is important. I urge every patriotic American to cooperate now with the National Nutrition Program."

Director of the Office of Defense, Health and Welfare Services

Every day—eat this way...

MILK and MILK PRODUCTS
... at least a pint for everyone—more for children—or cheese or evaporated or dried milk.

BREAD and CEREAL
... whole grain products or enriched bread and flour.

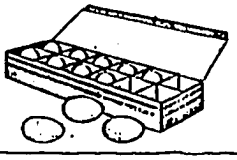


ORANGES, TOMATOES, GRAPEFRUIT
... or raw cabbage or salad greens—at least one of these.

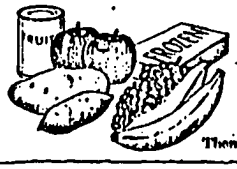
MEAT, POULTRY or FISH
... dried beans, peas, or nuts occasionally.

GREEN or YELLOW VEGETABLES
... one big helping or more—some raw, some cooked.

EGGS
... at least 3 or 4 a week, cooked any way you choose—or in "made" dishes.



OTHER VEGETABLES, FRUITS
... potatoes, other vegetables or fruits in season.



BUTTER and OTHER SPREADS
... vitamin-rich fats, peanut butter and similar spreads.

Then eat other foods you like, too.

EVERY DAY your children grow. Every day your own body, too, goes through a process of re-growth. It builds muscles, tissues, new cells. And the foods your children need for growth, and adults need for repair, are meat, poultry or fish and other good sources of proteins. Because your body cannot store proteins for later use, you need a "building" food every day.

So Lesson 3 in our simple course in nutrition is "Eat Meat, Poultry or Fish." Every adult, every child, needs at least one adequate serving of meat, poultry or fish every day—fresh, canned or frozen. (Or occasionally other protein foods.) The thriftier cuts of meat, the less tender chickens, the less expensive fish, are just as rich in vital proteins. Meat is an especially good source of the important "B" vitamins. And both meat and fish are rich in minerals.

Recent studies show that Americans, by and large, get too little proteins. What to do about it? Serve meat more often! The thriftier cuts are just as nutritious. Have an extra fish meal every week. Serve liver, heart and kidneys often. And when you don't have meat or fish, be sure you serve dried beans or peas, lentils, nuts or a main dish made with cheese, eggs or milk.

THIS IS THE THIRD IN A SERIES of four advertisements telling you all you need to know to feed your family well.

We urge teachers, dietitians, Red Cross nutrition aids, home demonstration agents to use these government-approved pages in their nutrition and cooking courses. We urge every housewife and mother to use these pages in checking the family diet. So keep these ideas on good eating.

The first of this series appeared in the June 6 issue of the Post. Part 2 appeared in last week's issue, June 13. The fourth and last part of this quick course will be found in next week's issue, June 27.

SATURDAY EVENING POST WARTIME NUTRITION CAMPAIGN

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The National Nutrition Program published a new food guide in 1943, replacing the 1942 "U. S. Needs Us Strong" program. The National Wartime Nutrition Guide (War Food Administration, 1943) (see Table 8) reflected the impact of food shortages and rationing. The guide had seven food groups: (a) Green leafy and yellow vegetables; (b) Oranges and tomatoes; (c) Potatoes and other fruits and vegetables; (d) Milk; (e) Meat, poultry, fish, and eggs; (f) Bread, flour, and cereal - natural whole grain or enriched; and (g) Butter and fortified margarine. The Egg and the Meat, fish, and poultry groups from the 1942 guide were collapsed into a single group, reflecting wartime shortages in animal products.

The seven food groups were pictured as sectors in a wheel, implying that no single group was more important than the other (see Figure 12). There were no portion or minimum serving size recommendations because of food shortages. The guide provided information to enable homemakers to:

> Plan menus so that *some* foods from each *main* group are served daily. If certain foods are not available, or if you cannot afford them in cash or ration points, choose other foods from the same group which serve similar needs in food value and menu planning (War Food Administration, 1943).

The guide also included "a dozen points on conservation," including the advice to "use every scrap - bread crumbs in stuffing; meat bones and remnants for soup stock; vegetables in pies and hash; cooking water for soups" (War Food Administration, 1943) (see Figure 13).

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Table 8.

NATIONAL WARTIME NUTRITION GUIDE
THE U. S. NEEDS US STRONG
EAT THE BASIC 7 EVERY DAY

War Food Administration Branch
1943

Nutrition and Food Conservation Branch
United States Department of Agriculture

Food Group	Portion/ Serving
Green and yellow vegetables	*
Citrus fruits, tomatoes, raw cabbage	*
Potatoes, and other fruits and vegetables	*
Milk, cheese, and ice cream	*
Meat, poultry, fish Eggs Dried beans and peas Nuts Peanut butter	*
Breads, flour, and cereals Natural, whole grain, or "enriched," or "replenished"	*
Butter and fortified margarine	*

* No portion quantity or size designation

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Figure 12

A DOZEN HINTS ON CONSERVATION

1. Plan meals for the week with alternate choices to use foods available.
2. Try new foods when usual foods are scarce.
3. Buy fresh fruits and vegetables before spending ration points on canned foods.
4. Plan on a weekly basis to meet just your family needs in all perishable products.
5. Cover fresh meat loosely. Wipe with damp cloth just before cooking. If ground, store in extra cool place and cook soon.
6. Store each food where it will keep in best condition until ready for use.
7. Serve some fruits and vegetables raw; cook others in their skins, jackets, or natural covering.
8. Cook vegetables in small amounts of water and only until tender.
9. Serve vegetables in water in which they were cooked or use this water in soups, gravies, and sauces. Use left-over juice from canned or cooked fruit for cold drinks.
10. Use every scrap—bread crumbs in stuffing; meat bones and remnants for soup stock; vegetables in pies and hash; cooking water for soups.
11. Don't take more food on your plate than you will eat.
12. Waste no fats. Store butter and other table fats in tightly covered dishes in a cold dark place away from strong odors. To keep fats, strain fat drippings and store in clean, covered jars in a cool, dark place until used.

A80.123:
NFC-4

NATIONAL WARTIME NUTRITION GUIDE

UNITED STATES DEPARTMENT OF AGRICULTURE
War Food Administration
Nutrition and Food Conservation Branch
Washington, D. C.
NFC-4 July 1943

NATIONAL WARTIME NUTRITION GUIDE

When marketing in wartime, plan menus so that some foods from each main group are served daily.

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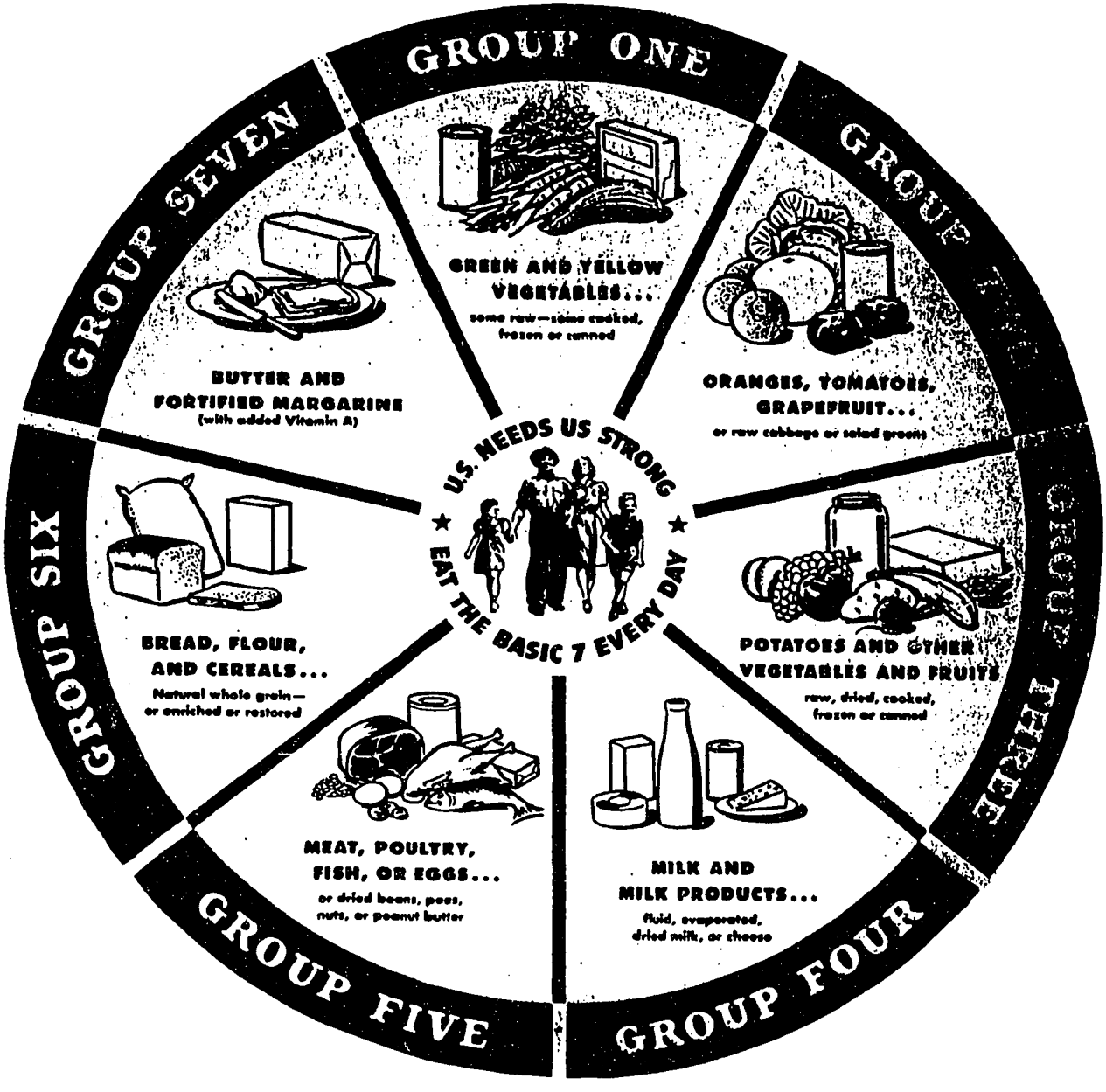
Figure 13



NATIONAL WARTIME NUTRITION GUIDE

U. S. needs us strong. Eat the Basic 7 every day.

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As during World War I, Americans were urged to grow their own vegetables to assure adequate intake of vitamin and mineral-rich protective foods and to substitute for other food shortages. Cities plowed football fields and tennis courts to provide "Victory Garden" plots for urban dwellers (Trese, 1991). The American Dietetic Association urged all members to plant gardens to increase local produce supplies (Plimmer, 1942; American Dietetic Association, 1943).

The National Wartime Nutrition Guide was widely publicized (Hertzler, 1974; Schlossberg, 1978). Food industry representatives cooperated with committees of the National Nutrition Program to develop brochures, pamphlets, and posters for mass distribution. On July 4, 1943, General Mills, Inc., ran an advertisement in the Philadelphia Enquirer for a "Breakfast of Champions:" "...A Program for Americans...to help us fight for the independence we celebrate today" (Philadelphia Enquirer, 1943). The advertisement included a picture of the seven group food wheel with a large bowl filled with Wheaties and milk. The copy advised Americans to eat three meals a day, starting with a nutritional breakfast.

The Food Distribution Program in the USDA developed a nutrition education program to assist factory workers and their families plan adequate and economical diets (Food Distribution Administration, 1943). Pamphlets were

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distributed to assist factory workers plan adequate lunchbox meals (see Figure 14). Menus and large quantity recipes were developed for use in industrial cafeterias. The war effort demanded that many factory employees work rotating shifts. The worksite cafeterias therefore offered breakfasts and suppers, as well as the traditional dinner meal service. The explicit goal of the Industrial Workers Nutrition Program was improving health and productivity of workers and their families: "The improved health and morale of workers which results when inadequate diets are brought up to adequate levels may be translated into greater working efficiency, fewer absences from work, and a decrease in the number of accidents" (Food Distribution Administration, 1943, p. 2).

1946. Peace?

The Wheel of Good Eating

Rationing ended by 1946 when domestic food supplies increased as overseas shipments slowed. Fertilizer and farm machinery became available to further augment agricultural production. However, the immediate post-war economy expanded at a slower rate than the food supply (Schlossberg, 1978). Dietary survey data collected by the Committee on the Diagnosis and Pathology of Nutritional Deficiencies, National Research Council, indicated many Americans were consuming less than 50% of the 1941 RDAs for

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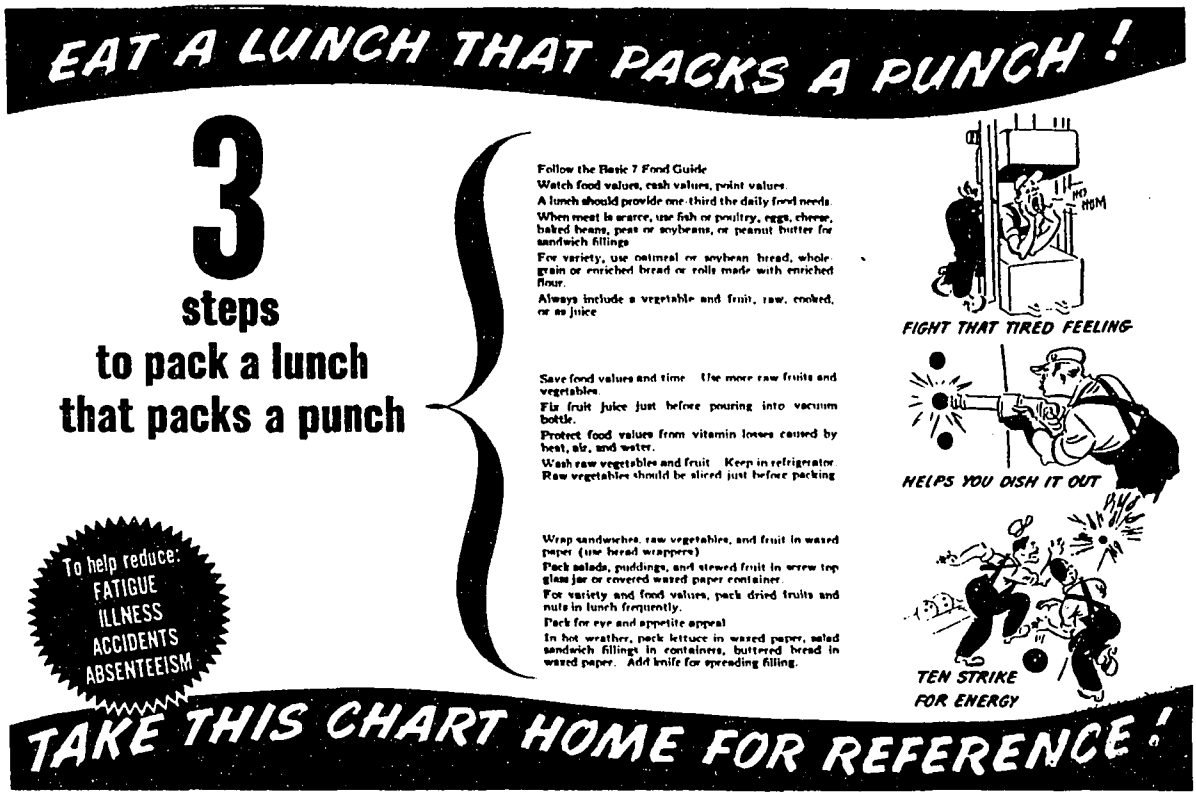
Figure 14



OFFICE DEFENSE AND HEALTH SERVICES

How industry can cooperate with the national nutrition program.

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the micronutrients. Laboratory data demonstrated low levels of hemoglobin, serum albumin, and ascorbic acid, especially among school children (Morgan, 1957). These clinical studies substantiated inadequate intakes of food rich in iron, protein, and ascorbic acid throughout the surveyed population.

The Human Nutrition Research Branch of the USDA released The National Food Guide in August, 1946 (Human Nutrition Research, 1946) (see Figure 15). This guide, commonly referred to as the "Basic 7," replaced the National Wartime Nutrition Guide. The same seven food groups were again presented in a wheel format - the "Wheel of Good Eating." Dried peas and beans were added to the Meat sector, acknowledgement that not all households could afford to put meat or other animal protein foods on the table every day. Unlike the "Wartime" guide, however, portion sizes and minimum serving recommendations were provided for each of the food groups. The USDA nutrition planners assumed the Basic 7 would provide a *foundation* diet supplying the minimum amounts of nutrients, especially Vitamins A and C and the mineral iron, recommended in the 1941 RDAs. Additional foods, including fats, sugars, rice, macaroni, spaghetti, cakes, candy, chocolate, cookies, and pastries could add kilocalories for a *total* diet. These "additional foods" which did not contribute significant amounts of nutrients should only be selected after eating the Basic 7

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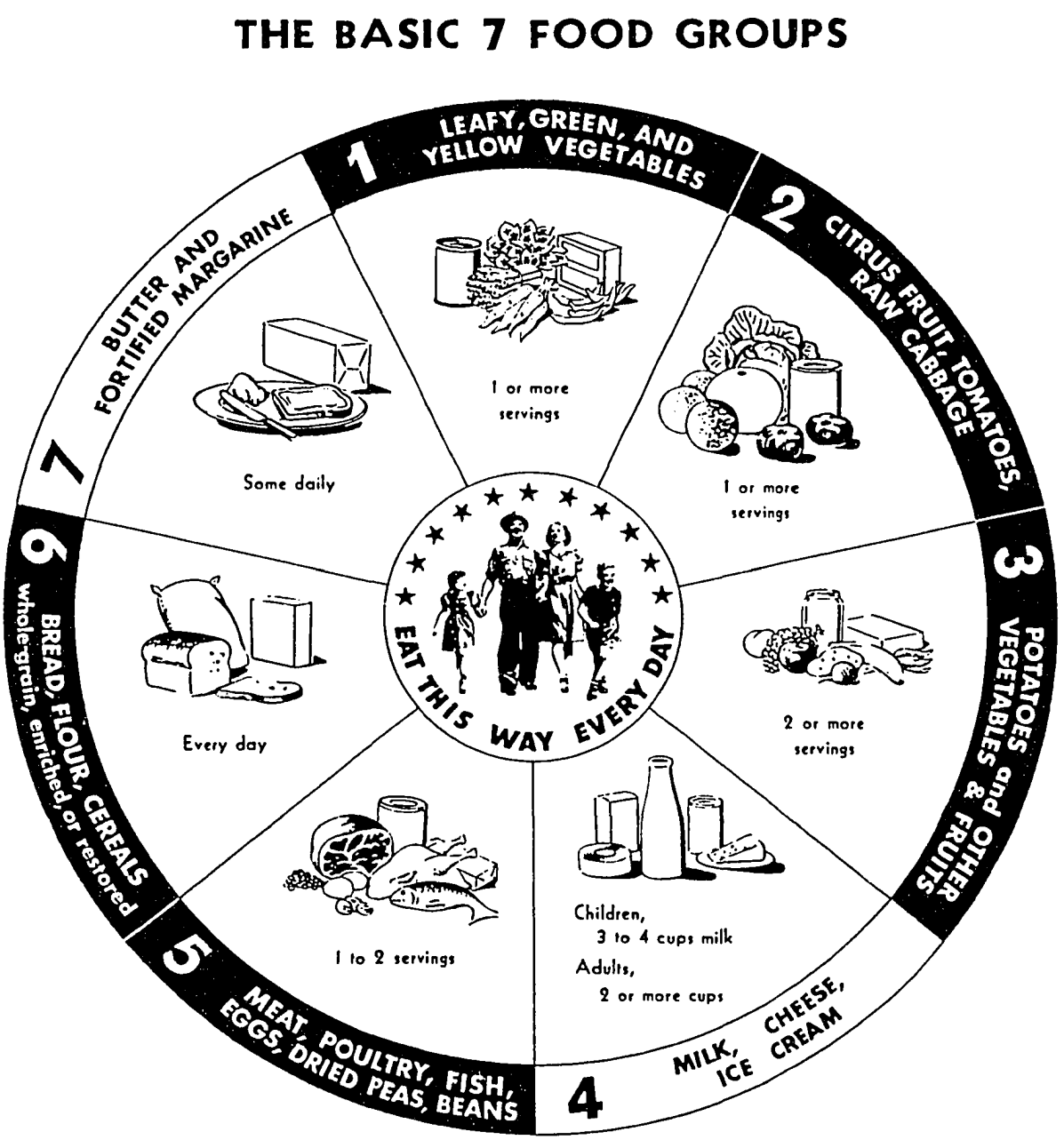
Figure 15



NATIONAL FOOD GUIDE

The Basic 7 Food Groups. Eat this way every day.

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(see Table 9). Americans were urged to "eat this way (the Basic 7) every day" (Human Nutrition Research, 1946).

The Basic 7 was used as the basis for nutrition education programs for the general population. It was also used as the foundation for planning menus and evaluating food diaries collected in national food consumption surveys. The major national food program encouraged to use the Basic 7 for menu planning and evaluation was the School Lunch Program.

School Lunches and Child Nutrition

In a Congressional committee meeting debating the proposed funding for the 1946 School Lunch Act, USDA representatives noted:

> The correlation between poor diet in childhood and rejections in the draft was strikingly demonstrated by the facts adduced by the Surgeon General of the U. S. which showed that 70% of the boys who had poor nutrition 10 to 12 years ago were rejected by the Selective Service (USDA, 1980, p. 5).

In 1946, with a temporary reprieve from international military conflict, the 79th Congress turned to domestic concerns, including the state of the economy and child nutrition. School lunch programs, distributing agricultural commodities and subsidized milk, had been reviewed and funded only on a yearly basis since 1935. Because of growing concerns with child malnutrition and a continued interest in supporting agricultural interests, Congress

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Table 9.

NATIONAL FOOD GUIDE
THE BASIC 7 FOOD GROUPS
EAT THIS WAY EVERY DAY

Human Nutrition Research Branch
1946

Agriculture Research Services
United States Department of Agriculture

Food Group	Portion/ Serving
Leafy, green, and yellow vegetables	1 or more serving
Citrus fruits, tomatoes, raw cabbage	1 or more serving
Potatoes and other vegetables and fruits	2 or more servings
Milk, Cheese, Ice Cream	3 servings for children 2 servings for adults
Meat, Poultry, fish	1 serving daily if possible
Eggs	4 or more/ week
Dried peas and beans, nuts and peanut butter	2 or more/ week
Bread, flour, and cereal Natural whole grain or enriched or replenished	Eat some every day
Butter and fortified margarine	Eat some every day

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passed PL 79-396, the School Lunch Act (USDA, 1980). The two stated objectives were: "improvement of the health and well-being of the Nation's youth," and "the assurance, both immediately and in the period of post war reconversion, of a substantial market for agricultural production" (p. 4).

Participating schools were directed to use commodities in daily meal service. Cafeteria managers were also *required* to use special commodities whenever donated by the Secretary of Agriculture. The School Lunch Act also allocated limited funds to school districts to purchase and maintain equipment necessary for the storage and preparation of the commodity items. Schools in wealthier areas that already had food service equipment readily participated in the commodities programs. However, many schools in poor urban areas were not able to participate in the commodity distribution school lunch programs. These schools did not have the funds to purchase even basic food service equipment (Schlossberg, 1978).

The lunches served by participating schools had to meet the minimum nutritional requirements prescribed by the Secretary of Agriculture on the basis of tested nutritional research. Since the RDAs and the Basic 7 National Food Guide were developed by divisions within the Department of Agriculture, the 1941 RDAs became the yardstick to measure the nutritional adequacy of school lunches, and the Basic 7 became the food service manager's menu planning guide.

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CHAPTER 8

THE HORN OF PLENTY

Post World War II Agriculture and Economics

Recovering from the War

During the 15 years following World War II, the United States experienced sustained economic and agricultural expansion. Factories that had produced goods for the war effort retooled to supply goods for Americans returning from overseas. The Federal government stimulated the economy by establishing GI loans for housing and education for the returning veterans. Despite isolated pockets of poverty, especially in the South where King Cotton was being replaced by synthetic fabrics manufactured in the North, displacing thousands of cotton workers, general prosperity and relative affluence pervaded the country (Schlossberg, 1978).

Agricultural output increased exponentially in the early 1950s. Mechanized planting and harvesting increased crop output per acre and reduced labor costs. Federal irrigation projects and innovative equipment transformed arid desert valleys into fertile acreage. Research and development provided the farmer with improved seeds, pest controls, and fertilizers (Stiebeling, 1953; Schlossberg, 1978). In 1951, Hazel Stiebeling, then Chief of the Bureau

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of Home Economics, USDA, provided the assessment: "Food supplies are now abundant and varied enough to provide good nutrition to everyone in the United States" (1951, p. 1).

Even with an abundant food supply and general economic prosperity, not all Americans selected or consumed nutritionally adequate diets (Stiebeling, 1953; Hundley, 1957; Morgan, 1957; Hill, 1970). Stiebeling observed: "High incomes and general prosperity do not eliminate problems of choice that face the American family" (1969, p. 1).

Malnutrition in the Midst of Plenty

The Research and Marketing Act of 1946 authorized the Bureau of Home Economics, USDA, to conduct periodic nation-wide food consumption studies and national food supply surveys (Stiebeling, 1946; Page & Phipard, 1956; Haughton, 1987). Hazel Stiebeling from the Bureau of Home Economics had conducted pilot food consumption surveys in high-risk urban poverty areas during the 1930s and early 1940s (Stiebeling, 1932; 1941; Federal Security Agency, 1942; Morgan, 1957). During the second half of 1946, the Bureau conducted another pilot survey of urban families and a smaller study of rural families. Similar surveys were authorized and financed by the state legislatures in New York, Colorado, and Michigan (Morgan, 1957). The goal of the 1946 surveys was to evaluate the dietary intakes of selected populations, using the 1941 RDAs and the newly

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developed Basic 7 food group guide as measures of nutritional adequacy. The Bureau also collected regional agricultural production data to determine food supplies available in the surveyed marketplaces. Preliminary data from all the food consumption surveys indicated that many Americans were consuming diets which did not meet the dietary standards established by the 1941 RDAs (Morgan, 1957).

In 1948, the Bureau of Home Economics launched a comprehensive National Food Consumption Survey, patterned after the 1946 pilot studies (Stiebeling, 1949; 1957; Hill, 1970). During the next three years, nutritionists and medical researchers from agricultural research stations across the United States collected and analyzed data. Nutritionists collected three-day food diaries. Laboratory technicians collected biomedical data, including serum levels of vitamins and minerals and serum hemoglobin. Scientists recorded observed incidences of pellagra, night blindness, rickets, and goiter among selected subsets of the surveyed population (Stiebeling, 1953; Morgan, 1957).

Nutritional adequacy was defined as those diets meeting 80% of the Recommended Dietary Allowance for the eight nutrients identified in the 1941 RDAs. Kilocalorie consumption was recorded but was not used as a nutrient adequacy criteria. Data collected from this comprehensive National Food Consumption Study indicated that the diets of

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many Americans, especially women and Southerners, were deficient in calcium, Vitamin A, Vitamin C, and the B Vitamins (Stiebeling, 1953; 1957; Hill, 1970; Hertzler, 1974). Iron deficiency anemia was identified throughout the surveyed population using laboratory analyses of hemoglobin levels. These nutrient deficiencies were present despite a high incidence of obesity observed in the studied populations and the relative abundance of nutrient-rich foods, including milk, fresh fruits, and fresh and frozen vegetables, available in the marketplaces (Stiebeling, 1953).

Revisions of the Basic 7 National Food Guide

The USDA

In 1953, the Food and Nutrition Board of the National Research Council reviewed the most current data available on nutrient requirements and nutrient bioavailability. The Board revised the 1941 RDAs and issued the 1953 RDAs as the national dietary standard yardstick (Miller, 1968; Harper, 1985). Nutritionists from USDA and the NRC then reviewed the discrepancies between the nutrient intakes estimated from the 1948 Food Consumption Survey and the newly revised RDAs. Several civilian nutrition education groups and Federal nutrition science groups from the USDA determined that a new food guide also necessary to teach Americans how to select a nutritious diet (Hill, 1970; Hertzler, 1974).

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Hazel Stiebeling, Head of the Bureau of Home Economics in the USDA, directed nutritionists at the Bureau to develop a new food guide to replace the Basic 7. Stiebeling advised that the new food guide should be *simple* and *reliable*. A reliable food guide "...can be depended upon to give a nutritionally good diet" (Page & Phipard, 1956, p. 16). The following criteria were used in the development of the new food guide to assure its reliability:

1. Emphasis should be placed on the shortfall nutrients identified during the analysis and evaluation of the Food Consumption Survey data.
2. Consideration should be given to people's food habits, traditions, and dietary patterns identified during analysis of the 1948 Food Consumption Survey data.
3. Foods recommended in the food guide should be readily available in the domestic food supply. Data from the national food supply surveys should be utilized during the development of any new food guide.
4. Provision should be made to include a wide variety of foods within a food grouping. Individuals are more likely to achieve optimal nutrient intake while avoiding potentially harmful excesses when selecting and eating a variety of foodstuffs.
5. Assurance should be made that the guide will meet

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the nutritional needs of population groups. The National Research Council's 1953 RDAs should be used as the dietary standard for evaluating dietary intake and planning menus (Page & Phipard, 1956; Hill, 1970).

Nutritionists from the Bureau of Home Economics completed a working draft of the proposed revision of the Basic 7 in 1955 (Hill, 1970). This new guide met the reliability standards previously established. The proposed new guide included only four food groupings rather than the seven in the National Wartime Nutrition Guide and the National Food Guide and therefore met criteria recommended for simplicity. A prototype of the new guide was sent to several leading authorities on nutrition science and education to review the proposed guide to assure its validity as a food guidance tool (Hill, 1970; Hertzler, 1974). Governmental agencies that reviewed the proposed new guide included the Interagency Committee on Nutrition Education, the Food and Nutrition Advisory Council, and the Food and Nutrition Council of the NRC. The National Dairy Council, Sunkist Growers, the Cereal Institute, and the National Cattlemen's Association also were asked to review the proposed food guide. These food industry groups had developed nutrition education materials promoting the "Basic 7" and had been instrumental in funding national nutrition education projects (Hill, 1970).

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Harvard School of Public Health

During the spring of 1955, a group of faculty, including Dr. Frederick Stare from the Department of Nutrition, Harvard School of Public Health, sharply criticized the 1946 Basic 7 National Food Guide:

> The desirable goal of such tools (ie food guides) is to achieve maximum simplicity consistent with scientific facts, available foods, and acceptable food patterns in a country in which they are to be used. It is questionable whether the "Basic 7," the most widely used nutrition education tool of this kind in the United States, achieves this goal of maximum simplicity. ...Two criteria by which one may judge the effectiveness of a teaching aid are validity and simplicity. It is impossible to teach effectively from a tool that is inaccurate; it is difficult to teach from one that is complicated or cumbersome (Hayes, 1955, p. 1103-1104).

The Harvard group proposed two simple models to replace the Basic 7. The first, a "scales of a balanced diet," recommended only two food groups: "energy foods" and "protective foods." The second model, "a shield for health," suggested four food groups:

1. Bread, flour, cereal, and potatoes;
2. Meat, poultry, fish, and eggs;
3. Fruits and vegetables, including citrus fruits and leafy green vegetables; and
4. Milk, cheese, and ice cream (Hayes, 1955).

The "shield for health" emphasized the more expensive animal products, implying that half of the foods selected should be Meat and Milk products. Hayes and Stare noted: "Animal

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protein foods are readily available in this country and their use should be encouraged" (1955, p. 1106).

The recommendations and the rationale for the two proposed Basic 7 food guide revisions were presented at the American Dietetic Association Annual Meeting in October, 1955, in St. Louis (Gussow, 1986b). The proposed Basic 7 revisions and accompanying materials were published in the Journal of the American Dietetic Association in November, 1955 (Hayes, 1955).

The "Basic Four" Food Groups

In early 1956, Louise Page and Esther Phipard, home economists with the Bureau of Home Economics, USDA, reviewed the comments and suggestions returned with the USDA's Basic 7 food guide revision proposals (Hill, 1970). The Cereal Institute had stated that bread was not nutritionally equivalent to whole grain cereals, and therefore recommended a fifth serving of bread when breads were chosen more frequently than whole grain cereals. The Cattlemen's Association was displeased with the small serving size recommended for meats. The representatives noted that Americans frequently ate more than the two to three ounces of meat per serving designated in the food guide. Nutritionists at USDA stated the small serving size for meat was a "minimum" recommendation, and individuals could, and often would, choose larger portions. Noting that the Meat

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group held such a dominant position in the new guide, the Cattlemen and their allies approved the overall guide. The National Dairy Council, pleased with the proposed food guide and the recommendations for two to four servings of Milk and dairy products per day for all Americans, approved the proposed four food group guide (Hill, 1970; Hertzler, 1974).

In 1956, Louise Page and Ester Phipard published the revised food guide and accompanying dietary recommendations. Essentials of an Adequate Diet... Facts for Nutrition Programs was designed:

> ...as a source material for nutritionists, extension workers, and others who are teaching the principles of good food selections. The aim has been to provide enough basic facts and flexibility in food choices with reasonable assurance that a good diet will be obtained day by day, week by week (Page & Phipard, 1956, preface).

Page and Phipard's four group food guide included in the Essentials for an Adequate Diet was commonly referred to as the "Daily Food Guide." This food guide retained the original criteria of reliability recommended by Hazel Stiebeling. Page and Phipard utilized data from the 1948 Food Consumption Studies and National Food Supply Surveys to form the groups of the four group guide. The "Daily Food Guide" four food groups differed little from the groups proposed by the Harvard group in 1955:

1. Milk: 2 to 4 servings per day; 2 for adults, 4 for lactating women;
2. Meat, fish, and poultry: 2 or more servings, 2 to

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3 ounces per serving;

3. Vegetable and fruit group: 4 or more servings, including 1 citrus fruit daily;
   Include one dark green leafy or yellow vegetable every other day;
4. Breads and cereals: 4 or more servings daily; add an extra serving if bread, rather than whole grain cereals, is usually chosen (Page & Phipard, 1955).

The "Daily Food Guide" was developed explicitly to provide a *foundation diet* of 1200 kilocalories (Page & Phipard, 1956; Hill, 1970). Previous guides by Hunt and Stiebeling had been developed to provide food guidance for a *total* diet of 3000 - 3500 kilocalories. Guides developed during the 1940s omitted serving size and portion recommendations because of wartime food shortages. Even though these food guides recommended fats and sugars as additional energy sources, no kilocalorie recommendations were implied or stated. These 1940 food guides could therefore be considered *foundation* food plans.

To assure validity, the "Daily Food Guide" was constructed to provide at least 80% of the eight nutrients defined in the 1953 edition of the RDAs (Page & Phipard, 1956). In addition, the guide was specifically designed to provide 90 to 100% of the "shortfall" nutrients: calcium, Vitamin A, and Vitamin C. These nutrients were deficient in the diets of 60% of the population, as identified during the

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1948 Food Consumption Survey studies. The Milk group provided 75% of the average adult RDAs for calcium. Dairy products used in cooking and baking would increase calcium intake to levels near 90% of the RDAs. The specified dark leafy green or orange Vegetables and the citrus fruits would supply 90-100% of the RDAs for Vitamins A and C. In addition to protein, the Meat group provided 50% of the RDAs for iron and "niacin equivalents." Although iron and niacin were not identified as shortfall nutrients, anemia and pellagra were well-known nutrient deficiency diseases, especially among Southerners (Stiebeling, 1942; Hundley, 1957). The Bread and cereal group provided the additional thiamin, riboflavin, niacin, and iron, and thereby brought the totals for those nutrients to 80% of the RDAs.

The "Daily Food Guide" provided between 1200 - 1400 kilocalories of energy, depending upon the fat content of the meat, milk, and other dairy products selected by family members. Page and Phipard assumed Americans would round out meals and satisfy appetites by choosing additional servings from the recommended food groups, larger portions of those recommended foods, and *some* foods not specified in the "Daily Food Guide," especially fats and oils, sugars, and refined sweets (Page & Phipard, 1956). Those Americans who wanted to select an adequate diet but reduce kilocalorie consumption to reduce weight or maintain reduced or desirable weight could follow the meal plans as recommended.

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Alcoholic beverages were not mentioned in the guide.

Essentials of an Adequate Diet... Facts for Nutrition Programs included advice for adapting the meal plans to meet the lower RDAs for young children and the higher RDAs for adolescent males. Menus were included for a five year old, using the basic food plan and serving size recommendations, adding a "cooky," gelatin, margarine, and sugar for oatmeal. This menu provided 100% of the RDAs for a child and approximately 1500 kilocalories. The menu for the 15 year-old male included larger portion sizes, additional milk and cookies as snacks, plus butter and mayonnaise as condiments. This menu met 100% of the RDAs for an adolescent male and provided approximately 2800 kilocalories.

Essentials of an Adequate Diet was published in 1956 as nutrition education resource material for teachers and health educators (Page & Phipard, 1956). The 22-page publication was not developed for distribution to the general public (Hill, 1970; Hertzler, 1974).

Food for Fitness

In March, 1958, the Consumer and Food Economics Research Division, Bureau of Home Economics, released Food For Fitness - A Daily Food Guide (Consumer and Food, 1958) (see Figure 16). This leaflet, developed to replace the 1946 National Food Guide Basic 7 wheel, pictured the "Daily Food Guide" food groups developed by Page and Phipard in

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Essentials of an Adequate Diet as colorful geometrics suspended from a mobile. "Food for Fitness" included the same four groups, portion sizes, and serving recommendations included in the 1956 "Daily Food Guide" (see Table 10). This leaflet was developed for consumer use, and provided practical information on serving sizes and amounts, sources of Vitamins A, C, thiamin, riboflavin, niacin, and the minerals calcium and iron. "Food for Fitness" included general guidelines for selecting a nutritionally adequate, foundation diet for individuals and family members.

The USDA distributed "Food for Fitness," commonly referred to as the "Basic Four," through the agricultural extension service. The USDA likewise encouraged the food processing industry and commodity food groups to incorporate the "Basic Four" nutrition message into advertising promotions and nutrition education materials. The Dairy and Food Nutrition Council developed extensive nutrition education materials based on the "Basic Four" food guide.

This *simple* and *reliable* "Basic Four" food guide, derived from the 1948 Food Consumption Survey, 1948 national Food Supply Data, and the 1953 RDAs, served as the Department of Agriculture's food guidance standard for the next 21 years (Hertzler, 1974).

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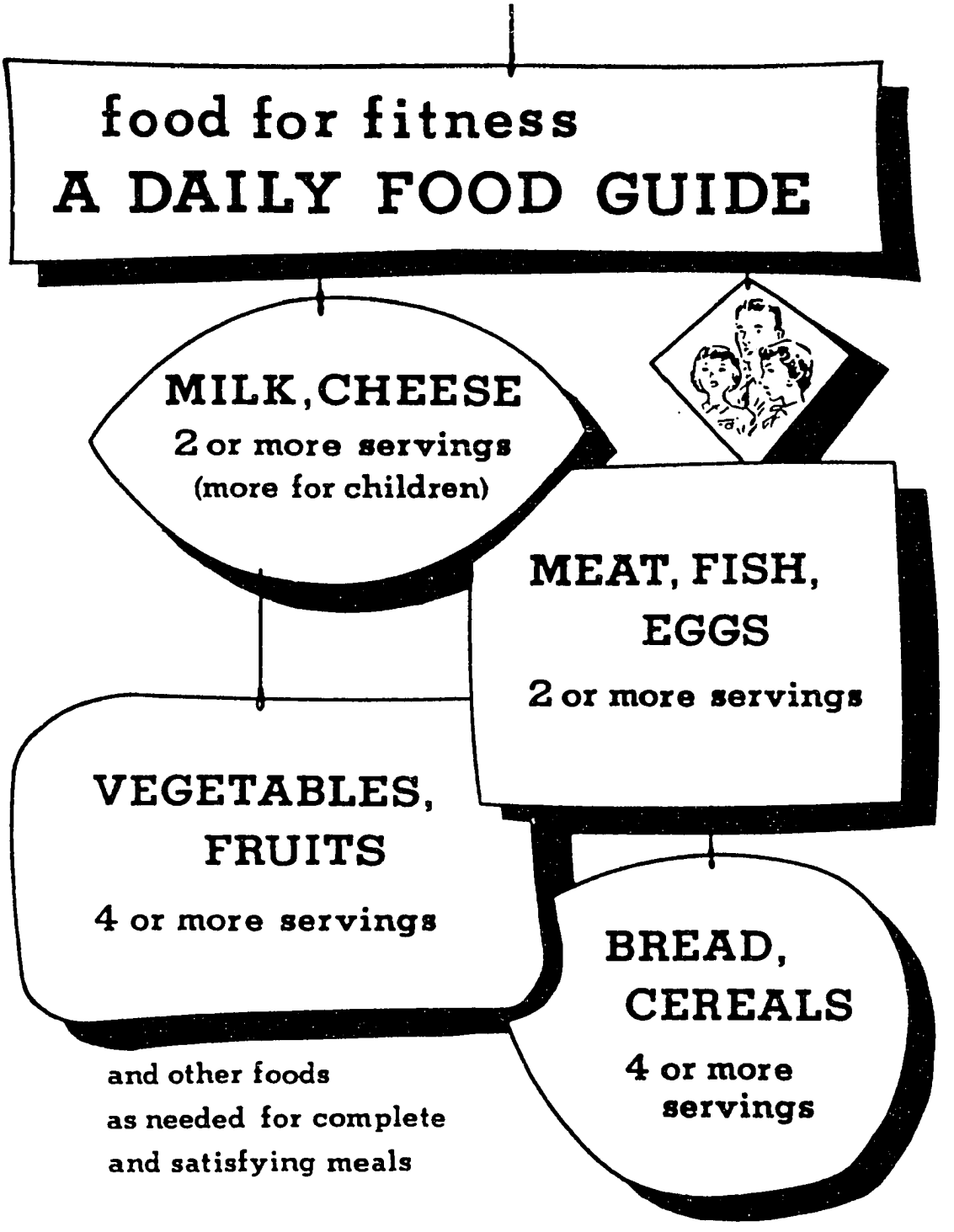
Figure 16



FOOD FOR FITNESS. A DAILY FOOD GUIDE

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Table 10.

FOOD FOR FITNESS
A DAILY FOOD GUIDE

Consumer and Food Economics Research Division
1958

United States Department of Agriculture

Food Group	Portion/ Serving
Milk	3 or 4 servings for children 4 servings for teens 2 or more for adults
Meat	2 or more servings daily. 1 Serving = 2 or 3 oz. meat, 2 eggs, 1 cup dry beans 1/4 cup peanut butter
Vegetable - Fruit	4 or more servings include one citrus fruit; one leafy green or yellow vegetable daily.
Bread and Cereal Group	4 or more servings

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CHAPTER 9

THE 1960s

Hunger in the United States

The Horn Empties

The United States entered the 1960s free from international military conflict, anticipating Federal budgetary surpluses. Policy initiatives and Federal funding allocations during the first four years of the decade were directed toward domestic programs. For the first time in the Nation's history, Federal aid was given to private and parochial schools to bolster education programs in science and mathematics. Innovative programs were also piloted in high poverty areas to provide for the public welfare (Schlossberg, 1978). The only dark cloud on the horizon in a country enjoying relative affluence was the inequity of opportunities identified by the Civil Rights Movement. Many Americans expressed a growing concern for basic human rights, especially equity in public education opportunities. The twin problems of absolute poverty and hunger in concentrated urban and isolated rural populations were brought to national attention by the Southern Christian Leadership Conference under the leadership of the Reverend Martin Luther King and the writings of Michael Harrington

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(Mayer, 1972).

The Democratic Response to Hunger and Poverty

President John Fitzgerald Kennedy urged a Democratic Congress to implement his comprehensive plans for improving public education and eliminating poverty throughout the United States. The Kennedy Administration proposed ambitious programs to encourage educational opportunities for the poor, to build community recreation centers in low income urban areas, staff local health centers to provide preventive medical care for the poor, and to create jobs for the unemployed (Schlossberg, 1978).

President Lyndon Johnson pushed many of Kennedy's proposed programs for eliminating poverty through Congress. Johnson created the Office for Economic Opportunity (OEO) under the Economic Opportunities Act of 1964. Declaring a "War on Poverty," the Johnson administration allocated $2 billion per year to the newly empowered OEO. Head Start was created by the OEO to help preschool children from low-income families achieve social competence and overcome the handicaps of poverty. Unfortunately, the job training and placement programs created by the OEO were too ambitious and conflicted openly with other Federal agencies and local programs. The OEO eventually lost Congressional support and funding to the Vietnam War effort (Schlossberg, 1978). Head Start was later subsumed and refinanced under the Child

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Nutrition Act of 1977 (Owen, 1981).

Activities within the OEO identified and brought national public attention to incidences of abject poverty, hunger, and malnutrition throughout the nation. Federally supported nutrition and feeding programs became leading weapons in the war against poverty. These popular programs became major federal policy initiatives throughout the 1960s (Chaote, 1972; Mayer, 1972; Schlossberg, 1978; Owen, 1981). During its first two years, the Johnson Administration enacted legislation designed to correct some of the major flaws identified in earlier social welfare and food programs (Schlossberg, 1978; U.S. Senate, 1981).

Food and Nutrition Legislation in the 1960s

Congress attempted to remedy inequities and perceived discriminatory practices, high minimum cash payments, and stringent eligibility requirements of the original Food Stamp Plan of 1940 with the passage of the Food Stamp Act of 1964 (7 U.S.C. 2011-2025) (Owen, 1981). The two objectives of the revised food stamp program administered by the Food and Nutrition Service (FNS) of the USDA were: (a) to raise the level of nutritional status among low income households, and (b) to increase the demand for domestic farm products (Owen, 1981).

Family food stamp allotments were based on the USDA estimated monthly food costs using the Low Cost Food Plan

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(Obert, 1978; Goodwin, 1981). Stiebeling's original "Food Plans at Four Levels of Nutrition and Cost" were revised in 1962 to reflect changes in the 1958 RDAs, current food costs throughout the country, and 1948 food consumption data (USDA, 1962). Three food plans, "low cost" (LCFP), "moderate" (MCFP), and "liberal" (LFP) were developed to estimate a family's annual food costs in 1962 prices. In 1964, after publication of the 1964 edition of the RDAs, nutritionists and food economists at the USDA revised the three 1962 food plans using food preferences identified during the 1962 USDA food consumption surveys and the 1963 Bureau of Labor and Statistic's retail food price averages. USDA also added a LCFP for the Southeastern States to reflect regional food preferences and an "emergency food plan" (EFP) to be used only on a temporary basis when funds were low, such as at the end of the month before receipt of government checks (USDA, 1964; Owens, 1981).

No attempt was made to model the food plans after the 1958 "Basic Four" food guide, developed as a *foundation diet* rather than a *total* diet plan (Obert, 1978; Goodwin, 1981). These five food plans were developed as standards to calculate the total monthly food budget for welfare recipients rather than as guides to plan daily menus (Owen, 1981). Financial allotments for food stamps in the Food Stamp Act of 1964 were based on the "Low Cost Food Plan" (Obert, 1978; Goodwin, 1981).

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Title III of the Older American Act of 1965 (42 U.S.C. 3045) authorized the Department of Health, Education, and Welfare (DHEW) to expand medicare payments and health benefits for those Americans 60 years of age and older. Congressional authorities anticipated that an increase in income would enable older low income Americans to purchase enough food to provide for an adequate diet (Owen, 1981).

The National School Lunch and Child Nutrition Act of 1966 (PL 89-642, 42 U.S.C. 1786) expanded the school lunch feeding program (USDA, 1980). The Act also authorized the Food and Nutrition Service of the USDA to implement and evaluate pilot child care feeding programs, summer food programs, milk distribution programs, and school breakfast programs. The stated goal of all the subsidized food programs was to reduce hunger among the Nation's children (Obert, 1978; Goodwin, 1981; Owen, 1981).

Hunger in America

Hunger persisted despite these hastily enacted programs. In 1967, "hunger" made front-page newspaper headlines and news magazine covers across America (Chaote, 1972; Mayer, 1972; Schlossberg, 1978; Kotz, 1981). Sims noted: "Going Hungry in America: Government's Fault," "Hunger...Its Here Too," and "America's Starving Children" appeared on news stands throughout the country (1983, p. 134).

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In April, 1967, the United States Senate Subcommittee on Employment, Manpower, and Poverty held review hearings on Federal antipoverty programs in Jackson, Mississippi. Instead of reporting on employment opportunities and joblessness, witnesses at the hearings told graphic stories of malnutrition and acute hunger in the Mississippi Delta region. The testimonies were picked up and broadcast on national television. The following day, Senators Robert Kennedy (D-NY) and Joseph Clark (D-PA) conducted a personal tour of the Delta region. These Senators observed incidences of "malnutrition and unmet hunger" and reported their experiences to the media, Congressional delegates, and to the United States Secretary of Agriculture, Orville Freeman (Schlossberg, 1978; Sims, 1983).

Secretary Freeman sent a medical team to the Mississippi Delta Region to conduct a more thorough investigation of the hunger problem. At the same time, Field Foundation, a private philanthropic organization, sent Dr. Robert Coles and a team of physicians to examine children enrolled in the Head Start program in Mississippi. Nutrient deficiency diseases, hunger, general illness, and squalid living conditions reported by both investigations shocked the Congress and American public viewing the reports on evening national news programs (Schlossberg, 1978; U.S. Senate, 1981; Sims, 1983). The Surgeon General of the Public Health Service, Dr. Luther Terry, admitted his agency

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knew more about malnutrition in under-developed countries than it did about hunger and malnutrition in the United States (Schlossberg, 1978; Owen, 1981; U.S. Senate, 1981).

Congress responded to the initial investigative reports and the growing public concern with hunger and malnutrition by authorizing another investigation. In December 1967, Congress passed PL 90-104, authorizing the Secretary of Health, Education, and Welfare to "make a comprehensive survey of the incidence and location of serious hunger and malnutrition and health problems incident thereto and ...report his findings and recommendations for dealing with these conditions within six months from the enactment of this survey" (Schlossberg, 1978). The resulting investigation, the Ten State National Nutrition Survey, commenced the following spring.

Political Interest and Public Concern on the 1968 Campaign Trail

During the spring of 1968, while the Department of Health, Education, and Welfare conducted its comprehensive survey on nutrition, a private citizens' group of nutritionists, physicians, lawyers, and social activists conducted a review of the Federal feeding programs. The "Citizens' Board of Inquiry into Hunger and Malnutrition" published its findings, Hunger, USA, in April, 1968. Hunger, USA concluded:

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1. Hunger and malnutrition do exist in the United States.
2. Hunger and malnutrition lead to infant deaths, brain damage, retarded physical growth, increased vulnerability to disease, withdrawal, apathy, frustration, and violence.
3. Federal efforts to secure adequate nutrition for the poor have been insufficient and ineffective.
4. Hunger and malnutrition in a country of abundance result from political and economic systems that spend billions of dollars to remove food from the marketplace, limit production, retire land from production, and to guarantee profits for the producer (Citizen's Board, 1968).

One month after the publication of Hunger, USA, the National Council on Hunger and Malnutrition in the United States released a comprehensive analysis of hunger, malnutrition, health status, and living conditions among the country's poor (U.S. Senate, 1981). Chairman of this National Council was Jean Mayer, Professor of Nutrition at the School of Public Health at Harvard University (Mayer, 1972). Council members included Senators Robert Kennedy, Joseph Clark, and George McGovern (D - S.DAK). In May, 1968, CBS aired the television documentary, "Hunger in America," which dramatically magnified the impact of

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malnutrition described in the Council's report (Mayer, 1972; Schlossberg, 1978). The documentary showed pictures of severely malnourished babies and young children living in filth and squalor. The narrator stated that one of the babies pictured in the opening scenes had recently died from malnutrition (Mayer, 1972; Schlossberg, 1978; Sims, 1983).

Public and official response to "Hunger in America" was intense. Middle class Americans were outraged that children in the United States were dying from lack of food. Agriculture Secretary Freeman, responsible for the Commodities Distribution Program, Food Stamp Program, and the School Lunch Program, claimed the documentary was grossly inaccurate and demanded an investigation of CBS (Schlossberg, 1978; Sims, 1983). CBS responded by providing documentation for all photography and copy used in the program.

Congressional debate on the incidence and causes of hunger intensified throughout the month of June. In July, 1968, Senator George McGovern introduced Resolution 281 into the Senate. The proposed Resolution authorized the creation of a Senate Select Committee on Nutrition and Human Needs (Mayer, 1972; Schlossberg, 1978; Sims, 1983). The proposed committee would be authorized to:

1. Investigate hunger and malnutrition among America's poor;
2. Determine the extent and the causes of

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malnutrition;

3. Investigate the operation of current Federal food programs; and
4. Make comprehensive recommendations for solving the problems of the hungry (Mayer, 1972).

The Senate approved Resolution 281 on July 30. Senator McGovern was elected Chairman of the Senate Select Committee on Nutrition and Human Needs, a position he held for the next ten years. The Committee held its first hearings in December, 1968, listening to testimonies from the Secretaries of the Department of Agriculture and the Department of Health, Education, and Welfare, as well as the head of the Office of Economic Opportunity (Schlossberg, 1978). One decade later, this Senate Select Committee on Nutrition would release the first Federal report on overnutrition in the United States, heralding an era of disease prevention and health promotion.

The Republican Response

Ten State Nutrition Survey.

In January, 1969, the Senate Select Committee resumed hearings, reviewing the preliminary reports from the Ten State National Nutrition Survey which had been authorized in 1967. Dr. Arnold Schaeffer, project Director, presented a

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summary of some of the initial data collected from four of the ten surveyed states. Dr. Schaeffer reported:

> ...preliminary data on a subsample drawn from the lowest income quartile of the states indicate an alarming prevalence of those characteristics that are associated with undernourished groups. In general, the most widespread nutritional problem is one of multiple nutrient deficiencies of a combination of one or more nutrients. It is perhaps shocking to realize that the problems in the poverty groups in the United States seem to be very similar to those we encountered in developing countries (Schlossberg, 1978, p. 338).

Dr. Schaeffer reported seeing cases of (a) marasmus, calorie-protein deficiency; (b) kwashiorkor, protein deficiency; (c) anemias, including iron and folacin deficiency; (d) goiter, from iodine deficiency; (e) Vitamin A deficiencies; (f) dental problems, from inadequate calcium intake; (g) unhealthy gums, from Vitamin C deficiency; and (h) rickets, from Vitamin D deficiencies. In addition to these frank nutrient deficiencies, Schaeffer reported cases of bone growth retardation among children ages one through three (Mayer, 1970; Schlossberg, 1978; U.S. Senate, 1981).

These preliminary findings included data from only four states: Texas, Louisiana, New York, and Kentucky. Funding for the study was cut off by the new Nixon administration before the rest of the findings could be collected and tabulated (Schlossberg, 1978; Sims, 1983).

In March of 1969, after disbanding the Ten State Survey Committee, President Richard Nixon authorized his Urban Affairs Council, the principal policy-making group during

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his administration, to establish an independent Food and Nutrition Committee. This Committee, chaired by the new Secretary of Agriculture, Clifford Hardin, was directed to review the complex issues of hunger and food distribution and to recommend a plan of action to deal with the overlapping problems of hunger, malnutrition, and agriculture policy. By the summer of 1969, Secretary Hardin presented summary reports of the three Federal food programs then available to poor Americans (Schlossberg, 1978).

Food relief programs.

The Food Commodity Direct Distribution Program enacted in 1935 to sustain farm incomes and stabilize the agricultural sector was a surplus food distribution plan rather than a nutrition program. USDA shipped carlot quantities of foodstuffs to state agencies which then assembled packages of 23 of the available commodity items and sent these 30-pound packages to local social service centers. No attempt was made or intended to provide an adequate diet with the commodities. The program was intended as a means for distributing agricultural surpluses. Commodity recipients were encouraged to consume all the foodstuffs before the end of the month, using the packaged items as supplements to their own food purchases. Families, pregnant women, and the elderly had to report to the centers at the beginning of each month and carry the packages home,

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often to apartments that did not have refrigerators or ranges (Goodwin, 1981). The foodstuffs offered in the commodity packages included: (a) apple juice, (b) dried beans, (c) canned corn, (d) butter, (e) cheese, (f) corn meal, (g) egg mix, (h) flour, (i) lard, (j) grapefruit juice, (k) grits, (l) dried milk, (m) canned meat, (n) rolled oats, (o) orange juice, (p) canned peaches, (q) peanut butter, (r) canned peas, (s) canned pork, (t) white potatoes, (u) raisins, (v) rice, (w) corn syrup, (x) tomato juice, (y) canned turkey, and (z) vegetable shortening.

However, the distribution centers seldom had all 26, or even the 23, items available. Committee member Jean Mayer reported visiting a social service center in Boston in which bulgur wheat, corn flour, and lard were the only available commodity components of a potentially disastrous diet (Mayer, 1972). Nixon's Food and Nutrition Committee recommended termination of the Commodities Distribution Program (Chaote, 1972a; Schlossberg, 1978; Goodwin, 1981).

The Food Stamp Program, originally enacted in 1940 and revised periodically, provided additional purchasing power for low income families. The Program empowered families to plan menus, purchase foods at local groceries, and prepare their own meals reflecting personal preferences rather than commodity designations determined in Washington DC. Food Stamp recipients were given no guidance on planning or

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preparing a well-balanced diet which would simulate the Basic Four guide or meet the RDAs. The Food and Nutrition Committee recommended revision and then expansion of the Food Stamp Plan (Chaote, 1972b; Schlossberg, 1978; U.S. Senate, 1981).

Originally enacted in 1946 to distribute agriculture commodities, the School Lunch Program continued to serve primarily middle class neighborhoods. This program was popular among those middle-class voters whose children benefitted from reduced-price lunches and milk. After a thorough investigation, the Food and Nutrition Committee reiterated findings of a 1968 questionnaire survey report, "Their Daily Bread," conducted by five women's organizations (Schlossberg, 1978; Owen, 1981). The Food and Nutrition Committee and "Their Daily Bread" reports identified the following deficiencies in the School Lunch Program:

1. Funding for non-food equipment and personnel was woefully inadequate;
2. Administrative procedures between Federal, state, and local agencies created gross inequities between programs; and
3. Low income children were segregated during payment activities and food service, thereby creating discrimination between paying and non-paying students (Schlossberg, 1978).

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In 1968, the School Lunch Program fed only 2 million of the estimated 6 million school-age children who could not afford to purchase meals at school. The Food and Nutrition Committee recommended expansion of the School Lunch Program and implementation of measures which would prohibit discrimination, segregation, or identification of poor children in the classroom setting. "Their Daily Bread" report recommended *free* lunches for *all* needy children in the nation's schools (Schlossberg, 1978; Owen, 1981; U.S. Senate; 1981).

To the Moon and Back to Earth

In the summer of 1969, President Richard Nixon issued a national message on hunger in America. Responding to the recommendations made by his Committee on Nutrition, Nixon pledged that his administration would introduce legislation to revise the Food Stamp Program and the School Lunch Program. Nixon also announced plans for a White House Conference on Food, Nutrition, and Health, to be held just before Christmas. Nutritionists, representatives from the food industry, university researchers and faculty, community leaders, and consumer representatives were invited to the Conference. Harvard professor Jean Mayer was named Conference Chairman (Mayer, 1970; Sims, 1983).

Chairman Mayer presented the goals at the opening session of the conference: (a) to evaluate the state of

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nutrition of the American people and (b) to formulate a national nutrition policy (Mayer, 1970; Schlossberg, 1978, Sims, 1983). Conference participants debated four principal areas of concern which impacted on reaching the stated goals:

1. Food assistance for the poor;
2. Nutrition and health programs;
3. Regulation of food products and safety; and
4. Nutrition education (Mayer, 1970).

The Conference Report recommended that food assistance programs for the poor should be revised during the next decade. Food Stamp Plan and School Lunch Program revisions were already in Congressional committees (Schlossberg, 1978; U.S. Senate, 1981).

The Conference Report also recommended that nutrition and health programs should be expanded to reach a broader range of age and income groups. Previously, the elderly had been ignored during development of nutrition education and feeding programs. The Report recommended development of comprehensive nutrition programs to include nutrition education and food selection guidance, to supplement the feeding programs currently in place (Mayer, 1970).

The Food and Drug Administration had been charged with maintaining the purity and safety of the food supply. The Conference Report recommended increasing funding for the FDA

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to enable the agency to carry out the additional responsibilities acquired subsequent to the passage of the 1958 Food Additives Amendment (Delaney Clause) (Mayer, 1970; Schlossberg, 1978).

During the Conference, public health educators and nutritionists recommended development of national nutrition education programs to serve the general public. The food industry responded by launching an extensive "Nutrition Awareness" campaign in early 1970 (Ullrich, 1972). A commercial advertising agency developed a colorful graphic representing the Basic Four. Food companies then used the advertising slicks to sell products and promote concepts of a nutritious diet. The Federal government had not been involved with funding or promoting concepts of good nutrition to the general public since the "U.S. Needs Us Strong" nutrition campaign during World War II and therefore welcomed the food industry's technical and financial initiatives (Ullrich, 1972; Schlossberg, 1978).

The End of a Decade

As the decade of the 1960s opened, nutritionists were implementing a recently developed food guidance teaching tool, the "Basic Four," grounded in scientific validity and conceptual simplicity. American youth immersed themselves in science and math textbooks, confident of their ability to outperform their "Red" peers half-way around the world. The

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majority of Americans were enjoying relative affluence, with televisions in their living rooms and automobiles in their driveways. The Federal government was anticipating unprecedented fiscal surpluses. Except for the "Cold War" that challenged foreign policy makers and made defense department officials anxious, America was at peace.

By the end of the decade, a controversial war in Vietnam not only created schisms between Americans, but also drained the Federal treasury surpluses. At home, Americans were fighting Americans - race against race in the cities, students against authority on college campuses. A President, a Senator, and a Civil Rights Leader had been assassinated. America had landed men on the moon. But some Americans were still suffering because of hunger and malnutrition. And many more Americans were dying because of malnutrition caused by a more insidious phenomenon: dietary excesses.

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CHAPTER 10

THE 1970s

A Profusion of Dietary Recommendations

Hungry No More

On December 24, 1969, during the White House Conference on Food, Nutrition, and Health, Conference Director Jean Mayer announced President Richard Nixon's pledge to provide free school lunches to all needy children by Thanksgiving Day, 1970 (Mayer, 1970; Schlossberg, 1978). With Congress reconvening in January of an election year, public sentiment still focusing on the hungry faces broadcast on "Hunger in America," and an Executive Branch going on record in agreement with the proposition that "a hungry child can not learn," legislation to resolve the problems of hunger and malnutrition in America passed rapidly through congressional committees (Schlossberg, 1978).

Congress passed a comprehensive Food Stamp Plan in 1971, incorporating many of the revisions recommended during the 1969 White House Conference on Food, Nutrition, and Health. A second revision in 1973 made the 1971 Food Stamp program mandatory across the nation and eliminated the commodity distribution program. The National School Lunch Act of 1970 (PL 91-207) expanded the 1966 program and

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included an emergency assistance section funding free meals to needy children in public schools, thereby satisfying the President's pledge to feed hungry children by Thanksgiving. The Child Nutrition Act of 1972 (PL 92-233) expanded the age group served to include infants in the Women, Infants, and Children (WIC) program. By 1977, The Child Nutrition Act (PL 95-166) not only included funds for feeding programs but also included provision for child nutrition education programs (NETP) (Schlossberg, 1978; Owen, 1981).

Title VII Nutrition Services under the Older Americans Act of 1972 (PL 92-258) funded congregate meal sites, home-delivered meals, and supportive food services for needy senior citizens over the age of 60. This program was evaluated in 1977, determined to be an effective way to provide nourishing meals and socialization for older Americans, and expanded under the Title III Nutrition Services Program (PL 95-278) (Owen, 1981).

Legislation passed during the Nixon administration financed significant increases in nationwide feeding programs:

1. The School Lunch program grew from a $42 million program serving 3 million children in 1969 to a $1.2 billion program serving 12 million in 1979.
2. The Food Stamp Program grew from a $288 million program serving 2.8 million recipients in 1968 to a $6 billion program serving 16 million in 1979.

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3. WIC grew from a $14 million pilot program serving 206,000 in 1974 to a $550 million program serving 1.5 million families in 1979.
4. Nutrition programs for the elderly served 2.3 million seniors at a cost of $202 million in 1979.
5. The mandatory Commodities distribution program was terminated, although the USDA could continue to distribute surplus commodities when available (U. S. Senate, 1981).

Too Much Nutrition

With legislative resolutions of the issues of hunger and malnutrition, national interest in food and nutrition changed focus, turning toward the more pervasive nutrition problems of overnutrition and the relationships between diet and certain chronic diseases (Sims, 1983). The immediacy of nutrition as a public policy issue waned somewhat between 1973 and 1975, but growing interest in a "diet and disease hypothesis" pushed nutrition back into the headlines by 1977 (Sims, 1983). Three separate groups were responsible for projecting the issues of nutrition and enlightened food guidance into the public light for consideration: (a) professional health organizations, (b) nutrition education organizations, and (c) governmental groups (McNutt, 1980; Sims, 1983; Gussow, 1986b).

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Professional Health Organizations Provide Dietary Advice

In 1957, the American Heart Association (AHA) began releasing preliminary data from the Framingham Heart Disease Studies. American Heart Association researchers hypothesized a relationship between the incidence of heart disease and a number of health-style variables (Pollack, 1957; McNutt, 1980). During the following nine years, the AHA funded and released the results of animal studies that indicated a causal relationship between certain identified risk factors and the incidence of cardiovascular disease (AHA, 1968; AHA, 1982). In 1968, the Committee on Nutrition, AHA, released a set of eight dietary guidelines and recommendation (See Table 11). These early American Heart Association Guidelines recommended that all Americans should:

1. Reduce animal fat;
2. Decrease saturated fats and increase polyunsaturated fatty acids;
3. Reduce cholesterol;
4. Maintain ideal body weight;
5. Apply dietary recommendations early in life;
6. Maintain principles of good nutrition with the changes in the diet;
7. Adhere to dietary recommendations; and
8. Make sound food habits a family affair (AHA, 1968).

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Table 11.

DIET AND CORONARY HEART DISEASE:
GENERAL DIETARY RECOMMENDATIONS

American Heart Association
1968

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Maintain principles of good nutrition; make sound food habits a family affair
Weight Management	Balance calories to maintain ideal weight
Fat: (total)	Reduce to 30-35% of total calories
(saturated)	Reduce to less than 10% total calories
(polyunsaturated)	Intake should be 10% total calories
Cholesterol	Reduce to 300 mg/day
Complex carbohydrates	No recommendation
Fiber	No recommendation
Refined Sugars	No recommendation
Sodium	No recommendation
Alcohol	No recommendation

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The 1968 AHA Dietary Recommendations generated controversy among some scientists who felt that there was insufficient causal evidence to identify diet as a risk factor in the development of cardiovascular disease and, therefore, any dietary prescription for the general population was premature. Food industry spokesmen and representatives from the National Cattlemen's Association and the Dairy Council, lobbying to protect their own financial interests, criticized the AHA research and challenged the validity of the AHA Dietary Recommendations (Sims, 1983). The American public greeted the recommendations with general apathy. After a decade of hearing about undernutrition and hunger, most Americans could not rally behind dietary controversies relating to over-consumption of many favorite and familiar food items (Sims, 1983).

Published research confirming the causal relationship between diet and chronic diseases proliferated in the early 1970s (U.S. Senate, 1977; USDA/DHEW, 1980; Sims, 1983). In 1972, the Committee on Foods and Nutrition of the American Medical Association (AMA) and the Food and Nutrition Board (FNB) of the National Academy of Sciences released a joint statement advising physicians to prescribe dietary fat modifications to lower serum lipids for patients with a high risk for developing cardiovascular disease (McNutt, 1980). The AHA Committee on Nutrition released a statement in

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support of the AMA advisory, providing additional scientific evidence for the causal relationship between obesity, dietary fat, sodium, cholesterol, and the incidence of cardiovascular disease (AHA, 1973).

In 1978, one decade after the release of its first set of dietary guidelines, the American Heart Association released revised dietary recommendations with additional research supporting the relationship between diet and cardiovascular disease (AHA, 1973; AHA, 1974). The 1978 AHA Dietary Recommendations (see Table 12) expanded upon the 1968 AHA guidelines by advising all healthy Americans to:

1. Increase complex carbohydrates to compensate for reducing kilocalories from fat; and
2. Reduce sodium intake to 2000 mg daily (AHA, 1978).

The AHA recommendation to increase complex carbohydrates reflected preliminary epidemiological evidence reported by Burkitt indicating an inverse relationship between dietary fiber and the incidence of colon and rectal cancers and other chronic diseases of the colon (McNutt, 1980).

One year after the release of the 1978 AHA Dietary Recommendations, the Council on Scientific Affairs of the American Medical Association (AMA, 1973) released "Concepts of Nutrition and Health" (see Table 13) urging all healthy Americans to:

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Table 12.

DIET AND CORONARY HEART DISEASE:
GENERAL DIETARY RECOMMENDATIONS

American Heart Association
1978

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Maintain principles of good nutrition; make sound food habits a family affair
Weight Management	Balance calories to maintain ideal weight
Fat: (total)	Reduce to 30-35% of total calories
(saturated)	Reduce to less than 10% total calories
(polyunsaturated)	Intake should be 10% of total calories
Cholesterol	Reduce to 300 mg/day
Complex carbohydrates	Increase carbohydrates, particularly complex carbohydrates
Fiber	Emphasize complex carbohydrates
Refined Sugars	Emphasize complex carbohydrates
Sodium	Avoid excess sodium
Alcohol	Keep intake moderate

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Table 13.

CONCEPTS OF NUTRITION AND HEALTH

American Medical Association, Council on Scientific Affairs
1979

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Vary diet to increase nutrient adequacy
Weight Management	Maintain desirable weight through dietary control and exercise
Fat: (total)	Moderate intake regardless of source
(saturated)	Not of universal importance
(polyunsaturated)	Not of universal importance
Cholesterol	Level in the diet is not of universal importance
Complex carbohydrates	No recommendation
Fiber	No recommendation
Refined Sugars	No recommendation
Sodium	Moderate intake to less than 4,800 mg/ day
Alcohol	Moderation in intake

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1. Maintain ideal weight;
2. Use salt in moderation; and
3. Use alcohol only in moderation (AMA, 1979).

The report accompanying the guidelines stated:

> ...many problems with the usual American diet reflect abandonment of the dictum of moderation. The AMA recommends that the American public give primary emphasis to the achievement of the most desirable body weight and further recommends that this be accomplished through the combination of dietary control and exercise (AMA, 1979, preface).

The American Heart Association expressed dissatisfaction with the brief 1979 AMA "Concepts of Nutrition and Health Guidelines" (McNutt, 1980). The AMA declined to issue any recommendations concerning dietary fat or cholesterol intake, stating that the AMA Council had concluded that dietary fat and cholesterol restrictions for healthy individuals was inappropriate. The National Cancer Institute (NCI) of the National Academy of Sciences likewise objected to the dearth of AMA's dietary recommendations. The 1979 AMA "Concepts of Nutrition and Health Guidelines" made no recommendations concerning complex carbohydrates or fiber (McNutt, 1980). The 1979 National Cancer Institute Prudent Interim Principles report advised all Americans to increase fiber and complex carbohydrate intake, maintain ideal weight, reduce fat intake to 30% of calories, and reduce the intake of alcoholic beverages (McNutt, 1980).

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The 1978-1979 AHA, AMA, and NCI dietary recommendations generated less controversy among members of the scientific community than had the 1968 American Heart Association General Dietary Recommendations (McNutt, 1980). The diet-heart hypothesis was embraced and endorsed by a growing number of professional health organizations (Sims, 1983; Cronin, 1988; DHHS, 1988).

The American Diabetes Association revised its 1950 "Exchange List For Meal Planning" in 1976 (Obert, 1978; Rafkin-Mervis, 1990). The first edition had been published jointly by the American Dietetic Association and the American Diabetes Association and prescribed a diet with 40% of kilocalories from carbohydrate, 40% from fat, and 20% from protein. Although intended for use only by individuals with insulin dependent diabetes mellitus (IDDM), the Exchange List was adopted by popular weight loss programs. The food exchanges were based on the macronutrient content of foods (carbohydrates, fat, protein) rather than micronutrient content as were the food groupings used in the Basic 7 and Basic Four food groups. Therefore, many vegetables, such as beans, corn, and peas, had been considered "starches" rather than vegetables. IDDM patients were instructed to restrict carbohydrate intake to prevent hyperglycemic episodes. Dieters believed "starches" were "fattening" and therefore followed high protein and often high fat diets in attempts to lose weight quickly.

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Recognizing a markedly increased incidence of atherosclerosis and cardiovascular disease among persons with diabetes, the 1976 revision of the Exchange List recommended a reduction in fat to less than 35% of kilocalories. The 1986 revision recommended reduction of fat to 25-30% of kilocalories and increase of carbohydrate to 55-60% of kilocalories (Rafkin-Mervis, 1990).

Nutrition Education Organizations Urged Revised Dietary Recommendations

In 1968, a group of university faculty, community health educators, and nutritionists founded the Society for Nutrition Education (SNE) (Ullrich, 1972; 1983). The stated goal of the organization was to promote good nutrition for all Americans by making nutrition education more *effective*. As researchers, many of the members were concerned with issues of validity, reliability, and effectiveness of the food guides, the accompanying nutrition education materials, and the evaluation tools then used to teach nutrition (Gillespie, personal communication, May 16, 1991; Shaw, personal communication, June 1, 1991).

In 1971, Helen Ullrich, editor of the Journal of Nutrition Education, the official journal for the Society for Nutrition Education, questioned the validity and reliability of the 1958 Food for Fitness Basic Four Food Guide as a teaching tool (Ullrich, 1971; Gussow, 1986a).

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Suggesting that the use of food groupings in a society that ate formulated and fabricated foods and kept jars of vitamins on the breakfast table was outdated, Ullrich challenged SNE members to develop a new food guide to replace the Basic Four Food Group. She felt that a contemporary guide should be based on nutrients, rather than foods, and should reflect the snacking patterns followed by many Americans rather than the traditional three-meal pattern abandoned by many families: "We would like to make this Journal an open forum for ideas as a teaching tool. No idea is too far out. Please be brief so we can include lots of ideas. Perhaps from the suggestions, a new valuable tool can be devised" (Ullrich, 1971, p. 80).

Jean Mayer, Chairman of the 1969 White House Conference on Nutrition, was more succinct in his evaluation of the 1958 Food for Fitness food guide: "The Basic Four is not satisfactory" (Mayer, 1974, p. 135). Even though his Harvard colleagues had proposed a four food group system in 1955 (Hayes, 1955) and claimed credit for the Basic Four (Gussow, 1986a; F. Cronin, personal communication, May 17, 1991; A. Hertzler, personal communication, April 2, 1991), Mayer suggested that reverting back to the Basic 7 would focus more attention on nutrient-rich, low-calorie, high-fiber fruits, vegetables, and whole grain cereal foods instead of fatty animal products. Mayer also urged food manufacturers to provide comprehensive nutritional

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information on the labels of all processed foods. Consumers could then make rational and informed food choices in the marketplace (Mayer, 1974).

SNE members did not respond to Ullrich's challenge to develop a nutrient guide to replace the Basic Four until the early 1980s. However, a number of SNE nutritionists contributed research articles and editorials *evaluating* the validity and reliability of the Basic Four Food Guide.

Is the Basic Four Too Basic?

Louise Light and Francis Cronin from the Nutrition Education Research Staff, USDA, provided a comprehensive summary of the evaluations and criticisms launched against the 1958 Basic Four which appeared in the literature during the 1970s (Light, 1981). Light and Cronin grouped those criticisms into three general categories:

1. The Basic Four failed to assure *nutrient adequacy*. When menus based on the Basic Four were analyzed for nutrient content, most menus fell far short of the RDAs.
2. The Basic Four failed to provide any guidance or recommendations relating to the *contemporary dietary and health issues* in the United States, namely the influence of macronutrients on the incidence and risk of chronic diseases. Analysis of daily menus based on the Basic Four indicated

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daily intake of nutrients exceeded the 1978 AHA Guidelines and the 1977 Dietary Goals' guidelines for fat, saturated fats, and sodium intake.

3. No research had ever demonstrated that the Basic Four was an *effective teaching tool* or an efficient communication tool (Light, 1981).

Nutrient adequacy.

The Basic Four Food Guide was based on the 1953 edition of the RDAs (Page & Phipard, 1956). By 1980, the RDAs had been revised five times (Harper, 1985). Dietary allowances had been established for eight additional nutrients, and provisional allowances for safe and adequate ranges were made for 12 additional essential nutrients. Energy, or kilocalorie, recommendations had been adjusted downward because of the decreasing exercise patterns and energy expenditure with a concomitant increasing incidence of obesity in the general population (Light, 1981).

Janet King from the University of California at Berkeley analyzed 20 published menus which satisfied the Basic Four recommendations. Her research demonstrated those menus provided only 60% of the RDAs for Vitamin E, B_6, magnesium, zinc, and iron. Helen Guthrie from Pennsylvania State University analyzed the 24-hour dietary intake records of 212 college students. Only 46 of those records met the specified food group and serving size recommendations in the

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Basic Four. Only 33% of those records met the RDAs for Vitamin E, Vitamin B_6, iron, and zinc. Only 66% met the RDAs for folacin and magnesium (Light, 1981).

Jean Pennington of San Francisco City College developed a Dietary Nutrient Guide to facilitate the selection of an adequate diet. Noting that: "The Basic Four does not guarantee dietary adequacy even if followed, that the groupings are inadequate in view of the increased usage of fabricated, mixed, blended, and often uncategorized foods, and that the approach is intellectually unsatisfying," Pennington recommended a nutrition guide based on providing only nutrient information and allowing consumers to make their own food choices (Pennington, 1975, p. 2). Pennington also advocated Federal regulations mandating universal nutrition labeling on all processed foods.

Light and Cronin (1981) reviewed the USDA's 1977 Food Consumption Survey data and nutrient intake data reported in published analyses of menus written to satisfy the Basic Four Food Guide. When the Basic Four was developed, American diets were frequently deficient in calcium, Vitamin A, Vitamin C, and iron (Page & Phipard, 1956). Two decades later, American diets were frequently deficient in Vitamin B_6, folacin, magnesium, zinc, copper, and "probably the trace minerals" (Light, 1981, p. 59). The Basic Four did not include a food group rich in any of the 1977 shortfall nutrients, nor did it recommend adequate quantities of

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nutrient-dense foods to meet the revised RDAs. Light and Cronin concluded the Basic Four Food Guide was not a *valid* food guide because it did not assure the selection of a nutritionally adequate diet.

Contemporary dietary and health issues.

Not only did the Basic Four fail to meet micronutrient adequacy, the 1958 food guide failed to address the problems of nutrient excesses, especially kilocalories, saturated fats, sugar, and sodium, which were associated with increased risk for chronic diseases. In 1979, Helen Guthrie and Annemarie Crocetti from Anarem Systems Research analyzed the USDA 1977 Nationwide Food Consumption Survey data. Guthrie and Crocetti reported the following conclusions:

1. Only 3% of the American population actually followed the Basic Four.
2. The majority of those who did follow the Basic Four also consumed excessive amounts of fat (over 37% of kilocalories).
3. Almost 50% of the U. S. population consumed more than 35% of its total kilocalories as fat (Clapp, 1986).

Crocetti summarized by stating that the Basic Four Food Guide did not address the problems of the ratios of macronutrient to total kilocalorie intake. Furthermore, Americans did better when choosing micronutrients than when

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balancing macronutrients. Crocetti concluded: "Perhaps we should chuck the Basic Four" (Clapp, 1986, p. 87).

The Basic Four Food Guide had been developed during the 1950s, when the USDA was still collecting statistics on the incidence of morbidity and mortality from pellagra, beriberi, rickets, and night blindness (Hundley, 1957). Ancel Keys had only begun collecting data in Framingham, Massachusetts, to support his hypothesis linking diet and health with risk of cardiovascular disease (DHHS, 1988). As the life expectancy in the United States was lengthening during the 1970s, the importance of morbidity and mortality from the chronic diseases dwarfed the significance of nutrient deficiency diseases. Obesity, cardiovascular disease, diabetes, cirrhosis, and cancers were among the leading causes of death in the 1970s. Dietary components of total kilocalories, fat, saturated fat, sugar, salt, and alcohol impacted on these contemporary killers (U.S. Senate, 1977; USDA/ DHEW 1980). The Basic Four provided no information concerning desirable food selections of these macronutrients and other dietary components. Light and Cronin summarized the criticisms of the Basic Four:

> 1. Although available methods to maintain or reduce weight are not notably successful, dietary guidance must consider the issues of energy (kilocalorie) consumption.
>
> 2. There is general agreement that a recommendation of reduced sodium consumption is appropriate. There appears to be little justification for neglecting this subject in food guidance today.

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> 3. Scientists agree moderation (in fat, saturated fat, and cholesterol) is sound advice. Moderation also... increases nutrient density of the diet at the level of energy currently consumed by many people.
>
> 4. Moderation in the amount of sugars and sweeteners is good advice for dental health (Light, 1981, p. 59).

Light and Cronin's summary and analysis demonstrated that the Basic Four Food Guide did not consistently assure nutrient adequacy. The Basic Four therefore did not promote *reliable* food selection guidance to the public (Light, 1981).

Usability - effectiveness as a teaching tool.

The Basic Four was developed as a simple, "user-friendly" food guide (Hayes, 1955; Page & Phipard, 1956). Reviewing the published criticisms of the Basic Four, Light and Cronin summarized: "Despite these expressed dissatisfactions [with usability issues], there is no record in the nutrition literature of scientifically designed studies to test the usability aspects of any food guide" (1981, p. 59). Ardyth Gillespie from Cornell University faulted the Basic Four food group because it was never validated in published research (personal communication, May 16, 1991). With no notable improvement in the dietary status of many Americans between the release of the Basic Four in 1958 and the review in 1980, and with no published research supporting the Basic Four food guide as an

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effective teaching tool, perhaps the critics were correct to recommend "chucking the Basic Four" (Clapp, 1986).

The Federal Government Prescribes Dietary Recommendations

During the mid 1970s, the Federal government's interest in nutrition research and policy formulation waned. Congress was content that recent legislation was solving the problems of poverty and hunger. USDA was administering the resulting food and nutrition programs for the nation's needy. While the National Institutes of Health (NIH) in the Department of Health, Education, and Welfare (DHEW) was reviewing research on cardiovascular disease, only the American Heart Association was proactively recommending dietary changes (AHA, 1973; 1974; 1978).

1977 was a turning point for nutrition policy initiatives at the Federal level. By 1977, Congress had received appalling figures on the rising costs of health care, and started viewing preventive medicine as a panacea for the beleaguered health care industry (Broad, 1979a; 1979b; Sims, 1983). Senator George McGovern (D-S.DAK) and Representative Frederick Richmond (D-NY) were outspoken proponents for a National Nutrition Policy (Broad, 1979b). The USDA had come under attack by a number of public health nutritionists. Nutrition educators and health professionals stated that the Basic Four Food Group (Light, 1981; Clapp, 1986) and the 1964 Thrifty Meal Plan used to calculate Food

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Stamp allotments (Lane, 1979) had to be revised. The NIH came under pressure from Congress, the USDA, and consumer groups led by Michael Jacobson to provide valid nutrition education based on the newer knowledge of diet and disease risk for the general public (Broad, 1979a). However, officials at NIH were skeptical of the evidence linking diet to disease. NIH Director Donald Frederickson commented: "It would be better to tell the public nothing than call for a radical change in the American diet that might prove useless" (Broad, 1979a, p. 1175). Incremental Federal nutrition policy changes began in January, 1977.

Congressional Initiatives in Food Guidance

During the mid 1970s, Senator McGovern and the U. S. Senate Select Committee on Nutrition reviewed research and held Committee hearings on the relationship between the health of Americans and their dietary patterns (Sims, 1983). In January, 1977, Senator McGovern released the results of his Committee's findings. This report, Dietary Goals for the United States, claimed that an epidemic of killer diseases, including atherosclerosis, hypertension, cancer, and obesity, was linked to inappropriate dietary habits (U. S. Senate, 1977). Anticipating the controversy that might result from the release of the "Dietary Goals" report, Harvard biologist Mark Hegstead defended the dietary proscriptions:

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> There will undoubtedly be many people who will say that we have not demonstrated that the dietary modifications we recommend will yield the dividends expected. But ischemic heart disease, cancer, diabetes, and hypertension are diseases that kill us. We can not afford to temporize. We have an obligation to inform the public about the current state of knowledge and assist them in making the correct food choices (U. S. Senate, 1977, p. XV).

Dietary Goals for the United States made the following food choice recommendations:

1. Increase carbohydrate consumption to account for 55-60% of kilocalorie intake.
2. Reduce total fat consumption from approximately 40% to 30% of energy intake.
3. Reduce saturated fat consumption to account for less than 10% of energy balance.
4. Reduce cholesterol consumption to 300 mg per day.
5. Reduce sugar consumption by 40% to account for about 15% of total energy intake.
6. Reduce salt consumption by 50-80% to 3 grams sodium per day (U. S. Senate, 1977).

The release of Dietary Goals for the United States elicited the controversy that Hegstead had predicted. Strong opposition came from food producers, physician groups, some officials in the NIH, and Secretary of Agriculture John Block (Broad, 1979a; Sims, 1983; Gussow, 1986b). Secretary Block stated:

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> Hogs are just like people. You can provide protein and grain to a hog and he will balance his ration. He will not overeat on the protein or the grain. People are surely as smart as hogs. I am not so sure that the government needs to get so deeply into telling people what they should or should not eat (Gussow, 1986b, p. 112).

Richard Eamer, Chairman of National Medical Enterprises, did not credit humans with such porcine intelligence:

> We have no nutrition policy. You can live on Mars bars and Coca Cola if you want. But you can't go to the drugstore and get any drug you want. That's because we have a drug policy. But the funny thing is: Its probably a hell of a lot more important to have a food policy than a drug policy (Gussow, 1986b, p. 112).

A majority of health professionals and nutrition educators sided with Mr. Eamer.

The United Fresh Fruit and Vegetable Association, the National Fisheries Institute, the National Association of Wheat Growers, and Milling and Baking News fully endorsed Dietary Goals. The Egg Council, Dairy Association, American Cattlemen's Association, the National Livestock Feeders Association, and the National Livestock and Meat Board were outraged (Broad, 1979c; Sims, 1983; Gussow, 1986b). This report attacked their commodity products as the high fat, high cholesterol dietary "killers" which should be *avoided* for good health.

The Senate Select Committee released a revised set of Dietary Goals in December, 1977 (see Table 14) (U. S. Senate, 1977), in part due to the pressure from the cattle

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Table 14.

DIETARY GOALS FOR THE UNITED STATES

U.S. Senate Select Committee on Nutrition
2nd Edition, December, 1977

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	No recommendation
Weight Management	To avoid overweight, consume only as many calories as expended
Fat: (total)	Reduce to 27-33% of total energy
(saturated)	Reduce to 8-12% of total calories
(polyunsaturated)	Intake should be 8-12% of total calories
Cholesterol	Reduce to 250-300 mg/day
Total carbohydrates	Increase to 45-51% of total energy
Fiber	Increase
Refined Sugars	Reduce to 8-12% of total energy
Sodium	Decrease to 1600 - 2400 mg sodium daily (1 teaspoon salt)
Alcohol	Keep intake moderate

** Note also: Reduce use of additives and processed foods.

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lobbyists in Chairman McGovern's home state of South Dakota (Broad, 1979c). The initial recommendation to "eat less meat" was revised to "choose those meats, poultry, and fish which will reduce saturated fat intake." The revised edition also increased the sodium recommendation from three to five grams daily (U.S. Senate, 1977).

Even after the December revision, the debate over the Dietary Goals for the United States continued to rage (Gussow, 1986b). Opponents felt the evidence linking diet with chronic disease was insufficient to offer any restrictive dietary advice to the average, healthy American. Addressing a committee on nutrition of the House Committee on Domestic Marketing, Consumer Relations, and Nutrition, NIH Director Donald Frederickson recommended that the Federal government should avoid telling people what to eat:

> I have been concerned about this question (of diet and coronary heart disease) as Director of the NIH and the Heart Institute and as a scientist in the field for 25 years. I feel the problem we still have is that we can't bring you proof that changing the diet for the average American will lengthen his life or reduce the likelihood of having a coronary (Broad, 1979b, p. 1178).

Federal Initiatives in Food Guidance

Healthy People. The Surgeon General's Report on Health Promotion and Disease Prevention.

The Public Health Service felt the evidence linking diet and disease was compelling, even though absolute "proof" of the relationship had not been demonstrated. In

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July, 1979, Julius Richmond, M. D., Surgeon General of the United States Public Health Service, released the first public Federal document reporting morbidity and mortality rates in the United States and establishing goals and objectives for reducing the incidence of the chronic diseases through healthier lifestyles (U. S. DHEW, 1979). President Jimmy Carter provided the preface for Healthy People. The Surgeon General's Report on Health Promotion and Disease Prevention:

> We have come to take the seemingly miraculous cures of modern medicine almost for granted. And we tend to forget that our improved health has come more from preventing disease than from treating it once it strikes. Our fascination with the more glamorous "pound of cure" has tended to dazzle us into ignoring the more often effective "ounce of prevention" (U. S. DHEW, 1979, p. V).

Healthy People established health goals for five separate age categories: (a) infants, (b) children, (c) adolescents, (d) adults, and (e) older Americans. The report urged improved nutrition practices to reduce the incidence of cardiovascular disease, obesity, tooth decay, cirrhosis, and certain types of birth defects and cancers (see Table 15). The dietary recommendations included a statement to avoid eating processed foods because of the excess salt added and nutrients destroyed. Healthy People urged expanding nutrition education programs in schools, implementing community education programs, piloting training programs for physicians and other public health educators,

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Table 15.

HEALTHY PEOPLE: SURGEON GENERAL'S REPORT ON HEALTH PROMOTION AND DISEASE PREVENTION

Department Health, Education, Welfare
1979

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Balance and vary food choices every day
Weight Management	Exercise and balance calories to maintain desirable weight
Fat: (total)	Reduce excess intake
(saturated)	Consume less
(polyunsaturated)	No recommendation
Cholesterol	Consume less
Complex carbohydrates	Consume more
Fiber	Consume more complex carbohydrates
Refined Sugars	Consume less
Sodium	Consume less salt
Alcohol	No recommendation

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encouraging nutrition education components in food advertising campaigns, and providing nutritional educational components in all Federal nutrition and food distribution programs.

Toward Healthful Diets.

The Food and Nutrition Board (FNB), National Research Council (NRC) of the National Academy of Sciences entered the nutrition and health promotion controversy in 1978 (National Academy Sciences [NAS], 1980). Responding to congressional interests in diet, health, and risk of chronic diseases which were generated following the release of Dietary Goals and consumer interest groups' pressures for the Academy to release heart study results, the FNB Board started a two-year review of nutrition and health literature. In May, 1980, FNB Chairman Alfred Harper released Toward Healthful Diets (see Table 16) (National Academy of Sciences, 1980). The dietary guidelines and accompanying rationale were intended to augment dietary recommendations released with the recently revised RDAs and to refute the guidelines included in the 1977 Dietary Goals for the United States (Olsen, 1980):

> The Board considers it scientifically unsound to make single, all-inclusive recommendations to the public regarding intakes of energy, protein, fat, cholesterol, carbohydrate, fiber, and sodium. ....The Board recognizes epidemiology establishes coincidence, but not cause and effect. The Board believes advice should be given [only] when strength, extent, consistency, coherence, and

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Table 16.

TOWARD HEALTHFUL DIETS

Food and Nutrition Board, National Research Council
National Academy of Sciences
1980

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Select a wide variety of foods from all food groups
Weight Management	Adjust calorie intake to maintain appropriate weight for height
Fat: (total)	Reduce intake if overweight
(saturated)	Recommendations not warranted for the public
(polyunsaturated)	Recommendations not warranted for the public
Cholesterol	Recommendations not warranted for the healthy person
Complex carbohydrates	No recommendations
Fiber	No recommendations
Refined Sugars	Reduce intake if energy requirement is low
Sodium	Use salt in moderation: 1,200 - 3,200 mg Na/day
Alcohol	Reduce intake if energy intake is low

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> plausibility of evidence converge to indicate dietary practices promote health benefits without incurring undue risks (National Academy of Sciences, 1980, p. 4-5).

Toward Healthful Diets recommended eating a variety of foods to assure adequate micronutrient intake, maintaining a desirable weight, and reducing salt (sodium) intake to the RDAs' recommended level of 2000 mg sodium daily. The FNB made no recommendation for reducing intake of dietary fats or cholesterol, altering the ratio of complex carbohydrates to total kilocalories, increasing fiber, or limiting intake of simple sugars. The FNB stated: "Proof of benefit should be demonstrated before recommendations are made to the public. In fact, *50%* of coronary heart disease is *not* [italics added] accounted for by any known risk factor" (Olsen, 1980, p. 189). Health professionals would be satisfied with preventing the *other 50%*.

The publication of the Senate Select Committee's Dietary Goals for the United States had spawned intense controversy and debates between departments in the Federal government, between scientific groups (especially heart and cancer groups) and Federal agencies, and among members of scientific groups (Broad, 1979a; 1979b; 1979c; Sims, 1983). Toward Healthful Diets was greeted with general public apathy and scientific curiosity (Broad, 1979c). Subsequent guidelines published by the USDA further eroded any impact the NAS report might have made.

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The United States Department of Agriculture versus the Department of Health, Education, and Welfare

If the American Heart Association and a U. S. Senate Select Committee on Nutrition could formulate dietary guidelines to promote health and prevent disease, members of Congress, including Representative Frederick Richmond (D-NY) and Senator Hubert Humphrey, wanted to know why the National Institutes of Health couldn't provide dietary advice (Broad, 1979b). Michael Jacobson, Director of Citizens for Science in the Public Interest (CSPI), became an outspoken critic of NIH's reluctance to take a stand on the diet-health debate:

> Scientists at NIH constitute a constituency that calls for perpetually higher research budgets. No knowledge is ever enough knowledge, so instead of urging current knowledge about foods and health be conveyed to the general public, scientists urge more research (Broad, 1979b, p. 1176).

The USDA also urged that the NIH issue a set of dietary guidelines urging Americans to adopt a more prudent diet. Mark Hegstead, who had edited the Dietary Goals, was named to direct the USDA's new Human Nutrition Center. By December of 1977, the USDA adopted the Dietary Goals for the United States as a policy base for future research and education programs (Broad, 1979b).

Controversy surrounding the Dietary Goals and the NIH reluctance to issue dietary guidelines erupted into frank competition between the USDA and the NIH in the Department Health, Education, and Welfare (DHEW). During the summer of

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1977, Congress debated components of a new agriculture bill. The bill proposed subsidies and price supports for wheat, rice, peanuts, and tobacco, and also proposed funding to study the chronic diseases associated with nutrition:

> Congress hereby finds there is increasing evidence of a relationship between diet and many of the leading causes of death in the United States; that improved nutrition is an integral component of preventive care; there is serious need for research on the chronic effects of diet on degenerative diseases and related disorders (Broad, 1979a, p. 1060).

Secretary of Agriculture Robert Bergland lobbied for funding for the proposed research projects on the basis that USDA had always been the lead Federal agency providing nutrition education materials for the public. Secretary of Health, Education, and Welfare Joseph Califano countered that NIH already had medical facilities in place and could therefore conduct research on disease-related nutrition topics (Broad, 1979a). William Broad (1979a) described the final Congressional conference committee debate which brought the USDA versus DHEW conflict to a climax:

> There were pieces of paper being floated by various interest groups, and Califano's people were there, pushing for their side. People from USDA who were fighting for a lead role for funding priorities were having second thoughts, starting to give in. Amid the shuffle sat Senator Hubert Humphrey, wasted by cancer, with only five months to live. "Look," he said, pounding his fist on the table. "HEW has avoided the area of prevention like the plague, and its about time that USDA moves in. Its going to take this aspect of the nutrition program whether it likes it or not." The room fell silent, the issue settled (p. 1070).

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The 1977 Farm Bill (PL 95-113) passed, assigning USDA as lead agency in human nutrition investigation and education (Broad, 1979a).

Six months later, a USDA-DHEW task force was organized to conduct joint research on the diet and disease associations and to issue a set of dietary guidelines appropriate for all Americans based on the 1977 Dietary Goals. NIH Director Donald Frederickson, Commissioner of Food and Drug Administration Donald Kennedy, USDA Assistant Secretary for Education Rupert Cutler, and USDA Assistant Secretary for Food and Consumer Services Carol Tucker met for two years before agreeing on a new set of guidelines.

"Hassle-Free Food Guidance"

While the USDA and DHEW task force met to formulate dietary advice consistent with the Dietary Goals, Carol Davis and other USDA nutritionists evaluated the Basic Four Food Guide, then 20 years old. The Basic Four had been under attack for more than ten years, and new RDAs and Food Consumption Survey Data were available for a possible revision of the 1958 food guide. Mark Hegstead, newly appointed Director of USDA's Nutrition Center, was very sympathetic to the health issues raised in the "Dietary Goals" and interested in promoting a nutrition message that diet could affect the incidence of chronic diseases (Broad, 1979b). Davis and co-workers revised the Basic Four, and

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USDA released Food. The Hassle-Free Guide to a Better Diet in 1979 (Davis).

The "Hassle-Free Guide" (see Figure 17) provided more information on micronutrients, reflecting the recent additions of Vitamins D, E, and B_6, folacin, B_{12}, phosphorus, magnesium, zinc, and iodine to the RDAs. Fruits and Vegetables and the Grains and Cereal groups were placed at the top of the guide, implying the relative importance of these groups "over" the Meats and Milk groups. The addition of a fifth group, Fats, Sweets, Alcohol, acknowledged that many Americans were eating these calorie-dense food items. By including the Fifth Group, USDA nutritionists hoped people would consider the high caloric content but low nutrient value of such foods when planning daily menus (see Table 17). The guide also emphasized the desirability of reducing fat intake, stating that red meat was especially high in fat and saturated fats. (Davis, 1979).

The "Hassle-Free Guide" also included an introductory statement, providing information that many scientists believed current evidence warranted reducing calories, fats, cholesterol, sugars, and salt to reduce the risks of chronic diseases. The introduction also included the disclaimer that some scientists did *not* feel that there was sufficient causal evidence to warrant dietary changes (Davis, 1979): "So the choice is yours. You can make changes in the way you eat or not. The information is offered to make it

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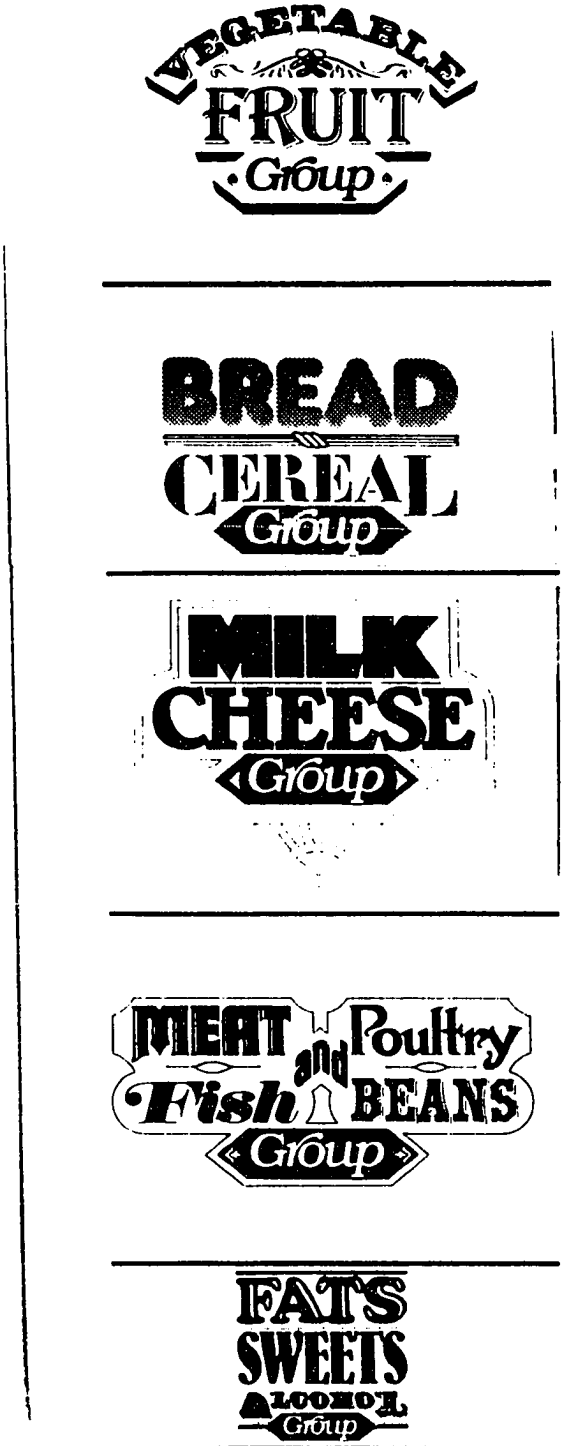
Figure 17



THE HASSLE-FREE GUIDE TO A BETTER DIET

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Table 17.

THE HASSLE FREE GUIDE
TO BETTER EATING

Science and Education Administration
C. A. Davis
1979

United States Department of Agriculture

Food Group	Portion/ Serving
Vegetable - fruit	4 or more servings include a citrus and a leafy green or yellow vegetable daily
Bread and Cereal Group	4 or more servings
Milk	3 or 4 servings for children 4 servings for teens 2 or more for adults
Meat	2 or more servings daily. 1 Serving = 2 or 3 oz. meat; 2 eggs; 1 cup dry beans or lentils; or 1/4 cup peanut butter
Fats, Sweets, Alcohol	Caution: These foods provide calories but few nutrients

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easier for you to follow a balanced diet, *if you want*" [italics added] (p. 3).

Food industry representatives, especially from the Cattlemen's Association, the National Livestock Association, and the Dairy Council, were furious because of specific references to red meats and dairy products as high fat foods (F. Cronin, personal communication, May 17, 1991; Sugarman, 1991b). Professional response to the new food guide was underwhelming. In 1981, SNE editor Susan Oace urged further debate on the development of a new food guide, specifically questioning the validity, reliability, and effectiveness of the Basic Four (Oace, 1981). A second printing of Food. Hassle-Free Guide to a Better Diet was canceled (Sugarman, 1991b).

Nutrition and Your Health - Dietary Guidelines for Americans

In 1980, the USDA / DHEW task force completed the challenge of developing a new food guide for healthy Americans (see Figure 18, Table 18) (USDA/ DHEW, 1980). Nutrition and Your Health - Dietary Guidelines for Americans provided the following advice for Americans:

1. Eat a Variety of Foods. (Eating a variety of foods would increase the probability of getting all of known nutrients the body needs daily, and would also decrease the risk of potentially toxic overexposure to food constituents.)

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Figure 18

Nutrition and Your Health

Dietary Guidelines for Americans

1 Eat a Variety of Foods page 4

2 Maintain Ideal Weight page 7

3 Avoid Too Much Fat, Saturated Fat, and Cholesterol page 11

4 Eat Foods with Adequate Starch and Fiber page 13

5 Avoid Too Much Sugar page 15

Avoid Too Much Sodium page 17

7 If You Drink Alcohol, Do So in Moderation page 19

DIETARY GUIDELINES FOR AMERICANS - 1980

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Table 18.

NUTRITION AND YOUR HEALTH:
DIETARY GUIDELINES FOR AMERICANS

Home and Garden Bulletin 232
USDA / DHEW
1980

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a variety of foods
Weight Management	Maintain ideal weight
Fat: (total)	Avoid too much
(saturated)	Avoid too much
(polyunsaturated)	No recommendation
Cholesterol	Avoid too much
Complex carbohydrates	Eat foods with adequate starch
Fiber	Eat foods with adequate fiber
Refined Sugars	Avoid too much
Sodium	Avoid too much
Alcohol	If you drink, do so in moderation

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2. Maintain Ideal Weight. (The Guidelines included a 1973 DHEW Conference on Obesity ideal weight table for assessing "ideal" weight).
3. Avoid Too Much Fat, Saturated Fat, and Cholesterol. (The task force committee believed there was sufficient evidence to link dietary fat, serum cholesterol, and the incidence of cardiovascular disease).
4. Eat Foods With Adequate Starch and Fiber. (Choose complex carbohydrates as the primary energy source in the diet. Choose fiber to reduce risks for certain cancers and for symptoms of constipation, diverticulitis, and irritable bowel syndrome).
5. Avoid Too Much Sugar. (Sugar increases the risk for developing dental caries, and provides calories with no nutrients).
6. Avoid Too Much Sodium. (Although not everyone who has hypertension is sodium sensitive, excessive sodium intake increases the risk for developing hypertension).
7. If You Drink Alcohol, Do So In Moderation. (Alcohol consumption during pregnancy has caused birth defects. Heavy drinking may cause cirrhosis, cancer of the throat, or neurological disorders) (USDA/DHEW, 1980).

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The Dietary Guidelines for Americans were intended for the average healthy American, not for persons who needed special diets because of diseases or conditions interfering with normal nutrition (USDA / DHEW, 1980). The "Dietary Guidelines" advised:

> Health depends on many things, including heredity, lifestyle, personality traits, and environment, in addition to diet. Food alone can not make you healthy. But good eating habits based on moderation and variety can help keep you healthy and even improve your health (USDA / DHEW, 1980, p. 2-3).

Nutrition and Your Health - Dietary Guidelines for Americans elicited controversy, but not the furor generated with the release of the Senate's 1977 Dietary Goals (Harper, 1980; Wolf, 1984; Gussow, 1986b). Some nutritionists felt the Dietary Guidelines were too general, avoiding quantified recommendations for changes in macronutrient percentages of kilocalories or total intake of nutrients per day (McNutt, 1980). Harper (1980) and other nutrition educators criticized the Guidelines for being too negative (*avoid* fat, *avoid* sugar, *avoid* salt).

Congress had designated the USDA as "lead agency for human nutrition research and education" in 1977. Despite any controversy, Nutrition and Your Health - Dietary Guidelines for Americans, released by the USDA and DHEW in 1980, became the official Federal dietary advice for the general public.

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CHAPTER 11

FROM DIETARY GOALS TO FOOD GUIDES

Dietary Guidelines for Americans

The 1980 release of Nutrition and Your Health - Dietary Guidelines for Americans coincided with significant changes in the executive branch of the Federal government. Jimmy Carter had won support from the National Education Association during the 1976 campaign by pledging to establish a separate cabinet position for the Department of Education (Berube, 1991). At the end of his single term of office, President Carter fulfilled that pledge. The two remaining portions of the former Department of Health, Education, and Welfare were reorganized to form the Department of Health and Human Services (DHHS).

The Department of Agriculture was reorganized to include a basic human nutrition research component under the Agriculture Research Center and an information and education component under the newly created Human Nutrition Information Service (HNIS). This newly created HNIS included a Consumer Nutrition Center, a Food and Nutrition Information Center of the National Agriculture Library, and the Nutrition Information and Dietary Guidance Center. The HNIS was directed to develop supplemental food guidance

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materials to help Americans implement the dietary recommendations made in the 1980 Dietary Guidelines for Americans (Jarratt, 1981; USDA 1981; F. Cronin, personal communication, May 17, 1991).

The Dietary Guidelines for Americans generated less opposition among scientists and health educators than had the U. S. Senate's 1977 Dietary Goals for the United States. Some segments of the food industry were still displeased with the specific references to reduce intake of animal and dairy fats (F. Cronin, personal communication, May 17, 1991; Sugarman, 1991b). However, the Dietary Guidelines encouraged eating a variety of foods and moderating, rather than avoiding, consumption of high fat animal products.

The Dietary Guidelines were *directional* rather than *quantitative*. In 1978, Betty Peterkin from the Bureau of Home Economics, USDA, developed a set of menus which would meet the quantitative levels of fat, carbohydrate, protein, and salt recommended in the 1977 Dietary Goals and the micronutrients advised in the 1974 RDAs. Peterkin's menus provided less than 30% of kilocalories from fat, 50% of kilocalories from carbohydrates, 10% from sugar, and 10% from protein. These restrictive menus were significantly different from the average American diet as calculated from the USDA's food disappearance and household food consumption data (Peterkin, 1978). In 1977, the average American diet derived 40% of kilocalories from fat, 30% of kilocalories

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from carbohydrates, 16% from sugars, and 14% from protein. The *directional* 1980 Dietary Guidelines recommended eating *less* fat, *less* sugar, *less* sodium, and *more* starch than the average American ate in 1977. Food producers and manufacturers could find a place for each of their products within these directional Dietary Guidelines.

The American Public Health Association (APHA) and the Society for Nutrition Education endorsed the Dietary Guidelines (Cronin, 1988). Other health organizations, including the American Heart Association (AHA, 1982; 1986; 1988) and the American Cancer Society (NAS, 1982; Butram, 1988) urged for more *quantitative* guidelines.

Healthy Hearts

The American Heart Association issued revisions of its "Dietary Guidelines for Healthy Hearts" throughout the 1980s (AHA, 1982; 1986; 1988). In 1986, the Heart Association Nutrition Committee stated that dietary recommendations could modify risk factors associated with heart disease (AHA, 1986). Those risk factors were elevated plasma cholesterol, increased blood pressure, diabetes mellitus, and obesity (AHA, 1982, p. 840A). The 1988 AHA "Dietary Guidelines for Healthy American Adults" revision (see Table 19) varied little from the 1978 edition. Both focused on the reduction of fat, saturated fat, cholesterol, and sodium, and both established quantified limits for fats

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Table 19.

DIETARY GUIDELINES FOR HEALTHY AMERICAN ADULTS

American Heart Association
1988

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a wide variety of foods
Weight Management	Maintain recommended body weight
Fat: (total)	Reduce to less than 30% of total calories
(saturated)	Reduce to less than 10% total calories
(polyunsaturated)	Intake should not exceed 10% of total calories
Cholesterol	Reduce to 300 mg/day
Complex carbohydrates	Increase carbohydrates to 50% of calories
Fiber	Emphasize complex carbohydrates
Refined Sugars	Emphasize complex carbohydrates
Sodium	Reduce to less than 3000 mg daily
Alcohol	Reduce intake to no more than 1-2 ounces ethanol daily

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and sodium consumption. The 1988 revision also specified limiting ethanol to one to two ounces daily and increasing total carbohydrates to 50% of kilocalories (AHA, 1988).

In 1984, the National Heart, Lungs, and Blood Institute (NHLBI) in the National Institutes of Health and agencies within the Department of Health and Human Services met to discuss educational strategies to reduce serum cholesterol in the general adult population (Mathews, 1990). The National Cholesterol Education Program (NCEP) grew out of these initial meetings. In 1990, the NCEP and the NHLBI issued a joint report elucidating strategies for reducing elevated cholesterol in the American population (U.S. DHHS, 1990). The NCEP-NHLBI dietary recommendations (see Table 20) for reducing dietary fats and cholesterol reflected the primary health goal of reducing serum cholesterol. The NCEP-NHLBI guidelines were more limited than the 1988 AHA Dietary Guidelines which had been developed to reduce serum cholesterol and also reduce hypertension and obesity as risk factors for coronary heart disease (AHA, 1982; 1988).

Reducing the Risk

A Committee on Diet, Nutrition, and Cancer was formed in 1980 by the National Research Council to review the scientific literature identifying a relationship between nutrition and cancer (National Academy of Sciences, 1980). This committee was directed to:

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Table 20.

NCEP-NHLBI REPORT ON POPULATION STRATEGIES
NATIONAL CHOLESTEROL EDUCATION PROGRAM

U. S. DHHS
1990

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	No recommendations
Weight Management	Maintain desirable weight
Fat: (total)	Reduce intake to no more than 30% of calories
(saturated)	Reduce to no more than 10% of calories
(polyunsaturated)	No recommendation
Cholesterol	Reduce to less than 300 mg daily
Complex carbohydrates	Calories to maintain weight should be derived from carbohydrate sources
Fiber	No recommendations
Refined Sugars	No recommendations
Sodium	No recommendations
Alcohol	No recommendations

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> ...develop a series of recommendations related to nutrition and the incidence of cancer and to develop a series of recommendations related to dietary components (nutrients and toxic compounds) and the incidence of cancer (NAS, 1982, p. V).

The final report, Diet, Nutrition, and Cancer (NAS, 1982), concluded that there was insufficient scientific evidence to link dietary carbohydrates, fiber, sugars, and sodium to carcinogenesis. Therefore, the committee did not recommend altering the carbohydrate composition of the diet. The committee report (see Table 21) did recommend reducing fat intake to 30% of kilocalories and moderating the use of alcoholic beverages. The committee recommended conducting further research on other dietary components, including Vitamins A, E, and C, beta carotene, and minerals, to investigate any potential protective factors these food components might provide (NAS, 1982).

By 1988, the National Cancer Institute's Dietary Guidelines (Butram, 1988) added a quantitative recommendation of 20 - 30 grams fiber daily to protect against cancers of the colon and breast. The "NCI Dietary Guidelines" (see Table 22) reiterated the possible significance of beta carotene and Vitamins A and C as antioxidants in reducing the risk of developing some cancers. The "NCI Dietary Guidelines" also cautioned against the consumption of salt-cured or smoked meats as potential carcinogens. The report confirmed the association between obesity and increased risk for developing certain

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Table 21.

DIET, NUTRITION, AND CANCER

Committee on Diet, Nutrition, and Cancer
National Research Council
National Academy of Sciences
1982

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	No recommendation
Weight Management	No recommendation
Fat: (total)	Reduce intake to 30% of calories
(saturated)	Reduce intake
(polyunsaturated)	Reduce intake
Cholesterol	No recommendation
Complex carbohydrates	No recommendation
Fiber	Increase consumption of fruits and vegetables
Sugars	No recommendation
Sodium	No recommendation
Alcohol	If consumed, do so in moderation

**Note: Beta carotene and Vitamins A and C found in fruits and vegetables have been shown to be protective against some cancers. Eat cruciferous vegetables.

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Table 22.

NCI DIETARY GUIDELINES

National Cancer Institute, National Institutes Health
R. R. Butram
1988
Department Health and Human Services

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	No recommendations
Weight Management	Avoid obesity
Fat: (total)	Reduce to 30% of calories
(saturated)	No recommendation
(polyunsaturated)	No recommendation
Cholesterol	No recommendation
Complex carbohydrates	No recommendation
Fiber	Increase fiber to 20-30 grams/day, with an upper limit of 35 grams
Refined Sugars	No recommendation
Sodium	No recommendation
Alcohol	If you drink, do so in moderation

**Note: Beta carotene and Vitamins A and C found in fruits and vegetables have been shown to be protective against some cancers.

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cancers and therefore urged a balance of energy intake with exercise to promote weight loss or to prevent excessive weight gain.

Dietary Guidelines for General Health: The Federal Government's Approach

In 1983, Secretary of Agriculture John Block appointed an Advisory Committee of nine scientists from USDA, DHHS, and National Academy of Sciences to review the scientific validity of the recommendations in the 1980 Nutrition and Your Health... Dietary Guidelines for Americans (Wolf, 1984; Cronin, 1988). Dr. Bernard Schweigert, Administrator of USDA's Human Nutrition Information Service, was appointed Committee Chairman. The Advisory Committee formed seven subcommittees to review each of the Dietary Guidelines. Releasing its report in 1985, the Advisory Committee proposed several modifications in the 1980 Dietary Guidelines and provided benchmark scientific references supporting these changes (Wolf, 1985). The Advisory Committee also made the following recommendations:

1. The revised Dietary Guidelines for Americans should be used as the basis for policy development related to Federal nutrition education and information programs of both departments [ie, USDA and DHHS].

2. The Departments should plan and publish a broad distribution of a publication presenting the revised Dietary Guidelines.

3. The Departments should convene an advisory committee of nationally recognized nutrition

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authorities to review the Dietary Guidelines for scientific accuracy and appropriateness on a five to ten year basis.

4. The Department of Agriculture should continue work aimed at developing a system of simple food groupings, consistent with the currently available food supply, that can be used in nutrition education programs related to the Dietary Guidelines concepts (Wolf, 1985, p. ii).

The committee's recommended modifications were accepted and included in the second edition of Nutrition and Your Health - Dietary Guidelines for Americans (see Figure 19) (USDA / DHHS, 1985). These revised Dietary Guidelines (see Table 23) included changes in Guidelines 2 and 7. In Guideline 2, "Maintain *ideal* weight" was revised to "Maintain *desirable* weight," reflecting a lack of scientific agreement on the concept of "ideal" weight. Guideline 2 included the 1959 Metropolitan Life Insurance Desirable Weight Tables as its standard for "desirable" weight.

Guideline 7 was corrected from "If you drink alcohol, do so in moderation" to the grammatically preferred "If you drink alcoholic beverages, do so in moderation." "Moderation" was further defined as one to two standard drinks (1 1/2 ounce liquor, 5 ounces wine, or 12 ounces beer) for adults. Pregnant women were advised to refrain from the use of any alcohol. The Guideline also urged: "If you drink, be moderate in your consumption, and DO NOT DRIVE" (USDA / DHHS, 1985, p. 23).

The centerfold of the 1985 Dietary Guidelines pamphlet depicted each of the guidelines as a colorful hexagonal

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Figure 19

Nutrition and Your Health

Dietary Guidelines for Americans

DIETARY GUIDELINES FOR AMERICANS - 1985

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Table 23.

NUTRITION AND YOUR HEALTH
DIETARY GUIDELINES FOR AMERICANS

Home and Garden Bulletin 232, 2nd edition
USDA / DHHS
1985

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a variety of foods
Weight Management	Maintain desirable weight If obese, lose weight gradually; increase physical activity
Fat: (total)	Avoid too much
(saturated)	Avoid too much
(polyunsaturated)	No recommendation
Cholesterol	Avoid too much
Complex carbohydrates	Eat foods with adequate starch
Fiber	Eat foods with adequate fiber
Refined Sugars	Avoid too much
Sodium	Avoid too much
Alcohol	If you drink alcoholic beverages, do so in moderation. If you are pregnant, don't drink.

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block intertwined with each other to form a "balanced diet:"

> Good nutrition is a balancing act; choosing foods with enough protein, vitamins, minerals, and fiber; but not too much sodium, sugar, and alcohol. Also, energy intake must be balanced with energy expended. The Seven Dietary Guidelines, used together, can help you select a healthful diet (USDA / DHHS, 1985, p. 12-13) (see Figure 20).

The 1985 Dietary Guidelines were *directional* rather than *quantitative*, even though members of some scientific groups had urged more quantitative recommendations (Cronin, 1988). Release of the 1985 Dietary Guidelines for Americans generated little controversy from professional groups or food industry lobbyists. The colorful visual materials used to promote the concepts of balance and variety were well accepted by the public. The American Dietetic Association endorsed the 1985 Dietary Guidelines. APHA and SNE had endorsed the 1980 edition and also endorsed the 1985 revision (Cronin, 1988).

The Advisory Committee recommended that the 1985 Dietary Guidelines should be used as the basis for public nutrition policy development, and therefore should be used as the nutrition standard in the School Lunch, WIC, Food Stamps, and Older Americans Nutrition programs. The Advisory Committee also urged USDA to develop a new food guide and supportive educational materials to implement the 1985 Guidelines' recommendations. These two recommendations served to seal the fate of the 1958 Basic Four Food Group

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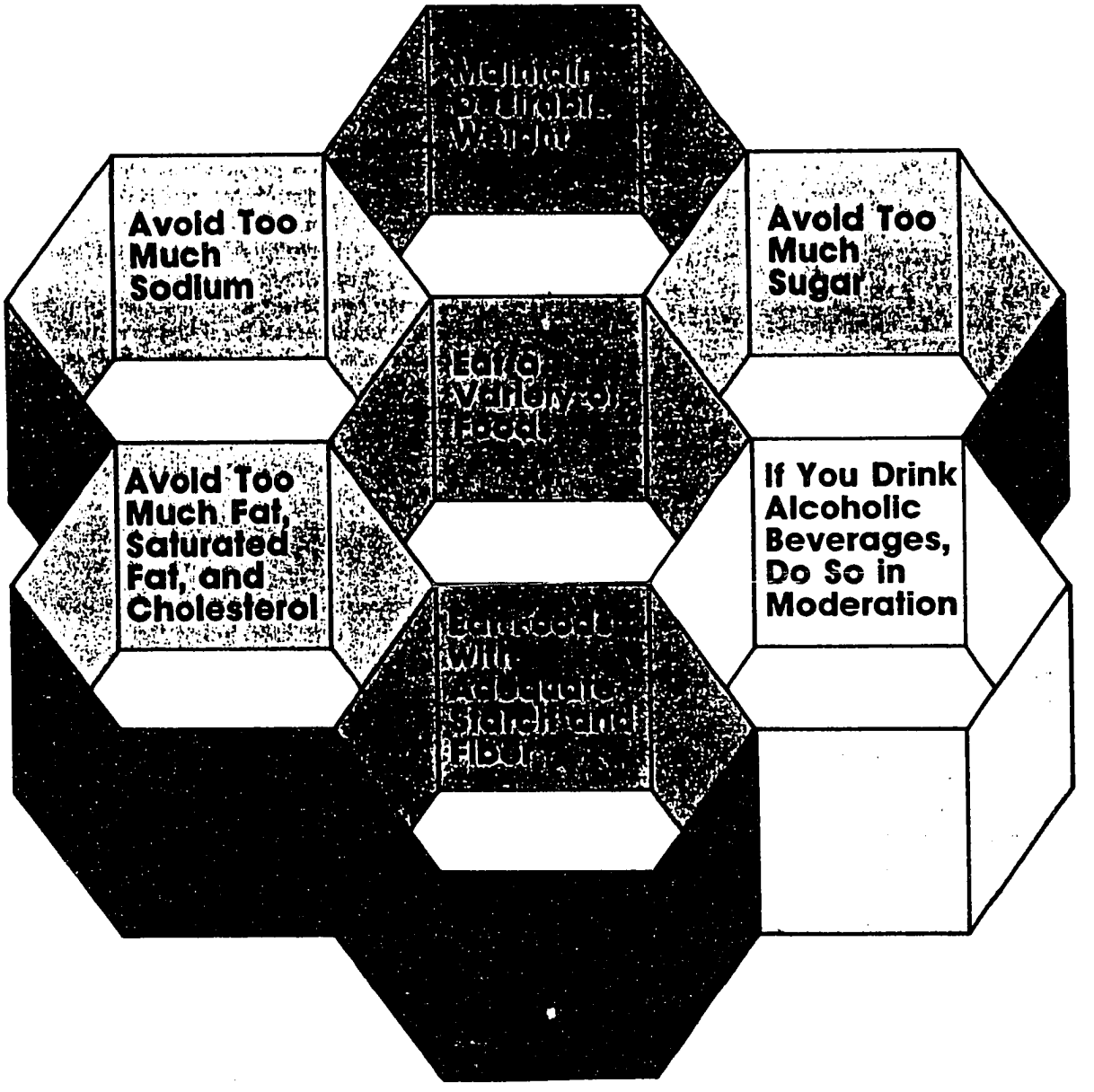
Figure 20



DIETARY GUIDELINES FOR AMERICANS - 1985

Getting the right balance.

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and the 1979 Hassle Free Guide (USDA / DHHS, 1985; Wolf, 1985; F. Cronin, personal communication, May 17, 1991).

Public Health Service

Responding to the 1983 Dietary Guidelines Advisory Committee's recommendation to adopt the 1985 Dietary Guidelines as the basis for all Federal nutrition policies, Surgeon General Dr. C. Everett Koop appointed a Public Health Service Committee to review all literature available on the impact of daily dietary patterns on the health of all Americans. The committee was chaired by Assistant Secretary for Health (Office of Disease Prevention and Health Promotion) J. Michael McGinnis, and included 10 members from the Nutrition Policy Board of DHHS, 10 members from the scientific community, and an additional 10 DHHS staff members. The purpose of this committee's proposed report was to identify key nutrition research issues which had implications for Federal agriculture policy, dietary guidance, nutrition programs and services, preventive health research, and nutrition surveillance. The report would follow the precedent set with the 1964 Surgeon General's report on tobacco and smoking, which called attention to the inescapable conclusion that cigarettes were a major source of illness and death (U.S. DHHS, 1988).

The Surgeon General's Report on Nutrition and Health (U.S. DHHS, 1988) was released in 1988 (see Figure 21).

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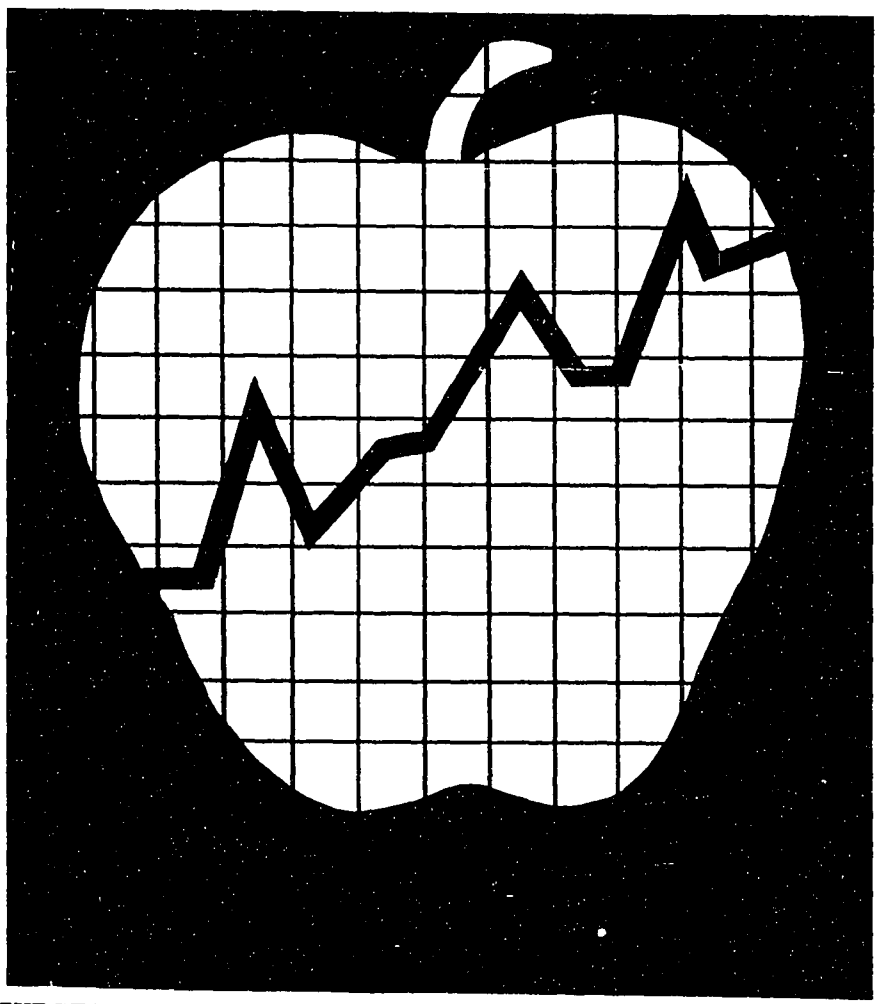
Figure 21

The Surgeon General's Report on

NUTRITION AND HEALTH



SURGEON GENERAL'S REPORT ON NUTRITION AND HEALTH

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This report supported Federal nutrition and dietary recommendations as stated in the 1985 Dietary Guidelines. Surgeon General Koop concluded, "...over consumption of certain dietary components is now a major concern for Americans. While many food factors are involved, chief among them is the disproportionate consumption of foods high in fats, often at the expense of foods high in complex carbohydrates and fiber that may be more conducive to health" (U.S. DHHS, 1988, p. 2).

The dietary recommendations included in Nutrition and Health (see Table 24) were very similar to those included in the 1985 Dietary Guidelines (USDA / DHHS, 1985; U.S. DHHS, 1988). The recommendations again were *directional*, recommending *increasing* carbohydrates, calcium for females, and iron-rich foods while *decreasing* fats, sugars, sodium, and alcohol. The report also urged fluoridation of public water supplies to protect against dental caries.

The Report was prepared primarily for nutrition policy makers. However, the implications for dietary advice were directed to all Americans. C. Everett Koop provided the preface to Nutrition and Health:

> I am convinced that with a concerted effort on the part of policy makers throughout the nation, and eventually by the public, our daily diets can bring a substantial measure of health to all Americans (U.S. DHHS, 1988, p. IV).

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Table 24.

THE SURGEON GENERAL'S REPORT ON NUTRITION AND HEALTH

Public Health Services
U. S. DHHS
1988

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a variety of foods
Weight Management	Achieve and maintain a desirable body weight. Use Body Mass Index to determine obesity.
Fat: (total)	Reduce consumption of total fat
(saturated)	Reduce
(polyunsaturated)	No recommendation
Cholesterol	Limit to 300 mg daily
Complex carbohydrates	Increase consumption by choosing whole grains foods and cereal products, vegetables, and fruits
Fiber	Increase consumption
Refined Sugars	Those vulnerable to dental caries should decrease consumption
Sodium	Reduce to 1100 mg to 3300 mg daily
Alcohol	Reduce intake to no more than 2 drinks per day

*** Other issues: Community water supplies should contain fluoride. Adolescent girls and women should increase calcium. Children, adolescents, women should increase consumption of iron-rich foods.

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National Academy of Sciences

One year after the release of the Surgeon General's Report, the Food and Nutrition Board of the National Research Council, National Academy of Sciences (1989) released Diet and Health, Implications for Reducing Chronic Disease. This 749-page Diet and Health review, affectionately referred to as the "nutrition telephone book" in Washington, DC, was the most comprehensive review of the nutrition and chronic disease literature (Matthews, 1990; McDean, 1990). The goal of the review was to develop a consensus on diet and disease relationships and to recommend dietary practices which would maintain optimal health and reduce the risk of chronic diseases (NAS, 1989; Matthews, 1990).

Diet and Health presented *quantitative* dietary guidance (see Table 25) and set forth specific food selection recommendations. The dietary recommendations were compatible with recommendations published by the American Heart Association (AHA, 1988) and the National Cancer Institute (Butram, 1988). Diet and Health recommended increasing intake of carbohydrates and fiber by selecting five or more servings of fruits and vegetables and six or more servings of whole grain cereal products. The review recommended reducing fat to no more than 30% of kilocalories by choosing low fat animal products and limiting consumption of fried foods, baked goods, and fat-containing dressings.

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Table 25.

DIET AND HEALTH
IMPLICATIONS FOR REDUCING CHRONIC DISEASE RISK

Food and Nutrition Board, National Research Council
National Academy of Sciences
1989

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a variety of foods
Weight Management	Maintain desirable body weight
Fat: (total)	Reduce to no more than 30% of calories
(saturated)	Reduce to less than 10% of calories
(polyunsaturated)	May consume up to 10% of calories
Cholesterol	Reduce to less than 300 mg daily
Complex carbohydrates	Increase to at least 55% of calories
Fiber	Increase fiber by choosing more than 5 servings fruits and vegetables, 6 servings whole grain cereals
Refined Sugars	Limit intake
Sodium	Reduce to less than 6 grams salt (1 teaspoon)
Alcohol	Limit to less than 1 ounce daily

**Also note: Maintain adequate calcium intake. Moderate protein intake.

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The review also recommended reducing sodium intake to six grams of salt (2400 - 3000 mg sodium) by reducing the use of salt in cooking and limiting the consumption of highly processed and salt-preserved foods.

Diet and Health also urged moderating intake of animal foods, reflecting the excessive intake of protein by many Americans (greater than 200% RDAs) and the association between high protein intakes and the increased risk for developing certain cancers, coronary heart disease, kidney disease, and osteoporosis. Americans were urged to maintain an adequate calcium intake to enhance bone formation, thus reducing the risk of developing osteoporosis and also preventing calcium-sensitive hypertension (NAS, 1989).

Diet and Health provided a comprehensive review of diet and chronic disease associations and made the first comprehensive *quantitative* dietary recommendations combined with food guidance recommendations. Shortly after the release of Diet and Health, the National Academy of Sciences also released the 10th edition of the RDAs (NRC, 1989) which supported many of the statements and recommendations for micronutrients in the Diet and Health review.

Nutrition and Your Health - Dietary Guidelines for Americans. Third Edition

The 1983 Dietary Guidelines Advisory Committee reviewing the 1980 Dietary Guidelines recommended that new

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advisory committees should be convened at five to 10 year intervals to revise the 1985 edition and subsequent revisions (Wolf, 1985). In 1989, USDA and DHHS appointed an advisory committee, chaired by Dr. Malden Nesheim, to evaluate the scientific recommendations included in the 1985 Dietary Guidelines (McDean, 1990; USDA / DHHS, 1990). This committee reviewed the Surgeon General's Report on Nutrition and Health (U.S. DHHS, 1988) and the NAS review, Diet and Health - Implications for Reducing Chronic Disease Risk (1989). Nutrition education researchers from the Human Nutrition Information Service, USDA, and Pennsylvania State University provided the statistical data and recommendations generated from research on the usability of the 1985 Dietary Guidelines as an educational tool (Peterkin, 1991; A. Shaw, personal communication, June 1, 1991; Sugarman, 1991b). The committee also solicited written comments from the general public on validity and usability issues (Peterkin, 1991; A. Shaw, personal communication, June 1, 1991).

The third edition of Nutrition and Your Health - Dietary Guidelines for Americans was released in 1990 (USDA / DHHS, 1990). The general recommendations and the graphic format remained similar to the 1985 edition (see Figures 22 and 23). However, the wording of each of the guidelines was changed significantly. Each guideline was presented as a *positive* statement. Guideline 3, "Choose a diet low in fat, saturated fat, and cholesterol," replaced the more negative

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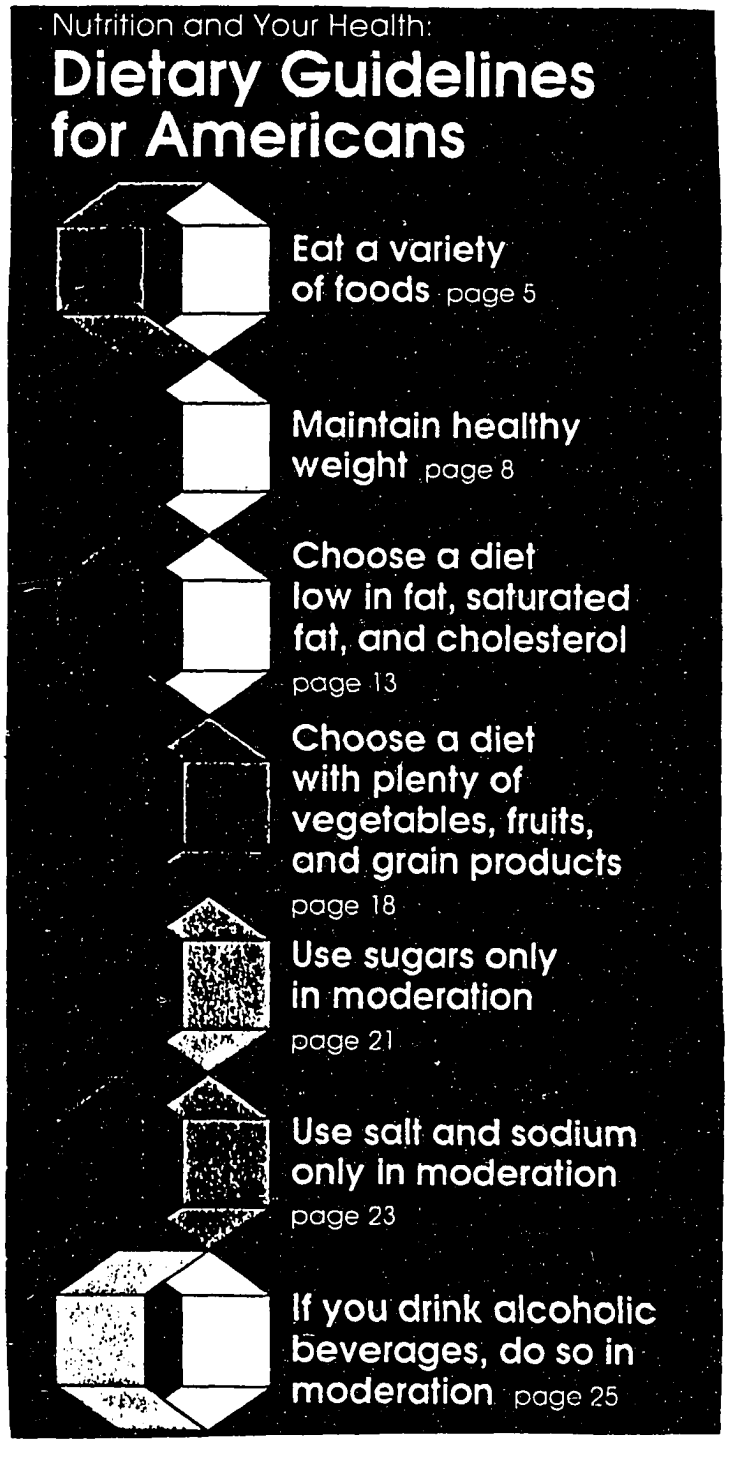
Figure 22



DIETARY GUIDELINES FOR AMERICANS - 1990

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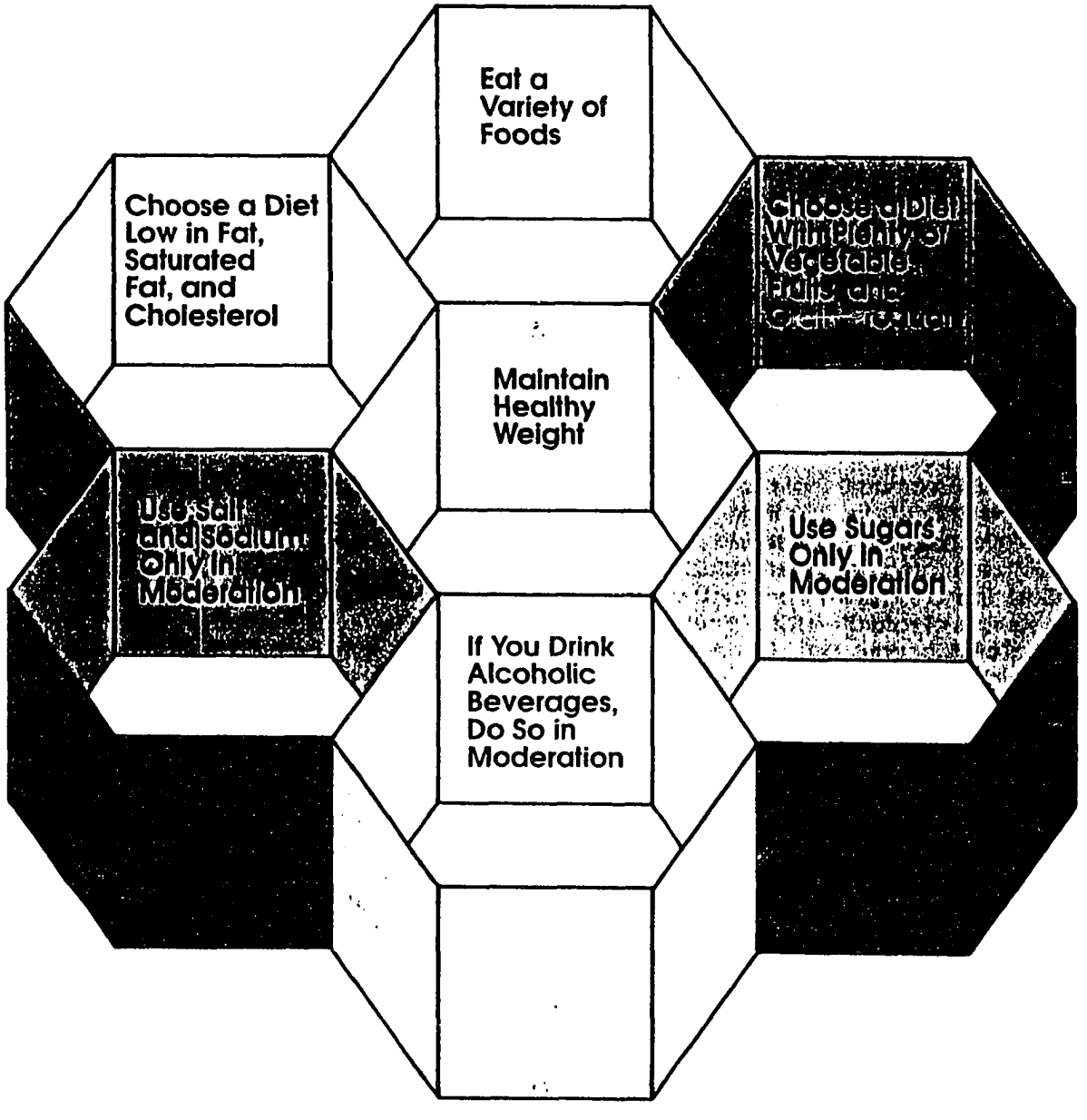
Figure 23



Use the seven guidelines together as you choose a healthful and enjoyable diet.

DIETARY GUIDELINES FOR AMERICANS - 1990

Getting the right balance.

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"Avoid too much fat, saturated fat, and cholesterol" from the 1980 and 1985 editions. Similar changes were made for Guideline 5, "Eat sugars in moderation" and Guideline 6, "Use salt and sodium only in moderation" (USDA / DHHS, 1990). Guideline 4, "Choose a diet with plenty of vegetables, fruits, and whole grain cereal products," replaced the 1980 and 1985 recommendations to "Eat more complex carbohydrates." Results of surveys and solicited comments indicated that Americans had a negative perception of "complex carbohydrates" and "starch" and did not know how to translate this dietary guideline into actual food choices (A. Shaw, personal communication, June 1, 1991). Vegetables, fruits, and whole grains provided complex carbohydrates and also dietary fiber, beta carotene, and other components linked to good nutritional health. The recommendations for increased servings of fruits, vegetables, and whole grains reflected the revised 1989 RDAs. Individuals could only achieve adequate intakes of the 18 specified vitamins and minerals only by choosing more servings of unprocessed plant foodstuffs.

The 1990 Dietary Guidelines also included text which introduced additional information on nutrition and food selection. Guideline 1, "Eat a variety of foods," included text which emphasized the importance of eating a variety of nutrient-dense, low fat foods, to assure an adequate intake of the essential nutrients. Consumer comments indicated a

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greater need for food selection recommendations (A. Gillespie, personal communication, May 16, 1991; A. Shaw, personal communication, June 1, 1991). Guideline 1, "Eat a Variety of Foods," included a five group food guide to help consumers select an appropriate diet.

Guideline 2 was revised to "Maintain a *healthy* weight." The 1989 NRC "Suggested Weights for Adults" published in Diet and Health (NAS, 1989) was used as a weight reference. However, "healthy weight" was defined as a waist to hip circumference ratio of less than 0.80 for women and 0.95 for men. Guideline 2 also defined a healthy weight loss as losing 0.5 to 1.0 pounds per week rather than the earlier recommendation for losing 2.0 pounds per week.

Guideline 7, "If you drink alcoholic beverages, do so in moderation," warned pregnant women and women trying to conceive *not* to drink. Guideline 7 also warned people planning to drive *not* to drink.

The 1990 Dietary Guidelines' statements themselves remained *directional*: "choose plenty..." or "choose a diet low in..." However, unlike the first two editions, the text accompanying the guidelines provided *quantitative* recommendations for percent of kilocalories from macronutrients, and the numbers of servings from individual food groups.

Nutrition and Your Health - Dietary Guidelines for Americans, Third edition, reflected growing consensus in the

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scientific community regarding the relationship between dietary patterns and risk of chronic diseases (U.S. DHHS, 1988; NAS, 1989). This 1990 edition of the Dietary Guidelines was a comprehensive dietary and nutrition guide developed for the average, healthy American (see Table 26).

Dietary Guidelines versus Food Guidance

The dietary goals and guidelines published between 1977 and 1989 were intended for use as reference materials for health professionals and educators, not by the general public (Cronin, 1988; Mathews, 1990; McDean, 1990). Several private health organizations, including the American Institute for Cancer Research, the American Heart Association, the American Dietetic Association, and the American Cancer Society distributed pamphlets, posters, and cookbooks translating specific guidelines into practical shopping and food preparation information (Mathews, 1990). The 1980 and 1985 editions of the Dietary Guidelines were distributed to the general population, but critics complained the dietary recommendations were too general to provide effective *food selection* guidance (A. Shaw, personal communication, June 1, 1991). USDA Nutritionist Francis Cronin advised:

> In order for dietary recommendations to be useful, they must be translated into terms consumers can understand and use. This means translating recommendations about food nutrients and food components into useful information about food choices (1988, p. 34).

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Table 26.

NUTRITION AND YOUR HEALTH
DIETARY GUIDELINES FOR AMERICANS

Home and Garden Bulletin 232, 3rd edition
USDA / DHHS
1990

NUTRIENT COMPONENT	RECOMMENDATION
Nutrient Adequacy	Eat a variety of foods
Weight Management	Maintain healthy weight. Set reasonable weight goals based on excess body fat.
Fat: (total)	Choose a diet low in fat
(saturated)	Choose a diet low in saturated fat
(polyunsaturated)	No recommendation
Cholesterol	Choose a diet low in animal fats
Complex carbohydrates	Choose a diet with plenty of vegetables, fruits, and whole grain products
Fiber	Eat a variety of foods that contain natural fiber
Refined Sugars	Use sugars only in moderation
Sodium	Use salt and sodium only in moderation
Alcohol	If you drink alcoholic beverages, do so in moderation

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Professional Food Guides

In 1981, three members of the Society for Nutrition Education accepted editor Helen Ullrich's 1971 challenge to develop an effective teaching tool to replace the Basic Four (Ullrich, 1971).

The "Peace Symbol" food guide.

Paul LaChance (1981) graphically presented the Basic Four as a circle divided into unequal sectors. The Fruits and Vegetables and the Grains and Cereals groups were emphasized by placing these two groups at the top of the circle, designating one third of the area of the circle to each of the two groups. The remaining two groups, Milk Products and Meats and Legumes, shared the remaining third at the bottom of the circle. LaChance's graphic focused attention on the plant foods and deemphasized the animal foods. However, the graphic was not adapted by any Federal or industry sponsor and was not used in nutrition education materials distributed to the public.

The Handy Five.

Janice Dodds (1981) developed the "Handy Five," a visual presentation of nutrient-dense foods. Her graphic was designed for use in developing countries or with persons unable to read general food guides. The five groups, "Flesh around seeds," "leaves and stalks," "seeds on grasses,"

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"seeds in pods," and "animal products," were pictured as digits on an outstretched hand (see Table 27). Dodds stated that the visual characteristics of foods, rather than abstract concepts of nutrient composition, should form the basis for classification of foods. The "Handy Five" Food Guide was used in Indonesia, Korea, Egypt, the Philippines, Kenya, and Indonesia. Dodd's "Handy Five" could not be used to classify the chips, rollups, trail mixes, and marshmallow -filled cereal boxes and frozen confections which dominate grocery shelves in the United States.

The Inverse Pyramid.

Jean Pennington, from the Division of Nutrition, Food and Drug Administration, suggested a food guide to replace the 1958 Basic Four Food Guide and the 1979 Hassle Free Food Guide (Pennington, 1981). Her guide used four food groups, collapsing Milk and Meat, Fish, and Poultry into a Protein group and retaining the Alcohol, Sweets, and Fat group as a Luxury group (see Table 28). Pennington used a pyramid, inverted with the wide base at the top and the apex at the bottom, to present her model. Leafy Vegetables, other Vegetables, Fruits, and Legumes and Grains were depicted in a broad band across the "top" or base of the inverted pyramid. Low fat Dairy and Meat products were presented in the adjacent, narrower band. Fatty Meats and Dairy products

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Table 27.

THE HANDY FIVE

Janice Dodds
Journal Nutrition Education
1981

Food Group	Portion/ Serving
Flesh around seeds (fruits)	2 servings
Leaves, stalk, roots, flowers (vegetables)	2 servings
Seeds on grasses (grains)	4 servings
Seeds in pods (legumes and nuts)	4 servings
Animal products	1 milk 3 ounces meat

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Table 28.

THE INVERSE PYRAMID

Jean Pennington

1981

Food Group	Portion/ Serving
Vegetable and fruits	6 or more daily At least 1 from leafy greens
Grains and grain products	6 or more daily At least 3 from whole grains
Protein foods	6 to 15 daily At least 2 from dairy foods and at least 4 from "others" ie. eggs, cheese, meat, fish, poultry, legumes, or peanut butter 1 serving = 1 ounce
Luxury foods	
Desserts	1 or less
Fats	4 or less
Sweets	4 or less
Alcohol	1 or less

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were assigned to a narrow band, illustrating the recommendation to consume those foods only in moderate portions. Luxury foods, including sweets, desserts, fats, and alcohol, were placed in the smallest portion at the "bottom" of the inverted pyramid, advising that these calorie-dense foods should be eaten in very "sparse" quantities. The "Inverse Pyramid" enabled Pennington to combine concepts of food selection and dietary guidance for health into one food guide graphic. Concepts from the Inverse Pyramid were incorporated into the NCI "Reducing the Risk" nutrition education program, the 1990 Australian National Food Guide, and a proposed USDA Food Pyramid (Pennington, 1981; A. Hertzler, personal communication, April 6, 1991; J. Pennington, personal communication, May 9, 1991).

USDA Food Guides

Ideas for Better Living.

In 1981, nutritionists at HNIS developed a booklet of recipes and menus to assist homemakers implement the 1980 Dietary Guidelines (USDA, 1981; F. Cronin, personal communication, May 17, 1991). Ideas for Better Living supplemented information included in the Dietary Guidelines for Americans pamphlet, then provided six days' worth of menus which complied with the 1980 Dietary Guidelines recommendations. Daily menus were calculated at 1600

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kilocalorie and 2400 kilocalorie levels to provide greater flexibility for the homemaker preparing meals for different family members with various energy requirements. Kilocalorie content of the menus was adjusted by altering serving sizes, avoiding high fat red meats, cheese, and whole milk products, or adding snacks to increase kilocalories when necessary. Recipes included in the pamphlet featured whole grains, vegetables, and fat-free legumes. The recipes were calculated to provide less than 33% of kilocalories from fat (F. Cronin, personal communication, May 17, 1991). Ideas for Better Living was reprinted in 1982, but distribution was canceled under pressure from the meat, egg, and dairy lobby groups (F. Cronin, personal communication, May 17, 1991; Sugarman, 1991b).

"Better Eating for Better Health."

In 1984, HNIS nutritionists used the menu planning strategy developed in Ideas for Better Living to develop a comprehensive food guidance system for the American Red Cross (USDA, 1985; Cronin, 1987). "Better Eating for Better Health" (ARC, 1984) was a comprehensive 6-week nutrition course developed to assist healthy Americans make food choices for good nutritional health. This food guidance system organized information to teach individuals how to select foods that met the objectives of nutrient adequacy,

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as elucidated in the 1979 Hassle Free Guide, and also moderation of food components related to risk of chronic disease, as recommended in the 1980 Dietary Guidelines (ARC, 1984; Cronin, 1987).

The framework of the food guidance system was a Food Wheel presenting six food groups (see Table 29). The groups were similar to the five identified in the 1979 Hassle Free Guide, but the Fruits and Vegetables group was separated into two groups. The number of servings recommended for each of the Food Wheel groups differed significantly from the Hassle Free Guide. The Food Wheel recommended 6 to 11 servings of Breads and Cereals (and also added pasta) instead of the four recommended by the Hassle Free Guide. The Food Wheel recommended five to nine servings of Fruits and Vegetables instead of the four recommended in the Hassle Free Guide.

The Food Wheel was designed to teach participants how to plan a *total* diet rather than a *foundation* plan of 1200 kilocalories developed for the Basic Four and the Hassle Free Guide. The emphasis on choosing plentiful servings of cereals and whole grain products, fruits, and vegetables was consistent with the 1980 Dietary Guidelines recommendations for eating less fat and more complex carbohydrates. The Food Wheel therefore *quantified* the *directional* recommendations in the Dietary Guidelines and translated those recommendations into a practical food guide.

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Table 29.

FOOD WHEEL. A PATTERN FOR DAILY FOOD CHOICES

Better Eating For Better Health
American National Red Cross and HNIS/USDA
1984

Food Group	Portion/ Serving
Milk, cheese, and yogurt	2 servings 3 servings for teens who are pregnant
Meat, poultry, fish, alternates	2 or 3 servings total: 5 to 7 ounces lean
Fruits	2 to 4 servings citrus, melon, berries, also other fruits
Vegetables	3 to 5 servings dark-green leafy, deep yellow, dry peas and beans starchy vegetables others
Bread, Cereal, and whole grains	6 to 11 servings
Fats, Sweets, Alcohol	Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation

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Companion materials, including "A Days Worth of Foods and Nutrients," provided additional information about each food group, nutrient contributions, and food serving sizes. Supplemental information on sodium, sugar, fatty acids, and the cholesterol content of foods was included with other course materials. The Food Wheel food guide, the "Days Worth of Foods and Nutrients," and the supplemental nutrient information comprised the complete food guidance system (USDA, 1985).

Nutritionists from USDA and staff members from the American Red Cross field tested the six-week nutrition course at several American Red Cross centers (F. Cronin, personal communication, May 17, 1991; A. Shaw, personal communication, June 1, 1991). The course was "found to be effective in helping course participants learn and apply concepts of variety, moderation, and balance to their own diets" (USDA, 1985, p. 2). However, because of administrative reorganization and changes in focus at the National Red Cross headquarters, the "Better Eating for Better Health" nutrition course was dropped from course offerings (F. Cronin, personal communication, May 17, 1991).

Dietary Guidelines and Your Diet.

The 1983 Dietary Guidelines Advisory Committee recommended that USDA develop a system of simple food groupings, consistent with the revised Dietary Guidelines,

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which could be used in nutrition education programs for the public (Wolf, 1985). In 1986, nutritionists at Human Nutrition Information Service published Dietary Guidelines and Your Diet, a series of seven information booklets designed to assist the average American implement the 1985 edition of the Dietary Guidelines for Americans (USDA, 1986).

These seven booklets incorporated many of the materials developed for the Red Cross "Better Eating for Better Health" course. The Food Wheel food guide was revised and presented in tabular format in Guideline 1 as "A Pattern for Daily Food Choices" (see Table 30). Each booklet presented a Guideline and provided detailed information on food selection, menu planning, adapting recipes, food shopping and preparation hints, and activities. This series provided comprehensive, quantitative food guidance for a total diet designed to meet micronutrient requirements from the 1980 RDAs while balancing the macronutrients (USDA, 1985; Cronin, 1987). Dietary Guidelines and Your Diet was distributed to nutrition educators and to the general public through the Consumer Information Service in Pueblo, Colorado.

Nutrition and Your Health - Dietary Guidelines for Americans.

The 1990 edition of the Dietary Guidelines for Americans included a food guide in Guideline 1 which was

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Table 30.

DIETARY GUIDELINES AND YOUR DIET
A PATTERN FOR DAILY FOOD CHOICES

Home and Garden Bulletin HG 232-1 through 232-7
United States Department of Agriculture
1986

Food Group	Portion/ Serving
Milk, cheese, and yogurt	2 servings 3 servings for teens 4 servings for teens who are pregnant
Meat, poultry, fish, alternates	2 or 3 servings total 5 to 7 ounces
Fruits	2 to 4 servings citrus, melon, berries other fruits
Vegetables	3 to 5 servings dark-green leafy, deep yellow, dry peas and beans starchy, others
Bread, Cereal, and whole grains	6 to 11 servings
Fats, Sweets, and Alcoholic beverages	Avoid too many fats and sweets. If you drink alcoholic beverages, do so in moderation

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similar in concept to the 1984 American Red Cross Food Wheel and the 1986 Pattern for Daily Food Choices (USDA / DHHS, 1990). "A Daily Food Guide" (see Table 31) listed five food groups, omitting the Fats, Sweets, and Alcoholic Beverages group in the 1984 and 1986 guides. Portion sizes and recommended numbers of servings were the same as those in the two earlier guides and were calculated to provide dietary guidance for a *total* diet.

The 1990 Dietary Guidelines combined a consensus of scientific opinion on dietary guidance to reduce the risk for chronic diseases and a five group food guide to assure nutrient adequacy. These 1990 Dietary Guidelines translated dietary recommendations from the 1985 Dietary Guidelines (USDA / DHHS, 1985), the 1988 Surgeon General's Nutrition and Health report (U. S. DHHS, 1988), the 1989 Diet and Health (NAS, 1989), and the 1989 RDAs (NRC, 1989) into practical information about food choices.

The "Eating Right Food Pyramid."

On April 13, 1991, the Washington Post announced HNIS plans to release a new food guide to replace the 1958 Food for Fitness mobile and the 1979 Hassle Free Guide (Gladwell, 1991a). The "Eating Right Food Pyramid" was developed as a simple graphic to illustrate the "Daily Food Guide" that appeared in the 1990 Dietary Guidelines. The Eating Right Food Pyramid was to form the centerpiece of USDA's

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Table 31.

NUTRITION AND YOUR HEALTH
DIETARY GUIDELINES FOR AMERICANS

Home and Garden Bulletin 232, 3rd edition
USDA / DHHS
1990

Food Group	Portion/ Serving
Milk, cheese, and yogurt	2 servings 3 servings for teens 4 servings for teens who are pregnant
Meat, poultry, fish, alternates	2 or 3 servings Total 5 to 7 ounces
Fruits	2 to 4 servings citrus, melon, berries other fruits
Vegetables	3 to 5 servings dark-green leafy, deep yellow, dry peas and beans starchy, others
Bread, Cereal, and whole grains	6 to 11 servings

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proposed "Eating Right" campaign, a nutrition education program developed to assist consumers implement the 1990 Dietary Guidelines (Gladwell, 1991a).

The "Eating Right Food Pyramid" used the same five food groups, serving sizes, and quantities as recommended in "A Daily Food Guide" (see Table 32 and Figure 24). The Food Pyramid also depicted a sixth group, Fats, Oils, and Sweets, which was similar to the sixth group in the Red Cross Food Wheel and the 1986 USDA Dietary Guidelines and Your Diet pamphlets except that Alcohol was deleted from the sixth group in the Food Pyramid.

The Food Pyramid was designed to provide food guidance for a total diet (A. Shaw, personal communication, June 1, 1991). Grains and Cereals were placed at the broad base of the pyramid, with Fruits and Vegetables placed on the next level. Low fat Animal and protein foods and Dairy products shared a narrow band near the top. Fats, Oils, and Sweets were placed at the peak of the pyramid to emphasize that most Americans' diets were too high in fats, oils, and sweets. Accompanying text provided strategies for choosing low fat foods and controlling sugar intake.

The proposed "Eating Right Food Pyramid" generated a storm of controversy (Puzo, 1991; Snider, 1991; Sugarman, 1991a; 1991b). Two weeks after the Washington Post announced the release of the Food Pyramid, USDA announced that it had abandoned plans to "turn the symbol of good

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Table 32.

EATING RIGHT FOOD PYRAMID

United States Department of Agriculture
1991

Food Group	Portion/ Serving
Milk, cheese, and yogurt	2 to 3 servings
Meat, poultry, fish, alternates (dry beans and nuts	2 or 3 servings total 5 to 7 ounces
Fruits	2 to 4 servings citrus, melon, berries other fruits
Vegetables	3 to 5 servings dark-green leafy deep yellow dry peas and beans starchy others
Bread, Cereal, Rice and Pastas	6 to 11 servings
Fats, Sweets,and Oils	Use sparingly

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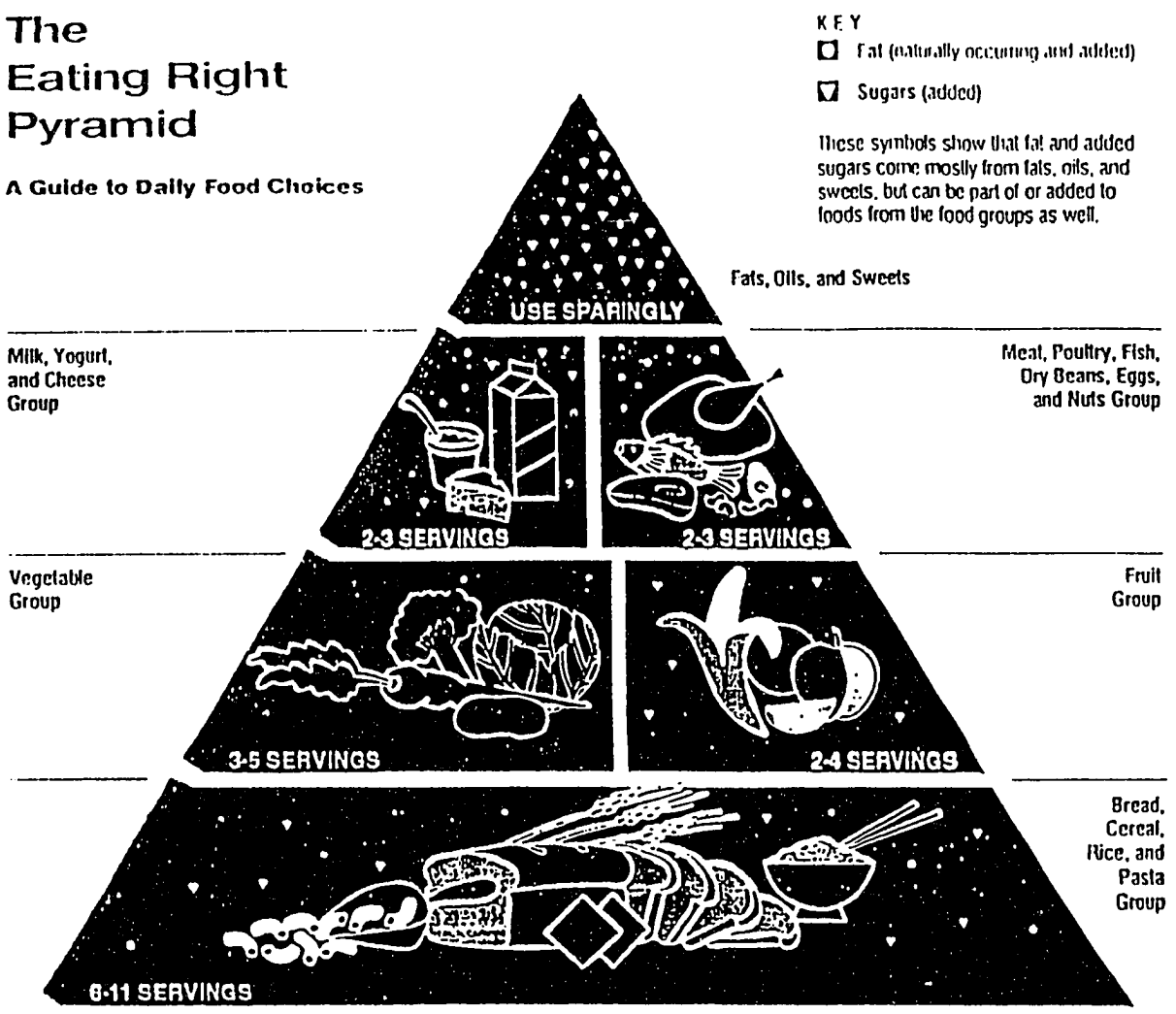
Figure 24



EATING RIGHT FOOD PYRAMID

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eating from the Basic Four to an 'Eating Right Food Pyramid' that sought to deemphasize the place of meat and dairy products in a healthful diet" (Sugarman, 1991a, p. 1).

Representatives of the dairy and meat industries met with the new Secretary of Agriculture Edward Madigan during April, complaining that the "Eating Right Food Pyramid" was misleading and stigmatized their commodity products. The industry groups said they were unhappy not just with the suggestion that portions of meat and dairy products should be relatively small, but that their place in the Food Pyramid was next to that of Fats, Oils, and Sweets, the least healthful foods. Jeannine Kenney, a lobbyist with the National Milk Producers Federation, said her group's concerns were one of the reasons the (Food Pyramid) proposal was pulled: "We're not happy with the way we look" (Sugarman, 1991a, p. 1).

The National Cattlemen's Association complained to Sue Ann Ritchko at USDA's Human Nutrition Information Service:

> "We wanted to be sure that consumers did not misinterpret the Pyramid to be a ranking of food," said Gary Wilson, director of research and food policy for the Cattlemen's group. "We wanted to avoid a good-food, bad-food ranking and the de-emphasis of meats" (Burros, 1991, p. 16).

Alisa Harrison, also from the Cattlemen's Association, felt consumers would interpret the Food Pyramid to mean "they should drastically cut down on meat consumption" (Sugarman, 1991a, p. 1). Relative to the consumption of

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breads, grains, vegetables, and fruits, that would have been an accurate, and healthful, interpretation.

Nutritionists at HNIS stated that the information base used for the Food Pyramid had been developed, validated, and published in USDA pamphlets since 1981 (USDA, 1981; ARC, 1984; USDA, 1986; Cronin, 1987; USDA / DHHS, 1990; A. Shaw, personal communication, June 1, 1991). The research demonstrating reliability and usability with consumers had been published in 1987 (Cronin) and 1988 (Carlson). The Food Pyramid graphic, developed by the Porter Novelli public relations firm, underwent extensive consumer research and peer review throughout 1989 and 1990 (A. Shaw, personal communication, June 1, 1991; Sugarman, 1991b).

Nutrition educators welcomed the proposed Food Pyramid. Joan Gussow from Columbia University and Marion Nestle from New York City University provided interviews with the New York Times and the Washington Post in support of the proposed nutrition education tool (Burros, 1991; J. Gussow, personal communication, May 7, 1991; Sugarman, 1991b). Consumer activists, including Bonnie Liebman from Citizens for Science in the Public Interest and Ellen Haas from Public Voice for Food and Health Policy also praised the Food Pyramid (Burros, 1991; Sugarman, 1991a). The American Dietetic Association, American Cancer Society, and Society for Nutrition Education wrote to USDA Secretary Madigan, urging him to release the new "Eating Right Food Pyramid"

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(Snider, 1991).

The release of the proposed Eating Right Food Pyramid was placed on hold in June, 1991, pending usability research with children and low income consumers, two groups Secretary Madigan was reportedly interested in reaching. The food guidance information presented graphically as a pyramid continued to be distributed in tabular format in the 1986 Nutrition and Your Health - Dietary Guidelines and Your Diet booklets and the 1990 Nutrition and Your Health - Dietary Guidelines for Americans pamphlet during this review process (F. Cronin, personal communication, May 17, 1991; Sugarman, 1991b).

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Chapter 12

Summary, Analysis, and Recommendations

Dietary Standards

Summary and Analysis

During the past 155 years, knowledge of food and its functions in the body has been deliberately applied to the prevention of disease and the promotion of general health (Hertzler, 1974; Haughton, 1987; Cronin, 1988). The Merchant Seamans's Act was enacted to prevent the nutrient deficiency disease, scurvy (McCollum, 1957). Subsequent 19th century dietary standards were developed to prevent starvation among various unemployed population subgroups throughout Europe (Leitch, 1942; Harper, 1985).

Early 20th century dietary standards were used primarily to calculate rations to feed armies and the workers supporting the war effort (Leitch, 1942; Harper, 1985). The political and economic imperative to maintain a healthy army for national defense stimulated further nutrition research and agricultural expansion.

Dietary standards proposed in the United States during the 1930s evolved from the twin objectives of subsidizing agriculture and feeding large segments of the population unable to purchase sufficient food for an adequate diet

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(Stiebeling, 1933; Federal Security Agency, 1942).

Discoveries in food science and nutrient requirements during the 1920s and 1930s and the looming crisis of World War II led to the development of the 1941 Recommended Dietary Allowances. Since 1941, these RDAs have been reviewed and revised to reflect scientific advances in nutrient requirements and dietary essentials. The history of food guides parallels the scientific developments in food science, nutrient requirements, and dietary standards.

Food Guidance

A Summary

Translation of these dietary standards into simple, reliable, and valid food groupings to assist individuals select an adequate diet commenced almost 75 years ago (Hertzler, 1974; Haughton, 1987; Cronin, 1988). The USDA (first through the Bureau of Home Economics, then through the War Food Administration, and later the Human Nutrition and Information Service) has assumed the lead role in the development of food guides (Hill, 1970; Broad, 1979a). The evolution and revision of these food guides reflected the expanding scientific knowledge of food composition, human nutritional needs, and the relationship of diet to health and disease etiology (Stiebeling, 1957; Haughton, 1987).

The history of food guidance also elucidates other assumptions, both stated and implicit, which have influenced

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the development and subsequent modification of the various national food guides (Haughton, 1987). Political events and orientations as well as economic crises have impacted on the evolution of food guidance in the United States.

Analysis of Assumptions Underlying the Development of Food Guides in the United States

Nutrient needs of the population.

Each food guide developed in the United States was based on currently available dietary standards, nutrient requirements, and food composition. The first five-group food guide used energy (kilocalories) and protein as dietary standards (Hunt, 1916; Langworthy, 1916a). This guide reflected data from the innovative calorimetry techniques and respiration studies then available. Other food components were not fully identified and were only vaguely referred to as "body-regulating substances." These speculative substances did not merit special consideration in a valid food guide (Langworthy, 1918).

As the "mineral ashes" and "vitamines" were identified, the 1920s food guide revisions placed increasing emphasis on foods rich in the "protective substances" (Hunt, 1921; 1923; 1928; Hertzler, 1974). In 1928, the final revision of the five group food guide urged Americans to choose liberally from the Milk, Leafy Green Vegetable and Vitamin C-rich Fruit food groups (Hunt, 1928).

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By the mid 1930s, all the major vitamins (except B_{12}) had been discovered. Stiebeling's 1933 12-group food guide provided explicit evidence of the goal of food guides to assure micronutrient adequacy rather than recommendations for just kilocalories and protein (Stiebeling, 1933a; USDA, 1939).

The release of the 1941 Recommended Dietary Allowances provided a quantitative dietary standard for nutritionists to use to construct a reliable and valid food guide. (Roberts, 1958; Harper, 1985; Haughton, 1987). Although not stated explicitly, the 1940s food guides likely were based on these first RDAs for calcium, iron, niacin, thiamin, riboflavin, Vitamin A, Vitamin C, and protein (Hertzler, 1974; Haughton, 1987). The dietary recommendations released with the 1943 and 1946 Basic 7 food guides (Leafy Green and Yellow Vegetables, Oranges and Tomatoes, Potatoes and other Fruits and Vegetables, Milk, Meat, Cereals and Whole Grain Cereals, and Butter) urged consumers to choose "enriched" grain products and "fortified" margarine, which further substantiated the impact of the 1941 RDAs on development of the Basic 7. Energy recommendations were absent in the 1940s food guides even though the 1941 RDAs included kilocalorie allowances of 2500 to 3000 kcal for the moderately active adult.

The Basic Four Food Group guide, Food for Fitness, was based on the explicitly stated goal to assure micronutrient

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adequacy, adopting the 1953 RDAs as a yardstick for nutrient adequacy (Page & Phipard, 1956; Hertzler, 1974; Haughton, 1987). The Basic Four was constructed to provide between 80% and 100% of the seven essential micronutrients (Vitamins A and C; niacin; thiamin; riboflavin; minerals calcium and iron) and protein. Nutritionists assumed individuals would select additional foods from the four food groups to assure an adequate intake of micronutrients and supplement the intake of kilocalories (Page & Phipard, 1956).

During the 1970s and 1980s, diseases associated with over-consumption emerged as new dietary directives for food guidance. The 1979 Hassle Free Guide directed attention to the potential risks of excess dietary fats, sweets, and alcohol, but the guide did not provide quantitative meal planning recommendations for "avoiding excesses" of fats and soduim (Davis, 1979; A. Gillespie, personal communication, May 16, 1991). A plethora of dietary guidelines was issued between 1977 and 1990, emphasizing the health risks associated with various food excesses and advising changes in the macronutrient content of the diet (Cronin, 1988; Matthews, 1990; McDean, 1990). The third edition of the Dietary Guidelines for Americans used *directional* recommendations for macronutrient intake and also included a *quantitative* food pattern for a healthful diet, reflecting the 1989 revised RDAs for protein and kilocalories and the requirements for 11 additional micronutrients (USDA / DHHS,

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1990). Despite consensus on diet and health risk issues and the release of the 1989 edition of the RDAs (U. S. DHHS, 1988; NAS, 1989), the USDA has not issued an independent food guide to replace the 1979 Hassle Free Guide.

Economic underpinnings in the development of food guides.

In 1916, Langworthy and Hunt assumed that all Americans could afford a nutritionally adequate diet (Hertzler, 1974; Haughton, 1987). By 1921, Hunt recognized variations in food budgets between families, and therefore urged homemakers to compare the costs of specific food items within each of the five food groups and to choose the most economical in terms of absolute cost and nutrient density. Vegetables and fruits did not contribute significant energy value or protein to the diet, and therefore were not considered a good nutrient value (Hunt, 1921; 1923; 1928).

The threat of food shortages became a concern as the United States entered World War I (Sherman, 1919). In the revised five group food guides released during the 1920s, Hunt urged homemakers to grow vegetables in backyard gardens to supplement foods available in local groceries (Hunt, 1921; 1928). Langworthy urged homemakers to purchase locally grown produce to reduce food distribution costs and possible food spoilage, even when local selections resulted in reduced menu variety (Langworthy, 1918). Langworthy and

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Sherman advocated Federal subsidies to stimulate agricultural expansion which would ultimately reduce future food shortages (Sherman, 1919).

The economic depression during the 1930s drastically affected the ability of many Americans to purchase sufficient food to satisfy hunger (Stiebeling, 1939; Federal Security Agency, 1942; Schlossberg, 1978). Americans affected by unemployment and low wages could not afford a nutritionally adequate diet. USDA nutritionists responded to these financial constraints by developing a 12 group food guide, calculated at four cost levels (Stiebeling, 1933b).

Each of the four food plans promoted agricultural products which were readily available in the marketplace. The 12 group food guide promoted a ready market for growing agricultural surpluses. The 12 group food guide assured nutrient adequacy only at the upper three cost levels. Unlike the food guides of the 1920s, the 1933 food guide defined nutrient density in terms of vitamins and minerals, not merely kilocalories. A menu rich in vitamins and minerals was more costly than an energy-dense menu because of the higher cost of perishable fruits, vegetables, and fresh meats (Stiebeling, 1933a; 1933b; USDA, 1939).

The USDA nutritionists did not expect the average consumer to plan menus using the 12 group food guides. The guides and the accompanying menus were developed for nutritionists to use in evaluating food consumption survey

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data from unemployed or low income population groups. The low cost food plan was used to plan farm surplus and commodity distribution allocations to families unable to purchase an adequate diet (Federal Security Agency, 1942).

Food guides developed between 1941 through 1943 reflected the effects of food rationing rather than economic depression. All consumers, regardless of income, were urged to supplement rationed purchases and support wartime conservation efforts by growing more of their own food products (War Food Administration, 1945; Hertzler, 1974; Schlossberg, 1978).

Economic constraints were not significant factors in food guides developed after the end of World War II. By the early 1950s, both the Harvard nutrition group and USDA nutritionists noted a generalized public affluence and an abundance of foodstuffs in the marketplace. The Harvard group urged increasing use of the more expensive animal products, noting the widespread abundance of fresh meat in the marketplace and consumer preference for the generous use of meat in daily menus (Hayes, 1955). The 1958 Food for Fitness guide promoted the use of the more expensive animal foods by collapsing three of the Basic 7 plant food groups into a single Fruit/Vegetable group and eliminating the Fats group (Page & Phipard, 1956). The resulting Basic Four (Meats, Dairy, Fruits/Vegetables, and Grains/Cereals) therefore implied that the more expensive Meats and Dairy

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should comprise two-fourths of the daily food allowances.

Despite the discovery in the 1960s that many Americans could not afford an nutritionally adequate diet, the USDA did not revise the 1958 Food for Fitness food guide to reflect the large pockets of undernutrition in this country. Food stamps, school lunches, and commodity distribution programs were established for the economically disadvantaged. The Federal government assumed that the remaining sectors of the population could afford an adequate diet, generous in animal products, and that the Basic Four should remain the model for a foundation diet.

Political underpinnings and influences in food guidance.

National defense and welfare crises impacted on the impetus for development of food guides between 1920 and 1946. Political concerns surrounding the skyrocketing health care costs led to the development of dietary guidelines during the 1970s and 1980s. Political pressures from various lobbyists and special interest groups have influenced the content and emphasis of food guides developed in the United States.

Atwater published dietary recommendations and food guidance as early as 1894. Few urban Americans read the USDA Farmers Bulletins, however, and Atwater's advice to choose more whole grain foods, fewer fatty meats, and less

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sugar was not widely publicized. With a working budget of $10,000 per year, Atwater chose to spend USDA monies on further research on mineral ashes rather than mass distribution of nutrition information and food composition publications (Atwater, 1910). The science of nutrition was still in its infancy. More research on micronutrients was necessary before offering valid general dietary recommendations to the public.

By the turn of the century, urban Americans were purchasing and eating more commercially prepared and processed foods. In The Jungle, Upton Sinclair described the filth and rodent parts found in meat packing factories, and widespread adulteration of processed foods in Chicago (Means, 1962). The USDA did not release a food guide promoting animal products until Federal programs corrected the problems of sanitation and food safety and public outrage subsided. The Wiley Act of 1906 (the Pure Food and Drug Act) established a Federal inspection and regulation program to assure the purity and safety of processed foods, drinks, and drugs. The Federal Meat Inspection Act of 1906 established grading and inspection standards for fresh meats and poultry. Implementation of these Federal programs and scheduled inspections of meat packing plants eventually restored consumer confidence in meats and other processed foods (Todhunter, 1957; U. S. DHHS, 1988).

The USDA released its first food guide in 1916, when

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public sentiment was focused on child health and welfare issues (Hunt, 1916; Means, 1962). The dairy industry was seeking Federal assistance at that time in an attempt to recover from several deficit years. The Food for Young Children guide promoted good nutrition for American children and included liberal portions of milk and other dairy products. Release of the 1916 food guide placated child health activists and pleased dairy lobbyists. With a national food guide promoting the liberal use of dairy products, the U. S. Congress felt pressured to include dairy subsidies in the 1924 Farm Bill (Means, 1962; Public Voice, 1985).

The 1921 Food for an Average Family food guide reflected Federal concerns to promote the health of citizens of all age groups as an essential component of national security (Hertzler, 1974; Haughton, 1987). Sherman (1919) and McCollum (1936) urged food conservation during the postwar recovery period to preserve the food resource base and as a possible benefit to health. However, Federal policy promoted expansion of the agricultural base. The food guides of the 1920s encouraged consumption rather than conservation of food resources (Haughton, 1987).

Federal policies stimulating agricultural expansion throughout the 1920s led to growing farm surpluses by the early 1930s. With agricultural surpluses building and unemployed Americans starving, the farm economy fell into a

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state of disaster (Schlossberg, 1978). Federal policy initiatives first bailed out the bankrupt farmers by purchasing agriculture products at higher than market prices. These policies focused on feeding the hungry and unemployed only after substantial stockpiles of food rotted and thousands of Americans succumbed to deficiency diseases and starvation (USDA, 1939; Federal Security Agency, 1942). Stiebeling's 12 group food guide served as a framework for the distribution of agricultural surpluses and commodities, thereby supporting the farmers and providing social welfare services and nutrition services to disadvantaged Americans (Federal Security Agency, 1942).

World War II once again focused national attention on the health status of young males and the constraints which deficiency diseases and malnutrition placed on national security (Federal Security Agency, 1942). During 1941 and 1942, new food guides were developed to reduce the incidence of deficiency diseases and improve the general health status of all Americans (Hertzler, 1974). The USDA launched a national nutrition education campaign to promote good nutrition for all Americans. This was the most ambitious and comprehensive general nutrition education program the Federal government had ever initiated (War Food Administration, 1943; Hertzler, 1974; Schlossberg, 1978). Earlier food guides had been printed as Farmers' Bulletins or Home Extension materials but had never been widely

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distributed to consumers.

The major Federal nutrition education policy implemented during the 1940s has had a major impact on the development and revision (or lack of revision) of food guides during the subsequent 50 years. Throughout the "U. S. Needs Us Strong" War Food and Nutrition program, the Federal government solicited technical and financial assistance from food industry groups to promote the production and consumption of nutritious foods (Office of Defense and Health Services, 1942; Food Distribution Administration, 1943). Food industry and commodity groups responded with overwhelming enthusiasm. Advertising budgets promulgated Federally-specified nutrition messages. Not only did food companies promote their products, but the government endorsed the health value of these product as long as the foods could be identified as belonging to one of the Basic 7 food groups (Schlossberg, 1978; Trese, 1991).

The dairy industry took the lead in nutrition education programming. Their 1941 Food Guide highlighted dairy products in three out of seven food groups (National Dairy Council, 1941). After a compromise between the Dairy industry and the FDA over Vitamin A fortification of vegetable fats and oils, the Dairy Council produced and distributed nutrition education posters and pamphlets throughout the United States. The Dairy Council also developed nutrition education materials featuring dairy

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products for use in home economics classes. These materials were provided free, and Dairy Council nutritionists offered inservice training sessions for teachers to use the materials (A. Gillespie, personal communication, May 17, 1991).

The Cereal Institute and Bakers' Union supported the 1941 enrichment program and used this "public service" to promote their products. Breakfast cereal manufacturers promoted their products as part of a good breakfast (The Philadelphia Enquirer, 1943). Because their primary market competition was bacon and eggs, enhancing and advertising the nutritive value of less expensive cereal products augmented sales (Gussow, 1981).

After the war and food rationing ended, the Cattlemen Association and Meat Boards implemented a series of advertising campaigns promoting their products as an essential part of a balanced diet (Stiebeling, 1959). Consumers who had been deprived of steaks throughout the war years responded enthusiastically to the advertising campaigns, confident of the nutritive value of their menu choices.

The World War II policy initiative to promote good nutrition by soliciting the financial assistance of food processing and commodity groups expanded into the 1950s. Nutrition advertising was economically beneficial for food industry and commodity groups, and the Federal government

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was content that private enterprises were willing and financially able to assume the task of educating the public. The dairy industry was particularly active in the development of inexpensive nutrition education materials designed for use in elementary school classrooms (Public Voice, 1985).

As industry groups assumed a more proactive role in food and nutrition advertising, they exerted more influence in developing food guidelines. This influence became evident during the development of the Basic Four Food For Fitness Guide (Hill, 1970). Considerable controversy arose concerning who should receive credit for developing the four-group food guide concept (Hill, 1970; Hertzler, 1974; Haughton, 1987; Hertzler, personal communication, April 7, 1991). The Harvard group, led by Dr. Frederick Stare, claimed credit for the four food group proposal, but stated their concepts had been stolen during a peer review process prior to the publication of their article in the Journal of the American Dietetic Association. USDA claimed their nutritionists had been working on the Basic 7 revision prior to the Harvard initiatives. *Who developed* the four group model is relatively inconsequential. The Basic Four survived and *thrives today* because each food group corresponds to one of the four major food lobbyists in Washington D.C. (Dairy Council; the Cattlemen's Association and the National Livestock Board; the United Fruit and

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Vegetable Growers and Sunkist Growers; and the Cereal Institute, Baker's Union, and Rice Council) (Gussow, 1981; 1986b).

The food industries were again encouraged to "sell" nutrition messages during the 1969 White House Conference on Food, Nutrition, and Health. The resulting 1970 "Nutrition Awareness" campaign messages promoted the Basic Four as the nutrition standard (Ullrich, 1972). The Basic Four will survive as long as food industries are encouraged to "sell" food using their own interpretation of food guidance and dietary standards.

USDA attempted to replace the Basic Four in 1979, but canceled the Hassle Free Guide because the guide's low fat message angered the dairy and meat industries (F. Cronin, personal communication, May 16, 1991; Sugarman, 1991b). In 1989, 10 years after the demise of the Hassle Free Guide, the Dairy and Food Nutrition Council released the "Guide to Good Eating" (see Figure 25), a five-group food guide depicting Dairy in the primary position on the guide. The Basic Four (or Five) has served entrepreneurial perspectives of the food processing and commodities industries (Gussow, 1986b).

The politics of agriculture, the food industry, health and welfare, and nutrition education have spun a web of dependencies and interdependencies in the development of food guidance. These underpinnings were driven by economics

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Figure 25

GUIDE TO GOOD EATING

Every day eat a wide variety of foods from the Four Food Groups in moderation.

Milk Group
Supplies many nutrients including
- calcium
- protein
- riboflavin

2 servings for adults
3 servings for children
4 servings for teenagers and pregnant or breastfeeding women

Meat Group
Supplies many nutrients including
- protein
- iron
- niacin
- thiamin

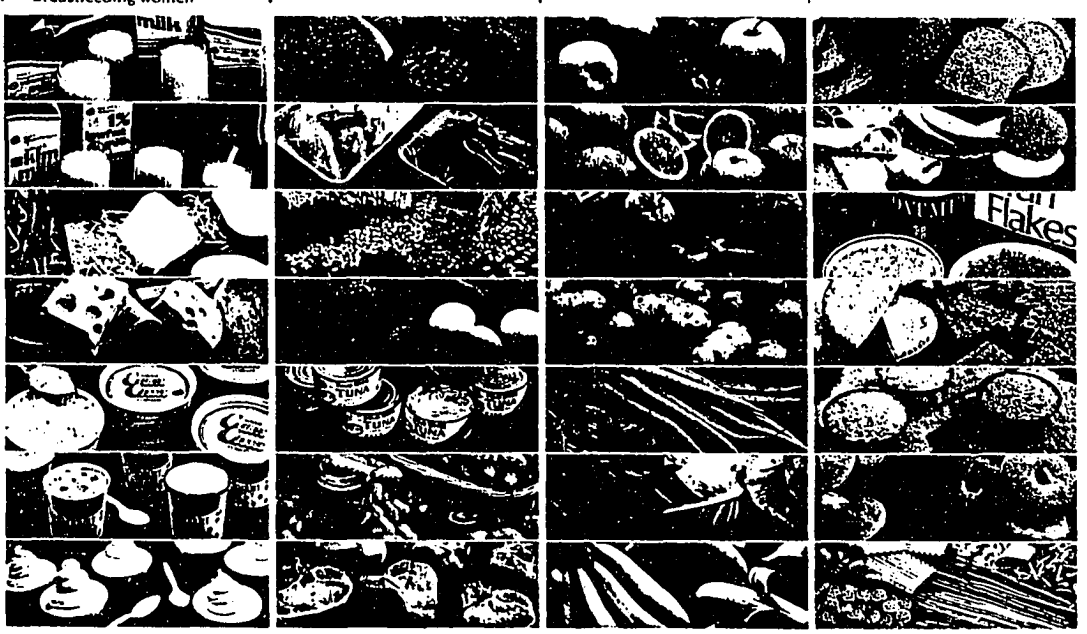
2 servings for all ages
3 servings for pregnant women

Fruit-Vegetable Group
Supplies many nutrients including
- vitamin A
- vitamin C

4 servings for all ages

Grain Group
Supplies many nutrients including
- carbohydrate
- iron
- thiamin
- niacin

4 servings for all ages



Combination Foods

Category
Foods in the "Others" category are often high in calories and/or low in nutrients. They don't take the place of foods from the Four Food Groups in supplying nutrients

Condiments	Chips and Related Products	Fats and Oils	Sweets	Alcohol	Other Beverages
Barbeque sauce	Corn chips	Coffee whitener	Brownies, cookies	Beer	Coffee, tea
Catsup, mustard	Popcorn	Cream, sour cream	Cakes, pies	Gin, vodka	Fruit-flavored drinks
Olives, pickles	Potato chips	Gravy, cream sauce	Candy	Whiskey, rum	Soft drinks
Salt	Pretzels	Margarine, butter	Jelly, jam	Wine	
Soy sauce	Tortilla chips	Mayonnaise	Sugar, honey, syrup		
		Oil, lard, shortening	Sweet rolls, doughnuts		
		Salad dressing			

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GUIDE TO GOOD EATING

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and tempered by personal autonomy and the desire by many consumers to make food selections on the basis of taste, tradition, culture, and personal preference, as well as the nutritive value and health benefits of food components. In 1977, Federal legislation designated the USDA as the lead agency in the development of food guidance (Broad, 1979a; Schlossberg, 1979), and until that designation is superseded, the USDA must balance political influences and economics with the overriding urgency for developing a valid and reliable food guide based on nutrient needs and clearly stated nutrition education goals and objectives.

Food Guidance: A Status Report

The United States currently does not have an official food guide to use as a foundation for a national nutrition or food policy (Mayer, 1972; Ostenso, 1988; Cronin, personal communication, May 17, 1991; Gussow, personal communication, May 7, 1991). The Dietary Guidelines for Americans has been offered as the nutrition policy standard, but the Guidelines are not a nutrient-based food guide. USDA officials canceled publication of the Hassle Free Guide, responding to the irate Dairy and Cattlemen's lobby. The Dairy and Food Council continues to promote the Basic Four (or five) and cereal companies promote lavender-colored marshmallow confections as a breakfast "cereal" which is part of a good breakfast (Gussow, 1981). Since the cancellation of the

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Hassle Free Guide, nutritionists at USDA have struggled with various political interest groups, food producer and commodity lobbies, and other Federal agencies, to develop a reliable and valid food guide. Secretary of Agriculture Madigan temporarily withdrew the release of the proposed Eating Right Food Pyramid, succumbing to the vagaries of political pressures. The Meat and Dairy lobbyists were concerned with their public image. They were also concerned with the economic impact resulting food and nutrition policies based on nutrient needs and health concerns rather than on personal or industry financial interests.

Political Players Influencing Food Guidance

Federal agency versus Federal agency in food guidance policy.

In a June, 1991, Washington Post news article covering the withdrawal or "postponement" of the release of the Eating Right Food Pyramid, columnist Carole Sugarman (1991b) questioned whether the USDA can "cater to cows and consumers," implying that conflicting loyalties make the Department of Agriculture an inappropriate agency to conduct the nation's nutrition education programs. Agriculture Secretary Madigan publicly pledged to support agricultural interests, including the 1991 Farm Bill with its Dairy subsidies (Gladwell, 1991a). If the late Senator Hubert Humphrey erred in his support of the USDA becoming lead

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agency in nutrition education policy development, then the question arises, who should be responsible for developing food guides and educating the public?

There are currently too many fingers in the Federal nutrition policy development pie. In 1977, the USDA was designated lead agency in nutrition education. However, an exception to this designation was made with respect to biomedical aspects of human nutrition concerned with the diagnosis and treatment of disease (Broad, 1979a; Ostenso, 1988). The National Institutes of Health, specifically the National Cancer Institute and the National Cholesterol Education Program of the National Heart, Lungs, and Blood Institute, interpreted this designated exception to the 1977 Agriculture Bill as giving *it* the authority to develop nutrition education programs.

During the 1977 Agriculture Bill debates, the Department of Health, Education, and Welfare submitted the following statement in support of *its* claim to funding for nutrition education:

> Human nutrition policy must be fundamentally directed toward the promotion of health. In order to achieve this objective, nutrition policy must reflect the health needs of consumers and patients, not the market needs of producers (Ostenso, 1988, p. 913).

No one in Congress disputed this objective. The Public Health Service within the DHEW (now the Department of Health and Human Services) therefore claimed authority for nutrition education for the purpose of health promotion.

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The final quasi-independent Federal agency claiming authority to develop nutrition guides has been the Food and Nutrition Board of the National Research Council, National Academy of Sciences. This agency has researched nutrient requirements and issued nutrient recommendations (the RDAs) for the past half century. The FNB released Diet and Health in 1989 (NAS, 1989).

If there are too many fingers in the Federal nutrition guidance, education, and policy development pie, there are likewise too many Federal agencies attempting to deliver nutrition services, regulate food production and safety, and to monitor and evaluate nutrition programs. USDA is authorized to recommend food guidance, but the Food and Drug Administration (FDA) is authorized to develop "Standards of Identity" which define product contents. These standards determine the fat content of milk, cheese, and ice cream products, the sugar content of jams and jellies, and the proportion of meat to fat and vegetables in canned "meat stews" products. If a USDA food guide recommended eating low fat cheese, food processors could not develop a low fat "cheese" and call it "cheese" because of FDA standards (these products are currently referred to as "cheese foods" or "dairy spreads," terms many consumers view as nutritionally inferior to the "real" product (Ostenso, 1988).

The FDA is also responsible for regulating nutrition

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labeling on most processed food products. USDA food guides might recommend choosing "low fat" microwave dinners, but because the FDA does not define "low fat," individual food manufacturers assume the responsibility for assigning definitions and determining serving sizes. The term "low fat" is therefore rendered meaningless as individual food manufacturers use the term haphazardly merely to influence consumer choice at the supermarket. The Federal Trade Commission (FTC) regulates advertising and promotion. Often FDA prohibits the use of health claims on a package label but the FTC does not prevent such claims in television and radio advertising. In April, 1991, newly appointed FDA Commissioner David Kessler began enforcing the FDA regulation which prohibits a manufacturer from making a health claim for one ingredient in a product when another ingredient in the same product is unhealthful (Gladwell, 1991b; Puzo, 1991). Kessler told Fleishmann's margarine (owned by R.J.R Nabisco, the tobacco company) that it could not label its product "cholesterol free," a claim which implies that Fleishmann's margarine fights heart disease, when, in fact, the margarine is all fat (and predominately saturated fat) and therefore a major risk factor for heart disease. Fleishmann's continued to make such claims in national advertisements because FTC did not prohibit such claims.

The USDA inspects meat, poultry, milk, and eggs for

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wholesomeness. The FDA inspects processed foods. The Commerce Department inspects fish and shellfish (Ostenso, 1988). This myriad of overlapping and ineffectively organized Federal food and nutrition activities precludes the development of a comprehensive national food guide and nutrition policy.

Food lobbies in nutrition education.

Food industry and commodity lobbying groups have kept the Basic Four Food Group model alive for almost 40 years. These lobbies have had a major impact on Congressional legislation, including Agriculture Bills (dairy subsidies) and Child Nutrition Bills (School Lunch), which in turn direct nutrition research and policies (Ostenso, 1988).

The influence of food lobbies has expanded as tobacco companies have diversified, gobbling up food subsidiaries. Philip Morris makes Marlboro cigarettes. Philip Morris also owns Post Cereals, Kraft (and Kraft subsidiaries Cheez Whiz, Light N' Lively, and Velveeta), Breyer's ice cream, Sealtest, Bird's Eye frozen foods, and Miracle Whip. R. J. Reynolds made Winston and Camels. R. J. R. Nabisco now owns Nabisco, Planter's Peanuts, Nabisco cereals, Blue Bonnet margarines, and Fleishmann's margarine and Egg Beaters (Schmidt & Jones, 1990). The power and influence of the tobacco companies have endured a quarter-century Public Health Service campaign to promote a tobacco-free America.

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Without a valid food guide and national nutrition policy, these powerful lobbies will continue to influence dietary regulations and food guidance recommendations.

A recent survey of this author's library demonstrated the influence that food processors and commodity groups have on nutrition professionals. These groups fund nutrition research and publish educational materials, many of which promote their own products. This library shelf held the following newsletters: (a) Food and Nutrition News (National Livestock and Meat Board); (b) Dairy Council Digest (Dairy Council); (c) Oat Fiber Factor (Quaker Oats and Company); (d) Nutrition Close Up (Egg Nutrition Council); (e) Sports Science Exchange (Gatorade, from parent company Quaker Oats); (f) Dietetic Currents (Ross Laboratories, makers of Similac baby formula), (g) Contemporary Nutrition (General Mills), and (h) Nutrition Counselor (Nabisco). Except for Food and Nutrition News, which cost six dollars, all newsletters were distributed at no charge. Nabisco also provided nutrition educators with 25-count bundles of the 1990 Nutrition and Your Health: Dietary Guidelines for Americans pamphlets. The last page listed an array of Nabisco crackers and cookies. The display implied that Nabisco products met the Dietary Guidelines recommendations. (Fortunately, Nabisco did not picture Oreos or Chips Ahoy with their advertisement).

Food manufacturers have influenced Congress through

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organized lobbying efforts and influenced some health professionals through distribution of nutrition education materials. Food manufacturers have influenced consumer purchases and knowledge of nutrition through food labels (or absence of food labels in 50% of processed foods) and advertising (Levy, 1991).

The 1974 Nutrition Labeling Act prohibited explicit disease-related labeling. In 1984, a Battle Creek cereal company labeled its bran cereal with a message implying that eating that high fiber food could reduce the incidence of cancer. The FDA objected to the disease-related claim. The cereal company quoted studies released by the National Cancer Institute to validate its nutrition and health claim, thus positioning itself between two agencies within the Department of Health and Human Services (Ostenso, 1988). This initial challenge to FDA regulations opened a Pandora's box which spewed forth a multitude of misleading, if not spurious, nutrition and health claims which appeared on food labels during the next six years. Cholesterol-free cheese foods do not reduce the risk of cardiovascular disease (a low fat diet does); beta-carotene fortified sports beverages do not reduce the risk of some cancers (eating foods naturally high in fiber does), calcium-fortified diet cola does not reduce the risk of osteoporosis (eating calcium-rich foods in combination with Vitamin D, fluoride, and weight-bearing activity does). These misleading statements

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were written to increase food sales, not disseminate nutrition and health information (Gussow, 1981). In April, 1991, FDA Commissioner Kessler began enforcing the 17 year-old disease-related labeling regulations. Food and commodity groups should not determine the health benefits of their own food products. The food guide and resulting food policy should establish health-benefits criteria. The food companies must disclose the ingredients and the nutrient content of all products. This disclosure will enable the consumer to make an informed choice (Gladwell, 1991b).

The 1990 Nutrition Labeling and Education Act (PL 101-535) required that "almost all food products carry nutrition information, pursuant to regulations, including format specification, being developed by the FDA" (Levy, 1991, p. 2). The FDA has solicited input from various scientific groups to develop a revised nutrition label by 1993. Food manufacturers and commodity groups are also submitting label criteria. A national food guide, not a committee of lobbyists, should direct the development of this label.

The food guide should also define a serving size. Currently, food companies determine serving sizes and portions for their own products. If a dessert food subsidiary wants to minimize the number of calories in a cheesecake, she can define a serving as 1/16 of the whole cheesecake (even though the average individual cuts the pie into 6, rather than 16, slices). If a cheese food

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subsidiary wants to maximize the calcium content of its cheese slices, it can define a serving as one ounce (even when a one ounce portion is 1 2/3 slices of the cheese. Who eats the other 1/3 slice?) The food guide recommends the number of servings of a food required to meet nutrient allowances (as defined by the RDAs). That recommendation is based on a defined serving size, and it is *that* serving size which should appear on nutrition labels.

Food manufacturers defined classes of foods to promote their products. Food manufacturers have defined raisins as fruits, flavored sugar-water with added beta carotene as vegetable juice (Gladwell, 1991b), almonds as meat, and granola (with more calories from saturated coconut oil than from grains) has been called a whole grain cereal (Ostenso, 1988). The food guide must establish the standard for which processed, formulated, and fabricated products can be designated as food products.

Food manufacturers and lobbyists should not set standards for foods, food labels, food guides or define nutrition policy. They should comply with food and nutrition standards and food and nutrition policy as defined in a national food guide.

Recommendations

Who Should Develop a National Food Guide?

The development of a food guide is an evolutionary

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process which should emanate from a firm foundation of scientific research and terminate in a practical, food-specific teaching tool. This process has been influenced and sometimes undermined by political interests groups, food processors, and food commodity lobbyists. These political and self-interest underpinnings have overshadowed the importance of scientific developments in the field of nutrition and health and therefore have eroded the effectiveness of the food guide as a tool for teaching nutrition and affecting nutrition and food policies.

Nutritionists must transgress the political controversies which currently confound development of food and nutrition policies, the practice of dietary guidance, and nutrition education. Food guides should evolve from a scientific foundation rather than from political compromise. Nutritionists, not congressmen, food companies, lobbyists, Cabinet members, or agency department heads, must develop the food guide. Nutritionists are qualified to use scientific principles to establish nutrition and food guidance models and recommend policies which can then integrate the goals of education, agriculture, economics, and health.

Strategic Planning in Development of a Model Food Guide

The food guide is a model for food guidance, and should reflect current knowledge of nutrition, health, and food

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composition. The food guide itself should form the backbone of more comprehensive food guidance systems which then can be adjusted and adapted to meet the educational needs of various subgroups within the general population. A food guide based on a set of valid scientific assumptions, developed to include measurable goals and objectives, should then be used to *direct* national food and nutrition policies rather than *reflect* agriculture and food industry interests.

Nutrient Adequacy and Dietary Excesses

The Basic 7 and the Basic Four food guides were developed to assure nutrient adequacy and thus eliminate nutrient deficiency diseases. The goals and guidelines suggested between 1977 through 1989 focused on macronutrient components while assuming micronutrient adequacy as long as "variety," "moderation," and "balance" were used in menu planning. A valid food guide should provide guidance for choosing foods which will assure adequate intake of all known micronutrients (using the most recent RDAs as a yardstick for adequacy). The guide should also provide guidance for balancing macronutrients and other dietary constituents consistent with current health concerns (using the Surgeon General's Nutrition and Health and the NAS Diet and Health to determine valid dietary risks). This duel objective will necessitate a periodic revue (every five to ten years) of nutrient requirements and health risk

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relationships, and require subsequent food guide revisions to reflect advancement in the scientific knowledge of nutrition and food composition.

Total Diet Versus Foundation Diet

A food guide should provide direction for a *total* diet rather than a *foundation* diet. The first food guides stressed the total diet concept, not just for a single day's intake but for an entire week of menus. The use of these comprehensive menu guides was abandoned during the food shortages of the war years. Later food guides assumed individuals would select "more of a good thing" when left to their own discretion as long as basic nutrition information was presented. Food consumption studies, menu analyses, and health statistics demonstrated that individuals who selected "more" food did not choose more of the "good," or recommended, foods. A foundation diet approach is only appropriate during emergency food shortages or when economic conditions are so limiting that purchasing adequate food is of more immediate importance than purchasing a nutritionally adequate diet. Food guides should be developed with an objective to provide dietary guidance for a total diet.

"Food" Rather Than "Nutrient" Focus

The first food guide told homemakers *what* foods to feed their children to assure health and normal growth. Guides

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issued during the next decade provided more expansive nutrition information, elucidating *why* each nutrient and food was important for good health. Nutritionists assumed that providing individuals with sufficient information concerning nutrient needs would be sufficient motivation for those persons to select a balanced diet. Studies demonstrated that individuals do not select foods on the basis of nutrient content, but will select a specific food when recommended (Light, 1981; Shaw, personal communication, June 1, 1991). A food guide should be a basic tool, specifying which foods should be eaten to meet nutrient requirements. Establishing a goal to provide specific examples of nutrient-dense foods would also overcome the faults of the various dietary guidelines developed during the 1980s which focused on the "do not eat" foods and food components.

Food guidance systems developed to implement the food guide should provide the supplemental information on nutrients, food composition, menu planning, and rationale for eating particular foodstuffs.

Directional versus Quantitative Food Guidance.

The directional statements "eat more of" or "eat less of" are ineffective and unmeasurable concepts in general nutrition education guidance. A food guide should specify quantitative recommendations, such as "eat 11 servings of

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breads, cereals, and pasta" or "eat three to five servings of vegetables." A food guide could also provide a quantitative comparison, such as "eat twice as much rice as broccoli" or "eat four times as much rice-vegetable mixture as lean beef strips." Quantitative guidance can be measured and therefore evaluated.

Variety, Moderation, and Balance.

Nutritionists have cautiously avoided labeling any single food as "bad" or unhealthful to avoid angering food producers and agriculture lobbyists (USDA canceled the 1979 Hassle Free Guide because Meats and Dairy products were labeled "high fat" foods). Food guides have suggested that *every* food could be included in a nutritious and adequate diet as long as that food was consumed only in "moderation," along with a "variety" of other foods, and "balanced" by enough other healthful foods to provide a nutritional potpourri. However, the terms "variety," "moderation," and "balance" are such relative concepts in dietary guidance that they should be used only individual nutrition counseling (when a food diary id available for analysis) or in menu planning (for example, offer a *"variety"* of colors and textures on the menu, use highly seasoned foods or very bland foods only in *"moderation"* throughout the menus, and *"balance"* the number of labor intensive foods with convenience or commercially prepared foods).

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Reflect Current Food Supplies Versus Influence Future Food Supplies.

A food guide should direct product development and agricultural production rather than merely mirror current food surpluses. The food guides of the 1930s and 1940s were developed to promote consumption of abundant or surplus agricultural products, especially dairy products (school lunch and the Penny milk programs). As food manufacturers responded to Federal requests to develop nutrition education materials, food advertising agencies produced "nutrition" advertisements which created demand for products already developed. The USDA was content with this arrangement. However, until 1958, there was no Federal watchdog to evaluate the validity of these nutrition messages which appeared on food labels, information pamphlets, or advertising copy. Furthermore, the FDA was reluctant to enforce the ban on spurious claims until 1991 (Gladwell, 1991b).

A food guide should *direct* food product development and agriculture production, rather than reduce current food stockpiles. The food guide should serve as the standard for product development. If the Eating Right Food Pyramid (or text from the Dietary Guidelines) is adopted as the next U.S. food guide, manufacturers would be directed to develop more pastas with low fat vegetable sauces, microwave dinners featuring rice as the entree, sandwiches with less meat

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filling and a side serving of salad rather than potato chips, and whole grain cereals rather than the "natural" high fat granolas currently promoted as "healthful choices." Similarly, the Food Pyramid food guide would grant agriculture subsidies to those dairy farmers raising Holsteins (high milk producers) rather than farmers raising Jerseys and Guernseys (high butterfat but low volume producers) (Public Voice, 1985). The Food Pyramid guide would direct farmers to grow more wheat (for bread, pasta, and cereals) than corn (used for animal feed). The Pyramid would direct farmers to grow rapeseed (for Canola oil) by raising import taxes on Canadian rapeseed or Malaysian tropical oils. The Food Pyramid food guide would direct the FDA to establish lower fat Standards of Identity for milk, cream, ice cream, and other dairy products. If the food guide identified "low fat milk" as the desirable food choice, the FDA would establish a new standard for homogenized milk as 3% butterfat instead of the current 3.5%-4%, and Congress would lift the agriculture subsidy for "rich milk."

Conclusions and Recommendations

Cows, Consumers, and Conflicts of Interest.

Perhaps former Senator Humphrey acted with exasperation and haste when designating the USDA as lead agency in nutrition education. The Department of Agriculture must

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serve the interests of its farming constituency. During the past 30 years, USDA has demonstrated that it serves the agricultural sector before serving the general population. An independent food and nutrition agency which serves the entire American population must be created to develop and implement food guides and food and nutrition policy. Staff that independent agency with nutritionists who respond to valid scientific evidence rather than Elsie the Cow. Nutritionists and nutrition scientists can then develop a valid, reliable food guide without compromising to food and commodity interest groups or a multitude of fractionated Federal agencies.

Recommendations: Food Guide Model Directives

1. Establish an independent Federal food and nutrition agency to develop a national food guide and comprehensive food and nutrition policy. Staff that agency with nutritionists, nutrition scientists, and complementary health and science professionals.
2. Develop a national food guide based on nutrient adequacy, a total diet, and practical food selections, using quantitative descriptors.
3. Develop comprehensive food guidance systems to facilitate implementation of the food guide.
4. Submit the food guide to tests of validity,

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reliability, and consumer usability. Evaluate and revise the food guide at regular intervals (every 5 to 10 years).

5. Use the national food guide as the cornerstone of a national food and nutrition policy which will then direct agriculture production and food product development.
6. Empower the newly created agency to conduct nutrition research (in the areas of nutrient requirements as well as diet and health relationships), develop education materials (for consumers as well as food assistance recipients), assess the nutritional status of the population, regulate all related nutrition education and food safety activities (including food labeling, advertising, and food inspections), deliver nutrition services (including school lunch, food stamp, WIC, and Older Americans feeding programs), and monitor and evaluate all aspects of nutrition and food policy.
7. Use the newly created food and nutrition agency and the validated, reliable food guide to *direct,* rather than *reflect*, a comprehensive nutrition policy in the United States.

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APPENDIX A

CHRONOLOGY OF EVENTS IN NUTRITION SCIENCE

1747	Lind proved that citrus fruits cure scurvy in first controlled human dietary experiments
1753	Lind published Treatise on Scurvy
1835	British Parliament passed the Merchant Seaman's Act mandating lemons in the rations of commercial shipping
1838	Mulder introduced the term "protein"
1895	Atwater introduced the first chemical composition of foods reference tables
1912	Funk coined the term "vitamine"
1916	McCollum and Davis discovered "fat soluble A"
1916	McCollum and Davis, Osborne and Mendel discover "water soluble B"
1921-1923	Pilot study adding iodine to drinking water prevents goiter
1922	McCollum discovered Vitamin D
1929	Water soluble B was identified as including several separate essential vitamins
1937	Szent-Gyorgyi and Haworth were awarded a Nobel prize for elucidating the structures of ascorbic acid
1941	Publications of the first Recommended Dietary Allowances (RDAs) by the Food and Nutrition Board, National Research Council, National Academy of Sciences
1942	First widescale "enrichment" of bread and flour by the Federal government

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APPENDIX A

CHRONOLOGY OF EVENTS IN NUTRITION SCIENCE (continued)

1945	Grand Rapids Michigan becomes the first city to fluoridate its drinking water to prevent tooth decay
1948	Crystalline Vitamin B_{12} discovered
1949	Framingham Study of coronary heart disease risk begins

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APPENDIX B

FEDERAL DIETARY RECOMMENDATIONS FOR THE GENERAL PUBLIC

		RECOMMENDATIONS						
Agency	Publication	Variety	Maintain body weight	Include Starch and Fiber	Limit sugar	Limit fat	Limit sodium	Limit alcohol
USDA 1916	Food for Young Children	+ 5 food groups		+	**	**		
USDA 1917	What the Body Needs- Five Food Groups	+ 5 food groups		+	**	**		
USDA 1921	A Weeks Worth of Food for an Average Family	+ 5 food groups		+	**	**		
USDA 1933	Diets at Four Levels of Nutritive Content	+ 12 food groups		+	**	**		
FNB, NRC 1941	Recommended Dietary Allowances	+ 7 food groups		+	**	**		
USDA 1942	US Needs us Strong	+ 8 food groups		+	**	**		
USDA 1943	National Wartime Nutrition Guide	+ 7 food groups		+	**	**		
USDA 1946	National Food Guide Basic 7 Food Groups	+ 7 food groups		+	**	**		
USDA 1958	Food for Fitness Basic Four Food Groups	+ 4 food groups		+				

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FEDERAL DIETARY RECOMMENDATIONS (continued)

Agency	Publication	Variety	Maintain body weight	Include Starch and Fiber	Limit sugar	Limit fat	Limit sodium	Limit alcohol
U.S. Senate 1977	Dietary Goals for the United States		+	+	+	+	+	+
USDA 1979	The Hassle Free Guide to Better Eating	+ 5 food groups	+	+		+		
DHEW 1979	Surgeon General's Report on Health Promotin, Disease Prevention	+	+	+	+	+	+	
USDA DHEW 1980	Dietary Guidelines for Americans	+	+	+	+	+	+	+
USDA DHHS 1985	Dietary Guidelines for Americans	+	+	+	+	+	+	+
DHHS 1988	Surgeon General's Report on Nutrition and Health	+	+	+	+	+	+	+
NAS 1989	Diet and Health	+	+	+	+	+	+	+
USDA DHHS 1990	Dietary Guidelines for Americans	+	+	+	+	+	+	+

** Early food guides recommended <u>increasing</u> fats and sugars as inexpensive energy sources.

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APPENDIX C

NUTRIENT BASIS FOR FOOD GUIDES

FOOD GUIDE	NUTRIENTS				
	Vitamins	Minerals	Fat	Protein	Calories
"Food for an entire Family" 1921, 1923, 1928	"Protective foods"	"Ashe" - Calcium, iron, iodine	40% calories	----	3000 - 3500
"Basic 7" 1943, 1946	Vitamins A & C, niacin, thiamin, riboflavin	Calcium, iron	----	60-70 gm	2500 - 3000
"Basic Four" 1958	Vitamins A & C, niacin, thiamin, riboflavin	Calcium, iron	----	60-75 gm	1250
Hassle-Free Guide: 1979	Vitamins A, C, D, E niacin, thiamin, riboflavin, B6, B12, folate	Calcium, iron, phosphorus, zinc, magnesium, iodine	Reduce	44-56 gm	----
Dietary Guidelines and your Diet: 1986 Red Cross Food Wheel: 1987	Vitamins A, C, D, E niacin, thiamin, riboflavin, B6, B12, folate	Calcium, iron, phosphorus, zinc, magnesium, iodine	27-35% calories	44-56 gm	1600 - 2400
Dietary Guidelines for Americans: 1990	Vitamins A, C, D, E niacin, thiamin, riboflavin, B6, B12, folate, Vitamin K	Calcium, iron, phosphorus, zinc, magnesium, iodine, selenium	30% calories	50-63 gm	1800 - 2400

APPENDIX D

FEDERAL NUTRITION POLICY INITIATIVES

1862	U. S. Department of Agriculture established
1862	Morrill Act established Land Grant Universities
1887	Hatch Act established agriculture experiment stations
1888	Wilbur Atwater became the first Director of the Agriculture Research Station at Stoors, Connecticut
1894	Agriculture Act authorized USDA to conduct nutrition studies on humans
1894	Atwater published Food - Nutritive Value and Cost
1895	Atwater published Methods and Results of Investigations on the Chemistry and Economy of Foods, the first published table of food composition
1906	Pure Food and Drug Act passed to assure wholesomeness of food. Federal Meat Inspection Act passed
1914	Cooperative Extension Service created as a part of USDA
1916	USDA published Food for Young Children, the first food guide
1917	USDA published Good Proportions in the Diet - Five Food Groups, food guide for the entire family
1921	USDA published A Week's Food for an Average Family
1924	Iodine added to salt to prevent goiter is the first food fortification program

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FEDERAL NUTRITION POLICY INITIATIVES (continued)

1930	Federal Emergency Relief Administration authorized to purchase surplus agricultural commodities
1933	Agriculture Act amendments permitted distribution of surplus agricultural products to school lunch programs
1935	Food distribution program established
1939	Federal Surplus Commodities Corporation authorized experimental Food Stamp Program
1941	President Roosevelt convened the National Nutrition Conference, Food and Nutrition Board announced the first Recommended Dietary Allowances FDA established standards for the enrichment of flour and bread with iron and B Vitamins
1946	National School Lunch Program established
1958	Delaney Clause passed which prohibits use of carcinogenic additives. GRAS list established.
1958	"Food for Fitness" - Basic Four Food Group guide released
1965	Food Stamp Act passed
1966	Child Nutrition Act authorized pilot child breakfast program. President Johnson declared "War on Hunger"
1968	U. S. Senate Select Committee on Nutrition and Human Needs established

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FEDERAL NUTRITION POLICY INITIATIVES (continued)

1969	President Nixon convenes White House Conference on Food, Nutrition, and Health
1972	USDA established Special Supplemental Food Program for Women, Infants, and Children (WIC) and Older American Act established congregate meals program for older Americans
1977	U.S. Senate Select Committee released Dietary Goals for the United States
1979	DHEW released Surgeon General's Report on Health Promotion and Disease Prevention
1980	USDA and DHEW released Nutrition and Your Health - Dietary Guidelines for Americans
1985	USDA and DHHS released Nutrition and Your Health - Dietary Guidelines for Americans, second edition
1988	DHHS released The Surgeon General's Report on Nutrition and Health
1989	National Research Council released 10th edition of the RDAs
1989	National Academy of Sciences released Diet and Health
1990	USDA and DHHS released Nutrition and Your Health - Dietary Guidelines for Americans

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APPENDIX E

CHRONOLOGY OF DIETARY GUIDES IN THE UNITED STATES

1916 USDA	Food For Young Children
1917 USDA	Good Proportions in the Diet
1921 USDA	A Week's Worth of Food for an Average Family
1933 USDA	Diets at Four Levels of Nutritive Content and Expense
1941 NRC	Recommended Dietary Allowances
1941 USDA	Eat the Right Foods to Keep You Fit
1941 National Dairy Council	A Guide to Good Eating
1942 Defence Health and Welfare Service	U. S. Needs us Strong - Eat Nutritional Foods
1943 War Food Administration	National Wartime Nutrition Guide - Eat the Basic 7 Every Day
1946 USDA	National Food Guide - The Basic 7 Food Groups
1958 USDA	Food for Fitness - A Daily Food Guide
1968 AHA	General Dietary Recommendations - Diet and Coronary Heart Disease
1977 U. S. Senate	Dietary Goals for the United States
1978 AHA	General Dietary Recommendations - Diet and Coronary Heart Disease

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CHRONOLOGY OF DIETARY GUIDES (continued)

1979 AMA	Concepts of Nutrition and Health
1979 USDA	The Hassle Free Guide to Better Eating
1979 DHEW	Healthy People - Surgeon General's Report on Health Promotion and Disease Prevention
1980 NAS	Toward Healthful Diets
1980 USDA/DHEW	Nutrition and Your Health - Dietary Guidelines for Americans
1982 NAS	Diet, Nutrition, and Cancer
1984 American Red Cross/ USDA	Better Eating for Better Health
1985 USDA / DHHS	Nutrition and Your Health - Dietary Guidelines for Americans, 2nd edition
1985 USDA	Dietary Guidelines and Your Diet
1988 NCI, NIH, DHHS	NCI Dietary Guidelines
1988 AHA	Dietary Guidelines for Healthy Americans
1988 DHHS	The Surgeon General's Report on Nutrition and Health
1989 NAS	Diet and Health. Implications for Reducing Chronic Disease Risk
1990 DHHS	National Cholesterol Education Program, report of the Expert Panel on Population Strategies
1990 USDA / DHHS	Nutrition and Your Health - Dietary Guidelines for Americans, 3rd edition

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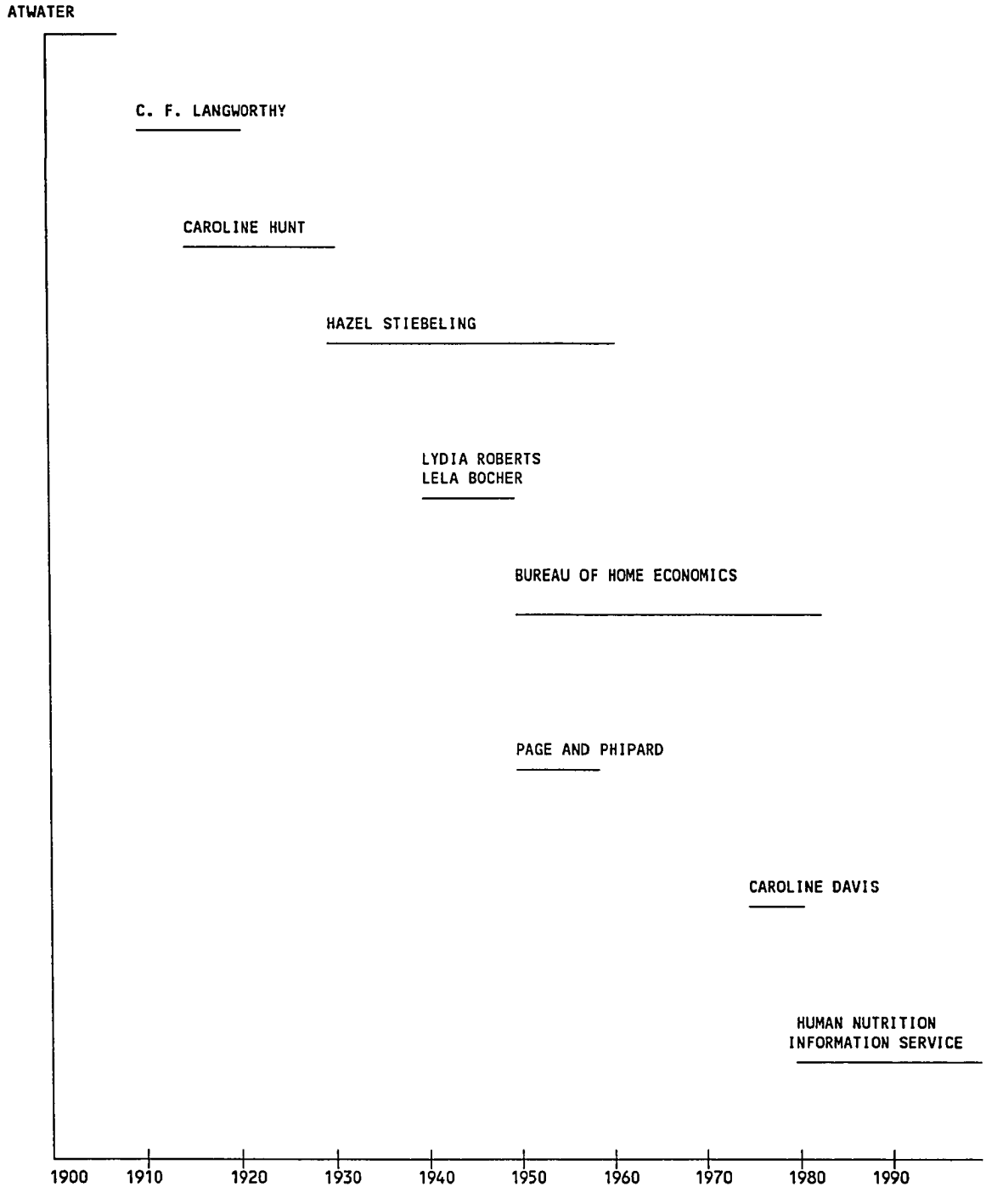
APPENDIX F

KEY PERSONS IN THE EVOLUTION OF U.S. FOOD GUIDES



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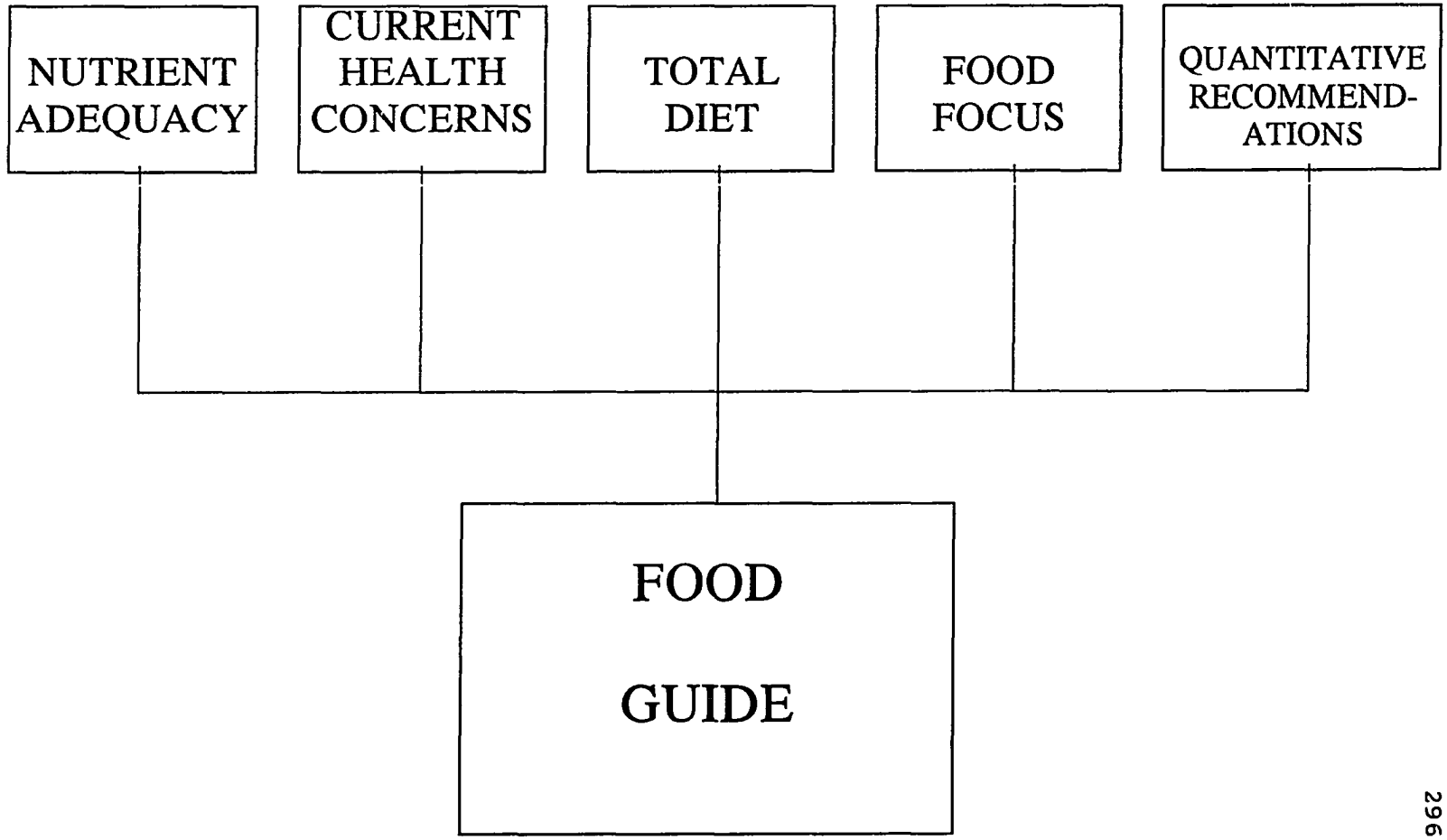
APPENDIX G

FOOD GUIDE MODEL DEVELOPMENT



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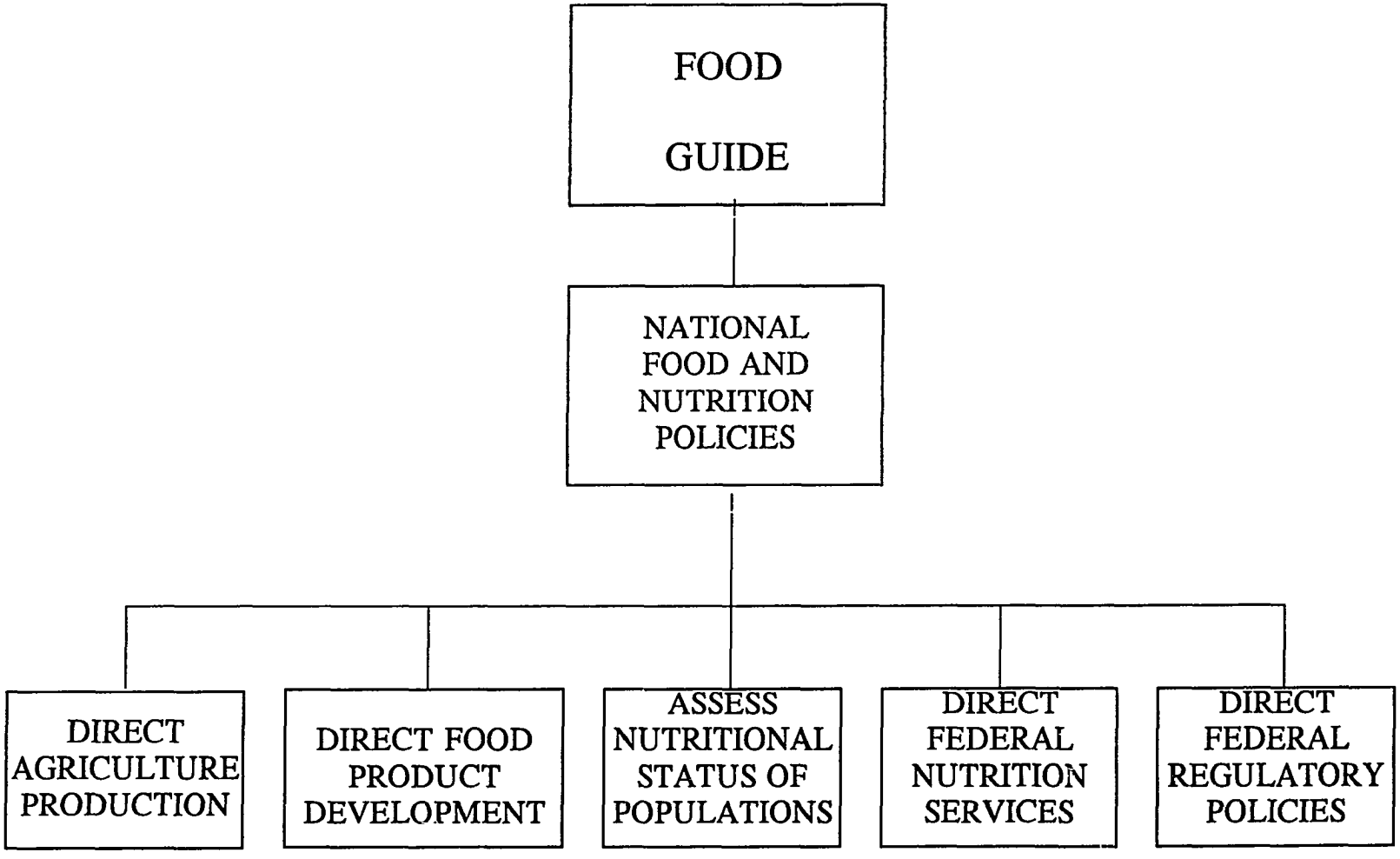
APPENDIX H

FOOD GUIDE MODEL DIRECTIVES



Autobiographical Statement

Barbara B Carlson was born in Amherst, Ohio, on May 15, 1947. Carlson graduated from Ohio State University with a B.S. Degree in Medical Dietetics in June, 1969 and from Virginia Polytechnic Institute and State University with a M.S. in Nutrition in May, 1988.

Carlson is a Registered Dietitian and has worked as a clinical dietitian at Ohio State University Hospitals in Columbus, Ohio, and at Lake Taylor City Hospital in Norfolk, Virginia. Carlson currently teaches nutrition education, cardiac rehabilitation, pulmonary rehabilitation, and weight management classes for a Lifestyle Fitness Center, a wellness program associated with Chesapeake General Hospital, Chesapeake, Virginia. She has held three Research Assistant positions at Old Dominion University since 1988: the first with the Center for Gerontology, the second with the Clinical Practice Center, and currently with Commonhealth, the employee wellness program.

Carlson was inducted into Phi Kappa Phi Honor Society at Old Dominion University in 1989 and was awarded the Dr. Ruth Harrell Memorial Scholarship in 1991.

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