

Part V

Human Nutritional Status Assessment

11

Dietary Guidelines, Food Guidance, and Dietary Quality

Eileen Kennedy

The 1969 White House Conference on Food, Nutrition, and Health¹ was instrumental in the development of the first set of U.S. dietary guidelines. Specific recommendations emerged out of this conference advocating that the government examine the links between diet and chronic disease. The 1969 conference was followed in 1977 by the release of the U.S. Senate Dietary Goals;² these dietary goals for the first time summarized specific recommendations for diet-related goals for the American public.

The Dietary Guidelines for Americans are the cornerstone of federal nutrition policy in the U.S. Nutrition programs use the Dietary Guidelines as the basis of the nutrition standards; thus programs such as Food Stamps, School Lunch/School Breakfast, and Women, Infants, and Children (WIC) use the dietary guidelines in developing program services. In addition, all nutrition education programs at the federal level must have messages consistent with the Dietary Guidelines. As a result, the impact of the Dietary Guidelines is broad. It is estimated that one of every five Americans participates in at least one federal nutrition program.

History of the Dietary Guidelines for Americans

The Dietary Guidelines attempt to answer the question, “what should Americans eat to stay healthy?” Specifically, the Dietary Guidelines provide advice for healthy Americans age two years and over about food choices that promote health and reduce the risk of disease.

The Dietary Guidelines were first developed in 1980³ and have been updated every five years since then — 1985, 1990, 1995, and the most recent, Dietary Guidelines 2000.^{4,7} The *National Nutrition Monitoring and Related Research Act* of 1990⁸ requires the Secretary of Agriculture and the Secretary of Health and Human Services to jointly publish a report every five years entitled “The Dietary Guidelines for Americans.” The report must (1) contain nutrition and dietary information and guidelines for the general public, (2) be based on the preponderance of scientific and medical knowledge current at the time of publication, and (3) be prompted by each federal agency in carrying out federal food, nutrition, or health programs. The 1995 Dietary Guidelines were the first to be statutorily mandated by the U.S. Congress.

Since 1985, the United States Department of Agriculture (USDA) and the Department of Health and Human Services (HHS) have used essentially the same process to prepare the Dietary Guidelines. An external Dietary Guidelines Advisory Committee (DGAC) has been appointed by the two secretaries to review and revise the Dietary Guidelines as necessary. The members of the DGAC are widely recognized nutrition and medical experts. A series of open public meetings are held to review and discuss the guidelines. Upon completion of the DGAC process, a technical report is sent to the two secretaries and reviewed within the two departments. In addition, in 1995 and 2000, consumer research was conducted⁹⁻¹⁰ to test consumer reaction to specific design and content elements of the technical report. The consumer research is also used as one element in promoting the Dietary Guidelines.

Dietary Guidelines for Americans

From 1980 to 1995, the Dietary Guidelines have been relatively stable (Table 11.1), maintaining seven guidelines. However, the 1995 guidelines reflected some exciting and important changes. The 1995 guidelines,⁶ more than ever before, put an emphasis on total diet; the wording moved away from individual foods in the direction of a total diet based on variety, moderation, and proportionality. The concept of total diet is reflected symbolically through the graphic of the 1995 Dietary Guidelines bulletin that links all seven guidelines together, anchored around “Eat a Variety of Food.”

In the 1995 guideline on variety, the bulletin⁶ stresses a total diet rather than an individual food approach to healthy eating. The recommendation is to choose foods from each of the five major food groups in the Food Guide Pyramid. Also, an emphasis is placed on

TABLE 11.1

Dietary Guidelines for Americans, 1980 to 2000

1980 7 Guidelines	1985 7 Guidelines	1990 7 Guidelines	1995 7 Guidelines
Eat a variety of foods. Maintain ideal weight	Eat a variety of foods. Maintain desirable weight	Eat a variety of foods. Maintain healthy weight	Eat a variety of foods. Balance the food you eat with physical activity—maintain or improve your weight
Avoid too much fat, saturated fat, and cholesterol Eat foods with adequate starch and fiber	Avoid too much fat, saturated fat, and cholesterol Eat foods with adequate starch and fiber	Choose a diet low in fat, saturated fat, and cholesterol Choose a diet with plenty of grain products, vegetables, and fruits	Choose a diet with plenty of grain products, vegetables, and fruits Choose a diet low in fat, saturated fat, and cholesterol
Avoid too much sugar	Avoid too much sugar	Use sugars only in moderation	Choose a diet moderate in sugars
Avoid too much sodium	Avoid too much sodium	Use salt and sodium only in moderation	Choose a diet moderate in salt and sodium
If you drink alcohol, do so in moderation	If you drink alcohol beverages, do so in moderation	If you drink alcoholic beverages, do so in moderation	If you drink alcoholic beverages, do so in moderation

foods from the base of the pyramid (grains) to form the center of the plate, accompanied by food from other food groups.

For the first time, the Dietary Guidelines in 1995 recognized that with careful planning, a vegetarian diet can be consistent with the Dietary Guidelines and the Recommended Dietary Allowances.¹¹ The guidelines also present a clear message that food sources of nutrients are preferred to supplements. This “food first” strategy is reinforced by a discussion of other healthful substances present in food but not in dietary supplements. However, the 1995 guidelines do provide specific examples of situations where dietary supplements may be needed.

The 1995 guidelines also more forcefully moved in the direction of providing a discussion of the direct link between diet and health. Weight gain with age was discouraged for adults. Weight maintenance is encouraged as a first step to achieving a healthy weight. The benefits of physical activity are emphasized, and for the first time, a statement was included on the benefits of moderate alcohol consumption in reducing the risk of heart disease. On this later point, both HHS and USDA were clear that the alcohol guideline was not intended to recommend that people start drinking.

In the 1995 guidelines there was also direct reference to nutrition education tools that could be used to promote the Dietary Guidelines. The guidelines explain how consumers can use the “three crown jewels” to build a healthy diet — the Dietary Guidelines, the Food Guide Pyramid,¹² and the Nutrition Facts Label.

The Dietary Guidelines 2000, released by President Clinton in May 2000,⁷ break with the tradition of seven guidelines and now incorporate ten guidelines. Not only do the Dietary Guidelines 2000 continue to emphasize a total diet approach, they also emphasize a healthy lifestyle approach. This is reflected clearly in three concepts that are used as organizing principals for the 2000 Guidelines aim for fitness, build a healthy base, and choose sensibly.

Three new guidelines have been added to the Dietary Guidelines 2000 (Table 11.2). There is now a separate guideline for physical activity which states, “be physically active every

TABLE 11.2

U.S. Dietary Guidelines 2000 and Countries having Similar Guidelines

U.S. Dietary Guidelines 2000 ⁷	Countries Having Similar Guidelines ¹³
Aim for a healthy weight	Australia, Canada, China, Japan, Korea, Malaysia, The Netherlands, New Zealand, Philippines, Singapore, Thailand, United Kingdom
Let the Pyramid guide your food choices	<i>Variety:</i> Australia, Canada, China, France, Germany, Hungary, Indonesia, Korea, Malaysia, New Zealand, Philippines, Singapore, South Africa, Sri Lanka, Thailand, United Kingdom, Japan <i>Five Steps to Healthy Eating:</i> India
Eat a variety of grains daily, especially whole grains	Australia, Canada, Denmark, Germany, Hungary (choose potatoes over rice), India, Malaysia, Norway, Singapore, South Africa (starchy foods), Thailand
Choose a diet that is low in saturated fat, and cholesterol, and moderate in total fat	Australia (but low fat diets not suitable for children), Canada, Japan, The Netherlands, New Zealand, Singapore, South Africa
Choose and prepare foods with less salt	Australia, Canada, China, Denmark, Germany, Hungary, India, Japan, Korea, Malaysia, The Netherlands, Singapore, South Africa, Thailand
If you drink alcoholic beverages, do so in moderation	Canada, China, France, Germany, Indonesia (avoid), Hungary (forbidden for pregnant women and children), Korea, The Netherlands, New Zealand, Singapore, South Africa, United Kingdom

day.” In addition to help in maintaining a healthy weight, this guideline discusses other health benefits of physical activity. Specific quantitative recommendations are given for amount of physical activity for adults (30 minutes or more) and children (60 minutes or more) per day. For the first time ever, there is a guideline on food safety. Again, this reinforces components of a healthy diet and healthy lifestyle. Finally, there is a separate guideline for fruits and vegetables.

The consumer research conducted as part of the Dietary Guidelines 2000 process¹⁰ influenced the development of the guidelines. One clear message is that consumers preferred simple, action-oriented guidelines. Thus, the guidelines are much more direct and action oriented as evidenced by “aim for a healthy weight” and “keep foods safe to eat.”

The guidelines are more consumer friendly, and emphasize practical ways in which the consumers can put the concepts into practice. To that end, a section entitled “Advice for Today” is included at the end of each individual guideline and includes suggestions on key ways to operationalize the guidelines. The consumer research on the 2000 Dietary Guidelines¹⁰ indicated that consumers particularly appreciated sections such as “Advice for Today.”

Comparison with Other Dietary Guidelines

A large number of countries — both industrialized and developing — have authoritative sets of dietary guidelines.¹³ Despite vastly different geographical and sociocultural contexts, six elements are common to the sets of dietary guidelines (Table 11.2).

A guideline on variety is common; it is often the core element of the different sets of dietary guidelines, and is used to reflect the concepts of dietary diversity. The variety guidelines range from general statements such as, “Eat a variety of foods” to very specific quantifications, such as that as found in the Japanese guideline: “Obtain well-balanced nutrition with a variety of foods; eat 30 foodstuffs a day.”

Many of the country-specific dietary guidelines emphasize limiting or moderating total fat and saturated fat intake. Where there is a quantification of limits, this is most commonly a diet containing no more than 30% of total energy from fat and less than 10% of energy from saturated fat.

Countries typically also include a weight guidelines, clearly emphasizing maintaining or achieving a healthy weight; in the French guideline this is more specific, indicating that individuals should weigh themselves monthly.¹³ Most of the dietary guidelines worldwide promote a plant-based diet as the building block of healthful eating. To that end, many countries emphasize grains as the basis of good diet. Reduction of salt and/or sodium is emphasized in a number of the sets of dietary guidelines.

Finally, the issue of alcohol consumption is addressed in many sets of dietary guidelines. There is always a level of caution related to the role of alcohol as part of a healthy diet. The most recent 2000 Dietary Guidelines for Americans, for example, indicates that the benefits of alcohol in reducing the risk of heart disease can be achieved in other ways: maintaining a healthy weight, cessation of smoking, increasing physical activity, and reducing the level of fat and saturated fat in the diet. Indeed, countries like Venezuela go even further, and specify that “alcoholic beverages are not part of a healthy diet.”¹⁴

Comparison of U.S. Dietary Guidelines with Disease-Specific Guidelines

A number of professional associations have developed sets of dietary guidelines. [Table 11.3](#) compares the U.S. Dietary Guidelines 2000⁷ with guidelines of the American Heart Association (AHA)¹⁵ and American Cancer Society (ACS).¹⁶ Clearly the AHA and ACS have somewhat different objectives in developing their specific sets of guidelines. The AHA guidelines put forward recommendations for a healthful diet which, if followed, reduce the risk of heart disease. Similarly, recommendations from the ACA are for dietary guidelines which reduce the risk of cancer. Given the somewhat differing objectives, there is a remarkable degree of similarity in the three sets of guidelines ([Table 11.3](#)). Here again, the USDA/HHS, the AHA, and the ACA each recommend dietary guidelines related to weight, total fat/saturated fat, salt, and alcohol in moderation as the basis of a healthful diet.

Future Directions

Many countries have been successful in developing and promoting food-based Dietary Guidelines. In most cases these guidelines are intended for individuals ages two and older. In the U.S., the Dietary Guidelines from their inception in 1980 have been intended for individuals ages two and older. There is a clear gap in dietary guidelines for children ages two and younger.

A limited number of countries have some parts of their food-based guidelines devoted to children less than two years of age. In most cases the advice for children under two years of age relates to a discussion of breastfeeding. Australia, for example, states: “encourage and support breastfeeding.” Similar wording is found in guidelines from the Philippines and Singapore.

Most industrialized countries rely on national pediatric associations to guide the broad policy recommendations for infant feeding and/or feeding practices for the first two years of life. In almost all cases, advice from pediatric associations stresses that human milk is the preferred form of infant feeding.¹⁷

In devising food-based dietary guidelines for children under two, there would be a clear need to segment this group of children by age groups; birth to 6 months, 6 to 12 months, and 13 to 24 months. The dietary issues addressed across these three age groups would differ.

Dietary Guidance

In the preceding segment the development of the U.S. Dietary Guidelines was traced. The United States Department of Agriculture (USDA) has a long, rich history of providing science-based nutrition information and education for the general public ([Table 11.4](#)). The Organic Act of 1862 not only created USDA but also mandated that the department, “acquire and diffuse among people useful information on subjects connected to agriculture.” This led to some of the pioneering work of W.O. Atwater, who in the 1890s began identifying the links between food composition, dietary intake, and health. This seminal

TABLE 11.3

Comparison of Three Sets of Dietary Recommendations

Recommendation	DGA	AHA	ACS
Include a variety of foods in the diet; emphasis on a plant-based diet.	Yes, include food from five major food groups: bread, cereal, rice, and pasta; vegetables, fruits, meat, poultry, fish, dry beans, eggs, and nuts; and milk, yogurt, and cheese. Also provide information on good food sources of nutrients.	Yes, echo DGA recommendations: grains, fruits, and vegetables should supply 55 to 60 percent of total kcalories.	Yes, with emphasis on grains, especially whole grains, fruits, vegetables, and beans as an alternative to meat.
Encourages maintenance of a healthy weight including importance of physical activity.	Yes, defined as Body Mass Index (BMI) of 19 to 25. Recommend gaining no more than 10 pounds after achieving adult height. Recommend moderate activity for 30 minutes/day on most, if not all days.	Yes, healthy weight not specifically defined. Weight gain in adulthood not specifically addressed. Regular physical activity encouraged.	Yes, refers to DGA definition of BMI of 19 to 25. Recommend moderate activity for 30 minutes/day on most, if not all days.
Limit fat intake.	Yes, recommend choosing a diet with no more than 30 percent of calories from total fat and less than 10 percent of kcalories from saturated fat. Refers to Daily Value of 300 mg/day cholesterol on food labels, without making specific recommendation. Briefly discusses use of omega-3 and trans fatty acids.	Yes, recommend choosing a diet with no more than 30 percent of kcalories from total fat, less than 10 percent of kcalories from saturated fat, and less than 300 mg cholesterol/day. Limit intake of omega-5 polyunsaturated fatty acids to no more than 10 percent of total kcalories. Recommend limiting trans fatty acids but do not give quantitative limit.	Yes, do not give quantitative limits. Recommend limiting consumption of meats, especially high-fat meats.
Limit salt and sodium consumption.	Yes, refer to Daily Value on food labels of 2400 mg of sodium/day without making specific recommendation.	Yes, limit salt to 6g/day (equivalent to 2400 mg of sodium).	Not specifically addressed.
Moderate intake of sugars. Limit consumption of alcoholic beverages.	Yes, no quantitative limitations given. Yes, includes caveat to limit to 1 drink/day for women, if you drink at all. Also includes list of those who should not drink at all including children and pregnant women.	Yes, no quantitative limitations given. Yes, echo DGA recommendations.	Not specifically addressed. Yes, refer to DGA recommendations.

TABLE 11.4

History of USDA Food Guidance

1860s	1862 USDA formed
1870s	
1880s	
1890s	1890 W. O. Atwater — human nutrition research
1900s	1902 Atwater — Variety, Balance, and Moderation
1910s	1914 Cooperative Extension Service 1916 Caroline Hunt — First food guide
1920s	
1930s	1933 Food Plans at 4 Cost Levels
1940s	1941 National Nutrition Conference for Defense 1946 School Lunch Program began
1950s	1956 Basic Four Food Guide
1960s	1964 Food Stamp Program began 1969 White House Conference on Food, Nutrition, and Health
1970s	1970 EFNEP began 1971 FNIC formed at NAL 1975 WIC began (WIC pilot projects authorized in 1972) 1977 Food and Agriculture Act of 1977, NET began; USDA named “lead” agency for nutrition research, extension, and teaching
1980s	1980 Dietary Guidelines for Americans first issued 1982 JSHNR defines “nutrition education research” 1986 USDA Comprehensive Plan for HN Research and Education
1990s	1990 National Nutrition Monitoring and Related Research Act 1990 Nutrition Labeling and Education Act/NEFLE 1992 Food Guide Pyramid 1994 Nutrition and Food Safety Education Task Force 1995 Dietary Guidelines for Americans, 4th edition
2000	May, 2000 National Nutrition Summit

science led to the development of the USDA food guides. Dissemination of the food guides was facilitated by the 1914 Smith-Lever Act which created the Cooperative Extension Service and specified that the Extension Service provide people with, “useful and practical information on subjects relating to agriculture and home economics.”

In the 1930s the USDA began developing family food plans at four separate cost levels. The food plans continue to be used with the best known — the Thrifty Food Plan — serving as the nutritional basis of benefits of the Food Stamp Program. Former Secretary of Agriculture Henry Wallace once commented, “the lack of common-sense knowledge of nutrition even among the many well to-do people in the U.S. is appalling.”

In 1941 the first set of Recommended Dietary Allowances was released at the National Nutrition Conference for Defense; at this conference USDA scientists noted that consumers spent enough money on food but did not obtain an adequate diet. As a result, the USDA was urged to develop nutrition education and media-type materials to promote good nutrition for the American public. This emphasis on nutrition education continued in the 1950s and 1960s, culminating with the 1969 White House Conference on Food, Nutrition, and Health.^{18,19} The 1969 conference reinforced the need for aggressive nutrition promotion activities for all Americans, with a special emphasis on reaching low income populations.

Throughout the 1970s, federal agencies increased funding for nutrition programs and nutrition education activities.²⁰ New programs were created, including the Special Supplemental Food Program for Women, Infants, and Children (WIC), School Breakfast, and other programs such as Food Stamps and School Lunch were expanded nationwide.

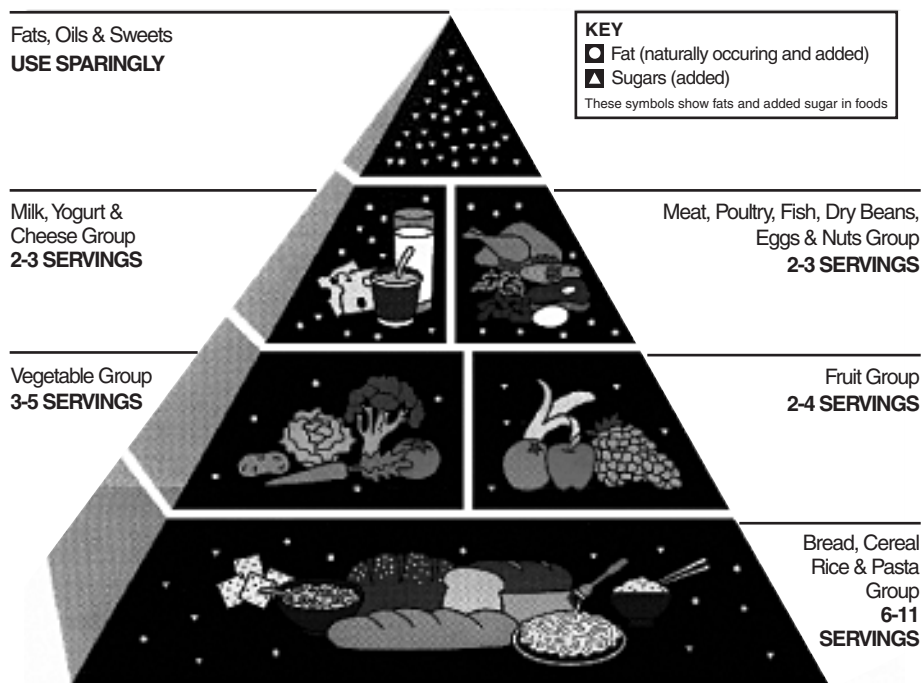


FIGURE 11.1
Food Guide Pyramid: a guide to daily food choices.

The 1977 Food and Agriculture Act named USDA as the lead agency for nutrition research, extension, and teaching. In 1980 USDA and HHS released the first Dietary Guidelines for Americans.²¹ Throughout the 1980s and into the 1990s USDA placed a renewed emphasis on developing comprehensive, coordinated efforts to promote nutrition for all Americans.

Food Guide USDA Pyramid

The release of the 1980 Dietary Guidelines for Americans provided the impetus for the development of a new food guide that would allow consumers to put the dietary guidelines into action. Work throughout the 1980s and into the early 1990s culminated in the now well-known 1992 USDA Food Guide Pyramid.²² The Pyramid has been a popular success, recognized by the majority of Americans. The Pyramid builds on the extensive experience with food guidance systems within USDA. The three essential concepts underlying the Food Guide Pyramid are variety, balance, and moderation. Different visuals were tested with consumers to assess which graphic portrayal most effectively communicated the underlying concepts of balance, variety, and moderation. The graphics were tested first with adults with at least a high school education; consumer testing was expanded later to include children and low-literacy and low-income adults. The Pyramid shape emerged as the most effective graphic, communicating the concepts of variety, balance, and moderation (Figure 11.1).

The USDA Pyramid communicates a wealth of information with little accompanying text. Very complex information is presented in the Pyramid visual. As a result, many consumers are not aware that a more detailed publication on the Food Guide Pyramid exists.²² This publication discusses the differing energy needs of individuals illustrated at

1600, 2200, and 2800 kcalories. Within the Food Guide Pyramid Bulletin (USDA, 1992) there is an in-depth discussion of “How to Make the Pyramid Work for You.” Topics such as what constitutes a serving, different types of fats, and how to use the Pyramid to make low-fat selections are also included in the Pyramid Bulletin.

The Pyramid graphic shown in [Figure 11.1](#) communicates not only balance, variety, and moderation but provides the basis of a healthful diet. The number and amounts of foods recommended in the Pyramid are based on three factors:

- Recommended Dietary Allowances for age and gender groups
- Dietary Guidelines for Americans
- Americans’ typical consumption patterns

The advice provided in the Food Guide Pyramid is designed to provide dietary guidance that ensures nutritional adequacy — defined as the RDAs and Dietary Guidelines — within the framework of typical consumption patterns. Thus, while ostensibly an infinite number of food combinations could be used to ensure nutritional adequacy, the five major food groups emphasized in the USDA Pyramid anchor the food selections to current consumption patterns.

A proliferation of pyramids has emerged since the USDA version was published in 1992. However, all of the Pyramids, whether Asian, Mediterranean, or vegetarian, are based on the same building blocks — grains, vegetables, and fruits.²³⁻²⁵ The similarities in the various pyramids are more dominant than the differences.

In addition, in 1999, USDA released a children’s version of the Food Guide Pyramid targeted at children ages two to six years. Here again, the concepts of balance, variety, and moderation underpin the children’s graphic ([Figure 11.2](#)). The specific icons used in the food groups are based on foods typically consumed by children. Worth noting are the age-specific recommendations for serving sizes at the bottom of the graphic as well as the deliberate inclusion of exercise icons.

The year 2000 Dietary Guidelines for Americans²⁶ for the first time include the Food Guide Pyramid as part of a specific guideline; “Let the Pyramid Guide Your Food Choices” is the first guideline put forward to build a healthy base. One key reason for including the Pyramid as a direct part of the Dietary Guidelines is the wide-ranging familiarity of consumers with the Pyramid and the messages embedded within. The USDA Food Guide Pyramid and the Children’s Food Guide Pyramid will continue to be essential parts of the nutrition education and nutrition promotion efforts within the USDA.

Diet Quality Measures

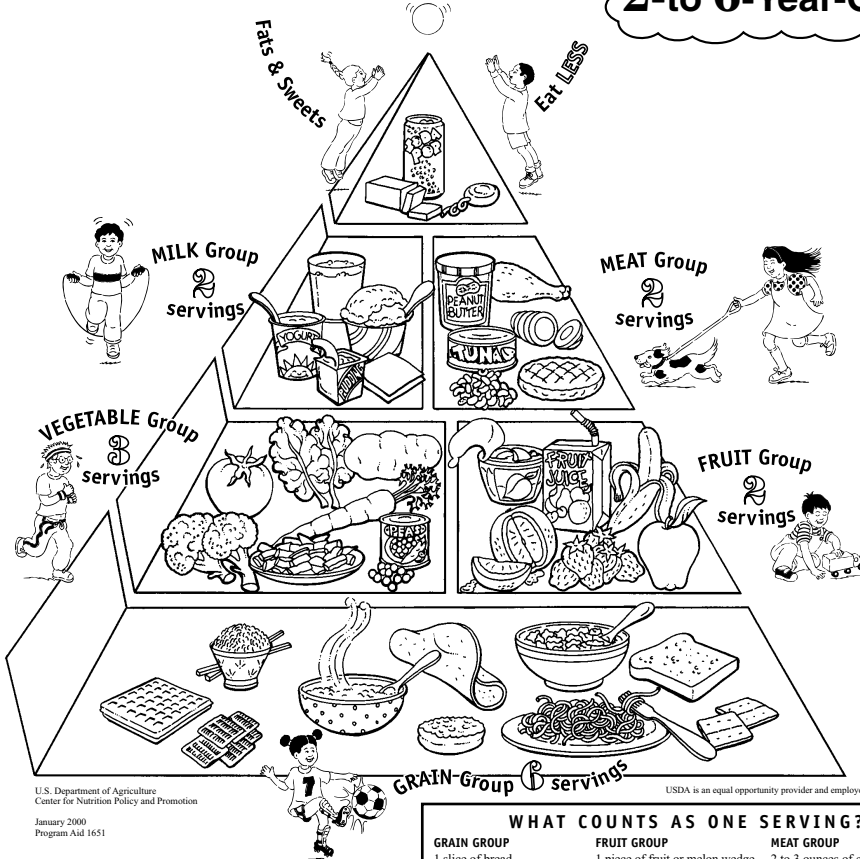
Since the early 1900s, the major areas of concern in public health nutrition have shifted from problems of nutritional deficiency to problems of excesses and imbalances. Problems of relative overconsumption are, on average, more prevalent today than problems of underconsumption. The successive sets of U.S. Dietary Guidelines that have emerged since 1980 have emphasized the links between diet and a range of chronic diseases. An extensive body of scientific literature exists to document the association between diets high in total fat, saturated fat, and low in fiber and complex carbohydrate with coronary heart disease, stroke, diabetes, and certain forms of cancer.

While extensive research has been conducted to link the typical American diet to a range of chronic diseases, less research has been done on methods of measuring diet quality. Until recently, most of the diet quality measures focused on individual nutrients; most

FOOD Guide PYRAMID

for Young Children

A Daily Guide for
2-to 6-Year-Olds



FOOD IS FUN and learning about food is fun, too. Eating foods from the Food Guide Pyramid and being physically active will help you grow healthy and strong.

WHAT COUNTS AS ONE SERVING?

GRAIN GROUP	FRUIT GROUP	MEAT GROUP
1 slice of bread	1 piece of fruit or melon wedge	2 to 3 ounces of cooked lean meat, poultry, or fish.
1/2 cup of cooked rice or pasta	1/4 cup of juice	1/2 cup of cooked dry beans, or 1 egg counts as 1 ounce of lean meat. 2 tablespoons of peanut butter count as 1 ounce of meat.
1/2 cup of cooked cereal	1/2 cup of canned fruit	
1 ounce of ready-to-eat cereal	1/4 cup of dried fruit	
VEGETABLE GROUP	MILD GROUP	FATS AND SWEETS
1/2 cup of chopped raw or cooked vegetables	1 cup of milk or yogurt	Limit calories from these.
1 cup of raw leafy vegetables	2 ounces of cheese	

Four- to 6-year-olds can eat these serving sizes. Offer 2- to 3-year-olds less, except for milk. Two- to 6-year-old children need a total of 2 servings from the milk group each day.

EAT a variety of FOODS AND ENJOY!

FIGURE 11.2
Food Guide Pyramid for Young Children.

TABLE 11.5

Components of the Healthy Eating Index and Scoring System

	Score Ranges ¹	Criteria for Maximum Score of 10	Criteria for Minimum Score of 0
Grain consumption	0–10	6–11 servings ²	0 servings
Vegetable consumption	0–10	3–5 servings ²	0 servings
Fruit consumption	0–10	2–4 servings ²	0 servings
Milk consumption	0–10	2–3 servings ²	0 servings
Meat consumption	0–10	2–3 servings ²	0 servings
Total fat intake	0–10	30% or less energy from fat	45% or more energy from fat
Saturated fat intake	0–10	Less than 10% energy from saturated fat	15% or more energy from saturated fat
Cholesterol intake	0–10	300 mg or less	450 mg or more
Sodium intake	0–10	2400 mg or less	4800 mg or more
Food variety	0–10	8 or more different items in a day	3 or fewer different items in a day

¹ People with consumption or intakes between the maximum and minimum ranges or amounts were assigned scores proportionately.

² Number of servings depends on Recommended Energy Allowance.

often these measures were based on measures such as mean percent of the Recommended Dietary Allowances.^{27,28}

Despite the U.S. Dietary Guidelines' emphasis on a total diet, indices based on the dietary guidelines have tended to be selective in the components included.^{29,30} Few assessment indices have been developed to assess overall diet quality. In an effort to measure how well American diets conform to recommended healthy eating patterns, USDA developed the Healthy Eating Index (HEI) in 1995.

Healthy Eating Index Structure

The Healthy Eating Index (HEI) was designed to measure various aspects of a healthful diet. As shown in Table 11.5; the HEI is a ten-component index; components one through five measure the degree to which a person's diet conforms to the Food Guide Pyramid's serving recommendations for the five major food groups of grains, vegetables, fruits, milk, and meat. The number of recommended servings for each food group varies with the individual's age, gender, physiological status, and energy requirements. The use of food groups rather than nutrients was meant to provide consumers with an easier standard against which to judge their dietary patterns. In addition, there may be as yet unknown components in foods that would not be picked up by measuring simply the nutrients in foods.

Components 6 to 9 measure various aspects of the dietary guidelines, including total fat, saturated fat, cholesterol, and sodium, respectively. Component 10 provides a measure of dietary variety. Despite general agreement that dietary variety is important, it is surprising how few studies have attempted to quantify the concept of variety.^{30,31} The HEI counted the total number of different foods that contribute substantially to meeting one or more of the five food group requirements. Foods were counted only if they were eaten in amounts sufficient to contribute at least a half serving in any of the food groups. Identical foods eaten on separate occasions were aggregated before imposing the one-half serving cutoff point. Foods that were similar, such as different forms of potatoes or two different forms of white bread, were counted only once in the variety category.

Each of the ten components has a score ranging from zero to ten; cutoffs for scoring the minimum and maximum scores are shown in [Table 11.5](#). Thus, the HEI can vary from one to 100.

What Are Americans Eating?

The HEI was applied to nationally representative data derived from the Continuing Survey of Food Intake by Individuals (CSFII) for two time periods, 1989 to 1990 and 1994 to 1996. The combined score for 1989 to 1990 was 63.9,²³ contrasted with 63.6, 63.5, and 63.8 for 1994, 1995, and 1996 respectively.²⁵ Clearly there were not wide variations in the average HEI across this seven-year period.

In addition, the distribution of the average HEI scores did not vary dramatically over the period of 1989 to 1996. Throughout this time period, the majority of individual scores fell in the 51 to 80% range, a category defined as “needs improvement.” Only about 11 to 12% of individuals fell in the “good diet” category at any point in time; conversely, approximately 18% of individuals were classified in the “poor diet” category. Scores for the individual HEI components varied with the average score, with the fruit category consistently being the lowest, and the cholesterol score doing best.

The HEI score varied with some economic and demographic factors.^{23,25} Females had slightly higher scores than males, and persons in the younger and older groups scored higher than adults in the 19 to 50 age category. Children two to three years had the highest HEI score. Children in this age category scored particularly high on the fruit and dairy component of the HEI when compared with older children, suggesting that changes in dietary habits may play an important role as children age.

Throughout the seven-year period we see a pattern of increasing HEI with increase in income. However the effect of increases in education are more dramatic than the effect of income on increases in HEI. One interpretation is that higher education may enable individuals to translate dietary guidance into improved food patterns.

The scientific rigor of the HEI depends on its ability to accurately measure diet quality. Research has documented that the average HEI in 1989 and 1990 correlated with a range of nutrients and energy intake.²³ For most nutrients, the likelihood of falling below 75% of the RDA for a selected nutrient decreased as the HEI score increased. For example, only 47% of persons with an HEI of 50 or less had vitamin C intake greater than 75% of the RDA, compared to approximately 91% of people scoring 80 or more on the HEI. The data would suggest that as the HEI increases, levels of nutrient intake also increase.

Interestingly, the correlation of the HEI with overall energy intake was modest, suggesting that simply consuming larger quantities of food will not by itself result in a better diet.

Finally, the HEI was compared to individuals’ self-rating of their diets.⁶ Persons who rated their diets as excellent or good had a significantly higher probability of having an HEI classified as a “good diet.” Conversely, individuals who self-rated their diet as fair or poor had an HEI more likely to be classified as “needs improvement.”

Policy Implications

The Food Guide Pyramid and the Dietary Guidelines for Americans provide a standard against which to evaluate the total diet. However, neither the Pyramid nor the Dietary Guidelines provide a method for easily assessing total diet. The development of the USDA Healthy Eating Index provided an easy to use, single summary measure of diet quality. The HEI provides a method for monitoring diet quality over time using national survey

data. In addition, the HEI has the potential to serve as a tool for individuals to self-evaluate diet quality.

The data from both 1989 to 1990 and 1994 to 1996 indicate that improvements need to be made in the dietary patterns of most Americans. The data obtained from applying the HEI to nationally representative surveys can be one tool to help focus our national nutrition promotion interventions.

Summary

Worldwide major improvements in public health will be accomplished by improvement in dietary patterns. Food-based dietary guidelines have been developed in a broad range of countries. A move toward consensus on food-based dietary guidelines is a practical way to develop core elements of global dietary guidelines that can be effectively promoted by individual countries as well as international health organizations.

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