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Using Food Labels To Follow the Dietary Guidelines for Americans: A Reference


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Using Food Labels To Follow the Dietary Guideline for Americans: A Reference

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Using the New Food Label To Select a Healthy Diet—An Overview

Federal nutrition policy is expressed in the Dietary Guidelines for Americans, which are seven basic principles for healthy eating. The most recent revision of the Dietary Guidelines was issued in 1990 (USDA and DHHS, 1990). The seven Dietary Guidelines are:

- **Eat a variety of foods** to get the energy (calories), protein, vitamins, minerals, and fiber you need for good health.
- **Maintain healthy weight** to reduce your chances of having high blood pressure, heart disease, a stroke, certain cancers, and the most common kind of diabetes.
- **Choose a diet low in fat, saturated fat, and cholesterol** to reduce your risk of heart disease and certain types of cancer. Because fat contains more than twice the calories of an equal amount of carbohydrates or protein, a diet low in fat can help you maintain a healthy weight.
- **Choose a diet with plenty of vegetables, fruits, and grain products** which provide needed vitamins, minerals, fiber, and complex carbohydrates. They are generally low in fats.
- **Use sugars only in moderation.** A diet with lots of sugars has too many calories and/or too few nutrients for most people and can contribute to tooth decay.
- **Use salt and sodium only in moderation** to help reduce your risk of high blood pressure.
- **If you drink alcoholic beverages, do so in moderation.** Alcoholic beverages supply calories, but little or no nutrients. Drinking alcohol is also the cause of many health problems and accidents and can lead to addiction.

New food labels will soon be appearing on most packaged foods. The new labels are the result of the Nutrition Labeling and Education Act of 1990 (NLEA), which required the Food and Drug Administration (FDA) to issue new nutrition labeling regulations (DHHS/FDA, 1993). Although not required to do so by the NLEA, the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA) has issued regulations for nutrition labeling of meat and poultry products (USDA/FSIS, 1993) that parallel those issued by FDA. The overriding goal of both agencies was to produce a single set of sensible nutrition labeling requirements for all foods. A brief history of events leading up to the issuing of the new regulations is provided in the Appendix.

In addition to mandating changes in nutrition labeling of food products, the NLEA requires that these changes be accompanied by an educational campaign. USDA voluntarily undertook similar efforts, recognizing that food labeling could serve as a useful nutrition education tool to help consumers apply the Dietary Guidelines.

In 1992, several USDA agencies, including FSIS, the National Agricultural Library (NAL), and the Human Nutrition Information Service (HNIS),¹ joined with FDA to establish the National Exchange for Food Labeling Education (NEFLE). NEFLE seeks to ensure that consumers learn what they need to know to make the most of the new food label.

A particular goal of NEFLE is to see that the labeling education needs of special populations, such as older Americans, children, people with dietary restrictions, and people with low reading skills, are met. Thus, a major thrust of NEFLE is to encourage and build partnerships that can develop and evaluate education materials and projects that are appropriate for a diverse population.

USDA has produced this report as part of the nutrition education campaign accompanying the introduction of new food labels. It is designed to be used as a reference by cooperative extension staff, food editors, educators, public relations professionals, and other professionals who write for consumers.

How To Use This Report

This report is organized into nine chapters: an overview, a chapter covering each of the seven Dietary Guidelines, and a chapter discussing message communication ideas. The overview shows how the Dietary Guidelines, the Food Guide Pyramid, and the new food labels work together to help consumers choose a healthy diet. The overview also gives a brief history of nutrition labeling in the United States, summarizes the new labeling regulations, and presents the new label format.

The chapters covering the Dietary Guidelines identify important dietary guidance issues, provide information about the population groups most at nutritional risk, and summarize food label features useful in helping consumers follow the guidelines. A section of key concepts is presented at the

¹ In 1994, HNIS was combined with the Agricultural Research Service of USDA which assumed HNIS's program responsibilities.

conclusion of each of these chapters. The key concepts are written for consumers and repeat important points and provide practical tips to help them use the label information to choose a more healthful diet. Users of this report can choose the concepts most appropriate for their target audience. The final chapter presents the results of relevant communication research, along with ideas for communicating information about the new label to the public.

Throughout the report, results of various surveys are discussed. Some of the surveys cited were conducted by USDA, FDA, and other government agencies. Others were conducted by market research organizations. Specific information about each of these surveys is summarized in table 1. All surveys were designed to sample nationally representative portions of the U.S. population unless otherwise noted.

Figure 1

The Food Guide Pyramid

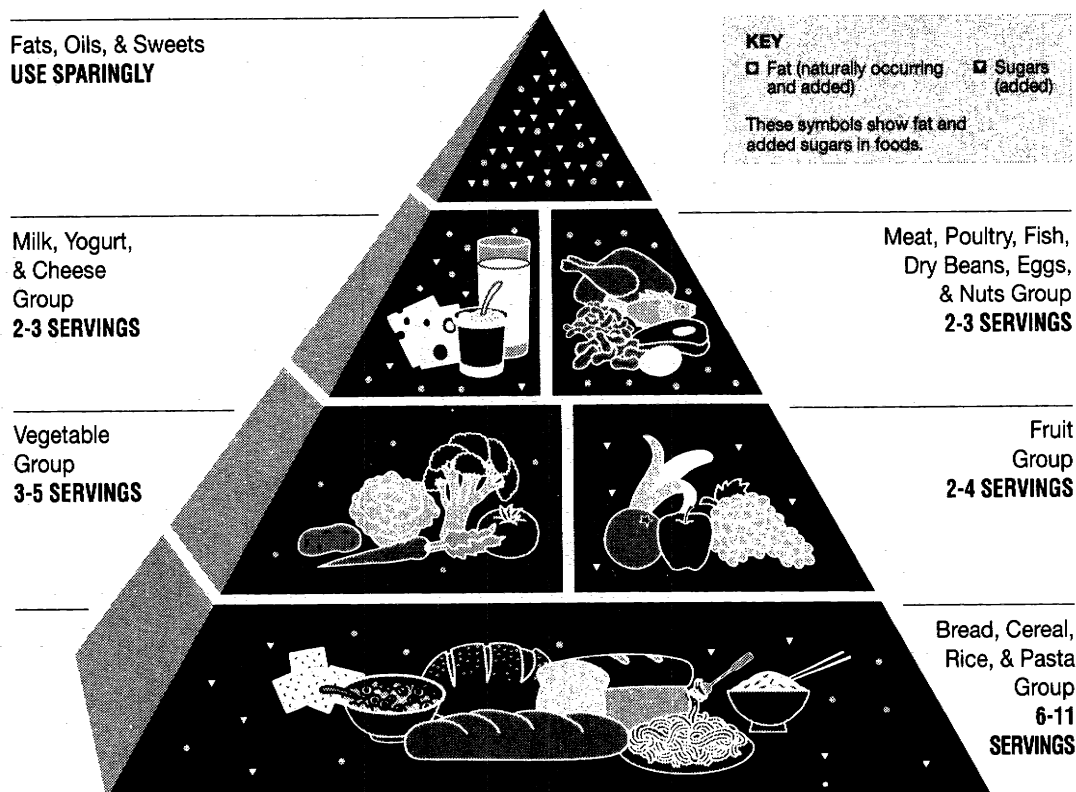
The Food Guide Pyramid/Food Label Connection

The new Food Guide Pyramid (figure 1) was developed as a graphic representation of the Dietary Guidelines with the goal of helping people implement the Guidelines through making appropriate food choices. The philosophical goals of the new food guide were based on a study of the evolution of food guides and on a needs assessment of the professional community conducted in the early 1980's. The goals for the new food guide are:

- It should promote overall health.
- It should be based on up-to-date research.
- It should focus on the total diet.

Food Guide Pyramid

A Guide to Daily Food Choices



Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services

How to Use The Daily Food Guide

What counts as one serving?

Breads, Cereals, Rice, and Pasta

- 1 slice of bread
- 1/2 cup of cooked rice or pasta
- 1/2 cup of cooked cereal
- 1 ounce of ready-to-eat cereal

Vegetables

- 1/2 cup of chopped raw or cooked vegetables
- 1 cup of leafy raw vegetables

Fruits

- 1 piece of fruit or melon wedge
- 3/4 cup of juice
- 1/4 cup of dried fruit

Milk, Yogurt, and Cheese

- 1 cup of milk or yogurt
- 1-1/2 to 2 ounces of cheese

Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts

- 2-1/2 to 3 ounces of cooked lean meat, poultry, or fish
- Count 1/2 cup of cooked beans, or 1 egg, or 2 tablespoons of peanut butter as 1 ounce of lean meat (about 1/3 serving)

Fats, Oils, and Sweets

LIMIT CALORIES FROM THESE especially if you need to lose weight

The amount you eat may be more than one serving. For example, a dinner portion of spaghetti would count as two or three servings of pasta.

How many servings do you need each day?

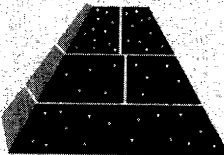
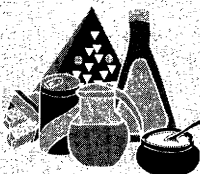
	Women & some older adults	Children, teen girls, active women, most men	Teen boys & active men
Calorie level*	about 1,600	about 2,200	about 2,800
Bread group	6	9	11
Vegetable group	3	4	5
Fruit group	2	3	4
Milk group	**2-3	**2-3	**2-3
Meat group	2, for a total of 5 ounces	2, for a total of 6 ounces	3 for a total of 7 ounces

*These are the calorie levels if you choose lowfat, lean foods from the 5 major food groups and use foods from the fats, oils, and sweets group sparingly.

**Women who are pregnant or breastfeeding, teenagers, and young adults to age 24 need 3 servings.

A Closer Look at Fat and Added Sugars

The small tip of the Pyramid shows fats, oils, and sweets. These are foods such as salad dressings, cream, butter, margarine, sugars, soft drinks, candies, and sweet desserts. Alcoholic beverages are also part of this group. These foods provide calories but few vitamins and minerals. Most people should go easy on foods from this group.



Some fat or sugar symbols are shown in the other food groups. That's to remind you that some foods in these groups can also be high in fat and added sugars, such as cheese or ice cream from the milk group, or french fries from the vegetable group. When choosing foods for a healthful diet, consider the fat and added sugars in your choices from all the food groups, not just fats, oils, and sweets from the Pyramid tip.

Table 1.—Information About Surveys Cited in This Report.

Name of Survey	Sponsoring Agency or Organization	Purpose and Methods	Date	Approximate Number of Respondents
Continuing Survey of Food Intakes by Individuals (CSFII)	USDA/HNIS	Collected data on food intakes by individuals; in-person and telephone interviews; oversampled low-income population.	1985 1989-90 ¹	3,250 7,780
Diet and Health Knowledge Survey (DHKS)	USDA/HNIS	Collected data on people's attitudes and knowledge about healthy eating; telephone follow-up of main meal-planners/preparers identified in CSFII, thus could relate attitudes/knowledge to intakes.	1989-90 ¹	2,880
Nationwide Food Consumption Survey (NFCS)	USDA/HNIS	Collected information on household food purchases and use as well as data on individual food intakes; in-person interviews.	1977-78 ¹	36,100
Weight Loss Practices Survey	DHHS/FDA	Collected information on current weight loss practices as well as other information such as weight history and health status; telephone interviews of adults; oversampled black population.	1991	1,400
Health and Diet Survey	DHHS/FDA ²	Collected information about knowledge, attitudes and practices about food and nutrition, particularly as they relate to health problems such as hypertension, hypercholesterolemia, coronary heart disease, and cancer; telephone interviews of adults.	1988 ¹	3,200
National Health Interview Survey (NHIS)	DHHS/National Center for Health Statistics (NCHS)	Collected information to help monitor the health status of the U.S. population; included information about weight status and weight loss; household interviews.	1990 ³	41,100
Second National Health and Nutrition Examination Survey (NHANES II)	DHHS/NCHS	Collected health and nutrition data, including data on height, weight, dietary intake, blood pressure, anemia, hypertension, and diabetes. Data were obtained by direct physical examination, clinical and laboratory tests, and interviews.	1976 to 1980	25,300
Survey of American Dietary Habits	The American Dietetic Association (ADA)	Collected data on Americans' attitudes, behavior, and knowledge regarding nutrition and eating habits; telephone survey of adults.	1991 1993	1,000 1,000
How Americans Are Making Food Choices	The International Food Information Council and ADA	Collected information about motivations behind consumer food choices; telephone survey of adults.	1989 1994	800 800
5 A Day For Better Health Baseline Study	Produce for Better Health Foundation	Collected information about current fruit and vegetable consumption by Americans, and about their awareness of and attitudes toward diet and health issues; telephone interview of adults; oversampled black and Hispanic populations.	1991	2,800
Consumer Awareness/Behavior Study	Wheat Foods Council	Collected information on consumer behavior and attitudes regarding the foods they eat, nutrition, and wheat foods; telephone interview of adults.	1991	1,000

¹ These surveys are conducted periodically; dates listed are the dates cited in this report.

² Periodically cosponsored by National Institutes of Health, National Heart, Lung, and Blood Institute

³ The NHIS is conducted annually; date listed is the date cited in this report.

- It should be useful to the target audience.
- It should meet nutritional goals in a realistic manner.
- It should allow maximum flexibility.
- It should be practical.
- It should be evolutionary—that is, build on successful elements of previous guides and accommodate anticipated direction of dietary recommendations in the future.

A more detailed discussion of the development of the food guide can be found elsewhere (Welsh, Davis, and Shaw, 1993). Briefly, the steps followed during the development of the food guide were:

- Establishment of nutritional goals
- Definition of food groups
- Assignment of serving sizes
- Determination of nutrient profiles
- Determination of the numbers of servings

After its development, the new food guide was used in several USDA publications, including the current edition of the Dietary Guidelines for Americans (USDA and DHHS, 1990). To bring the new food guide to the attention of consumers, there was a need for an appealing illustration that would convey, in a memorable way, the key messages of the food guide—variety, proportionality, and moderation. Several graphic presentations of the food guide were developed and extensively tested with adults, children, and low-income groups. A pyramid-shaped graphic was found to be most effective at communicating the three key messages (Welsh et al., 1992, 1993). A bulletin introducing the Food Guide Pyramid was released in April 1992 (USDA/HNIS, 1992).

The Food Guide Pyramid is an outline of what to eat each day. It is not a rigid prescription, but a general guide that lets people choose a healthy diet that is right for them. The Food Guide Pyramid calls for eating a variety of foods in the amounts needed to get essential nutrients and, at the same time, the proper amount of calories to maintain a healthy weight. It also calls for a diet low in fat, saturated fat, and cholesterol, and moderate in sodium, sugars, and alcohol (if consumed).

The Pyramid suggests a range of servings for the five major food groups that people should have each day (figure 1). The five major food groups are: 1) breads, cereals, rice, and

pasta; 2) vegetables; 3) fruits; 4) milk, yogurt, and cheese; and 5) meat, poultry, fish, dry beans, eggs, and nuts. The number of servings that is right for an individual depends on how many calories he or she needs, which in turn depends on factors such as age, sex, and how active the person is. Almost everyone should have at least the minimum number of servings from each food group. Many active women, older children, and most teenagers and men need more because of their body size and activity level.

The symbols for fat and added sugars are used in the Pyramid graphic to show that fat and added sugars come mostly from fats, oils, and sweets in the Pyramid tip, but can be part of or added to foods from the other food groups as well. Although everyone should choose lowfat foods from the major food groups most of the time, people with relatively low calorie needs, such as those who are sedentary or trying to lose weight, may need to make a special effort to choose lower fat and lower calorie foods more often. Everyone should use foods from the fats, oils, and sweets in the Pyramid tip sparingly.

Food labels can help consumers implement the message of moderation presented in the Food Guide Pyramid by helping them identify foods lower in fat and sodium and without added sugars. The fat and sodium information listed on the “Nutrition Facts” panel of the label can help consumers make lower fat and lower sodium choices from the five major food groups identified in the Pyramid. The “sugars” information on the “Nutrition Facts” panel includes the total amount of sugars in the product (some foods, such as dairy products and fruits, contain sugars naturally), not just sugars added during processing. The ingredient listing on the label can help people identify foods containing *added* sugars.

The Food Guide Pyramid advises consumers to choose a variety of foods within each of the five major food groups in order to get adequate amounts of essential nutrients. Food labels can help consumers with this task by helping them find foods that are especially good sources of vitamins A and C, calcium, iron, dietary fiber, and other vitamins and minerals if they are listed on the label. This information may be particularly useful to people who restrict their intakes of certain foods. For example, someone who limits intake of dairy products because of a milk allergy or lactose intolerance can use food labels to find other foods that are good sources of calcium.

The Food Guide Pyramid and the new food label are tools that consumers can use together to follow the advice presented in the Dietary Guidelines. However, questions

sometimes arise because of differences in serving sizes used on the label from those used in the food guide. The serving sizes on the label are based on reference amounts set by FDA and USDA. They are not intended to be recommendations of amounts people should eat. Rather, to meet a requirement of the NLEA, the reference amounts are intended to reflect what consumers customarily eat and therefore are based on food consumption data. However, the reference amounts are also intended to make labeled serving sizes across product lines more uniform so that consumers can more easily compare the nutrient content of products that are used interchangeably. Therefore, even though food consumption data shows that most Americans drink 1 cup of milk at a sitting, and 3/4 cup of juice at a sitting, the reference amount for serving sizes on food labels was set at 240 milliliters (1 cup) for all beverages. This standardization makes it easy for the consumer with a milk allergy to determine if calcium-fortified orange juice contains about the same amount of calcium as milk.

Like the serving sizes used on food labels, the serving sizes used in the Food Guide Pyramid are based on food consumption data. Food guide servings sometimes differ from labeled servings because they are also based on two additional considerations—nutrient content and traditional serving sizes used in previous food guides. Food guide serving sizes are not intended to be a prescribed amount to eat, but are intended to provide flexibility for consumers to eat in a way that suits their taste and lifestyle while meeting nutritional criteria (Welsh et al., 1992, 1993). They use units of measure (such as cups) that consumers can easily divide or multiply to determine the number of servings they actually eat.

Serving sizes used in the food guide were designed to ensure that persons consuming the minimum number of servings specified would get adequate amounts of essential nutrients. Therefore, serving sizes for foods within each food group were set so that a serving of food from that group would provide equivalent amounts of nutrients, regardless of the specific food chosen. For example, in the milk group, serving size was specified as an amount approximately equivalent in calcium content to 1 cup of milk. For meat alternates, 1/2 cup of cooked dry beans provides about the same amount of protein and minerals as 1 ounce of meat. Serving size for all ready-to-eat cereals was set at 1 ounce, based on carbohydrate content. For example, the carbohydrate content of 1 ounce of corn flakes (about 1-1/4 cups) is similar to that of 1 ounce of bran cereal (about 1/3 cup). In contrast, the serving sizes used on food labels were set to reflect the amount customarily consumed rather than equivalent **nutrient content**.

Tradition was also considered during the development of the food guide. Sometimes the serving size used in past food guides and the typical serving size found in recent surveys were not the same. For example, a typical serving reported in surveys for the grain group more nearly equates to 2 slices of bread or 1 cup of pasta. However, traditional serving sizes widely used in nutrition education materials have been 1 slice of bread and 1/2 cup of cereal or pasta. In addition, increasing the serving size from 1 to 2 slices of bread would reduce the minimum number of servings from the grain group in the new food guide from 6 to 3. This might give the erroneous impression that, compared to the “Basic Four” (which called for 4 servings from the grain group), the new food guide called for a reduction in grain product consumption. In this case, the decision was made to retain 1 slice of bread as the serving size (Welsh et al., 1992, 1993). On the label, most breads will have a serving size of 1 slice, but breads weighing less than 25 grams per slice, such as many “diet” breads, may have a labeled serving size of 2 slices.

Consumers can use the serving sizes presented in the Food Guide Pyramid to choose foods in the amounts needed from each food group to get the nutrients they need and not too many calories, or too much fat, saturated fat, cholesterol, sugar, sodium, or alcohol. When making food choices, they can use the serving size on the label to compare foods within each food group and to get specific information about the nutrient content of a food product. More information about serving sizes used on the new food labels is presented on pp. 7–9. The Food Guide Pyramid and the new food labels work together to help consumers follow the advice presented in the Dietary Guidelines.

An Overview of Current Nutrition Labeling Regulations

Labeling of fresh meat and poultry and most processed meat and poultry products is regulated by USDA under the authority of the Federal Meat Inspection Act and the Poultry Products Inspection Act. Labeling of most other products is regulated by FDA under the authority of the FD&C Act of 1938, as amended by the NLEA of 1990.

Key changes in food labels resulting from the new regulations are summarized below. More detailed information about the new regulations can be found in the appropriate chapter. For example, definitions of nutrient content claims related to fat can be found in the chapter “Choose a Diet Low in Fat, Saturated Fat, and Cholesterol.”

General requirements. Effective in 1994, nutrition labeling is required on almost all packaged and processed foods. Nutrition information is voluntary on most raw foods, including the 20 most frequently consumed fresh fruits and vegetables and raw fish and the most popular cuts of raw meat and poultry (see lists below). Voluntary nutrition information for raw foods may be provided at the point of purchase, for example, or on a poster, brochure, or tear-off sheet. FDA and FSIS have stated their intent to consider mandatory nutrition labeling programs for raw foods if at least 60 percent of retailers do not participate. FDA assessed compliance with the voluntary labeling of raw fruits, vegetables, and fish in 1993 and found that over 60 percent of retailers were participating. FSIS will evaluate participation in the voluntary program in 1995.

Nutrition information is required on most processed foods. However, some foods are exempt from the requirements:

- Foods produced by small businesses. (While FDA's and USDA's definitions of a small business differ somewhat, both are based on having fewer than a specified number of employees and producing less than a specified amount of product per year.)
- Food served for immediate consumption, such as in restaurants, hospital cafeterias, airplanes, and by food service vendors, such as mall or sidewalk vendors and vending machines. Under the regulations, restaurants that make nutrient content claims (such as "low fat" or "light") for foods they serve are required to ensure that the food meets FDA's definitions of these terms (for example, a "low fat" entree would have to have 3 grams of fat or less and no more than 30 percent of calories from fat per 100 grams).
- Ready-to-eat foods prepared on site, as in a bakery or deli.
- Foods shipped in bulk, as long as they are not for sale in that form to consumers. Foods sold to consumers from bulk containers must provide nutrition information, either on the container or on a counter card or sign.
- Plain coffee and tea, some spices, and other foods that contain no significant amounts of any nutrients.
- Foods sold in small packages, provided no nutrition claim is made on the label. USDA defines a small package as having a net weight of less than 1/2 ounce. FDA defines a small package as being less than 12 square inches in surface area (about the size of a single pack of chewing gum). FDA-regulated products in small packages must provide an address or telephone number for consumers to write or call to get nutrition information.

The required content of the nutrition label has changed. Food components which can be listed (and the order in which they are listed) are shown in the box below. The food components which are required are underlined. Other information (such as calories from carbohydrate or amounts of individual amino acids) may *not* be listed on the "Nutrition Facts" panel.

<u>calories</u>
<u>calories from fat</u>
calories from saturated fat
<u>total fat</u>
<u>saturated fat</u>
stearic acid (allowed only on meat and poultry products regulated by USDA)
polyunsaturated fat
monounsaturated fat
<u>cholesterol</u>
<u>sodium</u>
potassium
<u>total carbohydrate</u>
<u>dietary fiber</u>
soluble fiber
insoluble fiber
<u>sugars</u>
sugar alcohol (such as sorbitol or xylitol)
other carbohydrate (the difference between total carbohydrate and the sum of dietary fiber, sugars, and sugar alcohol if declared)
<u>protein</u>
<u>vitamin A</u>
percent of vitamin A present as beta-carotene
<u>vitamin C</u>
<u>calcium</u>
<u>iron</u>
other essential vitamins and minerals for which there is a label reference value

Serving sizes. As in the past, food labels report nutrient content in terms of serving size. However, in the past, manufacturers were allowed to set the serving size. Under the new regulations, serving sizes must be based on "Reference Amounts Customarily Consumed Per Eating Occasion." These reference amounts were set by FDA and USDA for 139 FDA-regulated product categories and 45 USDA-regulated categories. They were based on data from several national food consumption surveys which determined the amounts of these foods most commonly consumed in the United States. Requiring labeled serving sizes to be based on reference amounts ensures that serving sizes are consistent across all brands of similar products, so consumers can more easily make comparisons.

THE 20 MOST FREQUENTLY CONSUMED FRESH FRUITS

Banana, Apple, Watermelon, Orange, Cantaloup, Grape, Grapefruit, Strawberry, Peach, Pear, Nectarine, Honeydew melon, Plum, Avocado, Lemon, Pineapple, Tangerine, Sweet cherry, Kiwi fruit, Lime

THE 20 MOST FREQUENTLY CONSUMED FRESH VEGETABLES

Potato, Iceberg lettuce, Tomato, Onion, Carrot, Celery, Sweet corn, Broccoli, Green cabbage, Cucumber, Bell pepper, Cauliflower, Leaf lettuce, Sweetpotato, Mushroom, Green onion, Green (snap) bean, Radish, Summer squash, Asparagus

THE 20 MOST FREQUENTLY CONSUMED FISH

Shrimp, Cod, Pollock, Catfish, Scallop, Atlantic/coho salmon, Flounder, Sole, Oyster, Orange roughy, Atlantic/Pacific and jack mackerel, Ocean perch, Rockfish, Whiting, Clam, Haddock, Blue crab, Rainbow trout, Halibut, Lobster

MAJOR CUTS OF RAW MEAT AND POULTRY

Beef: Chuck blade roast, Loin top loin steak, Rib roast large end, Round eye round steak, Round top round steak, Round tip roast, Chuck arm pot roast, Loin sirloin steak, Round bottom round steak, Brisket, Rib steak small end, Loin tenderloin steak, Regular ground, Extra lean ground

Pork: Loin chop, Loin country style ribs, Loin top loin chop boneless, Loin rib chop, Spareribs, Loin tenderloin, Loin sirloin roast, Shoulder blade steak, Loin top roast boneless, Ground

Lamb: Shank, Shoulder arm chop, Shoulder blade chop, Rib roast, Loin chop, Leg

Veal: Shoulder arm steak, Shoulder blade steak, Rib roast, Loin chop, Cutlets

Chicken: Whole*, Breast, Wing, Drumstick, Thigh

Turkey: Whole*, Breast, Wing, Drumstick, Thigh

* without neck and giblets. Separate nutrient panels for white and dark turkey meat are permitted as an option.

The nutrition information on the label is based on the labeled serving size, not on the reference amount. The serving size must generally use the common household measure, such as cups, tablespoons, pieces, or ounces, coming closest to the reference amount, which is usually given in metric units of measure, such as grams or milliliters. For example, the reference amount for most beverages is 240 milliliters, but on the label, the serving size is listed as “8 fluid ounces (240 milliliters).”

The serving size for items that come in individual units, such as cookies, frankfurters, or candies, is the number of whole units that comes closest to the reference amount. For example, the reference amount for cookies is 30 grams. If a certain brand of cookie weighs 14 grams each, the serving size listed on the label is 2 cookies (28 grams).

For foods that are divided into sections before eating, such as pizza or melon, the serving size is the fraction that comes closest to the reference amount, for example one-fourth of a pizza or one-third of a melon. For meal and main dish products that come in single-serving containers, the serving size must be the entire contents of the package (in the past, such containers could be labeled as having smaller multiple servings, which gave a misleading impression of the nutrient content). FDA and USDA differ slightly in their definitions of meal and main dish products, but in general these refer to products weighing at least 6 ounces and containing ingredients from at least two of four food groups—bread, cereal, rice and pasta; fruits and vegetables; milk, yogurt, and cheese; and meat, poultry, fish, dry beans, eggs, and nuts.

To help consumers visualize the serving size, nutrition labels also indicate how many servings are in each container. On packages containing between two and five servings the number of servings can be rounded to the nearest 0.5 serving. On all other packages, the number of servings must be rounded to the nearest whole number. With some exceptions, foods sold in individual packages which contain less than 200 percent of the reference amount must list the entire contents as one serving. For example, a 12-fluid-ounce (360 milliliter) can of soda contains 150 percent of the reference amount (240 milliliters) for beverages and therefore contains one serving. Random weight products such as meats and cheeses can state “varied” for the number of servings if nutrition information is expressed in ounces closest to the reference amount.

Daily Reference Values (DRV’s) and Reference Daily Intakes (RDI’s). These terms refer to the dietary standards that were created to serve as reference amounts for nutrition

labeling. In order to make label reading easier for consumers, both references are listed on the label as Daily Values.

Daily Reference Values (DRV’s) were established by FDA for total fat, saturated fat, cholesterol, sodium, potassium, total carbohydrate, dietary fiber, and protein. Reference Daily Intakes (RDI’s) were established for vitamins and minerals. DRV’s for fat, saturated fat, total carbohydrate, protein, and dietary fiber are based on the number of calories consumed per day. A daily intake of 2,000 calories was chosen for the reference for several reasons. It is a round number which is easy to use in quick mental calculations. It also represents an appropriate number of calories for weight maintenance for many American women, who are relatively inactive, and for very inactive men. Reference amounts based on daily intakes of 2,000 and 2,500 calories are shown at the bottom of larger food labels. The DRV’s and RDI’s are listed in table 2. Methods for calculating the DRV’s are shown below.

- The DRV for fat is based on 30 percent of calories and is 65 grams for a 2,000 calorie intake ($2,000 \times 0.30 = 600$ calories from fat; $600 \text{ calories from fat} \div 9 \text{ calories per gram of fat} = 67 \text{ grams of fat}$, rounded to 65 for use on the label).
- The DRV for saturated fat is based on 10 percent of calories and is 20 grams for a 2,000 calorie intake ($2,000 \times 0.10 = 200$ calories from saturated fat; $200 \text{ calories from saturated fat} \div 9 \text{ calories per gram of fat} = 22 \text{ grams of saturated fat}$, rounded to 20 for use on the label).
- The DRV for carbohydrate is based on 60 percent of calories, and is 300 grams for a 2,000 calorie intake ($2,000 \times 0.6 = 1,200$ calories from carbohydrate; $1,200 \text{ calories from carbohydrate} \div 4 \text{ calories per gram of carbohydrate} = 300 \text{ grams of carbohydrate}$).
- The DRV for protein is based on 10 percent of calories, and is 50 grams for adults and children over 4 years of age eating 2,000 calories a day ($2,000 \times 0.10 = 200$ calories from protein; $200 \text{ calories from protein} \div 4 \text{ calories per grams of protein} = 50 \text{ grams of protein}$). RDI’s for protein for infants under 1 year of age, children 1 to 4 years of age, and pregnant and lactating women have been established based on the 1989 Recommended Dietary Allowances (RDA’s) issued by the National Academy of Sciences because these groups have special protein needs for growth and development. Note that the label reference value for protein is a recommended **minimum** intake. People eating the minimum numbers of servings from the major food groups recommended by the Food Guide Pyramid will be getting more than 50 grams of protein per day in their diets.

Table 2.—Daily Values*

Daily Reference Values		Reference Daily Intakes	
Food Component	Amount	Nutrient	Amount
total fat	65 grams	vitamin A	5,000 International Units
saturated fat	20 grams	vitamin C	60 milligrams
cholesterol	300 milligrams	calcium	1.0 gram
total carbohydrate	300 grams	iron	18 milligrams
dietary fiber	25 grams	vitamin D	400 International Units
sodium	2,400 milligrams	vitamin E	30 International Units
potassium	3,500 milligrams	thiamin	1.5 milligrams
protein**	50 grams	riboflavin	1.7 milligrams
		niacin	20 milligrams
		vitamin B ₆	2.0 milligrams
		folate	0.4 milligrams
		vitamin B ₁₂	6 micrograms
		biotin	0.3 milligrams
		pantothenic acid	10 milligrams
		phosphorus	1.0 gram
		iodine	150 micrograms
		magnesium	400 milligrams
		zinc	15 milligrams
		copper	2 milligrams

* Daily Reference Values are based on a daily intake of 2,000 calories and are for adults and children over 4 only. See pp. 9–11 for a discussion of how these values were derived. Reference Daily Intakes are based on National Academy of Sciences' 1968 Recommended Dietary Allowances.

**Reference Daily Intakes for protein have been established for the following special groups: infants under 1 year: 14 grams; children 1 to 4 years: 16 grams; pregnant women: 60 grams; nursing mothers: 65 grams.

- The DRV for fiber is based on 11.5 grams of fiber per 1,000 calories, and is 25 grams for a 2,000 calorie diet (11.5 grams of fiber per 1,000 calories x 2 = 23 grams of fiber, rounded to 25 grams for use on the label).
- The DRV for cholesterol is 300 milligrams regardless of daily calorie intake.
- The DRV for sodium is 2,400 milligrams regardless of daily calorie intake.
- The DRV for potassium is 3,500 milligrams regardless of daily calorie intake (potassium is an optional label element).

The RDI's are the same as the U.S. RDA's, which were label reference values for vitamins and minerals based on the 1968 RDA's issued by the National Academy of Sciences. The name was changed to avoid confusion of label reference values with the RDA's. The Dietary Supplement Act of 1992 prohibited FDA from changing label reference values for vitamins and minerals before the end of 1993. Since that prohibition has now expired, FDA can propose updated reference values in the future.

Nutrition Label Format. The format for presenting nutrition information has also changed. An example of the new format for larger labels (those of 40 or more square inches in area) is shown in figure 2. The nutrition information heading has been changed from "Nutrition Information Per Serving" to "Nutrition Facts."

The "%Daily Value" information tells consumers about the individual food's contribution toward a 2,000-calorie diet. A "%Daily Value" figure is optional for protein. Calculation of the percentage of the Daily Value supplied by the food is dependent on amino acid profile and protein digestibility as well as quantity. Because these analyses are costly and protein deficiency is not a public health problem in the United States, FDA decided not to make the listing of "%Daily Value" mandatory for protein.

FDA did not establish a Daily Value for sugars because health experts have not identified a dietary level above which consumption of total sugars has been demonstrated to increase the risk of disease. Therefore, there is no "%Daily Value" for sugars on the label. The Food Guide Pyramid does suggest upper limits of **added** sugars intake (USDA/HNIS, 1992). These limits were set to ensure that nutrient needs are met without providing excessive calories. As noted previously, the amount of sugars listed on the label is for **total** sugars (including sugars added during manufacturing) rather than just **added** sugars. Consumers can consult the

ingredient listing on the label to see if sugars have been added to the food (see pp. 59–60 for label-reading tips related to sugars content).

The percent Daily Value for vitamins and minerals contained in one labeled serving of the food is listed below the information for other nutrients. Absolute amounts of vitamins and minerals are not listed. On larger labels, the bottom of the panel contains a footnote which provides reference values for total fat, saturated fat, cholesterol, sodium, total carbohydrate, and dietary fiber based on daily intakes of 2,000 and 2,500 calories. Information about the caloric content of protein, fat, and carbohydrate may also be provided at the bottom of the panel, but is not required. This information can help consumers compare their individual nutrient needs to the Daily Values used on the label.

Some variations in the format are allowed. FDA allows labels that are between 12 and 40 square inches in area to omit the footnoted information, but they must state that the Daily Values are based on a 2,000-calorie daily intake. An example of one type of shortened format allowed is shown in figure 3. As previously stated, labels on small packages are not required to provide nutrition information unless a nutrition claim (such as "high in vitamin C") is made.

A simplified format can be used on products regulated by FDA when a serving of the food contains insignificant amounts of seven or more of the mandatory nutrients or total calories (figure 4). An "insignificant amount" is defined as an amount that could be listed as zero (or "less than 1 gram" in the case of carbohydrate, dietary fiber, and protein). The simplified format must still list total calories, total fat, total carbohydrate, protein, and sodium, even when they are present in insignificant amounts. Other nutrients present in significant amounts and nutrients which have been added to the food must also be listed.

USDA allows a simplified format when one or more nutrients other than calories, total fat, sodium, total carbohydrate, or protein are present in an insignificant amount (figure 5). The insignificant nutrient(s) can be omitted, but a statement such as "not a significant source of" must appear on the "Nutrition Facts" panel. Footnoted information can be omitted when the simplified format is used.

Other variations in the format are required for certain foods. Foods for children under 4 years of age do not contain a %Daily Value listing for total fat, saturated fat, cholesterol, total carbohydrate, sugars, dietary fiber, and sodium, because Daily Values have not been established for this age group.

Additionally, foods for children under 2 years of age cannot provide information about fatty acid and cholesterol content, because infants and toddlers should not restrict their intake of these nutrients, which are needed for adequate growth and development. An example of a label for a food specifically intended for children under 2 years of age is shown in figure 6. Infant formula is not covered under these regulations, but has special labeling rules under the Infant Formula Act of 1980.

Nutrient content claims. The new regulations define terms which may be used to describe the nutrient content of foods. Some of the nutrient content claims which have been defined are “free,” “low,” “lean,” “extra lean,” “high,” “good source,” “reduced,” “less,” “fewer,” “light” or “lite,” and “more.” The specific definitions of these terms depend on the food component being described. For instance, “low fat” means the product contains 3 grams or less of fat per reference amount, and “low calorie” means the food contains 40 or fewer calories per reference amount. When a claim applies to all foods in a particular class, the claim must clearly refer to all foods of its type and not to a specific brand. In other words, a claim may state “broccoli, a high vitamin A food,” but not “Green Thumb Broccoli, high in vitamin A.”

Specific definitions for each of the nutrient content claims will be provided in the appropriate chapter. For example, definitions relating to fat content can be found in the chapter “Choose a Diet Low in Fat, Saturated Fat, and Cholesterol.”

Health claims. Claims for relationships between a nutrient or a food and the risk of a disease or health-related condition will be allowed for the first time on products regulated by FDA. USDA is not currently allowing health claims on meat and poultry labels but is in the process of evaluating the use of health claims on a case-by-case basis. The allowed claims concern the following relationships:

- calcium and a reduced risk of osteoporosis
- dietary fat and an increased risk of cancer
- dietary saturated fat and cholesterol and an increased risk of coronary heart disease
- fiber-containing grain products, fruits, and vegetables and a reduced risk of cancer
- fruits, vegetables, and grain products that contain fiber, particularly soluble fiber, and a reduced risk of coronary heart disease
- sodium and an increased risk of high blood pressure
- fruits and vegetables and a reduced risk of cancer

Figure 2

Basic Label Format

Nutrition Facts	
Serving Size 1 cup (228g)	
Servings Per Container 2	
Amount Per Serving	
Calories 260 Calories from Fat 120	
	% Daily Value*
Total Fat 13g	20%
Saturated Fat 5g	25%
Cholesterol 30mg	10%
Sodium 660mg	28%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A 4%	• Vitamin C 2%
Calcium 15%	• Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram: Fat 9 • Carbohydrate 4 • Protein 4	

Source: Food and Drug Administration

Figure 3

Tabular Format, for use on labels less than 40 square inches in size.

Nutrition Facts	Amount/serving	% DV*	Amount/serving	% DV*
	Serv. Size 1/3 cup (56g) Servings about 3 Calories 80 Fat Cal. 10	Total Fat 1g	2%	Total Carb. 0g
	Sat. Fat 0g	0%	Fiber 0g	0%
	Cholest. 10mg	3%	Sugars 0g	
	Sodium 200mg	8%	Protein 17g	
*Percent Daily Values (DV) are based on a 2,000 calorie diet.	Vitamin A 0% • Vitamin C 0% • Calcium 0% • Iron 6%			

Source: Food and Drug Administration

Figure 4

FDA Simplified Format (soft drink).

Nutrition Facts	
Serving Size 1 can (360 mL)	
Amount Per Serving	
Calories 140	
% Daily Value*	
Total Fat 0g	0%
Sodium 20mg	1%
Total Carbohydrate 36g	12%
Sugars 36g	
Protein 0g	
* Percent Daily Values are based on a 2,000 calorie diet.	

Source: Food and Drug Administration

Figure 5

USDA Simplified Format

Nutrition Facts	
Serving Size 1 Tbsp (14g) Servings Per Container 64	
Amount Per Serving	
Calories 130 Calories from Fat 130	
% Daily Value*	
Total Fat 14g	22%
Saturated Fat 2g 10%	
Sodium 0mg	0%
Total Carbohydrate 0g	0%
Protein 0g	
Not a significant source of cholesterol, dietary fiber, sugars, vitamin A, vitamin C, calcium, and iron.	
* Percent Daily Values are based on a 2,000 calorie diet.	

Source: Food Safety and Inspection Service, USDA

Figure 6

Format for Product Specifically for Children Less Than 2 Years of Age

Nutrition Facts	
Serving Size 1 jar (140g)	
Amount Per Serving	
Calories 110	
Total Fat	0g
Sodium	10mg
Total Carbohydrate	27g
Dietary Fiber 4g	
Sugars 18g	
Protein	0g
% Daily Value	
Protein 0%	• Vitamin A 6%
Vitamin C 45%	• Calcium 2%
Iron 2%	

Source: Food and Drug Administration

- folate intake in women of childbearing age and reduced risk of neural tube defects in infants

FDA is currently considering allowing claims concerning the relationship between antioxidant vitamins and reduced risk of cancer. This or other claims may be approved in the future if there is significant scientific agreement concerning the relationship described by the claim.

Foods that exceed the disqualifying levels of total fat, saturated fat, cholesterol, and sodium are prohibited from making any health claims. Disqualifying levels for most foods are 13 grams of total fat, 4 grams of saturated fat, 60 milligrams of cholesterol, or 480 milligrams of sodium per reference amount customarily consumed, per labeled serving, and per 50 grams if the reference amount is 30 grams or less or 2 tablespoons or less. For example, a food that is high in calcium but has more than 13 grams of fat per reference amount cannot make a health claim about calcium and osteoporosis. Disqualifying levels are somewhat higher for meal and main dish products and are based on labeled serving size. In addition to these requirements, the food must also contain 10 percent or more of the Daily Value of one or more of the following nutrients per Reference Amount Customarily Consumed prior to any nutrient addition: vitamin A, vitamin C, iron, calcium, protein, or fiber. This last requirement was made to limit the use of health claims to foods that make positive nutritional contributions to the diet. Information regarding specific requirements for each health claim is presented in the appropriate chapter; for example, information on health claims related to fruit and vegetable intake is presented in the chapter “Choose a Diet With Plenty of Vegetables, Fruits, and Grain Products.”

Ingredient labeling. Requirements for listing ingredients on food labels have also changed. Previously, foods regulated by FDA which conformed to the Federal standard of identity, such as catsup and ice cream, did not have to list mandatory ingredients on the label. USDA has always required a complete listing of ingredients on all the products it regulates. Now, all foods are required to list ingredients on the label. These changes have been made to help consumers who have sensitivities to certain food ingredients identify the presence of those ingredients in a food. New information which must be specified on foods regulated by FDA include:

- FDA-certified color additives must be specified by name, such as “FD&C Blue No. 1”
- Protein hydrolysates must be specified by name, such as “hydrolyzed soy protein”

- Caseinate must be listed as a milk derivative in the ingredient listing of non-dairy foods, such as coffee whiteners.

Changes have also been made in the way ingredients must be listed on the labels of beverages containing fruit or vegetable juices. The percentage of total juice in the product must be declared. If the beverage has less than 100 percent juice, it must be called a “juice beverage” or “juice drink.” When the predominantly named juice is present in minor amounts, the product’s name must state that the beverage is flavored with that juice or declare the amount of the juice in a 5-percent range. For example, a product containing only a small amount of raspberry juice may be called a “raspberry-flavored juice blend” or “juice blend, 2 to 7 percent raspberry juice,” but may not be called “raspberry juice.”

Key Dietary Guidance Issues

New food labels contain a wealth of information. In order to help consumers make the best use of this information, several key areas for providing dietary guidance have been identified:

- New food labels are appearing on foods and will soon be on most processed and packaged foods.
- The new labels are a tool consumers can use to choose foods within each food group shown in the Food Guide Pyramid. The label provides the nutritional information consumers need to compare foods within food groups in the Pyramid and to make choices that fit into a healthy diet that meets recommendations expressed in the Dietary Guidelines for Americans.
- The serving sizes listed on the label are based on reference amounts set by the Federal Government. Serving sizes reflect more closely the amounts of food that people usually eat. Label serving sizes are now similar across similar product lines (for example, 8 fluid ounces for all beverages), so that consumers can compare the nutrient content of foods more easily.
- The “%Daily Value” listed on the “Nutrition Facts” panel of the label tells consumers about the nutrient content of the food. The “%Daily Value” shows how the amount of nutrient in one serving of the food compares to the amount recommended for a person eating 2,000 calories a day. Consumers can use this figure to compare foods and to keep track of their daily intake of a particular nutrient, such as fat.

- Nutrient content claims such as “light,” and health claims concerning the relationship between a nutrient or food and the risk of a disease are now regulated by the Federal Government. Consumers can use them with confidence to make more healthful food choices. However, a food that does not contain a nutrient content claim or health claim on the label is not necessarily “unhealthy.”

Eat a Variety of Foods

Rationale for the Guideline

Variety is the framework of a healthy diet. There are more than 40 different nutrients essential for good health, including vitamins, minerals, amino acids (protein), certain fatty acids (fat), and sources of calories (protein, carbohydrates, and fat). No single food provides all the necessary nutrients in the amounts we need. Some foods are rich in certain nutrients, but lacking in others. For example, milk is high in calcium but low in iron; meat is a good source of iron, but provides little calcium. To have a nutritious diet, one must eat a variety of different foods.

The best way to ensure variety—and a nutritious diet—is by choosing appropriate amounts of foods from the five major groups each day. Vegetables and fruits provide vitamins A and C, folate, fiber, and some minerals. Breads and cereals supply B vitamins, iron, protein, and fiber. Milk is an important source of protein, B vitamins, vitamins A and D, calcium, and phosphorus. Meat provides protein, B vitamins, iron, and zinc.

Any food that supplies calories and nutrients can be part of a nutritious diet. The content of the total diet is what counts.

Specific Recommendations

USDA's Food Guide Pyramid (p. 2) gives an outline of what and how much to eat each day for good health (USDA and DHHS, 1992). It emphasizes a variety of foods that people can use to plan a nutritious diet that is right for them. The five major food groups are 1) breads, cereals, rice, and pasta; 2) vegetables; 3) fruits; 4) milk, yogurt, and cheese; and 5) meat, poultry, fish, dry beans, eggs, and nuts. See pp. 2–6, for more information about the Food Guide Pyramid.

For most people, the nutrients needed for good health should come from a variety of foods rather than from highly-fortified foods or vitamin and mineral supplements. Large-dose supplements of nutrients can be harmful. Supplements at or below the Recommended Dietary Allowances (RDA) are safe but generally are not needed if you choose a variety of foods. Also, foods may have naturally-occurring compounds other than the known vitamins and minerals which may have beneficial health effects. Supplements will not provide these—that is why the Dietary Guidelines emphasize eating a *variety* of foods.

Trends in Dietary Intakes

How varied is the American diet and how has it changed in recent years? Do average nutrient intakes meet the Recommended Dietary Allowances (RDA's)? If not, what nutrients are of concern?

To answer these questions, the U.S. Department of Agriculture, as a part of the National Nutrition Monitoring System (NNMS), collects data on the food and nutrient intakes of individuals at regular intervals. Data from the 1989 and 1990 Continuing Survey of Food Intakes by Individuals (CSFII) conducted by USDA provide information on the type and quantity of foods individuals ate during 3 consecutive days. These data can be compared with data collected in 1977-78 by USDA's Nationwide Food Consumption Survey (NFCS) to assess trends in dietary intakes.

For both NFCS 1977-78 and CSFII 1989-90, up to 3 days of dietary intake data were collected from each survey participant. Trained interviewers collected 1 day of dietary intake data from survey participants using the dietary recall method. Survey participants then were asked to keep a record of subsequent food intake for the next 2 days. The estimates of food and nutrient intakes presented in this section are weighted averages of the 3 days of data collected unless otherwise noted.

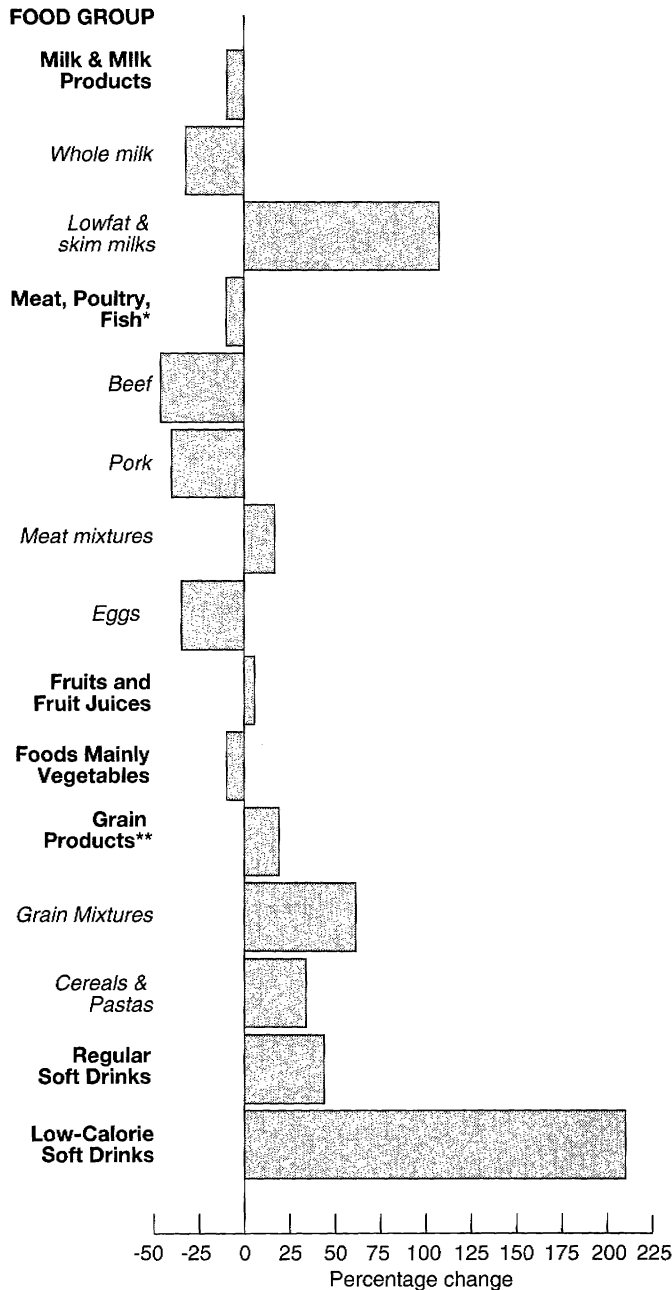
Trends in food consumption. Between NFCS 1977-78 and CSFII 1989-90, consumption of major food groups shifted and the types of foods within a food group that were most consumed also changed. (Figure 7 provides a graphic overview of changes in food consumption.) When food consumption patterns were examined in terms of the Food Guide Pyramid food groups, the following trends were seen:

- **Milk, Yogurt, and Cheese Group.** Consumption of milk and milk products declined by about 9 percent. In 1977-78, average consumption of milk and milk products by all individuals was 322 grams per day. By 1989-90, average consumption had dropped to 292 grams per day (one cup of milk weighs 245 grams, one cup of yogurt weighs 227 grams, and 1-1/2 ounces of natural cheese weighs 42 grams). Average consumption of cheeses and milk desserts (ice cream, ice milk, frozen yogurt, etc.) was virtually unchanged between the two time periods. There was a shift to more consumption of low fat and skim milks. In 1977-78, about one-third of the milk drunk was low fat or skim; by 1989-90, low fat and skim milks accounted for about 60 percent of the milk consumed. Older age groups generally drank larger proportions of their milk as low fat or skim milk (Enns et al., 1994).

Figure 7

Shifts in Food Group Consumption, 1977-78 to 1989-90.

Source: NFCS 1977-78 and CSFII 1989-90; 3-day data.



* Includes fresh and cured meat, poultry, fish, and mixtures mainly meat, poultry, or fish (meat mixtures).

**Includes yeast breads and rolls, other baked goods, cereals and pastas and mixtures mainly grain (grain mixtures)

- Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group.** There was a slight decrease in total intake of meat, poultry, and fish. For all individuals, average daily consumption of meat, poultry, fish, and mixed dishes in which meat, poultry, or fish were the main ingredients (casseroles, stews, stir-frys, sandwiches, etc.) declined by about 10 percent. The biggest decline was in consumption of beef and pork as separate entrees (such as steaks or roasts); consumption of these items dropped by over 40 percent.

The biggest increase was in consumption of mixed foods in which meat, poultry, or fish were the main ingredients (meat mixtures). Consumption of these foods increased by over 15 percent. There was little change between the two survey periods in the consumption of poultry; fish and shellfish; and frankfurters, sausages, and luncheon meats (Enns et al., 1994).

Egg consumption decreased by about 35 percent, going from an average intake of eggs by all individuals of 26 grams per day in 1977-78 to 17 grams per day in 1989-90—about one-third of the weight of one large egg (the figure reported here does not include eggs added to baked products, casseroles, etc.). About 40 percent of individuals reported consuming eggs at least once in 3 days in 1989-90, down from 55 percent in 1977-78. In 1989-90, the individuals most likely to report consuming eggs were children 1 to 2 years old, men 20 to 39 years of age, men 60 years of age and over, blacks, and low-income people (people with incomes at or below 130 percent of the poverty level) (Enns et al., 1994).

Dry beans and peas (legumes), nuts, and seeds continue to play only a small part in the American diet. The average intake of these foods by all individuals was 26 grams/day in 1977-78; in 1989-90, it was 24 grams/day (1/2 cup of cooked dry beans weighs about 90 grams). In 1989-90, only about 25 percent of individuals ate legumes at least once over the 3-day period of the survey (Enns et al., 1994).

- Fruit Group.** There appears to be only a slight increase in the level of fruit consumption. For all individuals, the average intake of fruits and fruit juices was 150 grams per day, up from 142 grams per day in 1977-78 (1 medium apple weighs about 140 grams, 3/4 cup of orange juice weighs about 185 grams, and 1/2 cup of canned, sliced peaches weighs about 125 grams). In 1989-90, more than a quarter of all individuals ate no fruit and drank no fruit juice during the three consecutive days of the survey. A larger proportion of low-income people (33 percent) than of high-income people (23 percent) ate no fruit (Enns et al., 1994).

- **Vegetable Group.** Consumption of foods in which vegetables (not including legumes) were the main or only ingredient (steamed vegetables, tossed salad, etc.) declined slightly, from an average of 198 grams/day for all individuals in 1977-78 to an average of 179 grams/day in 1989-90 (1/2 cup of cooked, chopped broccoli weighs about 90 grams, 1 cup of lettuce weighs about 55 grams, and 10 french fries weigh about 50 grams). In both surveys, white potatoes accounted for about one-third of vegetable consumption. Overall, in 1989-90, about 15 percent of the intake of white potatoes was french fries (Enns et al., 1994).

The decline in consumption of vegetables as a primary ingredient was probably at least partially offset by increased consumption of vegetables as secondary ingredients in "mixed" or "combination" foods, especially meat- or grain-based mixtures such as casseroles, stews, stir-frys, sandwiches, pizzas, and pastas. Consumption of these foods increased between 1977-78 and 1989-90, and many of them contain substantial amounts of vegetables. When USDA researchers calculated total consumption of vegetables, considering foods in which vegetables were the main ingredient and several types of mixed foods in which vegetables were secondary ingredients, it was found that mixed foods added substantially to vegetable consumption, contributing about one-fifth of the total vegetable intake (Guthrie et al., 1993; based on 1-day intake data).

- **Bread, Cereal, Rice, and Pasta Group.** Consumption of grain products such as bread, cereal, rice, pasta, and grain-based mixtures such as pizza is up. Consumption increased from 213 grams in 1977-78 to 254 grams in 1989-90 (1 slice of bread weighs about 25 grams, 1/2 cup of cooked spaghetti weighs about 70 grams, and 1 ounce of ready-to-eat cereal weighs 28 grams). Consumption of grain mixtures accounted for much of the increase, but consumption of cereals and pasta also increased (figure 7).
- **Fats, Oils, and Sweets.** Reported consumption of fats and oils added at the table or in cooking changed little between 1977-78 and 1989-90, averaging 13 grams/day for all individuals in 1977-78 and 15 grams/day in 1989-90—this amount is roughly equivalent to 3-1/2 teaspoons of fat. However, data from previous USDA surveys indicate that many people may be consuming substantial amounts of "hidden" fats and oils that are part of mixed dishes and prepared foods (Krebs-Smith et al., 1990).

The biggest change in consumption of sugary and sweet foods was the rise in soft drink consumption. Between 1977-78 and 1989-90, average consumption of regular soft drinks by all individuals increased by 45 percent, from 121

grams/day (about one third of a 12-ounce can of soda) to 176 grams/day (about one half of a 12-ounce can). Although regular soft drinks remained the predominant choice of consumers, consumption of low-calorie soft drinks rose dramatically, increasing by 210 percent between 1977-78 and 1989-90 (figure 7).

Do Average Nutrient Intakes Meet Recommendations?

Does the variety of foods consumed provide individuals with recommended amounts of essential nutrients? The Food and Nutrition Board (FNB) of the National Academy of Sciences has established Recommended Dietary Allowances (RDA's) for essential nutrients (FNB, 1989). The RDA's are recommended allowance levels for population groups, not individual requirements, and are intentionally set high to cover the needs of almost everyone in a given age-sex group. Therefore, nutrient intakes below the RDA's do not necessarily mean that intakes are below requirements or that physiological nutritional deficiencies necessarily exist. However, when a population group consumes, on average, lower than recommended amounts of a given nutrient, it may indicate a need for dietary guidance that promotes consumption of foods that are good sources of the nutrient.

Using CSFII 3-day data, USDA has compared intakes of energy and of 15 vitamins and minerals to the 1989 RDA's. For nearly all age, income, and race groups, reported energy levels were below the average energy allowances recommended in the 10th edition of the RDA's (NAS, 1989). However, there is some evidence that people in nutrition surveys underreport the food they eat (Mertz et al., 1991). It is not known whether this effect is due to the omission of food items or to underestimation of the amount eaten. Reported energy intakes below the RDA's may also be explained by the fact that the RDA's for energy are designed for a light-to-moderate level of physical activity. It is possible that many Americans' level of physical activity is lower than light-to-moderate.

For most age-sex groups, average intakes exceeded the RDA's for the following nutrients: protein, vitamin A, vitamin C, thiamin, riboflavin, niacin, folate, vitamin B-12, and phosphorus. However, a recommendation that women of childbearing age consume 400 micrograms of folate daily (higher than the current RDA of 180 micrograms) was recently issued by the U.S. Public Health Service (DHHS/PHS/CDC, 1992). This recommendation was based on research that indicated that women who consume 400 micrograms of folate daily have a lower risk of having children born with neural tube defects. Folate intakes of women ages 15-50 were compared to the new higher recom-

mended levels. Average folate intakes of women in this age group was 203 micrograms per day, only about half of the PHS recommendation. There were no appreciable differences in folate intake among low, medium, and high-income women.

Of the other nutrients for which average intakes of some groups were below recommendations, calcium and iron are of special concern. The U.S. National Nutrition Monitoring System has identified low intakes of these nutrients as a current public health concern (Life Sciences Research Office (LSRO), 1989). Calcium, which is necessary for developing and maintaining healthy bones, was consumed in lower than recommended amounts by all females ages 12 years and over. Calcium intakes were particularly low among female teens (12-19 years) and young women (20-29 years). These groups consumed, on average, only about two-thirds of their RDA for calcium.

Lower than recommended iron intakes are a particular problem for female teenagers and women in their childbearing years. Iron intakes of females 12-19 years of age averaged 77 percent of their RDA. Women 20-49 years of age consumed about 73 percent of their RDA for iron, on average.

Average intakes of zinc were below the RDA for all age-sex groups excluding infants. Vitamin B-6 intakes, on average, fell below recommendations for adult men and women (20 years of age and over). Females 12-19 years of age also averaged lower than recommended vitamin B-6 intakes. Zinc and vitamin B-6 have both been identified by the NNMS as potential public health concerns, because intakes of many population groups fall below recommendations and thus the potential health effects of lower than recommended intakes warrant further study (LSRO, 1989). Intakes of magnesium and vitamin E were also below recommendations for several age-sex groups.

What About Vitamin-Mineral Supplements? The Dietary Guidelines caution that supplements of some nutrients taken regularly in large amounts can be harmful. Vitamin and mineral supplements at or below the RDA level are safe but are not a substitute for a nutritious, varied diet.

How common is supplement use? In response to a question in CSFII 1989-90, approximately 3 out of 10 adults 20 years of age and over reported using vitamin/mineral supplements “every day” or “almost every day.” Supplement use was

more commonly reported by women than by men. Interestingly, previous research indicates that individuals who use vitamin-mineral supplements tend to consume diets that are higher in nutrients from food alone than the diets of those who don’t use supplements (LSRO, 1989).

Current Beliefs and Misconceptions

What springs to mind when people hear the advice “eat a variety of foods”? And, what do they think is a “healthy” diet? Are there barriers to change stemming from misconceptions? This section will address these issues.

Importance of guideline and self-assessment of diet. In the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b), main meal planners/preparers were asked how important eating a variety of foods was to them personally. Seventy-three percent rated it of high importance, 22 percent rated it of moderate importance, and 5 percent rated it of low importance. When asked to assess their own diets for variety as compared with what was most healthful, 70 percent of these DHKS respondents felt their diets were “about right.” In fact, 60 percent agreed that there was no need to make dietary changes because they viewed their diets as healthy. However, this general view of dietary adequacy and importance did not seem to carry down to the more specific food guide recommendations, which help define the “variety” Guideline. For example, one-quarter of DHKS respondents indicated it was of low importance to them to eat at least five servings a day of fruits and vegetables. Similarly, about one-quarter said it was of low importance to eat at least six servings a day of grain products. So, while the respondents may be motivated to “eat a variety of foods,” they may need more knowledge about what this really means.

Interpretation of “healthy” diet. Healthy eating. What does it mean? For many people, it is associated with a “good” food versus “bad” food misperception. The American Dietetic Association’s (ADA) “Survey of American Dietary Habits” (ADA, 1993) found that 75 percent of respondents believed this dichotomy existed among foods. This misconception might discourage people from improving their diets by leading them to believe that “healthy eating” means eliminating their favorite foods. Indeed, the International Food Information Council’s (IFIC) survey on “How Americans are Making Food Choices” (Gallup Organization, 1994) noted that over one-fourth of respondents still held this misconception. About 30 percent of respondents agreed with

the statement that foods that are good for you do not taste good, and three-quarters agreed with the statement that there are too many conflicting reports about nutrition. Three-quarters of the DHKS respondents generally agreed with a similar statement (“There are so many recommendations about healthy ways to eat, it’s hard to know what to believe.”). Forty-two percent agreed strongly. The challenge to nutrition educators is to demonstrate to people that making dietary improvements doesn’t have to be difficult or require major lifestyle changes.

The supplement alternative. The Guideline on variety emphasizes eating foods each day from the five major food groups to ensure a nutrient-rich diet for good health. It does not emphasize obtaining essential nutrients from a few highly fortified foods or supplements. When DHKS respondents were asked about the concept of variety, 81 percent generally agreed and 39 percent “strongly agreed” with the statement: “Eating a variety of foods each day probably gives you all the vitamins and minerals you need.” However, when respondents were questioned about supplements, one-quarter of the DHKS sample generally agreed with the statement: “If you take a vitamin-mineral supplement each day, eating a variety of foods is not necessary.”

Label Information Related to the Guideline

Nutrition information will be available on virtually all foods by summer, 1994, either at the point of purchase for fresh fruits and vegetables, and raw meat, poultry, and fish or on the Nutrition Facts panel for processed foods. The Nutrition Facts panel lists the amounts of total calories, calories from fat, total fat, saturated fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugars, protein, vitamin A, vitamin C, calcium, and iron contained in a serving of the food. The amounts of these nutrients are then compared to standards for healthy Americans, called Daily Values. For more information about the nutrition label and Daily Values, see pp. 9–11.

It is not necessary to rely on a few highly fortified foods or supplements which provide 100 percent of the Daily Value of the nutrients listed on the label. Not all essential nutrients are required to be listed on the label, and no single food can supply all nutrients in the amounts needed. Eating a variety of foods from the five major food groups provides the average person with adequate amounts of the nutrients listed on the nutrition panel, as well as “unlisted” nutrients. See the Food Guide on pp. 2–3 for a listing of the major food groups and the recommended number of servings from each group.

Nutrient content claims—“good source,” “high in,” and “more than.” These claims are generally used to emphasize the content of beneficial nutrients. They can be used to help consumers identify food sources of nutrients. For example, an individual who cannot eat dairy products might look for alternative sources of calcium by searching for food products labeled as being “high” in calcium. Definitions of these claims are presented in table 3.

Health claims. Health claims concerning the relationship of calcium intake to prevention of osteoporosis can help consumers identify good food sources of calcium. Such claims may appear on the labels of foods regulated by FDA that provide at least 20 percent of the Daily Value (at least 200 milligrams) of calcium per reference amount and on the labels of supplements that provide at least 200 milligrams of usable calcium (based on U.S. Pharmacopeia standards). Because current research evidence shows that diets high in phosphorus and low in calcium have an adverse effect on hormonal factors that regulate calcium and bone metabolism, there must not be more phosphorus than calcium in the food or supplement.

Foods using the calcium-osteoporosis claim on the label must also meet general requirements for the use of health claims (see pp. 12–14). USDA is still reviewing the use of health claims on meat and poultry products. Foods which could qualify to use the health claim include lowfat yogurt, 1- and 2-percent lowfat milk, skim milk, calcium-fortified citrus drinks, and some types of tofu. The claim must clearly state that lifelong adequate calcium intake is only one factor influencing risk of osteoporosis and must list other risk factors such as age, race, and sex (for example, white and Asian women have a higher risk of developing osteoporosis than black women). The claim must also relate lifelong adequate calcium intake to building and maintaining good bone health. An FDA model health claim for most conventional foods is:

Regular exercise and a healthy diet with enough calcium helps teen and young adult white and Asian women maintain good bone health and may reduce their high risk of osteoporosis later in life.

An FDA model health claim for foods which are exceptionally high in calcium and for most calcium supplements is:

Regular exercise and a healthy diet with enough calcium helps teen and young adult white and Asian women maintain good bone health and may reduce their high risk of osteoporosis later in life. Adequate calcium intake is important, but daily intakes above about 2,000 mg are not likely to provide any additional benefit.

Table 3.—Definitions of Nutrient Content Claims Which Emphasize Beneficial Nutrients.

Claim	Synonyms	Definition
Good Source	Contains, provides	Contains 10 to 19 percent of the Daily Value of the nutrient described per reference amount and per labeled serving
High in	Rich in, excellent source of	Contains at least 20 percent of the Daily Value of the nutrient described per reference amount and per labeled serving
More than		Contains at least 10 percent more of the Daily Value of the nutrient described per reference amount than the comparison food

The use of health claims concerning the relationship of folate intake by women of childbearing age and reduced risk of neural tube defects in infants was recently approved by FDA (DHHS/FDA, 1993). These claims can help consumers identify foods that are high in folate. The claims may appear on the labels of foods regulated by FDA that naturally provide at least 10 percent of the Daily Value (at least 40 micrograms) of folate per reference amount and on the labels of supplements that provide at least 40 micrograms of folate. Labels of foods fortified with folate, such as ready-to-eat cereals, cannot use the claim. Because excessive consumption of folate may mask the symptoms of vitamin B-12 deficiency, fortified foods and folate supplements containing more than 25 percent of the Daily Value (100 micrograms) per serving or per unit must carry the following warning on the label:

Folate consumption should be limited to 1,000 micrograms per day from all sources.

Foods which naturally contain more than 100 micrograms of folate do not have to carry the warning because naturally occurring folate in foods is less bioavailable than the form used in supplements and in fortification.

Foods using the folate-neural tube defects claim on the label must also meet general requirements for the use of health claims (see pp. 12–14). USDA is still reviewing the use of health claims on meat and poultry products. Foods which could qualify to use the health claim include broccoli, orange juice, red kidney beans, and lentils. The claim must identify sources of folate. The FDA has approved several model health claims. One of these is:

Women who consume adequate amounts of folate, a B vitamin, daily throughout their childbearing years may reduce their risk of having a child with a neural tube birth defect. Such birth defects, while not widespread, are very serious. They can have many causes. Adequate amounts of folate can be obtained from diets rich in fruits, dark-green leafy vegetables and legumes, enriched grain products, fortified cereals, or a supplement. Folate consumption should be limited to 1,000 micrograms per day from all sources.

Key Concepts for Consumers—Variety

What is the guideline on variety?

“Eat a variety of foods.”

- The Guideline means eating appropriate amounts of foods from the five major food groups each day. The major food groups are: 1) breads, cereals, rice, and pasta; 2) vegetables; 3) fruits; 4) milk, yogurt, and cheese; and 5) meat, poultry, fish, dry beans, eggs, and nuts.
- Any food that supplies calories or nutrients can be part of a nutritious diet. The content of the total diet is what counts.
- The nutrients we need for good health should come from appropriate amounts of a variety of foods rather than from highly fortified foods or vitamin and mineral supplements.

Why is the guideline important?

- No single food provides all the necessary nutrients in the amounts we need.

- You need more than 40 different nutrients for good health. Essential nutrients include vitamins, minerals, amino acids from protein, certain fatty acids from fat, and sources of calories (protein, carbohydrates, and fat).
- Some foods are rich in certain nutrients but lacking in others. For example, milk is high in calcium but low in iron; on the other hand, meat is a good source of iron but provides little calcium.

How can I evaluate my diet for variety?

- Almost everyone should have at least the minimum number of servings from each food group presented in the Food Guide Pyramid (p. 2).
- Many women, older children, and most teenagers and men need more than the minimum number of servings because of their body size and activity level.
- People with relatively low calorie needs, such as those who are sedentary or trying to lose weight, need to go easy on the fats, oils, and sweets in the Pyramid tip. They also need to make a special effort to choose lower calorie foods from the major food groups.
- Preschool children need the same variety of foods as older family members do, but may need fewer than 1,600 calories. For fewer calories they can eat smaller servings. However, it is important that they have the equivalent of 2 cups of milk a day.
- Results of national food consumption surveys show that the average American is eating fewer than the minimum number of servings recommended in the Food Guide Pyramid for the milk, yogurt, and cheese; fruit; vegetable; and bread, cereal, rice, and pasta food groups.

What do people think about the importance of variety?

- There is confusion about what healthy eating is. A USDA survey found that about three-quarters of Americans generally agree with the statement: “There are so many recommendations about healthy ways to eat, it’s hard to know what to believe.”
- The same survey found that about 70 percent of Americans believe their diets are “about right” in variety as compared with what they think is most healthful. In fact, over 60 percent feel no need to make dietary changes because they view their diets as healthy.

- The same survey by USDA found that while most people believe that eating a variety of foods is important, this belief does not necessarily transfer to specific food guide recommendations. For example, one-quarter of the respondents say it is of low importance to them personally to eat at least five servings a day of fruits and vegetables; one-quarter also say it is of low importance to them to eat at least six servings of grain products a day.
- A survey sponsored by the American Dietetic Association found that 75 percent of Americans believe there are “good” and “bad” foods.
- A survey sponsored by the International Food Information Council found that 25 percent of Americans agreed that healthy eating means giving up favorite foods, and 30 percent felt that healthful foods don’t taste good.
- The misperceptions listed above might discourage people from improving their diets by leading them to believe that “healthy eating” means eliminating their favorite foods.

How can food labels help me eat a variety of foods to meet my nutrient needs?

- Food labels **alone** won’t tell you how to decide what foods to eat. You need to also use a food guide such as the Food Guide Pyramid to plan your daily food intake. The Pyramid shows you how many servings of foods from each food group to include in your own and your family’s diet.
- Use the number of servings and serving size shown in the Food Guide Pyramid as a guide to how much to eat. For example, if you are a moderately active woman who eats about 2,200 calories a day, you need to eat 9 servings from the bread, cereal, rice, and pasta group. A serving is one slice of bread, 1 ounce of ready-to-eat cereal, or 1/2 cup of cooked cereal, rice, or pasta. If you eat 1 cup of pasta, you’ve had 2 servings.
- Food labels **can** help you decide which foods to choose within the food groups shown in the Food Guide Pyramid. Look for information about fat, saturated fat, sugars, and sodium content on the nutrition panel of food labels. Also check the ingredient listing to see if sugars have been added to the food. This information can help you make lower fat, lower saturated fat, lower sugar, and lower sodium choices within each food group.

- Food labels can also help you find foods that contain the vitamins, minerals, and fiber that you need. Look for foods with the words “good source” or “high” on the front panel (as in “good source of calcium” or “high in vitamin A”). These foods must contain **at least** 10 percent of the Daily Value of the nutrient mentioned.
- The serving sizes shown on food labels are now more uniform for similar products so you can easily compare different brands. For example, you can compare breads to find the one that has the most fiber without worrying about the serving size. However, the serving size on the label is not necessarily a recommended amount to eat and may not be the same as the serving size used in the Food Guide Pyramid.
- If a food label contains a claim about the relationship of calcium intake to risk of developing osteoporosis, you can be sure that the food is high in calcium.
- If a food label contains a claim about the relationship of folate intake in women of childbearing age and reduced risk of neural tube defects in infants, you can be sure the food is high in folate.

Maintain Healthy Weight

Rationale for the Guideline

Obesity is one of the most prevalent diet-related problems in the United States. A person who is 20 percent or more over the suggested weight for height is generally considered obese. One-fourth of American adults are overweight and nearly one-tenth are obese (DHHS, 1988; NAS/NRC, 1989).

Excess body fat is stored under the skin and around internal organs. Being too fat is linked with high blood pressure, heart disease, stroke, the most common type of diabetes, certain cancers, and gallbladder disease. Two important factors associated with the risk of developing chronic diseases are 1) total body fat and 2) the location of that fat—abdomen or hips and thighs.

Being too thin is a less common problem among Americans, but is linked to conditions such as osteoporosis in women. It also occurs with anorexia nervosa, a state of self-induced starvation, and can be life-threatening.

The large number of American adults who are overweight and therefore at risk for many chronic diseases suggests that its prevention be a high public health priority. In general, Americans would benefit from a lifestyle that includes more physical activity and a diet containing fewer calories (DHHS, 1988).

Specific Recommendations

Healthy weight refers to being neither too fat nor too thin for your height. Whether an individual's weight is "healthy" depends on:

- (1) how much of the weight is fat,
 - (2) where in the body the fat is located, and
 - (3) whether there are weight-related medical problems for which a doctor advises weight gain or weight loss.
1. *Weight should be within the range suggested in the height-weight table shown here (USDA and DHHS, 1990; derived from NAS/NRC, 1989).*

Table 4.—Suggested Weights for Adults.

Height ¹	Weight in pounds ²	
	19 to 34 years	35 years and over
5'0"	97-128 ³	108-138
5'1"	101-132	111-143
5'2"	104-137	115-148
5'3"	107-141	119-152
5'4"	111-146	122-157
5'5"	114-150	126-162
5'6"	118-155	130-167
5'7"	121-160	134-172
5'8"	125-164	138-178
5'9"	129-169	142-183
5'10"	132-174	146-188
5'11"	136-179	151-194
6'0"	140-184	155-199
6'1"	144-189	159-205
6'2"	148-195	164-210
6'3"	152-200	168-216
6'4"	156-205	173-222
6'5"	160-211	177-228
6'6"	164-216	182-234

¹ Without shoes.

² Without clothes.

³ The higher weights in the ranges generally apply to men, who tend to have more muscle and bone; the lower weights more often apply to women, who have less muscle and bone.

Remember, height-weight tables give only rough estimates of proper weight. The table shows higher weights for people over 35 years old. Some research suggests that people can be a little heavier as they grow older without added risk to health (USDA and DHHS, 1990). Note that the lower weights in the ranges more often apply to women. Women generally have smaller proportions of muscle and bone than men of the same height.

2. *Waist-to-hip ratio for women should be 0.80 or below and for men 0.95 or below (Dietary Guidelines Advisory Committee, 1990).*

The waist-to-hip ratio indicates which of these two areas contains relatively more fat. Research suggests that, for adults, body shape as well as weight is important to health. Excess fat in the abdomen is believed to be of greater health risk than that in the hips and thighs. People with excess weight in the abdomen have an "apple" body shape while people with excess weight in the hips and thighs look more like a "pear."

Check waist-to-hip ratio in the following way:

Measure around the waist while standing relaxed, not pulling in the stomach. Measure around the hips at the largest part. Divide the waist measure by the hip measure to get the waist-to-hip ratio. A value greater than 1.0 means the measure for the waist is larger than the hips (an “apple” body shape). In general, a value greater than 1.0 means that too much fat is carried in the abdomen. More specifically, values above 0.80 for women and above 0.95 for men have been linked to greater risk for several chronic diseases such as cardiovascular disease, hypertension, and gallbladder disease (NAS/NRC, 1989). However, ratios have not been defined for all populations or age groups.

EXAMPLE:

Waist = 40 inches

Hips = 33 inches

Waist-to-hip ratio = $40 \div 33 = 1.2$

A ratio of 1.2 means too much fat in the abdomen

3. *Doctor's advice should be followed regarding a gain or loss in weight because of a medical problem.*
4. *If an individual is overweight according to the three criteria mentioned above, what can the person do?*
 - If inactive, try to increase physical activity. Regular exercise may help an individual lose weight and keep it off.
 - If an individual eats too much, decreasing calorie intake will help. Eat a variety of foods low in calories and high in nutrients. Remember that fat provides twice as many calories as the same amount of carbohydrate or protein.
 - Do not try to lose weight too fast. A steady loss of 1/2 to 1 pound a week until the weight goal is reached is generally safe.
 - Set reasonable weight goals and try for long-term success through better habits of eating and exercise.
 - Avoid crash weight-loss diets that severely restrict the variety of foods or the calories.
 - Children need calories to grow and develop normally; weight-reducing diets are usually not recommended for them. Overweight children should increase their physical activity and learn to choose nutritious foods with adequate but not excessive calories.

- Have children's heights and weights checked regularly by a doctor.

Body weight alone is not always a good measure of how much extra fat a person is carrying. For example, muscular athletes may weigh more than the suggested weight in a height-weight table but not have too much body fat. Muscle weighs more than fat. On the other hand, very inactive people may weigh within the acceptable range but have excess body fat. The Body Mass Index (BMI) is often used to define overweight because it is closely related to the amount of body fat a person has (NAS/NRC, 1989). The standards shown in the weight table on p. 24 were based on the BMI's associated with the lowest overall risk to health (NAS/NRC, 1989). BMI tends to be high in persons who have a large proportion of body fat. BMI is a ratio of weight to height which is calculated as follows:

$$\text{BMI} = \frac{\text{weight, kilograms}}{(\text{height, meters})^2}$$

To convert pounds to kilograms, divide by 2.2; to convert inches to meters, multiply by 0.0254. For a 165 pound (75 kilogram) man, who is 5'9" (1.75 meters) tall:

$$\text{BMI} = \frac{75 \text{ kilograms}}{(1.75 \text{ meters})^2} = 24.5$$

The National Center for Health Statistics has defined overweight as having a BMI greater than or equal to 27.8 for men and 27.3 for women, and severe overweight as having a BMI greater than or equal to 31.1 for men and 32.3 for women (Kuczmarski, 1992). According to these definitions, the man in the example above is not overweight.

Current Weight Status of Americans and Related Diet and Lifestyle Characteristics

What Proportion of Americans Are Overweight? In 1976-80, approximately one-fourth of American adults 20-74 years of age were overweight; almost 10 percent were severely overweight. Heights and weights of Americans were measured in 1976-80 as part of the National Health and Nutrition Examination Survey (NHANES II). These data indicated that 24 percent of American men 20-74 years of age were overweight, with overweight defined as a body mass index (BMI) greater than or equal to 27.8. A slightly higher proportion of women—27 percent—were found to be overweight, based on a definition of overweight as BMI greater than or equal to 27.3 (Kuczmarski, 1992).

The prevalence of severe overweight was also examined, with severe overweight defined as a BMI greater than or equal to 31.1 for men and 32.3 for women. Again, severe overweight was found to be slightly more common in women than in men. Eleven percent of women 20-74 were found to be severely overweight, compared to 8 percent of men (Kuczmarski, 1992).

Since 1980, have we made progress towards maintaining healthy weight? More recent data on measured heights and weights are not currently available. However, as part of the 1989-90 Continuing Survey of Food Intake by Individuals (CSFII), USDA collected data on self-reported heights and weights of a large nationwide sample of individuals. Twenty-eight percent of men 20 years of age and over were found to be overweight, based on BMI's calculated from their self-reported weights and heights; the same proportion of women were found to be overweight (Tippett and Goldman, 1994). Given that overweight men and women tend to underreport their weight (Rowland, 1990), the rise in prevalence of obesity since 1976-80 may be greater than these data indicate.

Weight Status of Selected Population Groups. *Healthy People 2000*, a report by the Department of Health and Human Services (DHHS, 1991), identifies several special population groups among whom high prevalence of overweight is a special concern. These groups could be defined in terms of demographics, economics, and health-related conditions.

Overweight has been found to be especially prevalent in several minority populations, particularly minority women. Data from the NHANES II indicate that in 1976-80, 45 percent of black women 20-74 years of age were overweight and 20 percent were severely overweight. Among black men, 26 percent were overweight, only slightly higher than the prevalence among white men (Kuczmarski, 1992).

Results of the 1982-84 Hispanic Health and Nutrition Examination Survey (HHANES) indicate that women from several Hispanic subgroups are also more likely to be overweight. For women 20-74 years of age, the age-adjusted prevalence of obesity was estimated to be 42 percent among Mexican-American women, 40 percent among Puerto Rican-American women, and 32 percent among Cuban-American women (Kuczmarski, 1992).

No national survey data on the weight status of Native Americans (American Indians and Alaska Natives) are available. *Healthy People 2000* (DHHS, 1991) reports that estimates of the prevalence of overweight within various

tribes range from 29 to 75 percent, indicating a general problem but one that varies considerably in severity from tribe to tribe.

Low income is associated with higher prevalence of overweight among women. Of women 20 years of age and older, 37 percent of those with incomes below the poverty level were overweight in 1976-80, compared to 25 percent of women with incomes above the poverty level (DHHS, 1991). As income goes up, a woman's likelihood of being overweight declines. In 1989-90, based on self-reported heights and weights collected from women 20-74 years of age as part of USDA's CSFII, 38 percent of women with household incomes less than 131 percent of the Federal poverty level were overweight, 28 percent of women with household incomes between 131 and 350 percent of the poverty level were overweight, and 23 percent of women with household incomes above 350 percent of poverty level were overweight (figure 8).

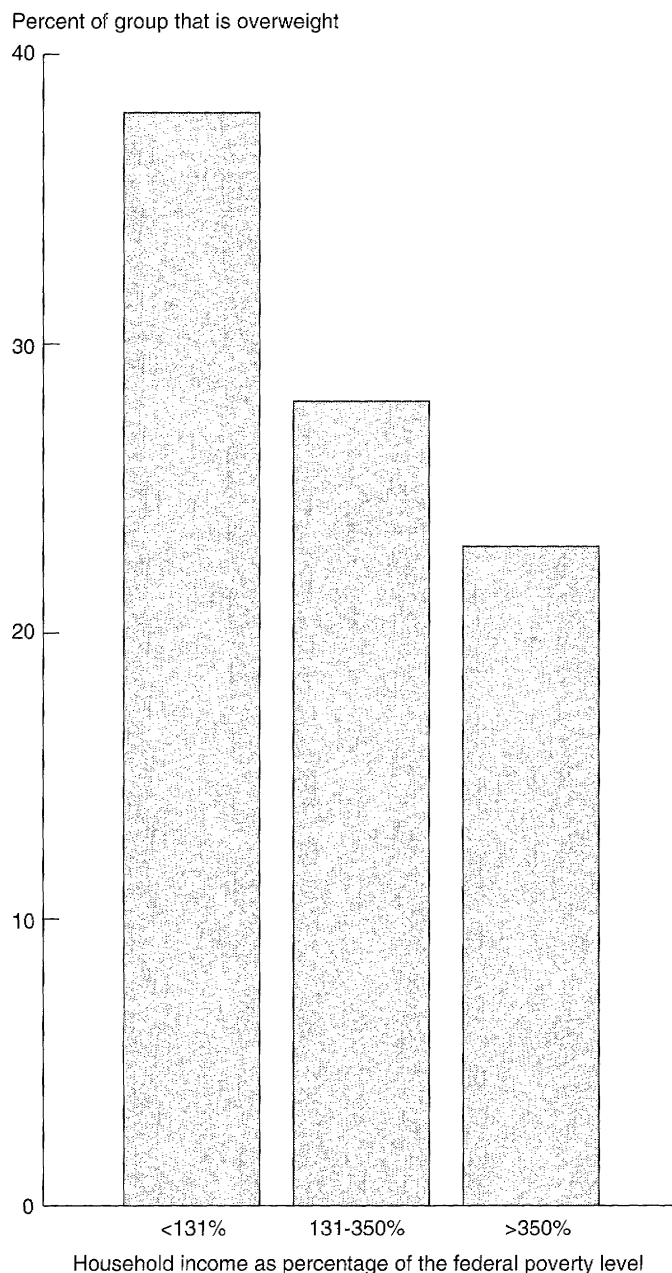
Finally, overweight is also associated with some health conditions. In 1985, 36 percent of individuals with disabilities (defined as any limitation in activity caused by a chronic condition) were estimated to be overweight (DHHS, 1991). In 1976-80, 50 percent of women suffering from high blood pressure were overweight, as were 39 percent of males, according to NHANES II data (DHHS, 1991). Since overweight can exacerbate many health problems and add other problems to existing health conditions, these relationships are of special concern.

Dietary Patterns Associated With Overweight and With Weight Reduction Diets. Balanced eating habits can help maintain healthy weight. For overweight individuals, eating a variety of foods low in calories and high in nutrients is recommended. Analysis of data from USDA's 1985 and 1986 Continuing Survey of Food Intakes by Individuals (CSFII) indicated that overweight women 19-50 years of age ate significantly smaller amounts of fruits and vegetables than normal weight women and had lower vitamin C intakes. They also drank larger amounts of diet soft drinks (Moshfegh et al., 1989).

Altering dietary behavior to lose weight (weight-loss dieting) is extremely common in America. In 1992, based on the Food and Drug Administration's (FDA) Weight Loss Practices Survey, an estimated 33 percent of women 18 and over and 20 percent of men were attempting to lose weight at any given time (Levy and Heaton, 1993). Of those trying to lose weight, 87 percent of women and 81 percent of men reported using "diet" as a weight loss method (the second

Figure 8

Income and Weight: Proportion of Women 20-74 Years of Age Who Are Overweight, Based on Self-Reported Heights and Weights, By Income; 1989-90.



Source: CSFII, 1989-90

most common weight loss practice was exercise, reported by 83 percent of women and 78 percent of men who were trying to lose weight) (Levy and Heaton, 1993).

Individuals seeking to lose weight may need guidance on choosing a low-calorie diet that is also nutritionally adequate. Using USDA's CSFII 1985 data, researchers found that women 19-50 years of age on a weight-reduction diet tended to have lower-than-average intakes of several nutrients, including iron, zinc, thiamin, and vitamin B-12 (Harrison et al., 1988).

The types of diet-alteration strategies pursued by individuals attempting to lose weight may explain why weight reduction diets may not be nutritionally balanced. In response to the FDA's 1992 Weight Loss Practices Survey, one-fifth of individuals trying to lose weight reported that they skipped meals as part of their weight loss plan, while only about 12 percent used planned menus for their meals (Levy and Heaton, 1993). "Counting calories" was a strategy employed by 25 percent of female and 17 percent of male dieters, but only 15 percent of female and 8 percent of male dieters kept food diaries (Levy and Heaton, 1993).

Use of "diet" foods such as low-calorie sweeteners and soda was common among those trying to lose weight (Levy and Heaton, 1993). The majority of dieters used at least one diet food. On average, women used four diet foods and men used three diet foods. The most commonly used diet foods were diet soft drinks, low-calorie sweeteners, low-calorie dressings, lowfat ice cream, lowfat cheeses, and diet breads (table 5). "Light" alcoholic beverages were used by 17 percent of male and 12 percent of female dieters.

Lifestyle Characteristics Associated with Overweight.

Exercise. Along with diet, exercise is important in maintaining healthy weight. Nevertheless, physical activity levels of most Americans are low. According to *Healthy People 2000*, only 22 percent of people 18 years and older engage in at least 30 minutes of light-to-moderate physical activity (such as sustained walking) 5 or more times a week (DHHS, 1991).

Television Viewing. While physical activity is important for maintaining healthy weight, recent studies indicate that television viewing may be associated with increased risk of overweight. Researchers at Harvard School of Public Health have found that the likelihood of children and adolescents

Table 5.—Use of Diet Foods by Female and Male Dieters, 1992.

	WOMEN ¹	MEN ¹
AVERAGE NUMBER OF DIET FOODS USED	4.1	3.1
LOW CALORIE SWEETENERS	43%	33%
DIET SOFT DRINKS	52%	45%
LOW CALORIE DRESSINGS	56%	39%
LOWFAT ICE CREAM	35%	31%
LOWFAT CHEESE	32%	19%
DIET BREADS	36%	19%
LIGHT ALCOHOLIC BEVERAGES	12%	17%

¹Values for women and men who reported being on a weight-loss diet

Source: Levy and Heaton, 1993.

being overweight increases with time spent watching television (Dietz and Gortmaker, 1985). USDA data indicate that television viewing may also be a risk factor for overweight in adult women. Data from USDA's 1989 CSFII show that among women 20-49 years of age, mean levels of BMI tend to rise with the average number of hours of television watched per day (Interagency Board for Nutrition Monitoring and Related Research, 1993). For the women studied, time spent watching television may substitute for the exercise that helps maintain healthy weight. Women who reported "light" levels of leisure-time physical activity watched an average of more than 2-1/2 hours of television per day, while those who reported "heavy" leisure-time physical activity averaged less than 2 hours of television viewing daily.

Current Beliefs and Misconceptions

The prevalence of obesity in the U.S. population appears to be increasing despite efforts by professionals to address this health concern. During these past two decades, there has also been a growing obsession with weight loss and body image. The weight loss industry has grown rapidly to become a multi-billion-dollar business today. The ties of weight to success and sense of self-worth have fueled the psychologically damaging weight loss-gain cycle. This section will explore certain beliefs and misconceptions about "healthy weight" that may help or hinder achievement of appropriate weight status for individuals.

The weight guideline and perceptions about weight status.

From the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) we learned that 76 percent of the respondents considered it of high importance to maintain a healthy weight. People's perceptions about their own weight status and their belief in their ability to change it are key factors and potential barriers to achieving or maintaining a healthy weight.

DHKS respondents were asked: "Do you consider yourself to be overweight, underweight, or about right?" Forty-nine percent replied that their weight status was "about right." Half the sample believed they were overweight. Results from the 1990 National Health Interview Survey (NHIS) (Horn, 1992) were in agreement with this latter figure, and showed that more women (over half) than men (over a third) held this belief about their body size. This overweight perception is a major concern to professionals because many of these people are of normal or underweight status. Data from both the DHKS and the Continuing Survey of Food Intakes by Individuals (CSFII) indicate that, based on the National Health and Nutrition Examination Survey (NHANES II) Body Mass Index (BMI) cutpoints, 35 percent of female respondents in the normal weight range assessed themselves as overweight. Compare this to 23 percent of men in the normal weight range who said they were overweight.

The NHIS identified other factors associated with perceptions about weight status. Persons in lower socioeconomic conditions were generally more likely to consider themselves underweight than were people in higher socioeconomic strata. Black respondents were least likely to consider themselves overweight and more likely to consider themselves just right. Individuals in the 45-to-64-year-old age group were found most likely to think they were overweight.

As to whether people perceive that they have control over this aspect of their lives, 44 percent of the DHKS respondents generally agreed with the statement, “Some people are born to be fat and some thin; there is not much you can do to change this.” Low-income respondents were more likely to agree with the statement than higher income respondents. This misperception represents a barrier to getting people to achieve and maintain a healthy weight.

The health connection. Ninety percent of DHKS respondents replied that they had heard of health problems related to being overweight. The Food and Drug Administration’s (FDA) Weight Loss Practices Survey (Levy and Heaton, 1993) found that health concerns were the major reason for weight loss attempts among respondents with a BMI equal to or greater than 30. Over 50 percent of women and 60 percent of men in this BMI range cited health reasons. For those individuals with BMIs less than 26, more than half cited fitness or appearance as the main reason for trying to lose weight.

Beliefs about the best weight loss methods. When asked about their perception of the best way to lose weight, about 60 percent of 1990 NHIS respondents cited “eating fewer calories,” down from 71 percent who gave this response in 1985. Nineteen percent cited “not eating before going to bed” as the best way to lose weight, down from 25 percent in 1985. These were the first and second most cited responses in both the 1985 and 1990 surveys.

The number of respondents who believed that the best way to lose weight was by “increasing their physical activity” rose from 3 percent in the 1985 NHIS to 17 percent in the 1990 survey. This response was the third most cited method.

Label Information Related to the Guideline

Information about calories per serving of a food has been a part of the primarily voluntary nutrition label since its inception. However, the new regulations require nutrition information to appear on most packaged foods, and serving sizes will be more uniform across all brand of similar foods. Weight-conscious consumers will now be able to find the caloric content listed on the label of most of the foods they eat and comparison of the calories provided by similar foods should be easier. However, consumers should consider the amount of food they eat relative to the serving size listed on the label. USDA and FDA have established reference serving sizes, known as reference amounts customarily consumed, for 139 FDA-regulated categories and 45 USDA-regulated categories of foods. Manufacturers must use these reference amounts to determine serving sizes for their products, which are given in common household measures. See pp. 7–9 for more information about serving sizes.

While the serving size is based on the amount customarily consumed in the United States, it is not a recommended amount to eat and it may not be the amount that an individual actually eats. For example, the serving size listed on a can of chili with beans may be 1 cup; a person who eats 2 cups of chili should double the amount of calories listed on the label when totaling up calories consumed during the day.

Because serving sizes listed on the label must now be based on reference amounts customarily consumed, different brands of the same type of product have similar serving sizes. This is a definite advantage for calorie counters who want to compare different brands. However, serving sizes for discrete items (such as sliced bread, muffins, bagels, or cans of soda) may vary from 50 to 200 percent of the reference amount to allow the entire unit to be listed as one serving. For example, the reference amount for muffins is 55 grams, or about 2 ounces. Muffins are sold in different sizes. Both 2-ounce and 3-ounce muffins would be considered single servings. Since the nutrition information on the label is based on the whole muffin, the label would show that the 2-ounce muffin has fewer calories, less fat, less protein, and less sugars than the 3-ounce muffin, although the nutrient content per ounce of the two products might be very similar. Consumers need to consider the unit size when comparing different brands of this type of product.

Similarly, with some exceptions, a product that is packaged and sold individually and that contains less than 200 percent of the reference amount is considered a single-serving container. The nutrition information on the label is based on the entire content of the container. Consumers need to compare the size of single-serving containers to the amount they usually eat.

Nutrient content claims relating to calorie content. The claims listed in table 6 may be useful to people who are trying to lose or maintain weight.

Key Concepts for Consumers—Weight

What is the guideline on weight?

“Maintain healthy weight.”

- Check your weight for your height on the weight chart (see p. 24). The higher weights in the ranges generally apply to men, who have more muscle and bone; the lower weights more often apply to women, who have less muscle and bone. (Remember, height-weight tables give only rough estimates of proper weight.)
- Whether your weight is “healthy” depends on how much of your weight is fat, where in your body the fat is located, and whether you have a weight-related medical problem.
- Body weight alone is not a good measure of fatness. For example, a muscular athlete may weigh more than the suggested weight but not have too much body fat.
- For adults, body shape as well as weight is important to health. Adults with too much fat in the abdomen (“pot belly”) are at greater risk for heart disease, diabetes, and hypertension than adults with excess fat in the hips and thighs.
- Check your body shape: Measure around your waist near your navel; do not pull in your stomach. Measure around your hips, over the buttocks, where they are largest. Divide the waist measure by the hips measure to get your waist-to-hips ratio. A value greater than 1.0 means the measure for your waist is larger than your hips. Research in adults suggests that ratios close to or above one are linked with greater risk for several diseases. However, ratios have not been defined for all populations or age groups.

Why is the guideline important?

- Being too fat or too thin increases your chance for health problems.
- Being too fat is linked with high blood pressure, heart disease, certain cancers, and the most common type of diabetes.
- Being too thin is linked with osteoporosis in women.

What causes us to gain too much weight?

- Too many calories or too little activity or both are the main causes of getting fat.
- Fats are a very concentrated source of calories. Because each gram of fat provides more than twice the amount of calories provided by carbohydrates or protein, a diet high in fat can contribute to eating too many calories.

What are some practical ways to maintain a healthy weight?

- Regularly check your weight and shape and “catch” yourself before you get far from your suggested weight.
- Balance food intake and physical activity to maintain appropriate body weight.
- Physical activity should be a part of a healthy lifestyle at any age. Physical activities can improve your shape and decrease your body fat.
- Use the Food Guide Pyramid as a guide to the types and amounts of food you should eat. The chart on p. 3 shows you the number of servings needed at three different levels of caloric intake. Many sedentary women and some older adults need about 1,600 calories a day to maintain their weight; most children, teenage girls, active women, and many sedentary men need about 2,200 calories; and teenage boys, many active men, and some very active women need about 2,800 calories.
- If you are between calorie categories, estimate servings using the chart on p. 3. For example, some less active women may need only 2,000 calories a day to maintain a healthy weight. At that calorie level, 8 servings from the bread group would be about right.
- Try to choose foods which are low in fat and added sugars from the five major food groups more often. These foods are generally also lower in calories.
- Go easy on foods from the fats, oils, and sweets group in the Pyramid tip. These foods give you calories but few nutrients.

Table 6.—Definitions of Nutrient Content Claims Related to Caloric Content.

Claim	Synonyms	Definition
Calorie free	Free of calories, no calories, zero calories, without calories, trivial source of calories, negligible source of calories, dietarily insignificant source of calories	Contains fewer than 5 calories per reference amount ¹
Low calorie	Few calories, contains a small amount of calories, low source of calories, low in calories	Contains 40 calories or less per reference amount ²
Reduced calorie	Reduced in calories, calorie reduced	Contains 25 percent fewer calories per reference amount than comparison food ³
Fewer calories	Lower in calories, lower calorie	
Light	Lite	Contains at least 33.3 percent fewer calories or 50 percent less fat per reference amount than comparison food ⁴

¹ Per 50 grams of product if the reference amount is less than 30 grams or 2 tablespoons. For meal and main dish products (see p. 9 for definition), the amount specified is the maximum allowed per 100 grams of product.

² Per 50 grams of product if the reference amount is less than 30 grams or 2 tablespoons. Meal and main dish products (see p. 9 for definition) can contain 120 calories or less per 100 grams.

³ For “reduced” claims, the comparison food is another brand or variety of the same food (for example, cheesecake might be compared to the same manufacturer’s “regular” cheesecake or to another brand of cheesecake). For “fewer” claims, the comparison is to similar foods (for example pretzels might be compared to potato chips).

⁴ If the product has over 50 percent of calories from fat, there must be a 50 percent reduction in fat from the comparison food. The comparison must be made to an industry-wide norm or database value, rather than to a specific brand. “Light” can be used to describe properties of food if it is qualified (“light in color,” “light and fluffy,” or “light brown sugar,” for example). “Light” can also be used to describe the sodium content of a food in some cases (see table 9).

What if you need to lose weight?

- If your weight is not “healthy,” set reasonable weight goals and try for long-term maintenance through better habits of eating and exercise. Excess weight does not appear overnight so don’t expect to lose it overnight.
- Avoid extreme approaches to losing weight. A steady loss of 1/2 to 1 pound a week is generally safe.
- Most people should have at least the lowest number of servings in the ranges given in the Food Guide Pyramid shown on p. 2. Consult your doctor or other health professional if you think you need fewer servings (or less than 1,600 calories a day) to lose weight. Getting enough of some nutrients is difficult in diets of 1,200 calories or less.
- To reduce calorie intake, limit your consumption of foods high in fats and sugars shown in the Pyramid tip and minimize alcohol consumption. Choose lower calorie foods from the five major food groups shown in the Pyramid more often.

- Don’t skip meals. Your body works best when it receives calories in moderate amounts at regular intervals.

What about children?

- Children need calories to grow and develop normally; weight-reducing diets are usually not recommended for them. If you’re not sure of the amount of calories your child needs, check with your doctor.
- Have children’s heights and weights checked regularly by a doctor. Overweight children may need special help in choosing physical activities they enjoy and nutritious diets with adequate but not excessive calories.
- Most children should have at least the minimum number of servings recommended in the Food Guide Pyramid, and many need more. Check with your doctor if you’re unsure about the number of calories your child needs to grow normally. Then check the chart on page 3 to see how many servings they need from each of the major food groups.

- Like adults, children 2 years of age and older should limit their intake of foods high in fats and sugars shown in the Pyramid tip. They also need to choose lower calorie foods from the five major food groups shown in the Pyramid more often.
- Active children tend to grow into active adults. Make regular physical activity a family habit.

What are our attitudes and perceptions about weight?

- Surveys by USDA and DHHS found that about half of American adults think of themselves as overweight. More women than men hold this belief.
- USDA surveys found that women with low incomes (less than 131 percent of the Federal poverty level) have a greater proportion of overweight individuals than do women with moderate (131 to 350 percent of the Federal poverty level) and high (greater than 350 percent of the Federal poverty level) incomes.
- A USDA survey found that just under half of Americans generally agree with the statement, "Some people are born to be fat and some thin; there is not much you can do to change this."
- An FDA survey noted that people who are likely not to be overweight cite fitness or appearance as the main reason for trying to lose weight, whereas people who are overweight cite health concerns as the major reason.
- The same FDA survey found that the majority of people who are dieting to lose weight use at least three "diet" foods (such as low-calorie sweeteners or diet sodas).

How can food labels help me maintain healthy weight?

- Read the "Nutrition Facts" panel for calories and fat per serving of the product. This information can help you choose lower calorie foods from within the food groups shown in the Pyramid. Be sure to compare the serving size given on the label to the amount you usually eat.
- Check the label for nutrient content claims such as "low calorie," "reduced calorie," "light," or "lite."
- Look for "lowfat" or "nonfat" on the label when choosing dairy products. You'll get all the nutrients without extra calories from fat.
- "Lean" and "extra lean" are terms used on meat, poultry, fish, and game labels to identify lower fat products. These products are lower in fat and therefore lower in calories than similar products.
- Other products labeled "low fat," "reduced fat," or "non-fat" may or may not be low in calories. Some have calories from added sugars; check "Nutrition Facts" to be sure they're low in calories.
- The product name and list of ingredients can alert you to foods higher in fats and sugars and therefore higher in calories than other similar food items. For example:
 - frozen vegetables in butter sauce are higher in calories than plain frozen vegetables.
 - pears in heavy syrup have more calories than pears in juice.

Choose a Diet Low in Fat, Saturated Fat, and Cholesterol

Rationale for the Guideline

Many American diets are higher in fat, saturated fat, and cholesterol than health authorities recommend (DHHS, 1988; NAS/NRC, 1989; and USDA and DHHS, 1990). Populations such as ours with diets high in fat have more obesity and certain types of cancer than do populations with diets low in fat. The higher levels of saturated fat and cholesterol in our diets are linked to our increased risk for heart disease.

Coronary heart disease is the leading cause of death in the United States today. Total blood cholesterol levels above 200 milligrams/deciliter increase the risk for heart disease. Additional risk factors include high blood pressure, cigarette smoking, diabetes, obesity, a family history of premature heart disease, being male and over 45 years of age, and being female and over 55 years of age (National Cholesterol Education Program, 1993).

The relationship between dietary cholesterol and blood cholesterol varies among individuals. However, blood cholesterol levels in most people increase with a diet high in saturated fat and cholesterol and too high in calories. A diet low in saturated fat and cholesterol helps maintain a desirable blood cholesterol level. Of these factors, saturated fat in the diet has the single greatest effect on blood cholesterol.

Fat provides more than twice as many calories as the same amount of protein or carbohydrate. Therefore, it is not surprising that high fat intakes have been associated with an increased risk for obesity. There is also evidence that diets high in total fat are associated with increased risk for some types of cancer, especially breast and colon cancer. Eating less fat makes it easier to get the variety of foods needed for good health without getting too many calories.

Specific Recommendations

Health experts recommend that all adults over 20 years of age have their total blood cholesterol and high density lipoprotein (HDL) cholesterol levels (see p. 36) checked every 5 years. A total blood cholesterol level below 200 milligrams/deciliter and HDL cholesterol level at or above 35 milligrams/deciliter is considered desirable (National Cholesterol Education Program, 1993). Persons with levels above the threshold for total cholesterol and/or below the threshold for HDL cholesterol are advised to consult a physician for additional testing and treatment, if needed.

Children and adolescents who have a family history of premature cardiovascular disease or at least one parent with a total blood cholesterol level above 240 milligrams/deciliter are advised to have their total blood cholesterol levels checked. A total blood cholesterol level below 170 milligrams/deciliter is acceptable; children and adolescents with higher levels should consult a physician for additional testing and treatment, if needed (National Cholesterol Education Program, 1991).

The goals outlined below will help healthy adults and children over 2 years old maintain their blood cholesterol levels within the desirable range.

Suggested goals for fats in American diets are:

- *30 percent or less of calories from fat.* The amount of fat (in grams) that provides 30 percent of calories will vary depending on the total number of calories in the diet. Therefore, people with lower calorie needs should consume less fat than people with higher calorie needs. See Key Concepts (p. 43) for more information about calculating individual fat intakes.
- *Less than 10 percent of total calories from saturated fat.* This amount will also vary according to the calorie level of the diet. The fats in animal products are the predominant sources of saturated fat in most American diets. Hydrogenated fats, found in margarines, shortenings, and many baked products, are also sources of saturated fat. Tropical oils, such as coconut, palm, and palm kernel oil, contribute saturated fat to the diet as well.
- *The Dietary Guidelines advise Americans to eat diets low in cholesterol.* Some health authorities recommend a diet containing less than 300 mg of cholesterol per day (NAS/NRC, 1989). All dietary cholesterol comes from animal products. Eating less fat from animal sources will help lower both saturated fatty acids and cholesterol in the diet.

NOTE: These goals for fats are not intended for children under 2 years of age, who may need more fat to get enough calories for normal growth and development. Children over 2 years can grow and develop normally on diets with 30 percent of calories from fat. Older children and adults with established food habits may need to change their diets gradually toward these goals.

The goals for fats apply to the diet over the whole day, *not to a single meal or food*. Some foods that contain fat, saturated fat, and cholesterol also provide high-quality protein and are high in certain vitamins and minerals. Low fat choices of these foods are lean meat and lowfat milk and cheeses.

Functions of fat. Dietary fat serves a number of important functions in the body. It is the most concentrated source of energy, or calories, in the diet, providing 9 calories per gram (compared to 4 calories per gram from either protein or carbohydrate). Fat supplies essential fatty acids (linoleic and alpha-linolenic acid), which are used to maintain healthy skin, regulate cholesterol metabolism, and produce other substances that regulate metabolism. Fat is also needed for the absorption and transport of fat-soluble vitamins in the body. Fat in the diet that is not used for energy is stored predominantly in the body's adipose (fat) tissue. In addition to acting as energy reserves, these stores provide insulation and support for body organs.

Key terms. Chemically, fats are composed of carbon, hydrogen, and oxygen.

Triglycerides are the form in which most fats occur in foods. Triglycerides are made up of one molecule of glycerol and three fatty acids. Fatty acids are made up of carbon atoms linked to each other in a chain with hydrogen atoms attached (figure 9). They vary in size (the number of carbon atoms) and in degree of saturation (the number of hydrogen atoms attached to each carbon). The fats found in foods contain mixtures of different types of fatty acids.

Saturated fatty acids have all the carbon atoms linked by single bonds (figure 9). Each carbon atom has two hydrogen atoms attached, so the carbons are considered to be "saturated" with hydrogen. They are provided primarily by animal products, such as meat and dairy products. Hydrogenated fats (see definition below) and tropical oils (palm, palm kernel, and coconut) provide smaller amounts. High dietary intakes of saturated fatty acids have been linked to increased levels of blood cholesterol. However, consumption of stearic acid, a saturated fatty acid, does not appear to raise blood cholesterol levels (Denke and Grundy, 1991).

Monounsaturated fatty acids contain one pair of carbon atoms which are linked together by a double bond (figure 9). Each of these carbons has only one hydrogen atom attached and is therefore "unsaturated." They are found in large amounts in olive, peanut, and canola (a type of rapeseed) oils. Dietary intakes of monounsaturated fatty acids have not been associated with increased blood cholesterol levels.

Polyunsaturated fatty acids contain two or more pairs of carbon atoms which are linked by double bonds (figure 9). They are provided by vegetable oils, such as soybean, corn, sunflower, safflower, and others. Dietary intakes of polyunsaturated fatty acids, as with monounsaturated fatty acids, have not been associated with increased blood cholesterol levels.

Essential fatty acids cannot be manufactured in the body and therefore must be supplied in the diet. Linoleic and alpha-linolenic acids are considered to be essential. These polyunsaturated fatty acids are required for proper growth in children, for growth and maintenance of the brain, for normal vision, and for a number of other important functions.

Hydrogenation is a chemical process used to convert liquid oils to a more solid form, such as vegetable margarine or shortening. This process adds hydrogen atoms to the fatty acids contained in the oil, making them more saturated.

Trans fatty acids are an unusual form of unsaturated fatty acid. They occur rarely in nature but are found in products containing hydrogenated or partially hydrogenated oils. A few studies have shown that *trans* fatty acids behave more like saturated than unsaturated fatty acids in that their consumption is associated with increased blood cholesterol levels. However, there is not yet conclusive evidence of this effect.

Omega-3 fatty acids are a type of polyunsaturated fatty acid of the alpha-linolenic family (see structure in figure 9). Soybean and canola oils are the richest sources of omega-3 fatty acids in our diet, but they are also found in many green vegetables and legumes. Very-long-chain omega-3 fatty acids (20 or more carbons) are made in our bodies for brain and visual function and they are also found in substantial concentrations in fish.

Cholesterol is a fat-like substance used by the body to make certain hormones and bile acids (used in fat digestion). The body can manufacture all the cholesterol it needs; most people also get some from their diets.

- **Dietary cholesterol** is found only in animal foods, such as meat, eggs, and dairy products.
- **Blood cholesterol** refers to the level of cholesterol circulating in the blood. Levels higher than 200 milligrams/deciliter are associated with an increased risk of heart disease. Cholesterol is transported in the blood by carriers called lipoproteins.

- **Lipoproteins** are packages of fat, cholesterol, and protein found in the blood. Since fat and cholesterol are not water-soluble, they must be coated with protein in order to travel through the blood.
 - **High-density lipoproteins (HDL)** carry cholesterol from the peripheral tissues to the liver, where it can be broken down and excreted. A higher level of HDL (above 60 milligrams/deciliter) is associated with a lower risk of developing heart disease (National Cholesterol Education Program, 1993). Quitting cigarette smoking and engaging in regular physical activity tend to raise HDL levels.
 - **Low-density lipoproteins (LDL)** carry cholesterol from the liver to the peripheral tissues where it is used in the formation of hormones, cell membranes, and nervous tissue. Excess LDL or LDL damaged by oxidation may be deposited in blood vessel walls. Higher levels of LDL are associated with an increased risk of developing heart disease. Eating a diet high in saturated fat and cholesterol raises LDL levels.

Trends in Dietary Intakes

On the Average, How Do Diets Compare to Recommendations?

Fat: USDA survey data indicate that Americans have made progress in meeting the recommendation on dietary fat, but there is still room for improvement. In 1977-78, average fat intakes were about 40 percent of calories (USDA/HNIS, 1984).¹ In 1985, according to Continuing Survey of Food Intakes by Individuals (CSFII) results, adult men and women who were 19 to 50 years old averaged 36 to 37 percent of calories from fat (USDA/HNIS, 1985a-b). Although this indicated a drop in fat intake, it was still above the level recommended by the Dietary Guidelines. Findings from the CSFII 1989-90 were similar to those obtained in 1985 (Enns et al., 1994). Overall, diets averaged 35 percent of calories from fat. The percentage of calories from fat differed little by sex and age, by income, and by race.

Saturated fat: Intakes of saturated fat also exceed the Guidelines' recommendations. In 1989-90, all individuals averaged 12 percent of calories from saturated fat; similar intakes were reported in 1985.

Cholesterol: In 1989-90, average cholesterol intakes of men below 70 years of age and teenage boys exceeded 300 mg/day, while women and children in other age groups consumed

diets that met recommendations (Enns et al., 1994). Men 20 years and older consumed an average of 328 milligrams of cholesterol daily; males 70 and over had the lowest average intake at 296 milligrams a day, and males 20 to 29 had the highest average intakes at 365 milligrams a day. Among adult women 20 and over, cholesterol intake averaged 220 milligrams per day. Although most men's intakes still exceeded recommendations, their cholesterol intakes were lower than those estimated by previous surveys. At least some of this decrease is probably due to the fact that eggs, a major source of dietary cholesterol, are now known to be lower in cholesterol than previously believed, and the 1989-90 survey calculated total cholesterol intake using the revised data on cholesterol content of eggs. Changes in eating patterns may also be responsible for some of the decrease.

Dietary sources of fat, saturated fat, and cholesterol.

Where do fat, saturated fat, and cholesterol in the diet come from? Food choices and food preparation practices can have significant effects on the sources and amounts of these nutrients in the diet. The trend towards eating away from home may also affect fat intake.

Food group consumption trends and food group sources of fat:

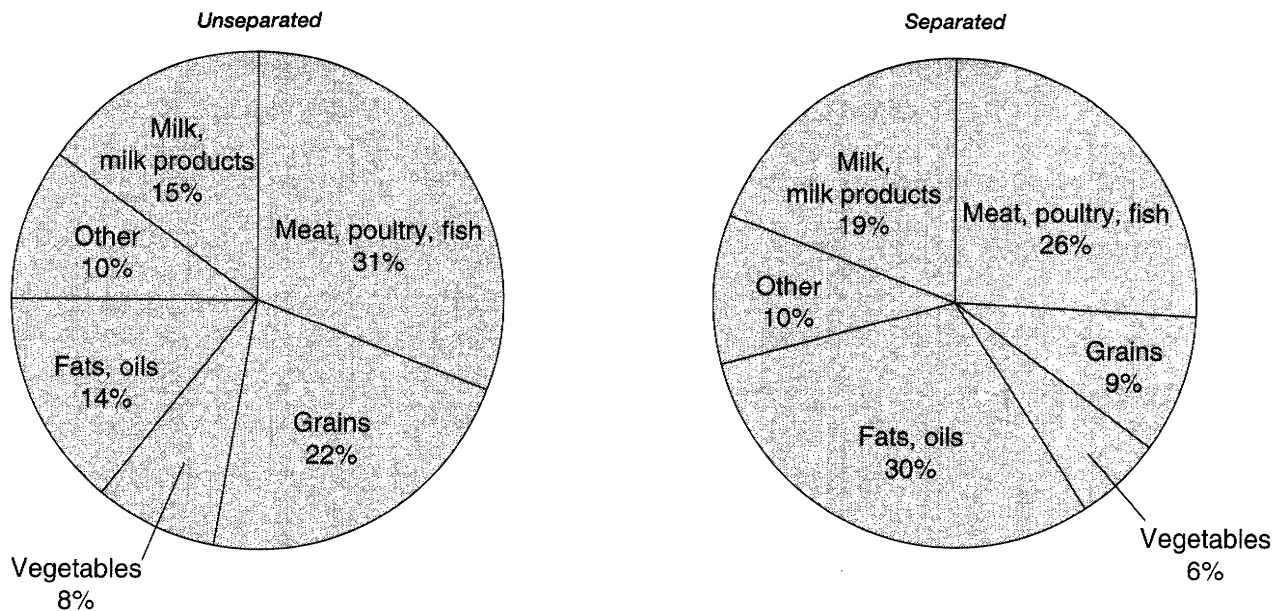
USDA survey data revealed several changes in food consumption patterns between 1977-78 and 1989-90 that might affect intakes of fat, saturated fat, and cholesterol. Among the most notable of these were a shift from consumption of whole milk to low fat and skim milks, a decrease in consumption of beef and pork as separate entrees, and an increase in consumption of mixed dishes, including those with meat, poultry, or fish as a main ingredient, and those with grain as a main ingredient.

USDA researchers used data from CSFII 1985 to identify food group sources of fat and saturated fat (Krebs-Smith et al., 1990). One of their major findings was that "hidden" sources of fat—that is, fat added during preparation of a mixed dish—make a large contribution to fat intake. Traditionally, when the contributions of different food groups to nutrient intake has been estimated, mixed dishes have been categorized in terms of their major food ingredient (for instance, beef stew would be placed in the "meat, fish, and poultry" group because it is mainly meat, and pizza would be placed in the "grains" group). When foods consumed by adult women over 4 survey days were grouped according to this method, the "meat, fish, and poultry" group contributed the largest share of fat to the diet—31 percent. In terms of fat contribution, it was followed by grain products (22 percent), milk products (15 percent), and fats and oils (14 percent) (figure 10).

¹ All average intakes reported in this section are based on 3-day data unless otherwise noted.

Figure 10

Total Fat: Percent Contribution of Major Food Groups When Food Mixtures Are Separated vs. Unseparated, Women 19-50 Years; 4 Nonconsecutive Days; 1985.



Source: CSFII, 1985

However, when mixed foods were separated into their component ingredients (for instance, a chicken salad sandwich would have been separated into bread, meat, and mayonnaise), the fats and oils group was found to contribute the largest share of total fat in the diet—30 percent. The contribution of the milk products group to total fat also rose, from 15 percent to 19 percent, probably reflecting added milk and cheese in mixed dishes. The contribution of the meat, poultry, and fish group dropped to 26 percent, and the contribution of grain products dropped to 9 percent (figure 10).

Separating mixed foods into their component ingredients also revealed that fats and oils made a larger contribution to saturated fatty acid intake than had previously been realized. With consumption of mixed foods on the increase in our society, consumers may need advice on identifying fat and saturated fat in commercial mixed foods and tips on limiting added fats in home-prepared foods.

Food preparation and eating practices: How foods are prepared and consumed can dramatically affect the amount of fat they contribute to the diet. Researchers at Cornell University used 4-day data from CSFII 1985 and 1986 to

investigate eating patterns of American women between 19 to 50 years of age (Thompson et al., 1992). They found that about 71 percent of the time that poultry was eaten, it was eaten fried or breaded and/or without removing the skin (i.e., in a higher-fat form). Pork was eaten untrimmed and fried or breaded about 68 percent of the time.

Eating away from home: Over the past few years, there has been a major shift toward more consumption of food away from home. With women entering the workforce, shifts in female eating patterns are particularly notable. In 1977-78, 37 percent of adult women 19-50 years of age ate all their food at home over a 3-day period; by 1985, of a comparable group of women, only 14 percent ate everything at home over the course of 3 days. Researchers at the University of North Carolina, using USDA survey data, found that increased consumption of food away from home tends to be associated with higher fat and calorie intakes (Haines et al., 1992).

Dietary intakes of selected population groups. USDA surveys indicate that Americans of all socioeconomic backgrounds tend to eat diets that are higher than recommended in fat and saturated fat. However, comparison of some important socioeconomic and demographic groups

reveals some differences in fat, saturated fat, and cholesterol intakes, as well as differences in food group sources of these nutrients. These differences may be of interest in planning nutrition intervention programs and developing nutrition education messages.

Black Americans: When researchers at Cornell University used data from USDA's 1985 and 1986 surveys to investigate eating patterns of American women, they found that black women 19 to 50 years of age had slightly lower intakes of fat and saturated fat than white women (Thompson et al., 1992). Black women had higher intakes of cholesterol; unlike white women, their average cholesterol intakes exceeded the recommended limit of 300 mg/day. In 1989-90, black women's average cholesterol intake was 268 milligrams per day. While it exceeded that of white women (212 milligrams per day), it did not exceed the recommended limit on cholesterol intake. The 1989-90 cholesterol data, unlike the 1985-86 data, were calculated using the new, lower cholesterol level for eggs; further research is needed to determine to what extent the change in black women's estimated average cholesterol intake between 1985-86 and 1989-90 was determined by the change in cholesterol data and to what extent it was determined by changes in eating patterns.

The Cornell researchers found that in 1985 and 1986, there were some differences in the food groups that made important contributions to the fat content of the diets of black and white women (Thompson et al., 1992). Grain-based mixed dishes (such as pizza and macaroni and cheese) and beef were important sources of fat for both black and white women. However, for white women, the other most important fat sources were meat-based mixed dishes (that is, those containing mainly meat, fish, and poultry); sweet grain products (like cakes, cookies, sweet rolls); and salad dressing. Among black women, the other most important fat sources were frankfurters and bacon, poultry, and eggs.

Hispanic Americans: Average fat and saturated fat intakes of Hispanic women appear to be lower than those of American women as a whole. Using data from USDA's 1985 and 1986 surveys, Cornell University researchers estimated the average fat intake of Hispanic women 19 to 50 years of age to be 34 percent of calories and saturated fat intake to be 12 percent of calories (Thompson et al., 1992). In comparison, the average for all American women was 36 percent of calories from fat and 13 percent of calories from saturated fat. Hispanic women's average cholesterol intakes did not exceed recommended levels (300 mg per day). The principal food group sources of fat in Hispanic women's diets were meat- and grain-based mixed dishes, beef, sweet grain products, and

eggs. Whole milk and cheeses and cream were major sources of saturated fat.

Does income affect fat intake? To assess the relationship of income to fat intake, USDA researchers used survey data from 1985 to group women 19 to 50 into three income categories: a) low, defined as having a household income less than or equal to 130 percent of the poverty level—the cutoff for eligibility for the Food Stamp Program; b) mid-level, defined as household income 131-300 percent of poverty; and c) high, greater than 300 percent of poverty (Krebs-Smith, 1988). Of the three groups, the women in the mid-level income group had the lowest intake of fat, 36 percent of calories. Low-income women consumed 37 percent of calories from fat, the same level as the average for women as a whole. High-income women had the highest fat intakes, 38 percent of calories. The difference in fat intake between women in the mid-level income group and high-income women was statistically significant. The fat intake of low-income women did not differ significantly from the intakes of other groups.

Cornell University researchers used data from USDA's 1985 and 1986 surveys to identify food group sources of fat for women of lower income levels (defined as having a household income less than or equal to 185 percent of the poverty level) and higher income levels (greater than 185 percent of poverty) (Thompson et al., 1992). For both groups, meat- and grain-based mixtures, beef, sweet grain products, cheeses and cream, and butter or margarine were major fat sources. However, for higher-income women, salad dressing was also a notable source of fat. For lower-income women, lunch meats and bacon and whole milk were more common sources of fat than they were for higher-income women.

Does education affect fat intake? Using data from the 1985 CSFII, USDA researchers found that women 19 to 50 years of age with less than a high school education consumed 35 percent of calories from fat, while women with high school or college education averaged 37 percent of calories from fat (Krebs-Smith, 1988). This difference was statistically significant.

The higher fat intakes of more educated women may seem surprising, because educated women are often thought to be a particularly health-conscious group. Moreover, when researchers at the University of North Carolina used USDA survey data to compare diets of adult women in 1977-78 and 1985, educated women were found to be leaders in the trend away from some higher-fat products, like whole milk, and toward some lower-fat products, like low fat and skim milks

(Popkin et al., 1989). However, the shifts in educated women's food choices and eating patterns were inconsistent. While they decreased their consumption of some higher-fat foods, their consumption of other higher-fat foods, like higher-fat grain mixtures and higher-fat desserts, increased. More educated women are also more likely to eat food away from home, an eating pattern associated with higher fat intakes.

While Americans are making progress in decreasing consumption of fat, saturated fat, and cholesterol, intakes are still higher than recommended levels. It is especially interesting to note the shift in sources of fat intake to "hidden" sources, such as grain mixtures and desserts. Nutrition education programs that stress careful label-reading may help consumers identify the "hidden" sources of fat in their own diets.

Current Beliefs and Misconceptions

The myriad diet and health messages from both credible and questionable sources, as well as the influence of media and industry, have contributed to an environment of confusion for the consumer. The concerns surrounding fat and cholesterol are no exception. This issue has spurred greater educational efforts to address what people should know about their health and what they should do to improve it, but the messages have been tempered by misconceptions and misinformation.

Misinterpretation of the recommendation. Many consumers have misconstrued the recommendation that fat should be limited to 30 percent of total calories. They have interpreted this to mean that 30 percent applies to each food they eat. Sixty-nine percent of respondents in the International Food Information Council (IFIC) survey on "How Americans Are Making Food Choices" (Gallup Organization, 1994) held this misperception. Educators need to emphasize that it is the total amount of fat and cholesterol eaten over several days, rather than in a single meal or food, that is important. In order to avoid such a misperception, the new food label shows the number of calories from fat, but not the percent of calories from fat. The label does show the "%Daily Value" for fat based on 30 percent of calories from fat for a 2000-calorie diet.

Evaluation of Own Diet. From the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) we learned that people's perceptions of their own diets, in terms of their fat, saturated fat and cholesterol intakes, do not always match reality.

Reality for most Americans is that current dietary consumption of fat and saturated fat average about 35 and 12 percent of total calories, respectively. Mean cholesterol intakes are below 300 milligrams for women and somewhat above for men. In comparison, the Dietary Guidelines for Americans recommend that fat consumption be limited to 30 percent of total calories and that saturated fat compose no more than 10 percent of total calories. In addition, other health experts have advised cholesterol intakes of less than 300 milligrams.

Perceived reality, as observed in the DHKS, is that 42 percent of respondents believe their diets are "about right" in fat. More than half of the respondents feel their diets are "about right" for both saturated fat and cholesterol.

As for the relationship of intakes to recommended levels, data from the 1989 and 1990 Continuing Survey of Food Intakes by Individuals (CSFII) showed that about one-quarter of DHKS respondents had fat intakes (3-day average) that provided 30 percent or less of calories. Similarly, about one-quarter had saturated fat intakes of less than 10 percent of calories (Tippett and Goldman, 1994). There was disparity in the percent of men and women with mean cholesterol intakes less than 300 milligrams per day. Forty-nine percent of men versus 78 percent of women averaged intakes that met the recommended levels.

Beliefs About Dietary Advice. The DHKS probed for attitudes toward advice about fat in healthy diets. Sixty percent of the sample rated it of high importance to avoid too much fat, whereas 14 percent considered it unimportant. Sixty-six percent rated "avoid too much saturated fat" and 69 percent rated "avoid too much cholesterol" as of high importance; 9 percent rated each of low importance.

However, dietary advice can be taken too far. On the opposite end of the spectrum from the dietary 'lipophilics' are the dietary 'lipophobic' who believe fat should be eliminated completely from their diets. This was found to be true for 15 percent of respondents in the American Dietetic Association's "Survey of American Dietary Habits" (ADA, 1993). The point needs to be made that some fat is needed in the diet to obtain essential fatty acids required in bodily processes and to help the body absorb fat-soluble vitamins like A and D. Another point is that fat is a natural component of foods and it is impossible to eliminate it completely from one's diet.

The Diet-Disease Connection. Awareness of diet-disease relationships among DHKS participants varied by nutrient. In general, 86 percent of the DHKS respondents had heard about health problems related to cholesterol intake, 76

percent had heard about health problems related to fat intake, and 63 percent were aware of health problems linked to a person's intake of saturated fats. Awareness of diet-disease relationships was consistently lower in the low-income group.

Cholesterol Misconceptions. A common misperception concerns distinguishing blood cholesterol from dietary cholesterol. An earlier survey done for IFIC (Gallup Organization, 1990) found that 35 percent of respondents were unsure if there was a difference; 15 percent believed they were the same. Many consumers are unaware that the body can manufacture much of the cholesterol it needs for its various functions and that cholesterol in foods does not automatically become the cholesterol levels in blood once consumed.

A pervasive misconception about cholesterol is that it is found in all foods containing fat or oil. Fifty-six percent of DHKS respondents agreed with this statement. However, 42 percent believed the correct statement that cholesterol is found only in foods from animal sources. FDA's Health and Diet Study found similar results (Levy et al., 1993).

One other point of confusion is the belief that foods low in cholesterol are also low in fat. Only 35 percent of respondents in FDA's Health and Diet Study correctly stated that a food labeled "cholesterol free" could be either low or high in saturated fat (Levy et al., 1993). Take the example of the cookies and crackers, as well as vegetable oils, labeled with "no cholesterol." The fats in these products are from plant, not animal, sources. Hence, cholesterol was never part of the nutrient composition. As for the fat content of these products, the total fat grams and ingredients must be scrutinized. Such products may contain no cholesterol but may be quite high in fat. Some cookies derive 30 to 40 percent of their calories from fat. "Baked" crackers are often sprayed with vegetable oil in production, thereby increasing the fat content. The new label regulations regarding the use of nutrient content claims such as "no cholesterol" are designed to overcome such misconceptions.

The Confusing Fat-Free Claim. The percent fat-free statements found on package labels before the new regulations become effective have been confusing to many consumers. The claim "96 percent fat-free" has been interpreted to mean "not much fat" or "almost fat-free" by many consumers. The confusion lies with the missing qualifying phrase that the product is x percent fat-free *by weight* (rather than x percent of *calories* from fat).

In the past, bologna might have been labeled "80 percent fat-free"; this means 20 percent of the weight, or 20 grams per 100 grams (3-1/2 ounces) of the bologna is fat. The nutrition label for this same product would list 5 grams of fat per 60 calorie slice, which equals 75 percent calories from fat:

$$\begin{aligned} 5 \text{ grams fat} \times 9 \text{ calories per gram} &= 45 \text{ calories from fat} \\ (45 \text{ calories from fat} \div 60 \text{ total calories}) \times 100 & \\ &= 75 \text{ percent of calories from fat} \end{aligned}$$

The best approach to finding products lower in fat is to look at the label and see how many grams of fat are in the product per serving. The new label regulations will help overcome past confusion, since they severely limit use of the "percent fat-free" claim. Products using the claim must meet the definition of a "low fat" product (meaning they contain 3 grams or less of fat per reference amount customarily consumed).

Label Information Related to the Guideline

The new food label provides additional information that will help consumers reduce their intakes of fat, saturated fat, and cholesterol. Labels can be especially useful in detecting food sources of "hidden" fat because most packaged and processed foods will now have nutrition labels with total fat, saturated fat, and cholesterol content listed. New regulations require that products using nutrient content claims such as "low fat" and "no cholesterol" adhere to standard definitions for these terms, eliminating the use of misleading claims (definitions are summarized below).

Daily Reference Values (DRV's) for Fat, Saturated Fat, and Cholesterol. The DRV's are the average upper limit of intake of fat, saturated fat, and cholesterol for moderately active, average size adult men and women. The DRV's for fat and saturated fat are based on recommendations stated in the Dietary Guidelines for Americans that no more than 30 percent of calories come from fat and less than 10 percent of calories come from saturated fat. The Food and Drug Administration based the DRV's on a daily energy intake of 2,000 calories. This energy level was used because 2,000 is a round number which is easy to use in mental calculations, and because it is an appropriate energy level for many American women, who are relatively inactive, and for very inactive men. Reference values for fat and saturated fat were calculated as follows:

2,000 calories x 0.30 = 600 calories from fat
 600 calories from fat ÷ 9 calories/gram of fat = 67 grams of fat (this has been rounded to 65 grams for labeling purposes)

2,000 calories x 0.10 = 200 calories from saturated fat
 200 calories ÷ 9 calories/gram of fat = 22 grams of saturated fat (this has been rounded to 20 grams for labeling purposes)

An individual's actual upper limit of fat intake may be higher or lower than the DRV, based on his or her actual caloric requirements. A footnote at the bottom of larger labels lists DRV's (shown as Daily Values on the label) for energy intakes of 2,000 and 2,500 calories. The DRV's based on 2,500 calories (80 grams of total fat and 25 grams of saturated fat) are more appropriate for many teenage boys and men and very active women. Some people may prefer to calculate their own upper limit for fat and saturated fat intake. The Key Concepts at the end of this chapter provide more information about calculating individual limits for fat and saturated fat consumption (p. 43).

The DRV for cholesterol is based on the recommendations of several scientific groups that Americans consume less than 300 milligrams of cholesterol per day (National Cholesterol Education Program, 1993; NAS/NRC, 1989; American Heart Association, 1988). This recommendation is not based on caloric intake, and is the same for all healthy persons over 2 years of age. The suggested limits for fat, saturated fat, and cholesterol intakes are not intended for children under 2 years of age because they have special dietary needs.

On the nutrition label, the "%Daily Value" column provides a comparison of the amount of fat, saturated fat, and cholesterol in the product to the DRV's. If a product contains 7 grams of fat, 3 grams of saturated fat, and 15 milligrams of cholesterol, the portion of the nutrition label which lists these nutrients would look like this:

		% Daily Value
Total Fat	7 g	11%
Saturated Fat	3 g	15%
Cholesterol	15 mg	5%

This information can be used in a variety of ways. Consumers can simply scan the "%Daily Value" column to determine whether a food is relatively low or high in fat, saturated fat, or cholesterol and to compare products. They can also look at the "%Daily Value" numbers to see how the food fits into a 2,000 calorie diet. For example, the product whose label is shown above supplies about one-tenth of the daily fat allowance for a person eating 2,000 calories per day. Some consumers may want to compare the absolute amount of fat, saturated fat, and cholesterol in the product to the Daily Values provided in the footnote at the bottom of larger labels or to their individualized reference values.

Fat, Saturated Fat and Cholesterol Nutrient Content Claims. In the past, many consumers were confused by the numerous claims found on food labels. For example, a product could be labeled "low cholesterol" (implying that it was a "heart healthy" item), but still contain large amounts of saturated fat. The new label regulations define nutrient content claims such as "low fat" and "low cholesterol," so that consumers can use them with confidence to select food items which are lower in fat, saturated fat, or cholesterol. For example, a cholesterol claim cannot be made for a food that contains more than 2 grams of saturated fat per serving. Table 7 provides definitions for nutrient content claims related to fat, saturated fat and cholesterol.

In addition to the claims listed in table 7, "x percent fat free" (as in "95 percent fat free") claims can be used. A claim of "95 percent fat free" means the product contains 5 percent fat **by weight**. For example, a 55 gram frankfurter displaying a "95% fat free" claim on the label would contain 3 grams of fat (55 x .05 = 2.75, rounded to 3 grams for labeling purposes). The "x percent fat free" claim is now allowed only on products meeting the "low fat" definition. The manufacturer of the frankfurter in the example above can still use the claim because the product meets the "low fat" definition (it contains 3 grams or less of fat per reference amount customarily consumed, which is 55 grams for frankfurters).

Health Claims. The FDA has authorized health claims for two disease risks related to fat intake for use on labels of products it regulates. These are claims involving the relationship of fat intake to reduction of cancer risk and the relationship of fat, saturated fat, and cholesterol intake to reduction of coronary heart disease risk. USDA is still evaluating the use of health claims on meat and poultry products. See pp. 12–14, for general information concerning the use of health claims. Additional requirements for the two claims related to dietary fat intake are discussed below.

Table 7.—Definitions of Nutrient Content Claims Related to Fat, Saturated Fat, and Cholesterol Content.¹

TERM	FAT	SATURATED FAT ²	CHOLESTEROL ³
“No” (Also “free,” “zero,” “without,” “non,” “trivial source of,” “negligible source of,” or “dietarily insignificant source of”) ⁴	less than 0.5 grams	less than 0.5 grams from saturated fat and <i>trans</i> fatty acids	less than 2 milligrams
“Low” (Also “low in,” “contains a small amount of,” “low source of,” and “little”)	3 grams or less ⁵	1 gram or less and 15% or less of calories from saturated fat	20 or less milligrams
Reduced ⁶ Less ⁶	Reduced by at least 25 percent from an appropriate reference food	Reduced by at least 25 percent from an appropriate reference food	Reduced by at least 25 percent from an appropriate reference food
Lean ⁷	less than 10 grams	less than 4.5 grams	less than 95 milligrams
Extra Lean ⁷	less than 5 grams	less than 2 grams	less than 95 milligrams

¹ Per reference amount, or per 50 grams of product if the reference amount is 30 grams or less or 2 tablespoons or less. For meal and main dish products (see p. 9), the amount specified is the maximum allowed per 100 grams of product.

² All products regulated by FDA making claims about saturated fat content must also disclose the amount of total fat in the product unless the product meets the “low fat” or “fat free” definitions. Such products must also disclose the amount of cholesterol in the product unless the product meets the “low cholesterol” definition.

³ Claims concerning cholesterol content will only be allowed on foods containing 2 grams or less of saturated fat per reference amount customarily consumed.

⁴ Products displaying “no” claims on the label which contain added ingredients that are generally understood by consumers to contain the nutrient for which the claim is made must refer to an explanatory statement. For example, if a “fat free” salad dressing contains a small amount of vegetable oil, the “fat free” claim must be marked by an asterisk referring to a statement such as “contains vegetable oil, adds a trivial amount of fat.”

⁵ Although 2-percent-fat milk exceeds this threshold, it can continue to be labeled as “lowfat.”

⁶ “Reduced” claims are used when the food is compared to another type of the same food (for example when microwave popcorn is compared with another brand or an average value for microwave popcorn). “Less” claims are used when the food is compared to a food which has a similar use (for example, when microwave popcorn is compared to potato chips). “Reduced” and “less” claims cannot be used when the reference food meets the “low” definition.

⁷ “Lean” and “extra lean” claims may be used only on meat, poultry, fish, and game products. These two definitions apply to the fat, saturated fat, **and** cholesterol content of the product.

Relationship of dietary saturated fat and cholesterol intake to heart disease: The food must meet the requirements necessary to use the “low fat,” “low saturated fat,” and “low cholesterol” claims (see above). Fish and game products may use the claim if they meet the requirements necessary to use the “extra lean” claim (see above). USDA has not approved the use of health claims on meat and poultry products at this time. A model health claim which meets FDA’s requirements is shown below.

Diets low in saturated fat, cholesterol, and total fat may reduce the risk of heart disease. Heart disease is dependent upon many factors, including diet, a family history of the disease, elevated blood LDL-cholesterol levels, and physical inactivity.

Relationship of dietary fat intake to cancer: The product must meet the requirements necessary to use the “low fat” nutrient content claim. Fish and game products may use the claim if they meet the requirements necessary to use the “extra lean” claim (see above). A model health claim which meets FDA’s requirements is shown below.

Development of cancer depends on many factors. A diet low in total fat may reduce the risk of some cancers.

Key Concepts for Consumers—Fat, Saturated Fat, and Cholesterol

What is the guideline on fat intake?

“Choose a diet low in fat”

- Choose a diet with 30 percent or fewer calories from fat. This Guideline applies to your intake of fat and calories over the entire day, not to a single food or even a single meal.
- Use foods in the fats, oils and sweets group (e.g., butter, margarine, salad dressing, gravy, creamy sauces) sparingly.
- Make low fat, lean choices in other food groups (for more information, see the label-reading tips on pp. 45–46).
- The suggested upper limit of fat intake (Daily Value) shown on food labels is 65 grams per day. This value is the amount of fat which a person eating 2,000 calories a day can eat and stay within the recommended limit of 30 percent or fewer calories from fat.
- Each individual’s allowance for fat depends on his or her caloric needs which in turn depend on age, sex, size, and activity level. Taller, more active people can have somewhat more fat, whereas smaller, older, or less active people should have somewhat less fat per day.
- For most people, the limit on fat intake is between 53 and 93 grams per day. A tall, active young man who needs 2,800 calories a day can eat up to 93 grams of fat per day and still have a lowfat diet. However, a small, inactive older woman who needs 1,600 calories a day should limit her fat intake to 53 grams per day.
- To estimate your upper limit on fat, divide your daily calorie intake by 30 (see the food guide on pp. 2–3 for information on determining your calorie needs).
- If your calorie intake is in the high range or about 2,800 calories, then your fat intake could be as much as 93 grams per day ($2,800 \div 30 = 93$ grams).
- If your calorie intake is in the low range or about 1,600 calories, then your fat intake needs to be limited to 53 grams per day ($1,600 \div 30 = 53$ grams).

“Choose a diet low in saturated fat.”

- Choose a diet with less than 10 percent of calories from saturated fat. To estimate your upper limit for saturated fat, divide your upper limit of total fat (determined above) by 3.

- Choose fewer foods that contain saturated fats (butter, lard, coconut, palm and palm kernel oils, beef fat, cream, and cocoa butter).
- The suggested upper limit of saturated fat intake (Daily Value) shown on food labels is 20 grams per day, based on a daily intake of 2,000 calories. As with the total fat allowance, the saturated fat allowance is based on a person’s size, age, sex, and activity level.
- For most people, the limit on saturated fat intake is between 18 and 31 grams per day. A tall, active young man might be able to eat 31 grams of saturated fat per day and still have a diet low in saturated fat. A small, inactive woman might have to limit her saturated fat intake to 18 grams per day.
- If your calorie intake is in the high range or about 2,800 calories and your fat intake is about 93 grams per day, you can have a saturated fat intake of up to 31 grams per day ($93 \div 3 = 31$).
- If your calorie intake is in the low range or about 1,600 calories and your fat intake is about 53 grams per day, you can have a saturated fat intake of up to 18 grams per day ($53 \div 3 = 18$).

“Choose a diet low in cholesterol.”

- The recommended upper limit of cholesterol intake (Daily Value) shown on food labels is 300 milligrams per day (DHHS/FDA, 1993). This recommendation is the same for all persons over the age of two, regardless of age, size, sex, activity level, or caloric intake.
- Children under the age of 2 years old have special needs. The suggested limits for fat, saturated fat, and cholesterol intakes do not apply to them.
- Foods containing egg yolk or organ meats (e.g., liver) are high in cholesterol.
- Other foods from animals (meat, poultry, fish, dairy products) contain cholesterol in varying amounts.
- Foods from plants (vegetable oils, fruits and vegetables, breads, grains, and cereals) do not contain cholesterol.

Why is the guideline important?

- Diets high in fat, saturated fat, and cholesterol are linked to increased risk for heart disease, obesity, and certain types of cancers.
- Obesity is a risk factor for heart disease, high blood pressure, diabetes, and some types of cancer.

- As blood cholesterol increases, greater risk for heart disease occurs.
- “Blood cholesterol” refers to the cholesterol that circulates in the blood. It is influenced by the amount of fat, saturated fat, and cholesterol in your diet.
- Saturated fat in the diet has a greater effect on blood cholesterol levels than dietary cholesterol.
- For adults, a total blood cholesterol level below 200 milligrams/deciliter is desirable.
- Fats are a very concentrated source of energy (calories) in the diet. Each gram of fat provides 9 calories, more than twice the amount provided by carbohydrate or protein.

How can I evaluate my diet?

- Many Americans have diets high in fat, saturated fat, and cholesterol. Americans currently get about 35 percent of their total calories from fat and 12 percent of calories from saturated fat.
- According to a USDA survey, over 40 percent of Americans believe their diets are “about right” in fat and over half feel their diets are “about right” in saturated fat. However, food consumption data shows that only about one-quarter of the respondents met the Dietary Guidelines recommendations for fat and saturated fat intake.
- The Dietary Guidelines recommend that Americans choose a diet that provides 30 percent of calories or less from fat, and less than 10 percent of calories from saturated fat. Some people have misinterpreted this recommendation to mean that they shouldn’t eat a meal or a food that contains more than 30 percent of calories from fat. However, it is your intake of calories and fat over an entire day (not in a single meal or food) that is important.

How can I implement the guideline in my own diet?

Choosing foods lower in fat

- The fat and cholesterol content of the diet depends on what foods are purchased, what is added during preparation, what cooking methods are used, and what extras are added at the table.
- Butter, margarine, shortening, and oil are obvious sources of fat.
- Sauces, gravies, dressings, toppings, and spreads can add fat to food.

- Meat, eggs, milk, and cheese naturally contain some fat. To reduce your fat intake, choose low-fat, nonfat, or lean versions of these foods when they are available.
- Fried foods have more fat than those that are baked, boiled, steamed, or broiled.
- Check nutrition information on ground meats for fat content when it’s available. If no nutrition information is available, remember that ground “beef” is usually higher in fat than ground “chuck,” while ground “round” and ground “sirloin” are leaner. Fat content of these meat products ranges from about 20 grams of fat (or about 30 percent of the Daily Value) per 4 ounces of raw ground meat for ground “round” and “sirloin” to about 30 grams of fat (or about 45 percent of the Daily Value) per 4 ounce portion for ground “beef.”
- Grades of meat can also give you an indication of fat content. In general, “select” grades are lower in fat than “prime” and “choice” grades.

Choosing foods lower in saturated fat

- Saturated fats are found primarily in foods of animal origin. Exceptions include the “tropical oils”—palm, coconut, and palm kernel oils, which are high in saturated fat.
- Although butter and margarine contain the same amount of calories and total fat, butter is higher in saturated fat. Margarines vary considerably in the amount of saturated fat they contain—read the label to choose types lower in saturated fat.
- Margarine and shortenings are made from vegetable oils by a process called hydrogenation, which changes the unsaturated liquid oil to a more saturated solid form. Hydrogenation also changes the chemical form of some of the fatty acids in the oil from the *cis* form (found in nature) to the *trans* form. This is a concern because *trans* fatty acids appear to act more like saturated fatty acids than their *cis* counterparts in terms of raising blood cholesterol levels.
- Margarines with liquid oils listed as the first ingredients are generally lower in saturated fat and *trans* fatty acids than margarines with hydrogenated oils listed first.
- Stearic acid is a saturated fatty acid, but unlike other saturated fatty acids, its consumption does not appear to lead to increased blood cholesterol levels. USDA is allowing the voluntary listing of stearic acid on meat and poultry labels.

Choosing foods lower in cholesterol

- Cholesterol in the diet is found only in foods of animal origin. High sources of cholesterol include egg yolks and organ meats.
- Dry beans and peas (often used in place of meat) contain no cholesterol, and most contain very little fat.
- Ounce for ounce, poultry meat has about the same amount of cholesterol as lean beef and pork. However, poultry without skin is often a lower fat choice.
- Because cholesterol is found in both the fat and muscle portions of meat, lean meats contain some cholesterol. However, in dairy products cholesterol is found only in the fat; lowfat and nonfat dairy products are therefore low in cholesterol.

How can I use the food label to implement the guideline?

Look at the information on the “Nutrition Facts” panel

- The “Nutrition Facts” panel lists grams of total fat, grams of saturated fat, milligrams of cholesterol, and number of calories from fat contained in one serving of the product.
- Daily Values have been established for total fat (65 grams), saturated fat (20 grams), and cholesterol (300 milligrams). The label declares the percentage for each food component supplied by one serving of the product in a column with the heading “%Daily Value” (DHHS/FDA, 1993).
- Before purchasing foods, check the “%Daily Value” numbers to compare their fat, saturated fat, and cholesterol content.
- The “%Daily Value” numbers can also be used to see how a food fits into a 2,000 calorie diet. For example, a woman eating about 2,000 calories a day who chooses an entree containing 40% of the Daily Value for fat may want to choose lower fat items as side dishes and as entrees for other meals to keep her fat intake within recommended levels for the day.
- A serving size is approximately the same for all brands of similar products. This can help you compare products. However, check the serving size when making comparisons, since a product’s labeled serving size may not be the same as the amount you usually eat.
- To assess the fat, saturated fat, and cholesterol content of a product compared to your upper limit, compare gram or milligram contents with the Daily Values (if you eat about 2,000 or 2,500 calories a day) or with your personalized values, if you wish to use them. See p. 43 for instructions

on how to calculate your personalized values. As an example, if you eat about 2,500 calories a day, your upper limit for total fat intake is about 80 grams per day ($2,500 \div 30$). If a product contains 10 grams of total fat per serving, it supplies about 12 percent of your fat limit for the day ($10 \div 80 \times 100 = 12.5$).

- Occasionally, you may want to “add up” the grams of fat in all the foods you eat in a day and compare your intake to your recommended upper limit. If you’re over your limit, you may want to review the tips on pp. 44–45 to see how you can cut back on your fat intake.
- Saturated, polyunsaturated, and monounsaturated fatty acids all contribute to total fat and provide the same number of calories (9 per gram). Saturated fat content must be listed on the label. Monounsaturated and polyunsaturated fat content may be listed but are not required.
- Labels on meat and poultry products may provide information about the grams of stearic acid they contain per serving.
- Note that when they are all listed on the label, grams of saturated, monounsaturated, and polyunsaturated fat may still not “add up” to equal grams of total fat, because these numbers are rounded and *trans* fatty acids and other fat components are not included.

Look for nutrient content claims on the label

- Terms such as “low fat,” “lean,” and “extra lean” have been defined by the Federal government. Foods displaying these terms must conform to strict definitions and are indeed low in fat.
- Fat free products contain virtually no fat.
- “Skim,” “low fat,” or “nonfat dry” milk and “nonfat” or “low fat” yogurt and cheese are low fat dairy choices.
- “Reduced fat” or “less fat” claims may be found on the labels of products that are lower in fat than similar foods. Read the fine print next to the claim to see how much fat is in the product.
- Products labeled “saturated fat free” contain less than 0.5 grams saturated fat and less than 0.5 grams *trans* fatty acids per reference amount.
- Products labeled “low saturated fat” contain 1 gram or less saturated fat per reference amount and 15% or less of calories from saturated fat.
- “Reduced saturated fat” or “less saturated fat” claims may be found on the labels of products that contain less saturated fat than similar foods.

- Foods labeled “cholesterol free” or “low cholesterol” are *not* necessarily low in total fat. However, they must disclose the amount of fat they contain if they are high in fat. They must also contain 2 grams or less saturated fat per reference amount.
- “Reduced cholesterol” or “less cholesterol” claims on the label indicates a product that contains less cholesterol than similar foods.
- “Light” or “Lite” products **may or may not** be low in fat. Look at the “Nutrition Facts” panel of these products to find out how much they contain.

Look for health claims on the label

- Foods on which a claim about the relationship of saturated fat and cholesterol in the diet to risk of heart disease appears on the label must be low in fat, saturated fat, **and** cholesterol.
- Foods on which a claim about the relationship of fat in the diet to risk of cancer appears on the label must be low in fat.

Look at the ingredient list

- Ingredients in all food products are listed from the most to the least by weight. While ingredient labels do not show the exact amount of any ingredient, they give an idea of the relative amount of each ingredient.
- Products containing hydrogenated vegetable oils are generally higher in saturated fat and *trans* fatty acids than products containing liquid oils.

Choose a Diet with Plenty of Vegetables, Fruits, and Grain Products

Rationale for the Guideline

Fats and carbohydrates are the two major sources of calories (energy) in the American diet. Populations like ours with diets low in dietary fiber and complex carbohydrates and high in fat, especially saturated fat, tend to have more heart disease, obesity, and some cancers. Many health authorities suggest Americans should get more of their calories from carbohydrates and less from fats.

The most healthful way to get more calories from carbohydrates is to eat plenty of vegetables, fruits, and grain products. These foods are important for their vitamins, minerals, and complex carbohydrates including dietary fiber. Vegetables, fruits, and grain products are generally low in calories if fats and sugars are used sparingly in their preparation and at the table.

Scientific research is showing that there are naturally occurring compounds in vegetables and fruits that may help protect against some cancers. Vitamins A, C, and E, the carotenes, several minerals, and possibly other substances may be responsible alone or together for the protective effect of vegetables and fruits. More research is being done in this area.

Some studies indicate that foods containing soluble fiber may help reduce blood cholesterol levels in some people. Eating foods containing insoluble fiber is important for proper bowel function and can reduce symptoms of chronic constipation, diverticular disease, and hemorrhoids. Most high-fiber foods contain both soluble and insoluble fiber but in different proportions. Research continues on the possible protective effects of dietary fiber against colon cancer, heart disease, and diabetes.

Specific Recommendations

USDA's Food Guide recommends eating at least three servings of vegetables, two servings of fruits, and six servings of grain products, such as breads, cereals, rice, and pasta—with an emphasis on whole grains—every day.

All healthy people over 2 years of age should be encouraged to eat the minimum number of servings recommended by the Food Guide. These recommendations are repeated in Healthy People 2000: National Health Promotion and Disease Prevention Objectives (DHHS/PHS, 1991) as well as in the Dietary Guidelines for Americans (USDA and DHHS, 1990).

The numbers of recommended servings is based on research done to develop USDA's Food Guide illustrated by the Food Guide Pyramid on p. 2. The Food Guide was developed to help people follow the Dietary Guidelines. The idea behind emphasizing vegetables, fruits, and grain products is to provide recommended amounts of vitamins and minerals, to increase dietary fiber intake, and to replace calories from fat with calories from carbohydrates.

Choosing the recommended number of daily servings of vegetables, fruits, and grain products recommended will—

- (1) help supply sufficient quantities of essential vitamins and minerals,
- (2) increase intake of total carbohydrates and complex carbohydrates, and
- (3) make up for caloric deficit due to fat reduction.

Some health organizations have suggested that healthy, adult Americans increase dietary fiber to 20 to 30 grams per day, roughly twice what most Americans eat now. They also suggest an upper limit of 35 grams per day to avoid any adverse effects such as bloating, gas, or cramping

WHAT COUNTS AS 1 SERVING?

VEGETABLES	FRUITS	GRAIN PRODUCTS
1 cup of raw leafy greens	1 medium apple, orange, banana	1 slice of bread
1/2 cup cooked vegetables	1/2 cup of small or diced fruit	1/2 bun, bagel, or english muffin
1/2 cup chopped raw vegetables	3/4 cup fruit juice	1 ounce dry ready-to-eat cereal
3/4 cup vegetable juice	1/2 grapefruit	1/2 cup cooked cereal, rice, or pasta
	1/4 cup dried fruit	

(NAS/NRC, 1989). These suggestions are not meant for children, older adults, or people on special diets. Not enough research has been done with these groups to support specific fiber intake levels for them; however, everyone should include plenty of vegetables, fruits, and grain products in their daily diet. Some of the benefit from a higher fiber diet may be from the food that provides the fiber, not from the fiber alone. For this reason, it is best to get fiber from foods rather than from supplements.

Definitions:

Sugars, starches, and dietary fiber are three kinds of carbohydrates.

Sugars are simple carbohydrates made up of one or two sugar units. They occur naturally in fruits, vegetables, and milk along with vitamins and minerals. Foods may have simple sugars added to them or are mostly composed of simple sugars—this adds calories but not vitamins or minerals.

Starch and most types of **dietary fiber** are **complex carbohydrates**. They are called complex because they are made of chains of many sugar units, not just one or two as found in simple sugars. Starches are in breads, cereals, pasta, rice, dry beans and peas, and vegetables such as potatoes and corn. Foods that are high in starch generally are low in fat and provide vitamins, minerals, and dietary fiber as well as calories.

Dietary fiber is the part of plant foods that cannot be broken down by human digestive enzymes. Fiber does not supply vitamins and minerals but it does appear to play a role in preventing some diseases. Dietary fiber is in whole-grain breads and cereals, dry beans and peas, vegetables, and fruits. Most high-fiber foods contain both soluble and insoluble fiber but in different proportions; so, it is best to eat a variety of fiber-rich foods.

Soluble fiber includes some pectins, some hemicelluloses, and gum and is found in oats, dry beans and peas, and some fruits and vegetables.

Insoluble fiber produces the tough, chewy texture of wheat bran, whole grains, and vegetables. Cellulose, some hemicelluloses, some pectins, and lignin are insoluble fibers.

Whole grains are products that contain the entire grain kernel, or all of the kernel that is edible. Some examples are whole wheat, cracked wheat, oatmeal, popcorn, and brown rice. Whole grains provide more vitamins, minerals, and dietary fiber than more processed grains.

Trends in Dietary Intakes

Choosing a diet with plenty of vegetables, fruits, and grain products is the most healthful way for Americans to get a larger proportion of their caloric intake from carbohydrate and add more dietary fiber to their diets. In addition, vegetables, fruits, and grain products are good sources of many vitamins and minerals, including vitamins A and C, several B vitamins, iron, and magnesium.

Current Carbohydrate Intake. Data from USDA's 1977-78 Nationwide Food Consumption Survey (NFCS) and 1989-90 Continuing Survey of Food Intakes by Individuals (CSFII) indicate a trend to higher levels of carbohydrate consumption.¹ In 1977-78, on the average, 43 percent of total calories came from carbohydrate. By 1989-90, the percent of calories from carbohydrate had increased to 49 percent.

Current Intakes of Dietary Fiber. Based on CSFII 1989-90 data, dietary fiber intakes of men 20 and older averaged 16 grams/day. Women averaged 12 grams of fiber daily (Tippett and Goldman, 1994). These levels are below the 20 to 30 grams per day recommended by the National Cancer Institute.

Fruits, Vegetables, Grains: The Major Food Group Sources of Carbohydrate and Dietary Fiber. What proportions of dietary carbohydrate and fiber are obtained from fruits, vegetables, and grains? USDA researchers used data from USDA's 1985 Continuing Survey of Food Intakes by Individuals (CSFII) to identify the food group sources of carbohydrate and fiber in the diets of women 19-50 years of age (Krebs-Smith et al., 1990). For this analysis, mixed foods, which are traditionally categorized in terms of their major food ingredient (for instance, a hamburger on bun would be categorized as a "meat mixture" and placed in the meat group), were separated into their component ingredients (the hamburger on bun was separated into hamburger and bun) and each ingredient was placed in the appropriate food group (hamburger in the meat group; the bun in the grains group, etc.). This process provides a more accurate picture of the contribution of vegetables and grains to the diet, since they are often found in mixed foods such as sandwiches, casseroles, etc.

¹ All average intakes reported in this section are based on 3-day data unless otherwise noted.

Using this method, it was found that over 4 days of reported dietary intake, fruits, vegetables, and grains supplied 60 percent of the carbohydrate and 86 percent of the fiber in the diets of women 19-50 years of age. Grains supplied almost 36 percent of total dietary carbohydrate and 30 percent of the dietary fiber. Fruits and vegetables (not including legumes) each supplied about 12 percent of total carbohydrate. Vegetables were especially important as sources of dietary fiber, providing 36 percent of the fiber in women's diets. Fruits supplied 20 percent of total dietary fiber intake.

Current Patterns of Grain Consumption. Traditionally, grain products have been a basic part of the daily diet. USDA's CSFII 1989-90 data indicate that this continues to be the case. In 1989-90, 99 percent of all individuals consumed at least one grain product during the 3-day survey period (Enns et al., 1994).

Grain consumption appears to be on the rise. Between 1977-78 and 1989-90, consumption of grain-based products increased by 19 percent. This increase was due primarily to the rise in consumption of grain-based mixtures like pizzas and pastas.

Current Patterns of Fruit Consumption. Based on USDA survey data, it appears that many individuals do not include fruit in their diet on a daily basis. In 1989-90, according to data from USDA's CSFII, only about three-quarters of individuals reported consuming fruit at least once during the 3-day survey period (Enns et al., 1994). Less than one-half of individuals reported consuming citrus fruit or juice at least once in 3 days.

Overall fruit consumption averaged 150 grams per day. This amount is roughly equivalent to one serving of fruit daily, well below the 2-4 servings recommended. Lower income individuals were less likely to consume fruit than more affluent individuals. Of those individuals living in households with incomes below 131 percent of the Federal poverty level, 67 percent ate fruit or fruit juice at least once in 3 days. By comparison, 77 percent of individuals living in households with incomes that were over 350 percent of the Federal poverty guideline ate fruit or fruit juice at least once during the 3-day survey period.

Current Patterns of Vegetable Consumption. Vegetables appear to be eaten daily by almost everyone. In 1989-90, more than 9 out of 10 individuals reported consuming vegetables at least once in 3 days (Enns et al., 1994). Potatoes and tomatoes were the most widely consumed vegetables. The dark-green and deep-yellow vegetables that are especially rich sources of vitamin A were less popular. Only about 20 percent of individuals ate dark-green vegetables as a separate item at least once during the 3-day survey period; the same was true for deep-yellow vegetables.

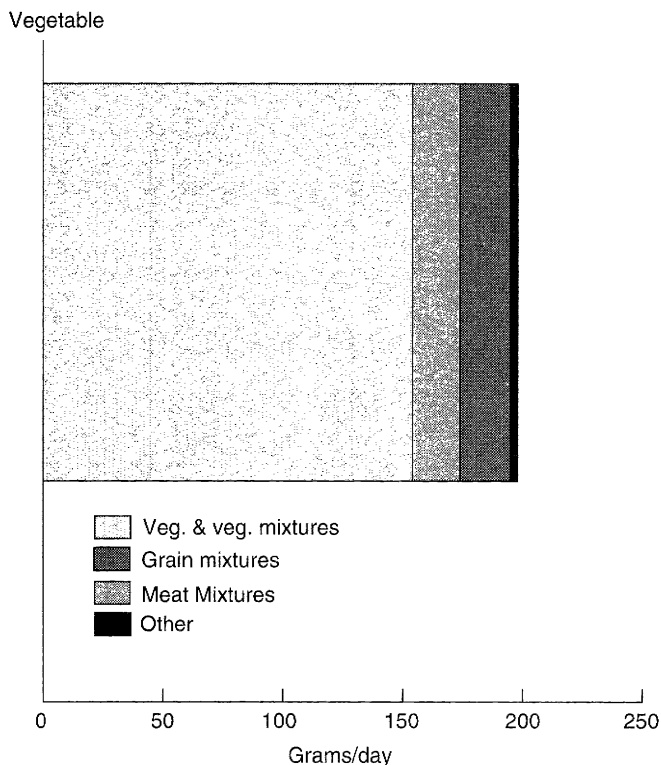
Besides eating vegetables as separate menu items, individuals also consumed vegetables as part of many mixed dishes, such as casseroles, stews, sandwiches, and some baked goods (carrot cake, pumpkin pie). Using CSFII 89-90 data, USDA researchers separated the vegetable component from all other ingredients in all foods reported consumed by individuals 2 years of age and older on a given survey day (Guthrie et al., 1993; based on 1-day data). When all sources of vegetables were considered and nonvegetable components of primarily vegetable foods were removed (e.g., mayonnaise in coleslaw), average vegetable consumption (not including legumes) by individuals 2 years of age and over in 1989-90 was estimated to be 198 grams (1/2 cup cooked, chopped broccoli weighs about 90 grams, 1 cup lettuce weighs about 55 grams, and 10 french fries weigh about 50 grams). Of this total almost 80 percent or 154 grams came from foods in which vegetables were the main ingredient; the remainder came from mixed dishes in which vegetables were secondary ingredients (figure 11).

What About Dry Beans and Peas? Dry beans and peas (legumes) are a part of the meat, poultry, fish, dry beans, eggs, and nuts group because they are high in protein and can be used as meat alternates in the diet. The Food Guide also groups dry beans and peas with vegetables, specifically starchy vegetables. A serving of dry beans or peas can be counted as *either* a serving from the meat, poultry, fish, dry beans, eggs, and nuts group or one from the vegetables group (the estimate of vegetable consumption presented above does not include legumes).

CSFII 1989-90 data indicate that legumes are not a major part of the diets of most Americans (Enns et al., 1994). Only about one-quarter of all individuals reported consuming legumes at least once during the 3-day survey period, and the average daily intake of legumes was 24 grams, equivalent to slightly more than 1/4 cup of cooked dry beans. Given that legumes are good sources of protein, complex carbohydrate, dietary fiber, and many vitamins and minerals, it is unfortunate that consumption is low.

Figure 11

Vegetable Consumption from All Food Categories; Vegetable Consumption Measured at the Prime Ingredient Level.



Source: CSFII, 1989-90; 1-day data.

Current Beliefs and Misconceptions

As the relationship between health and diet has been more clearly defined, nutrition authorities have recognized the importance of increasing consumption of fruits, vegetables, and grain products. A major promotional program currently underway is the national “5 A Day” campaign to increase fruit and vegetable consumption. This united effort of the private and public sector is a major step toward effecting positive change in the American diet. As one nutritionist pointed out recently, this is a key opportunity to tell Americans to eat more of something versus less. As for grain products, nutritionists have long been advocating increased consumption of these foods rich in complex carbohydrates such as bread, cereal, and pasta. So what do Americans think about eating more fruits, vegetables, and grain products?

Fruits and vegetables. The American Dietetic Association’s (ADA) Survey of American Dietary Habits (ADA, 1993) found that the nutrition message for fruits and vegetables has been effective. Respondents were asked which foods they buy specifically to achieve a healthy diet; vegetables were named most often (52 percent, up from 40 percent in ADA’s 1991 survey) followed by fruit (36 percent, up from 27 percent in 1991). In the survey done for ADA and the International Food Information Council (IFIC) (Gallup Organization, 1994), 80 percent of respondents agreed with the statement “eating lots of fruits and vegetables can reduce your risk of cancer.”

The Produce for Better Health Foundation sponsored a survey entitled “5 A Day for Better Health: A Baseline Study of Americans’ Fruit and Vegetable Consumption” (DHHS/PHS/NIH, 1992b). This study found that 40 percent of adult respondents believed it was likely that eating fruits and vegetables would help prevent cancer, 50 percent thought it would help prevent heart disease, and 60 percent thought it would help them lose or maintain weight. However, only 8 percent of respondents thought they should eat five or more servings of fruits and vegetables each day and 66 percent thought two or fewer servings were sufficient. In addition, this survey found that respondents who ate the largest amounts of fruits and vegetables were more aware of the related health benefits. Women, people aged 35 to 49, and those with more than a high school education were more likely to equate specific health benefits with fruit and vegetable consumption.

Respondents in the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) were asked to rate on a scale from 1 to 6 how important eating at least five servings a day of fruits and vegetables was to them. Forty-five percent rated it of high importance, 30 percent rated it of moderate importance, and 25 percent rated it of low importance.

Grain Products. Thirty-six percent of DHKS respondents rated the health advice to eat at least six servings a day of grain products as of high importance to them. Twenty-four percent rated it of low importance.

The “Consumer Awareness/Behavior Study” (Gallup Organization, 1992) conducted by the Wheat Foods Council found that 44 percent of respondents said they were either “not too likely” or “not at all likely” to meet the 6 to 11 servings a day of grain products recommended by the U.S. Dietary Guidelines for Americans. The major reason cited was the perception that the recommended number of servings was too high.

The same study noted that respondents, especially women, viewed wheat foods as high in nutritional value and cost-worthy. This study also found that 66 percent of respondents agreed that wheat foods were high in complex carbohydrates and low in fat and calories, and 65 percent agreed that a high consumption of wheat foods helps prevent colon cancer.

Label Information Related to the Guideline

Vegetables, fruits, and grain products are good sources of complex carbohydrates, dietary fiber, vitamins and minerals. They are also generally low in fat. When the new regulations become effective, nutrition information will be on the label of almost all grain products and canned and frozen fruits and vegetables. Information may also be available at the point of purchase (e.g., in the produce section of the supermarket) for the 20 most commonly consumed fresh fruits and vegetables. See pp. 7–8 for more information about voluntary labeling of fresh fruits and vegetables.

General information about what is included on the nutrition label is presented in the Overview, beginning on p. 6. The “%Daily Value” information for dietary fiber and the vitamins and minerals may be especially helpful to consumers. They can use this information to compare products (for example, to find out which fruit contains more vitamin C) or to choose foods that are especially good sources of these nutrients. Nutrient content claims such as “good source” and “high” can point out foods that are particularly good sources of dietary fiber or of certain vitamins and minerals. See the

labeling section under the guideline “Eat a Variety of Foods” (pp. 20–21) for more information concerning these claims.

When purchasing breads, consumers can look for the “Nutrition Facts” panel to determine how much fiber is in a serving. Breads labeled as containing “wheat flour” and “caramel coloring” may look like whole-wheat bread but in fact contain little dietary fiber. Also, some items listing bran (such as oat bran, rice bran, or wheat bran) as an ingredient may contain little dietary fiber because the amount of bran added is small.

Health Claims. FDA has approved three health claims concerning the relationship of fruit, vegetable, and grain products to health for use on the labels of products it regulates. These concern the relationship of fiber-containing grain products, fruits, and vegetables to the risk of cancer; the relationship of fruits, vegetables, and grain products that contain dietary fiber to the risk of coronary heart disease; and the relationship of fruits and vegetables to the risk of cancer. General information concerning the use of health claims is presented in the Overview, pp. 12–14. More specific information about these three claims is presented below.

Grain products, fruits, and vegetables and cancer risk. A claim concerning the relationship of dietary intake of fiber-containing grain products, fruits, and vegetables to the risk of cancer may appear on the labels of grain products, fruits, and vegetables, provided that they meet the requirements necessary to use the “low fat” claim *and* the “good source of dietary fiber” claim. The fiber claim must be met without fortification. A model health claim which meets FDA’s requirements is shown below:

Low fat diets rich in fiber-containing grain products, fruits and vegetables may reduce the risk of some types of cancer, a disease associated with many factors.

Grain products, fruits, and vegetables and heart disease risk. Claims concerning the relationship of dietary intake of fruits, vegetables, and grain products that contain fiber, particularly soluble fiber, to the risk of coronary heart disease can appear on fruits, vegetables, or grain products or foods that contain them. The food must simultaneously meet the requirements necessary to use the “low fat,” “low saturated fat,” and “low cholesterol” claims and must contain at least 0.6 grams of soluble fiber per reference amount customarily consumed. The amount of soluble fiber in the product must be listed on the “Nutrition Facts” panel (normally the listing of soluble fiber is voluntary). A model claim which meets FDA’s requirements is—

Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain some types of dietary fiber, particularly soluble fiber, may reduce the risk of heart disease, a disease associated with many factors.

Fruits and vegetables and cancer risk. Claims concerning the relationship of dietary intake of fruits and vegetables to the risk of cancer can appear on fruits and vegetables or foods containing fruits and vegetables. The food must be a “good source” (without fortification) of vitamin A, vitamin C, and/or dietary fiber. A model health claim which meets FDA’s requirements is shown below.

Low fat diets rich in fruits and vegetables (foods that are low in fat and may contain dietary fiber, vitamin A, and vitamin C) may reduce the risk of some types of cancer, a disease associated with many factors. [Name of food] is high in [or is a good source of] [nutrient—vitamin A, vitamin C, and/or dietary fiber].

Key Concepts for Consumers—Vegetables, Fruits, and Grains

What is the guideline on vegetables, fruits, and grain products?

“Choose a diet with plenty of vegetables, fruits, and grain products.”

- Vegetables, fruits, and grain products are important parts of the varied diet discussed in the first guideline. They provide needed vitamins, minerals, and dietary fiber.
- Many health authorities suggest we should get more of our calories from complex carbohydrates and less from fats.
- The most healthful way to get more carbohydrates is to eat plenty of vegetables, fruits, and grain products.

Why is the guideline important?

- Populations like ours with diets low in dietary fiber and complex carbohydrates and high in fat, especially saturated fat, tend to have more heart disease, obesity, and some cancers.
- Vegetables, fruits, and grain products contain complex carbohydrates, dietary fiber, vitamins, and minerals. These foods are generally low in fats.

- By choosing the suggested amounts of these foods, you are likely to increase carbohydrates, vitamins, minerals, and dietary fiber and decrease fats in your diet, as health authorities suggest.
- Some of the benefits of a higher fiber diet may be from other substances rather than the fiber found in the food. For this reason, it’s best to get fiber from foods rather than from supplements.
- Eating foods containing insoluble fiber, such as wheat bran, whole grains, and vegetables, is important for proper bowel function.
- Some studies indicate that foods containing soluble fiber, such as oats, dry beans and peas, and some fruits and vegetables, may help reduce blood cholesterol levels in some people.
- Eating a variety of different fruits and vegetables can help you get the vitamins and minerals you need for good health.
- Vitamins A, C, and E, the carotenes, several minerals, and possibly other substances may be responsible alone or together for the protective effect of vegetables and fruits against some cancers.

How can I evaluate my intake of fruits, vegetables, and grain products?

- What does “plenty” mean? It means that everyone should have at least the minimum number of servings each day recommended by USDA’s Food Guide, that is, three servings from the vegetable group, two servings from the fruit group, and six servings from the bread group.
- People with higher calorie needs should have more than the minimum number of servings of fruits, vegetables, and grain products. For example, if you’re a moderately active woman eating 2,200 calories a day, you should eat four servings from the vegetable group, three servings from the fruit group and nine servings from the bread group. If you’re an active young man eating 2,800 calories a day, you should eat five servings from the vegetable group, four servings from the fruit group, and eleven servings from the bread group.
- Some health authorities have suggested that healthy, adult Americans consume 20 to 30 grams of dietary fiber per day, which is roughly twice what most Americans eat now. The Daily Value on food labels, based on a 2,000 calorie diet, is 25 grams per day.

- These levels of fiber intake are not meant for children, the elderly, or people on special diets. However, everyone, including young children, should include vegetables, fruits, and grain products in their daily diet.

What are our current beliefs and misconceptions about this guideline?

- The National Cancer Institute’s fruit and vegetable consumption study found that only 8 percent of adults thought they should eat five or more servings of fruits and vegetables each day. This study also found that 66 percent thought two or fewer servings were enough.
- USDA’s Diet and Health Knowledge Survey found that over 30 percent of adults stated that it was generally not important to them personally to eat at least five servings a day of fruits and vegetables.
- The same USDA survey found that over 20 percent of adults said it was generally not important to them personally to eat at least six servings a day of grain products.
- A study conducted for the Wheat Foods Council found that 44 percent of adults said they were either “not too likely” or “not at all likely” to meet the 6 to 11 servings a day of grain products recommended by the U.S. Dietary Guidelines for Americans. Many respondents thought the recommendation was too high.

How can I implement the guideline in my own diet?

- Complex carbohydrates such as starches are in breads, cereals, pasta, rice, dry beans and peas, and other vegetables such as potatoes and corn.
- Many people think starchy foods such as breads and potatoes are fattening. In fact, most of the calories come from additions such as butter or margarine, sour cream, and gravies. Carbohydrates in starchy foods provide 4 calories per gram, while fat provides 9 calories per gram.
- Dietary fiber is in whole-grain breads and cereals, dry beans and peas, vegetables, and fruit.
- Increase your fiber intake by eating a variety of foods that contain fiber naturally.
- Fiber is often concentrated in the skin and outer layers of fruits and vegetables.
- Processing affects the fiber content of foods—for example, a whole medium apple contains 3 grams of fiber, 1/2 cup of applesauce contains 1.8 grams of fiber, and 3/4 cup of apple juice contains only 0.2 grams of fiber.

- You can get about 20 grams of fiber a day if you choose at least:

three servings of vegetables such as broccoli spears, corn, baked potato, and kidney beans

plus two servings of fruit such as banana, pear, apple, and figs

plus three servings of whole-grain products such as whole-wheat bread, hot oatmeal, and other whole-grain cereal.

- Choose a variety of high-fiber foods—vegetables, fruits, and whole-grain products—in order to get enough of both soluble and insoluble fibers daily. Both types are important because they have different health benefits.
- Choosing a variety of fruits, vegetables, and grain products will also ensure that you get enough of the vitamins and minerals you need every day.
- Dry beans and peas are high in some of the nutrients we count on meat for—iron, zinc, and vitamin B₆, for example—and they are also low in fat. They can be used as either a meat alternate or a vegetable serving in meals.

How can I use the food label to implement the guideline?

- USDA’s Food Guide (see p. 2) recommends that everyone eat at least three servings from the vegetable group, two servings from the fruits group, and six servings from the bread group every day.
- Food labels can help you identify good sources of the vitamins and minerals listed on the label, and good sources of fiber within the vegetable, fruit and bread groups shown in the Food Guide.
- Nutrition information for some raw vegetables and fruits is often available at the point of purchase. Nutrition information about grain products and frozen and canned fruits and vegetables is on the label. Read the information and use it when making food choices.
- To find baked products higher in fiber, look for the “%Daily Value” number on the nutrition label. Products containing at least 10% of the Daily Value for fiber are generally considered to be good sources.
- Dark breads are not always whole-grain; sometimes the dark color comes from “caramel coloring,” listed on the ingredient label. Check the “Nutrition Facts” panel to see how much fiber these breads contain.

- Not all foods containing bran are high in fiber. Check for the amount of dietary fiber on the “Nutrition Facts” panel to be sure.
- Look for the “%Daily Value” listing for vitamin C, vitamin A, calcium, iron, and possibly other vitamins and minerals. This value compares the amounts of these nutrients contained in a serving of the food to reference levels for healthy Americans. You can check these numbers to see if you’re getting enough of these vitamins and minerals. You can get all you need from the food you eat; most people don’t need to take vitamin and mineral supplements.
- Look for the words “good source” and “high” on the front panel of the label. Examples are “good source of fiber” or “high” in vitamin C. Foods that contain these statements are good sources of the nutrient(s) listed.

Use Sugars Only in Moderation

Rationale for the Guideline

The American diet contains many different sugars. In addition to enhancing flavor, sugars provide calories, and act as preservatives, thickeners, and other agents in processed foods. Sugars added to foods supply additional calories but few additional nutrients. The American Dietetic Association recommends that added sugars and other sweeteners be used in moderation and in the context of an otherwise nutritious and well-balanced diet (Franz and Maryniuk, 1993).

Both sugars and starches (which the body breaks down into sugars) can contribute to tooth decay. The risk increases the more often these foods are eaten, and the longer they are exposed to the teeth. Thus, sugars and starches eaten frequently between meals may be more harmful to the teeth than those eaten at meals. Fluoride from toothpastes, public water supplies, supplements, and other sources is also important in preventing tooth decay, particularly for children whose teeth are not yet fully developed.

Diabetes does not result from a diet high in sugar. The most common type of diabetes is associated with being overweight, but avoiding sugar will not correct the weight problem by itself.

Artificial sweeteners are commonly used as noncaloric sugar substitutes. Among healthy people, however, there are no known health advantages associated with using these sweeteners, and the evidence that they are effective in helping people lose weight is inconclusive.

Specific Recommendations

Sugars, also known as simple sugars, are a type of carbohydrate made up of one or two single sugar units. They can occur naturally in foods such as fruits and dairy products, or can be added to foods during processing. Sugars are found in foods in many different forms. Names of some of these include table sugar (sucrose), brown sugar, raw sugar, glucose (dextrose), fructose, maltose, lactose, honey, syrup, corn sweetener, high-fructose corn syrup, molasses, and fruit juice concentrate.

The Dietary Guidelines recommend that sugars be used in moderation by most healthy people. Sugars and many foods high in them supply calories but are limited in other nutrients. While sugars can serve as a useful source of energy for active people with high calorie needs, they should be used sparingly by those who have lower calorie requirements.

USDA's Food Guide suggests upper limits of added sugars intake to ensure that nutrient needs are met without providing excessive calories. These limits are the amount of sugars that can be added to the diet when—

- the recommended number of servings from the five major food groups for the suggested calorie level is eaten (see the chart on p. 3 for recommended numbers of servings),
- fat intake from both added fats and higher fat choices from within the major food groups is kept below 30% of calories from fat, and
- calorie recommendations are not exceeded.

The suggested limits for added sugars are 6 teaspoons (24 grams) a day for persons eating 1,600 calories, 12 teaspoons (48 grams) a day for persons eating 2,200 calories, and 18 teaspoons (72 grams) a day for persons eating 2,800 calories. Note that these limits are intended to be averages over time, not rigid prescriptions.

Tooth decay is associated with both sugars and starches (another type of carbohydrate made up of chains of many sugar units) in the diet. To reduce the risk of developing caries, these foods should be eaten with meals rather than as between-meal snacks. Regular tooth brushing and flossing are also recommended. Fluoride toothpastes should be used because of fluoride's protective effect against tooth decay. To prevent dental caries, sugar water should not be put in a bottle to be used as a pacifier for infants and young children.

Trends in Dietary Intakes

National food consumption survey data, such as that available from the USDA's Nationwide Food Consumption Survey (NFCS), report average total carbohydrate intakes of individuals, but do not report average intakes of sugars alone. However, the Food and Drug Administration (FDA) used data from NFCS 1977-78 in a special analysis to estimate average intakes of added, naturally occurring, and total sugars (Glinsmann et al., 1986). The FDA's results indicated that the total intake of all sugars (including lactose) for all individuals averaged about 21 percent of calories in 1977-78, with added sugars accounting for about half of that.

Has sugar intake changed since 1977-78? Similar analyses using more recent data have not been conducted; however, some indication of trends in sugar consumption can be gained by comparing intakes of sweets and sugary foods in 1977-78 and 1989-90, using data from USDA's NFCS and CSFII.¹

Current Intakes of Sweets and Sugary Foods. Average intakes of sugars and sweets (defined as including sugar, sugar substitutes, syrups, honey, molasses, icing, sweet toppings and sauces, jelly, jam, marmalade, preserves, sweet pastes, fruit butters, gelatin desserts, ices, popsicles, candy, and chewing gum) changed little between 1977-78 and 1989-90, based on data from USDA's NFCS and CSFII. Intakes of sugars and sweets were estimated to average 23 grams per day for all individuals in 1977-78; 21 grams per day in 1989-90.

In both 1977-78 and 1987-88, about one-quarter of individuals reported consuming either a regular or low-calorie fruit-flavored drink or "ade" at least once during the 3-day survey period (Enns et al., 1994). The average intake of regular fruit drinks and "ades" for all individuals was 48 grams/day in 1977-78 and 42 grams/day in 1989-90 (an 8 fluid-ounce serving of fruit drink weighs about 250 grams). Average consumption of low-calorie fruit-flavored drinks and "ades" rose from 2 grams/day in 1977-78 to 11 grams/day in 1989-90.

Rise in Soft Drink Consumption. While intakes of most sugary foods changed little between 1977-78 and 1989-90, soft drinks grew in popularity. In 1989-90, 63 percent of all individuals used soft drinks at least once in 3 days, compared to 52 percent in 1977-78. Regular soft drinks remained the predominant choice; in 1989-90, half of all individuals reported consuming regular soft drinks at least once in 3 days. The biggest change, however, was the increased use of low-calorie soft drinks. In 1977-78, only 8 percent of individuals reported using low-calorie soft drinks at least once in 3 days; by 1987-88, that figure had risen to 20 percent (Enns et al., 1994).

Between 1977-78 and 1989-90, average consumption of regular soft drinks by all individuals rose by 45 percent, from 121 grams/day to 176 grams/day. Consumption of low-calorie soft drinks by all individuals increased by 210 percent, averaging 62 grams/day in 1987-88 compared to 20 grams/day in 1977-78.

Soft Drinks Versus Milk. Soft drinks appear to be most popular with teens and young adults. In 1989-90, the highest consumption levels were reported by individuals 12-49 years of age (Enns et al., 1994). Among other problems associated with consumption of large amounts of sugary foods, there is a concern that sugary foods may replace more nutritious foods in the diet. This problem is of particular concern when individuals are in a period of rapid growth and development, such as the teen years. Analysis of USDA's NFCS 1977-78 data indicated that, based on 3 days of reported dietary intake, increasing soft drink consumption was associated with decreasing milk consumption among teenagers 13 to 18 years of age (Guenther, 1986). Soft drinks were as likely to be consumed with lunch or dinner as with snacks, suggesting that soft drinks were replacing milk consumption at meals.

Are teens continuing to substitute soft drinks for milk? In 1989-90, based on CSFII data, females 12-19 years of age drank less milk, on average, than their 6- to 11-year-old counterparts. Average soft drink consumption, on the other hand, was more than twice as high for both males and females 12-19 years of age than for those 6-11 years of age (figure 12). Since milk is an excellent source of calcium, the possibility of its displacement in the diet by soft drinks raises the concern that calcium intakes may be lower than recommended. In 1989-90, calcium intakes of 12- to 19-year-old males averaged 1,170 milligrams/day, just below their Recommended Dietary Allowance (RDA) of 1,200 milligrams/day (Food and Nutrition Board, 1989). Average calcium intake of females 12-19 years of age was only 775 mg/day, 65 percent of their RDA of 1,200 milligrams/day.

Current Beliefs and Misconceptions

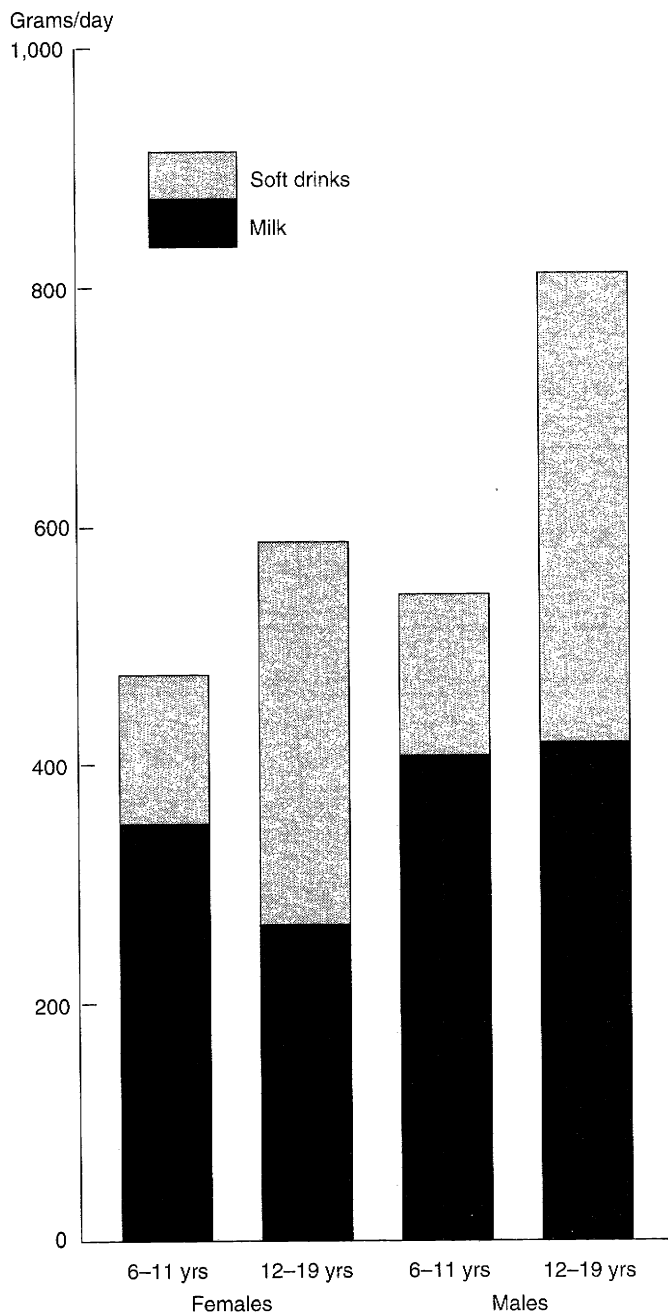
Sugars. On the one hand, we associate them with dental caries; on the other, with a pleasing sweet taste. In their various forms, sugars are found in many of the foods we eat. Whether naturally occurring or added during production, these taste enhancers have become a part of the American diet at an ever-increasing rate.

Respondents from the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) were asked how important the health advice to avoid too much sugar was to them personally. Sixty-one percent rated the advice as of high importance, 29 percent rated it of moderate importance, and 10 percent rated it of low importance. Approximately half of the respondents said their diets were about right with respect to sugars, but the other half stated that their diets should be lower in "sugar and sweets."

¹ All average intakes reported in this section are based on 3-day data unless otherwise noted.

Figure 12

Mean Milk and Soft Drink Consumption of Females and Males 6–11 Years of Age and 12–19 Years of Age



Source: CSFII, 1989-90; 3-day data.

Are people aware of health problems related to how much sugar a person eats? Eighty-two percent of DHKS respondents replied “yes” when asked if they were aware of a link between sugar intake and certain health problems.

One misconception about sugars that has been used as a marketing tool is the belief that honey is better and more nutritious than granulated sugar because it is a ‘natural’ product which has undergone less processing. Actually, the nutritional advantage of honey is negligible; honey basically contains more moisture and some potassium. Honey and granulated sugar are both sources of sugars. The processing of each is of little concern given the similar nutritional value of the end product.

Another misperception about sugars was reported by the American Heart Association (AHA, 1991). They noted that a majority of respondents believe complex carbohydrates include honey, molasses, and corn syrup. These products contain simple carbohydrates composed of one or two sugar units; complex carbohydrates such as starch and dietary fiber are made up of multiple sugar units linked together.

Misconceptions arise from the “sugarless” or “sugar free” labeling of chewing gum and hard candies. These products are often sweetened with *sugar alcohols*, which do not promote tooth decay but do contain calories. One type of sugar alcohol used in these products is sorbitol which is calorically similar to table sugar (sucrose); another type used is mannitol which is poorly digested and yields about one half as many calories per gram as glucose. Both are slowly absorbed by the body. To avoid the misconception that “sugar free” products are always low in calories, products displaying such a claim on the label must also include a statement such as “not a low calorie food,” “not a reduced calorie food,” or “not for weight control” if they do not meet the “low calorie” or “reduced calorie” definitions.

Label Information Related to the Guideline

Americans eat sugars in many forms but haven’t always been able to easily identify foods high in sugars. The new labels can be helpful for those who are trying to cut back on their intake of sugars. The “Nutrition Facts” panel is now required to list the amount of sugars (in grams) present in a serving of the food. Note that the term “sugars” includes both natural sugars in the product (e.g., lactose in milk, fructose in fruit) and sugars added to the product during processing. This is because there are no analytical methods currently available that can distinguish between naturally occurring and added

sugars after the product has been made. Of course, during preparation in a food processing plant or in the kitchen, the amount of added sugars can be easily identified. On the label, added sugars are named in the ingredient list.

There is no “%Daily Value” number on the “Nutrition Facts” panel for sugars. A Daily Value was not set for sugars because health experts have not agreed on quantitative recommendations for **total** sugars intake. USDA’s Food Guide Pyramid does suggest upper limits of **added** sugars in the total daily intake to ensure that individuals meet their nutrient requirements without exceeding their caloric needs (see p. 55). These suggested limits are intended to be averages over time, not rigid prescriptions.

Consumers can look at the ingredient listing to detect added sugars in foods. Terms used to describe sugars which are added to foods include: “sugar (sucrose),” “fructose,” “maltose,” “lactose,” “honey,” “syrup,” “corn syrup,” “high-fructose corn syrup,” “molasses,” and “fruit juice concentrate.” If one of these sweeteners is listed first or if several are listed, the food is likely to be high in added sugars.

Nutrient Content Claims Relating to Sugars Content.

The nutrient content claims shown in table 8 may be useful for consumers wanting to limit their intake of sugars. The amount specified by the definition is per reference amount customarily consumed, or per 50 grams if the reference amount is less than 30 grams or 2 tablespoons. For meal and main dish products (see definition on p. 9), the amount specified is per 100 grams (or per labeled serving for “free” claims).

Key Concepts for Consumers—Sugars

What is the guideline on sugar intake?

“Use sugars only in moderation.”

- The Dietary Guidelines recommend that you use sugars of all types only in moderation.
- USDA’s Food Guide recommends that you choose foods without added sugars from the major food groups shown in the Food Guide Pyramid more often, and that you go easy on the fats, sweets, and oils shown in the Pyramid tip.

Table 8.—Definitions of Nutrient Content Claims Related to Sugars Content.

Claim	Synonyms	Definition
Sugar free	Free of sugar, no sugar, zero sugar, without sugar, sugarless, trivial source of sugar, and dietarily insignificant source of sugar	Less than 0.5 grams sugars per reference amount ^{1,2}
Reduced sugar ³	Reduced in sugar, sugar reduced	Total sugars reduced by at least 25 percent from an appropriate reference food
Less sugar ³	Lower in sugar, lower sugar	
No added sugar	Without added sugar, no sugar added	No sugars or ingredients containing sugars (for example, fruit juice concentrates or jellies) added during processing or packaging ²

¹ Products displaying “sugar free” claims on the label cannot contain added ingredients that are generally understood by consumers to contain sugars, unless the claim is marked by an asterisk referring to a statement such as “adds a trivial amount of sugar.” “Sugar free” products may contain sugar alcohols and are not necessarily low in calories.

² If a food regulated by FDA does not meet “low calorie” or “reduced calorie” definitions (see p. 31), a statement such as “not a low calorie food,” “not a reduced calorie food,” or “not for weight control” must accompany the claim.

³ “Reduced” claims are used when the food is compared to another type of the same food (for example when cookies are compared with another brand or an average value for cookies). “Less” claims are used when the food is compared to a food which has a similar use (for example, when cookies are compared to another dessert such as cake).

- The Food Guide suggests upper limits of added sugars intake. These limits were set to help you meet your nutrient needs without eating too many calories. They are intended to be averages over time, not rigid prescriptions to follow. These limits are the amount of sugars you can add to your diet when—
 - you choose the recommended number of servings from the five major food groups shown in the Food Guide Pyramid (see figure 1, pp. 2–3),
 - you keep your fat intake from both added fats and higher fat choices within the major food groups below 30 percent of calories from fat, and
 - you keep your intake of calories at the level suggested for you
- The average upper limits of **added** sugars intake suggested by the Food Guide are—
 - 6 teaspoons (24 grams) a day for people eating 1,600 calories, such as sedentary women and many older adults
 - 12 teaspoons (48 grams) a day for persons eating 2,200 calories such as active women, teenage girls, most children, and many sedentary men
 - 18 teaspoons (72 grams) a day for persons eating 2,800 calories such as teenage boys, many active men, and some very active women.
- Sugars are added to foods in many different forms. Some ingredients which contain sugars include “sugar (sucrose),” “fructose,” “maltose,” “dextrose,” “lactose,” “honey,” “syrup,” “corn syrup,” “corn syrup solids,” “high-fructose corn syrup,” “molasses,” and “fruit juice concentrate.”
- Artificial sweeteners are commonly used as noncaloric sugar substitutes. For healthy people, however, they provide no known health advantages.

Why is the guideline important?

- Added sugars and many foods high in them provide calories but few nutrients. While they can serve as a useful source of calories if you have higher calorie needs, you should use them sparingly if you have lower requirements.
- The Dietary Guidelines and USDA’s Food Guide recommend eating a variety of foods in amounts necessary to get the nutrients you need. If you have lower calorie needs, you need to go easy on foods that are high in calories but low in nutrients.
- Both sugars and starches contribute to tooth decay. To reduce the risk of decay, eat these foods with meals (rather than as between-meal snacks). Regular tooth brushing (preferably with a fluoride toothpaste) and flossing are also recommended.

- Eating too much sugar does not cause diabetes. The most common type of diabetes occurs in adults who are overweight, but avoiding sugars alone will not correct the problem. However, it’s difficult to lose weight and meet your nutrient needs on a diet high in added sugars.

What are current beliefs and misconceptions about sugars?

- In a USDA survey, 61 percent of respondents rated the health advice to “avoid too much sugar” as highly important.
- About half of the respondents to the same survey said their diets were “about right” in sugar and sweets; another 49 percent said their diets should be lower.
- In the same USDA survey, 82 percent of respondents said they were aware of health problems related to how much sugar a person eats.
- A misconception about honey is that it is more nutritious than granulated sugar. However, honey does not contain significant amounts of nutrients other than sugars.
- Another misconception is that “sugarless” or “sugar-free” gums and candies are free of calories. These products contain sugar alcohols like sorbitol and mannitol which contain calories but are slowly digested by the body.

How can food labels help me moderate my intake of sugars?

- Foods which contain natural sugars, such as milk and fruit, are often good sources of other nutrients. Sugars added to foods add calories but few nutrients.
- USDA’s Food Guide recommends that you choose foods without added sugars from the five major food groups shown in the Food Guide Pyramid most of the time. Go easy on sweets found in the Pyramid tip.
- USDA’s Food Guide also suggests upper limits for the amount of added sugars to eat to make sure you get the nutrients you need without getting too many calories. These limits are averages over time, not rigid prescriptions. They are the amount of sugars you can add to your diet when:
 - you choose the recommended number of servings for the calorie level suggested for you from the five major food groups shown in the Food Guide Pyramid (figure 1, pp. 2–3) and
 - you keep your fat intake from both added fats and from higher fat choices within the major food groups below 30 percent of calories from fat.

The suggested limits for added sugars are:

- 6 teaspoons (24 grams) a day if you eat 1,600 calories,
 - 12 teaspoons (48 grams) a day if you eat 2,200 calories,
or
 - 18 teaspoons (72 grams) a day if you eat 2,800 calories.
- The amount of sugars (in grams) in a food product is listed under “Nutrition Facts.” This number includes sugars present naturally in the food (milk and fruit contain natural sugars) as well as sugars added during processing.
 - To visualize the amount of sugars in a food, remember that 4 grams of sugars is equivalent to 1 level measuring teaspoon of table sugar.
 - There is no “%Daily Value” number for sugars on the nutrition label because health authorities have not made recommendations concerning the total amount of sugars a person can eat.
- Read the ingredient label to get an idea of the amount of sugars added to a food. Ingredients are listed from most to least by weight. If “sugar (sucrose),” “fructose,” “maltose,” “lactose,” “honey,” “syrup,” “corn syrup,” “high-fructose corn syrup,” “molasses,” or “fruit juice concentrate” is listed first or second, or if several of these appear in the ingredient list, the food is likely to be high in added sugars.
 - Items labeled “sugar free” contain virtually no sugars.
 - Items labeled “no added sugar” do not contain sugars added during processing or packaging. They may contain sugars present naturally in the food, and may or may not be low in calories.
 - A food labeled “reduced in sugar” or “contains less sugar” is lower in sugars than the food to which it is being compared. Check the nutrition information to see if the food is low in sugars.

Use Salt and Sodium Only in Moderation

Rationale for the Guideline

As many as one in four adults in the United States have high blood pressure (hypertension). Research studies indicate there is a link between habitual sodium intake and blood pressure (DHHS, 1988; NAS/NRC, 1989). High blood pressure is more common in populations with diets high in salt than in populations with diets low in salt. If not treated, high blood pressure increases the risk of heart attack and stroke.

It is not necessary to omit all salt and sodium from the diet; in fact, it is impossible to do so because many foods contain sodium naturally. Sodium is needed by the body, but many Americans consume sodium at levels well above physiological need. The exact amount of sodium that people should consume is not known because everyone's needs are different.

Some people can consume a lot of sodium without developing hypertension; others cannot. Those who cannot are "salt sensitive" and should limit their salt and sodium intake. Because it is difficult to identify who is "salt sensitive," many health professionals believe it is wise for most Americans to consume less salt and sodium.

There is no known harm from using salt and sodium in moderation; rather, moderate sodium intake will benefit those people whose blood pressure rises with higher sodium intake. They may reduce their risk of developing hypertension. However, there are other factors known to affect blood pressure such as heredity, obesity, level of physical activity, and excessive drinking of alcoholic beverages (National High Blood Pressure Education Program Working Group, 1993).

Specific Recommendations

Because there often are no symptoms, a person can have high blood pressure and not even know it. Everyone—including children— should have his/her blood pressure checked.

A normal reading for an adult is less than 140/85 (that is, less than 140 millimeters of mercury over less than 85 millimeters of mercury). High blood pressure is a condition in which blood pressure goes up above normal limits and stays up. If the blood pressure reading is high, consult a doctor about diet and medication. If the reading is normal, the guidelines still suggest using salt and sodium only in moderation in order to keep it normal.

Some health authorities suggest that healthy adults try to limit the amount of sodium they consume to 2,400 milligrams a day (NAS/NRC, 1989). The Daily Value for sodium used on food labels is also 2,400 milligrams. One level teaspoon of salt contains 2,325 milligrams of sodium.

Trends in Dietary Intake

Current Sodium Intakes. Dietary sources of sodium include foods in which sodium occurs naturally, salt- and sodium-containing compounds added to foods during processing, salt added to foods in cooking or at the table, and drinking water. Sodium also may be found in many over-the-counter medications, such as antacids. This multiplicity of sources makes it difficult to obtain accurate estimates of total sodium consumption (Life Sciences Research Office, 1989).

Sodium intake data reported as part of USDA's 1989-90 Continuing Survey of Food Intakes by Individuals (CSFII) represent sodium naturally occurring in food, sodium contributed by compounds used in food processing and an assumed amount of sodium used in food preparation.¹ For men 20 years of age and over, sodium intakes from these sources averaged about 3,700 milligrams per day. This level of sodium intake is above the National Academy of Sciences' recommended limit of 2,400 milligrams per day (NAS/NRC, 1989), even without considering salt added at the table and sodium obtained from other sources. Women's sodium intakes averaged about 2,400 milligrams, just at the recommended limit. However, it must be remembered that this value does not include salt added at the table or obtained from nonfood sources. Were these sodium sources considered, the average intake would probably be higher.

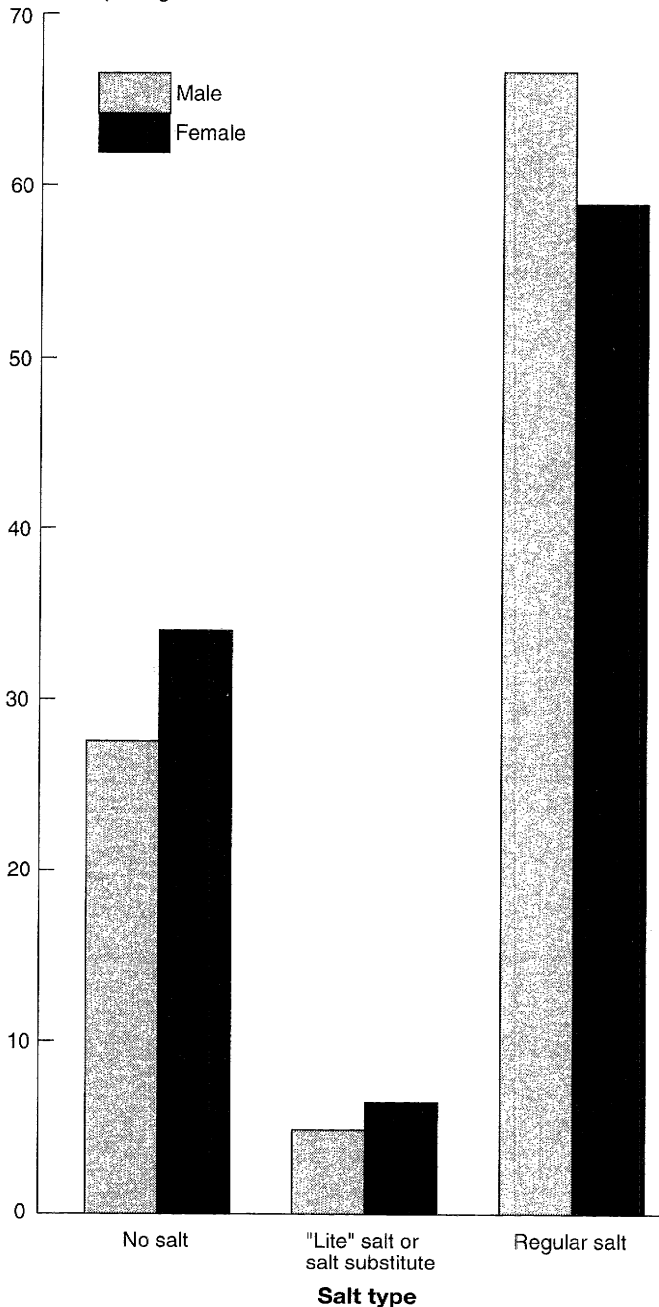
Use of Table Salt and Salt Substitutes. The CSFII 1989-90 also collected information on how frequently people add salt at the table. Among adults 20 years of age and over, 28 percent of men and 34 percent of women reported that they "never" added salt to their food at the table. About 5 percent of men and 6 percent of women reported using "lite salt" or a salt substitute, while two-thirds of men and almost 60 percent of women reported adding regular salt at the table at least sometimes (figure 13). The majority of those who reported salt use at the table said that they used it "rarely" or "occasionally." Among those who added regular salt to food at the table, about one-quarter of men and 15 percent of women said that they added it "very often."

¹ All average intakes reported in this section are based on 3-day data unless otherwise noted.

Figure 13

Proportions of Men and Women 20 Years of Age and Older Who Reported Adding Salt to Food at the Table; 1989-90.

Percent reporting salt use at table



Source: CSFII, 1989-90; 3-day data.

Current Beliefs and Misconceptions

Salt and sodium play a major role in most American diets. Serving as a preservative, flavor enhancer, and baking agent, these two are found in a multitude of products that we eat every day. Concern about its association with hypertension has long been a diet and health issue. What consumers think about salt and sodium is discussed in this section.

Respondents from the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) were asked to rate the degree of importance they felt about the health advice to avoid too much salt or sodium. Sixty-two percent rated it of high importance, 26 percent rated it of moderate importance, and 12 percent rated it of low importance. Sixty-five percent of respondents assessed their diets as about right with respect to salt and sodium intake; 33 percent said their diets should be lower. When DHKS respondents were asked if they were aware of any health problems related to how much salt or sodium a person eats, 86 percent said "yes."

Label Information Related to the Guideline

Many Americans eat more salt and sodium than they need. However, identifying food sources of sodium has not been an easy task. As with sugar, processed foods are often "hidden" sources of salt and sodium. Since 1986, FDA has required that information about sodium content be included on the nutrition panel. However, the new regulations require that the sodium content be compared to the Daily Value of 2,400 milligrams per day, which is the maximum amount of sodium intake recommended for healthy adults by some health authorities (NAS/NRC, 1989). The Daily Value for sodium is not based on calorie intake.

Nutrient content claims relating to sodium content were defined by FDA in 1986. The new regulations have not changed these definitions. However, in the past, information about sodium content could be provided without requiring the full nutrition panel. Now the listing of sodium content is part of the "Nutrition Facts" panel, which is required on virtually all foods.

Nutrient Content Claims Relating to Sodium Content.

Nutrient content claims concerning the sodium content of foods are summarized in table 9. The amount specified by the definition is per reference amount customarily consumed, or per 50 grams if the reference amount is less than 30 grams or 2 tablespoons. For meal and main dish products (see definition on p. 9), the amount specified is per 100 grams (or per labeled serving for “free” claims).

Health Claims. Health claims concerning the relationship of salt and sodium intake to hypertension (high blood pressure) have been approved by FDA. General information concerning the use of health claims is presented on pp. 12–14. The food displaying the claim on the label must meet the definition of a “low sodium” food. A model health claim which meets FDA’s requirements is shown below.

Diets low in sodium may reduce the risk of high blood pressure, a disease associated with many factors.

Key Concepts for Consumers—Salt and Sodium

What is the guideline on salt and sodium?

“Use salt and sodium only in moderation.”

- It is recommended that healthy Americans over the age of two use salt and sodium in moderation.
- The average American consumes 4,000 to 6,000 milligrams of sodium a day—much more than is needed (NAS/NRC, 1989). Some health authorities suggest adults try to limit daily sodium intake to 2,400 milligrams. The Daily Value for sodium used on food labels is also 2,400 milligrams.
- Both “salt” and “sodium” are used in this guideline because salt is a familiar term and is the main dietary source of sodium. Salt is 40 percent sodium and one teaspoon of salt weighs about 6 grams. One teaspoon of salt contains 2,325 milligrams of sodium.

Table 9.—Definitions of Nutrient Content Claims Related to Sodium Content.

Claim	Synonyms	Definition
Sodium free	Salt free, free of sodium, no sodium, zero sodium, without sodium, trivial source of sodium, negligible source of sodium, and dietarily insignificant source of sodium	Less than 5 milligrams ^{1,2}
Very low	Very low in sodium	35 milligrams or less
Low sodium	Low in sodium, little sodium, contains a small amount of sodium, or low source of sodium	140 milligrams
Reduced sodium ²	Reduced in sodium, sodium reduced	Contains at least 25 percent less sodium than an appropriate reference food
Less sodium ²	Lower in sodium, lower sodium	
Light or light in sodium ³	Lite, light in sodium	Contains at least 50 percent less sodium than an appropriate reference food
No salt added	Unsalted, without added salt	No salt is added during processing ⁴

¹ Products displaying “sodium free” claims on the label cannot contain added ingredients that are generally understood by consumers to contain sodium, unless the claim is marked by an asterisk referring to a statement such as “adds a trivial amount of sodium.”

² “Reduced” claims are used when the food is compared to another type of the same food (for example when popcorn is compared with another brand or an average value for popcorn). “Less” claims are used when the food is compared to a food which has a similar use (for example, when popcorn is compared to another snack food such as potato chips).

³ “Light” may be used on products regulated by FDA when the reference food contains 40 calories or less and 3 grams of fat or less per reference amount. “Light in sodium” must be used on all products regulated by USDA and on products regulated by FDA when the reference food contains more than 40 calories or more than 3 grams of fat per reference amount.

⁴ Used on foods which normally have salt added during processing (peanut butter or tomato sauce, for example). If the food does not meet the “low sodium” definition, a statement such as “not a low sodium food,” or “not for control of sodium in the diet” must accompany the claim.

Why is the guideline important?

- As many as one in four adults in the United States have high blood pressure (hypertension).
- Research indicates there is a link between high sodium intake and high blood pressure in some people.
- It is difficult to tell which people will develop high blood pressure because of eating a diet that is too high in salt or sodium. The current recommendation is for everyone to try to stay under the suggested limit of 2,400 milligrams of sodium a day.

How can I evaluate my sodium intake?

- Take a look at your usual food habits...Do you add salt to your food before you taste it? Do you eat a lot of processed foods such as canned soups, frozen meals, vegetables in sauce? Do you add salt to cooking water for vegetables, rice, or pasta? Do you often eat at restaurants (fast-food or other)? If you answer “yes” to these questions, you may be eating too much sodium.

What are the current beliefs and misconceptions about sodium?

- In a USDA survey, 62 percent of respondents rated the health advice to avoid too much salt or sodium as being of high importance to them personally.
- Sixty-five percent of respondents to the same survey said their diets were “about right” in salt and sodium; 33 percent said their diets should be lower.
- Eighty-six percent of respondents to the same USDA survey said they were aware of health problems related to how much salt or sodium a person eats.
- Contrary to popular belief, you can’t judge the sodium content of a food by taste alone. For example, instant puddings, danish pastry, chocolate cake, and canned kidney beans all contain a lot of sodium but don’t taste very salty.

How can food labels help me moderate my intake of salt and sodium?

- Check “Nutrition Facts” to find out if a food is high in sodium. You can’t always judge a food’s sodium content by its taste.
- The “Nutrition Facts” panel lists the amount of sodium, in milligrams, contained in one serving of the product. To help visualize this amount, remember that 2,325 milligrams of sodium is equivalent to 1 teaspoon of salt.
- The “Nutrition Facts” panel also lists the “%Daily Value” for sodium. This value compares the amount of sodium contained in one serving of the food to the Daily Value for sodium (2,400 milligrams). For example, a frozen dinner containing 850 milligrams per serving would contain 35 percent of the Daily Value for sodium ($850 \div 2,400 \times 100 = 35$).
- Foods labeled “sodium free” contain less than 5 milligrams of sodium per reference amount.
- Foods labeled “very low sodium,” contain 35 milligrams or less sodium per reference amount.
- Foods labeled “low sodium” contain 140 milligrams or less sodium per reference amount.
- Foods labeled “unsalted” or “no salt added” have no salt added during processing. However, these foods could contain sodium naturally, so you need to check the “Nutrition Facts” panel to see how much sodium they actually contain.
- Foods labeled “reduced sodium” or “less sodium” must contain 25 percent less sodium than the product to which they are compared. For example, if a manufacturer’s “regular” canned soup contains 800 milligrams of sodium per serving, their “reduced sodium” soup can contain no more than 600 milligrams per serving.
- Health messages about the relationship of a low sodium diet to blood pressure can only appear on foods that are low in sodium.

If You Drink Alcoholic Beverages, Do So in Moderation

Rationale for the Guideline

Alcoholic beverages supply calories but little or no nutrients. Drinking them in excess is linked with many health problems and can lead to addiction. Major birth defects in infants have been attributed to heavy drinking by their mothers while pregnant, and scientific studies have not been able to identify a threshold level of safety for alcohol intake during pregnancy. Other serious health consequences of heavy drinking include malnutrition (due to poor food intake and poor nutrient absorption), cirrhosis of the liver, inflammation of the pancreas, damage to the heart and brain, and increased risk for certain cancers.

Excessive alcohol intake is also a primary contributor to two other leading causes of death in the United States—motor vehicle and other accidents and suicide. In addition, the many toxic side effects of medications (even over-the-counter ones) can be exaggerated if they are taken with alcohol.

Most people retain some alcohol in their blood 3 to 5 hours after even moderate drinking. Generally, women develop higher blood concentrations of alcohol than men given the same amount to drink. Women are able to tolerate less alcohol in part because they are smaller in size. They also appear to absorb more ethanol from a drink than men because they have less activity of the enzyme that breaks down alcohol in the stomach (Frezza et al., 1990). For this reason, moderate drinking is defined at a lower level for women than for men.

Adults who choose to drink alcoholic beverages at all should limit their intakes to moderate amounts. Some studies have suggested that moderate drinking can lower the risk of a heart attack. However, drinking is also associated with a higher risk for hypertension and hemorrhagic stroke (NAS/NRC, 1989). Thus, alcohol consumption is not suggested as a means for preventing coronary heart disease.

Specific Recommendations

Moderate drinking is defined for healthy women as no more than one drink per day, and for healthy men as no more than two drinks per day (see p. 67 for the definition of a “drink”).

Some people should not drink alcoholic beverages at all. These include women who are pregnant or trying to conceive, people who plan to drive or engage in other activities requiring attention or skill, people using medication, and people who cannot keep their drinking moderate.

Trends in Dietary Intakes

Trends in Alcohol Consumption. The Alcohol Epidemiology Data System maintained by the National Institute on Alcohol Abuse and Alcoholism estimates alcohol consumption on the basis of alcoholic beverages sales, shipments, and tax receipts. Results are expressed in terms of gallons of ethanol (alcohol) per person over age 14 per year (referred to as per capita alcohol consumption). Although these data overestimate consumption because they do not account for waste or storage, they are useful for assessing trends in alcohol use. Based on these data, per capita alcohol use has declined from 2.76 gallons in 1981 to 2.54 gallons in 1987 and 2.43 gallons in 1989 (Williams et al., 1992) (figure 14).

Estimates of alcohol consumption that are based on individuals’ self-reports of their behavior produce lower estimates of alcohol consumption than sales data (Smith, Remington, Williamson, and Anda, 1990). Nevertheless, self-reported data can provide some information about patterns of alcohol use by various population groups. In 1990, the National Health Interview Survey, conducted by NCHS, collected information on alcohol consumption habits from a national sample of Americans. The results indicate that in 1990, 61 percent of individuals 18 years of age and over had consumed at least one drink of beer, wine, or liquor during the previous year (Piani and Schoenborn, 1993). More males reported consuming alcohol than females—72 percent of men, compared to 51 percent of women. Reported alcohol consumption was more common among whites than blacks and among non-Hispanics than Hispanics (Piani and Schoenborn, 1993).

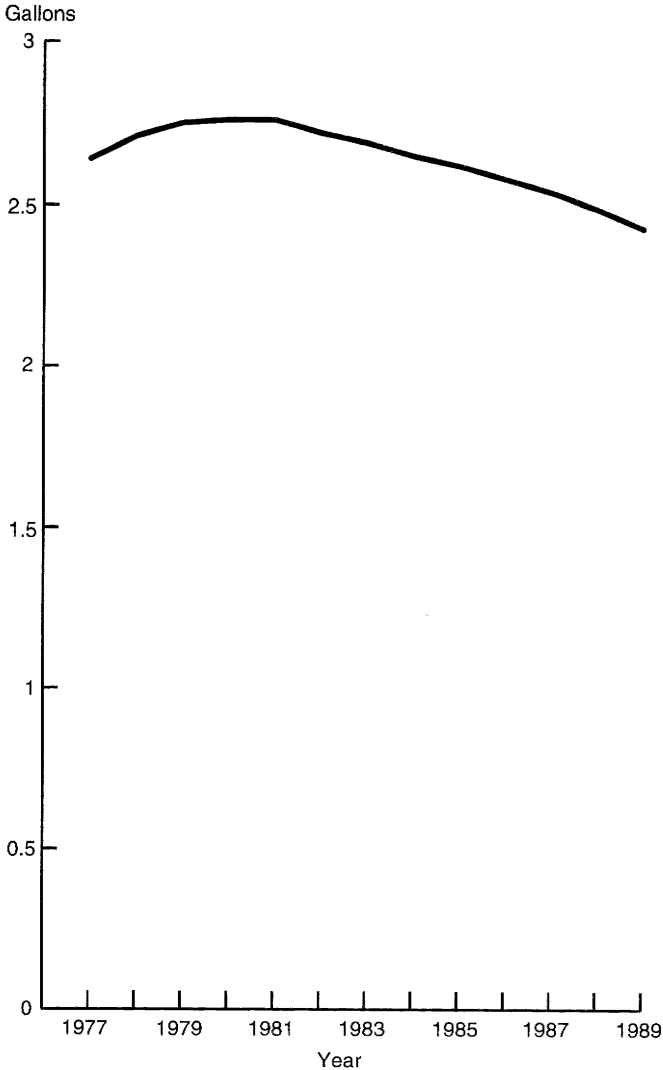
Although the majority of adult Americans reported consuming alcohol, most reported only light-to-moderate consumption levels. Only 5.5 percent of individuals reported that, on the average, they consumed two or more drinks of beer, wine, or liquor per day (Piani and Schoenborn, 1993).

What About Pregnant Women? The Dietary Guidelines state that some people should not drink alcoholic beverages, including pregnant women. While nutrition labeling is not mandated for alcoholic beverages, labels warning pregnant women of the dangers of Fetal Alcohol Syndrome are required on alcoholic beverages.

Data from 21 states who participated in the Centers for Disease Control’s Behavioral Risk Factor Surveillance System were used to examine trends in alcohol consumption by pregnant women between 1985 and 1988 (Serdula et al., 1991). The proportion of pregnant women who reported using alcohol in the past month declined from 32 percent in

Figure 14

Apparent¹ Per Capita² Annual Ethanol Consumption, United States; 1977-89.



¹Based on sales and shipments.

²For the population age 14 and over.

Adapted from Courtless, 1994. Data from Williams et al., 1992.

1985 to 20 percent in 1988. Among less-educated and younger (under 25 years) pregnant women, however, reported alcohol use did not decline.

Alcohol and Weight Control. Alcohol is relatively high in calories, and individuals seeking to lose weight may be concerned about their caloric consumption from alcohol. Data from FDA's 1992 Weight Loss Practices Survey indicate that, among those actively trying to lose weight, 17 percent of men and 12 percent of women use "light" alcoholic beverages (Levy and Heaton, 1993). Although nutrition labeling is not mandatory for alcoholic beverages, individuals may benefit from information on their caloric content.

Current Beliefs and Misconceptions

Alcoholic beverages are consumed by many cultures, and alcohol use crosses all socioeconomic strata. Its role in the American diet has been a cause for concern in terms of the nutritional status of certain individuals and in terms of alcohol misuse and the public consequences. The topic of alcohol consumption has been found to be a sensitive issue in personal interviews and surveys. So, what do we know about what Americans think about alcohol and what are some misconceptions about drinking alcoholic beverages?

Respondents in the Diet and Health Knowledge Survey (DHKS) (USDA/HNIS, 1993a, 1993b) were asked to rate the degree of importance they felt about the health advice to drink alcoholic beverages in moderation, if at all. Forty-six percent said it was of high importance, 34 percent said it was of moderate importance, and 19 percent said it was of low importance.

Confusion about the caloric value of alcohol has been noted among Americans. Some believe there are no calories associated with alcohol, whereas others believe it contains less than the seven calories per gram of alcohol actually present.

There are misconceptions about the meaning of "light" as labeled on alcoholic products. Are these beverages lower in calories, lower in alcoholic content, or both? For beer, it generally means about one-third fewer calories than regular beer produced by the same brewer because it contains less carbohydrate. However, alcohol content is about the same as regular beer. For wines, the term "light" refers to products with about one-third less alcohol than table wine. The calories are less because the alcohol content is lower.

There is some confusion about how much alcohol wine coolers contain. These popular carbonated beverages contain wine, fruit juice, and added sugars. A typical serving (about 12 ounces) contains as much alcohol and more calories than a 5-fluid-ounce glass of table wine.

Label Information Related to the Guideline

Labeling of most alcoholic beverages is regulated by the Bureau of Alcohol, Tobacco, and Firearms (BATF). Labeling of wine beverages containing less than 7 percent alcohol by volume is regulated by FDA. At present, labels of beverages regulated by BATF are not required to provide nutrition information. Alcohol content (in percentage by volume) appears on the front panel of some alcoholic beverage labels. Some alcoholic beverages also provide information about the amount of calories, carbohydrate, protein, and fat they contain. This information may be useful for people who are counting calories because alcoholic beverages generally contain calories but few nutrients.

The nutrition information provided on the labels of foods and beverages regulated by FDA and USDA does not list alcohol content. However, consumers can check the ingredient listing to see if alcohol is added to the food or beverage.

Key Concepts for Consumers—Alcoholic Beverages

What is the guideline on alcohol intake?

“If you drink alcoholic beverages, do so in moderation.”

- Adults who choose to drink alcoholic beverages at all should limit their intakes to moderate amounts.
- Moderate drinking is defined as no more than one drink per day for healthy women, and no more than two drinks per day for healthy men.
- One drink is equivalent to 12 ounces of regular beer, 5 ounces of wine, or 1-1/2 ounces of distilled spirits (80 proof).
- In general, women are able to tolerate less alcohol than men because they are smaller in size and appear to absorb more ethanol from a drink and metabolize it more slowly than men. For this reason, moderate drinking is defined at a lower level for women than men.
- Some people should *not* consume alcoholic beverages. These include women who are pregnant or who are trying to conceive, persons who plan to drive or perform other activities requiring attention or skill, persons using

medicines (including over-the-counter kinds), persons who cannot keep their drinking moderate, and children and adolescents.

- Alcohol consumption is not suggested as a means for reducing the risk of developing coronary heart disease. While some studies have suggested that moderate drinking can lower the risk of having a heart attack, drinking has also been associated with a higher risk for hypertension and hemorrhagic stroke.

Why is the guideline important?

- Alcoholic beverages supply calories but few nutrients. Drinking them is associated with many health problems, is the cause of many accidents, and can lead to addiction.
- Heavy drinking by pregnant women has been associated with birth defects in their infants. Studies have not yet been able to identify a safe level for alcohol consumption during pregnancy. Therefore, pregnant women and women who may become pregnant should avoid drinking alcoholic beverages.
- Too much alcohol can cause cirrhosis of the liver, inflammation of the pancreas, damage to the brain and heart, and increased risk for many cancers.
- Most people retain some alcohol in the blood 3 to 5 hours after even moderate drinking. This has serious implications for driving (and other activities requiring skill) after drinking.

What are the current beliefs and misconceptions about alcoholic beverages?

- Forty-six percent of DHKS respondents rated the health advice to drink alcoholic beverages in moderation, if at all, of high importance.
- Misconceptions exist regarding the caloric value of alcohol; many people are not aware it actually contains seven calories per gram of alcohol.
- Another misconception concerns the meaning of “light” on alcoholic beverage labels. People often think “light” means lower in alcohol, which is not always true. A “light” beer generally has the same alcohol content but about one-third fewer calories than the same brand of regular beer; calories are lower because the amount of carbohydrate is lower. “Light” wines generally have about one-third less alcohol than table wines; calories are less due to the reduced alcohol content.

How can food labels help me follow the guideline?

- The nutrition information on food labels is not required to include alcohol content. Check the ingredient list to determine if alcohol is present in the food.
- Most alcoholic beverages, which are regulated by the Bureau of Alcohol, Tobacco, and Firearms, are not required to include nutrition information on their labels.
- Some alcoholic beverages provide information about calorie, carbohydrate, protein, and fat content on the label. This information may be especially useful to persons who are counting calories.

Message Communication Ideas

When communicating nutrition information to the public, educators and writers want to make sure that the message is received and understood by the target audience. A great deal of research has been conducted in order to determine some of the most effective ways of communicating nutrition information to the consumer. Studies that specifically looked at presentation of food labeling information and presentation of dietary guidance are discussed in this section.

Research Related to Consumer Use of Labels and Label Formats

The Federal Food and Drug Administration (FDA), USDA's Food Safety and Inspection Service (FSIS) and Human Nutrition Information Service (HNIS),¹ universities, professional and trade associations, and food companies have conducted studies on consumer food label preferences and consumers' use of food labels. This report highlights results of such research.

FSIS contracted for a study using focus groups to obtain information about use of labels by consumers. Focus group interviews are generally conducted with groups of 8 to 10 people. A trained moderator uses a prepared outline to lead the discussion while allowing all participants to voice opinions concerning the topics of interest. It should be noted that because of the small number of persons interviewed and the methods used to select participants, focus groups usually do not provide valid statistical results that can be generalized to a target population. However, focus groups can provide suggestions about how a program or product (such as a food label) can be improved before large investments of time and money are made (Achterberg and Shepherd, 1992).

In the FSIS study, participants were asked about the factors they consider when selecting a grocery item. Nine percent ranked brand name recognition first, while 7 percent ranked nutrition information first. However, more respondents ranked nutrition information as one of their top three factors than brand recognition. Respondents expressed fear that products without nutrition labels were "hiding something."

One of the focus groups was composed of people with low literacy skills. These participants reported that they read nutrition labels less frequently than the members of the general consumer focus groups. They reported that they looked more often at health claims and nutrient content claims than at the nutrition panels. Price and brand name

often seemed to be their primary concern (Anderson and Calingaert, 1992).

USDA's 1989 Diet and Health Knowledge Survey (DHKS) found that 71 percent of main meal planner/preparers reported that they "always" or "sometimes" use nutrition information on labels when choosing foods. These respondents were classified as "label users." Twenty-nine percent of respondents reported that they "rarely" or "never" used nutrition information, and were classified as "label nonusers."

Data from the 1989 DHKS and Continuing Survey of Food Intakes by Individuals (CSFII) were combined to identify the characteristics that distinguished label users from nonusers. Characteristics examined included sociodemographic factors such as age, race, and sex, as well as individual's knowledge and attitudes concerning diet and health. Based on this analysis of the data, the most likely person to use the nutrition label was an educated woman who lived with others, was knowledgeable about nutrition, concerned about the quality of the food she buys, and believed that following the principles of the Dietary Guidelines for Americans is important. It could also be said that male meal planner/preparers who lived alone, were less educated, less knowledgeable about nutrition, less concerned with the quality of the food they purchase, and believed following the Guidelines principles not to be important were the least likely to use nutrition labels. (Welsh et al., 1992).

The effect of label use on the quality of label users' diet was assessed using a statistical procedure that takes into account the fact that individuals choose—or "self-select"—to use nutrition labeling on the basis of personal characteristics, such as higher levels of nutrition knowledge, which might lead them to select a more nutritious diet whether or not they used labeling. After controlling for this selectivity effect, it was found that label use was associated with having a diet that was more dense in vitamin C (more milligrams of vitamin C per 1,000 calories) and less dense in cholesterol (fewer milligrams of cholesterol per 1,000 calories) (Welsh et al., 1992). It is interesting to note that vitamin C and cholesterol are nutrients that have been prominently featured on food labels. They often appear on the front of the label as descriptors, as well as on the nutrition panel.

The FDA's 1988 Health and Diet Survey (HDS) has been able to track changes in label use over time, since questions about label use were asked in earlier editions of the survey. Use of the nutrition label increased significantly between 1982 and 1988, from 68 percent to 74 percent of respondents, respectively. However, use of the ingredient list decreased

¹ In 1994, HNIS was combined with the Agricultural Research Service of USDA, which assumed HNIS's program responsibilities.

from 80 percent in 1986 to 74 percent in 1988. In 1988, 63 percent of respondents reported using both the ingredient list and nutrition label. Label users tended to be better-educated women (Bender and Derby, 1992). These proportions and characteristics of label users were similar to results found in the USDA study discussed above. FDA's study also found that people on self-initiated special diets were more likely to use nutrition labels than persons not on a diet or persons on a physician-prescribed diet (Bender and Derby, 1992).

The American Dietetic Association's Survey of American Dietary Habits asked adults about their use of food labels in 1993. Eighty-six percent of respondents said they read food labels for at least a few products when making a first-time purchase. Of these, 75 percent said they frequently or sometimes refer to the nutrition information on the label *after* they have purchased a product for the first time. The pieces of label nutrition information reported to be most useful were fat content, calories, and sodium content (ADA, 1993).

A survey of food shoppers conducted for the American Meat Institute found that 70 percent of respondents reported reading the ingredient and nutrition information on food labels when buying a product for the first time. Of those who read them, 87 percent said the information had at least some influence on their purchase decisions. These responses indicate that shoppers use labels to select a food rather than to track intakes of fat, calories, etc. Forty percent of respondents to the same survey reported having difficulty in understanding the present food labels (Roper Organization, 1992).

Some studies examined consumers' attitudes toward the use of health claims and nutrient content claims on the label. Researchers at the University of Utah found the consumers with higher education levels had a better understanding of diet-disease-related messages (health claims) on food labels and a more positive attitude toward health messages on food labels than consumers with less formal education. Overall, attitudes toward placing health claims on food labels were positive (Fullmer et al., 1991).

In the FSIS-sponsored studies described above, most participants felt that nutrient content claims (such as "light," "lean," and "less sodium") were potentially useful if the definitions could be understood without further qualification and did not vary from brand to brand (Anderson and Calingaert, 1992). In an FDA focus group study, consumers did not distinguish between absolute ("low in fat," "high in fiber") and comparative ("reduced fat," "more fiber") claims (Market Facts, 1992).

Results of these studies show fairly consistently that over two-thirds of shoppers look at food labels when they purchase food. Both USDA and FDA studies found that higher levels of nutrition knowledge and positive attitudes concerning diet were associated with label use. Therefore, increasing consumers' awareness of the importance of a healthful diet will probably increase their motivation to read food labels. More research is needed to determine how shoppers use the information, how well they comprehend the information presented, how much influence label-reading has on purchasing decisions and dietary quality, and how label users differ from nonusers. The FDA conducted a baseline survey of consumers' use of food labels in early 1994, before most new labels appeared on food products, and will continue to ask food labeling questions in its Health and Diet Survey. USDA has added more nutrition labeling questions to its upcoming Diet and Health Knowledge Survey. Results of this research can help educators in their efforts to get as many people as possible to use the information on nutrition labels.

Research Related to Communication of Dietary Guidelines or Labeling Information

A number of reference materials are available which provide advice about communication of health and nutrition information. Some of the research related to communication of nutrition information is summarized below. While space limitations do not permit a lengthy discussion of this topic, publications such as *Making Health Communication Programs Work: A Planner's Guide* (DHHS/PHS/NIH, 1992) and *Writing for Reading: A Guide for Developing Print Materials for Low Literacy Adults* (Nitzke et al., 1985) provide more detailed guidance for preparing educational materials for general and low-literate audiences.

While it is easier to communicate simple concepts, people often need more complex information in order to make decisions (Gillespie, 1987). Interpersonal communication is often more successful at influencing behavior than mass communication, and messages targeted toward a narrowly defined audience tend to be more effective than broadly targeted messages. New technology allows educators to make communications more personal and to more narrowly define target audiences; for example, by using personalized mail (Gillespie, 1987).

Pretesting of educational materials for their appropriateness for the target audience is essential. Focus groups and cognitive response testing are useful when funds permit (DHHS/PHS/NIH, 1992a; Shepherd et al., 1989; Shepherd and Sims, 1990; Trenkner and Achterberg, 1991). Even when the budget limits the amount of pretesting that can be done, materials can be analyzed for reading level and can be peer reviewed (DHHS/PHS/NIH, 1992).

Consumers prefer the use of bright colors to either black and white or dark colors in print materials. Using color and boldface or underlined text to create blocks of information makes materials easier to read. Artwork should be used to illustrate concepts discussed in the text, and should not be added just for its own sake (Shepherd et al., 1989; Achterberg and Bradley, 1991).

Several studies have been conducted to examine consumers' acceptance of materials related to the Dietary Guidelines for Americans and to consumers' use of nutrition information either at the point of purchase or on food labels. These studies used qualitative methods, such as focus groups and individual interviews, and quantitative methods, such as surveys. Their results have implications for nutrition educators who are planning a program or preparing materials to educate consumers about nutrition labeling of foods.

Researchers at the Pennsylvania State University found that consumers prefer guidance based on *foods* rather than *nutrients*. They also discovered that people can better accept quantitative advice when terms are familiar to them. For example, they're familiar with the term "calories," but not with "grams" or "milligrams" (Trenkner and Achterberg, 1991; Achterberg and Bradley, 1991). These same studies showed that consumers like practical "how-to" and self-evaluation activities. They do not like long definitions or material that "seems like homework."

Researchers at FDA and a supermarket chain in the Washington/Baltimore area tracked sales of booklets containing detailed information about the nutrient content of foods. They found that novelty is a positive selling factor (sales of the booklet declined over time). The rate of purchase of the booklets in this study was approximately equal to the rate of use of cents-off coupons mailed to consumers—7-10 percent (Levy et al., 1988).

Other studies found that the presence of nutrition information at the point of purchase, either as a poster or on a shelf label, "flagging" low-sodium, lowfat, low cholesterol, or low-calorie items does affect the purchasing behavior of consumers (Muller, 1984; Mullis et al., 1987; Schucker et al., 1992). The effects were variable, however. Purchase of items perceived as more nutritionally desirable increased for some items but not for others. It is possible that there are categories of foods (condiments, for example) for which nutrient content is not a primary concern for consumers. Also, these studies looked only at short-term effects on purchases. It is not known if behavior changes made in response to nutrition information will become permanent behaviors.

Results of a study conducted in conjunction with the Minnesota Heart Health Program suggested that nutrition programs in grocery stores are more likely to be successful in changing purchasing behavior if: the grocer is involved in planning the program; store personnel receive some training on the program; there is a plan for monitoring and following up to make sure information remains current and in the stores in the appropriate place; and advertising is used to create and maintain interest in the program (Mullis et al., 1987).

Summary of Research Implications

- It is not possible to provide one set of educational materials to target all of the consumers in the United States. Surveys show us that some people are already familiar with and use nutrition information on labels, other people would like to use the label but have trouble understanding the information presented there, and still others have little interest in using nutrition information on food labels. Educational programs targeted at these three groups would have different goals. These three groups can be even further segmented.
- A majority of shoppers report using nutrition information on food labels to make food choices at least some of the time. However, many of these label users have some difficulty in understanding all of the information that is presented. Therefore, consumers need more information about how to use the nutrition information that is available on food labels.

- Consumers want nutrition information (including information about food labels) presented in terms that are familiar to them. Because nutrient content on the label is necessarily provided in unfamiliar units, such as grams, educators may need to teach consumers how to translate this information into a form they can visualize. For example, people can be told that 4 grams of sugars is equivalent to one level measuring teaspoon of granulated sugar.
- Persons with low literacy skills tend to look more at information on the front of the label (such as health claims and nutrient content claims) than at the nutrition information on the back. For this target audience, it may be more important to concentrate on these claims rather than to present detailed information about using the “Nutrition Facts” panel.
- Shelf labeling programs have had some success in influencing food purchases. Nutrition educators may want to investigate working with grocers in their area to initiate such a program if one does not already exist or to use the introduction of new food labels to revitalize interest in an existing program.

Appendix

Food Labeling in the United States—A Brief History

Food labels were not regulated by the Federal Government until shortly after the turn of the century. The following timeline outlines key events related to food labeling that have occurred since then.

- 1906 **Food and Drug Act.** Prohibited use of misleading statements on food labels.
- 1907 **Federal Meat Inspection Act.** Authorized inspection of meat by USDA and established definitions for adulteration and misbranding of meat. Required prior approval of labels by USDA to ensure accuracy and to ensure that products contain only safe and suitable ingredients before they are marketed.
- 1938 **Food, Drug, and Cosmetic Act (FD&C Act).** Superseded Food and Drug Act of 1906. Required food labels to contain the name of the food, the net weight, a list of ingredients (with the exception of foods for which specific ingredients or “standards of identity” were defined), and the name and address of the manufacturer. Defined foods which were required to be labeled as “imitation” or “for special dietary use.”
- 1957 **Poultry Products Inspection Act.** Gave USDA authority to inspect and regulate labeling of poultry products.
- 1969 **White House Conference on Food, Nutrition, and Health.** Discussed problems related to poor nutrition of the U.S. population. Conference participants suggested that providing information about the nutrition content of food products on the label would help consumers make more healthful food choices.
- 1973 USDA began requiring nutrition labeling when nutrition claims are made on meat and poultry products.
- 1975 FDA regulations covering voluntary nutrition labeling of food products became effective. Foods to which one or more nutrients were added and foods for which a nutrition claim (such as “high in Vitamin C”) was made were required to provide nutrition information. Established U.S. Recommended Daily Allowances (U.S. RDA), based on the 1968 edition of the Recommended Dietary Allowances (RDA) issued by the Food and Nutrition Board of the

National Academy of Sciences, as reference amounts for nutrition labels. When nutrition information was provided on the label, the following information was required:

- serving size (determined by the manufacturer)
- number of servings per container
- amount of calories, protein, carbohydrate, and fat per serving
- percent of the U.S. RDA for protein, thiamin, riboflavin, niacin, vitamin A, vitamin C, calcium, and iron per serving (and percent of U.S. RDA per serving of any other vitamins and minerals listed in the Code of Federal Regulations if they were added to the food)

Information about other food components, such as cholesterol, saturated fat or dietary fiber, could be provided but was not required.

- 1978 FDA regulations defining the terms “low calorie” and “reduced calorie” became effective.
- 1985 FDA regulations requiring listing of sodium content on the nutrition label of products became effective. The terms “very low sodium,” “low sodium,” “sodium free,” and “no salt added” were defined.
- 1986 USDA issued policies defining the terms “extra lean,” “lean,” “low fat,” “light or lite,” “leaner,” and “lower fat” for meat and poultry products.
- 1989 FDA and FSIS participated in a series of public hearings to discuss nutrition labeling issues such as ingredient labeling, health messages, and nutrition labeling formats. The two agencies contracted with the National Academy of Sciences to conduct a study that would provide options for improving food labeling. The results of the study were published in 1990 in *Nutrition Labeling: Issues and Directions for the 1990’s* (Porter and Earl, 1990).
- 1990 FDA issued proposed changes in nutrition labeling regulations in July. The **Nutrition Labeling and Education Act (NLEA)** was passed in November, amending the 1938 FD&C Act. The NLEA provided a legal basis for FDA to mandate changes in nutrition labels.

- 1991 FDA proposed food labeling regulations as required by the NLEA. Although labeling of meat and poultry products was not covered by the NLEA, USDA also issued proposed regulations for mandatory labeling of processed meat and poultry products and voluntary labeling of raw meat and poultry. USDA's proposed regulations paralleled those issued by FDA in order to provide the same type of nutrition information on virtually all food products.
- 1992 FDA's voluntary nutrition labeling program for point-of-purchase labeling of fresh fruits and vegetables and raw fish became effective.
- 1993 FDA and USDA issued final nutrition labeling regulations in January. FDA regulations covering health claims became effective in May.
- 1994 FDA and USDA regulations became effective August 8.

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For More Information

For information about food labeling

1. Contact the FDA/USDA Food Labeling Education Information Center. The Center, part of the National Exchange for Food Labeling Education (NEFLE), encourages the exchange of information about the public education campaign for the new food label (see p. 1 for more information about NEFLE). The Food and Drug Administration of the United States Department of Health and Human Services and the Food Safety and Inspection Service of the United States Department of Agriculture established the Center in 1992 in response to the Nutrition Labeling and Education Act of 1990. Through an inter-agency agreement, the Center is housed at the Food and Nutrition Information Center of the National Agricultural Library in Beltsville, Maryland.

The cornerstone of the Center is a data base of diverse activities and materials relevant to food labeling education. Staff solicit and acquire listings from consumer groups, industry associations, health professional associations, voluntary health organizations, private companies, and government agencies. Listings include—

- reproducible and nonreproducible print materials (books, fact sheets, articles, posters, brochures, newsletters)
- audiovisuals (slide sets, transparencies, tapes)
- children's materials (games, comic books, interactive video)
- media kit pieces (ad slicks, press releases, radio scripts)
- programs and program materials (exhibits, conferences, calendars, health fairs)
- computer materials (CD-ROM's, data bases, software)
- research results (reports, studies, bibliographies)

Searches of the data base, available by phone, mail, or on site, provide the user with information about projects and research in labeling education. Visitors to the Center are welcome to review the materials. The Center publishes periodic updates and lists activities on the Library's electronic bulletin board, Agricultural Library Forum (ALF). Information specialists can also refer the user to experts who can provide additional information. Professionals are encouraged to contribute information about their own label education and research to the data base.

To contact the Center, write to—

FDA/USDA Food Labeling Education Information Center
c/o Food and Nutrition Information Center/NAL/USDA
10301 Baltimore Boulevard, Room 304
Beltsville, MD 20705-2351
301 504-5719 Fax: 301 504-6409
Internet: gmcneal@NALUSDA.GOV

2. Contact USDA's Meat and Poultry Hotline. Home economists and dietitians answer questions on safe handling and storage of meat and poultry products and provide information about the basic nutrition of meat and poultry products and the labeling of these items. Their telephone number is 1-800-535-4555 (toll-free outside the Washington, DC, area; in the Washington, DC area, call 202-720-3333).
3. Contact FDA's Food Labeling and Seafood Hotline. The telephone number is 1-800-FDA-4010.

For information about the Dietary Guidelines and Food Guide Pyramid

Contact USDA's Agricultural Research Service (ARS). In an effort to make research and resources on the Food Guide Pyramid more available to nutrition researchers and educators, ARS and the National Agricultural Library maintain a specialized data base.

The Food Guide Pyramid Data Base is a computerized listing of nutrition education materials that feature the Food Guide Pyramid and of nutrition education research articles that have focused on the Pyramid. In addition to facilitating the use of the Pyramid as an educational tool, this system will also assist researchers and educators by helping them identify research and information gaps. Materials are listed in the data base with the source, ordering information, description, language, target audience, and keywords. The data base includes brochures, posters, videos, textbooks, curriculum guides, training manuals, and food labels. Listings for the data base are obtained from consumer groups, industry associations, health professional associations, universities, private companies, and government agencies.

For information about contributing materials to the data base
or for general information about the Food Guide Pyramid and
Dietary Guidelines for Americans, contact:

U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
Suite 240 - E
14th and Independence Ave, SW
Washington, DC 20250

For information about using the data base, contact:

Food and Nutrition Information Center/NAL/USDA
10301 Baltimore Blvd, Room 304
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