CHAPTER 12

Guidelines for Dietary Planning

KEY TERMS

adequate intake (AI) the recommended daily intake level based on observed or experimentally determined approximations of nutrient intake by a group (or groups) of healthy people; used when a recommended dietary allowance cannot be determined

daily reference values (DRVs) a set of food labeling reference values for which no nutrient recommendation previously existed; established for fat, saturated fatty acids, cholesterol, total carbohydrate, protein, dietary fiber, sodium, and potassium

daily value (DV) reference term on food labels to aid consumers in selecting a healthy diet; consists of two sets of references—the reference daily intakes (RDIs) and daily reference values (DRVs)—expressed as percentages

Dietary Guidelines for Americans (DGA) dietary recommendations that promote health and reduce risk of chronic disease for people ages 2 years and older

dietary reference intake (DRI) an overall term designed to encompass the four specific types of nutrient recommendations (adequate intake [AI], estimated average requirement [EAR], recommended dietary allowance [RDA], and tolerable upper intake level [UL]); used for nutrient recommendations for the United States and Canada

estimated average requirement (EAR) nutrient intake value that is estimated to meet the requirements of half the healthy individuals in a group

estimated safe and adequate daily dietary intake (ESADDI) recommended intake ranges of nutrients for which not enough information is available to establish a recommended dietary allowance

health claim any claim on a food package label or other label (such as an advertisement) of a food, including fish and game meat, that characterizes the relationship of any nutrient or other substance in the food to a disease or health-related condition

Healthy Eating Index (HEI) summary measure of overall diet quality; designed to assess and monitor the dietary status of Americans

MyPyramid Food Guidance System translates the Dietary Guidelines for Americans and nutrient recommendations into a visual form of the types and amounts of food to eat each day; new system incorporates physical activity into daily patterns

nutrition facts label nutrient content information on food products designed to help consumers (4 years of age and older) select foods to incorporate into a healthy diet using the MyPyramid Food Guidance System and Dietary Guidelines for Americans

recommended dietary allowance (RDA) the amount of a nutrient needed to meet the requirements of almost all (97% to 98%) of the healthy population

reference daily intakes (RDIs) set of dietary references for vitamins and minerals on food labels based on the 1968 recommended dietary allowances; replaces the U.S. recommended daily allowances that were previously used with nutrition labeling on food products

tolerable upper intake level (UL) the highest daily intake amount of a nutrient that is likely to pose no risk of adverse health effects for almost all individuals in the general population

Sections of this chapter were written by Susan T. Borra, RD, and Paul R. Thomas, EdD, RD, for previous editions of this text.
An appropriate diet is adequate and balanced and considers the individual’s characteristics such as age and stage of development, taste preferences, and food habits. It also reflects the availability of foods, socioeconomic conditions, storage and preparation facilities, and cooking skills. An adequate and balanced diet meets all the nutritional needs of an individual for maintenance, repair, living processes, growth, and development. It includes energy and all nutrients in proper amounts and in proportion to each other. The presence or absence of one essential nutrient may affect the availability, absorption, metabolism, or dietary need for others. The recognition of nutrient interrelationships provides further support for the principle of maintaining variety in foods to provide the most complete diet.

With increasing knowledge of diet and disease links that lead to premature disability and mortality among Americans, an appropriate diet is now considered one that helps reduce the risk of developing chronic degenerative diseases and conditions. In this era of vastly expanding scientific knowledge and information about food components, the way the public thinks about food intake for health promotion and disease prevention is changing rapidly. In addition to traditional nutrient requirements, the public often hears references to functional foods, which are foods or food components that provide more benefits than basic nutritional benefits. Dietitians and other health professionals are essential translators of food, nutrition, and health information into dietary choices and patterns for groups and individuals. See Conceptual Framework on the inside back cover.

According to the Food and Nutrition Board, choosing various foods to meet dietary recommendations should provide adequate amounts of the nutrients that do not have well-defined recommended levels. A varied diet also ensures that a person is consuming sufficient amounts of food constituents that, although not defined as nutrients, have biologic effects and may influence health and susceptibility to disease. Examples include dietary fiber and carotenoids, as well as lesser known phytochemicals (substances found in plant products) such as isothiocyanates in broccoli or other cruciferous vegetables and lycopene in tomato products (see Tables 9-1 and 9-2). Diets rich in phytochemicals may help reduce the risk of developing certain types of cancer, but their exact mechanisms are not totally understood.

**Determining Nutrient Needs**

**Worldwide Guidelines**

Numerous standards serve as guides for planning and evaluating diets and food supplies for individuals and population groups. Many countries have issued guidelines appropriate for the circumstances and needs of their populations. The Food and Agriculture Organization (FAO) and the World Health Organization (WHO) of the United Nations have established international standards in many areas of food quality and safety, as well as dietary and nutrient recommendations. In the United States the Food and Nutrition Board (FNB) of the Institute of Medicine (IOM) has led the development of nutrient recommendations since the 1940s. Since the mid-1990s, nutrient recommendations developed by the FNB have been used by the United States and Canada. The U.S. Department of Agriculture (USDA) and Department Health and Human Services (DHHS) have a shared responsibility for issuing dietary recommendations, collecting and analyzing food composition data, and formulating regulations for nutrition information on food products. In Canada, Health Canada is the agency responsible for Canadian dietary recommendations and food labeling regulations.

**Dietary Reference Intakes**

American standards for nutrient requirements have been the recommended dietary allowances (RDAs) established by the FNB of the IOM. They were first published in 1941 and most recently revised between 1997 and 2002. Each revision incorporates the most recent research findings. In 1993 the FNB developed a framework for the development of nutrient recommendations, called **dietary reference intakes (DRI)**. DRIs encompass four types of nutrient recommendations for healthy individuals: adequate intake (AI), estimated average intake (EAR), RDA, and tolerable upper intake level (UL).

DRIs for nutrients are now complete. Nutrition and health professionals should also use the most updated food composition databases and tables and inquire whether data used in computerized nutrient analysis programs have been revised to include the most up-to-date information.

**Components**

The DRI model expands the previous RDA, which focused only on levels of nutrients for healthy populations to prevent deficiency diseases. To respond to scientific advances in diet and health throughout the life cycle, the DRI model now includes four reference points.

The **adequate intake (AI)** is a nutrient recommendation based on observed or experimentally determined approximation of nutrient intake by a group (or groups) of healthy people when sufficient scientific evidence is not available to calculate an RDA or an EAR. The **estimated average requirement (EAR)** is the average requirement of a nutrient for healthy individuals; a functional or clinical assessment has been conducted, and measures of adequacy have been made at a specified level of dietary intake. An EAR is the amount of a nutrient with which approximately one half of individuals would have their needs met and one half would not. The EAR should be used for assessing the nutrient adequacy of populations, not individuals.

The **recommended dietary allowance (RDA)** presents the amount of a nutrient needed to meet the requirements of almost all (97% to 98%) of the healthy population of individuals for whom it was developed. An RDA for a nutrient should serve as a goal for intake for individuals, not as a benchmark of adequacy of diets of populations. Finally the **tolerable upper intake level (UL)** has been established for many nutrients to reduce the risk of adverse or toxic effects from increased consumption of nutrients in concentrated forms—either alone or combined with others (not in food)—or from enrichment and fortification. A UL is the highest level of daily nutrient intake...
that is unlikely to have any adverse health effects on almost all individuals in the general population. The DRIs for the macronutrients, vitamins and minerals, including the ULs are presented on the inside front cover and opening page of this text.

**Target Population**

Each of the nutrient recommendation categories in the DRI system is used for specific purposes among individuals or populations. The EAR is used for evaluating the nutrient intake of populations. The new RDA can be used for individuals. Nutrient intakes between the RDA and the UL may further define intakes that may promote health or prevent disease in the individual.

**Age- and Sex-Groups**

Because nutrient needs are highly individualized depending on age, sexual development, and the reproductive status of females, the DRI framework has 10 age-groupings, including age-group categories for children, men and women 51 to 70 years of age, and those over 70 years of age. It separates three age-group categories each for pregnancy and lactation—less than 18 years, 19 to 30 years, and 31 to 50 years of age.

**Reference Men and Women**

The requirement for many nutrients is based on body weight. The RDAs are listed according to reference men and women of designated height and weight. These values for age-sex groups of individuals older than 19 years of age are based on actual medians obtained for the American population by the third National Health and Nutrition Examination Survey (NHANES) III, 1988 to 1994. Although this does not necessarily imply that these weight-for-height values are ideal, at least they make it possible to define recommended allowances appropriate for the largest number of people. The reference heights and weights for children and adults in the U.S. are shown in Table 12-1.

**Estimated Safe and Adequate Daily Dietary Intakes**

Numerous nutrients are known to be essential for life and health, but data for some are insufficient to establish a recommended intake. Intakes for these nutrients are estimated safe and adequate daily dietary intakes (ESADDI). Most intakes are shown as ranges to indicate that not only are specific recommendations not known, but also at least the upper and lower limits of safety should be observed.

**Nutritional Status of Americans**

**Food and Nutrient Intake Data**

Twenty-two federal agencies collect information about the dietary and nutritional status of Americans and the relationship between diet and health. This effort is coordinated by the USDA and DHHS through the National Nutrition Monitoring and Related Research Program (NNMRRP) (FASEB, 1995). The NHANES and the Continuing Survey of Food Intakes by Individuals (CSFII) are the cornerstone surveys of the NNMRRP (see Chapter 11). Overall the nutritional quality of the American diet shows that the population is slowly changing eating patterns and adopting more healthy diets, although gaps exist between consumption and government recommendations among population subgroups. Intake of total fat, saturated fatty acids, and cholesterol has decreased among some

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**Table 12-1**

**Acceptable Macronutrient Distribution Ranges**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>AMDR Sample Diet Adult, 2000-kcal/day Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Reference*</td>
</tr>
<tr>
<td>Protein†</td>
<td>10</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>60</td>
</tr>
<tr>
<td>Fat</td>
<td>30</td>
</tr>
<tr>
<td>α-Linolenic acid (*n-3)‡</td>
<td>0.8</td>
</tr>
<tr>
<td>Linoleic acid (n-6)</td>
<td>7</td>
</tr>
<tr>
<td>Added sugars§</td>
<td>500</td>
</tr>
</tbody>
</table>


* Suggested maximum.
† Higher number in protein AMDR is set to complement AMDRs for carbohydrate and fat, not because it is a recommended upper limit in the range of calories from protein.
‡ Up to 10% of the AMDR for α-linolenic acid can be consumed as EPA, DHA, or both (0.06%-0.12% of calories).
§ Reference percentages chosen based on average dietary reference intake (DRI) for protein for adult men and women, then calculated back to percentage of calories. Carbohydrate and fat percentages chosen based on difference from protein and balanced with other federal dietary recommendations.
TABLE 12-2

Reference Heights and Weights for Children and Adults in the United States

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Previous Median Body Mass Index* (BMI) (kg/m²)</th>
<th>New Median BMI† (kg/m²)</th>
<th>New Median Reference Height† (cm, in)</th>
<th>New Reference Weight‡ (kg, lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male, female</td>
<td>2-6 mo</td>
<td>—</td>
<td>—</td>
<td>62 (24)</td>
<td>6 (13)</td>
</tr>
<tr>
<td></td>
<td>7-12 mo</td>
<td>—</td>
<td>—</td>
<td>71 (28)</td>
<td>9 (20)</td>
</tr>
<tr>
<td></td>
<td>1-3 yr</td>
<td>—</td>
<td>—</td>
<td>86 (34)</td>
<td>12 (27)</td>
</tr>
<tr>
<td></td>
<td>4-8 yr</td>
<td>15.8</td>
<td>15.3</td>
<td>115 (15)</td>
<td>20 (11)</td>
</tr>
<tr>
<td>Male</td>
<td>9-13 yr</td>
<td>18.5</td>
<td>17.2</td>
<td>144 (57)</td>
<td>36 (79)</td>
</tr>
<tr>
<td></td>
<td>14-18 yr</td>
<td>21.3</td>
<td>20.5</td>
<td>174 (68)</td>
<td>61 (134)</td>
</tr>
<tr>
<td></td>
<td>19-30 yr</td>
<td>24.4</td>
<td>22.5</td>
<td>177 (70)</td>
<td>70 (154)</td>
</tr>
<tr>
<td>Female</td>
<td>9-13 yr</td>
<td>18.3</td>
<td>17.4</td>
<td>144 (57)</td>
<td>37 (81)</td>
</tr>
<tr>
<td></td>
<td>14-18 yr</td>
<td>21.3</td>
<td>20.4</td>
<td>163 (64)</td>
<td>54 (119)</td>
</tr>
<tr>
<td></td>
<td>19-30 yr</td>
<td>22.8</td>
<td>21.5</td>
<td>163 (61)</td>
<td>57 (126)</td>
</tr>
</tbody>
</table>


*Taken from male and female median BMI and height-for-age data from the Third National Health and Nutrition Examination Survey (NHANES III), 1988-1994; used in earlier DRI reports.
†Taken from new data on male and female median BMI and height-for-age data from the Centers for Disease Control and Prevention/National Center for Health Statistics Growth Charts.
‡Calculated from CDC/NCIIS Growth Charts, median BMI and median height for ages 4 through 19 years.

portions of the population. The average consumption of servings of fruits and vegetables has risen to four per day, approaching the recommendation of five servings per day. However, many Americans experience food insecurity, or hunger from not getting enough to eat (see Chapter 11).

Nutrition-related health measurements indicate that overweight and obesity are increasing from lack of physical activity. The number of people with acceptable serum cholesterol levels is increasing, although some individuals still have high levels, a major risk factor for coronary heart disease. Hypertension remains a major public health problem in middle-age and older adults; among non-Hispanic blacks it increases the risk of stroke and coronary heart disease. Osteoporosis develops more often among non-Hispanic whites than non-Hispanic blacks or Mexican Americans.

Healthy Eating Index

The Center for Nutrition Policy and Promotion of the USDA releases the Healthy Eating Index (HEI) to measure how well people’s diets conform to recommended healthy eating patterns. The index provides a picture of foods people are eating, the amount of variety in their diets, and compliance with specific recommendations in the Dietary Guidelines for Americans (DGA). The HEI is designed to assess and monitor the dietary status of Americans by using data from the CSFII and evaluating 10 components, each representing different aspects of a healthy diet. The dietary components used in the evaluation include grains, vegetables, fruits, milk, meat, total fat, saturated fat, cholesterol sodium, and variety. Data from the HEI over time show that Americans are reducing total fat and saturated fat in their diets and eating a wider variety of foods but still need to eat more fruit, drink more milk or calcium and vitamin D concentrated beverages, and reduce their sodium intake. Women generally have scores higher than men, and children ages 2 to 3 have the highest HEI scores. The overall healthy eating index (HEI) score ranges from 0 to 100. In 1989 the overall HEI score was 61.5, in 1996 it was 63.8, and it remained the same in 2000. Of the U.S. population, 10% had a good diet with a rating of 80 or higher, 74% had diets that needed improvement, and 16% had poor diets with scores less than 51 (Basiotis et al., 2002). The Healthy Eating Index 2005 can be used to assess the diet of an individual also (Table 12-3).

Nutrition Monitoring Report

At the request of the DHHS and USDA, the Expert Panel on Nutrition Monitoring was established by the Life Sciences Research Office of the Federation of American Societies for Experimental Biology (FASEB) to review the dietary and nutritional status of the American population. The report of the committee summarized the results of data from NHANES II, Hispanic HANES, and the Nationwide Food Consumption Survey (NFCS) and CSFII surveys. In general, the committee concluded that the food supply in the United States is abundant, although some people may not receive enough nutrients for various reasons. Nutrient intakes are most likely to be low in persons living below the poverty level. Intakes of nutrients reported to be low in the general population are even lower in the poverty group. Key food components that are identified as current or potential public health issues are listed in Table 12-4.
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Intakes between the minimum and maximum levels are scored proportionately, except for saturated fat and sodium (see \[H20648\]).

Legumes counted as vegetables only after meat and beans standard is met.

Includes all milk products, such as fluid milk, yogurt, and cheese.

Includes nonhydrogenated vegetable oils and oils in fish, nuts, and seeds.

Saturated fat and sodium get a score of 8 for the intake levels that reflect the 2005 Dietary Guidelines: 10% of calories from saturated fat and 1.1 g of sodium per 1000 kcal, respectively.

### TABLE 12-3

**Healthy Eating Index 2005 Components and Standards for Scoring**

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum Points</th>
<th>Standard for Maximum Score</th>
<th>Standard for Minimum Score of Zero</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fruit (includes 100% juice)</td>
<td>5</td>
<td>≥0.8 cup equiv per 1000 kcal</td>
<td>No fruit</td>
</tr>
<tr>
<td>Whole fruit (not juice)</td>
<td>5</td>
<td>≥0.4 cup equiv per 1000 kcal</td>
<td>No whole fruit</td>
</tr>
<tr>
<td>Total vegetables</td>
<td>5</td>
<td>≥1.1 cup equiv per 1000 kcal</td>
<td>No vegetables</td>
</tr>
<tr>
<td>Dark green and orange vegetables and legumes†</td>
<td>5</td>
<td>≥0.4 cup equiv per 1000 kcal</td>
<td>No dark green or orange vegetables or legumes</td>
</tr>
<tr>
<td>Total grains</td>
<td>5</td>
<td>≥3.0 oz equiv per 1000 kcal</td>
<td>No grains</td>
</tr>
<tr>
<td>Whole grains</td>
<td>5</td>
<td>≥1.5 oz equiv per 1000 kcal</td>
<td>No whole grains</td>
</tr>
<tr>
<td>Milk‡</td>
<td>10</td>
<td>≥1.3 cup equiv per 1000 kcal</td>
<td>No milk</td>
</tr>
<tr>
<td>Meat and beans</td>
<td>10</td>
<td>≥2.5 oz equiv per 1000 kcal</td>
<td>No meat or beans</td>
</tr>
<tr>
<td>Oils§</td>
<td>10</td>
<td>≥12 g per 1000 kcal</td>
<td>No oil</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>10</td>
<td>≤7% of energy</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>10</td>
<td>≤0.7 g per 1000 kcal</td>
<td></td>
</tr>
<tr>
<td>Calories from solid fat, alcohol and added sugar (SoFAAS)</td>
<td>20</td>
<td>≤20% of energy</td>
<td>≥50% of energy</td>
</tr>
</tbody>
</table>


*Intakes between the minimum and maximum levels are scored proportionately, except for saturated fat and sodium (see \[\]).

†Legumes counted as vegetables only after meat and beans standard is met.

‡Includes all milk products, such as fluid milk, yogurt, and cheese.

§Includes nonhydrogenated vegetable oils and oils in fish, nuts, and seeds.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intakes of fat, saturated fatty acids, and cholesterol among all age-groups older than 2 years of age were higher than recommended levels (&lt;30% of calories for total fat and 8% to 10% of calories for saturated fatty acids). Cholesterol intakes were generally within the recommended range of 300 mg/dl or less.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intakes of alcohol are a public health concern because it displaces food sources of nutrients and has potential health consequences.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low intakes of iron and calcium continue to be a public health concern, particularly among infants and females of childbearing age. Prevalence of iron deficiency anemia was higher among these groups than among other age- and sex-groups. Low calcium intake is a particular concern among adolescent girls and adult women in most racial and ethnic groups.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium intake continues to exceed government recommendations of 2400 mg/day in most age- and sex-groups.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some population or age-groups may consume insufficient amounts of total carbohydrate and carbohydrate constituents such as dietary fiber; protein; vitamin A; antioxidant vitamins (vitamins C and E) carotenoids; folate, vitamins B6 and B12; magnesium, potassium, zinc, copper, selenium, phosphorus, and fluoride. Intakes of polyunsaturated and monounsaturated fatty acids, trans-fatty acids, and fat substitutes may be unbalanced.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Within the past 30 years, attention has been focused increasingly on the relationship of nutrition to chronic diseases and conditions. Although this interest derives somewhat from the rapid increase in number of older adults and their longevity, it is also prompted by the desire to prevent premature deaths from diseases such as coronary heart disease, diabetes mellitus, and cancer. Approximately two thirds of deaths in the United States are caused by chronic disease.

**Current Dietary Guidance in the United States and Canada**

Eating can be one of life’s greatest pleasures. People eat for enjoyment and to obtain energy and nutrients. Although many genetic, environmental, behavioral, and cultural factors affect health, diet is equally important for promoting health and preventing disease.

In 1969, then President Nixon convened the White House Conference on Nutrition and Health (White House, 1970). Increased attention was being given to prevention of hunger and disease. The development of dietary guidelines in the United States began with the 1977 report of the U.S. Senate Select Committee on Nutrition and Human Needs called *Dietary Goals for the United States* (U.S. Senate Select Committee on Nutrition and Human Needs, 1977).

In addition to these dietary guidelines, several other important government or expert reports have addressed dietary recommendations for healthy Americans. Previous Surgeon General’s Reports on Nutrition and Health and the National Academy of Sciences (NAS) have provided similar qualitative or quantitative dietary recommendations. In Canada, dietary recommendations are prepared by Health Canada (see Clinical Insight: Nutrition Recommendations for Canadians).

Guidelines directed toward prevention of a particular disease, such as those from the National Cancer Institute, the American Diabetes Association, The American Heart Association, and the National Heart, Lung, and Blood Institute’s cholesterol education guidelines, contain recommendations unique to particular conditions. The American Dietetic Association (ADA) (2002) published a position statement stating that all foods can fit into a healthful diet when the total diet, or overall pattern of food eaten, is consumed in moderation with appropriate portion sizes and combined with regular physical activity. The various guidelines, summarized in Box 12-1 can be used by health counselors throughout most of the developed world.

**Implementing the Guidelines**

The task of planning nutritious meals centers on including the essential nutrients in sufficient amounts as outlined in the newest DRIs, in addition to appropriate amounts of energy, protein, carbohydrate (including fiber and sugars), fat (especially saturated and trans-fats), cholesterol, and salt. Suggestions are included to help people meet the specifics of the recommendations. When specific numeric recommendations differ, they are presented as ranges.

The **MyPyramid Food Guidance System**, shown in Figure 12-1, offers a method for determining appropriate patterns for daily food choices based on servings from the five major food groups. The MyPyramid system replaces the Food Guide Pyramid used in previous guidelines.

### Clinical Insight

**Nutrition Recommendations for Canadians**

The revision to Canada’s Food Guide to Healthy Eating was released in 2007 and developed age- and gender-specific food intake patterns. These age- and gender-specific suggestions include 4 to 7 servings of vegetables and fruits, 3 to 7 servings of grain products, 2 to 3 servings of milk or milk alternatives, and 1 to 3 servings of meat or meat alternatives. Unlike MyPyramid in the United States, Canada’s Eating Well with Canada’s Food Guide contains four food groupings presented in a rainbow shape (Health Canada, 2007) (see Figure 12-2). Tips include:

- Consume no more than 400-450 mg of caffeine per day.
- Eat at least one dark green and one orange vegetable each day.
- Make at least half of grain products consumed each day whole grain.
- Compare the Nutrition Facts table on food labels to choose products that contain less fat, saturated fat, trans fat, sugar, and sodium.
- Drink skim, 1% or 2% milk, or fortified soy beverages each day. Check the food label to see if the soy beverage is fortified with calcium and vitamin D.
- Include a small amount (30-45 ml [2-3 Tbsp]) of unsaturated fat each day to get the fat needed.
- Limit the intake of soft drinks, sports drinks, energy drinks, fruit drinks, punches, sweetened hot and cold beverages, and alcohol.
- Eat at least two Food Guide Servings of fish each week.
- Build 30-60 minutes of moderate physical activity into daily life for adults and at least 90 minutes a day for children and youth.

Anatomy of MyPyramid

One size doesn’t fit all
USDA’s new MyPyramid symbolizes a personalized approach to healthy eating and physical activity. The symbol has been designed to be simple. It has been developed to remind consumers to make healthy food choices and to be active every day. The different parts of the symbol are described below.

Activity
Activity is represented by the steps and the person climbing them, as a reminder of the importance of daily physical activity.

Moderation
Moderation is represented by the narrowing of each food group from bottom to top. The wider base stands for foods with little or no solid fats or added sugars. These should be selected more often. The narrower top area stands for foods containing more added sugars and solid fats. The more active you are, the more of these foods can fit into your diet.

Proportionality
Proportionality is shown by the different widths of the food group bands. The widths suggest how much food a person should choose from each group. The widths are just a general guide, not exact proportions. Check the Web site for how much is right for you.

Variety
Variety is symbolized by the 6 color bands representing the 5 food groups of the Pyramid and oils. This illustrates that foods from all groups are needed each day for good health.

Gradual Improvement
Gradual improvement is encouraged by the slogan. It suggests that individuals can benefit from taking small steps to improve their diet and lifestyle each day.

Personalization
Personalization is shown by the person on the steps, the slogan, and the URL. Find the kinds and amounts of food to eat each day at MyPyramid.gov.

U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005 CNPP-16

For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

- **GRAINS**
  - Eat 6 oz. every day

- **VEGETABLES**
  - Eat 2½ cups every day

- **FRUITS**
  - Eat 2 cups every day

- **MILK**
  - Get 3 cups every day; for kids aged 2 to 6, it’s 2½ oz. every day

- **MEAT & BEANS**
  - Eat 3½ oz. every day

Goals report, the DHHS lead the effort. Following the Senate’s involvement in the issuance of dietary guidance, USDA and
30 years. Although numerous federal agencies are involved in the regulatory framework for nutrition information, the Food and Drug Administration (FDA) established a voluntary system of providing selected nutrient information on food labels. The food labels became mandatory in 1994.

**Mandatory Nutrition Labeling**

As a result of the NLEA, nutrition labels must appear on most foods except products that provide few nutrients (such as coffee and spices), restaurant foods, and ready-to-eat foods prepared on site, such as supermarket bakery and deli items (FDA, 1993). Providing nutrition information on many raw foods is voluntary. However, the FDA and USDA have called for a voluntary point-of-purchase program in which nutrition information is available in most supermarkets. Nutrition information is provided through brochures or point-of-purchase posters for the 20 most popular fruits, vegetables, and fresh fish and the 45 major cuts of fresh meat and poultry.

Nutrition information for foods purchased in restaurants is widely available at the point of purchase or from Internet sites or toll-free numbers. Ready-to-eat unpackaged foods in delicatessens or supermarkets may provide nutrition information voluntarily. However, if nutrition claims are made, nutrition labeling is required at the point of purchase.

If a food makes the claim of being organic, it also must meet certain criteria and labeling requirements. In 2002 the government regulations were established for organic food labeling (see Focus On: Is it Really Organic and Is it Healthier? in Chapter 11).

**Standardized Serving Sizes**

Serving sizes of products are set by the government based on reference amounts commonly consumed. For example, a serving of milk is 8 oz, and a serving of salad dressing is 2 tbsp. Standardized serving sizes make it easier for consumers to compare the nutrient contents of similar products.

**Nutrition Facts Label**

The nutrition facts label on a food product provides information on its per-serving calories and calories from fat. The label then lists the amount (in grams) of total fat, saturated fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugar, and protein. For most of these nutrients the label also shows the percentage of the daily value (DV) supplied by a serving. A product’s content of vitamins A and C, calcium, and iron is listed in terms of DV percentage only. DVs show how a product fits into an overall diet by comparing its nutrient content with recommended intakes of those nutrients.

It is important to remember that DVs are not recommended intakes for individuals; no one nutrient standard applies to everyone. They are simply reference points to provide some perspective on daily nutrient needs. DVs are based on a 2000-kcal diet; however, the bottom of the nutrition label also provides the DVs for a 2500-kcal diet. For example, individuals who consume diets supplying more or fewer calories can still use the DVs as a rough guide to ensure that they are getting adequate amounts of vitamin C but not too much saturated fat.
FIGURE 12-2, cont’d  Eating Well with Canada’s Food Guide.
Table 12-5

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A</td>
<td>5000 IU</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>60 mg</td>
</tr>
<tr>
<td>Thiamin</td>
<td>1.5 mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>1.7 mg</td>
</tr>
<tr>
<td>Niacin</td>
<td>20 mg</td>
</tr>
<tr>
<td>Calcium</td>
<td>1 g</td>
</tr>
<tr>
<td>Iron</td>
<td>18 mg</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>400 IU</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>30 IU</td>
</tr>
<tr>
<td>Folic acid</td>
<td>0.4</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>6 mcg</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>1 g</td>
</tr>
<tr>
<td>Iodine</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Magnesium</td>
<td>400 mg</td>
</tr>
<tr>
<td>Zinc</td>
<td>15 mg</td>
</tr>
<tr>
<td>Copper</td>
<td>2 mg</td>
</tr>
<tr>
<td>Biotin</td>
<td>0.3 mg</td>
</tr>
<tr>
<td>Pantothenic acid</td>
<td>10 mg</td>
</tr>
<tr>
<td>Selenium</td>
<td>70 mcg</td>
</tr>
</tbody>
</table>


Table 12-6

<table>
<thead>
<tr>
<th>Daily Reference Values (DRVs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Component</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Fat</td>
</tr>
<tr>
<td>Saturated fat</td>
</tr>
<tr>
<td>Cholesterol</td>
</tr>
<tr>
<td>Carbohydrates</td>
</tr>
<tr>
<td>Fiber</td>
</tr>
<tr>
<td>Protein</td>
</tr>
<tr>
<td>Sodium</td>
</tr>
<tr>
<td>Potassium</td>
</tr>
</tbody>
</table>

Note: The DRVs were established for adults and children over 4 years old. The values for energy yielding nutrients below are based on 2,000 calories per day.


The DVs exist for nutrients for which RDAs already exist (in which case they are known as reference daily intakes [RDIs]) (Table 12-5) and for which no RDAs exist (in which case they are known as daily reference values [DRVs]) (Table 12-6). However, food labels use only the term “daily value.” RDIs provide a large margin of safety; in general, the RDI for a nutrient is greater than the RDA for a specific age-group. The term RDI replaces the term U.S. RDAs used on previous food labels.

The previously mentioned nutrients must be listed on the food label. Nutrients that a manufacturer or processor may voluntarily disclose include those for which a DV has been established such as monounsaturated and saturated fat, potassium, vitamins such as thiamin and riboflavin, and minerals such as iodine and magnesium. As new DRIs are developed in various categories, labeling laws are updated. Figure 12-3 shows a sample nutrition facts label.

**Nutrient Content Claims**

Nutrient content terms such as reduced sodium, fat free, low calorie, and healthy must now meet government definitions that apply to all foods (Box 12-3). For example, lean refers to a serving of meat, poultry, seafood, or game meat with less than 10 g of fat, less than 4 g of saturated fat, and less than 95 mg of cholesterol per serving or per 100 g. Extra lean meat or poultry contains less than 5 g of fat, less than 2 g of saturated fat, and the same cholesterol content as lean, per serving, or per 100 g of product.

**Health Claims**

A health claim is allowed only on appropriate food products that meet specified standards. The government requires that health claims be worded in ways that are not misleading (e.g., the claim cannot imply that the food product itself helps prevent disease). Health claims cannot appear on foods that supply more than 20% of the DV for fat, saturated fat, cholesterol, and sodium. The following is an example of a health
**Free:** This term means that a product contains no amount of, or only trivial or “physiologically inconsequential” amounts of, one or more of these components: fat, saturated fat, cholesterol, sodium, sugar, and calories. For example, “calorie-free” means fewer than 5 calories per serving, and “sugar-free” and “fat-free” both mean less than 0.5 g per serving. Synonyms for “free” include “without,” “no” and “zero.” A synonym for fat-free milk is “skim.”

**Low:** This term can be used on foods that can be eaten frequently without exceeding dietary guidelines for one or more of these components: fat, saturated fat, cholesterol, sodium, and calories.

- **Low fat:** 3 g or less per serving
- **Low saturated fat:** 1 g or less per serving
- **Low sodium:** 140 mg or less per serving
- **Very low sodium:** 35 mg or less per serving
- **Low cholesterol:** 20 mg or less and 2 g or less of saturated fat per serving
- **Low calorie:** 40 calories or less per serving

Synonyms for low include “little,” “few,” “low source of,” and “contains a small amount of.”

- **Lean and extra lean:** These terms can be used to describe the fat content of meat, poultry, seafood, and game meats.
  - **Lean:** less than 10 g fat, 4.5 g or less saturated fat, and less than 95 mg cholesterol per serving and per 100 g.
  - **Extra lean:** less than 5 g fat, less than 2 g saturated fat, and less than 95 mg cholesterol per serving and per 100 g.

**High:** This term can be used if the food contains 20% or more of the daily value for a particular nutrient in a serving.

**Good source:** This term means that one serving of a food contains 10% to 19% of the daily value for a particular nutrient.

**Reduced:** This term means that a nutritionally altered product contains at least 25% less of a nutrient or of calories than the regular, or reference, product. However, a reduced claim can’t be made on a product if its reference food already meets the requirement for a “low” claim.

**Less:** This term means that a food, whether altered or not, contains 25% less of a nutrient or of calories than the reference food. For example, pretzels that have 25% less fat than potato chips could carry a “less” claim. “Fewer” is an acceptable synonym.

**Light:** This descriptor can mean two things:

- First, that a nutritionally altered product contains one-third fewer calories or half the fat of the reference food. If the food derives 50% or more of its calories from fat, the reduction must be 50% of the fat.
- Second, that the sodium content of a low-calorie, low-fat food has been reduced by 50%. In addition, “light in sodium” may be used on food in which the sodium content has been reduced by at least 50%.

- The term “light” still can be used to describe such properties as texture and color, as long as the label explains the intent (e.g., “light brown sugar” and “light and fluffy.”

**More:** This term means that a serving of food, whether altered or not, contains a nutrient that is at least 10% of the daily value more than the reference food. The 10% of daily value also applies to “fortified,” “enriched” and “added” “extra and plus” claims, but in these cases the food must be altered.


**BOX 12-4**

**Health Claims for Diet-Disease 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 and a reduced risk of coronary heart disease
- Sodium and an increased risk of hypertension
- Potassium and a decreased risk of hypertension
- Fruits and vegetables and a reduced risk of cancer
- Folic acid during pregnancy and a reduced risk of neural tube defects
- Sugar alcohols and a reduced risk of dental caries
- Soluble fiber from certain foods, such as whole oats and psyllium seed husk, and heart disease
- Stanol and sterol esters (in vegetable oil spreads and salad dressings) and a reduced risk of coronary heart disease

claim for dietary fiber and cancer: “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.” Box 12-4 lists health claims that manufacturers can use to describe food-disease relationships.

**Cultural Aspects of Dietary Planning**

To plan diets for individuals or groups that are appropriate from a health and nutrition perspective, it is important that nutritionists and health professionals develop cultural awareness (cultural competency) and use resources that are targeted to the specific client or group. Numerous population subgroups in the United States and throughout the world have specific cultural, ethnic, or religious beliefs and practices to consider. These groups have their own set of dietary practices or beliefs, which are important when considering dietary planning.

**The Mediterranean Diet**

Cultural, ethnic, or religious rules can have an effect on access to food, food choices, preparation, and storage methods. For example, the Mediterranean Diet Pyramid has been developed to represent the eating pattern of the Mediterranean culture and to demonstrate a reasonable diet for reducing chronic disease (Figure 12-4) (see Focus On: The Mediterranean Diet: Is It Good for All of Us?). Cultural aspects of dietary planning may also include vegetarianism, ethnic heritage practices, and religious customs or rules.

**FIGURE 12-4** The Traditional Healthy Mediterranean Diet Pyramid. (Courtesy Oldways Preservation and Exchange Trust. Adapted from: http://www.oldwayspt.org/, accessed March 13, 2007.)
The Mediterranean Diet: Is It Good for All of Us?

The Mediterranean Diet has received attention because of its potential for protecting the body against cardiovascular disease and cancers. The diet is rich in fruits, vegetables, whole grains, and sources of monounsaturated and polyunsaturated fatty acids (such as omega-3 fatty acids).

A trial involving this diet was conducted as part of the Lyon Diet Heart Study; 605 patients with coronary heart disease who had already had a heart attack were randomly selected to follow either a Mediterranean-type diet or a control diet (Hakim, 1998). Those following the Mediterranean pattern ate less delicatessen food, beef, pork, butter, and cream and more vegetable oils, vegetable oil margarine-type spreads, and olive oil. The control diet was similar to the Step 1 American Heart Association (AHA) Prudent Diet (30% energy from fat). Compared with the control diet, the Mediterranean diet provided more fiber, vitamin C, and omega-3 fatty acids both from fish and as α-linolenic acid from walnuts, seeds, and herbs and less cholesterol and saturated fatty acids. Participants were monitored for 4 years, and at the end there was a 50% to 75% reduction in risk for another heart attack. The risk ratios were also lower for cancers, and overall mortality rates. More use of these strategies in dietary planning may be beneficial in U.S. populations when combined with adequate daily physical activity.

Cultural Dietary Patterns

Table 12-7 lists common cultural dietary patterns. The following questions may help nutritionists accommodate food habits while meeting dietary recommendations:

- Which individual foods are the major components of the food or mixed dish to be classified?
- To which food groups in the MyPyramid system or the Mediterranean Diet Pyramid do the foods seem most related?
- What are the important nutrient sources and their contribution to overall nutrient adequacy?
- How is the food used, and in what quantity is the food typically consumed?
- Do any food handling, preparation, or storage considerations compromise food safety or limit food choices?

Common Dietary Patterns: Southeast Asian

During the past few decades the number of Southeast Asian refugees has increased dramatically worldwide. In the United States immigrants from Southeast Asia have become the third largest ethnic group after blacks and Hispanics. Among these immigrants are numerous groups, each with a distinct language, culture, and food habits. From Laos, Cambodia, and Vietnam come the native ethnic groups, as well as Muslims and ethnic Chinese. From Laos, Thailand, and Southern China come the nomadic hill people, the Hmong (Tripp, 1982). Urban and rural immigrants may have lifestyles that differ considerably even when the people come from the same country.

The traditional Hmong (Southeast Asian) diet is high in complex carbohydrates and low in refined carbohydrates, predominantly from rice that is eaten at every meal. The Southeast Asian Hmong diet includes large amounts of fruits, vegetables, and soy products (mostly tofu), and smaller amounts of meat, poultry, and fish. Common spices include lemon grass, coriander, chili peppers, green onion, basil, cilantro, ginger, and garlic. Lemon and lime juice often are used in place of salad dressings and salt; soy and fish sauces and monosodium glutamate (MSG) are common seasonings (American Dietetic Association [ADA] and American Diabetes Association, 1999).

Although lactose intolerance has been reported to be a problem in many Southeast Asians, many adults are able to drink it in small amounts without any discomfort. If the immigrants are refugees, they may be at nutritional risk because of low access to food supplies and parasitic anemias. General malnutrition, hypertension, dental caries, and iron deficiency anemia have been identified as problems among incoming refugees.

Common Dietary Patterns: Chinese

In Chinese culture food plays a vital role in preventing and treating diseases and addressing certain health conditions. The traditional Chinese diet is much richer in carbohydrates (i.e., rice) and includes various meats, poultry, and seafood in small quantities. The Chinese diet obtains more than 80% of its calories from grains, legumes, and vegetables; 20% from animal protein, fruits, and fats. Northern Chinese cuisine may include more noodles, dumplings, and steamed buns made from wheat flour. Stir-frying, deep-fat frying, braising, roasting, smoking, and steaming are common food preparation techniques. When foods are fried, peanut or corn oil is used rather than lard, which is more common in Southeast Asian cuisine.

Although pork is often a mainstay, soybeans are also commonly used in forms including sprouts, dried, or fermented as tofu. Dairy products are rarely consumed. Fruits are abundant. Vegetables are also frequent in the diet, though rarely eaten raw; they are generally stir-fried, steamed, or added to soups just before serving. The beverage of choice is clear, hot green tea.

Although Chinese meals are eaten communally, each region has its own set of foods, ingredients, and cooking methods. Northern cuisine is characterized by garlic, leeks, and scallions, with noodles rather than rice. In the Western region Hunan cuisine includes liberal use of chili peppers and hot pepper sauces. Hunan dishes are spicier and oilier than dishes in other regions. Southern Chinese cuisine, or Cantonese, includes primarily steamed and stir-fried dishes.
## Table 12-7

### Cultural Dietary Patterns

<table>
<thead>
<tr>
<th>Culture</th>
<th>Bread, Cereal, Rice, and Pasta Group</th>
<th>Vegetable Group</th>
<th>Fruit Group</th>
<th>Milk, Yogurt, Cheese Group</th>
<th>Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Groups</th>
<th>Fats, Oils, and Sweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native American</td>
<td>Blue corn flour (ground dried blue corn kernels) used to make cornbread, mush dumplings; fruit dumplings (walakshi); fry bread (biscuit dough deep fried); ground sweet acorn; hominy; tortillas; wheat and rye products; wild rice</td>
<td>Artichokes, cacti, chili, mushrooms, nettles, onions, potatoes, pumpkin, squash, sweet potatoes, tomatoes, wild greens, turnips, and yucca</td>
<td>Dried wild berries, cherries, and grapes; berries, elderberries, persimmons, plums, and rhubarb</td>
<td>None in traditional diet</td>
<td>Bear, buffalo, deer, elk, moose, rabbit, and squirrel; duck, goose, quail, and wild turkey; a variety of fish, legumes, nuts, and seeds</td>
<td>Tallow and lard Maple sugar and pine sugar</td>
</tr>
<tr>
<td>Northern European</td>
<td>Barley, hops, oat, rice, rye, and wheat products</td>
<td>Artichokes, asparagus, beets, Brussels sprouts, cabbage, carrots, cauliflower, celery, cucumbers, eggplant, fennel, green peppers, kale, leeks, mushrooms, olives, onions, peas, potatoes, radishes, spinach, turnips, and watercress</td>
<td>Apples, apricots, cherries, currants, gooseberries, grapes, lemons, melons, oranges, peaches, pears, plums, prunes, raspberries, rhubarb, and strawberries</td>
<td>Cheese (made from cow, sheep, and goat milk), cream, milk, sour cream, and yogurt</td>
<td>Beef, lamb, oxtail, pork, rabbit, veal, and venison; chicken, duck, goose, pheasant, pigeon, quail, and turkey; a wide variety of fish, legumes, and nuts</td>
<td>Butter, lard, margarine, olive oil, vegetable oil, and salt pork; honey and sugar</td>
</tr>
</tbody>
</table>

Used with permission as modified from Kittler PG, Sucher KP: *Food and culture*, ed 4, Belmont Calif, 2004; Thomson and Wadsworth; and Grodner M et al: *Foundations and clinical applications of nutrition: a nursing approach*, ed 4, St Louis, 2006; Mosby.

Common food choices associated within these cultural groups are noted, and individuals may also consume other foods. Continued
<table>
<thead>
<tr>
<th>Culture</th>
<th>Bread, Cereal, Rice, and Pasta Group</th>
<th>Vegetable Group</th>
<th>Fruit Group</th>
<th>Milk, Yogurt, Cheese Group</th>
<th>Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Groups</th>
<th>Fats, Oils, and Sweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern European</td>
<td>Cornmeal, rice, and wheat products</td>
<td>Arugula, artichokes, asparagus, broccoli, cabbage, cardoon, cauliflower, celery, chicory, cucumber, eggplant, endive, escarole, fennel, kale, kohlrabi, mushrooms, mustard greens, olives, pimentos, potatoes, radicchio, Swiss chard, turnips, and zucchini</td>
<td>Apples, apricots, bananas, cherries, citron, dates, figs, grapefruit, grapes, lemons, medlars, peaches, pears, pineapples, prunes, pomegranates, quinces, oranges, raisins, and tangerines</td>
<td>Cheese (made from cow, sheep, buffalo, and goat milk), and milk</td>
<td>Beef, goat, lamb, pork, and veal; chicken, duck, goose, pigeon, turkey, and woodcock; a variety of fish, shellfish, legumes, and nuts</td>
<td>Butter, lard, olive oil, and vegetable oil; honey and sugar</td>
</tr>
<tr>
<td>Central European and Russian</td>
<td>Barley, buckwheat, corn, millet, oats, potato starch, rice, rye, and wheat products</td>
<td>Asparagus, beets, Brussels sprouts, cabbage, carrots, cauliflower, celery, chard, cucumbers, eggplant, endive, kohlrabi, leeks, mushrooms, olives, onions, parsnips, peppers, potatoes, radishes, sorrel, spinach, and turnips</td>
<td>Apples, apricots, a variety of berries, currants, dates, grapes, grapefruit, lemons, melons, oranges, peaches, pears, plums, prunes, quinces, raisins, rhubarb, and strawberries</td>
<td>Buttermilk, cheese, cream, milk, sour cream, and yogurt</td>
<td>Beef, boar, hare, lamb, pork, sausage, veal, and venison; chicken, Cornish hen, duck, goose, grouse, partridge, pheasant, quail, squab, and turkey; a variety of fish, shellfish, legumes, and nuts</td>
<td>Butter, bacon, chicken fat, fissed oil, lard, olive oil, salt pork, and vegetable oil; honey, sugar, and molasses</td>
</tr>
<tr>
<td>Black (Southern United States)</td>
<td>Biscuits; cornbread as spoon bread, cornpone, hush puppies, or grits and rice</td>
<td>Broccoli, cabbage, corn; leafy greens including dandelion, kale, mustard, collard, and turnips; okra, pumpkin, potatoes, spinach, squash, sweet potatoes, tomatoes, and yams</td>
<td>Apple, banana, berries, fruit juices, peaches, and watermelon</td>
<td>Buttermilk and some cheese</td>
<td>Beef, pork and pork products, including scrapple (cornmeal and pork), chitterlings (pork intestines), bacon, pig feet and ears; fried meats and poultry, organ meats (kidney, liver, tongue, tripe); fish (catfish, crawfish, salmon, shrimp, tuna); frogs, rabbit, squirrel, and a variety of legumes and nuts</td>
<td>Butter and lard; honey, molasses, and sugar</td>
</tr>
<tr>
<td>Region</td>
<td>Main Ingredients</td>
<td>Meats</td>
<td>Fats</td>
<td></td>
<td></td>
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<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexican</td>
<td>Corn (tortillas, masa harina), wheat, and rice products; sweet bread</td>
<td>Beef, goat, pork, chicken, turkey, firm-fleshed fish, shrimp, and a variety of legumes</td>
<td>Bacon fat, lard (manteca), salt port, dairy cream, sugar, and panocha (raw brown cane sugar)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central American</td>
<td>Corn (tamales, tortillas), rice, and wheat products</td>
<td>Beef, iguana, lizards, pork, and venison; chicken duck, turkey, and a variety of fish, shellfish, and legumes</td>
<td>Butter, lard, vegetable oils, and shortening; honey, sugar, sugar syrup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caribbean Islands</td>
<td>Cassava bread; cornmeal (surrulitos); oatmeal; rice, and wheat products</td>
<td>Beef, goat, pork, chicken, turkey, and a variety of fish, shellfish, and legumes</td>
<td>Butter, coconut oil, lard, and olive oil, sugar cane products</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Culture</th>
<th>Bread, Cereal, Rice, and Pasta Group</th>
<th>Vegetable Group</th>
<th>Fruit Group</th>
<th>Milk, Yogurt, Cheese Group</th>
<th>Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Groups</th>
<th>Fats, Oils, and Sweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuban and Puerto Rican</td>
<td>Rice; starchy green bananas, usually fried (plantain)</td>
<td>Beets, breadfruit, chayote, chili peppers, eggplant, onion, tubers (yucca), white yams (boniato)</td>
<td>Coconuts, guava, mango, oranges (sweet and sour), prune and mango paste</td>
<td>Flan, hard cheese (queso de mano)</td>
<td>Chicken, fish, (all kinds and preparations, including smoked, salted, canned, and fresh), shellfish, legumes (all kinds, especially black beans), pork (fried), sausage (chorizo), calf brain, beef tongue</td>
<td>Olive and peanut oil, lard, coconut</td>
</tr>
<tr>
<td>South American</td>
<td>Amaranth (corn, rice, quinoa) and wheat products</td>
<td>Ahipa, arracacha, calabaza, cassava, green peppers, hearts of palm, kale, okra, oca, onions, rosella, squash, sweet potatoes, yacon, and yams</td>
<td>Avocados, abiu, acerola, apples, banana, cainito, casimiroa, cherimoya, feijoa, guava, grapes, jackfruit, jabuticaba, lemons, limes, lulo, mammee, mango, melon, olives, oranges, palm fruits, papaya, passion fruit, peaches, pineapple, pitanga, quince, sapote, and strawberries</td>
<td>Cheese and milk</td>
<td>Beef, frog, goat, guinea pig, llama, mutton, pork, and rabbit; chicken, duck, turkey and a variety of fish, shellfish, and nuts</td>
<td>Palm oil, olive oil, and butter; sugar cane, brown sugar, and honey</td>
</tr>
<tr>
<td>Chinese</td>
<td>Rice and related products (flour, cakes, and noodles); noodles made from barley, corn, and millet; wheat and related products (breads, noodles, spaghetti, stuffed noodles [won ton] and filled buns [bow])</td>
<td>Bamboo shoots, cabbage (nappa), celery, Chinese turnips (lo bok), dried daylilies, dry fungus (Black Juda's ear); leafy green vegetables including kale, cress, mustard greens (gai choy), chard (bok choy), amaranth greens (yin choy), wolfberry leaves (gou gay), and Chinese beans</td>
<td>Apples, bananas, custard apples, coconuts, dates, longan, figs, grapes, kumquats, lime, litchi, mango, muskmelon, oranges, papaya, passion fruit, peaches, persimmons, pineapples, plums, pomegranates, pomelos, tangerines, and watermelon</td>
<td>Milk (cows, buffalo, and soymilk)</td>
<td>Beef, lamb, and pork; chicken, duck, quail, squab, a large variety of fish and shellfish, in addition to legumes and nuts</td>
<td>Lard; peanut, soy, sesame and rice oil; honey, rice or barley malt, palm sugar, sorghum sugar, and dehydrated cane juice</td>
</tr>
<tr>
<td>Japanese</td>
<td>Rice and rice products, rice flour (mochiko), noodles (comen/soba), buckwheat and millet</td>
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<tr>
<td>Artichoke, asparagus, bamboo shoots (takenoko), burdock (gobo), cabbage (nappa), eggplant, horseradish (wasabi), mizuna, mushrooms (shiitake, matsutake, nameko), Japanese parsley (seri), lotus root (renkon), pickled cabbage (kimchee), pickled vegetables, seaweed (laver, nori, wakame, kambu), snow peas, spinach, sweet potato, vegetable soup (mizutaki), watercress, white radish (daikon)</td>
<td></td>
<td>Pearlike apple (nasi), apricots, bananas, cherries, figs, grapefruit (yuzu), kumquats, lemons, limes, persimmons, plums, pineapples, strawberry, and tangerine (mikan)</td>
<td>Milk, butter, and ice cream</td>
<td>Seafood (including dried fish with bones, raw fish (sashimi), and fish cake (kamaboko); a variety of poultry (chicken, duck, goose, turkey); legumes (black beans, red beans, soybeans—as tofu, fermented soybean and sprouts)</td>
<td>Lard; soy, sesame, rapeseed and rice oil; honey and sugar</td>
<td></td>
</tr>
<tr>
<td>Korean</td>
<td>Barley, buckwheat, millet, rice and wheat products</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bamboo shoots, bean sprouts, beets, cabbage, chives, chrysanthemum leaves, cucumber, eggplant, fern, green onion, green pepper, leeks, lotus root, mushrooms, onion, perilla, seaweed, spinach, sweet potato, turnips, water chestnut, watercress, and white radish</td>
<td>Apples, Asian pears, cherries, dates, grapes, melons, oranges, pears, persimmons, plums, and tangerines</td>
<td>Very little, if any, consumption</td>
<td>Beef, oxtail, pork, chicken, pheasant, and a variety of fish, shellfish, legumes, and nuts</td>
<td>Sesame oil and vegetable oil; honey and sugar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 12-7
Cultural Dietary Patterns—cont’d

<table>
<thead>
<tr>
<th>Culture</th>
<th>Bread, Cereal, Rice, and Pasta Group</th>
<th>Vegetable Group</th>
<th>Fruit Group</th>
<th>Milk, Yogurt, Cheese Group</th>
<th>Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Groups</th>
<th>Fats, Oils, and Sweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filipino</td>
<td>Noodles, rice, rice flour (mochiko), stuffed noodles (won ton), white bread (pan de sal)</td>
<td>Amaranth, bamboo shoots, beets, burdock root, cassava, Chinese celery, dark green leafy vegetables (malunggay and salvyot), eggplant, garlic, green peppers, hearts of palm, hyacinth bean, kamis, leek, mushrooms, okra, onion, sweet potatoes (camotes), turnips, and root crop (gabi)</td>
<td>Apples, avocados, banana, bitter melon (ampalaya), breadfruit, coconut, guavas, jackfruit, limes, mangoes, papaya, pod fruit (tamarind), pomelos, rambutan, rhubarb, star fruit, tamarind, tangelo (naranghita), and watermelon</td>
<td>White cheese, evaporated cow or goat milk, and soy milk</td>
<td>Beef, carabao, goat, pork, monkey, organ meats, and rabbit; fish, dried fish (dilis), egg roll (lumpia), fish sauce (alamang and bagoong); legumes such as mung beans, bean sprouts, chickpeas; and soybean curd (tofu)</td>
<td>Coconut oil, lard, and vegetable oil; brown and white sugar, coconut, and honey</td>
</tr>
<tr>
<td>Pacific Islanders</td>
<td>Rice and wheat products</td>
<td>Arrowroot, bitter melon, burdock root, cabbage, carrot, cassava, daikon, eggplant, fermis, green pepper, horseradish, jute, kohlrabi, leeks lotus root, mustard greens, green onions, seaweed, spinach, squashes, sweet potato, taro, water chestnuts, and yams</td>
<td>Acerola cherries, apples, apricot, avocado, banana, breadfruit, coconut, guava, jackfruit, kumquat, litchis, loquat, mango, melons, papaya, passion fruit, peach, pear, pineapple, plum, prune, strawberries, and tamarind</td>
<td>Very little, if any, consumption</td>
<td>Beef, pork, chicken, duck, squab, turkey; a variety of fish, shellfish, and legumes</td>
<td>Butter, coconut oil, lard, sesame oil, and vegetable oil; sugar</td>
</tr>
<tr>
<td>South Asian</td>
<td>Rice, wheat, buckwheat, corn, millet, and sorghum products</td>
<td>Agathi flowers, amaranth, artichokes, bamboo shoots, beets, bitter melon, Brussels sprouts, cabbage, collard greens, cucumbers, drumstick plant, eggplant, lotus root, manioc, mushrooms, okra, pandanus, plantain flowers, sago palm, spinach, squash, turnips, yams, water chestnuts, water convulus, and water lilies</td>
<td>Apples, apricots, avocados, bananas, coconut, dates, figs, grapes, guava, jackfruit, limes, litchis, loquats, mangoes, melon, nongus, oranges, papaya, peaches, pears, persimmons, pineapple, plums, pomegranate, pomelos, star fruit, sugar cane, tangerines, and watermelon</td>
<td>Milk (evaporated and fermented products), cheese, and milk-based desserts</td>
<td>Beef, goat, mutton, pork, chicken, duck, and a variety of fish, seafood, legumes, and nuts</td>
<td>Coconut oil, ghee, mustard oil, peanut oil, sesame seed oil, and sunflower oil; sugar cane, jaggery, and molasses</td>
</tr>
<tr>
<td>Jewish (both cultural and religious customs)</td>
<td>Bagel, buckwheat groats (kasha), dumplings made with matzo meal (matzoh balls or knaidelach), egg bread (challah), noodle or potato pudding (kugel), crepe filled with farmer cheese and/or fruit (blintz), unleavened bread or large cracker made with wheat flour and water (matzoh)</td>
<td>Potato pancakes (latkes); vegetable stew made with sweet potatoes, carrots, prunes, and sometimes brisket (tzimmes); beet soup (borscht)</td>
<td>A mixture of fish formed into balls and poached (gefilte fish); smoked salmon (lox)</td>
<td>Chicken fat</td>
<td></td>
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</tr>
</tbody>
</table>
with a lot of fish and shellfish. As Chinese adopt traditional American foods, their diet begins to include more sweets such as cookies, chocolate, soft drinks, and snacks.

Common Dietary Patterns: Hispanic Cultures
Hispanics are the most rapidly growing ethnic group in the United States, and Mexican-Americans are the largest subgroup of Hispanics. Hispanic cuisine is based on the concept of foods having “hot” and “cold” properties and on beliefs about the contribution of food to health and well-being (ADA and ADA 1998). “Cold” foods include most vegetables, tropical fruits, dairy products, and inexpensive cuts of meat. “Hot” foods include chili peppers, garlic, onions, most grains, expensive cuts of meat, oils, and alcohol. For example, pregnancy is considered a “hot” condition; thus “hot” foods upset the stomach. Therefore some Hispanics may not eat chili peppers while pregnant for cultural reasons rather than because of safety issues for the mother or developing fetus. Depending on the part of the world, the main dishes of Hispanic diets may include meat (pork, veal, sausage, poultry, or fish). Rice and tortillas are mainstays of the diet, as are fruits and vegetables. Milk and cheese are consumed when available. Fried foods are often eaten and may need to be limited for medical reasons. Chili peppers are commonly used and are a rich source of vitamin C. Chili peppers can range from mild to very hot and from small to very large.

Common Dietary Patterns: Native Americans
Native Americans (American Indians and Alaska Natives) often live on federal Indian reservations and in small rural communities. In this culture food has great religious and social significance for celebrations and ceremonies. Food is more of a social or religious obligation than simple nourishment. Common foods may be prepared and used in different ways in various regions and tribal organizations. Fry bread (fried dough) is a central part of American Indian cuisine and is eaten with foods such as stews, soups, and bean dishes. Fried foods are generally prepared with lard.

Corn is the carbohydrate staple of the American Indian diet, in addition to protein-rich dried beans. Fruits and vegetables were traditionally gathered from the wild but are also cultivated on small farms. Lamb (mutton), goat, game, and poultry are more common than pork or beef. Diabetes is a big problem in natives consuming the modern American diet (see Focus On: Diabetes Does Discriminate, in Chapter 30).

Common Dietary Patterns: Alaska Natives
The Alaska Native diet consists of a mixture of traditional foods and American prepared and processed foods. The diet is high in protein and fat since it is based on meat, fish, sea mammals, and game as staple foods. Seaweed, willow leaves, and sour dock are some of the few edible plants consumed. Since obesity and diabetes mellitus are common, it is important to merge cultural sensitivity with diet and health issues.

Dietary Patterns of Specific Religious Groups
Another major consideration is religious beliefs that affect dietary patterns (Table 12-8).

Jewish Food Customs, Dietary Laws, and Holidays
The Jewish dietary laws are biblical ordinances that include rules regarding food, chiefly about the selection, slaughter, and preparation of meat. Animals allowed to be eaten (clean) are quadrupeds that have cloven hooves and chew cud, specifically cattle, sheep, goats, and deer. Permissible fowl are chicken, turkey, goose, pheasant, and duck. All animals and fowl must be inspected for disease and killed by a ritual slaughterer according to specific rules. Only the forequarter of the quadruped may be used, except when the hip sinew of the thigh vein can be removed, in which case the hindquarter is also allowed.

Blood is forbidden as food because blood is synonymous with life. The traditional process of koshering meat and poultry removes all blood before cooking. Koshering involves soaking meat in water, salting it thoroughly, allowing it to drain, and then washing it three times to remove the salt. Foods that have been prepared in this way can carry a kosher designation.

Meat and milk cannot be combined in the same meal. Milk or milk-related foods can be eaten immediately before a meal but not with a meal. After eating meat, a person must wait 6 hours before consuming milk products. Because of the rules related to separating meat and milk products, those in traditional orthodox Jewish homes must keep two completely separate sets of dishes, silver, and cooking equipment—one for meat meals and one for dairy meals. Only fish with fins and scales can be eaten; thus no shellfish or eel is permissible. Fish can be eaten with dairy or meats. Eggs can also be combined with meat or milk. However, an egg yolk containing a drop of blood cannot be eaten because the blood is considered a chick embryo, or a sign of a new life.

Fruits, vegetables, cereal products, and all of the other foods that generally comprise a diet can be consumed with no restrictions. Bakery products and prepared food mixtures must be produced under acceptable kosher standards.

The most important of the Jewish holy days is the Sabbath, or day of rest, which is observed from sundown on Friday until sundown on Saturdays. The Friday night meal is the most special of the week and usually includes fish and chicken. No food is allowed to be cooked or heated on Saturday; thus all food eaten on the Sabbath is cooked on Friday and either kept warm in the oven or eaten cold. Festival holidays include Rosh Hashanah (the New Year) in September; Succoth, the fall harvest holiday; Chanukah (the Feast of Lights) in midwinter; and Purim, a joyful holiday in spring. Each holiday has certain associated food delicacies. Yom Kippur, the Day of Atonement, occurs 10 days after Rosh Hashanah and is a day of fasting from all food and drink from sundown on the eve of the holiday to sundown on the holiday. Pregnant females and those who are ill do not fast.
Passover, a spring commemorative festival lasting 8 days, includes special dietary requirements. During the Passover holiday leavened bread or cake is prohibited. Matzo, (i.e., unleavened bread) is eaten, and all cake and baked products are made of flour from ground-up matzo or potato starch and leavened only with beaten egg whites. No salt is allowed in traditional Passover matzo. Variations of fried matzo or matzo-meal pancakes are prepared with generous amounts of fat.

Muslim Food Customs, Dietary Laws, and Holidays

Islam promotes the concept of “eating to live.” Muslims are advised to stop eating while they are still hungry and always to share food. Although many foods are allowed, certain codes must be observed, and some dietary restrictions exist. The flesh of animals slaughtered in a humane way as outlined by Islamic law is considered halal (according to Islamic law). All meat to be consumed as food must be slaughtered with a ritual letting of blood while speaking the name of God. The slaughter can be done by anyone—no special person is designated for this function. Muslims eat kosher meat products because they know that they have been slaughtered properly. If an animal is slaughtered improperly, the meat becomes haram, or forbidden. Pork and pork products such as gelatin are prohibited, as are alcoholic beverages and alcohol products (e.g., vanilla extract or other alcohol-based food or flavoring extracts).

Although all foods not specifically prohibited are allowed to be eaten, certain foods are recommended such as milk, dates, meat, seafood, sweets, honey, and olive oil. Prayers are offered before any food is eaten. Muslims fast every year during the month of Ramadan, which occurs during the ninth month of the Islamic lunar calendar. Muslims fast completely from dawn to sunset and eat only twice a day—before dawn and after sunset. The end of Ramadan is marked by the Feast of Breaking the Fast (Eid-ul-Fitr). Muslims are also encouraged to fast 3 days of every month. Menstruating, pregnant, or lactating females are not required to fast but must make up the fasting days at some other time.

Vegetarianism

Vegetarian diets are increasing in popularity. Those who choose them may be motivated by philosophic, religious, or ecologic concerns or a desire to have a healthier lifestyle. Considerable evidence attests to the health benefits of a vegetarian diet. Studies of Seventh-Day Adventists indicate that the diet results in lower rates of type 2 diabetes, breast and colon cancer, and cardiovascular and gallbladder disease.
Of the millions of Americans who profess to be vegetarians, many eliminate “red” meats but eat fish, poultry, and dairy products. A lacto-vegetarian does not eat meat, fish, poultry, or eggs but does consume milk, cheese, and other dairy products. A lacto-ovo-vegetarian also consumes eggs. A true vegetarian, or vegan, does not eat any food of animal origin. The vegan diet is the only vegetarian diet that has any real risk of obtaining inadequate nutrition, but this risk can be avoided by careful planning.

Vegetarian diets tend to be lower in iron than omnivorous diets, although the nonheme iron in fruits, vegetables, and unrefined cereals is usually accompanied either in the food or in the meal by large amounts of ascorbic acid that aids in iron assimilation. Vegetarians do not have a greater risk of iron deficiency than those who are not vegetarians (ADA, 1997). Vegetarians who consume no dairy products may have low calcium intakes, and vitamin D intakes may be inadequate among those in northern latitudes where there is less exposure to sunshine (see Focus On: Sunshine, Vitamin D, and Fortification in Chapter 3). The calcium in some vegetables is inactivated by the presence of oxalates. Although phytates in unrefined cereals also can inactivate calcium, this is not a problem for Western vegetarians, whose diets tend to be based more on fruits and vegetables than on the unrefined cereals of Middle Eastern cultures. Long-term vegans may develop megaloblastic anemia because of a deficiency of vitamin B12, found only in foods of animal origin. The high levels of folate in vegan diets may mask the neurologic damage of a vitamin B12 deficiency. Vegans should have a reliable source of vitamin B12, such as fortified breakfast cereals, soy beverages, or a supplement.

Although most vegetarians meet or exceed the requirements for protein, their diets tend to be lower in protein than those of omnivores. This lower intake may help vegetarians retain more calcium from their diets. Furthermore, lower protein intake usually results in lower dietary fat because many high-protein animal products are also rich in fat (ADA, 1997).

Well-planned vegetarian diets are safe for infants, children, and adolescents and can meet all of their nutritional requirements for growth. They are also adequate for pregnant and lactating females. The key is that the diets be well planned. Vegetarians should pay special attention to ensure that they get adequate calcium, iron, zinc, and vitamins B12 and D. Calculated combinations of complementary protein sources is not necessary, especially if protein sources are reasonably varied.

### CLINICAL SCENARIO 1

Marty is a 45-year-old Jewish man who emigrated from Israel to the United States 3 years ago. He follows a strict kosher diet. In addition, he does not drink milk but does consume other dairy products. He has a body mass index (BMI) of 32 and a family history of heart disease. He has come to you for advice on increasing his calcium intake.

**Nutrition Diagnosis:** Knowledge deficit related to calcium as evidenced by request for nutrient and dietary information

1. What type of dietary guidance would you offer Marty?
2. What type of dietary plan following strict kosher protocols would meet his daily dietary needs and promote weight loss?
3. What suggestions would you offer him about dietary choices for a healthy heart?
4. Which special steps should Marty take to meet calcium requirements without using supplements?
5. How can food labeling information be used to help Marty meet his weight loss and nutrient goals and incorporate his religious dietary concerns?
Nan is a 20-year-old college student who has decided to become a vegetarian for nonreligious reasons. She does not eat red meat, chicken, fish, or dairy products. She is 5 ft, 2 in and weighs 95 lb. Her health is stable, but she does have low serum levels of iron, zinc, and vitamin B₁₂. Her blood pressure is 90/75 mm Hg. She has been referred to the nutrition clinic for counseling about changing some of her dietary habits.

**Clinical Scenario 2**

**Nutrition Diagnosis:** Inadequate intake of iron, zinc, and vitamin B₁₂ related to omission of animal foods as evidenced by low serum levels

1. What type of dietary guidance would you offer Nan?
2. Nan is at risk for developing deficiencies of which nutrients?
3. Plan a 3-day menu for Nan that excludes the foods she does not eat but provides adequate amounts of the key nutrients she needs.
4. What other dietary health-related advice would you give Nan?

**Useful Websites**

- American Dietetic Association
  www.eatright.org
- Center for Nutrition Policy and Promotion, USDA
  www.usda.gov/cnpp/
- Centers for Disease Control, NHANES Survey
  www.cdc.gov/nchs/nhanes.htm
- Dietary Guidelines for Americans
  www.health.gov/DietaryGuidelines
- Eat Smart, Play Hard
  http://www.fns.usda.gov/eatsmartplayhardkids/
- Ethnic and Cultural Food Guides
  www.nal.usda.gov/fnic/etext/000023.html#xtocid2381818
- Food and Drug Administration, Center for Food Safety and Applied Nutrition
  www.cfsan.fda.gov
- Food and Nutrition Information Center, National Agricultural Library, USDA
  www.nal.usda.gov/fnic/
- Health Canada
  http://www.hc-sc.gc.ca/fn-an/index_e.html
- Healthy Eating Index
  http://www.cnpp.usda.gov/

**References**


