

## Nutrition Guidelines and Assessment



### THINK About It

- 1 Do you and your friends discuss food and diet?
- 2 Have you ever taken a very large dose of a vitamin or mineral? If so, why? How did you determine whether it was safe?
- 3 Do you eat the same foods most days, or do you like variety?

### LEARNING Objectives

- Describe and discuss the nutrition concepts of adequacy: balance, calorie control, nutrient density, moderation, and variety.
- List the key recommendations of the *Dietary Guidelines for Americans, 2010*.
- Define the Dietary Reference Intake values: *DRI, EAR, RDA, AI,* and *DV*.
- Identify five mandatory components of a food label.
- List and describe four major factors in nutrition assessment of an individual.

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**S**o, you want to be healthier—maybe that’s why you are taking this course! You probably already know that a well-planned diet is one important element of being healthy. Although most of us know that the foods we choose to eat have a major impact on our health, we aren’t always certain about what choices to make. Choosing the right foods isn’t made any easier when we are bombarded by headlines and advertisements: Eat less fat! Get more fiber in your diet! Moderation is the key! Build strong bones with calcium!

For many Americans, nutrition is simply a lot of hearsay, or maybe the latest slogan coined from last week’s news headlines. Conversations about nutrition start with “*They* say you should ...” or “Now *they* think that ...” Have you ever wondered who “they” are and why “they” are telling you what to eat or what not to eat?

It’s no secret that a healthy population is a more productive population, so many of our nutrition guidelines come from the federal government’s efforts to improve our overall health. Thus, the government is one “they.” Undernutrition and overnutrition are examples of two nutrition problems that government policy has helped to correct.

Many important elements of nutrition policy focus on relieving undernutrition in some population groups. Let’s look at some examples. To prevent widespread deficiencies, the government requires food manufacturers to add nutrients to certain foods: iodine to salt, vitamin D to milk, and thiamin, riboflavin, niacin, iron, and folic acid to enriched grains. Another example is the publication of dietary standards, such as the Dietary Reference Intakes, which make it easier to define adequate diets for large groups of people.

Overnutrition has led to changes in public policy as well. Health researchers have discovered links between diet and obesity, high blood pressure, cancer, and heart disease; as a result, nutritionists suggest that we make informed food choices by reducing our intake of excess calories, sodium, saturated fats, and trans fats, while being physically active. Another aspect of nutrition policy is shaped by the public’s need to know what is in the food they eat. This need has led to increased nutrition information on food labels. Public education efforts have resulted in the development of teaching tools such as MyPlate.

New information about diet and health will continue to drive public policy. This chapter explores diet-planning tools, dietary guidelines, and current dietary standards and discusses how to evaluate nutritional health. How does your diet compare with these current guidelines and standards?

## Quick Bite

### Early “Laws” of Health

Galen might be the best-known physician who ever lived. During the second century, Galen expounded his “laws of health”—eat proper foods, drink the right beverages, exercise, breathe fresh air, get enough sleep, have a daily bowel movement, and control your emotions.

## Linking Nutrients, Foods, and Health

We all know that what we eat affects our health. Nutrition science has made many advances in identifying essential nutrients and the foods in which they are found. Eating foods with all the essential nutrients prevents nutritional deficiencies such as scurvy (vitamin C deficiency) or pellagra (deficiency of the B vitamin niacin). In the United States, few people suffer nutritional deficiencies as a result of dietary inadequacies. More often, Americans suffer from chronic diseases such as heart disease, cancer, hypertension, and diabetes—all linked to overconsumption and lifestyle choices. Your future health depends on today’s lifestyle choices, including your food choices.

## Planning How You Will Eat

Living in a high-tech world, we expect immediate solutions to long-term problems. It would be too easy if we could avoid the consequences of overeating by taking a pill, drinking a beverage, or getting a shot. But no magic food, nutrient, or drug exists. Instead, we have to rely on healthful foods, exercise, and lifestyle choices to reduce our risk of chronic disease.

Many tools are available to help us select healthful foods to eat. The U.S. Department of Agriculture's MyPlate food guidance system and the Exchange Lists are two common and comprehensive tools. Although different, these tools rely on the same core nutrition concepts: adequacy, balance, calorie (energy) control, nutrient density, moderation, and variety. Furthermore, these resources use a total diet approach to ensure nutritional adequacy and choices of healthful food.<sup>1</sup>

### **Adequacy**

Having an adequate diet means that the foods you choose to eat provide all the essential nutrients, fiber, and energy in amounts sufficient to support growth and maintain health.<sup>2</sup> Many Americans consume more calories than they need without getting 100 percent of the recommended intakes for a number of nutrients. Take, for example, a meal of soda pop, two hard-shell beef tacos, and cinnamon breadsticks. Although this meal provides foods from different food groups, it is high in sugar and fat and low in many vitamins and minerals found in fruit and vegetables. Occasionally skipping fruits and vegetables at a meal does not create a vitamin or mineral deficiency; however, dietary habits that skimp on fruit and vegetables most of the time provide an overall inadequate diet. Most people could improve the adequacy of their diet by choosing meals and snacks that are high in vitamins and minerals but low to moderate in energy (calorie) content. Doing so offers important benefits: normal growth and development of children, health promotion for people of all ages, and reduction of risk for a number of chronic diseases that are major public health problems.<sup>3</sup>

### **Balance**

A healthful diet requires a balance of food groups (grains, vegetables, fruits, oil, milk, and meat and beans), energy sources (carbohydrates, protein, and fat), and other nutrients (vitamins and minerals). Your diet is balanced if the amount of energy (calories) you eat equals the amount of energy you expend in daily activities and exercise. Also your diet can be balanced in a complementary way when the foods you choose to eat provide you with adequate nutrients. The trick is to consume enough, but not too much, from all the different food groups.

### **Calorie Control**

It can be a challenge to identify the amount of calories you need to maintain or achieve a healthy weight. The key is to choosing an adequate diet that balances the calories you eat with the amount of calories your body uses to sustain your metabolic and physical activities. The formula for weight maintenance seems simple: If you eat the same amount of calories that you use each day, your weight will stay the same. If you eat more than you use, you will gain weight, and if you eat less than you use, you will lose weight. This chapter focuses on how to choose foods by learning how to get the most nutrients without wasting calories. This is a lesson on budgeting.

### **Nutrient Density**

The concern that Americans' diets are becoming increasingly energy rich but nutrient poor has focused attention on the nutrient content of individual foods relative to the energy they provide.<sup>4</sup> The Dietary Guidelines Advisory Committee report and the *Dietary Guidelines for Americans* confirm that many Americans are overweight or obese, yet many are undernourished.<sup>5</sup> Understanding nutrient density can help you meet your nutrient needs without getting too many calories.

## **Quick Bite**

### **How Much Do Doctors and Dentists Know About Nutrition?**

Nutrition training in medical schools and residency programs has been identified as an essential component of medical education by numerous organizations, including the American Society for Clinical Nutrition, the American Medical Student Association, the National Academy of Sciences, and the U.S. Congress, which passed the National Nutritional Monitoring and Related Research Act of 1990 mandating nutrition as a part of the medical school curriculum. Findings indicate, however, that significant variation in nutrition knowledge of U.S. medical students exists and that the amount of time medical schools spend on nutrition education varies significantly, ranging from a mandatory course in nutrition to nutrition education being a component of another required course.

**Sources:** Data from National Nutritional Monitoring and Related Research Act of 1990. Public Law 1101-445/HR 1608, section 302; Endevelt R, Shahar DR, Henkin Y. Development and implementation of a nutrition education program for medical students: a new challenge. *Education for Health*. 2006;19(3):321–330; and Schaeffer J. Medical school checkup. *Today's Dietitian*. 2011;13(3):18.

Just as each of us has a monetary budget—a limited amount of money to spend on things such as food, rent, books, and transportation—in a sense we all have a calorie budget as well. Once you determine how many calories your body uses each day and how to manipulate your calorie expenditure to reach certain health goals, you will be making food choices to match your calorie needs. Every time you eat, you are choosing to spend some of your calorie budget for that day. Those who spend their budget wisely tend to be healthier than those who do not.

**nutrient density** A description of the healthfulness of foods. Foods high in nutrient density are those that provide substantial amounts of vitamins and minerals and relatively few calories; foods low in nutrient density are those that supply calories but relatively small amounts of vitamins and minerals (or none at all).

The **nutrient density** of food provides a clue to how “healthy” a food is. It is a ratio of nutrient content to energy content. Nutrient-dense foods provide substantial amounts of vitamins and minerals and relatively few calories.<sup>6</sup> Foods that are low in nutrient density supply calories but relatively small amounts of vitamins and minerals, sometimes none at all.<sup>7</sup> A food high in calories but low in vitamins and minerals is less nutrient dense than one that has a high vitamin and mineral content compared with its overall calories.

Let’s take a potato as an example. Potatoes are presented to us to eat in many different forms. We can eat baked potatoes, mashed potatoes with butter or sauces, or french fries. Depending on how it is cooked and what



## Going Green

### Is the American Diet Contributing to a Warmer Planet?

Our food choices, which include production, transport, processing, packaging, storage, and preparation, might be a significant contributor to global warming. The “food sector” in the United States accounts for 19 percent of total U.S. energy use each year. The average American diet creates 2.8 tons of carbon dioxide (CO<sub>2</sub>) emissions per person per year, which far surpasses the 2.2 tons of CO<sub>2</sub> emissions generated by Americans driving.<sup>1</sup>

The highly processed foods that have become a big part of our diets often require barrels of oil to create and deliver to our dinner plates and are often low in nutrient value as well. Your food choices not only contribute to your state of health, both current and future, but also are a significant part of your overall carbon footprint. The good news is that healthy, flavorful, and good-to-eat foods are entirely possible while also easing the load of your carbon footprint.

Here are some tips for lean and green eating:

- *Eat less red meat.* The amount of beef in your diet is one of the biggest factors in your global impact.
- *Ban the bottled water.* Liquids are one of the heaviest items to ship, and their plastic containers are filling landfills.
- *Snack sustainably.* This is good for your waist as well as your waste. Ditch the processed snack foods and choose whole, real foods instead.
- *Be an efficient shopper.* Minimize shopping trips to different stores if possible, reuse bags, and shop the bulk bins.
- *Become a locavore.* Eat locally (or regionally) and seasonally to the extent that you can.
- *Compost your food waste.* Food scraps are about 12 percent of a family’s household waste and emit powerful warming gases in landfills. Regenerate them into healthy soil instead!
- *Cook in more, take out less.* Dining out significantly increases a food’s carbon footprint, especially if there is packaging.
- *Practice “hara hachi bu.”* The Okinawan phrase *hara hachi bu* translates as “eat until you are eight parts full.” Slow down while you eat, and give your stomach time to tell your brain you are full.
- *Limit highly packaged, single-serving snacks, foods, and beverages.* Hit the bulk aisle and bulk up instead.
- *Pack a PB&J for lunch.* Make your own lunch and bring it with you. If it’s peanut butter and jelly or almond butter with local jam on whole-grain bread, it’s fast, easy, healthy, and greener, too.

<sup>1</sup> Eshel G, Martin PA. Diet, energy and global warming. *Earth Interactions*. 2006;10(9):1–17.

Source: Data from Geagan K. *Go Green, Get Lean: Trim Your Waistline with the Ultimate Low-Carbon Footprint Diet*. Emmaus, PA: Rodale; 2009.

is added to it before we eat it, the nutrient density of that potato changes. The most nutrient-dense form of this potato would be a plain baked potato, which provides the most vitamins and minerals with relatively few calories. The least nutrient-dense version of this potato is french fries because frying a food adds a lot more calories without adding more vitamins and minerals, producing a product that has a relatively low amount of vitamins and minerals compared to its overall (higher) calorie content.

Foods with little or no added sugar or fat are high-nutrient-dense food choices. For example, you might decide to eat a pear instead of a handful of caramel corn. Both provide about the same amount of calories. By choosing to eat the pear instead of the caramel corn, you are working toward meeting your daily nutrient needs on a lower energy budget. These choices result in a diet that is healthier.

### Moderation

Not too much or too little—that's what moderation means. Moderation does not mean that you have to eliminate low-nutrient-dense foods from your diet, but rather that you can include them occasionally. Moderation entails not taking anything to extremes. You probably have heard that vitamin C has positive effects, but that doesn't mean huge doses of this essential nutrient are appropriate for you. It's also important to remember that substances that are healthful in small amounts can sometimes be dangerous in large quantities. For example, the body needs zinc for hundreds of chemical reactions, including those that support normal growth, development, and immune function. Too much zinc, however, can cause deficiency of copper, another essential mineral, which can lead to impaired immune function. Being moderate in your diet means that you do not restrict or completely eliminate any one type of food, but rather that all types of food can fit into a healthful diet.

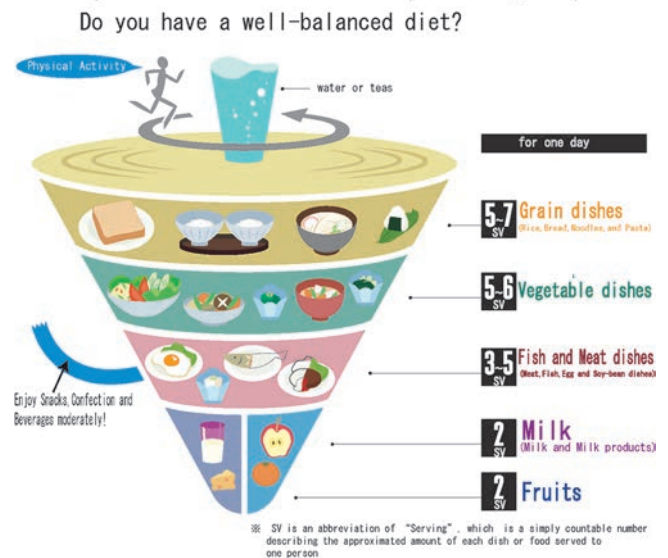
Food guides and their graphics convey the message of moderation by showing suggested amounts of different food groups. Appearing in diverse shapes, food guides from other countries reflect their cultural contexts. Japan, for example, uses the shape of a spinning top (see **Figure 2.1**).

### Variety

How many *different* foods do you eat on a daily basis? Ten? Fifteen? Would it surprise you that one of Japan's dietary guidelines suggests eating 30 different foods each day?<sup>8</sup> Now *that's* variety! Variety means including lots of different foods in the diet: not just different food groups such as fruits, vegetables, and grains but also different foods from each group. Eating two bananas and three carrots each and every day might give you the minimum number of recommended daily servings of fruits and vegetables, but it doesn't add much variety.

Variety is important for a number of reasons. Eating a variety of fruits, for example, provides a broader mix of vitamins, minerals, and phytochemicals than just including one or two fruits. Choosing a variety of protein sources gives you a different balance of fats and other nutrients. Variety can add interest and excitement to your meals while preventing boredom with your diet. Perhaps most important, variety in your diet helps ensure that you get all the nutrients you need. Studies have shown that people who have varied diets are more likely to meet their overall nutrient needs.<sup>9</sup>

## Japanese Food Guide Spinning Top



**Figure 2.1** **Dietary guidelines around the world.** Global differences in environment, culture, socioeconomic, and behavior create significant differences in the foods that make up our diets. Despite this, dietary guidelines from one country to the next show surprising similarities. Whether a country has only 3 guidelines or as many as 23, all share similar basic recommendations. For example, the Japanese dietary guidelines use a spinning top. The United States uses a plate, and Canada uses a rainbow. Mexico and most European countries use a circular form.

Source: Courtesy of the Japanese Ministry of Health, Labor and Welfare/USDA.

**U.S. Department of Agriculture (USDA)** The government agency that monitors the production of eggs, poultry, and meat for adherence to standards of quality and wholesomeness. The USDA also provides public nutrition education, performs nutrition research, and administers the WIC program.

**U.S. Department of Health and Human Services (DHHS)** The principal federal agency responsible for protecting the health of all Americans and providing essential human services. The agency is especially concerned with those Americans who are least able to help themselves.

**Dietary Guidelines for Americans, 2010** The *Dietary Guidelines for Americans* are the foundation of federal nutrition policy and are developed by the U.S. Department of Agriculture (USDA) and the Department of Health and Human Services (DHHS). These science-based guidelines are intended to reduce the number of Americans who develop chronic diseases such as hypertension, diabetes, cardiovascular disease, obesity, and alcoholism.

So remember, there are no magic diets, foods, or supplements. Instead, your overall, long-term food choices can bring you the benefits of a nutritious diet. A healthful diet is something you create over time, not the way you eat on any given day. Using the principles of adequacy, balance, calorie (energy) control, nutrient density, moderation, and variety can help you attain and achieve healthy eating habits, which in turn will contribute to your overall healthy lifestyle. Let's take a look at some general guidance for making those food choices.

**Key Concepts** Food and nutrient intake play a major role in health and risk of disease. For most Americans, overnutrition is more of a problem than undernutrition. The diet-planning principles of adequacy, balance, calorie (energy) control, nutrient density, moderation, and variety are important concepts in choosing a healthful diet.

## Dietary Guidelines

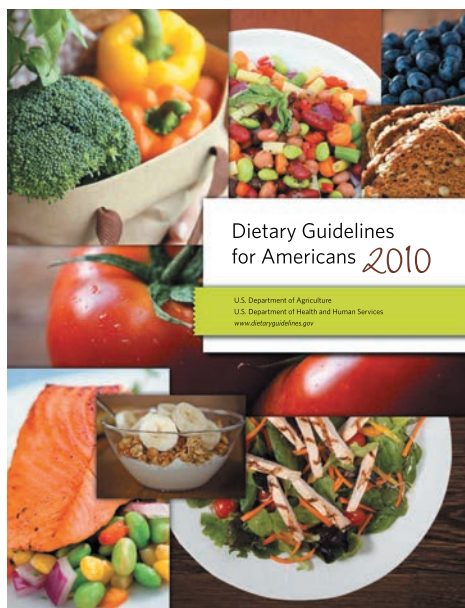
To help citizens improve their overall health, many countries have developed dietary guidelines—simple, easy-to-understand statements about food choices, food safety, and physical activity. This section examines dietary guidelines for the United States and Canada.

### Dietary Guidelines for Americans

In 1980, the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (DHHS) jointly released the first edition of the *Dietary Guidelines for Americans*. Revised guidelines have been released every five years as scientific information about links between diet and chronic disease is updated. The purpose of the *Dietary Guidelines for Americans* is to provide science-based advice to promote health and to reduce risk for chronic diseases through diet and physical activity.<sup>10</sup> The food and physical activity choices you make every day affect your health—how you feel today, tomorrow, and in the future.

The *Dietary Guidelines Americans, 2010* (see **Figure 2.2**) offers a road map intended to guide personal choices and help individuals make informed food and activity decisions. The result of a systematic, evidence-based review of the scientific literature, the *Dietary Guidelines for Americans, 2010* is based on what experts have determined to be the best advice for Americans to reduce the risk for chronic diseases and reduce the prevalence of overweight and obesity through improved nutrition and physical activity. These guidelines are the cornerstone of federal nutrition policy and education. They are used to develop educational materials and to aid in the design and implementation of nutrition-related programs, such as the National School Lunch Program and Meals on Wheels. The *Dietary Guidelines for Americans* serves as the basis for nutrition messages and consumer materials developed by nutrition educators and health professionals for the general public.<sup>11</sup>

Lifestyle choices, including a poor diet and lack of physical activity, are the most important factors that contribute to the overweight and obesity epidemic that is currently affecting men, women, and children throughout the United States. Even in individuals who are not overweight, a poor diet and physical inactivity are well known to be associated with the major causes of morbidity and mortality. Currently, the number of Americans who are overweight or obese is at an all-time high; as a consequence, the risk for various chronic diseases is also on the rise. In an effort to address this growing problem, the *Dietary Guidelines for Americans, 2010* focuses on the integration of government, agriculture, health care, business, educators, and communities



**Figure 2.2**

**2010 Dietary Guidelines for Americans.** A revised *Dietary Guidelines*

for Americans was released in 2010.

**Source:** Reproduced from US Department of Health and Human Services, US Department of Agriculture. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; 2010.

working together to encourage individuals to make healthy lifestyle changes.<sup>12</sup> The main objective of these guidelines is to encourage Americans to balance calorie intake with physical activity to manage weight. This means helping Americans make the choices they need to eat a healthier diet by promoting the consumption of more vegetables, fruits, whole grains, fat-free and low-fat dairy products, and seafood; the consumption of foods with less sodium, saturated and trans fats, added sugars, and refined grains; and an increase in daily physical activity.

## Key Recommendations from the *Dietary Guidelines for Americans*

The six chapters of the *Dietary Guidelines for Americans, 2010* contain two overarching concepts and 23 key recommendations for the general population, as well as 6 additional key recommendations for specific population groups. The recommendations within the *Dietary Guidelines for Americans, 2010* are intended for people age 2 years or older together with those who are at an increased risk of chronic disease.

This section reviews the overarching concepts and key recommendations from each chapter of the *Dietary Guidelines for Americans, 2010*. You can access the full report at [www.dietaryguidelines.gov](http://www.dietaryguidelines.gov).

### Overarching Concepts

The two overarching concepts in the *Dietary Guidelines for Americans, 2010* are as follows:

- *Maintain calorie balance over time to achieve and sustain a healthy weight.* To lower the number of overweight and obese children and adults, many Americans would benefit from a decrease in calorie consumption and an increase in calorie expenditure each day.
- *Focus on consuming nutrient-dense foods and beverages.* An eating pattern that frequently includes foods that are low in nutrients and high in calories (unhealthy) will often take the place of more nutrient-dense (healthier) foods in one's diet. In a healthy eating pattern, the majority of foods should be those foods and beverages that have a high nutrient content; foods with a low nutrient density should be limited.

### Balancing Calories to Manage Weight

Being successful at maintaining a healthy body weight requires a balance between the amount of calories you eat and the amount of calories you expend every day. Participating in physical activity on a regular basis helps make it easier for you to maintain a healthy weight. The *2008 Physical Activity Guidelines for Americans* suggests that adults should do the equivalent of 150 minutes of moderate-intensity aerobic activity each week—that's an average of only 30 minutes a day, five days a week. For children and adolescents age 6 years or older, the recommendation is 60 minutes or more of physical activity per day.<sup>13</sup>

The environment in which many Americans now live, work, learn, and play can be a roadblock for many people trying to achieve or maintain a healthy body weight. An obesogenic environment is a significant contributor to America's obesity epidemic because it affects both sides of the calorie balance equation.<sup>14</sup> In our modern lifestyle, the availability of high-calorie, palatable, inexpensive food is coupled with many mechanized labor-saving



## Dietary Guidelines for Americans, 2010

### Balancing Calories to Manage Weight: Key Recommendations

- Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors.
- Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.
- Increase physical activity and reduce time spent in sedentary behaviors.
- Maintain appropriate calorie balance during each stage of life—childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.

**Source:** Reproduced from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.



Relationship between energy balance and body fat storage.

**Source:** Data from Centers for Disease Control and Prevention. Image: © Kraska/Shutterstock, Inc.



The *Dietary Guidelines for Americans, 2010* recommends reducing intake of sodium (salt), added sugars (e.g., cookies), and refined grains (e.g., white bread). Reducing alcohol intake (e.g., beer) is a strategy that adults can use to reduce calorie consumption.

devices. The result is that we live in an environment that often promotes overeating while at the same time discouraging physical activity.

### **Foods and Food Components to Reduce**

Several foods and food components that Americans typically consume in excess are the focus of the second chapter of the *Dietary Guidelines for Americans, 2010*. These foods and food components include sodium, solid fats, added sugars, and refined grains. Consistently eating too much of these foods and food components increases the risk of certain chronic diseases, such as cardiovascular disease, diabetes, and certain types of cancer. In addition, when these foods and food components are a regular part of a person's diet, they tend to replace more nutrient-dense foods in the diet, making it even more difficult to meet recommended nutrient and calorie levels.

### **Foods and Nutrients to Increase**

In the United States, intakes of vegetables, fruits, whole grains, low fat or fat free milk and milk products, and oils (to replace solid fats) are lower than recommended. As a result, dietary intakes of several nutrients, such as potassium, dietary fiber, calcium, and vitamin D, are low enough for both adults and children to be of public concern. Choosing healthful foods that provide these nutrients has been found to aid in preventing disease and to benefit overall well-being.

Recommendations for a healthful eating pattern generally group foods based on commonalities in nutrients provided, their effects on health, and how the foods are viewed and used by consumers. When adopting the following recommendations for a healthy eating pattern, also consider recommendations from the previous section to help ensure that you are staying within your calorie needs. Examples of health benefits as well as tips for helping you to adopt the *Dietary Guidelines'* key recommendations can be found in [Table 2.1](#).

### **Recommendations for Specific Population Groups**

These recommendations are designed to improve food choices and health outcomes of people who have specific nutritional needs, such as pregnant and lactating women and older adults.

### **Building Healthy Eating Patterns**

The *Dietary Guidelines for Americans, 2010* also shows you how recommendations and principles described in its previous chapters can be combined into a healthy overall eating pattern. Culture, ethnicity, tradition, personal preferences, food cost, and food availability are all factors people consider when creating the way they choose to eat. Americans have flexibility in the choices they make when forming their own healthy eating patterns. Americans also have access to established eating plans, such as the USDA Food Patterns and DASH Eating Plan, to assist in such efforts.

In addition, this chapter of the guidelines focuses on eating patterns that prevent foodborne illness and identifies how the four basic food safety principles—clean, separate, cook, and chill—work together to reduce the risk of foodborne illnesses.

### **Helping Americans Make Healthy Choices**

This chapter focuses on two important factors for making healthy choices. The first is that people make choices every day about what to eat and how physically active they will be. Second, all elements of society—individuals and families, communities, business and industry, and various levels of government—should take a positive and productive role in the efforts to make



America healthy. The *Dietary Guidelines for Americans, 2010* employs the social-ecological model (see **Figure 2.3**) as a tool to illustrate how all elements of society combine to shape an individual's food and physical activity choices.

The *Dietary Guidelines for Americans, 2010* Call to Action includes three guiding principles:

1. Ensure that all Americans have access to nutritious foods and opportunities for physical activity.
2. Facilitate individual behavior change through environmental strategies.
3. Set the stage for lifelong healthy eating, physical activity, and weight management behaviors.

### Ways to Incorporate the Dietary Guidelines into Your Daily Life

Think about your diet and consider your overall food intake to determine whether it is consistent with the *Dietary Guidelines for Americans, 2010*. Choose more fruits, vegetables, and whole grains to make sure you are getting all the nutrients you need while lowering your intake of saturated fat, trans fat, and cholesterol. Eat fewer high-fat toppings and fried foods to help you balance energy intake and expenditure. Exercise regularly. Use the extra things—sugar, salt, and alcohol—in moderation. Drink water more often than soft drinks, and if you choose to drink alcohol at all, use caution.

Using the *Dietary Guidelines* as your road map for finding a healthier way of eating, you might find it easier to meet your nutrition needs while also protecting your health and achieving or maintaining a healthy weight along the way. Table 2.1 suggests things you might be able to change in your own diet or lifestyle. Pick one or two suggestions or come up with some simple changes of your own to try that incorporate the *Dietary Guidelines for Americans, 2010* into your daily life. **Table 2.2** summarizes daily limits or targets for a number of nutrients addressed in the *Dietary Guidelines*.

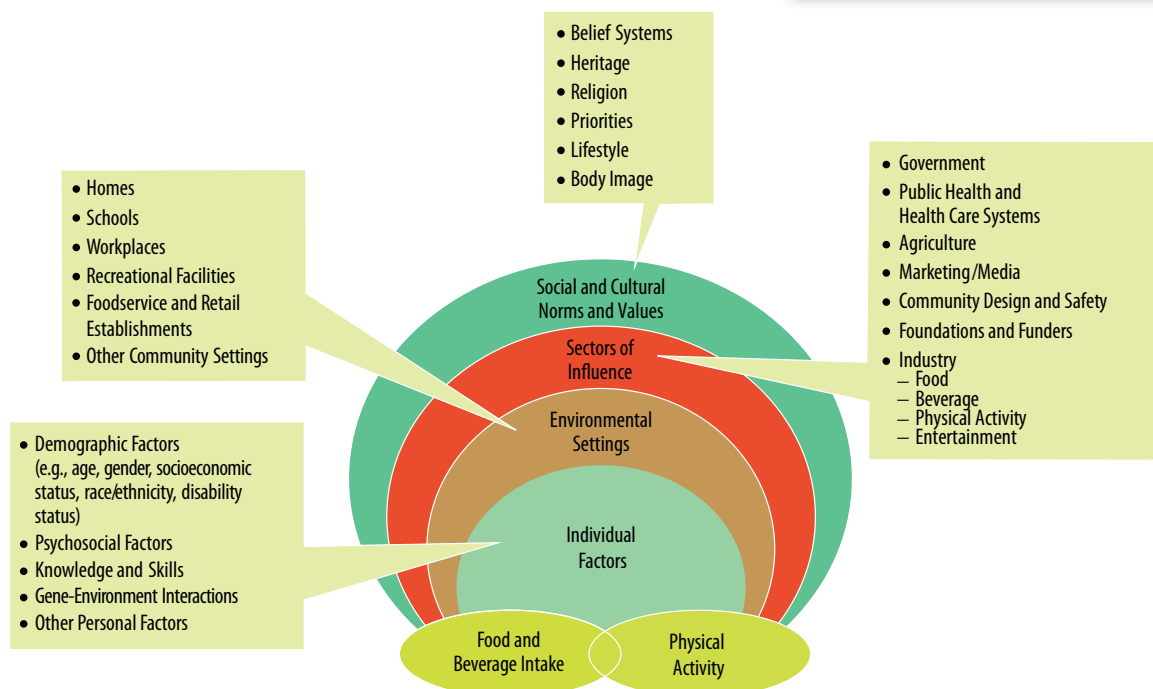


### Dietary Guidelines for Americans, 2010

#### Foods and Nutrients to Increase: Key Recommendations

- Increase vegetable and fruit intake.
- Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.
- Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.
- Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.
- Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds.
- Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.
- Replace protein foods that are higher in solid fat with choices that are lower in solid fats and calories and/or are sources of oils.
- Use oils to replace solid fats where possible.
- Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in U.S. diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

**Source:** Reproduced from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.



**Figure 2.3** A social-ecological framework for nutrition and physical activity decisions.

**Source:** Reproduced from US Department of Health and Human Services, US Department of Agriculture. *Dietary Guidelines for Americans, 2010*. 7th ed, p. 56. Washington, DC: US Government Printing Office; 2010.

Table 2.1 2010 Dietary Guidelines for Americans: Benefits, Behaviors, and Tips

	Dietary Guideline Recommendation Benefits to Your Health	Goals or Behaviors That Could Make You Healthier	How-to Tips
<b>Control total calorie intake to manage body weight.</b>	<ul style="list-style-type: none"> <li>Helps you to achieve and sustain a healthy weight.</li> <li>Benefits your physical health by improving blood pressure.</li> <li>Benefits your physical health by improving your blood cholesterol levels.</li> <li>Benefits your physical health by improving your blood sugar levels.</li> <li>Improves your energy level.</li> <li>Improves your physical mobility.</li> <li>Improves your overall general mood and self-confidence.</li> </ul>	<ul style="list-style-type: none"> <li>Consume foods and drinks to meet, not exceed, calorie needs.</li> <li>Plan ahead to make better food choices.</li> <li>Track food and calorie intake.</li> <li>Reduce portion sizes, especially of high-calorie foods.</li> <li>Cook and eat more meals at home, instead of eating out.</li> <li>Choose healthy options when eating out.</li> </ul>	<ul style="list-style-type: none"> <li>Know your calorie needs.</li> <li>Prepare and pack healthy snacks at home to be eaten at school or work.</li> <li>Track and evaluate what you eat using a food journal or an online food planner.</li> <li>Pay attention to feelings of hunger. Eat only until you are satisfied, not full.</li> <li>Limit eating while watching television, which often leads to overeating.</li> <li>Choose smaller plates and smaller portions.</li> <li>To feel satisfied with fewer calories, replace large portions of high-calorie foods with lower-calorie foods, like vegetables and fruits.</li> <li>Cook and eat at home more often.</li> <li>When eating out, choose a smaller size option or take home part of your meal.</li> <li>Choose dishes that include vegetables, fruits, and/or whole grains, and avoid choosing foods with the following words: creamy, fried, breaded, battered, or buttered.</li> </ul>
<b>Increase physical activity and reduce time spent in sedentary behaviors.</b>	<ul style="list-style-type: none"> <li>Helps to control your weight.</li> <li>Promotes psychological well-being.</li> <li>Reduces feelings of pressure and anxiety.</li> <li>Helps reduce your risk for chronic diseases such as diabetes, metabolic syndrome, high blood pressure, and some cancers.</li> <li>Helps build and maintain healthy bones, muscles, and joints.</li> <li>Improves your ability to do daily activities.</li> <li>Helps older adults become stronger and better able to move about without falling.</li> <li>Increases your chances of living longer.</li> </ul>	<ul style="list-style-type: none"> <li>Limit screen time.</li> <li>Be more active daily.</li> <li>Avoid couch time. Some physical activity is better than none.</li> <li>Slowly build up the amount of physical activity you choose.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the amount of time you spend watching television or using other media such as computers and video games.</li> <li>Pick activities you like and that fit into your life.</li> <li>Be active with family and friends. Having a support network can help you stay active.</li> <li>Keep track of your physical activity and gradually increase it to meet the recommendations of the 2008 Physical Activity Guidelines for Americans.</li> <li>Start by being active for longer each time you exercise, and then do more by exercising more often.</li> <li>Adults should do the equivalent of 150 minutes of moderate-intensity aerobic activity each week.</li> </ul>
<b>Increase vegetable and fruit intake.</b>	<ul style="list-style-type: none"> <li>Eating vegetables and fruits as part of a reduced-calorie diet can be of benefit to your body weight.</li> <li>Associated with a decreased risk for many chronic diseases such as cardiovascular disease and many cancers.</li> <li>Contributes to healthy aging.</li> </ul>	<ul style="list-style-type: none"> <li>Eat five or more servings of vegetables and fruit daily, made up of a variety of choices.</li> </ul>	<ul style="list-style-type: none"> <li>Add dark-green, red, and orange vegetables to soups, stews, casseroles, and stir-fries and other main and side dishes.</li> <li>Add beans or peas to salad, soups, and side dishes, or serve as a main dish.</li> <li>Have raw, cut-up vegetables and fruit handy for a quick side dish, snacks, salad, or desserts.</li> <li>When eating out, choose a vegetable as a side dish.</li> </ul>

<p><b>Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.</b></p>	<ul style="list-style-type: none"> <li>• Milk and milk products contribute many nutrients to the diet, including calcium and vitamin D, which help to build and maintain strong bones and teeth.</li> <li>• Adequate milk intake is associated with decreased chance of developing metabolic syndrome and high blood pressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose two to three servings of low-fat dairy products every day.</li> <li>• Replace higher-fat milk and milk products with lower-fat options.</li> </ul>	<ul style="list-style-type: none"> <li>• Drink fat-free (skim) or low-fat (1%) milk.</li> <li>• When drinking beverages such as cappuccino or latte, request fat-free or low-fat milk.</li> <li>• When recipes call for sour cream, substitute plain fat-free or low-fat yogurt.</li> </ul>
<p><b>Limit the consumption of foods that contain refined grains and added sugars.</b></p>	<ul style="list-style-type: none"> <li>• Eating foods that contain whole grains offers a good source of antioxidants such as vitamin E, magnesium, iron, and fiber to your diet.</li> <li>• Eating foods that contain fiber helps lower blood cholesterol levels, control blood glucose levels for people with diabetes, and causes a feeling of satiety.</li> <li>• A diet high in sugar is associated with being overweight/obese.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase whole-grain intake.</li> <li>• Consume at least half of all grains as whole grains.</li> <li>• Whenever possible, replace refined grains with whole grains.</li> <li>• Choose foods and drinks with added sugars or caloric sweeteners (sugar-sweetened beverages) less frequently.</li> <li>• Drink more water.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose 100 percent whole-grain breads, crackers, rice, and pasta.</li> <li>• Use the Nutrition Facts label to choose whole grains that are a good or excellent source of dietary fiber.</li> <li>• Eat fewer refined grain products, such as cakes, cookies, other desserts, and pizza.</li> <li>• Replace white bread, rolls, bagels, muffins, pasta, and rice with whole-grain versions.</li> <li>• To increase fiber in your diet, choose foods such as oat bran, barley, kidney beans, fruits, vegetables, wheat bran, and whole grains.</li> <li>• To increase insoluble fiber in your diet, choose foods such as wheat bran, vegetables, and whole grains.</li> <li>• Drink few or no regular sodas, sports drinks, energy drinks, and fruit drinks.</li> <li>• Eat less cake, cookies, ice cream, other desserts, and candy.</li> <li>• Choose water, fat-free milk, 100 percent fruit juice, or unsweetened tea or coffee as drinks rather than sugar-sweetened drinks.</li> </ul>
<p><b>Keep trans fatty acid consumption as low as possible.</b></p>	<ul style="list-style-type: none"> <li>• Eating a diet that includes saturated fat, trans fat, and dietary cholesterol raises low-density lipoprotein (LDL), or “bad” cholesterol, levels, which increases the risk of coronary heart disease (CHD).</li> </ul>	<ul style="list-style-type: none"> <li>• Be aware of the most likely sources of trans fat in your diet, such as many pastry items and donuts, deep-fried foods, many types of snack chips, cookies, and crackers.</li> </ul>	<ul style="list-style-type: none"> <li>• When using spreads, choose soft margarines with zero trans fats made from liquid vegetable oil, rather than stick margarine or butter.</li> <li>• Use vegetable oils such as olive, canola, corn, or sunflower oil rather than solid fats (butter, stick margarine, shortening, lard).</li> <li>• Check the Nutrition Facts label to choose foods with little or no saturated fat and no trans fat.</li> <li>• Limit foods that contain partially hydrogenated oils and other solid fats.</li> </ul>
<p><b>If alcohol is consumed, it should be consumed in moderation.</b></p>	<ul style="list-style-type: none"> <li>• Excessive drinking has no benefits, and the health and social hazards of heavy alcohol intake are numerous and well known.</li> </ul>	<ul style="list-style-type: none"> <li>• If you are of legal drinking age you should drink alcoholic beverages in moderation.</li> <li>• Avoid alcohol in situations that can put you at risk.</li> </ul>	<ul style="list-style-type: none"> <li>• Limit alcohol to no more than one drink per day for women and two drinks per day for men.</li> <li>• Avoid excessive (heavy or binge) drinking.</li> <li>• Avoid alcohol if you are pregnant or may become pregnant.</li> </ul>
<p><b>Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.</b></p>	<ul style="list-style-type: none"> <li>• Prevents foodborne illness.</li> </ul>	<ul style="list-style-type: none"> <li>• Learn proper food handling techniques.</li> <li>• When in doubt, throw it out.</li> <li>• Cook food to a safe temperature.</li> <li>• Store food safely.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean: Wash hands, utensils, and cutting boards before and after contact with raw meat, poultry, seafood, and eggs.</li> <li>• Separate: Keep raw meat and poultry apart from foods that won't be cooked.</li> <li>• Cook: Use a food thermometer.</li> <li>• Chill: Chill leftovers and takeout foods within 2 hours and keep the refrigerator at 40 degrees Fahrenheit or below.</li> </ul>

Source: Modified from US Department of Health and Human Services, US Department of Agriculture, *Dietary Guidelines for Americans, 2010*, 7th ed, p. 63. Washington, DC: US Government Printing Office; 2010.



## Dietary Guidelines for Americans, 2010

### Key Recommendations for Specific Population Groups

Women capable of becoming pregnant:

- Choose foods that supply heme iron, which is more readily absorbed by the body, additional iron sources, and enhancers of iron absorption such as vitamin C-rich foods.
- Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.

Women who are pregnant or breastfeeding:

- Consume 8 to 12 ounces of seafood per week from a variety of seafood types.
- Because of their methyl mercury content, limit white (albacore) tuna to 6 ounces per week and do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.
- If pregnant, take an iron supplement as recommended by an obstetrician or other health care provider.

Individuals age 50 years or older:

- Consume foods fortified with vitamin B<sub>12</sub>, such as fortified cereals, or take dietary supplements.

**Source:** Reproduced from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.

**Nutrition Recommendations for Canadians** A set of scientific statements that provide guidance to Canadians for a dietary pattern that will supply recommended amounts of all essential nutrients while reducing the risk of chronic disease.

**Canada's Guidelines for Healthy Eating** Key messages that are based on the 1990 *Nutrition Recommendations for Canadians* and that provide positive, action-oriented, scientifically accurate eating advice to Canadians.

#### **Eating Well with Canada's Food Guide**

Recommendations to help Canadians select foods to meet energy and nutrient needs while reducing the risk of chronic disease. The *Food Guide* is based on the *Nutrition Recommendations for Canadians* and *Canada's Guidelines for Healthy Eating* and is a key nutrition education tool for Canadians aged 4 years and older.

**Table 2.2** Daily Targets for Nutrients as Addressed in the *Dietary Guidelines for Americans, 2010*

Nutrient or Food Group	Target for Adults Ages 19–50
Total fat (percent of calories)	20–35
Saturated fat (percent of calories)	< 10
Cholesterol (mg)	< 300
Calcium (mg)	1,000
Potassium (mg)	4,700
Sodium (mg)	< 2,300
Vitamin D (mcg) <sup>a</sup>	15
Fiber (g)	14 g per 1,000 calories (28–34 g/day)
Vegetables and fruit (cups per day)	At least 4–5
Refined grains (oz per day)	> 3
Physical activity	150 minutes of moderate-intensity aerobic activity each week

<sup>a</sup> 1 mcg of vitamin D is equivalent to 40 IU.

**Source:** Data from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.

## Canada's Guidelines for Healthy Eating

Promoting healthy eating habits among Canadians has been a priority of Health Canada for many years. Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health. In the 1980s, a high priority was given to developing a single set of dietary guidelines. The result of this effort was the 1990 **Nutrition Recommendations for Canadians**. This report updated the existing dietary standards and provided a scientific description of the characteristics of a healthy dietary pattern. Also published in 1990 was **Canada's Guidelines for Healthy Eating**, a set of five positive, action-oriented messages for healthy Canadians older than age 2 years.

The 2007 revision of Canada's guidelines, *Eating Well with Canada's Food Guide*, recommends that Canadians do the following:<sup>15</sup>

- Eat at least one dark-green and one orange vegetable each day.
- Enjoy vegetables and fruit prepared with little or no added fat, sugar, or salt.
- Have vegetables and fruits more often than juice.
- Select whole grains for at least half of one's grain products.
- Choose grain products that are low in fat, sugar, or salt.
- Drink skim, 1 percent, or 2 percent milk each day.
- Consume meat alternatives, such as beans, lentils, and tofu, often.
- Eat at least two Food Guide servings of fish each week.
- Select lean meat and alternatives prepared with little or no added fat or salt.
- Include a small amount of unsaturated fat each day.
- Satisfy thirst with water.
- Limit foods and beverages high in calories, fat, sugar, or salt.
- Be active every day.

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The companion document, *Canada's Physical Activity Guide*, recommends 30 to 60 minutes of physical activity a day for children and youth.

Dietary guidelines in the United States and Canada address similar issues: less fat; more fruits, vegetables, and grains; less salt; and achieving healthy weights. In addition, both countries have developed graphic depictions of a healthful diet by showing the balance of food groups to be consumed each day. You can read about the USDA's MyPlate and *Canada's Food Guide* in the next section, "From Dietary Guidelines to Planning."

**Key Concepts** Dietary guidelines are recommendations based on current science that "guide" people toward more healthful choices. The *Dietary Guidelines for Americans, 2010* provides two overarching themes and 23 key recommendations for making food choices that promote good health and a healthy weight and help prevent disease. Six additional key recommendations target specific population groups. Behavioral strategies and creating a healthy environment are important for adopting the recommendations in the *Dietary Guidelines for Americans, 2010*. Both the United States and Canada have guidelines that embody the basic principles of balance, variety, moderation, and calorie control.

## From Dietary Guidelines to Planning: What You Will Eat

By understanding the *Dietary Guidelines for Americans*, you will be able to identify characteristics that can make your diet and your lifestyle healthy. The next step is to translate your knowledge into healthful food choices. For many years, nutritionists and teachers have used **food groups** to illustrate the proper combination of foods in a healthful diet. Even young children can sort food into groups and fill a plate with foods from each group. The foods within each group are similar because of their origins—fruits, for example, all come from the same part of different plants. But from a nutritional perspective, what fruits have in common is the balance of macronutrients and the similarities in micronutrient composition. Even so, the foods in one group can differ significantly in their vitamin and mineral profiles. Some fruits (e.g., citrus, strawberries, and kiwi) are rich in vitamin C, and others (e.g., apples, bananas) have very little. Here again, we can see the importance of variety, of not simply including different food groups but also choosing a variety of foods *within* each group.



### *Dietary Guidelines for Americans, 2010*

#### Building Healthy Eating Patterns: Key Recommendations

- Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.
- Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.
- Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.

**Source:** Reproduced from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.

## Quick Bite

### How Well Do School Cafeterias Follow Nutrition Guidelines?

About one in three kids and teenagers is obese, and high-fat school lunches might be part of the problem. Until recently, the USDA's nutritional standards for school meals had not been updated in more than 15 years. With the majority of school-age kids and teens getting 30 to 50 percent of their total calories from cafeteria meals each day, it's important that these meals be as healthy as possible. The Healthy, Hunger-Free Kids Act is a plan that will (1) boost the nutrition quality of school lunches by requiring fewer calories, less sodium, and more fresh fruits, vegetables, and whole grains; (2) expand the number of students enrolled in free- and reduced-cost meals; and (3) put into place a plan to eliminate things like unhealthy vending machines from school cafeterias.

**food groups** Categories of similar foods, such as fruits or vegetables.



## Academy of Nutrition and Dietetics

### Total Diet Approach to Communicating Food and Nutrition Information

It is the position of the Academy of Nutrition and Dietetics that the total diet or overall pattern of food eaten is the most important focus of a healthful eating style. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with regular physical activity. The Academy of Nutrition and Dietetics strives to communicate healthful eating messages to the public that emphasize a balance of foods, rather than any one food or meal.

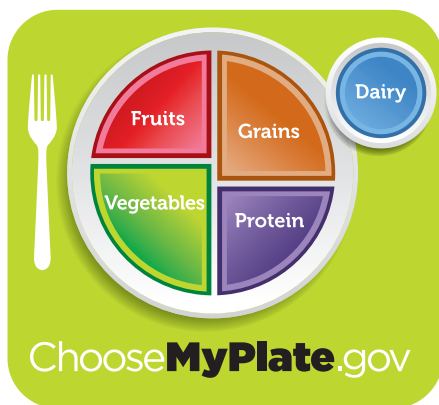
**Source:** Reproduced from Position of the American Dietetic Association: total diet approach to communicating food and nutrition information. *J Am Diet Assoc.* 2007; 107:1224–1232. Reprinted with permission from the American Academy of Nutrition and Dietetics.

## Quick Bite

### Pass Up the Salt

We require only a few hundred milligrams of sodium each day, but this would be unpalatable. Given our current high-salt food environment, it would also be difficult to achieve. The guideline is to eat less sodium, but not down to the level of actual requirements.

**MyPlate** An educational tool that translates the principles of the *Dietary Guidelines for Americans* and other nutritional standards to help consumers in making healthier food and physical activity choices.



**Figure 2.4**

**MyPlate.** Released in 2011, MyPlate is an Internet-based educational tool that helps consumers implement the principles of the 2010 *Dietary Guidelines for Americans* and other nutritional standards.

**Source:** Courtesy of the USDA.

## A Brief History of Food Group Plans

When the U.S. Department of Agriculture published its first dietary recommendations in 1894, specific vitamins and minerals had not even been discovered.<sup>16</sup> The initial guide stressed the importance of consuming enough fat and sugar and energy-rich foods to support daily activity. Because people performed more manual labor in those days, many people were simply not getting enough calories! Canada's Official Food Rules (1942) recommended a weekly serving of liver, heart, or kidney and regular doses of fish liver oils—good sources of vitamins A and D. Later food group plans, including the Basic Four that was popular from the 1950s through the 1970s, focused on fruits, vegetables, grains, dairy products, and meats and their substitutes. The Basic Four was usually illustrated as either a circle or a square, with each group having an equal share. The implication was that people should consume equal amounts of food from each group. Nutrition science now tells us that those proportions give us a diet too high in fat and protein for our modern lifestyle, and not high enough in carbohydrates and fiber.

After the development of the *Dietary Guidelines for Americans* in 1980, the USDA developed a new food guide that would promote overall health and be consistent with the *Dietary Guidelines*. To bring this new food guide and its key messages to the attention of consumers, the colorful Food Guide Pyramid was developed. The Pyramid was designed to illustrate the *Dietary Guidelines for Americans* in terms of food groups and recommended numbers of daily servings. Updated again and renamed in 2005, the USDA MyPyramid food guidance system was intended to be a visual reminder for individuals to make healthy food choices and be physically active every day. Based on the *Dietary Guidelines for Americans* and the Dietary Reference Intakes, the goal of MyPyramid was to translate dietary guidance into a total diet that met nutrient needs from food sources and aimed to limit dietary components often consumed in excess. By law, the *Dietary Guidelines for Americans* is reviewed, updated if necessary, and published every five years. Along with the current version, the *Dietary Guidelines for Americans, 2010*, MyPlate and ChooseMyPlate.gov were created (see **Figure 2.4**).

## MyPlate

**MyPlate** is the USDA's current icon and primary food group symbol to accompany the *Dietary Guidelines for Americans, 2010*. As part of the government's healthy eating initiative, MyPlate is designed to convey seven key messages from the *Dietary Guidelines for Americans, 2010*: Enjoy food but eat less; avoid oversized portions; make half your plate fruits and vegetables; drink water instead of sugary drinks; switch to fat-free or low-fat (1 percent) milk; compare sodium in foods; and make at least half your grains whole grains.

MyPlate is an easy-to-understand visual image intended to empower people with the information they need to make healthy food choices and create eating habits consistent with the *Dietary Guidelines for Americans, 2010*. Because we eat from plates, the design of the MyPlate icon identifies visually how much room on a plate each food group should occupy. It is the objective of this tool to remind people to think about, create, and make better, more balanced food choices. MyPlate uses the image of a dinner plate divided into four sections: fruits, vegetables, grains, and proteins, with a smaller plate (or glass) representing a serving of dairy. MyPlate is accompanied by a

supporting website: [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov). ChooseMyPlate.gov provides tools, resources, and practical information on dietary assessment, nutrition education, and other user-friendly nutrition information.

Unlike the USDA's former food guide systems, MyPlate does not suggest particular foods or specific serving sizes and does not even mention desserts or sweets. The purpose behind these changes is clear—this food guide is different! It is not intended to tell people what to eat, but to empower them to make their own healthy choices and to use this visual icon as a sensible guide.<sup>17</sup>

### Eating Well with Canada's Food Guide

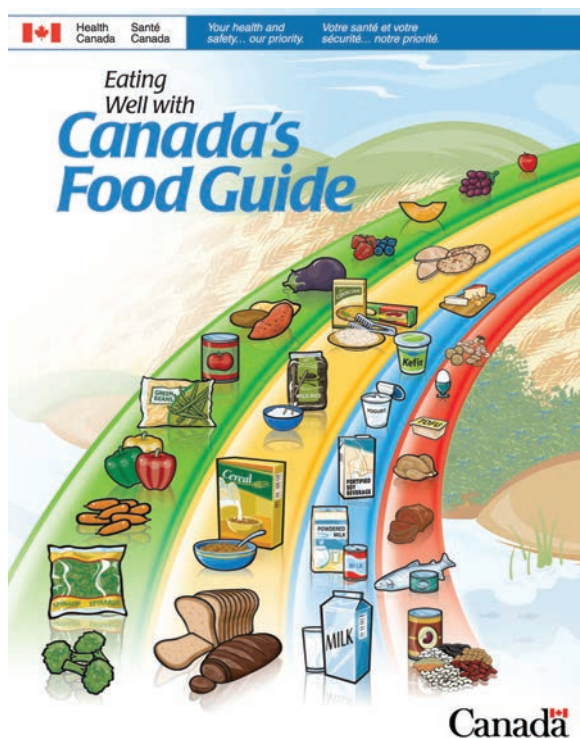
As science advanced and nutritional concerns changed, Canada's Official Food Rules evolved into *Eating Well with Canada's Food Guide* (see **Figure 2.5**). The amounts and types of foods recommended in the *Canada's Food Guide* are based on the nutrient reference values of the Dietary Reference Intakes (DRIs). The foods pictured in the *Canada's Food Guide* document essentially incorporate both the recommended eating pattern and associated dietary guidance.

The “rainbow” of *Canada's Food Guide* places foods into four groups: Grain Products, Vegetables and Fruits, Milk Products, and Meat and Alternatives. *Canada's Food Guide* describes the kinds of foods to choose from

## Quick Bite

### SuperTracker: My Foods, My Fitness, My Health

The MyPlate website includes an interactive diet and physical activity tool called SuperTracker. Get your personalized nutrition and physical activity plan. Track your foods and physical activities to see how they stack up to recommendations. Get tips and support to help you make healthier choices and plan ahead. Visit [www.choosemyplate.gov/SuperTracker/default.aspx](http://www.choosemyplate.gov/SuperTracker/default.aspx).



**Figure 2.5**

*Eating Well with Canada's Food Guide*. The rainbow portion of *Canada's Food Guide* sorts food into groups from which people can make wise food choices.

**Source:** *Eating Well with Canada's Food Guide*. Health Canada, 2011. Reproduced with the permission from the Minister of Health, 2013.

**10 tips**  
Nutrition  
Education Series

liven up your meals with  
vegetables and fruits

**10 tips to improve your meals  
with vegetables and fruits**



**Discover the many benefits of adding vegetables and fruits to your meals.** They are low in fat and calories, while providing fiber and other key nutrients. Most Americans should eat more than 3 cups—and for some, up to 6 cups—of vegetables and fruits each day. Vegetables and fruits don't just add nutrition to meals. They can also add color, flavor, and texture. Explore these creative ways to bring healthy foods to your table.

- 1 fire up the grill**  
Use the grill to cook vegetables and fruits. Try grilling mushrooms, carrots, peppers, or potatoes on a kabob skewer. Brush with oil to keep them from drying out. Grilled fruits like peaches, pineapple, or mangos add great flavor to a cookout.
- 2 expand the flavor of your casseroles**  
Mix vegetables such as sautéed onions, peas, pinto beans, or tomatoes into your favorite dish for that extra flavor.
- 3 planning something Italian?**  
Add extra vegetables to your pasta dish. Slip some peppers, spinach, red beans, onions, or cherry tomatoes into your traditional tomato sauce. Vegetables provide texture and low-calorie bulk that satisfies.
- 4 get creative with your salad**  
Toss in shredded carrots, strawberries, spinach, watercress, orange segments, or sweet peas for a flavorful, fun salad.
- 5 salad bars aren't just for salads**  
Try eating sliced fruit from the salad bar as your dessert when dining out. This will help you avoid any baked desserts that are high in calories.
- 6 get in on the stir-frying fun**  
Try something new! Stir-fry your veggies—like broccoli, carrots, sugar snap peas, mushrooms, or green beans—for a quick-and-easy addition to any meal.
- 7 add them to your sandwiches**  
Whether it is a sandwich or wrap, vegetables make great additions to both. Try sliced tomatoes, romaine lettuce, or avocado on your everyday sandwich or wrap for extra flavor.
- 8 be creative with your baked goods**  
Add apples, bananas, blueberries, or pears to your favorite muffin recipe for a treat.
- 9 make a tasty fruit smoothie**  
For dessert, blend strawberries, blueberries, or raspberries with frozen bananas and 100% fruit juice for a delicious frozen fruit smoothie.
- 10 liven up an omelet**  
Boost the color and flavor of your morning omelet with vegetables. Simply chop, sauté, and add them to the egg as it cooks. Try combining different vegetables, such as mushrooms, spinach, onions, or bell peppers.

Go to [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov) for more information.

The 10 Tips Series.

**Source:** Reproduced from U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines* Tip Sheet No. 10. Washington, DC: U.S. Government Printing Office; 2011.



## MyPlate: Foods, Serving Sizes, and Tips

Grains	Amount Equal to 1 Ounce	Common Portions and Ounce Equivalents
Bagels	1 "mini" bagel	1 large bagel = 4 ounce equivalents
Biscuits	1 small (2" diameter)	1 large (3") = 2 ounce equivalents
Breads	1 regular slice	2 regular slices = 2 ounce equivalents
Bulgur	½ cup cooked	
Cornbread	1 small piece (2½" × 1¼" × 1¼")	1 medium piece = 2 ounce equivalents
English muffin	½ muffin	1 muffin = 2 ounce equivalents
Muffins	1 small (2½" diameter)	1 large (3½" diameter) = 3 ounce equivalents
Oatmeal	½ cup cooked	
Pancakes	1 pancake (4½" diameter)	3 pancakes (4½" diameter) = 3 ounce equivalents
Popcorn	3 cups, popped	1 microwave bag, popped = 4 ounce equivalents
Ready-to-eat cereals	1 cup flakes; 1¼ cups puffed	
Rice	½ cup cooked (1 ounce dry)	1 cup cooked = 2 ounce equivalents
Pasta	½ cup cooked (1 ounce dry)	1 cup cooked = 2 ounce equivalents
Tortillas	1 small (6" diameter)	1 large (12" diameter) = 4 ounce equivalents

**Tips: Make at least half your grains whole grains.** Choose foods that name one of the following first on the label's ingredient list: brown rice, bulgur, graham flour, oatmeal, whole oats, whole rye, whole wheat, wild rice. Go easy on high-fat or sugary toppings.

Vegetables	Amount Equal to 1 Cup of Vegetables	Vegetables	Amount Equal to 1 Cup of Vegetables
<b>Dark-Green Vegetables</b>		<b>Starchy Vegetables</b>	
Spinach, romaine, collards, mustard greens, kale, other leafy greens	2 cups raw or 1 cup cooked	Corn	1 cup or 1 large ear (8" to 9" long)
Broccoli	1 cup chopped or florets	Green peas	1 cup
		White potatoes	1 cup diced or mashed 1 medium potato, boiled or baked
<b>Orange Vegetables</b>		<b>Other Vegetables</b>	
Carrots	1 cup, raw or cooked 2 medium whole 1 cup baby carrots (about 12)	Bean sprouts	1 cup cooked
Pumpkin, sweet potato, winter squash	1 cup, cooked 1 cup chopped, sliced, or cooked	Green beans	1 cup cooked
<b>Dry Beans and Peas</b>		Mushrooms	1 cup raw or cooked
Black, garbanzo, kidney, pinto, soybeans; black-eyed peas, split peas	1 cup whole or mashed, cooked	Tomatoes	1 large raw whole (3")
Tofu	1 cup of ½" cubes		

**Tips: Vary your veggies.** Make half your plate fruits and vegetables. Eat more dark-green vegetables, more orange vegetables, and more dry beans. Buy fresh vegetables in season for best taste and lowest cost. Buy vegetables that are easy to prepare.



Fruit	Amount Equal to 1 Cup of Fruit	Milk	Amount Equal to 1 Cup of Milk
Apple	1 small	Milk	1 cup
Applesauce	1 cup	Yogurt	1 regular container (8 ounces) or 1 cup yogurt
Banana	1 large (8" to 9" long)	Cheese	1½ ounces hard cheese
Melon	1 cup diced or melon balls		⅓ cup shredded cheese
Grapes	1 cup whole; 32 seedless grapes		2 ounces processed cheese
Canned fruit or diced raw fruit	1 cup		2 cups cottage cheese
Orange or peach	1 large	Milk-based desserts	1 cup pudding made with milk
Strawberries	About 8 large berries		1 cup frozen yogurt
100% fruit juice	1 cup	Soy milk	1 cup calcium-fortified soy milk

**Tips: Focus on fruit.** Make half your plate fruits and vegetables. Eat a variety of fruit. Choose fresh, frozen, canned, or dried fruit. Go easy on juices. When choosing a juice, look for "100% juice" on the label.

**Tips: Get your calcium-rich foods.** Switch to fat-free or low-fat milk. If you don't or can't consume milk, get your calcium-rich foods by choosing lactose-free or other calcium sources such as calcium-fortified juices, cereals, breads, soy beverages, or rice beverages.

Meat and Beans	Amount Equal to 1 Ounce	Common Portions and Ounce Equivalents
Cooked lean beef, pork, ham	1 ounce	1 small steak = 3½ to 4 ounce equivalents
Cooked chicken or turkey without skin	1 ounce	1 small lean hamburger = 2 to 3 ounce equivalents 1 small chicken breast half = 3 ounce equivalents
Cooked fish or shellfish	1 ounce	1 can tuna, drained = 3 to 4 ounce equivalents 1 salmon steak = 4 to 6 ounce equivalents 1 small trout = 3 ounce equivalents
Eggs	1 egg	
Nuts and seeds	½ ounce of nuts (12 almonds, 24 pistachios, 7 walnut halves) ½ ounce of seeds, roasted 1 tablespoon of peanut butter	
Dry beans and peas	¼ cup cooked beans or peas ¼ cup baked beans, refried beans ¼ cup tofu 1 ounce tempeh 2 tablespoons hummus	

**Tips: Go lean with protein.** Choose low-fat or lean meats and poultry. Bake it, broil it, or grill it. Vary your choices, with more fish, beans, peas, nuts, and seeds.

### Oils

Common oils: Vegetable oils (canola, corn, cottonseed, olive, safflower, soybean, sunflower)

Foods naturally high in oils:

Nuts

Olives

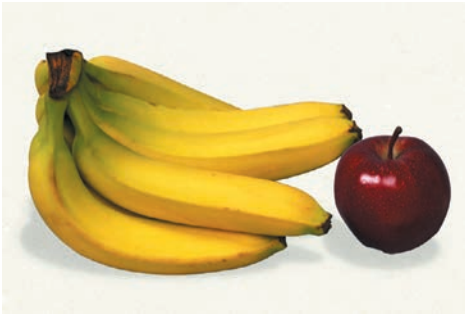
Some fish

Avocados

**Tips: Know your oils.** Oils are not a food group, but they provide essential nutrients. Make most of your fat sources from fish, nuts, and vegetable oils. Limit solid fats such as butter, stick margarine, shortening, and lard.

**Source:** Modified from US Department of Agriculture Center for Nutrition Policy and Promotion. Food Groups, MyPlate. [www.choosemyplate.gov/food-groups](http://www.choosemyplate.gov/food-groups).

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2–4 servings of fruit per day.

© Digital Stock



6–11 servings of bread, rice, and cereal per day.

each group. For example, in the Vegetables and Fruit group, *Canada's Food Guide* suggests “Drink fortified soy beverages if you do not drink milk.” *Canada's Food Guide* illustrates that vegetables, fruits, and grains should be the major part of the diet, with milk products and meats consumed in smaller amounts.

The “bar” side of *Canada's Food Guide* shows how many daily servings are recommended from each group and gives examples of serving sizes. *Canada's Food Guide* also provides specific advice for different ages and stages. Limiting foods and beverages high in calories, fat, sugar, or salt is recommended. Label reading is recommended, and a list of steps to healthy living is provided. The Health Canada website ([www.healthcanada.gc.ca/foodguide](http://www.healthcanada.gc.ca/foodguide)) includes a link to My Food Guide, which is an interactive tool for personalizing the information in *Canada's Food Guide*.

### Using MyPlate or *Canada's Food Guide* in Diet Planning

The first step in using MyPlate or *Canada's Food Guide* for diet planning is to determine the amount of calories you should eat each day. **Table 2.3** shows the recommended amounts of food for three calorie-intake levels. It also gives you an idea of how MyPlate varies with different energy needs. Next, become familiar with the types of food in each group, the number of recommended servings, and the appropriate serving sizes. For an intuitive guide to serving sizes, see **Table 2.4**, and plan your meals and snacks using the suggested serving sizes for your appropriate calorie level.

Let's start to plan a 2,000-calorie diet. Beginning with breakfast, you could plan to have the following: 1 cup (1 oz) of ready-to-eat cereal,  $\frac{1}{2}$  cup of skim milk, 1 slice of whole wheat toast with 1 teaspoon of butter, and 1 cup of orange juice.

Continue to plan your meals and snacks for the rest of the day with the amount of servings you have remaining for each food group. In this case,

**Table 2.3** MyPlate Suggested Daily Amounts for Three Levels of Energy Intake

Food Group	Energy Intake Level		
	Low (1,400 kcal) <sup>a</sup>	Moderate (2,000 kcal) <sup>b</sup>	High (2,800 kcal) <sup>c</sup>
Grains	5 oz eq	6 oz eq	10 oz eq
Vegetables	1½ cups	2½ cups	3½ cups
Fruits	1½ cups	2 cups	2½ cups
Milk	2 cups	3 cups	3 cups
Meat and beans	4 oz eq	5½ oz eq	7 oz eq
Oils	4 teaspoons	6 teaspoons	8 teaspoons
Empty calories allowed <sup>d</sup>	117 kilocalories	267 kilocalories	426 kilocalories

<sup>a</sup> 1,400 kilocalories is about right for many young children.  
<sup>b</sup> 2,000 kilocalories is about right for teenaged girls, active women, and many sedentary men.  
<sup>c</sup> 2,800 kilocalories is about right for teenaged boys and many active men.  
<sup>d</sup> Empty calorie allowance is the remaining amount of calories needed for all food groups, assuming that those choices are fat-free or low-fat and with no added sugars.












**Note:** Your calorie needs may be higher or lower than those shown. Women may need more calories when they are pregnant or breastfeeding.

**Source:** Modified from *Dietary Guidelines for Americans, 2010*. 7th ed. US Government Printing Office; 2010. Courtesy of US Department of Agriculture and US Department of Health and Human Services.

**Table 2.4**

**Playing with Portions**

Your favorite sports and games can help you visualize MyPlate portion sizes

<b>GRAINS</b>	1 cup dry cereal	2 ounce bagel	½ cup cooked cereal, rice, or pasta
			
	4 golf balls	1 hockey puck	tennis ball
<b>VEGETABLES</b>	1 cup of vegetables		
			
	1 baseball or 1 Rubik's cube		
<b>FRUITS</b>	1 medium fruit (equivalent of 1 cup of fruit)		
			
	1 baseball		
<b>OILS</b>	1 teaspoon vegetable oil	1 tablespoon salad dressing	
			
	1 die (1½" size)	1 jacks ball	
<b>MILK</b>	1½ ounces of hard cheese	⅓ cup of shredded cheese	
			
	6 dice (1½" size)	1 billiard ball or racquetball	
<b>MEAT AND BEANS</b>	3 ounces cooked meat	2 tablespoons hummus	
			
	1 deck of playing cards	1 ping pong ball	

it would be as shown in **Table 2.5**. Keep in mind that what you consider a serving might differ from the sizes defined in MyPlate. Research shows that Americans' serving sizes for common foods such as pasta, cookies, cereal, soft drinks, and french fries have increased significantly.<sup>18</sup> Do large portions promote overeating and obesity? See the FYI feature “Portion Distortion” for a scientific exploration related to this question.

Sometimes it's difficult to figure out how to account for foods that are mixtures of different groups—lasagna, casseroles, or pizza, for example. Try separating such foods into their ingredients (e.g., pizza contains crust, tomato sauce, cheese, and toppings, which might be meats or vegetables) to estimate the amounts. You should be able to come up with a reasonable approximation. All in all, MyPlate and *Canada's Food Guide* are easy-to-use guidelines that can help you select a variety of foods.

Watch the empty calories, too. Note in Table 2.5 that for a 2,000-calorie food plan, 267 calories are unused even when all the other food groups are accounted for. However, this accounting with leftover calories assumes that all food choices are fat-free or low-fat and do not have added sugars. What does this mean? If you are already in the habit of choosing low-fat and low-sugar options, you have a few calories to play with each day. These calories can be used for a higher-fat choice or for some sugar in your iced tea. But watch out! Those calories get used up quickly. One regular 12-ounce soft drink would take up 150 discretionary calories; an extra tablespoon of dressing on your salad is 100 calories.

Using the ChooseMyPlate.gov website is easy and informative. Getting a personalized plan, learning healthy eating tips, getting weight loss information, planning a healthy menu, and analyzing your diet are examples of what ChooseMyPlate.gov offers. The website is an excellent way to help guide you through the necessary steps of putting the *Dietary Guidelines* into practice, while at the same time teaching good nutrition and providing appropriate physical activity information.

**Key Concepts** MyPlate is a complete food guidance system based on the *Dietary Guidelines for Americans* and Dietary Reference Intakes to help Americans make healthy food choices and remind them to be active every day. The interactive tools on the ChooseMyPlate.gov website can help you monitor your food choices. *Eating Well with Canada's Food Guide* illustrates the dietary guidelines for Canadians and the Dietary Reference Intakes. These graphic tools show the appropriate balance of food groups in a healthful diet: more whole grains, low-fat dairy, vegetables, and fruits and less meat, and added fats and sugars.

**Table 2.5** Food Group Recommendations for a 2,000-Calorie Diet

Food Group	Total Recommended for 2,000-Calorie Diet	Amount Used at Breakfast	Amount Left for Remainder of the Day
Grains	6 oz eq	2 oz eq	4 oz eq
Vegetables	2½ cups	0	2½ cups
Fruits	2 cups	1 cup	1 cup
Dairy	3 cups	½ cup	2½ cups
Protein	5½ oz eq	0	5½ oz
Oils	6 tsp	1 tsp	5 tsp
Empty calories allowed	267 calories	0	267 calories

**Source:** Data from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans*, 2010. 7th ed. Washington, DC: US Government Printing Office; December 2010.



## Portion Distortion

The prevalence of obesity continues to be of great concern to both adults and children in the United States. A notable increase in obesity can be observed over the past 20 years. Thirty-six states had obesity rates greater than or equal to 25 percent; 12 of these states (Alabama, Arkansas, Kentucky, Louisville, Michigan, Mississippi, Missouri, Oklahoma, South Carolina, Tennessee, Texas, and West Virginia) had obesity rates greater than 30 percent (see **Figure A**).<sup>1</sup>

Many factors contribute to Americans' growing waistlines, but one observation in particular cannot be overlooked: The incidence of obesity has increased in parallel with increasing portion sizes.<sup>2</sup> In almost every eating situation, we are now confronted by huge portions, which are perceived as "normal" or "a great value." This perception that large portion sizes are appropriate has created an environment of *portion distortion*.<sup>3</sup> We find portion distortions in restaurants, where the jumbo-sized portions are consistently 250 percent larger than the regular portions.<sup>4</sup> We even find portion distortions in our homes, where the sizes of our bowls and glasses have steadily increased and where the surface area of the average dinner plate has increased 36 percent since 1960.<sup>5</sup> Research shows that people unintentionally consume more calories when faced with larger portions. In addition, research also shows that portion distortion seems to affect the portion sizes selected by young adults and children for some foods.<sup>6</sup> Consuming larger portion sizes can contribute to positive energy balance, which, over time, leads to weight gain and ultimately can result in obesity.

45 kcals



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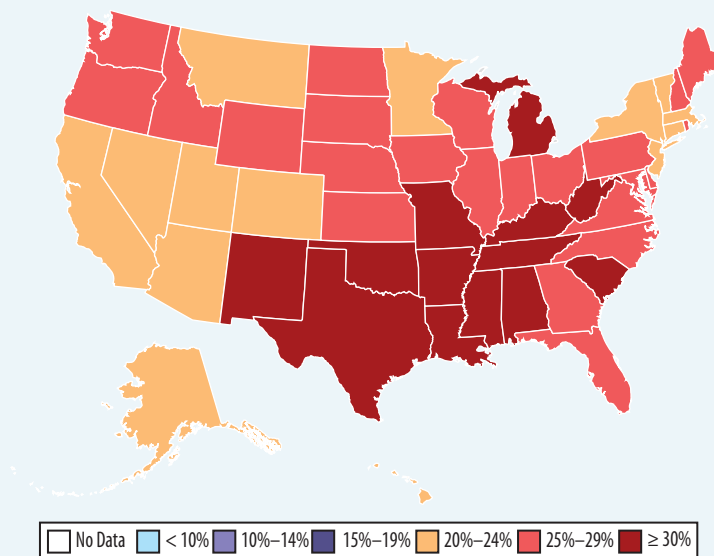
8 oz with milk and sugar

350 kcals



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16 oz mocha coffee



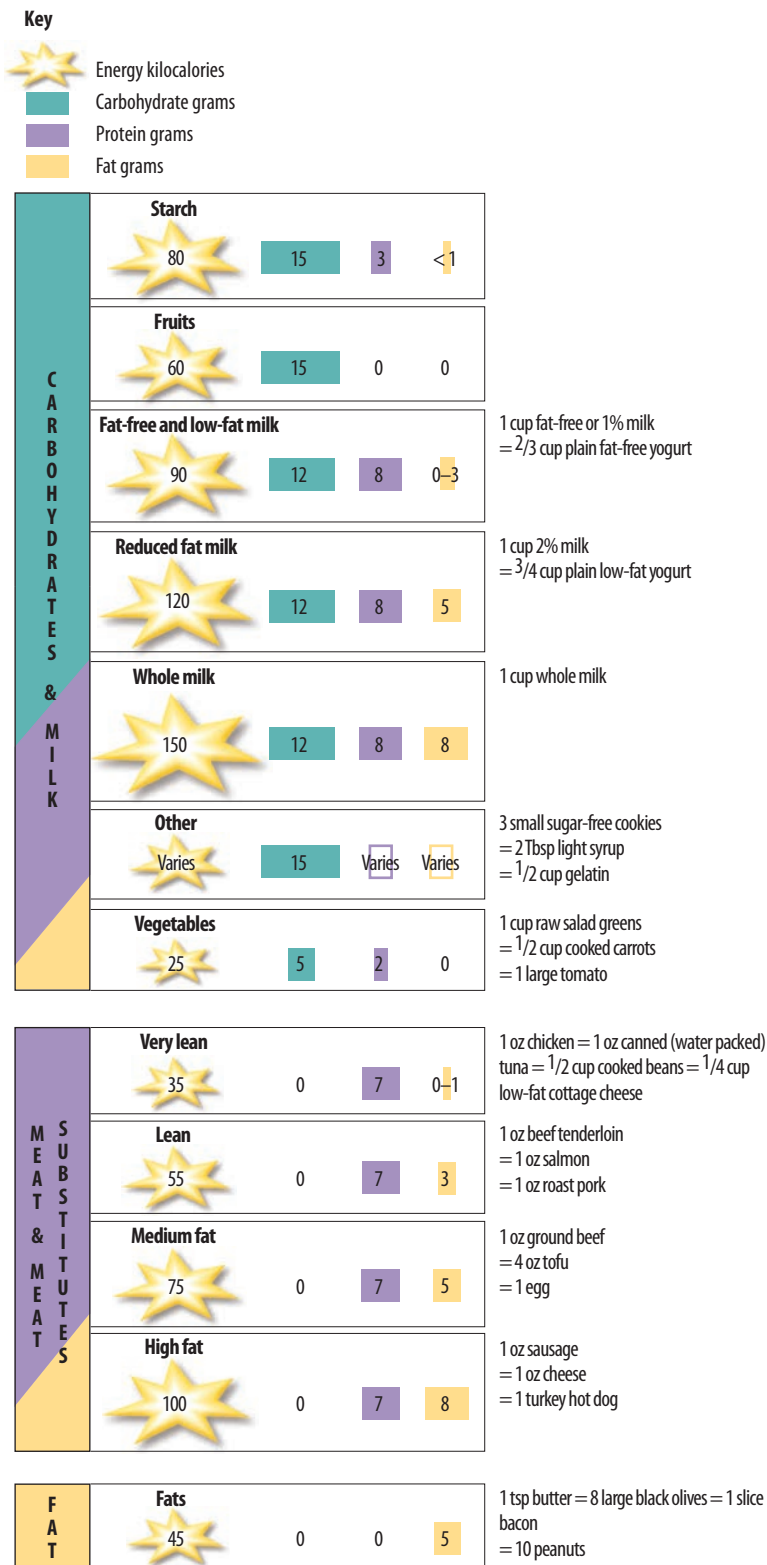
**Figure A** Prevalence of obesity.

**Source:** Reproduced from Centers for Disease Control and Prevention. U.S. obesity trends: trends by state, 1985–2010. [www.cdc.gov/obesity/data/trends.html](http://www.cdc.gov/obesity/data/trends.html). Accessed 11/24/11.

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- Wansink B, van Ittersum K. Portion size me: downsizing our consumption norms. *J Am Diet Assoc.* 2007;7(7):1103–1106.
- Ibid.
- Ibid.
- Schwartz, Byrd-Bredbenner. Op. cit.; and Lawhun SA, Starkoff B, Sundararajan S, et al. Influence of larger portion sizes on the diet of overweight children and adolescents. *J Am Diet Assoc.* 2008;108(9):A38.
- Schwartz, Byrd-Bredbenner. Op. cit.

The phenomenon of portion distortion has the potential to hinder weight loss, weight maintenance, and health improvement efforts. Food and nutrition professionals are working to develop ways to "undistort" what people perceive to be typical portion sizes and help individuals recognize what is an appropriate amount to eat at a single eating occasion.<sup>7</sup>

To see whether you know how today's portions compare to the portions available 20 years ago, take the interactive portion distortion quizzes on the National Heart Lung and Blood Institute's Portion Distortion webpage (<http://hp2010.nhlbi.nih.gov/portion>). You can also learn about the amount of physical activity required to burn off the extra calories provided by today's portions.



## Exchange Lists

Another tool for diet planning that uses food groups is called the **Exchange Lists**. Like MyPlate, the Exchange Lists divide foods into groups. Diets can be planned by choosing a certain number of servings, or exchanges, from each group each day. The original purpose of the Exchange Lists was to help people with diabetes plan diets that would provide consistent levels of energy and carbohydrates—both of which are essential for dietary management of diabetes. For this reason, foods are organized into groups or lists not only by the type of food (e.g., fruits or vegetables) but also by the amount of macronutrients (carbohydrate, protein, and fat) in each portion. The portions are defined so that each “exchange” has a similar composition. For example, 1 fruit exchange is ½ cup of orange juice or 17 small grapes or 1 medium apple or ½ cup of applesauce. All these exchanges have approximately 60 kilocalories, 15 grams of carbohydrate, 0 grams of protein, and 0 grams of fat. In the Exchange Lists, starchy vegetables such as potatoes, corn, and peas are grouped with breads and cereals instead of with other vegetables because their balance of macronutrients is more like bread or pasta than carrots or tomatoes.

**Figure 2.6** shows the amounts of carbohydrate, protein, fat, and kilocalories in one exchange from each group, along with a sample serving size. For a complete set of the Exchange Lists, go to [go.jblearning.com/nutrition](http://go.jblearning.com/nutrition).

## Using the Exchange Lists in Diet Planning

In addition to their use by people with diabetes, Exchange Lists are used in many weight-control programs. Planning a diet using the Exchange Lists is done in much the same manner as using MyPlate. The first step is to become very familiar with the components of each group, the variations in fat content for dairy and meat lists, and ways that other foods may be included. Then, an individual diet plan can be used to select meals and snacks throughout the day. An exchange-based diet plan specifies the number of exchanges to be consumed from each group at each meal. For example, a 1,500-kilocalorie weight reduction diet plan might have the following meal pattern:

**Figure 2.6**

**Exchange Lists.** The Exchange Lists are a widely used system for meal planning for people with diabetes. They are also helpful for people interested in healthy eating and weight control.

**Source:** Data from *Exchange Lists for Meal Planning*. Alexandria, VA: Academy of Nutrition and Dietetics; 2003.

<b>Breakfast:</b>	2 starch, 1 fruit, 1 milk, 1 fat
<b>Lunch:</b>	3 meat, 2 starch, 1 fruit, 1 vegetable, 1 fat
<b>Snack:</b>	1 milk, 1 starch, 1 fat
<b>Dinner:</b>	2 meat, 1 starch, 2 vegetable, 2 fat
<b>Snack:</b>	2 starch, 1 fruit

Using this pattern and a complete set of the Exchange Lists, you could then plan out a day or week of menus. Here's one sample:

<b>Breakfast:</b>	½ cup orange juice, ¾ cup corn flakes, 1 cup 2% milk, 1 slice toast, 1 tsp margarine
<b>Lunch:</b>	3 oz cooked hamburger on bun, 1 tsp mayonnaise, ½ cup baby carrots, 1 medium apple
<b>Snack:</b>	¾ cup low-fat yogurt, ½ bagel with 1 tbsp cream cheese
<b>Dinner:</b>	2 oz cooked pork chop, ½ cup rice with 1 tsp margarine, ½ cup yellow squash and ½ cup zucchini stir-fried in 1 tsp vegetable oil
<b>Snack:</b>	1 toasted English muffin, 1 medium pear

**Exchange Lists** Lists of foods that in specified portions provide equivalent amounts of carbohydrate, fat, protein, and energy. Any food in an Exchange List can be substituted for any other without markedly affecting macronutrient intake.

**dietary standards** Set of values for recommended intake of nutrients.

**Dietary Reference Intakes (DRIs)** A framework of dietary standards that includes Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL).

**Key Concepts** The Exchange Lists are a diet-planning tool that use the idea of food groups, but define groups specifically in terms of macronutrient (carbohydrate, fat, and protein) content. Individual diet plans can be developed for people who need to control energy or carbohydrate intake, such as for weight control or management of diabetes mellitus.

## Recommendations for Nutrient Intake: The DRIs

So far, the tools described (*Dietary Guidelines for Americans*, Canada's Guidelines for Healthy Eating, MyPlate, *Eating Well with Canada's Food Guide*, and Exchange Lists) deal with whole foods and food groups rather than individual nutrient values; after all, foods are what we think about in planning our daily meals and shopping lists. Sometimes, though, we need more specific information about our nutritional needs—a healthful diet is healthful because of the balance of *nutrients* it contains. Before we can choose foods that meet our needs for specific nutrients, we need to know how much of each nutrient we require daily. This is what **dietary standards** do—they define healthful diets in terms of specific amounts of the nutrients.

### Understanding Dietary Standards

Dietary standards are sets of recommended intake values for nutrients. These standards tell us how much of each nutrient we should have in our diets. In the United States and Canada, the **Dietary Reference Intakes (DRIs)** are the current dietary standards.

Consider the following scenario. You are running a research center located in Antarctica and staffed by 60 people. Because staff will not be able to leave the site to get meals, you must provide all their food. You must keep the group adequately nourished; you certainly don't want anyone to become ill as a result of a nutrient deficiency. How would you (or the nutritionist you hire) start planning? How can you be sure to provide adequate amounts of the

essential nutrients? The most important tool would be a set of dietary standards! Essentially the same scenario faces those who plan and provide food for groups of people in more routine circumstances—the military, prisons, and even schools. To assess nutritional adequacy, diet planners can compare the nutrient composition of their food plans to recommended intake values.

## A Brief History of Dietary Standards

Beginning in 1938, Health Canada published dietary standards called **Recommended Nutrient Intakes (RNIs)**. In the United States, the **Recommended Dietary Allowances (RDAs)** were first published in 1941. By the 1940s, nutrition scientists had been able to isolate and identify many of the nutrients in food. They were able to measure the amounts of these nutrients in foods and to recommend daily intake levels. These levels became the first RNI and RDA values. Committees of scientists regularly reviewed the standards and published revised editions; for example, the tenth (and final) edition of RDAs was published in 1989.

In the mid-1990s, the **Food and Nutrition Board** of the National Academy of Sciences began a partnership with Health Canada to make fundamental changes in the approach to setting dietary standards and to replace the RDAs and RNIs. In 1997, the first set of DRIs was published.

## Dietary Reference Intakes

Since the inception of the RDAs and RNIs, we have learned more about the relationships between diet and chronic disease, and nutrient-deficiency diseases have become rare in the United States and Canada. The new DRIs reflect not just intake levels for dietary adequacy but also for optimal nutrition.

The DRIs are reference values for nutrient intakes to be used in assessing and planning diets for healthy people (see **Figure 2.7**). The DRIs include four basic elements: Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL). Underlying each of these values is the definition of a **requirement** as the “lowest continuing intake level of a nutrient that, for a specific indicator of adequacy, will maintain a defined level of nutriture in an individual.”<sup>19</sup> In other words, a requirement is the smallest amount of a nutrient you should take in on a regular basis to remain healthy. In the DRI report on macronutrients, two other concepts were introduced: the Estimated Energy Requirement (EER) and the Acceptable Macronutrient Distribution Ranges (AMDRs).<sup>20</sup>

### Estimated Average Requirement

The **Estimated Average Requirement (EAR)** reflects the amount of a nutrient that would meet the needs of 50 percent of the people in a particular life-stage (age) and gender group. For each nutrient, this requirement is defined using a specific indicator of dietary adequacy. This indicator could be the level of the nutrient or one of its breakdown products in the blood, or the amount of an enzyme associated with that nutrient.<sup>21</sup> The EAR is used to set the RDA, and EAR values can also be used to assess dietary adequacy or plan diets for groups of people.

### Recommended Dietary Allowance

The **Recommended Dietary Allowance (RDA)** is the daily intake level that meets the needs of most people (97 to 98 percent) in a life-stage and gender group. The RDA is set at two standard deviations above the EAR. A nutrient will not have an RDA value if there are not enough scientific data available to set an EAR value.

**Recommended Nutrient Intakes (RNIs)** Canadian dietary standards that have been replaced by Dietary Reference Intakes.

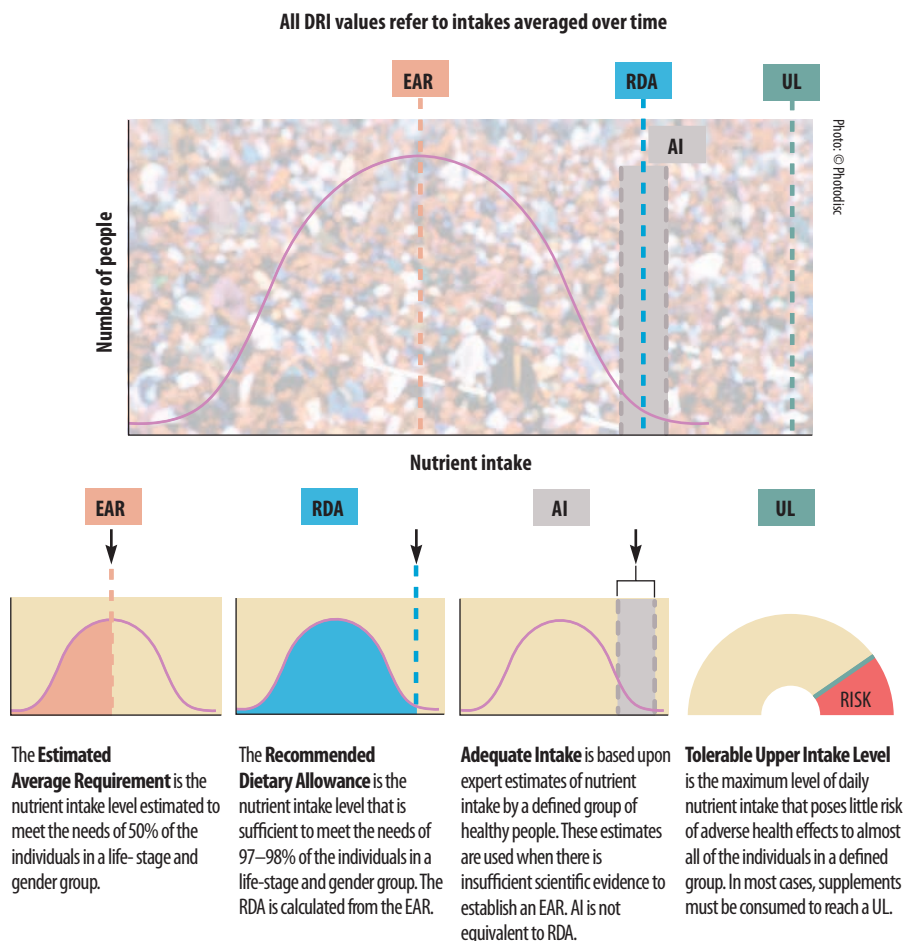
**Recommended Dietary Allowances (RDAs)** The nutrient intake levels that meet the nutrient needs of almost all (97 to 98 percent) individuals in a life-stage and gender group.

**Food and Nutrition Board** A board within the Institute of Medicine of the National Academy of Sciences. It is responsible for assembling the group of nutrition scientists who review available scientific data to determine appropriate intake levels of the known essential nutrients.

**requirement** The lowest continuing intake level of a nutrient that prevents deficiency in an individual.

**Estimated Average Requirement (EAR)** The intake value that meets the estimated nutrient needs of 50 percent of individuals in a specific life-stage and gender group.





**Figure 2.7** **Dietary Reference Intakes.** The Dietary Reference Intakes are a set of dietary standards that include Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL).

People can use the RDA value as a target or goal for dietary intake and make comparisons between actual intake and RDA values. It is important to remember, however, that the RDAs do not define an *individual's* nutrient requirements. Your actual nutrient needs might be much lower than average, and therefore the RDA would be more than you need. An analysis of your diet might show, for example, that you consume 45 percent of the RDA for a certain vitamin, but that might be adequate for your needs. Only specific laboratory or other tests can determine a person's true nutrient requirements and actual nutritional status. An intake that is consistently at or near the RDA level is likely to be meeting your needs.

### Adequate Intake

If not enough scientific data are available to set an EAR level, a value called an **Adequate Intake (AI)** is determined instead. AI values are determined in part by observing healthy groups of people and estimating their dietary intake. All the current DRI values for infants are AI levels because there have been too few scientific studies to determine specific requirements in infants. Instead, AI values for infants are usually based on nutrient levels in human milk, a complete food for newborns and young infants. Values for older infants and children are extrapolated from human milk and from data on adults. For nutrients with AI instead of RDA values for all life-stage groups (e.g., calcium, vitamin D), more

**Adequate Intake (AI)** The nutrient intake that appears to sustain a defined nutritional state or some other indicator of health (e.g., growth rate or normal circulating nutrient values) in a specific population or subgroup. AI is used when there is insufficient scientific evidence to establish an EAR.

**Tolerable Upper Intake Levels (ULs)** The maximum levels of daily nutrient intakes that are unlikely to pose health risks to almost all of the individuals in the group for whom they are designed.

**Estimated Energy Requirement (EER)** Dietary energy intake that is predicted to maintain energy balance in a healthy adult of a defined age, gender, weight, height, and level of physical activity consistent with good health.

**Acceptable Macronutrient Distribution Ranges (AMDRs)** Range of intakes for a particular energy source that are associated with reduced risk of chronic disease while providing adequate intakes of essential nutrients.

scientific research is needed to better define the nutrient requirements of population groups. AI values can be considered target intake levels for individuals.

### Tolerable Upper Intake Level

**Tolerable Upper Intake Levels (ULs)** have been defined for many nutrients. Consumption of a nutrient in amounts higher than the UL could be harmful. The ULs have been developed partly in response to the growing interest in dietary supplements that contain large amounts of essential nutrients. The UL is *not* to be used as a target for intake but rather should be a cautionary level for people who regularly take nutrient supplements.

### Estimated Energy Requirement

The **Estimated Energy Requirement (EER)** is defined as the energy intake that is estimated to maintain energy balance in healthy, normal-weight individuals. It is determined using an equation that considers weight, height, age, and physical activity. Different equations are used for males and females and for different age groups.

### Acceptable Macronutrient Distribution Ranges

**Acceptable Macronutrient Distribution Ranges (AMDRs)** indicate the recommended balance of energy sources in a healthful diet. These values consider the amounts of macronutrients needed to provide adequate intake of essential nutrients while reducing the risk for chronic disease. The AMDRs are shown in [Table 2.6](#).

## Use of Dietary Standards

The most appropriate use of DRIs is to plan and evaluate diets for large groups of people. Remember the South Pole scenario at the beginning of this section? If you had planned menus and evaluated the nutrient composition of the foods that would be included and if the average nutrient levels of those daily menus met or exceeded the RDA/AI levels, you could be confident that your group would be adequately nourished. If you had a very large group—thousands of soldiers, for instance—the EAR would be a more appropriate guide.

Dietary standards are also used to make decisions about nutrition policy. The Special Supplemental Food Program for Women, Infants, and Children (WIC), for example, takes into account the DRIs as it provides food or vouchers for food. The goal of this federally funded supplemental feeding program is to improve the nutrient intake of low-income pregnant and breastfeeding women, their infants, and young children. The guidelines for school lunch and breakfast programs are also based on DRI values.

Often, we use dietary standards as comparison values for individual diets, something you might be doing in class. It can be interesting to see how your daily intake of a nutrient compares with the RDA or AI. However, an intake that is less than the RDA/AI doesn't necessarily mean deficiency; your individual requirement for a nutrient can be less than the RDA/AI value. You can use the RDA/AI values as targets for dietary intake, while avoiding nutrient intake that exceeds the UL.

**Key Concepts** Dietary standards are levels of nutrient intake recommended for healthy people. These standards help the government set nutrition policy and also can be used to guide the planning and evaluation of diets for groups and individuals. The Dietary Reference Intakes are the dietary standards for the United States and Canada. These standards focus on maintaining optimal health and lowering the risks of chronic disease, rather than simply on dietary adequacy.

## Food Labels

Now that you understand diet-planning tools and dietary standards, let's focus on your use of these tools—for example, when making decisions at

**Table 2.6** Acceptable Macronutrient Distribution Ranges for Adults

Fat	20–35
Carbohydrate	45–65
Protein	10–35
<i>n</i> -6 Polyunsaturated fatty acids	5–10
<i>a</i> -Linolenic acid	0.6–1.2

**Note:** All values are percentage of energy intake.

**Source:** Reproduced from Institute of Medicine, Food and Nutrition Board. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Copyright © 2005 by the National Academy of Sciences, courtesy of the National Academies Press, Washington, DC.

the grocery store. One of the most useful tools in planning a healthful diet is the **food label**.

Specific federal regulations control what may and may not appear on a food label and what *must* appear on it. The **Food and Drug Administration (FDA)** is responsible for ensuring that foods sold in the United States are safe, wholesome, and properly labeled. The Health Products and Food Branch of Health Canada has similar responsibilities. The FDA's jurisdiction does not include meat, meat products, poultry, or poultry products; the USDA regulates these foods.

As information about the role of diet in chronic disease grew during the 1970s and 1980s, so did the demand for nutrition labels on all food products. As a result, in 1990 Congress passed the **Nutrition Labeling and Education Act (NLEA)**. Once the necessary regulations had been developed, "Nutrition Facts" labels began appearing on foods in 1994. By 1997, 96.5 percent of food products had nutrition labels.<sup>22</sup> Voluntary nutrition labeling was introduced in Canada in 1988, and final regulations to make nutrition labeling mandatory were released in 2002. Canadian nutrition labels now are similar in format to U.S. nutrition labels.

**food label** Labels required by law on virtually all packaged foods and having five requirements: (1) a statement of identity; (2) the net contents (by weight, volume, or measure) of the package; (3) the name and address of the manufacturer, packer, or distributor; (4) a list of ingredients; and (5) nutrition information.

**Food and Drug Administration (FDA)** The federal agency responsible for ensuring that foods sold in the United States (except for eggs, poultry, and meat, which are monitored by the USDA) are safe, wholesome, and labeled properly. The FDA sets standards for the composition of some foods, inspects food plants, and monitors imported foods. The FDA is an agency of the Department of Health and Human Services (DHHS).

**Nutrition Labeling and Education Act (NLEA)** An amendment to the Food, Drug, and Cosmetic Act of 1938. The NLEA made major changes to the content and scope of the nutrition label and to other elements of food labels. Final regulations were published in 1993 and went into effect in 1994.

## Ingredients and Other Basic Information

The label on a food you buy today has been shaped by many sets of regulations. As **Figure 2.8** shows, food labels have five mandatory components:

1. A statement of identity
2. The net contents of the package
3. The name and address of the manufacturer, packer, or distributor
4. A list of ingredients
5. Nutrition information



**Figure 2.8** The five mandatory requirements for food labels. Federal regulations determine what may and may not appear on food labels.

**statement of identity** A mandate that commercial food products prominently display the common or usual name of the product or identify the food with an “appropriately descriptive term.”

**Nutrition Facts** A portion of the food label that states the content of selected nutrients in a food in a standard way prescribed by the Food and Drug Administration. By law, Nutrition Facts must appear on nearly all processed food products in the United States.

The **statement of identity** requirement means that the product must prominently display the common or usual name of the product or identify the food with an “appropriately descriptive term.” For example, it would be misleading to label a fruit beverage containing only 10 percent fruit juice as a “juice.” The statement of net package contents must accurately reflect the quantity in terms of weight, volume, measure, or numerical count. Information about the manufacturer, packer, or distributor gives consumers a way to contact someone in case they have questions about the product.

Ingredients must be listed by common or usual name, in descending order by weight; thus, the first ingredient listed is the primary ingredient in that food product. Let’s compare two cereals:

*Cereal A ingredients:* Milled corn, sugar, salt, malt flavoring, high-fructose corn syrup

*Cereal B ingredients:* Sugar, yellow corn flour, rice flour, wheat flour, whole oat flour, partially hydrogenated vegetable oil (contains one or more of the following oils: canola, soybean, cottonseed), salt, cocoa, artificial flavor, corn syrup

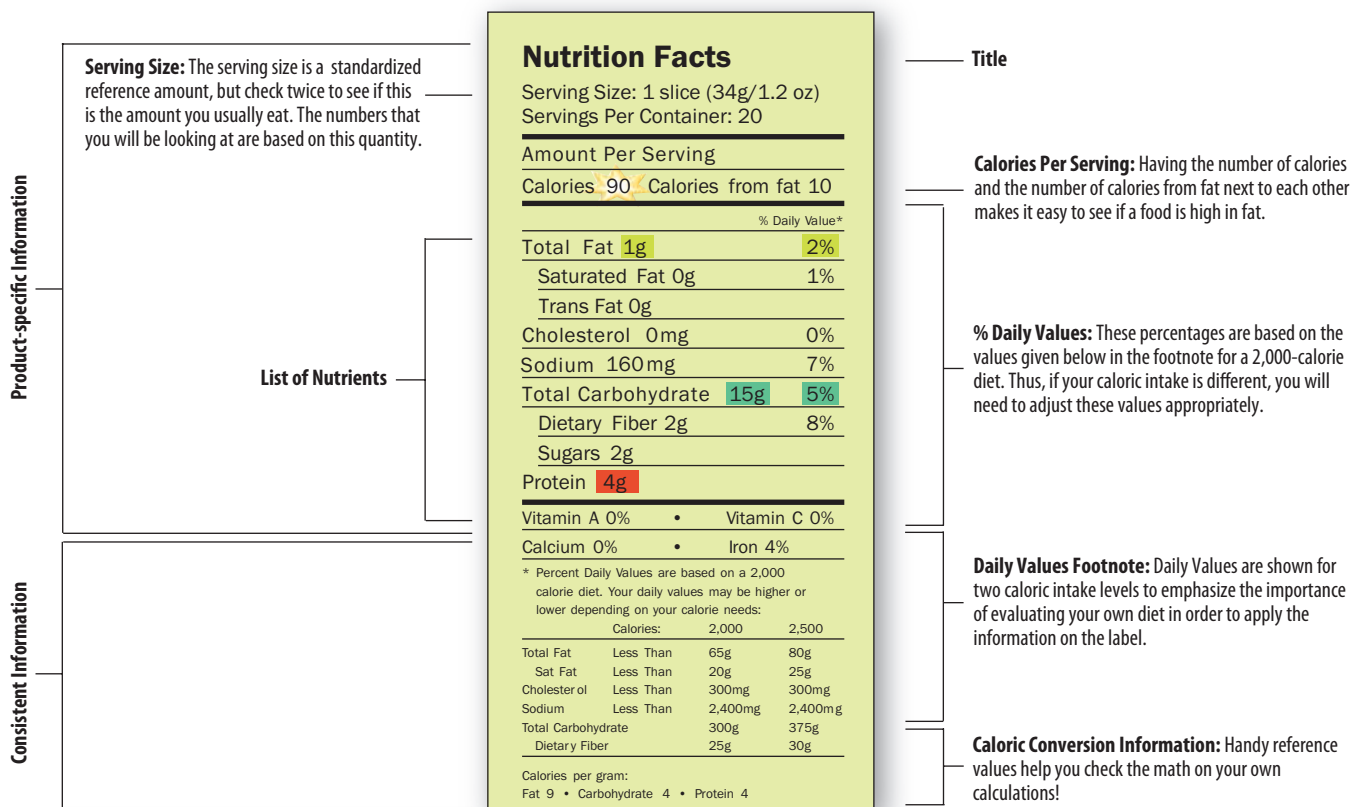
In Cereal B, the first ingredient listed is sugar, which means this cereal contains more sugar by weight than any other ingredient. Cereal A’s primary ingredient is milled corn. That can make quite a difference in the amount (grams) of sugar a cereal contains!

As you probably have noticed, when the ingredient list includes the artificial sweetener aspartame, it also displays a warning statement. Also, preservatives and other additives in foods must be listed, along with an explanation of their function. Accurate and complete ingredient information is vital for people with food allergies who must avoid certain food components. As of January 2006, the labels of foods that contain any of the eight major food allergens (egg, wheat, peanuts, milk, tree nuts, soy, fish, and crustaceans) have been required to include common names when listing these ingredients.

## Nutrition Facts Panel

The **Nutrition Facts** panel contains the most important label information for the health-conscious consumer. Eighty-three percent of shoppers regularly check the Nutrition Facts panel when buying a product for the first time, and 91 percent will make a purchasing decision based on nutrition information.<sup>23</sup> Although fat content is the most frequently sought piece of information, consumers are also looking for foods that are “low calorie,” “whole grain,” and “low salt/sodium.” The Nutrition Facts panel informs the consumer about the nutritional value of a food product, enabling an informed shopper to compare similar products.

Let’s take a closer look at the elements of the Nutrition Facts panel. It was designed so that the nutrition information would be easy to find on the label. The heading “Nutrition Facts” stands out clearly (see **Figure 2.9**). Just under the heading is information about the serving size and number of servings per container. It is important to note the serving size because all the nutrient information that follows is based on that amount of food, and the listed serving size might be different from what you usually eat. An 8-ounce bag of potato chips might be a small snack to a hungry college student, but according to the manufacturer, the bag really contains eight servings! Serving sizes are standardized according to reference amounts developed by the FDA. Similar products (cereals, for instance) have similar serving sizes (1 ounce). This should make it easier to compare products because the serving size on the food label will likely be the same.



**Figure 2.9** The Nutrition Facts panel. Consumers can use the Nutrition Facts panel to compare the nutritional values of different products.

The next part of the label shows the calories per serving and the calories that come from fat. This information reveals at a glance whether a food product is high or low in fat. If most calories in a product come from fat, it is a high-fat food. Following this is a list of the amounts of total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugars, and protein in one serving. This information is given both in quantity (grams or milligrams per serving) and as a percentage of the Daily Value—a comparison standard specifically for food labels (this standard is described in the following section). Listed next are percentages of Daily Values for vitamins A and C, calcium, and iron, which are the only micronutrients that must appear on all standard labels. Manufacturers can choose to include information about other nutrients, such as potassium, polyunsaturated fat, additional vitamins, or other minerals, in the Nutrition Facts panel. However, if they make a claim about an optional component (e.g., “good source of vitamin E”) or **enrich** or **fortify** the food, the manufacturers must include specific nutrition information for these added nutrients. This information must be included even when government regulations require enrichment or fortification, such as the fortification of milk with vitamin D to prevent rickets (a bone disease in children that results from vitamin D deficiency) and the fortification of grain products with folic acid to reduce the risk of birth defects. Food products that come in small packages (e.g., gum, candy, tuna) or that have little nutritional value (e.g., diet soft drinks) can have abbreviated versions of the Nutrition Facts on the label, as **Figure 2.10** shows.

**enrich** To add vitamins and minerals lost or diminished during food processing, particularly the addition of thiamin, riboflavin, niacin, folic acid, and iron to grain products.

**fortify** Refers to the addition of vitamins or minerals that were not originally present in a food.



**Figure 2.10** Nutrition Facts on small packages. When a product package has insufficient space to display a full Nutrition Facts panel, manufacturers may use an abbreviated version.

**Daily Values (DVs)** A single set of nutrient intake standards developed by the Food and Drug Administration to represent the needs of the “typical” consumer; used as standards for expressing nutrient content on food labels.

**nutrient content claims** These claims describe the level of a nutrient or dietary substance in the product, using terms such as *good source*, *high*, or *free*.

## Daily Values

Let’s come back to the Daily Values part of the label. The **Daily Values (DVs)** are a set of dietary standards used to compare the amount of a nutrient (or other component) in a serving of food to the amount recommended for daily consumption. Nutrients are listed as a percentage of the food’s Daily Value on the Nutrition Facts panel. This information lets consumers see at a glance how a food fits into their diets. Let’s say you rely on your breakfast cereal as a major source of dietary fiber intake. Comparing two packages, as in **Figure 2.11**, you find that a serving of corn-flakes cereal has 4 percent of the DV for dietary fiber, but choosing bran-flakes cereal gives you 20 percent. You don’t have to know anything about grams to see which has more! Keep in mind that the Daily Values (which were established in 1993) might not exactly match the more recent DRI values; in most cases, however, the differences are small.

## Nutrient Content Claims

The NLEA and the associated FDA regulations allow food manufacturers to make **nutrient content claims** using a variety of descriptive terms on labels,

Nutrition Facts		
Serving Size:		1 Cup (28g/1.0 oz.)
Servings Per Container:		About 18
Amount Per Serving	Cereal	with 1/2 cup Skim Milk
<b>Calories</b>	100	140
Fat Calories	0	0
% Daily Value		
<b>Total Fat</b> 0g	0%	0%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
<b>Cholesterol</b> 0mg	0%	0%
<b>Sodium</b> 300mg	13%	15%
<b>Potassium</b> 25mg	1%	7%
<b>Total Carbohydrate</b> 24g	8%	10%
Dietary Fiber 1g	4%	4%
Sugars 2g		
Other Carbohydrates 21g		
<b>Protein</b> 2g		
Vitamin A	15%	20%
Vitamin C	25%	25%
Calcium	0%	15%
Iron	45%	45%
Vitamin D	10%	25%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Vitamin B <sub>6</sub>	25%	25%
Folate	25%	25%
Vitamin B <sub>12</sub>	25%	35%

Nutrition Facts		
Serving Size:		3/4 Cup (30g)
Servings Per Container:		About 15
Amount Per Serving	Cereal	with 1/2 cup Skim Milk
<b>Calories</b>	100	140
Calories from fat	5	5
% Daily Value		
<b>Total Fat</b> 0.5g	1%	1%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
<b>Cholesterol</b> 0mg	0%	0%
<b>Sodium</b> 210mg	9%	12%
<b>Potassium</b> 200mg	6%	11%
<b>Total Carbohydrate</b> 24g	8%	10%
Dietary Fiber 5g	20%	20%
Sugars 5g		
Other Carbohydrates 14g		
<b>Protein</b> 3g		
Vitamin A	15%	20%
Vitamin C	0%	2%
Calcium	0%	15%
Iron	45%	45%
Vitamin D	10%	25%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Vitamin B <sub>6</sub>	25%	25%
Folate	25%	25%
Vitamin B <sub>12</sub>	25%	35%

**Figure 2.11**

**Comparing cereals.** These cereal labels come from different types of breakfast cereal: corn-flakes cereal (left) and bran-flakes cereal (right). What might influence your decision to buy one over the other?



## Definitions for Nutrient Content Claims on Food Labels

**Free:** Food contains no amount (or trivial or “physiologically inconsequential” amounts). May be used with one or more of the following: fat, saturated fat, cholesterol, sodium, sugar, and calories. Synonyms include *without, no, and zero*.

**Fat-free:** Less than 0.5 grams of fat per serving.

**Saturated fat-free:** Less than 0.5 grams of saturated fat per serving, and less than 0.5 grams of trans fatty acids per serving.

**Cholesterol-free:** Less than 2 milligrams of cholesterol and 2 grams or less of saturated fat per serving.

**Sodium-free:** Less than 5 milligrams of sodium per serving.

**Sugar-free:** Less than 0.5 grams of sugar per serving.

**Calorie-free:** Fewer than 5 calories per serving.

**Low:** Food can be eaten frequently without exceeding dietary guidelines for one or more of these components: fat, saturated fat, cholesterol, sodium, and calories. Synonyms include *little, few, and low source of*.

**Low-fat:** 3 grams or less per serving.

**Low saturated-fat:** 1 gram or less of saturated fat per serving; no more than 15 percent of calories from saturated fat.

**Low-cholesterol:** 20 milligrams or less and 2 grams or less of saturated fat per serving.

**Low-sodium:** 140 milligrams or less per serving.

**Very low sodium:** 35 milligrams or less per serving.

**Low-calorie:** 40 calories or less per serving.

**Lean and extra lean:** Describe the fat content of meal and main dish products, seafood, and game meat products.

**Lean:** Less than 10 grams fat, 4.5 grams or less saturated fat, and less than 95 milligrams of cholesterol per serving and per 100 grams.

**Extra lean:** Less than 5 grams fat, less than 2 grams saturated fat, and less than 95 milligrams of cholesterol per serving and per 100 grams.

**High:** Food contains 20 percent or more of the Daily Value for a particular nutrient in a serving.

**Good Source:** Food contains 10 to 19 percent of the Daily Value for a particular nutrient in one serving.

**Reduced:** Nutritionally altered product containing at least 25 percent less of a nutrient or of calories than the regular or reference product. *Note:* A “reduced” claim cannot be used if the reference product already meets the requirement for “low.”

**Less:** Food, whether altered or not, contains 25 percent less of a nutrient or of calories than the reference food. *Fewer* is an acceptable synonym.

**Light:** This descriptor can have two meanings:

1. A nutritionally altered product contains one-third fewer calories or half the fat of the reference food. If the reference food derives 50 percent or more of its calories from fat, the reduction must be 50 percent of the fat.
2. The sodium content of a low-calorie, low-fat food has been reduced by 50 percent. *Also, light in sodium* may be used on a food in which the sodium content has been reduced by at least 50 percent. *Note:* The term *light* can still be used to describe such properties as texture and color as long as the label clearly explains its meaning (e.g., *light brown sugar, light and fluffy*).

**More:** A serving of food, whether altered or not, contains more of a nutrient that is at least 10 percent of the Daily Value more than the reference food. This also applies to *fortified, enriched, and added* claims, but in those cases, the food must be altered.

**Healthy:** A *healthy* food must be low in fat and saturated fat and contain limited amounts of cholesterol (less than 60 milligrams) and sodium (less than 360 milligrams for individual foods and less than 480 milligrams for meal-type products). In addition, a single-item food must provide at least 10 percent or more of one of the following: vitamin A or C, iron, calcium, protein, or fiber. A meal-type

product, such as a frozen entrée or dinner, must provide 10 percent of two or more of these vitamins or minerals, or protein or fiber, in addition to meeting the other criteria. Additional regulations allow the term *healthy* to be applied to raw, canned, or frozen fruits and vegetables and enriched grains even if the 10 percent nutrient content rule is not met. However, frozen or canned fruits or vegetables cannot contain ingredients that would change the nutrient profile.

**Fresh:** Food is raw, has never been frozen or heated, and contains no preservatives. *Fresh frozen, frozen fresh, and freshly frozen* can be used for foods that are quickly frozen while still fresh. Blanched foods also can be called fresh.

**Percent fat-free:** Food must be a low-fat or a fat-free product. In addition, the claim must reflect accurately the amount of nonfat ingredients in 100 grams of food.

**Implied claims:** These are prohibited when they wrongfully imply that a food contains or does not contain a meaningful level of a nutrient. For example, a product cannot claim to be made with an ingredient known to be a source of fiber (such as “made with oat bran”) unless the product contains enough of that ingredient (e.g., oat bran) to meet the definition for “good source” of fiber. As another example, a claim that a product contains “no tropical oils” is allowed, but only on foods that are “low” in saturated fat, because consumers have come to equate tropical oils with high levels of saturated fat.

**Source:** Data from Food and Drug Administration. Appendix A: Definitions of Nutrient Content Claims. October 2009. Guidance for Industry: A Food Labeling Guide. [www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ucm064911.htm](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ucm064911.htm). Accessed 3/19/12.

such as *low fat* and *high fiber*. The FYI feature “Definitions for Nutrient Content Claims on Food Labels” contains a list of terms that may be used. The FDA has made an effort to make the terms meaningful, and the regulations have reduced the number of potentially misleading label statements. It would be misleading, for example, to print “cholesterol free” on a can of vegetable shortening—a food that is 100 percent fat and high in saturated and trans-fatty acids (types of fat that raise blood cholesterol levels). Although true, this type of statement misleads consumers who associate “cholesterol free” with “heart healthy.” Under the NLEA regulations, statements about low cholesterol content can be used only when the product is also low in saturated fat (less than 2 grams per serving). In addition to the content claims defined in the regulations, companies may submit to the FDA a notification of a new nutrient content claim based on “an authoritative statement from an appropriate scientific body of the United States Government or the National Academy of Sciences.”<sup>24</sup>

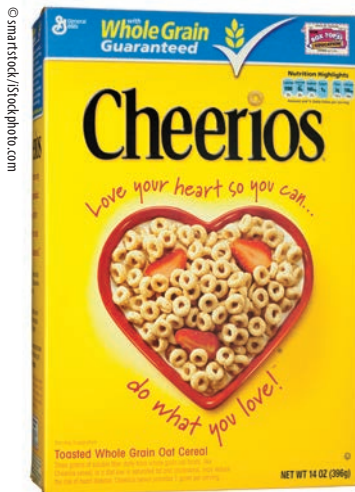
## Health Claims

**health claim** Any statement that associates a food or a substance in a food with a disease or health-related condition. The FDA authorizes health claims.

With the passage of the NLEA, manufacturers also were allowed to add health claims to food labels. A **health claim** is a statement that links one or more dietary components to reduced risk of disease—such as a claim that calcium helps reduce the risk of osteoporosis. Before the NLEA was passed, products making such claims were considered drugs, not foods.

A health claim must be supported by scientifically valid evidence for it to be approved for use on a food label. Regulations require a finding of “significant scientific agreement” before the FDA may authorize a new health claim. In addition, there are specific criteria for the use of claims. For example, a high-fiber food that is also high in fat is not eligible for a health claim. So far, the FDA has approved the following health claims:

- *Calcium, vitamin D, and osteoporosis:* Adequate calcium and vitamin D along with regular exercise may reduce the risk of osteoporosis.
- *Dietary fat and cancer:* Low-fat diets may reduce the risk for some types of cancer.
- *Dietary fiber, such as that found in whole oats, barley, and psyllium seed husk, and coronary heart disease (CHD):* Diets low in fat and rich in these types of fiber can help reduce the risk of heart disease.
- *Dietary noncarcinogenic carbohydrate sweeteners and dental caries (tooth decay):* Foods sweetened with sugar alcohols do not promote tooth decay.
- *Dietary saturated fat and cholesterol and coronary heart disease (CHD):* Diets high in saturated fat and cholesterol increase risk for heart disease.
- *Dietary saturated fat, cholesterol, and trans fat and heart disease:* Diets low in saturated fat and cholesterol and as low as possible in trans fat may reduce the risk of heart disease.
- *Fiber-containing grain products, fruits, and vegetables and cancer:* Diets low in fat and rich in high-fiber foods may reduce the risk of certain cancers.
- *Fluoridated water and dental caries:* Drinking fluoridated water may reduce the risk of dental caries.
- *Folate and neural tube defects:* Adequate folate intake prior to and early in pregnancy may reduce the risk of neural tube defects (a birth defect).
- *Fruits and vegetables and cancer:* Diets low in fat and rich in fruits and vegetables may reduce the risk of certain cancers.
- *Fruits, vegetables, and grain products that contain fiber, particularly pectins, gums, and mucilages, and CHD:* Diets low in fat and rich in these types of fiber may reduce the risk of heart disease.





- *Plant sterol/stanol esters and CHD*: Diets low in saturated fat and cholesterol that contain significant amounts of these additives may reduce the risk of heart disease.
- *Potassium and high blood pressure/stroke*: Diets that contain good sources of potassium may reduce the risk of high blood pressure and stroke.
- *Sodium and hypertension (high blood pressure)*: Low-sodium diets may help lower blood pressure.
- *Soy protein and CHD*: Foods rich in soy protein as part of a low-fat diet may help reduce the risk of heart disease.
- *Substitution of saturated fat with unsaturated fat and heart disease*: Replacing saturated fat with similar amounts of unsaturated fats may reduce the risk of heart disease.
- *Whole-grain foods and CHD or cancer*: Diets high in whole-grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may help reduce the risk of heart disease and certain cancers.

A new health claim may be proposed at any time, so this list might expand in the future. The most current information on label statements and claims can be found on food tab of the FDA website at [www.fda.gov](http://www.fda.gov).<sup>25</sup>

## Qualified Health Claims

Through an initiative called Consumer Health Information for Better Nutrition, the FDA hopes to facilitate the flow of information about sound dietary choices to consumers by allowing additional claims for foods and supplements. For many relationships between food components and the reduction of disease risk, the current scientific evidence is supportive but doesn't rise to the level of "significant scientific agreement" required for health claims. Consequently, the FDA does now allow manufacturers to submit health claims for approval for which the "weight of the evidence" supports the claimed relationship.<sup>26</sup> Such qualified health claims also may be made for dietary supplements.<sup>27</sup>

When a qualified health claim is approved, the allowed language and acceptable range of products are very specific. For example, the claim "Scientific evidence suggests but does not prove that eating 1.5 ounces per day of most nuts [such as almonds, hazelnuts, peanuts, and pecans] as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease."

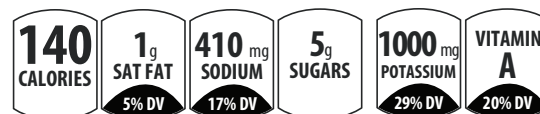
## Structure/Function Claims

Food labels also may contain **structure/function claims** that describe potential effects of a food, food component, or dietary supplement component on body structures or functions, such as bone health, muscle strength, and digestion. As long as the label does not claim to diagnose, cure, mitigate, treat, or prevent a disease, a manufacturer can claim that a product "helps promote immune health" or is an "energizer" if *some* evidence can be provided to support the claim. Currently, structure/function claims on foods must be related to the food's nutritive value. Many scientists are concerned about the lack of a consistent scientific standard for both health claims and structure/function claims.

## Using Labels to Make Healthful Food Choices

What's the best way to start using information on food labels to make food choices? Let's look at a couple examples. Perhaps one of your goals is to add more iron to your diet. Compare the cereal labels in Figure 2.11. Which cereal contains a higher percentage of the Daily Value for iron? How do they compare in terms of sugar content? What about vitamins and other minerals?

### PER 1 CUP SERVING



*Facts Up Front* is a new voluntary food and beverage industry nutrient-based labeling initiative that summarizes important nutrition information on the front of food packages with the intention of helping busy consumers make healthier food choices.

**Source:** Courtesy of Grocery Manufacturers Association, available at <http://www.factsupfront.org>.

**structure/function claims** These statements may claim a benefit related to a nutrient-deficiency disease (e.g., *vitamin C prevents scurvy*) or describe the role of a nutrient or dietary ingredient intended to affect a structure or function in humans (e.g., *calcium helps build strong bones*).

Nutrition Facts	
Serving Size: 1 Entrée (240g)	
Servings Per Container: 1	
Amount Per Serving	
<b>Calories</b> 400	Calories from fat 150
% Daily Value*	
<b>Total Fat</b> 16g	25%
Saturated Fat 2.5g	13%
Trans Fat 1g	
<b>Cholesterol</b> 10mg	3%
<b>Sodium</b> 780mg	33%
<b>Total Carbohydrate</b> 56g	19%
Dietary Fiber 2g	8%
Sugars 2g	
<b>Protein</b> 8g	
Vitamin A 2%	Vitamin C 4%
Calcium 6%	Iron 4%

### Product A

Nutrition Facts	
Serving Size: 1 package (269g)	
Servings Per Container: 1	
Amount Per Serving	
<b>Calories</b> 400	Calories from fat 140
% Daily Value*	
<b>Total Fat</b> 16g	24%
Saturated Fat 6g	30%
Trans Fat 2g	
<b>Cholesterol</b> 40mg	14%
<b>Sodium</b> 690mg	29%
<b>Total Carbohydrate</b> 48g	16%
Dietary Fiber 2g	9%
Sugars 5g	
<b>Protein</b> 15g	
Vitamin A 10%	Vitamin C 8%
Calcium 20%	Iron 15%

### Product B

**Figure 2.12** Comparing product labels. Labels might look similar, but appearances can be deceptive. Compare the amounts of saturated fat and sodium in these two products.

**nutrition assessment** Measurement of the nutritional health of the body. It can include anthropometric measurements, biochemical tests, clinical observations, and dietary intake, as well as medical histories and socioeconomic factors.

Maybe it's a frozen entrée you're after. Look at the two examples in **Figure 2.12**. Which is the best choice nutritionally? Are you sure? Sometimes the answer is not clear-cut. Product A is higher in sodium, whereas Product B has more saturated and trans fat. It would be important to know about the rest of your dietary intake before deciding. Do you already have quite a bit of sodium in your diet, or are you likely to add salt at the table? Maybe you never salt your food, so a bit extra in your entrée is okay. If you know that your saturated fat intake is already a bit high, however, Product A might be a better choice. To make the best choice, you should know which substances are most important in terms of your own health risks. The label is there to help you make these types of food decisions.

**Key Concepts** Making food choices at the grocery store is your opportunity to implement the *Dietary Guidelines for Americans* and your MyPlate-planned diet. The Nutrition Facts panel on most packaged foods contains not only specific amounts of nutrients shown in grams or milligrams, but also comparisons between amounts of nutrients in a food and recommended intake values. These comparisons are reported as %DV (Daily Values). The %DV information can be used to compare two products or to see how individual foods contribute to the total diet.

## Nutrition Assessment: Determining Nutritional Health

In a nutritional sense, what does it mean to be healthy? Nutritional health is quite simply obtaining all nutrients in amounts needed to support body processes. We can measure nutritional health in a number of ways. Taken together, such measurements can give you insight into your current and long-term well-being. The process of measuring nutritional health is usually termed **nutrition assessment**.

Nutrition assessment serves a variety of purposes. It can help evaluate nutrition-related risks that can jeopardize a person's current or future health. Nutrition assessment is a routine part of the nutritional care of hospitalized patients. In this setting, nutrition assessment not only identifies risks but also measures the effectiveness of treatment. In public health, nutrition assessment helps to identify people in need of nutrition-related interventions and to monitor the effectiveness of intervention programs. Sometimes, assessments determine the nutritional health of an entire population—identifying health risks common in a population group so that specific policy measures can be developed to combat them.

## The Continuum of Nutritional Status

Your nutritional status can be seen as a point along a continuum, with undernutrition and overnutrition at the extremes. Chronic undernutrition results in the development of nutritional deficiency diseases, as well as conditions of energy and protein malnutrition, and can lead to death. Unlike starvation, **undernutrition** is a condition in which *some* food is being consumed, but the intake is not nutritionally adequate. Although chronic undernutrition and associated deficiency diseases were common in the United States in the 1800s and early 1900s, today they are rare. Undernutrition now is most often associated with extreme poverty, alcoholism, illness, or some types of eating disorders.

**Overnutrition** is the chronic consumption of more than is necessary for good health. Specifically, overnutrition is the regular consumption of excess calories, fats, saturated fats, or cholesterol—all of which increase risk for chronic disease. Today, nutrition-related chronic diseases such as heart disease, cancer, stroke, and diabetes are among the 10 leading causes of death in the United States. All these problems have been linked to dietary excess.

(Remember that epidemiological [population] studies can show associations between various factors and diseases, but these correlations do not necessarily indicate cause and effect.)

Between these two extremes lies a region of good health. Good food and lifestyle choices, a balanced diet, and regular exercise help to reduce the risk of chronic disease and delay its onset, keeping us in a region of good health for more of our lifetime.

## Nutrition Assessment of Individuals

In health care settings, a registered dietitian or physician can do an individual nutrition assessment of a patient or client. Depending on the purpose of the nutrition assessment, the measures can be very comprehensive and detailed. A dietitian can then use this information to plan individualized nutrition counseling. Nutrition assessment measures are often repeated to assess the effectiveness of nutrition counseling.

## Nutrition Assessment of Populations

Typically, nutrition assessment of populations is not as comprehensive as an assessment of an individual. One of the largest ongoing nationwide surveys of dietary intake and health status is the National Health and Nutrition Examination Survey (NHANES). The survey is unique in that it combines interviews and physical examinations.

The NHANES program began in the early 1960s and has been conducted as a series of surveys focusing on different population groups or health topics. In 1999, the survey became a continuous program to meet emerging needs, with a changing focus on a variety of health and nutrition measurements. Data from NHANES have told us a great deal about the nutritional status and dietary intake of our population. This information is released periodically as the *What We Eat in America* report.

## Nutrition Assessment Methods

Just as there is not only one measure of physical fitness, there is not just one indicator of nutritional health. Nutrients play many roles in the body, so measures of nutritional status must look at many factors. Often these factors are called the **ABCDs of nutrition assessment**: anthropometric measurements, biochemical tests, clinical observations, and dietary intake. (See [Table 2.7](#).)

**undernutrition** Poor health resulting from depletion of nutrients caused by inadequate nutrient intake over time. It is now most often associated with poverty, alcoholism, and some types of eating disorders.

**overnutrition** The long-term consumption of an excess of nutrients. The most common type of overnutrition in the United States results from the regular consumption of excess calories, fats, saturated fats, and cholesterol.

**ABCDs of nutrition assessment** Nutrition assessment components: anthropometric measurements, biochemical tests, clinical observations, and dietary intake.

**Table 2.7** The ABCDs of Nutrition Assessment

Assessment Method	Why It's Done
Anthropometric measures	Measure growth in children; show changes in weight that can reflect diseases (e.g., cancer, thyroid problems); monitor progress in fat loss
Biochemical tests	Measure blood, urine, and feces for nutrients or metabolites that indicate infection or disease
Clinical observations	Assess change in skin color and health, hair texture, fingernail shape, etc.
Dietary intake	Evaluate diet for nutrient (e.g., fat, calcium, protein) or food (e.g., number of fruits and vegetables) intake



**anthropometric measurements** Measurements of the physical characteristics of the body, such as height, weight, head circumference, girth, and skinfold measurements. Anthropometric measurements are particularly useful in evaluating the growth of infants, children, and adolescents and in determining body composition.

**skinfold measurements** A method to estimate body fat by measuring with calipers the thickness of a fold of skin and subcutaneous fat.

To convert inches to centimeters, multiply the number of inches by 2.54

$$\text{inches} \times 2.54 = \text{centimeters}$$

To convert pounds to kilograms, divide the number of pounds by 2.2

$$\text{pounds} \div 2.2 = \text{kilograms}$$

## Anthropometric Measurements

**Anthropometric measurements** are physical measurements of the body, such as height and weight, head circumference, girth measurement, or skinfold measurements.

### Height and Weight

To provide useful information, height and weight must be accurately measured. For infants and very young children, measurement of height is really measurement of recumbent length (that is, length when they are lying down). Careful measurement of length at each checkup gives a clear indication of a child's growth rate. Standard growth charts show how the child's growth compares with that of others of the same age and sex. For children 2 to 20 years old, charts illustrating growth are based on standing height, or stature.

The standing height of older children and adults can be determined with a tape measure fixed to a wall and a sliding right-angle headboard for reading the measurement. Aging adults lose some height as a result of bone loss and curvature, so it is important to *measure* height and not simply rely on remembered values.

Weight is a critical measure in nutrition assessment. It is used to assess children's growth, predict energy expenditure and protein needs, and determine body mass index. Weight should be measured using a calibrated scale. For assessments that need a high degree of precision, subtract the weight of the clothing. Because many calculations and standards use metric measures of height and weight, it's important to be familiar with standard conversion factors.

For the anthropometric assessment of infants and young children, a third measurement is common: head circumference. This is measured using a flexible tape measure placed snugly around the head. Head circumference measures are compared with standard growth charts and are another useful indicator of normal growth and development, especially during rapid growth from birth to age 3 years.

### Body Mass Index

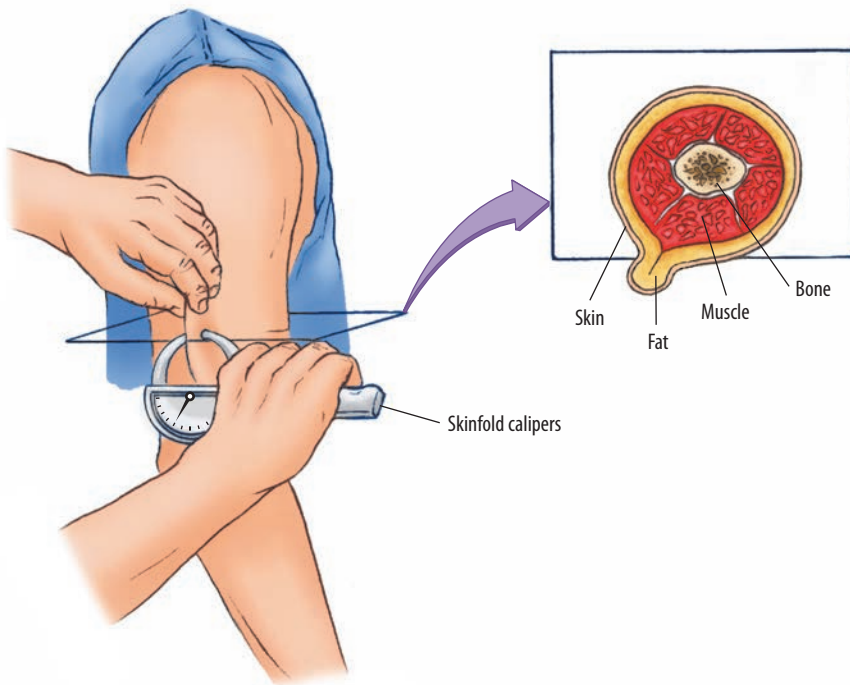
Body mass index (BMI) is a useful tool to estimate weight status of an individual. Assessed as the ratio of body weight for height, it is easy to calculate and can be a reasonably accurate measure of the health risks associated with body weight. Based on standards issued by the National Institutes of Health and adopted by the *Dietary Guidelines for Americans*, body weight status is categorized as underweight, healthy weight, overweight, and obese to describe a weight for a given height.

### Waist Circumference

One of the simplest means of determining body fat distribution uses waist circumference. Waist circumference is a good indicator of abdominal fat and risk for chronic diseases in adults.<sup>28</sup>

### Skinfolds

**Skinfold measurements** serve a variety of purposes. Because a significant amount of the body's fat stores is located right beneath the skin (subcutaneous fat), skinfold measurements at various sites around the body can give a good indication of body fatness. This information can be used to evaluate the physical fitness of an athlete or predict the risk of obesity-related disorders. Skinfold measurements also are useful in cases of illness; the maintenance of fat stores in a patient's body is a valuable indicator of dietary adequacy. Skinfold measurements are made with special calipers (see **Figure 2.13**).



**Figure 2.13** Skinfold measurements.

A significant amount of the body's fat stores lies just beneath the skin, so when done correctly, skinfold measurements can provide an indication of body fatness. An inexperienced or careless measurer, however, can easily make large errors. Skinfold measurements usually work better for monitoring malnutrition than for identifying overweight and obesity.

For reliable measurements, training in the use of calipers is essential. Skinfold measurements can be used to estimate the percentage of body fat or can be compared with percentile tables for specific sex and age categories.

## Biochemical Tests

Because of their relation to growth and body composition, anthropometric measurements give a broad picture of nutritional health—whether the diet contains enough calories and protein to maintain normal patterns of growth, normal body composition, and normal levels of lean body mass. However, anthropometric measures do not give specific information about *nutrients*. For that information, a variety of biochemical tests is useful.

**Biochemical assessment** measures a nutrient or metabolite (a related compound) in one or more body fluids, such as blood or urine, or in feces. For example, the concentration of albumin (an important transport protein) in the blood can be an indicator of the body's protein status. If little protein is eaten, the body produces smaller amounts of body proteins such as albumin.

Biochemical assessments can include measurements of a nutrient metabolite, a storage or transport compound, an enzyme that depends on a vitamin or mineral, or another indicator of the body's functioning in relation to a particular nutrient. These measures usually are a better indicator of nutritional status than directly measuring blood levels of nutrients such as vitamin A or calcium. The levels of nutrients excreted in the urine or feces also provide valuable information.

## Clinical Observations

**Clinical observations**—the characteristics of health that can be seen during a physical exam—help to complete the picture of nutritional health. Although often nonspecific, clinical signs are clues to nutrient deficiency or excess that can be confirmed or ruled out by further testing. In a clinical nutrition examination, a clinician observes the hair, nails, skin, eyes, lips, mouth, bones,

**biochemical assessment** Assessment by measuring a nutrient or its metabolite in one or more body fluids, such as blood and urine, or in feces. Also called laboratory assessment.

**clinical observations** Assessment by evaluating the characteristics of well-being that can be seen in a physical exam. Nonspecific, clinical observations can provide clues to nutrient deficiency or excess that can be confirmed or ruled out by biochemical testing.

## Quick Bite

### Nutrition and Nails

Do your nails have white marks or ridges? Contrary to popular belief, that does not necessarily mean you have a vitamin deficiency. Usually a slight injury to the nail causes white marks or ridges.

**diet history** Record of food intake and eating behaviors that includes recent and long-term habits of food consumption. Conducted by a skilled interviewer, the diet history is the most comprehensive form of dietary intake data collection.

**food records** Detailed information about day-to-day eating habits; typically includes all foods and beverages consumed for a defined period, usually three to seven consecutive days.

**weighed food records** Detailed food records obtained by weighing foods before eating and then weighing leftovers to determine the exact amount consumed.

#### food frequency questionnaire (FFQ)

A questionnaire for nutrition assessment that asks how often the subject consumes specific foods or groups of foods, rather than what specific foods the subject consumes daily. Also called food frequency checklist.

**24-hour dietary recall** A form of dietary intake data collection. The interviewer takes the client through a recent 24-hour period (usually midnight to midnight) to determine what foods and beverages the client consumed.

muscles, and joints. Specific findings, such as cracking at the corners of the mouth (suggestive of riboflavin, vitamin B<sub>6</sub>, or niacin deficiency) or petechiae (small, pinpoint hemorrhages on the skin indicative of vitamin C deficiency), need to be followed by other assessments. Clinical assessment should also include an evaluation of personal, social, environmental, and lifestyle factors that could impact access to healthy food and nutritional well-being.

## Dietary Intake

A picture of nutritional health would not be complete without information about dietary intake. Dietary information can confirm the lack or excess of a dietary component suggested by anthropometric, biochemical, or clinical evaluations.

There are a number of ways to collect dietary intake data. Each has strengths and weaknesses. It is important to match the method to the type and quantity of data needed. Remember, too, that the quality of information obtained about people's diets often relies heavily on people's memories, as well as their honesty in sharing those recollections. How well do you remember *everything* you ate yesterday?

### Diet History

The most comprehensive form of dietary intake data collection is **diet history**. In this method, a skilled interviewer finds out not only what the client has been eating in the recent past but also the client's long-term food consumption habits. The interviewer's questions also address other risk factors for nutrition-related problems, such as economic issues.

### Food Record

**Food records**, or diaries, provide detailed information about day-to-day eating habits. Typically, a person records all foods and beverages consumed during a defined period, usually three to seven consecutive days. Because food records are recorded concurrently with intake, they are less prone to inaccuracy from lapses in memory. The data are completely self-reported, therefore, food records are not accurate if the person fails to record all items or changes their usual food intake while completing the record. To make food records more precise, the items in a meal can be weighed before consumption. Remaining portions are weighed at the end of the meal to determine exactly how much was eaten. **Weighed food records** are much more time consuming to complete.

### Food Frequency Questionnaire

A **food frequency questionnaire (FFQ)** asks how often the subject consumes specific foods or groups of foods, rather than what specific foods the subject consumes daily. A food frequency questionnaire might ask, for example, "How often do you drink a cup of milk?" with the response options of daily, weekly, monthly, and so on. This information is used to estimate that person's average daily intake.

Although food frequency questionnaires do not require a trained interviewer and can be relatively quick to complete, there are disadvantages to this method of data collection. One problem is that it is often difficult to translate people's response to how often they drink milk, or how many cups of milk they drink per week, into specific nutrient values without more detailed information. More important, food frequency questionnaires require a person to average, over a long period, foods consumed erratically in portions that are sometimes large and sometimes small.

## 24-Hour Dietary Recall

The **24-hour dietary recall** is the simplest form of dietary intake data collection. In a 24-hour recall, the interviewer takes the client through a recent 24-hour period (usually midnight to midnight) to determine what foods and beverages the client consumed. To get a complete, accurate picture of the subject's diet, the interviewer must ask probing questions such as "Did you put anything on your toast?" but not leading questions such as "Did you put butter and jelly on your toast?" Comprehensive population surveys frequently use 24-hour recalls as the main method of data collection. Although a single 24-hour recall is not very useful for describing the nutrient content of an individual's overall diet (there's too much day-to-day variation), in large-scale studies it gives a reasonably accurate picture of the average nutrient intake of a population. Multiple dietary recalls also are useful for estimating the nutrient intake of individuals.

## Methods of Evaluating Dietary Intake Data

Once the data are collected, the next step is to determine the nutrient content of the diet and evaluate that information in terms of dietary standards or other reference points. This is commonly done using nutrient analysis software. Computer programs remove the tedium of looking up foods in tables of nutrient composition; large databases allow for simple access to food composition, and the computer does the math automatically.

## Comparison to Dietary Standards

It is possible to compare a person's nutrient intake to dietary standards such as the RDA or AI values. Although this will give a quantitative idea of dietary adequacy, it cannot be considered a definitive evaluation of a person's diet because we don't know that individual's specific nutrient requirements. The bottom line is that comparisons of individual diets to RDA or AI values should be interpreted with caution.<sup>29</sup>

## Comparison to MyPlate and the Dietary Guidelines for Americans

The MyPlate system has several online tools for assessment of dietary intake. Individuals (or evaluators) can use the SuperTracker feature on the ChooseMyPlate.com website to compare a typical day's intake to the MyPlate groups and *Dietary Guidelines*. Although these evaluations usually are not specific, they give a general idea of whether the subject's diet is high or low in saturated fat, or whether the subject is eating enough fruits, vegetables, and whole grains.

## Outcomes of Nutrition Assessment

When taken together, anthropometric measures, biochemical tests, clinical exams, and dietary evaluation, along with the individual's family history, socioeconomic situation, and other factors, give a complete picture of nutritional health. A client's assessment can lead to a recommendation for a diet change to reduce weight or blood cholesterol, the addition of a vitamin or mineral supplement to treat a deficiency, the identification of abnormal growth resulting from inadequate infant feeding, or simply the affirmation that dietary intake is adequate for current nutrition needs.

**Key Concepts** Nutrition assessment involves the collection of various types of data—anthropometric measurements, biochemical tests, clinical observations, and dietary intake—for a complete picture of one's nutritional health. Such data are compared to established standards to diagnose nutritional deficiencies, identify dietary inadequacies, or evaluate progress as a result of dietary changes.



## Dietary Guidelines for Americans, 2010

### Foods and Food Components to Reduce: Key Recommendations

- Reduce daily sodium intake to less than 2,300 milligrams (mg) (equals 1 teaspoon) and further reduce intake to 1,500 milligrams among persons who are 51 years or older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500-milligram recommendation applies to about half of the U.S. population, including children, and the majority of adults.
- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.
- Consume less than 300 milligrams per day of dietary cholesterol.
- Keep trans fatty acid consumption as low as possible by limiting foods that contain synthetic sources of trans fats, such as partially hydrogenated oils, and by limiting other solid fats.
- Reduce the intake of calories from solid fats and added sugars.
- Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.
- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age.

**Source:** Reproduced from US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; December 2010.

# Learning Portfolio



## Key Terms

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ABCs of nutrition assessment	61	food records	64
Acceptable Macronutrient Distribution Ranges (AMDRs)	52	fortify	55
Adequate Intake (AI)	51	health claim	58
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Canada's Guidelines for Healthy Eating	38	nutrient density	30
clinical observations	63	nutrition assessment	60
Daily Values (DVs)	56	Nutrition Facts	54
diet history	64	Nutrition Labeling and Education Act (NLEA)	53
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dietary standards	49	Recommended Dietary Allowances (RDAs)	50
<i>Eating Well with Canada's Food Guide</i>	38	Recommended Nutrient Intakes (RNIs)	50
enrich	55	requirement	50
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Exchange Lists	48	structure/function claims	59
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food groups	39	undernutrition	60
food label	53	U.S. Department of Agriculture (USDA)	32
Food and Nutrition Board	50	U.S. Department of Health and Human Services (DHHS)	32
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## Study Points

- The diet-planning principles of adequacy, balance, calorie (energy) control, nutrient density, moderation, and variety are important concepts in choosing a healthful diet.
- The *Dietary Guidelines for Americans* gives consumers advice regarding general components of the diet.
- MyPlate is a graphic representation of a food guidance system that supports the principles of the *Dietary Guidelines for Americans*.
- Each food group in MyPlate has a recommended daily amount based on calorie needs. A variety of foods from each group can supply all the nutrients.
- The Exchange Lists are a diet-planning tool most often used for diabetic or weight-control diets.

- Servings for each food in the Exchange Lists are grouped so that equal amounts of carbohydrate, fat, and protein are provided by each choice.
- Dietary standards are values for individual nutrients that reflect recommended intake levels. These values are used for planning and evaluating diets for groups and individuals.
- The Dietary Reference Intakes are the current dietary standards in the United States and Canada. The DRIs consist of several types of values: EAR, RDA, AI, UL, EER, and AMDR.
- Nutrition information on food labels can be used to determine a more healthful diet.
- Label information not only provides the gram or milligram amounts of the nutrients present, but also gives a percentage of Daily Values so that the consumer can compare the amount in the food to the amount recommended for consumption each day.
- Nutrition information, label statements, and health claims are specifically defined by the regulations that were developed after passage of the Nutrition Labeling and Education Act of 1990.
- Nutrition assessment is a process of determining the overall health of a person as related to nutrition.
- Nutrition assessment involves four major evaluations: anthropometric measurements, biochemical tests, clinical observations, and dietary intake.

## Study Questions

1. Define undernutrition and overnutrition.
2. What is the purpose of the *Dietary Guidelines for Americans*? List the two overarching concepts of the 2010 *Dietary Guidelines for Americans*.
3. What are the recommended amounts for each food group of MyPlate for a 2,000-calorie diet?
4. Describe how the exchange system works and why people with diabetes might use it.
5. List and define four main Dietary Reference Intake categories.
6. List five mandatory components found on all food labels.
7. The standard Nutrition Facts panel shows information on which nutrients?
8. What is the purpose of the "% Daily Value" listed next to most nutrients on food labels?
9. Define three types of claims that might be found on food labels.



## Try This

### Are You a MyPlate Pleaser?

Keep a detailed food diary for three days. Make sure to include things you drink, along with the amounts (e.g., cups, ounces, tablespoons) of each food or beverage. How well do you think your intake matches the *Dietary Guidelines* and MyPlate recommendations? To find out, go to [ChooseMyPlate.gov](http://ChooseMyPlate.gov) and click on SuperTracker, and then on Food Tracker. This feature allows you to do an online assessment of your food intake. Follow the directions to register and then enter your Personal Profile. Then, click on Proceed to Food Intake and enter each food you ate for one day. When you are done, you can click on Analyze Your Food Intake and see the comparisons to the *Dietary Guidelines* and MyPlate.

How did you do? From which groups did you tend to eat more than is recommended? Were there any groups for which you did not meet the recommendations? Was there a day-to-day variation in the number of servings you ate of each group? Use the results of this activity to plan ways you can improve your diet. You might want to visit this site frequently to monitor changes you are making in your food intake.

### Grocery Store Scavenger Hunt

On your next trip to the grocery store, find a food item that has any number other than a “0” listed for the two vitamins and minerals required to be listed on the food label %DV. It doesn’t matter whether you choose a cereal, soup, cracker, or snack item, as long as it has numbers other than “0” for all four items. Once you’re home, review the Daily Values (inside the back cover) and calculate the number of milligrams of calcium, iron, and vitamin C found in each serving of your food. Next, take a look at vitamin A: How many International Units (IUs) does each serving of your product have? If you can calculate these, you should have a better understanding of % Daily Values.

## What About Bobbie?

Now that you have learned something about the recommendations for a healthful diet, how do you think Bobbie did? Review her one-day food record, listed in the right column.

How closely does Bobbie’s intake fit MyPlate? Do you think she met most of the *Dietary Guidelines*? What about the RDA and AI values? Was her diet balanced enough to meet most of these recommendations? The following table summarizes the results of a computerized nutrient analysis of Bobbie’s diet.

You might be completing a similar analysis of your own diet as part of your course requirements. Later, you will explore many of these nutrients further and look at

### Sample one-day menu from Bobbie’s diet

#### 7:45 A.M.

1 raisin bagel, toasted  
3 tablespoons light cream cheese  
10 fluid ounces regular coffee  
2 packets of sugar  
2 tablespoons of 2% milk

#### 10:15 A.M.

1 banana

#### 12:15 P.M.

Turkey and cheese sandwich  
2 slices sourdough bread  
2 ounces sliced turkey lunch meat  
2 teaspoons regular mayonnaise  
2 teaspoons mustard  
2 slices tomato  
2 slices dill pickle  
shredded lettuce  
Salad from cafeteria salad bar  
2 cups shredded iceberg lettuce  
2 tablespoons each:  
shredded carrot  
chopped egg  
croutons  
kidney beans  
Italian salad dressing  
12 fluid ounces diet soda  
1 small chocolate chip cookie

#### 3:30 P.M.

16 fluid ounces water  
1½ ounces regular tortilla chips  
½ cup salsa

#### 6:00 P.M.

Spaghetti with meatballs  
1½ cups pasta  
3 ounces ground beef (meatballs)  
3 ounces spaghetti sauce  
2 tablespoons Parmesan cheese  
1 piece garlic bread  
½ cup green beans  
1 teaspoon butter  
12 fluid ounces diet soda

#### 10:15 P.M.

1 slice cheese pizza

the foods in Bobbie’s diet that contribute various nutrients. Keep in mind that this is only a one-day food record and might or might not represent her typical diet.

How do you think Bobbie’s food choices fit with the *Dietary Guidelines for Americans* and MyPlate? Can you classify all of Bobbie’s foods into one of the MyPlate groups? Some items, like the cheese pizza, have elements

	<b>Bobbie</b>	<b>RDA/AI</b>	<b>%RDA/AI</b>
Calories	2,300	2,290*	100%
Carbohydrates	292 g	130 g	225%
Fiber	25 g	25 g	100%
Fat	86 g	25 g	—
Cholesterol	261 mg	—	—
Protein	96 g	46 g	209%
Vitamin A	493 mcg RAE	700 mcg RAE	70%
Vitamin D	0.5 mcg	5 mcg	10%
Vitamin E	9 mg	15 mg	60%
Thiamin	2.0 mg	1.1 mg	182%
Riboflavin	2.2 mg	1.1 mg	200%
Niacin	27.5 mg	14 mg	196%
Vitamin B <sub>6</sub>	2.0 mg	1.3 mg	154%
Folate	650 mcg	400 mcg	163%
Vitamin B <sub>12</sub>	3.7 mcg	2.4 mcg	154%
Vitamin C	42 mg	75 mg	56%
Pantothenic acid	3.7 mg	5 mg	74%
Sodium	4,820 mg	1,500 mg	321%
Potassium	2,890 mg	4,700 mg	61%
Calcium	710 mg	1,000 mg	71%
Phosphorus	1,230 mg	700 mg	176%
Magnesium	310 mg	310 mg	100%
Iron	20 mg	18 mg	111%
Zinc	12 mg	8 mg	125%
Copper	1,560 mcg	900 mcg	173%
Manganese	2.8 mg	1.8 mg	156%
Selenium	152 mcg	55 mcg	276%

\*EER for 19-year-old female, 155 pounds, 5'4", low active. RAE, Retinol Activity Equivalents.

of more than one group. Others, like the dill pickle, don't seem to fit anywhere.

When Bobbie entered her food intake into the MyPlate diet analyzer, SuperTracker, she learned her diet was low in milk, fruits, and meat and beans. She was high in the Grains group, but without much whole grain. Her fat intake was also a little high, as was sodium. It's probably not fair to evaluate just this single day of eating, though. We would need to know more about Bobbie's usual diet and lifestyle before making specific recommendations.

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