

Tools for Designing a Healthy Diet

2

Real Life Scenario



Andy is like many other college students. He grew up on a quick bowl of cereal and milk for breakfast and a hamburger, French fries, and cola for lunch, either in the school cafeteria or at a local fast-food restaurant. At dinner, he generally avoided eating any of his salad or vegetables, and by 9 o'clock he was deep into bags of chips and cookies. Andy has taken most of these habits to college. He prefers coffee for breakfast and possibly a chocolate bar. Lunch is still mainly a hamburger, French fries, and cola, but pizza and tacos now alternate more frequently than when he was in high school. One thing Andy really likes about the restaurants surrounding campus is that, for just about half a dollar more, he can *supersize* his meal. This helps him stretch his food dollar; searching out value meals for lunch and dinner now has become part of a typical day.

Can you provide some dietary advice for Andy? Start with his positive habits and then

provide some constructive criticism, based on what you now know.

Chapter 2 Objectives

Chapter 2 is designed to allow you to:

1. Develop a healthy eating plan.
2. Outline the ABCDEs of nutrition assessment: *anthropometric, biochemical, clinical, dietary, and economic.*
3. Describe what the Recommended Dietary Allowances (RDAs) and other dietary standards represent.
4. Learn the food groupings used in MyPyramid.
5. List the Dietary Guidelines and the diseases these guidelines are designed to prevent or minimize.
6. Describe what a nutrition label currently consists of and the various health claims and label descriptors that are allowed.

Check out the **Contemporary Nutrition Online Learning Center**

www.mhhe.com/wardlawcont6 for quizzes, flash cards, other activities, and web links designed to further help you learn about various tools for diet planning.

Chapter 2 Outline

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Chapter 2 Objectives
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A Food Philosophy That Works
States of Nutritional Health
How Can Your Nutritional State Be Measured?
Recommendations for Food Choice
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Rate Your Plate

How many times have you heard wild claims about how healthful certain foods are for you? As consumers focus more and more on diet and disease, food manufacturers are asserting that their products have all sorts of health benefits. Supermarket shelves have begun to look like an 1800s medicine show. “Take fish oil capsules to avoid a heart attack.” “Eat more olive oil and oat bran to lower blood cholesterol.” Hearing these claims, you would think that food manufacturers have solutions to all of our health problems.

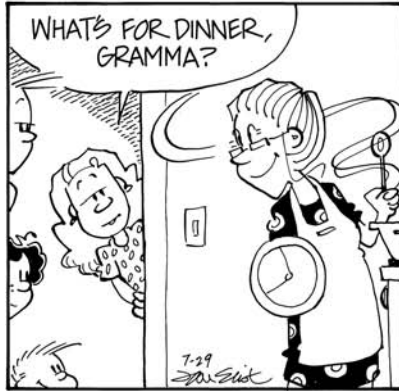
Advertising aside, nutrient intakes that are out of balance with our needs—such as excess calories, saturated fat, cholesterol, *trans* fat, salt, alcohol, and sugar intakes—are linked to many leading causes of death in North America, including obesity, hypertension, cardiovascular disease, cancer, liver disease, and type 2 diabetes. Physical inactivity is also too common. In Chapter 2, you will explore the components of a healthy diet and lifestyle—an approach that will minimize your risks of developing nutrition-related diseases. The goal is to provide you with a firm understanding of these concepts before you study the nutrients in detail.

Refresh Your Memory

As you begin your study of diet planning in Chapter 2, you may want to review:

- The terms in the margin in Chapter 1 and Table 1-1.
- The impact of the Dietary Supplement Health and Education Act (DSHEA) on certain label claims in Chapter 1.

STONE SOUP



JAN ELIOT

On what do nutrition experts generally agree regarding a healthy food or diet? Why is a diet rich in fiber that includes some fish and is low in fried foods and animal fat emphasized, along with at least 30 minutes or more of physical activity on most or all days of the week? Are North Americans generally following this plan? What are the potential consequences for those who do not? Chapter 2 provides some answers.

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A Food Philosophy That Works

You may be surprised to learn that what you should eat to minimize the risk of developing the common nutrition-related diseases seen in North America is exactly what you've heard many times before: *Consume a variety of foods balanced by a moderate intake of each food.* A variety of foods is best because no one food meets all your nutrient needs. Meat provides protein and iron but little calcium and no vitamin C. Eggs also provide protein but little calcium because the calcium is mostly in the shell. Cow's milk contains calcium, but very little iron. And none of these foods contains fiber. Thus you need a variety of foods in your diet because the required nutrients are scattered among many foods.

Health professionals have recommended the same basic diet and health plan for the past 40 years: Control how much you eat, focus on the major food groups, and stay physically active. Whole-grain breads and cereals, fruits, and vegetables have always been among the foods emphasized for our diet for these past 40 years.

It is disappointing, however, that according to a recent survey conducted by the American Dietetic Association, two of five people in the United States believe that following a healthful diet means completely giving up foods they enjoy. To the contrary, a healthful diet requires only some simple planning and doesn't have to mean deprivation and misery. Besides, eliminating favorite foods typically doesn't work for "dieters" in the long run. The best plan consists of learning the basics of a healthful diet—a variety and balance of foods from all food groups and moderate consumption of all foods. Let's now fine-tune this advice by focusing on variety, balance, moderation, nutrient density, and energy density.

Variety Means Eating Many Different Foods

Variety in your diet means choosing a number of different foods within any given food group rather than eating the "same old thing" day after day. Variety makes meals more interesting and helps ensure that a diet contains sufficient nutrients. For example, carrots—a rich source of a pigment that forms vitamin A—may be your favorite vegetable; however, if you choose carrots every day as your only vegetable source, you may miss out on the vitamin folate. Other vegetables, such as broccoli and asparagus,

Some people would like to live mostly on French fries. What is the nutrient content of French fries? Check the food composition table in Appendix J for the vitamin C content of French fries. How many servings would you need to eat to meet vitamin C needs (75 to 95 milligrams)?

(Answer: 4 to 5 servings)

Monitoring total calorie intake is also important for many of us, especially if unwanted weight gain is taking place.

phytochemical A chemical found in plants. Some phytochemicals may contribute to a reduced risk of cancer or cardiovascular disease in people who consume them regularly.

Some research suggests that increasing variety in a diet can lead to overeating. Thus, as one incorporates a wide variety of foods in a diet, attention to total calorie intake is also important to consider.

Foods rich in phytochemicals are now part of a family of foods referred to as **functional foods**. A functional food is a food that provides health benefits beyond those supplied by the traditional nutrients it contains. Since a tomato contains the phytochemical lycopene, it can be called a functional food. You may hear this term more from the food industry in the future.



Fruits, vegetables, beans, and whole-grain breads and cereals are typically rich in phytochemicals.

are rich sources of this nutrient. This concept is true of all classes of foods: fruits, vegetables, grains, and so on. Different foods within each class vary somewhat in the nutrients they contain, but they generally provide similar types of nutrients.

An added bonus of variety in the diet, especially within the fruit and vegetable groups, is the inclusion of a rich supply of what scientists call **phytochemicals**. These plant components are not considered essential nutrients in the diet. Still, many of these substances provide significant health benefits. Considerable research attention is focused on various phytochemicals in reducing the risk for certain diseases (e.g., cancer). You can't just buy a bottle of phytochemicals—they are generally available only within whole foods. Current multivitamin and mineral supplements contain few or none of these beneficial plant chemicals.

Numerous population studies show reduced cancer risk among people who regularly consume fruits and vegetables. This is true for cancer of the gastrointestinal (GI) tract, breast, lung, and bladder. Researchers surmise that some phytochemicals present in the fruits and vegetables block the cancer process. The cancer process and the specific roles of some phytochemicals in this regard are described in the Looking Further section in Chapter 15. For now, realize that cancer develops over many years via a multistep process. If an agent such as a phytochemical can block any one of the steps in this process, the chances that cancer will ultimately appear in the body are reduced. Some phytochemicals also have been linked to a reduced risk of cardiovascular disease. Could it be that, because humans evolved on a wide variety of plant-based foods, the body developed with a need for these phytochemicals, along with the various nutrients present, to maintain optimal health?

It will likely take many years for scientists to unravel the important effects of the myriad of phytochemicals in foods, and it is unlikely that all will ever be available or effective in supplement form. For this reason, leading nutrition and medical experts suggest that a diet rich in fruits, vegetables, and whole-grain breads and cereals is the most reliable way to obtain the potential benefits of phytochemicals. Table 2-1 lists

Table 2-1 Some Phytochemical Compounds Under Study

Phytochemical	Food Sources
Allyl sulfides/organosulfurs	Garlic, onions, leeks
Saponins	Garlic, onions, licorice, legumes
Carotenoids (e.g. lycopene)	Orange, red, yellow fruits and vegetables (egg yolks are a source as well)
Monoterpenes	Oranges, lemons, grapefruit
Capsaicin	Chili peppers
Lignans	Flaxseed, berries, whole grains
Indoles	Cruciferous vegetables (broccoli, cabbage, kale)
Isothiocyanates	Cruciferous vegetables, especially broccoli
Phytosterols	Soybeans, other legumes, cucumbers, other fruits and vegetables
Flavonoids	Citrus fruit, onions, apples, grapes, red wine, tea, chocolate, tomatoes
Isoflavones	Soybeans, other legumes
Catechins	Tea
Ellagic acid	Strawberries, raspberries, grapes, apples, bananas, nuts
Anthocyanosides	Red, blue, and purple plants (eggplant, blueberries)
Fructooligosaccharides	Onions, bananas, oranges (small amounts)
Resveratrol	Grapes, peanuts, red wine

Some related compounds under study are found in animal products, such as sphingolipids (meat and dairy products) and conjugated linoleic acid (meat and cheese). These are not phytochemicals per se because they are not from plant sources, but they have been shown to have health benefits.

some phytochemicals under study, with their common food sources. Table 2-2 provides a number of suggestions for including more phytochemicals in your diet, as does the website www.5aday.com and 5aday.nci.nih.gov.

■ Balance Means Not Overconsuming Any Single Type of Food

One way to balance your diet as you consume a variety of foods is to select foods from the six major food groups every day:

- Grains
- Vegetables
- Fruits
- Milk
- Meat & Beans
- Oils

A dinner consisting of a bean burrito, lettuce and tomato salad with oil and vinegar dressing, a glass of milk, and an apple covers all groups.

Table 2-2 Tips for Boosting the Phytochemical Content of a Diet

- Include vegetables in main and side dishes. Add these to rice, omelets, potato salad, and pastas. Try broccoli or cauliflower florets, mushrooms, peas, carrots, corn, or peppers.
- Look for quick-fixing grain side dishes in the supermarket. Pilafs, couscous, rice mixes, and tabbouleh are just a few that you'll find.
- Choose fruit-filled cookies, such as fig bars, instead of sugar-rich cookies. Use fresh or canned fruit as a topping for puddings, hot or cold cereal, pancakes, and frozen desserts.
- Put raisins, grapes, apple chunks, pineapples, grated carrots, zucchini, or cucumber into coleslaw, chicken salad, or tuna salad.
- Be creative at the salad bar: Try fresh spinach, leaf lettuce, red cabbage, zucchini, yellow squash, cauliflower, peas, mushrooms, or red or yellow peppers.
- Pack fresh or dried fruit for snacks away from home instead of grabbing a candy bar or going hungry.
- Add slices of cucumber, zucchini, spinach, or carrot slivers to the lettuce and tomato on your sandwiches.
- Try one or two vegetarian meals per week, such as beans and rice or pasta; Chinese vegetable stir fry; or spaghetti and tomato sauce.
- When daily protein intake more than meets recommended amounts, reduce the meat, fish, or poultry in casseroles, stews, and soups by one-third to one-half and add more vegetables and legumes.
- Keep a bowl of fresh vegetables in the refrigerator for snacks.
- Choose fruit or vegetable juices instead of soft drinks, and preferably 100% juice varieties.
- Substitute tea for coffee or soft drinks on a regular basis.
- Have a bowl of fruit on hand.
- Switch from crisphead lettuce to leaf lettuce, such as romaine.
- Use salsa as a dip for chips in place of creamy dips.
- Choose whole-grain breakfast cereals, breads, and crackers.
- Add flavor to your plate with ginger, rosemary, basil, thyme, garlic, onions, parsley, and chives in place of salt.
- Incorporate soy products, such as tofu, soy milk, soy protein isolate, and roasted soybeans into your meals (see Chapter 6).



Focus on nutrient-rich foods as you strive to meet your nutrient needs. The more colorful your plate, the greater the content of nutrients and phytochemicals.

Critical Thinking

Andy, described in the Real Life Scenario, would benefit from more variety in his diet. What are some practical tips he can use to increase his fruit and vegetable intake?



Choosing whole-grain cereals is an excellent way to increase the nutrient content of a diet. Ideally, the cereal should have at least 3 grams of fiber per serving.

nutrient density The ratio derived by dividing a food's contribution to nutrient needs by its contribution to calorie needs. When its contribution to nutrient needs exceeds its calorie contribution, the food is considered to have a favorable nutrient density.

energy density A comparison of the calorie (kcal) content of a food with the weight of the food. An energy-dense food is high in calories but weighs very little (e.g., many fried foods), whereas a food low in energy density has few calories but weighs a lot, such as an orange.

■ Moderation Refers Mostly to Portion Size

Although moderating portion size is a good practice, eating moderately also requires planning your entire day's diet so that you don't overconsume nutrient sources. For example, if you eat something relatively high in fat, salt, and calories, such as a bacon cheeseburger, you should eat other foods that are less concentrated sources of the same nutrients by incorporating foods such as fruits and salad greens at other meals that same day. This helps balance one's diet. If you prefer whole milk to low-fat or fat-free milk, reduce the fat elsewhere in your meals. Try low-fat salad dressings, or use jam rather than butter or margarine on toast. Overall, strive to simply moderate—rather than eliminate—serving sizes of some foods.

As noted in Chapter 1, many nutrition experts agree that there are no exclusively "good" or "bad" foods. Even so, many North Americans have diets that lack the foundations of a healthy food plan—variety, balance, and moderation. Consuming diets that are overloaded with foods high in fatty meats, fried foods, sugared soft drinks, and refined starches can result in substantial risk for nutrition-related chronic diseases.

■ Nutrient Density Focuses on Nutrient Content

Nutrient density has gained acceptance in recent years for assessing the nutritional quality of an individual food. To determine the nutrient density of a food, simply compare its vitamin or mineral content with the amount of calories it provides. A food is said to be nutrient dense if it provides a large amount of a nutrient for a relatively small amount of calories (compared with other food sources). The higher a food's nutrient density, the better it is as a nutrient source. Comparing the nutrient density of different foods is an easy way to estimate their relative nutritional quality. Generally, nutrient density is determined with respect to individual nutrients. For example, many fruits and vegetables have a high content of vitamin C compared with their modest calorie content: That is, they are nutrient-dense foods for vitamin C. Moreover, as Figure 2-1 shows, fat-free milk is much more nutrient dense than sugared soft drinks for many nutrients.

As noted previously, menu planning focuses mainly on the total diet—not on the selection of one critical food as key to an adequate diet. Nonetheless, nutrient-dense foods—such as fat-free and low-fat milk, lean meats, legumes (beans), oranges, carrots, broccoli, whole-wheat bread, and whole-grain breakfast cereals—do help balance less nutrient-dense foods—such as cookies and potato chips—which many people like to eat. The latter are often called empty-calorie foods because they tend to be high in sugar and/or fat but few other nutrients.

Eating nutrient-dense foods is especially important for people who tend to consume few calories. This includes some older people and those following weight-loss diets.

■ Energy (kcal) Density Especially Influences Calorie Intake

Energy density is a concept that has captured the attention of nutrition scientists in recent years. Energy density of a food is determined by comparing the calorie (kcal) content with the weight of food. A food that is rich in calories but weighs relatively little is considered energy dense. Examples include nuts, cookies, fried foods in general, and fat-free snacks, such as fat-free pretzels. Foods with low energy density include fruits, vegetables, and any food that incorporates lots of water during cooking, such as oatmeal (Table 2-3).

Researchers have shown that eating a meal with many foods of low energy density promotes satiety without contributing many calories. This is probably because we consume a constant weight of food at a meal, rather than a constant number of calories. How this constant weight of food is regulated is not known, but careful

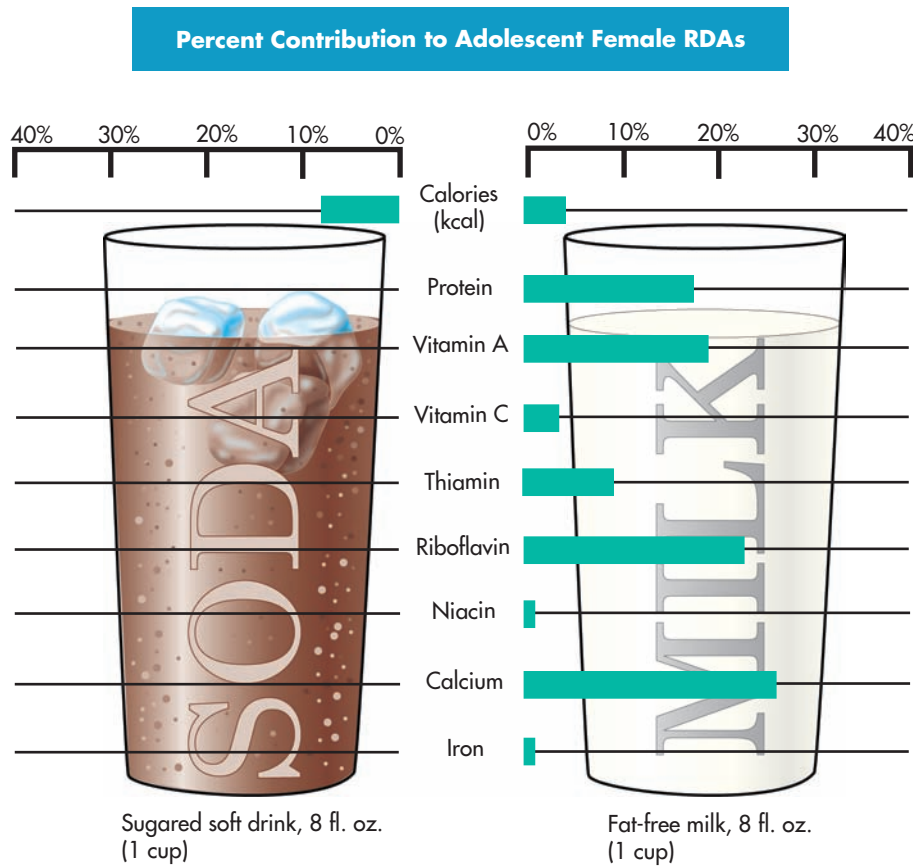


Figure 2-1 Comparison of the nutrient density of a sugared soft drink with that of fat-free (i.e., nonfat or skim) milk. Choosing a glass of fat-free milk makes a significantly greater contribution to nutrient intake than does a sugared soft drink. An easy way to determine nutrient density from this chart is to compare the lengths of the bars indicating vitamin or mineral contribution with the bar that represents calorie contribution. For the soft drink, no nutrient surpasses calorie content. Fat-free milk, in contrast, has longer nutrient bars for protein, vitamin A, the vitamins thiamin and riboflavin, and the mineral calcium. Including many nutrient-dense foods in your diet is a good way to meet nutrient needs.

Table 2-3 Energy Density of Common Foods (Listed in Relative Order)

Very Low Energy Density (less than 0.6 kcal per gram)	Low Energy Density (0.6 to 1.5 kcal per gram)	Medium Energy Density (1.5 to 4 kcal per gram)	High Energy Density (greater than 4 kcal per gram)
Lettuce	Whole milk	Eggs	Graham crackers
Tomatoes	Oatmeal	Ham	Fat-free sandwich cookies
Strawberries	Cottage cheese	Pumpkin pie	Chocolate
Broccoli	Beans	Whole-wheat bread	Chocolate chip cookies
Salsa	Bananas	Bagels	Tortilla chips
Grapefruit	Broiled fish	White bread	Bacon
Fat-free milk	Fat-free yogurt	Raisins	Potato chips
Carrots	Ready-to-eat breakfast cereals with 1% low-fat milk	Cream cheese	Peanuts
Vegetable soup	Plain baked potato	Cake with frosting	Peanut butter
	Cooked rice	Pretzels	Mayonnaise
	Spaghetti noodles	Rice cakes	Butter or margarine
			Vegetable oils

Data adapted from Rolls B, Barnett RA: *Volumetrics*. New York: HarperCollins, 2000.



Salads are low in energy density if we limit additional calories from salad dressing, and especially minimize bacon bits, cheese crumbles or cubes, and croutons.

One more dietary strategy to consider is increased meal frequency. Eating smaller, more frequent meals and snacks provides benefits to the body—such as lower blood glucose, cholesterol, and triglycerides—since body metabolism is not as overwhelmed as is seen with large meals. In addition, fasting for much of a day may lead to overeating once eating resumes. As long as overall calorie intake remains appropriate, spreading food throughout the day is a healthy practice. One idea is to pack a lunch and consume it throughout the day, rather than all at once at noontime.

laboratory studies show that people consume fewer calories in a meal if most of the food choices are low in energy density, compared with foods high in energy density. Following a diet low in energy density can aid in losing (or maintaining) weight.

Overall, foods with lots of water and fiber provide a low-energy-density contribution to a meal and help one feel full, whereas foods with high energy density must be eaten in greater amounts in order to contribute to fullness. This is one more reason to support a diet rich in fruits, vegetables, and whole-grain breads and cereals, a pattern that also is typical of many rural ethnic diets throughout the world. Still, favorite foods, even if they are high in energy density, can have a place in your dietary pattern, but you will have to plan for them. For example, chocolate is a very energy-dense food, but a small portion at the end of a meal can supply a satisfying finale. In addition, foods with high energy density can help people with poor appetites, such as some older people, to maintain or gain weight.

The following sections of Chapter 2 describe various states of nutritional health and provide tools and nutrient guidelines for planning healthy diets to support overall health.

Concept Check

Basic diet-planning concepts include consuming a variety of foods, balancing a diet by consuming foods from each of the five food groups, and moderating portion size with each food choice, so that the diet is not excessive in calories. Choosing nutrient-dense foods, such as fat-free milk, fruits, vegetables, and whole-grain breads and cereals, helps supply a diet with many nutrients but not excessive calories. Many of these foods are also rich sources of phytochemicals, supplying an even greater health benefit to the diet. Consuming foods of low energy density, such as fruits and vegetables, may also help in weight control, in that these provide satiety after a meal because of their large weight but relatively few calories.

States of Nutritional Health

The body's nutritional health is determined by the sum of its **nutritional state** with respect to each needed nutrient. Three general categories are recognized: desirable nutrition, undernutrition, and overnutrition. Maintaining a state of desirable nutrition is the basis for establishing human nutrient needs and the diet plans to meet those needs that are discussed later in Chapter 2. The common term **malnutrition** can refer to either **overnutrition** or **undernutrition**. Neither state is conducive to good health.

Desirable Nutrition

The nutritional state for a particular nutrient is desirable when body tissues have enough of the nutrient to support normal metabolic functions as well as surplus stores that can be used in times of increased need. A desirable nutritional state can be achieved by obtaining essential nutrients from a variety of foods.

Undernutrition

Undernutrition occurs when nutrient intake does not meet nutrient needs. Any surpluses are then put to use and health begins to decline. Many nutrients are in high demand due to the constant cycles of cell loss and later regeneration in the body, such as in the gastrointestinal tract. For this reason, certain nutrient stores are exhausted rapidly, including many of the B vitamins. In turn, a regular intake is needed. In addition, some women in North America do not consume sufficient iron to meet monthly losses and eventually deplete their iron stores (Fig. 2-2).

nutritional state The nutritional health of a person as determined by anthropometric measurements (height, weight, circumferences, and so on), biochemical measurements of nutrients or their by-products in blood and urine, a clinical (physical) examination, a dietary analysis, and economic evaluation; also called nutritional status.

malnutrition Failing health that results from long-standing dietary practices that do not coincide with nutritional needs.

overnutrition A state in which nutritional intake greatly exceeds the body's needs.

undernutrition Failing health that results from a long-standing dietary intake that is not enough to meet nutritional needs.

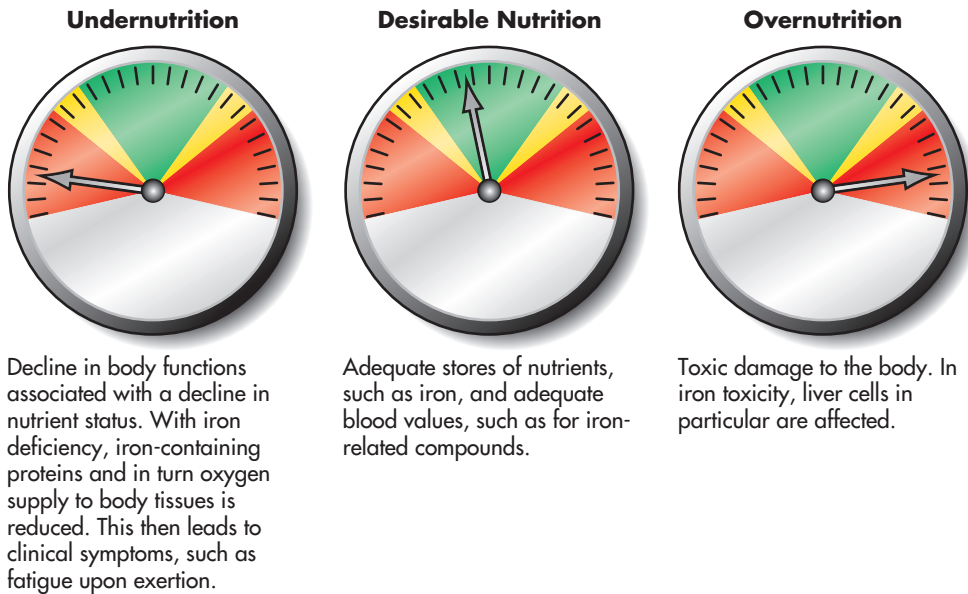


Figure 2-2 The general scheme of nutritional status. Green reflects good status, yellow marginal status, and red poor status undernutrition or overnutrition. This general concept can be applied to all nutrients. Iron was chosen as an example because you are likely familiar with this nutrient and iron deficiency is the most common nutrient deficiency worldwide.

Once availability of a nutrient falls sufficiently low, biochemical evidence indicates that the body's metabolic processes have slowed or stopped. At this state of deficiency there are no outward symptoms, thus it is termed a **subclinical** deficiency. A subclinical deficiency can go on for some time before clinicians are able to detect its effects.

Eventually clinical **symptoms** will develop, sometimes taking many years, and may result in clinical evidence of a deficiency; perhaps in the skin, hair, nails, tongue, or eyes. Often, clinicians do not detect a problem until a deficiency produces outward symptoms, such as pinprick-like sites of bleeding on the skin from a vitamin C deficiency.

■ Overnutrition

Prolonged consumption of more nutrients than the body needs can lead to overnutrition. In the short run (e.g., 1 to 2 weeks), overnutrition may cause only a few symptoms, such as stomach distress from excess iron intake. But if an excess intake continues, some nutrients may accumulate to toxic amounts, which can lead to serious disease. For example, too much vitamin A can have negative effects, particularly during pregnancy.

The most common type of overnutrition in industrialized nations—excess intake of calories—often leads to obesity. In the long run, outcomes of obesity include other serious diseases, such as type 2 diabetes and certain forms of cancer. Use the website shapeup.org to learn more about the importance of lifelong weight control.

For most vitamins and minerals, the gap between desirable intake and overnutrition is wide. Therefore, even if people take a typical balanced multivitamin and mineral supplement daily, they probably won't receive a harmful dose of any nutrient. The difference between optimal intake and overnutrition is smallest for vitamin A, and the minerals calcium, iron, and copper. Thus, if you take nutrient supplements, keep a close eye on your total vitamin and mineral intake from both food and supplements to avoid toxicity (see Chapter 8 for further advice on use of nutrient supplements).

subclinical Stage of a disease or disorder that is present but not severe enough to produce symptoms that can be detected or diagnosed.

symptom A change in health status noted by the person with the problem, such as stomach pain.

How Can Your Nutritional State Be Measured?

To find out how nutritionally fit *you* are, a nutritional assessment—either whole or in part—needs to be performed (Table 2-4). Generally, this is performed by a physician, often with the aid of a registered dietitian.

Analyzing Background Factors

Since family history plays an important role in determining nutritional and health status, it must be carefully recorded and critically analyzed as part of a nutritional assessment. Other related background parameters include: (1) a medical history, especially for any disease states or treatments that could impede nutrient absorptive processes or ultimate use; (2) a list of medications taken; (3) a social history; (4) information about the person's level of education to determine the degree of complexity that can be used in written materials and oral discussions; and (5) economic status to determine the ability of the person to purchase, transport, and cook food.

Evaluating the ABCDEs

In addition to background factors, four nutritional parameters complete the picture of nutritional status. **Anthropometric assessment** measurements of height, weight (and weight changes), skinfolds, and body circumferences provide an outline of the current state of nutrition. Measures of body composition are easy to obtain and are generally reliable. However, an in-depth examination of nutritional health is impossible without the more expensive process of **biochemical assessments**. This involves the measurement of the concentrations of nutrients and nutrient by-products in the blood, urine, and feces and of specific blood enzyme activities.

A **clinical assessment** would follow, during which a health professional would search for any physical evidence (e.g., high blood pressure) of diet-related diseases. Then, a close look at the person's diet (**dietary assessment**), including a record of at least the previous few days' intake, would look into possible problem areas. Finally, adding the **economic assessment** (from the background analysis), which impacts the ability to purchase and prepare foods needed to maintain health, provides further detail to the picture. Now the true nutritional state of a person emerges. Taken together, these five assessments form the ABCDEs of nutritional assessment: anthropometric, biochemical, clinical, dietary, and economic (Fig. 2-3).

anthropometric assessment Pertaining to the measurement of body weight and the lengths, circumferences, and thicknesses of parts of the body.

biochemical assessment An assessment focusing on biochemical functions (e.g., concentrations of nutrient by-products or enzyme activities in the blood or urine) related to a nutrient's function.

clinical assessment An assessment that focuses on one's general appearance of skin, eyes, and tongue; evidence of rapid hair loss; sense of touch; and ability to cough and walk.

dietary assessment An assessment that focuses on the typical food choices of the person, relying mostly on the recounting of one's usual intake or a record of one's previous days' intake.

economic assessment An assessment that focuses on the ability of the person to purchase, transport, and cook food. The person's weekly budget for food purchases is also a key factor to consider.

Table 2-4 Conducting an Evaluation of Nutritional Health

Parameters	Example
Background	Medical history (e.g., current diseases, past surgeries, current weight, weight history, and current medications) Social history (marital status, cooking facilities) Family history Education attainment Economic status
Nutritional	Anthropometric assessment: height, weight, skinfold thickness, arm muscle circumference, and other parameters Biochemical (laboratory) assessment of blood and urine: enzyme activities, concentrations of nutrients or their by-products Clinical assessment (physical examination): general appearance of skin, eyes, and tongue; rapid hair loss; sense of touch; ability to walk Dietary assessment: usual intake or record of previous days' meals



Figure 2-3 (a) Anthropometric, (b) biochemical, (c) clinical, and (d) dietary information helps determine a person's nutritional state. (e) Economic status adds further information, rounding out the ABCDEs of nutritional assessment.

Another Bite

A practical example using the ABCDEs for evaluating nutritional state can be illustrated in a person who chronically abuses alcohol. Upon evaluation, the physician notes:

- (a) Low weight-for-height, recent 10 pound weight loss, muscle wasting in the upper body
- (b) Low amounts of the vitamins thiamin and folate in the blood
- (c) Psychological confusion, facial sores, and uncoordinated movement
- (d) Dietary intake of little more than alcohol-fortified wine and hamburgers for the last week
- (e) Currently residing in a homeless shelter; \$35.00 in wallet; unemployed

Evaluation: This person needs professional attention, including nutrient repletion.



The first evidence that one's diet is out of balance with one's physiology could be a heart attack. About 25% of all heart attack victims do not survive the event.

heart attack Rapid fall in heart function caused by reduced blood flow through the heart's blood vessels. Often part of the heart dies in the process. Technically called a myocardial infarction.

■ Recognizing the Limitations of Nutritional Assessment

As mentioned, a long time may elapse between the initial development of poor nutritional health and the first clinical evidence of a problem. Recall that a diet high in saturated (typically solid) fat often increases blood cholesterol, but without producing any clinical evidence for years. However, when the blood vessels become sufficiently blocked by cholesterol and other materials, chest pain during physical activity or a **heart attack** may occur. Much of the current nutrition research is designed to develop better methods for early detection of nutrition-related problems such as heart attack risk.

Another example of a serious health condition with delayed symptoms is low bone density resulting from a calcium deficiency—a particularly relevant issue for adolescent females. Many young women consume well below the needed amount of calcium but often suffer no ill effects in their younger years. However, the bone structures of these women with low calcium intakes do not reach full potential during the years of growth, which makes osteoporosis more likely later in life.

Furthermore, clinical symptoms of nutritional deficiencies—diarrhea, an irregular walk, and facial sores—are not very specific. These may have different causes. The long time it takes for symptoms to develop and their potential to be quite vague often make it difficult to establish a link between an individual's current diet and nutritional state.

■ Concern about the State of Your Nutritional Health Is Important

Table 1-6 in Chapter 1 portrayed the close relationship between nutrition and health. The good news is that people who focus on maintaining nutritional health are apt to enjoy a long, vigorous life. For example, a recent study found that women who observe a healthy lifestyle experienced an 80% reduction in risk for heart attacks compared to women without such healthy practices. The healthy habits included:

- Consumed a healthy diet
 - Varied
 - Rich in fiber
 - Included some fish
 - Low in animal fat and *trans* fat
- Avoided becoming overweight
- Regularly drank a small amount of alcohol
- Exercised for at least 30 minutes daily
- Did not smoke

Should all adults follow this example (with optional use of alcohol)?

Concept Check

A desirable nutritional state results when the body has enough nutrients to function fully and contains stores to use in times of increased needs. When nutrient intake fails to meet body needs, undernutrition develops. Symptoms of such an inadequate nutrient intake can take months or years to develop. Overloading the body with nutrients, leading to overnutrition, is another potential problem to avoid. Nutritional state can be assessed by using anthropometric, biochemical, clinical, dietary, and economic assessments (ABCDEs).

Recommendations for Food Choice

The following sections of Chapter 2 will describe various guidelines for planning healthy diets.

■ MyPyramid—A Menu-Planning Tool

Since the early twentieth century, researchers have worked to clarify the science of nutrition into practical terms, so that people with no special training could estimate whether their nutritional needs were being met. A seven food-group plan, based on foods traditionally eaten by people in North America, was one of the first formats designed by USDA. Daily food choices had to include items from each group. This plan had been simplified by the mid-1950s to a four food-group plan: a milk group, a meat group, a fruit and vegetable group, and a bread and cereal group. In 1992 this plan was illustrated using a pyramid shape (i.e., Food Guide Pyramid).

In April 2005, USDA unveiled their latest food guide plan, MyPyramid. Entitled “Steps to a Healthier You,” MyPyramid provides a more individualized approach to improving diet and lifestyle than previous food guides. Overall, MyPyramid translates the latest nutrition advice into twelve separate pyramids based on calorie needs (1000 to 3200 kcal/day). Its goal is to provide advice that will help us live longer, better, and healthier lives. (MyPyramid replaces the Food Guide Pyramid.)

The MyPyramid symbol represents the recommended proportion of foods from each food group to create a healthy diet. Physical activity is a new element in the pyramid. To get the individualized advice that is the hallmark of the plan, however, consumers need to use the website, MyPyramid.gov.

MyPyramid is designed to illustrate (Fig. 2-4):

- **Personalization** demonstrated at the MyPyramid website, MyPyramid.gov.
- **Gradual improvement** encouraged by the statement, “Steps to a Healthier You.”
- **Physical activity** represented by the steps and the person climbing them.
- **Variety** symbolized by the six color bands representing the five food groups and oils. Foods from all groups are needed each day for good health. Orange is for grains, green is for vegetables, red is for fruits, yellow is for oils, blue is for milk and milk products, and purple is for meat & beans.
- **Proportionality**, shown by the different widths of the food group bands. The widths suggest how much food a person should choose from each group. The bands are wider for grains, vegetables, and fruits since these groups should form the bulk of one’s diet. The narrowest band is for oils, indicating these should be eaten sparingly. The widths are a general guide, however, and not exact proportions. Check MyPyramid.gov for the amount right for you.
- **Moderation**, represented by the narrowing of each food group from bottom to top. The wider base is for foods with little or no solid fats, added sugars or caloric sweeteners, and salt. These should be selected more often to get the most nutrition from calories consumed.

An innovative aspect of MyPyramid is the interactive technology found on MyPyramid.gov. This includes:

MyPyramid Plan—provides a quick estimate of what and how much food the individual should eat from the different food groups based on age, gender, and activity level.

Inside MyPyramid—provides in-depth information for every food group, including recommended daily amounts in commonly used measures, such as cups and ounces, with examples and everyday tips. The section also includes recommendations for choosing healthy oils, **discretionary calories**, and physical activity. (See Another Bite on page 46 for a discussion of the concept of discretionary calories. This refers to the calories allowed from food choices rich in added sugars or solid fat. For most of us very few discretionary calories are available in daily diet planning.)

Appendix B contains the Canadian Food Guide to Healthy Eating.



discretionary calories The calories allowed in a diet after the person has met overall nutrition need. This generally small amount of calories gives individuals the flexibility to consume some foods and beverages that may contain alcohol (e.g., beer and wine), added sugars (e.g., soft drinks, candy, and desserts), or added fats that are part of moderate- or high-fat foods (e.g., many snack foods).

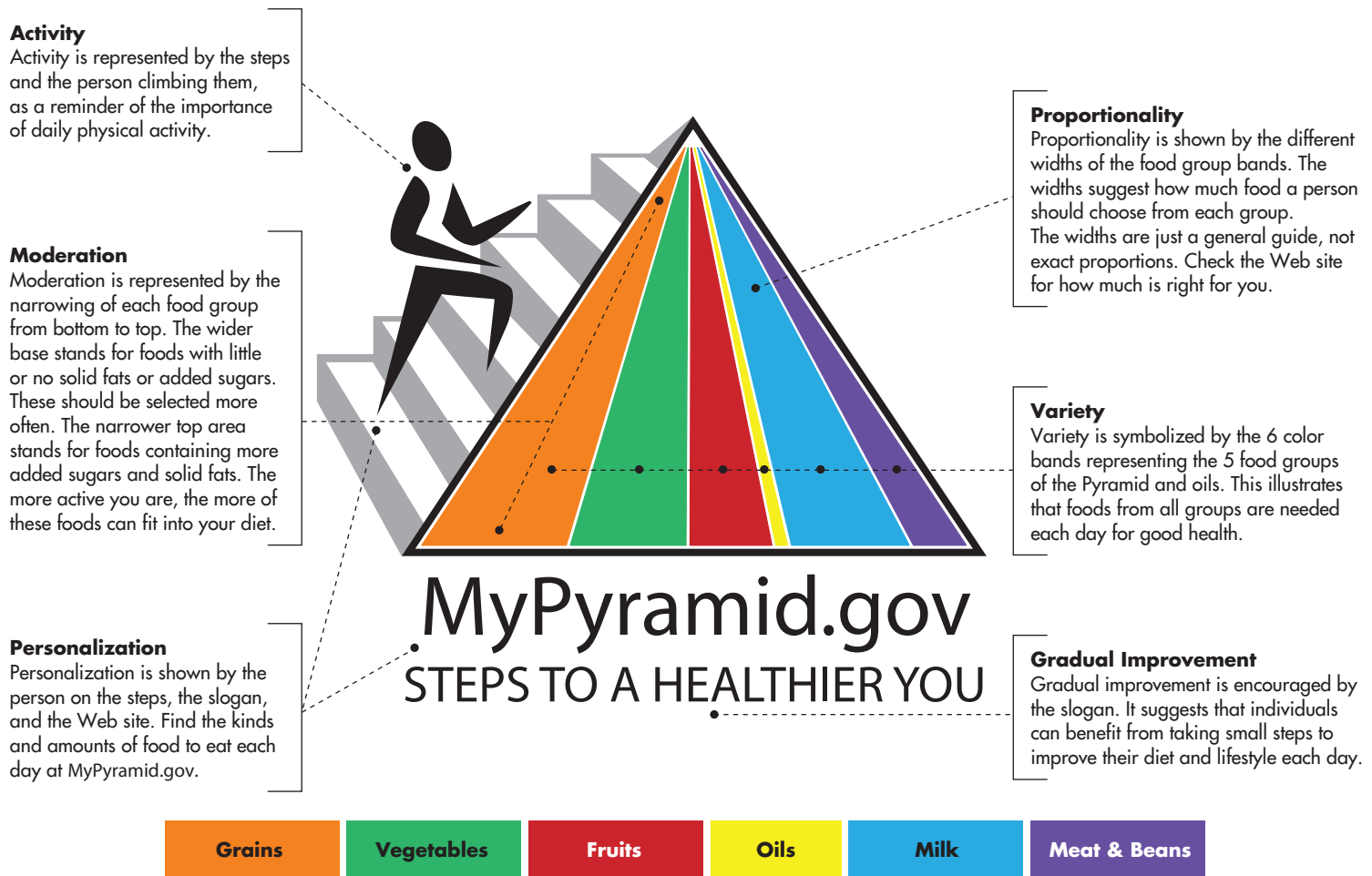


Figure 2-4 The anatomy of MyPyramid. USDA’s new MyPyramid symbolizes a personalized approach to healthy eating and physical activity. The symbol has been designed to be simple. It has been developed to remind consumers to make healthy food choices and to be active every day. In this figure, the different parts of the symbol are described.

Another Bite

Discretionary calories are estimated as follows:

Calorie Intake (kcal)	Discretionary Calories (kcal)	Calorie Intake (kcal)	Discretionary Calories (kcal)
1000	165*	2200	290
1200	171*	2400	362
1400	171*	2600	410
1600	132	2800	426
1800	195	3000	512
2000	267	3200	648

The overall intent is not to exceed this discretionary calorie allowance from the combination of foods and beverages with alcohol, added sugars, or added fats.

*The amount of discretionary calories is higher for 1000–1400 kcal diets than for a 1600 kcal diet because these lower calorie diets are intended for children 2–8 years of age. Adult calorie recommendations typically start at 1600 kcal.

MyPyramid Tracker—provides more detailed information on diet quality and physical activity status by comparing a day’s worth of foods eaten to the guidance provided by MyPyramid. It allows the user to select from 8,000 foods and 600 activities. Nutrition and physical activity messages are based on the need to maintain current weight or to lose weight.

Start Today—provides tips and resources that include downloadable suggestions on all the food groups and physical activity and a worksheet to track one’s diet.

Putting MyPyramid into Action

To put MyPyramid into action, first you need to estimate your calorie needs (the website helps you calculate this). Figure 2-5 provides a rough guide.

Once you have determined the calorie allowance appropriate for you, you can use Table 2.5 to discover how that calorie allowance corresponds to the recommended number of servings from each food group.

■ What Counts as One Serving?

MyPyramid provides serving sizes of foods for the various food groups in household units:

- **Grains:** 1 slice of bread, 1 cup of ready-to-eat breakfast cereal, or ½ cup cooked rice; pasta or cooked cereal counts as a 1-ounce equivalent.
- **Vegetables:** 1 cup of raw or cooked vegetables or vegetable juice or 2 cups of raw leafy greens.
- **Fruits:** 1 cup of fruit or 100% fruit juice or ½ cup of dried fruit.
- **Milk:** 1 cup of milk or yogurt, 1.5 ounces of natural cheese, or 2 ounces of processed cheese.
- **Meat & Beans:** 1 ounce of meat, poultry, or fish; 1 egg; 1 tablespoon of peanut butter; one ¼ cup cooked dry beans, or ½ ounce of nuts or seeds are all 1-ounce equivalents.

What about physical activity as part of MyPyramid? Physical activity is movement of the body that uses energy. Walking, gardening, briskly pushing a baby stroller, climbing the stairs, playing soccer, or dancing the night away are all examples of physical activity. For health benefits, physical activity should be moderate or vigorous and add up to at least 30 minutes on most or all days of the week. For weight loss or preventing weight gain, about 60 minutes a day may be needed. (The same goal applies to children and teenagers.) For maintaining prior weight loss, at least 60 to 90 minutes a day may be required.

	Calorie Range (kcal)	
	Sedentary	Active
Children		
2–3 years	1000	1,400
Females		
4–8 years	1200	1800
9–13	1600	2200
14–18	1800	2400
19–30	2000	2400
31–50	1800	2200
51+	1600	2200
Males		
4–8 years	1400	2000
9–13	1800	2600
14–18	2200	3200
19–30	2400	3000
31–50	2200	3000
51+	2000	2800

Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life.

Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.

Figure 2-5 Estimates of calorie needs (kcal) provided by MyPyramid.

Table 2-5 MyPyramid Recommendations for Daily Amounts of Foods to Consume from the Six Food Groups Based on Calorie Needs

Daily Amount of Food From Each Group												
Calorie Level	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
Fruits	1 cup	1 cup	1.5 cups	1.5 cups	1.5 cups	2 cups	2 cups	2 cups	2 cups	2.5 cups	2.5 cups	2.5 cups
Vegetables ^{1,2}	1 cup	1.5 cups	1.5 cups	2 cups	2.5 cups	2.5 cups	3 cups	3 cups	3.5 cups	3.5 cups	4 cups	4 cups
Grains ³	3 oz-eq	4 oz-eq	5 oz-eq	5 oz-eq	6 oz-eq	6 oz-eq	7 oz-eq	8 oz-eq	9 oz-eq	10 oz-eq	10 oz-eq	10 oz-eq
Meat & Beans	2 oz-eq	3 oz-eq	4 oz-eq	5 oz-eq	5 oz-eq	5.5 oz-eq	6 oz-eq	6.5 oz-eq	6.5 oz-eq	7 oz-eq	7 oz-eq	7 oz-eq
Milk ⁴	2 cups	2 cups	2 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups
Oils ⁵	3 tsp	4 tsp	4 tsp	5 tsp	5 tsp	6 tsp	6 tsp	7 tsp	8 tsp	8 tsp	10 tsp	11 tsp
Discretionary calorie allowance ⁶	165	171	171	132	195	267	290	362	410	426	512	648

oz-eq stands for ounce equivalent; tsp stands for teaspoon

¹Vegetables are divided into five subgroups (dark green, orange, legumes, starchy, and other). Over a week's time, a variety of vegetables should be eaten, especially green and orange vegetables.

²Dry beans and peas can be counted *either* as vegetables (dry beans and peas subgroup), *or* in the meat & beans group. Generally, individuals who regularly eat meat, poultry, and fish would count dry beans and peas in the vegetable group. Individuals who seldom eat meat, poultry, or fish (vegetarians) would consume more dry beans and peas and count some of them in the meat & beans group until enough servings from that group are chosen for the day.

³At least half of these servings should be whole grain varieties.

⁴Most of these servings should be fat-free or low-fat.

⁵Limit solid fats such as butter, stick margarine, shortening, and meat fat, as well as foods that contain these.

⁶Discretionary calories refers to food choices rich in added sugars or solid fat.

Pay close attention to the stated serving size for each choice when following MyPyramid. This aids in controlling total calorie intake. See Figure 2-6 for a convenient guide to estimating common household measures. Note that serving sizes listed for one serving in a MyPyramid group or on a food label are often less than is typically served in restaurants today.

- **Oils:** A teaspoon of any oil from plants or fish that is liquid at room temperature counts as a serving, as do such servings of foods rich in oils (e.g., mayonnaise and soft margarine).

Menu Planning with MyPyramid

Remember the following points when using MyPyramid to plan your daily menus:

1. The guide does not apply to infants or children under 2 years of age.
2. No one food is absolutely essential to good nutrition. Each food is rich in some nutrients, but deficient in at least one essential nutrient (Table 2-6).
3. No one food group provides all essential nutrients in adequate amounts. Each food group makes an important, distinctive contribution to nutritional intake.
4. Variety is the key to success of MyPyramid and is first guaranteed by choosing foods from all the groups. Furthermore, one should consume a variety of foods within each group, except possibly in the milk, yogurt, and cheese group.
5. The foods within a group may vary widely with respect to nutrients and calories. For example, the calorie content of 3 ounces of baked potato is 98 kcal, whereas that of 3 ounces of potato chips is 470 kcal. Compare an orange and an apple with respect to vitamin C using the food composition table in Appendix J.

Overall, MyPyramid incorporates the foundations of a healthy diet: variety, balance, and moderation. The nutritional adequacy of diets planned using this tool, however, depends on selection of a variety of foods (Table 2-7). In addition, to ensure enough vitamin E, vitamin B-6, magnesium, and zinc—nutrients sometimes low in diets based on this plan—consider the following advice:

1. Choose primarily low-fat and fat-free items from the milk group. By reducing calorie intake in this way, you can select more items from other food groups. If milk causes intestinal gas and bloating, emphasize yogurt and cheese (see Chapter 4 for details on the problem of lactose maldigestion and lactose intolerance).



Typical restaurant portions contain numerous servings from the individual groups in MyPyramid.

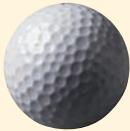

	=	2 tbsp measure	2 tbsp salad dressing, peanut butter, margarine, etc.
	=	1/2 to 2/3 cup measure	Medium/small fruit
	=	1 standard bagel	Bagel or English muffin
	=	1/2 to 3/4 cup	Baked potato; ground or chopped foods; 1/2 cup generally equals 2 ounces.
 or 	=	1 cup	Large apple or orange; 1 cup of ready-to-eat breakfast cereal

Figure 2-6 A golf ball, tennis ball, small yo-yo, computer mouse, baseball, and fist make convenient guides to judge MyPyramid serving sizes. Additional handy guides include:

- | | |
|-----------------------------------|------------------------------|
| thumb = 1 oz of cheese; | palm of a hand = 3 oz; |
| 4 stacked dice = 1 oz cheese; | 1 ice cream scoop = 1/2 cup; |
| thumb tip to first joint = 1 tsp; | handful = 1 or 2 oz of a |
| matchbox = 1 oz meat; | snack food; and |
| bar of soap or deck of | ping-pong ball = 2 tbsp. |
| cards = 3 oz meat; | |

Table 2-6 Nutrient Contributions of Groups in the MyPyramid Food Guide Plan

Food Category	Major Nutrient Contributions
Milk	Carbohydrate Protein Vitamins such as vitamin D Minerals such as calcium and phosphorus
Meat & Beans	Protein Vitamins such as vitamin B-6 Minerals such as iron and zinc
Fruits	Carbohydrate Vitamins such as folate and vitamin C Minerals such as potassium Fiber
Vegetables	Carbohydrate Vitamins such as plant pigments that form vitamin A Minerals such as magnesium Fiber
Grains	Carbohydrate Vitamins such as thiamin Minerals such as iron Fiber [†]
Oils	Fat Essential fatty acids Vitamins such as vitamin E

*Whole-grain varieties

2. Include plant foods that are good sources of proteins, such as beans and nuts, at least several times a week because many are rich in vitamins (such as vitamin E), minerals (such as magnesium), and fiber.
3. For vegetables and fruits, try to include a dark green vegetable for vitamin A and a vitamin C-rich fruit, such as an orange, every day. Don't focus primarily on potatoes (e.g., French fries) for your vegetable choices. Surveys show that fewer than 5% of adults eat a full serving of a dark green vegetable on any given day. Increased consumption of these foods is important because they contribute vitamins, minerals, fiber, and phytochemicals.
4. Choose whole-grain varieties of breads, cereals, rice, and pasta because they contribute vitamin E and fiber. A plate about two-thirds covered by grains, fruits, and vegetables and one-third or less covered by protein-rich foods promotes this diet advice. A daily serving of a whole-grain, ready-to-eat breakfast cereal is an excellent choice because the vitamins (such as vitamin B-6) and minerals (such as zinc) typically added to it, along with fiber, help fill in the potential gaps listed earlier.
5. Include some plant oils on a daily basis, such as those in salad dressing, and eat fish at least twice a week. This supplies you with health-promoting essential fatty acids.

How Does Your Current Diet Rate?

Regularly comparing your daily food intake with MyPyramid recommendations for your age, gender, and degree of physical activity, is a relatively simple way to evaluate your overall diet. Strive to meet the recommendations. (The diets of most adults fail in this evaluation, especially with respect to milk, vegetables, fruits, and whole grain breads and cereals.) If that is not possible, identify the nutrients that are low in your diet based on the nutrients found in each food group (review Table 2-6).



Leafy green vegetables contribute many nutrients to a diet.

Table 2-7 Putting the MyPyramid into Practice

Meal	Food Group
Breakfast	
1 small orange	Fruits
¾ cup Healthy Choice Low-fat Granola with ½ cup fat-free milk	Grains Milk
½ toasted, small raisin bagel with 1 tsp soft margarine	Grains Oils
Optional: coffee or tea	
Lunch	
Turkey sandwich	
2 slices whole-wheat bread	Grains
2 oz turkey	Meat & Beans
2 tsp mustard	
1 small apple	Fruits
2 oatmeal-raisin cookies (small)	Discretionary calories
Optional: diet soft drink	
3 P.M. Study Break	
6 whole-wheat crackers	Grains
1 tbsp peanut butter	Meat & Beans
½ cup fat-free milk	Milk
Dinner	
Tossed salad	
1 cup romaine lettuce	Vegetables
½ cup sliced tomatoes	Vegetables
1½ tbsp Italian dressing	Oils
½ carrot, grated	Vegetables
3 oz broiled salmon	Meat & Beans
½ cup rice	Grains
½ cup green beans	Vegetables
with 1 tsp soft margarine	Oils
Optional: coffee or tea	
Late-Night Snack	
1 cup “light” fruit yogurt	Milk
Nutrient Breakdown	
1800 kcal	
Carbohydrate	56% of kcal
Protein	18% of kcal
Fat	26% of kcal



Tomatoes are a rich source of nutrients and phytochemicals.

This menu meets nutrient needs for all vitamins and minerals for an average adult. For adolescents, teenagers, and older adults add one additional serving of milk or other calcium-rich sources.

For example, if you do not consume enough servings from the milk group, your calcium intake is most likely too low. You need to then find foods that you enjoy that supply calcium, such as calcium-fortified orange juice. Customizing MyPyramid to accommodate your food habits may seem a daunting task, but it is not difficult once you gain some additional nutrition knowledge.

Get Going

Start putting MyPyramid into practice and use the MyTracker feature to follow your progress. Implementing even small diet and exercise changes can have positive results. Better health will likely follow as you strive to meet your nutrient needs and balance your physical activity and calorie allowance. In addition, follow the guidance from the **2005 Dietary Guidelines for Americans** regarding alcohol and sodium intake, and safe food preparation.

Dietary Guidelines for Americans

General goals for nutrient intakes and diet composition set by the USDA and the U.S. Department of Health and Human Services.

Concept Check

MyPyramid translates the general needs for carbohydrate, protein, fat, vitamins, and minerals into the recommended number of daily servings from each of five major food groups and oils. It is a convenient and valuable tool for planning daily menus.

■ Dietary Guidelines—Another Tool for Menu Planning

MyPyramid was designed to help meet nutritional needs for carbohydrate, protein, fat, vitamins, and minerals. However, most of the major chronic “killer” diseases in North America, such as cardiovascular disease, cancer, and alcoholism, are not primarily associated with deficiencies of these nutrients. Deficiency diseases such as scurvy (vitamin C deficiency) and pellagra (niacin deficiency) are no longer common. For many North Americans, the primary dietary culprit is an overconsumption of one or more of the following: calories, saturated fat, cholesterol, *trans* fat, alcohol, and sodium (salt). (Underconsumption of calcium, iron, folate and other B-vitamins, vitamin C, vitamin D, vitamin E, potassium, magnesium, and fiber is also a problem for some people.)

In response to concerns regarding these killer disease patterns, since 1980 the USDA and U.S. Department of Health and Human Services (DHHS) have published Dietary Guidelines for Americans (Dietary Guidelines for short) to aid diet planning.

Compared to past reports, the 2005 Dietary Guidelines for Americans places stronger emphasis on monitoring one’s calorie intake and increasing physical activity. This is because more of us are becoming overweight each year.

The report identifies forty-one key recommendations, of which twenty-three are for the general public and eighteen are for special populations. They are grouped into nine general topics:

- Adequate Nutrient Intake Within Calorie Needs
- Weight Management
- Physical Activity
- Specific Food Groups to Encourage
- Fats
- Carbohydrates
- Sodium and Potassium
- Alcoholic Beverages
- Food Safety

Table 2-8 lists the key recommendations within each general topic. The advice provided refers to people two years and older.

Appendix B contains nutrient guidelines for Canadians.

- Consume a variety of nutrient-dense foods and beverages within and among the basic food groups of MyPyramid, while choosing foods that limit the intake of saturated and *trans* fats, cholesterol, added sugars, salt, and alcohol (if used). Foods to emphasize are vegetables, fruits, legumes (beans), whole grains, and fat-free or low-fat milk or equivalent milk products.
- Maintain body weight in a healthy range by balancing calorie intake from foods and beverages with calories expended. For the latter, engage in at least 30 minutes of moderate-intensity physical activity, above usual activity, at work or home on most days of the week.
- Practice safe food handling when preparing food. This includes cleaning hands, food contact surfaces, and fruits and vegetables before preparation and cooking foods to a safe temperature to kill microorganisms.

Table 2-8 Key Recommendations Within Each General Topic from the Latest Dietary Guidelines for Americans

Adequate Nutrients Within Calorie Needs

- Consume a variety of nutrient-dense foods and beverages within and among the basic food groups while choosing foods that limit the intake of saturated and *trans* fats, cholesterol, added sugars, salt, and alcohol.
- Meet recommended intakes within calorie needs by adopting a balanced eating pattern, such as MyPyramid.

Key Recommendations for Specific Population Groups

- *People over age 50.* Consume vitamin B-12 in its crystalline form (i.e., fortified foods or supplements).
- *Women of childbearing age who may become pregnant.* Eat foods high in iron from animal products and/or consume iron-rich plant foods or iron-fortified foods with an enhancer of iron absorption, such as vitamin C-rich foods.
- *Women of childbearing age who may become pregnant and those in the first few months of pregnancy.* Consume adequate amount of the synthetic form of the B vitamin folate (called folic acid) daily (from fortified foods or supplements) in addition to food forms of folate found in a varied diet.
- *Older adults, people with dark skin, and people exposed to insufficient ultraviolet band radiation (i.e., sunlight).* Consume extra vitamin D from vitamin D-fortified foods and/or supplements.

Weight Management

- To maintain body weight in a healthy range, balance calorie intake from foods and beverages with calories expended.
- To prevent gradual weight gain over time, make small decreases in calorie intake from food and beverages and increase physical activity.

Key Recommendations for Specific Population Groups

- *Those who need to lose weight.* Aim for a slow, steady weight loss by decreasing calorie intake while maintaining an adequate nutrient intake and increasing physical activity.
- *Overweight children.* Reduce the rate of body weight gain while allowing for growth and development. Consult a healthcare provider before placing a child on a weight-reduction diet.
- *Pregnant women.* Ensure appropriate weight gain as specified by a healthcare provider.
- *Breastfeeding women.* Moderate weight reduction is safe and does not compromise weight gain of the nursing infant.
- *Overweight adults and overweight children with chronic diseases and/or on medication.* Consult a healthcare provider about weight loss strategies prior to starting a weight-reduction program to ensure appropriate management of other health conditions.

Physical Activity

- Engage in regular physical activity and reduce sedentary activities to promote health, psychological well-being, and a healthy body weight.
- To reduce the risk of chronic disease in adulthood, engage in at least 30 minutes of moderate-intensity physical activity, above usual activity, at work or home on most days of the week.
- For most people, greater health benefits can be obtained by engaging in physical activity of more vigorous intensity or longer duration.

(continued)

Table 2-8 (continued)

- To help manage body weight and prevent gradual, unhealthy body weight gain in adulthood, engage in approximately 60 minutes of moderate- to vigorous-intensity activity on most days of the week while not exceeding calorie needs.
- To sustain weight loss in adulthood, participate in at least 60 to 90 minutes of daily moderate-intensity physical activity while not exceeding calorie needs. Some people (men over 40 years of age and women over 50 years of age) may need to consult with a healthcare provider before participating in this level of activity.
- Achieve physical fitness by including cardiovascular conditioning, stretching exercises for flexibility, and resistance exercises or calisthenics for muscle strength and endurance.

Key Recommendations for Specific Population Groups

- *Children and adolescents.* Engage in at least 60 minutes of physical activity on most, preferably all, days of the week.
- *Pregnant women.* In the absence of medical complications, incorporate 30 minutes or more of moderate-intensity physical activity on most, if not all, days of the week. Avoid activities with a high risk of falling or abdominal trauma.
- *Breastfeeding women.* Be aware that neither acute nor regular exercise adversely affects the mother's ability to successfully breastfeed.
- *Older adults.* Participate in regular physical activity to reduce functional declines associated with aging and to achieve the other benefits of physical activity identified for all adults.

Food Groups to Encourage

- Consume a sufficient amount of fruits and vegetables while staying within calorie needs. Two cups of fruit and 2 1/2 cups of vegetables per day are recommended for a reference 2,000 kcal intake, with higher or lower amounts depending on one's calorie needs.
- Choose a variety of fruits and vegetables each day. In particular, select from all five vegetable subgroups several times a week.
- Consume three or more ounce-equivalents of whole-grain products per day, with the rest of the recommended grains coming from enriched or whole-grain products. In general, at least half the grains should come from whole grains.
- Consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

Key Recommendations for Specific Population Groups

- *Children and adolescents.* Consume whole-grain products often; at least half the grains should be whole grains. Children 2 to 8 years should consume 2 cups per day of fat-free or low-fat milk or equivalent milk products. Children 9 years of age and older should consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

Fats

- Consume less than 10 percent of calorie intake from saturated fatty acids and less than 300 milligrams per day of cholesterol, and keep *trans* fatty acid consumption as low as possible.
- Keep total fat intake between 20 to 35 percent of calorie intake, with most fats coming from sources of polyunsaturated and monosaturated fatty acids, such as fish, nuts, and vegetable oils.
- When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free.
- Limit intake of fats and oils high in saturated and/or *trans* fatty acids, and choose products low in such fats and oils.

Key Recommendations for Specific Population Groups

- *Children and adolescents.* Keep total fat intake between 30 to 35 percent of calorie intake for children 2 to 3 years of age and between 25 to 35 percent of calorie intake for children and adolescents 4 to 18 years of age, with most fats coming from sources of polyunsaturated and monosaturated fatty acids, such as fish, nuts, and vegetable oils.

Carbohydrates

- Choose fiber-rich fruits, vegetables, and whole grains often.
- Choose and prepare foods and beverages with little added sugars or caloric sweeteners, such as amounts suggested by MyPyramid.
- Reduce the incidence of dental caries by practicing good oral hygiene and consuming sugar- and starch-containing foods and beverages less frequently.

Table 2-8 (continued)

Sodium and Potassium
<ul style="list-style-type: none"> • Consume less than 2,300 milligrams of sodium per day (approximately 1 tsp of salt). • Choose and prepare foods with little salt. At the same time, consume potassium-rich foods, such as fruits and vegetables. <p><i>Key Recommendations for Specific Population Groups</i></p> <ul style="list-style-type: none"> • <i>Individuals with hypertension, blacks, and middle-aged and older adults.</i> Aim to consume no more than 1,500 milligrams of sodium per day, and meet the potassium recommendation (4,700 milligrams per day) with food.
Alcoholic Beverages
<ul style="list-style-type: none"> • Those who choose to drink alcoholic beverages should do so sensibly and in moderation—up to one drink per day for women and up to two drinks per day for men (12 ounces of a regular beer, 5 ounces of wine or 1-1/2 ounces of 80 proof distilled spirits count as one drink for purposes of explaining moderation.) • Alcoholic beverages should not be consumed by some individuals, including those who cannot restrict their alcohol intake, women of childbearing age who may become pregnant, pregnant and lactating women, children and adolescents, individuals taking medications that may interact with alcohol, and those with specific medical conditions. • Alcoholic beverages should be avoided by individuals engaging in activities that require attention; skill; or coordination, such as driving or operating machinery.
Food Safety
<p>To avoid microbial foodborne illness:</p> <ul style="list-style-type: none"> • Clean hands, food contact surfaces, and fruits and vegetables. Meat and poultry should <i>not</i> be washed or rinsed to avoid spreading bacteria to other foods. • Separate raw, cooked, and ready-to-eat foods while shopping, preparing, or storing foods. • Cook foods to a safe temperature to kill microorganisms. • Refrigerate perishable food promptly and defrost foods properly. • Avoid unpasteurized milk or any products made from unpasteurized milk, raw or partially cooked eggs or foods containing raw eggs, or raw or undercooked meat and poultry, unpasteurized juices, and raw sprouts. <p><i>Key Recommendations for Specific Population Groups</i></p> <ul style="list-style-type: none"> • <i>Infants and young children, pregnant women, older adults, and those who are immunocompromised.</i> Do not eat or drink unpasteurized milk or any products made from unpasteurized milk, raw or partially cooked eggs or foods containing raw eggs, raw or undercooked meat and poultry, raw or undercooked fish or shellfish, unpasteurized juices, and raw sprouts. • <i>Pregnant women, older adults, and those who are immunocompromised:</i> Only eat certain deli meats and frankfurters that have been reheated to steaming hot.

A basic premise of the Dietary Guidelines is that nutrient needs should be met primarily through consuming foods. Foods provide an array of nutrients and other compounds that may have beneficial effects on health. Fortified foods and dietary supplements, however, are especially important for people whose typical food choices cannot meet one or more nutrient recommendations, such as for vitamin E or calcium. However, dietary supplements are not a substitute for a healthful diet.

The 2005 Dietary Guidelines for Americans (and the consumer brochure) are available at www.healthierus.gov/dietaryguidelines.

Practical Use of the Dietary Guidelines

The Dietary Guidelines are designed to meet nutrient needs while reducing the risk of obesity, hypertension, cardiovascular disease, type 2 diabetes, alcoholism, and foodborne illness.

The Dietary Guidelines are not difficult to implement (Table 2-9). Despite popular misconceptions, this overall diet approach is not especially expensive. Fruits, vegetables, and low-fat and fat-free milk are no more expensive than the chips, cookies, and sugared soft drinks they should in part replace.

A brochure designed for the public based on the 2005 Dietary Guidelines for Americans is entitled “Finding Your Way to a Healthier You.” It communicates the major themes of the 2005 Dietary Guidelines for Americans, but uses simpler message(s).

Table 2-9 Recommended Diet Changes Based on the Dietary Guidelines

If You Usually Eat This,	Try This Instead	Benefit
White bread	Whole-wheat bread	<ul style="list-style-type: none"> • Higher nutrient density, due to less processing • More fiber
Sugary breakfast cereal	Low-sugar, high-fiber cereal with fresh fruit	<ul style="list-style-type: none"> • Higher nutrient density • More fiber • More phytochemicals
Cheeseburger with French fries	Hamburger and baked beans	<ul style="list-style-type: none"> • Less saturated fat and <i>trans</i> fat • Less cholesterol • More fiber • More phytochemicals
Potato salad	Three-bean salad	<ul style="list-style-type: none"> • More fiber • More phytochemicals
Doughnuts	Bran muffin/bagel with light cream cheese	<ul style="list-style-type: none"> • More fiber • Less fat
Regular soft drinks	Diet soft drinks	<ul style="list-style-type: none"> • Fewer calories
Boiled vegetables	Steamed vegetables	<ul style="list-style-type: none"> • Higher nutrient density, due to reduced loss of water-soluble vitamins
Canned vegetables	Fresh or frozen vegetables	<ul style="list-style-type: none"> • Higher nutrient density, due to reduced loss of heat-sensitive vitamins • Lower in sodium
Fried meats	Broiled meats	<ul style="list-style-type: none"> • Less saturated fat
Fatty meats, such as ribs or bacon	Lean meats, such as ground round, chicken, or fish	<ul style="list-style-type: none"> • Less saturated fat
Whole milk	Low-fat or fat-free milk	<ul style="list-style-type: none"> • Less saturated fat • Fewer calories • More calcium
Ice cream	Sherbet or frozen yogurt	<ul style="list-style-type: none"> • Less saturated fat • Fewer calories
Mayonnaise or sour cream salad dressing	Oil and vinegar dressings or light creamy dressings	<ul style="list-style-type: none"> • Less saturated fat • Less cholesterol • Fewer calories
Cookies	Popcorn (air popped with minimal margarine or butter)	<ul style="list-style-type: none"> • Fewer calories and <i>trans</i> fat
Heavily salted foods	Foods flavored primarily with herbs, spices, lemon juice	<ul style="list-style-type: none"> • Lower in sodium
Chips	Pretzels	<ul style="list-style-type: none"> • Less fat

Critical Thinking

Shannon has grown up eating the typical American diet. Having recently read and heard many media reports about the relationship between nutrition and health, she is beginning to look critically at her diet and is considering making changes. However, she doesn't know where to begin. What advice would you give her?

Note also that diet recommendations for adults have been issued by other scientific groups, such as the American Heart Association, U.S. Surgeon General, National Academy of Sciences, American Cancer Society, Canadian Ministries of Health (see Appendix B), and World Health Organization. All are consistent with the spirit of the Dietary Guidelines. These groups encourage people to modify their eating behavior in ways that are both healthful and pleasurable.

The Dietary Guidelines and You

When using the Dietary Guidelines, you should consider your own state of health. Make specific changes and see whether they are effective. Note that results are sometimes disappointing, even when you are following a diet change very closely. Some people can eat a lot of saturated fat and still keep blood cholesterol under control. Other people, unfortunately, have high blood cholesterol even if they eat a diet low in saturated fat. Differences in genetic background are a key cause, as you will learn in Chapter 3. Thus, we have individual nutritional needs and risks of developing certain diseases. One's diet should be planned with this individuality in mind, taking into account when possible, one's current health status and family history for specific diseases. However, tailoring a unique nutrition program for every North American citizen is currently unrealistic. MyPyramid and the 2005 Dietary Guidelines provide typical adults with simple advice, which can be actively practiced by anyone willing to take a step toward good health.

There is no "optimal" diet. Instead, there are numerous healthful diets. Visit the website of the International Food Information Council (ific.org). This site is a great resource for current nutrition information.

Advice from the American Dietetic Association suggests five basic principles with regard to diet and health.

- Be realistic, making small changes over time.
- Be adventurous, trying new foods regularly.
- Be flexible, balancing some sweet and fatty foods with physical activity.
- Be sensible, including favorite foods in smaller portions.
- Finally, be active, including physical activity in daily life.



Nutrition recommendations are often made on a population-wide basis. However, in some cases, it would be more appropriate if these were made on an individual basis once a person's particular health status is known.

Concept Check

Dietary Guidelines for Americans have been set by government organizations. These guidelines are designed to reduce the risk of developing obesity, hypertension, type 2 diabetes, cardiovascular disease, alcoholism, and foodborne illness. To do so, they recommend eating a variety of foods, which is fostered by following MyPyramid. They also recommend performing regular physical activity, aiming for a healthy weight, and moderating total fat, saturated fat, *trans* fat, salt, sugar, and alcohol intake, while focusing more on fruits, vegetables, and whole-grain products in daily menu planning. Safe food preparation and storage are also highlighted.



Real Life Scenario

Follow-Up

The most positive aspect of Andy's diet is that it contains adequate protein, zinc, and iron because it is rich in animal protein. On the downside, his diet is low in calcium, some B vitamins (such as folate), and vitamin C. This is because it is low in dairy products, fruits, and vegetables. It is also low in many of the phytochemical (plant-based) substances discussed at the beginning of Chapter 2. In addition, his fiber intake is low because fast-food restaurants primarily use refined grain products, rather than whole-grain products. And, since most super-sized options apply to foods rich in fat (French fries) and sugar (soft drinks), his diet is likely excessive in these two components.

He could alternate between tacos and bean burritos to gain the benefits of plant proteins in a diet. He could choose a low-fat granola bar instead of the candy bar for breakfast, or he could take the time to eat a bowl of whole-grain breakfast cereal with low-fat or fat-free milk to increase fiber intake (and calcium intake as well in the latter case). He could also order milk at least half the time at his restaurant visits and substitute diet soft drinks for the regular variety. This would help *moderate* his sugar intake. Overall, Andy could improve his intake of fruits, vegetables, and dairy products if he focused more on variety in food choice and balance among the food groups.



The Alphabet Soup of Nutrient Needs

The overarching goal of any healthy diet plan is to meet nutrient needs. To begin, we must determine what amount of each essential nutrient is needed to maintain health. The standards that have been developed for such nutrient needs—DRI, RDA, AI, EER, and UL—can often seem like an alphabet soup of abbreviations. However, you can more easily sift through these nutrient standards if you have a knowledge base about their development and use (Table 2-10).

The ABCs of Nutrient Recommendations

Most of the terms that describe nutrient needs fall under one umbrella term—**Dietary Reference Intakes (DRIs)**. The development of DRIs is an ongoing, collaborative effort between Health Canada and the Food and Nutrition Board of the Institute of Medicine in the United States. Included under the DRI umbrella are **Recommended Dietary Allowances (RDAs)**, **Adequate Intakes (AIs)**, **Estimated Energy Requirements (EERs)**, and **Tolerable Upper Intake Levels (Upper Levels or ULs)**.

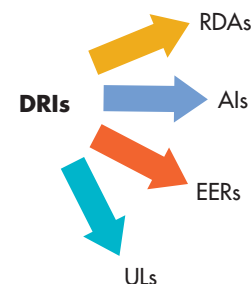
Recommended Dietary Allowance

A Recommended Dietary Allowance (RDA) is based on meeting the needs of nearly all individuals (about 97%) in a particular age and gender group. A person can compare his or her individual intake of specific nutrients to the RDA. Although an intake slightly above or below the RDA for a particular nutrient is no reason for concern, a significant deviation below (about 70%) or above (about three times or more for some nutrients) the RDA over an extended period of time can eventually result in a deficiency or toxicity of that nutrient, respectively.

A nutrition standard more relevant to everyday life is the Daily Value (DV). This is a generic standard used on food labels. It is applicable to both genders from 4 years of age through adulthood, and is based on a 2000 kcal diet. DVs are mostly set at or close to the highest RDA value or related nutrient standard seen in the various age and gender categories for a specific nutrient (see Appendix A). DVs have been set for vitamins, minerals, protein, and other dietary components. DVs allow consumers to compare their intake from a specific food to desirable (or maximum) intakes.

Table 2-10 Putting the Alphabet Soup of Nutrient Needs to Use

RDA	Recommended Dietary Allowance. Use to evaluate your current intake for a specific nutrient. The further you stray above or below this value, the greater your chances of developing nutritional problems.
AI	Adequate Intake. Use to evaluate your current intake of nutrients, but realize that an AI designation implies that further research is required before scientists can establish a more definitive number.
EER	Estimated Energy Requirement. Use to estimate calorie needs of the average person within a specific height, weight, gender, age, and physical activity pattern.
UL	Upper Level. Use to evaluate the highest amount of daily nutrient intake that is unlikely to cause adverse health effects in the long run in almost all people (97% to 98%) in a population. This number applies to chronic use and is set to protect even very susceptible people in the healthy general population. As intake increases above the Upper Level, the potential for adverse effects generally increases.
DV	Daily Value. Use as a rough guide for comparing the nutrient content of a food to approximate human needs. Typically, the Daily Value used on food labels refers to ages 4 years through adulthood. It is based on a 2000 kcal diet. Some Daily Values also increase slightly with higher calorie intakes (see Fig. 2-8 in the following section on food labeling).





With a little bit of study, you can master the alphabet soup of nutrition.

■ Adequate Intake

An RDA can be set for a nutrient only if there is sufficient information on the human needs for that particular nutrient. Today, there is not enough information on some nutrients, such as calcium, to set such a precise standard as an RDA. For this and other nutrients, the DRIs include a category called an Adequate Intake (AI). This standard is derived from the dietary intakes of people that appear to be maintaining nutritional health. That amount of intake is assumed to be adequate, as no evidence of a nutritional deficiency is apparent.

■ Estimated Energy Requirement

Instead of an RDA or AI for calorie needs, we use the Estimated Energy Requirement (EER). As described, the RDAs are set somewhat higher than the average needs for nutrients. This is fine for nutrients rather than calories because a slight excess of vitamins and minerals is not harmful. However, a long-term excess of calories will lead to weight gain. Therefore, the calculation of EER needs to be more specific, taking into account age, gender, height, weight, and physical activity (e.g., sedentary or moderately active). In some cases, the additional calorie needs for growth and lactation are also included (see Chapters 10, 13, and 14 for the specific formulas used). The EER also is based on the “average” person. Thus it can only serve as a starting point for estimating calorie needs.

■ Tolerable Upper Intake Level

A Tolerable Upper Intake Level (Upper Level or UL) has been set for some vitamins and minerals (see the inside cover). The UL is the highest amount of a nutrient that is unlikely to cause adverse health effects in the long run. As intake exceeds the UL, the risk of ill effects increases. These amounts generally should not be exceeded day after day, as toxicity could develop. For people eating a varied diet and/or using a balanced multivitamin and mineral supplement, exceeding the UL is usually not seen. Problems are more likely to arise with diets that promote excessive intakes of a limited variety of foods, or with the use of many fortified foods or excessive doses of individual vitamins or minerals.

How Should These Nutrient Standards Be Used?

To sum up the acronyms described so far, the type of standard that is set for nutrients depends on the quality of available evidence. A nutrient recommendation that is backed by lots of experimental research will have an RDA. For a nutrient that still requires more research, only an AI is presented. We use the EER as a starting point for determining calorie needs. Some nutrients also have a UL if information on toxicity is available. Periodically, new DRIs become available as expert committees review and interpret the available research.

RDAs and related standards are intended mainly for diet planning. Specifically, a diet plan should aim to meet the RDA or AI as appropriate, and not to exceed the UL over the long term (Fig. 2-7). Specific RDA, AI, EER, and UL standards are printed on the inside cover of this book. To learn more about these nutrient standards, visit the link for the Food and Nutrition Board on the Institute of Medicine’s web page (www.iom.edu).

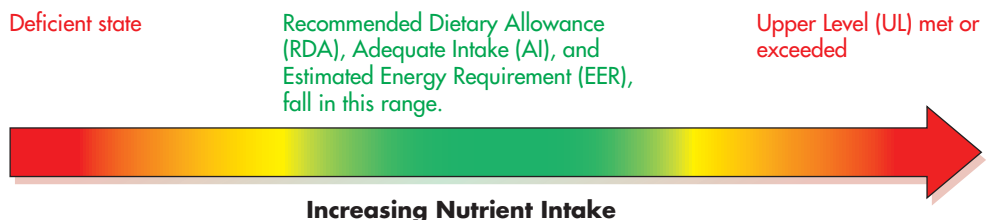


Figure 2-7 The alphabet soup of dietary standards. Think of the nutrient standards as snapshots along a line. As nutrient intake increases, the Recommended Dietary Allowance (RDA) for the nutrient, if set, is eventually met and a deficient state is no longer present. An individual’s needs most likely will be met as RDAs are set high to include almost all people. Related to the RDA concept of meeting an individual’s needs are the standards of Adequate Intake (AI) and the Estimated Energy Requirement (EER). These can be used to estimate an individual’s needs for some nutrients and calories, respectively. Still, keep in mind that these standards do not share the same degree of accuracy as the RDA. For example, EER may have to be adjusted upward if the individual is very physically active. Finally, as nutrient intake increases above the Upper Level (UL), poor nutritional health is again likely. However, this poor health is due now to the toxic effects of a nutrient, rather than those of a deficiency.

What Do Food Labels Have to Offer in Diet Planning?

Today, nearly all foods sold in the supermarket must be labeled with the product name, name and address of the manufacturer, amount of product in the package, and ingredients listed in descending order by weight. This food and beverage labeling is monitored in North America by government agencies such as the Food and Drug Administration (FDA) in the United States. The listing of certain food constituents also is required—specifically, on a Nutrition Facts panel (Fig. 2-8). Use this information to learn more about what you eat. The following components must be listed: total calories (kcal), calories from fat, total fat, saturated fat, *trans* fat, cholesterol, sodium, total carbohydrate, fiber, sugars, protein, vitamin A, vitamin C, calcium, and iron. In addition to these required components, manufacturers can choose to list polyunsaturated and monounsaturated fat, potassium, and others. Listing these components is *required*, however, if a claim is made about the health benefits of the specific nutrient (see the upcoming section in Chapter 2 entitled “Health Claims on Food Labels”) or if the food is fortified with that nutrient.

The percentage of the Daily Value (% Daily Value) is usually given for each nutrient per serving. It is important to understand that these percentages are based on a 2000 kcal diet. In other words, they are not as applicable to people who require considerably more or less than 2000 kcal per day with respect to fat and carbohydrate intake.

Serving sizes on the Nutrition Facts panel must be consistent among similar foods. This means that all brands of ice cream, for example, must use the same serving size on their label. (These serving sizes may differ from those of MyPyramid since those of food labels are based on typical serving sizes.) In addition, food claims made on packages must follow legal definitions (Table 2-11). For example, if a product claims to be “low sodium,” it must have 140 milligrams of sodium or less per serving.

Many manufacturers list the Daily Values set for dietary components such as fat, cholesterol, and carbohydrate on the Nutrition Facts panel. This can be useful as a reference point. As noted before, they are based on 2000 kcal; if the label is large enough, amounts based on 2500 kcal are listed as well for total fat, saturated fat, carbohydrate, and other components.

■ Exceptions to Food Labeling

Foods such as fresh fruits and vegetables, fish, meats, and poultry currently are not required to have Nutrition Facts labels. However, many grocers and some meat packers have voluntarily chosen to provide their customers with information about these products. Nutrition Facts labels on meat products will likely be required in the coming years. The next time you are at the grocery store, ask where you might find information on the fresh products that do not have a Nutrition Facts panel. You will likely find a poster or pamphlet near the product; often, these pamphlets contain recipes that use your favorite fruit, vegetable, or cut of meat. They may even assist you in your endeavor to improve your diet.

Because protein deficiency is not a public health concern in the United States, declaration of the % Daily Value for protein is not mandatory on foods for people over 4 years of age. If the % Daily Value is given on a label, FDA requires that the product be analyzed for protein quality. Because this procedure is expensive and time-consuming, many companies opt not to list a % Daily Value for protein rather than undergo the expense. However, labels on food for infants and children under 4 years of age must include the % Daily Value for protein, as must the labels on any food carrying a claim about protein content (see Chapter 14).



Use the Nutrition Facts label to learn more about the nutrient content of the foods you eat. Nutrient content is expressed as a percent of Daily Value. Canadian food laws and related food labels have a slightly different format (review Appendix B).

Recall from Chapter 1 that the nutrition label uses the term calorie to express energy content in some cases, but kilocalorie (kcal) values are actually listed.

Nutrient and herbal supplement labels have a different layout with a “Supplement Facts” heading. Chapters 1 and 8 show examples of these labels.

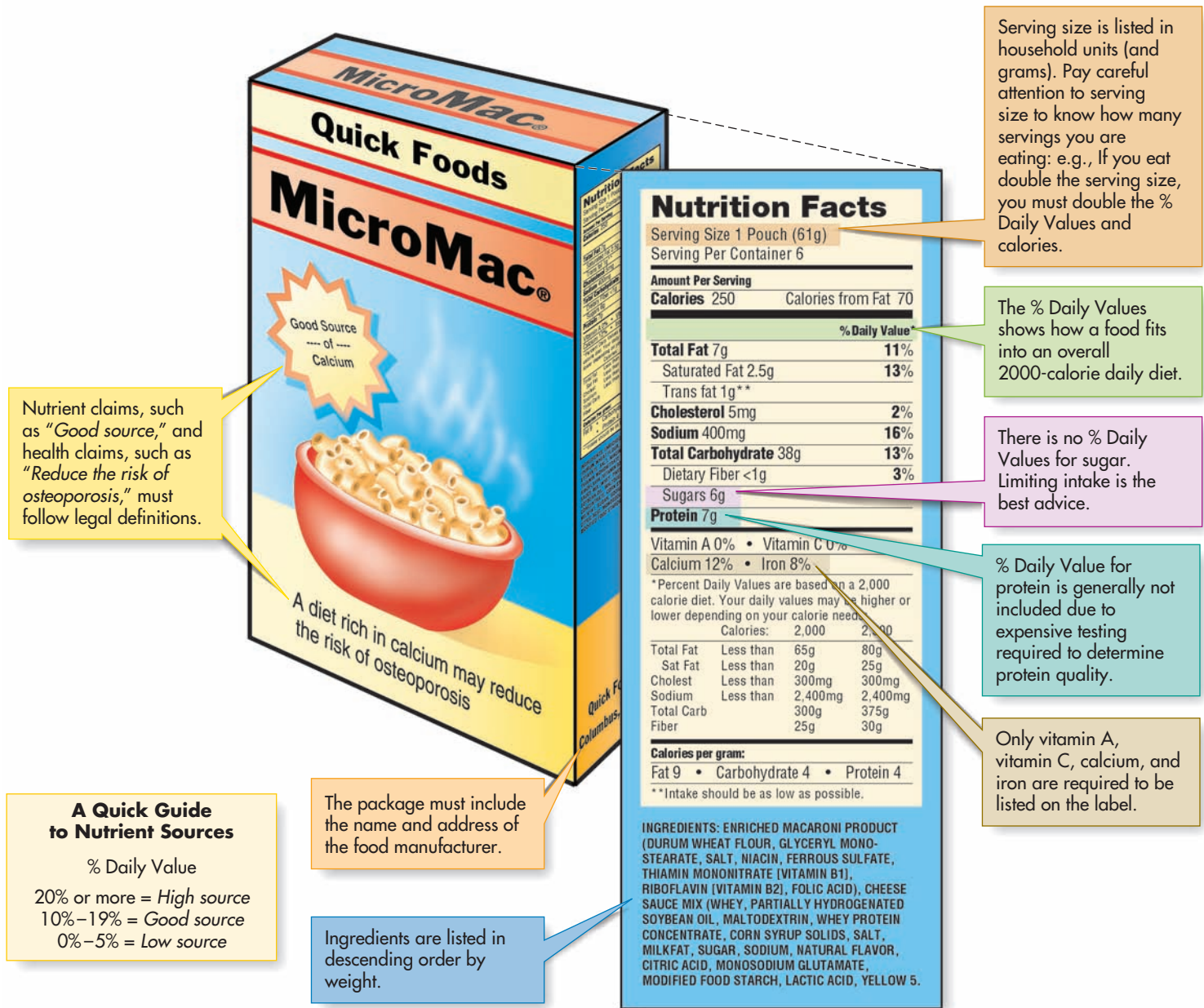



Figure 2-8 The Nutrition Facts panel on a current food label. This nutrition information is required on virtually all processed food products. The % Daily Value listed on the label is the percentage of the generally accepted amount of a nutrient needed daily that is present in 1 serving of the product. You can use the % Daily Values to compare your diet with current nutrition recommendations for certain diet components. Let's consider fiber. Assume that you consume 2000 kcal per day, which is the energy intake for which the % Daily Values listed on labels have been calculated. If the total % Daily Value for dietary fiber in all the foods you eat in one day adds up to 100%, your diet meets the recommendations for fiber. Food labels also contain the name and address of the food manufacturers. This allows consumers to contact the manufacturer if they desire.

■ Health Claims on Food Labels

As a marketing tool directed toward the health-conscious consumer, food manufacturers like to assert that their products have all sorts of health benefits. After reviewing hundreds of comments on the proposed rule allowing health claims, FDA, which has legal oversight over most food products, has decided to permit some health claims with certain restrictions.

Table 2-11 Definitions for Comparative and Absolute Nutrient Claims on Food Labels

Sugar	Cholesterol	Sodium
<ul style="list-style-type: none"> • Sugar free: less than 0.5 grams (g) per serving. • No added sugar; without added sugar; no sugar added: <ul style="list-style-type: none"> • No sugars were added during processing or packing, including ingredients that contain sugars (for example, fruit juices, applesauce, or jam). • Processing does not increase the sugar content above the amount naturally present in the ingredients. (A functionally insignificant increase in sugars is acceptable for processes used for purposes other than increasing sugar content.) • The food that it resembles and for which it substitutes normally contains added sugars. • If the food doesn't meet the requirements for a low- or reduced-calorie food, the product bears a statement that the food is not low calorie or calorie reduced and directs consumers' attention to the Nutrition Facts panel for further information on sugars and calorie content. • Reduced sugar: at least 25% less sugar per serving than reference food 	<p>3 g per serving. <i>Reduced fat</i> will be the term used instead.</p> <ul style="list-style-type: none"> • Low saturated fat: 1 g or less per serving and not more than 15% of kcal from saturated fatty acids • Reduced or less fat: at least 25% less per serving than reference food • Reduced or less saturated fat: at least 25% less per serving than reference food 	<p>fewer kcal or half the fat of reference food (if the food derives 50% or more of its kcal from fat, the reduction must be 50% of the fat) and, second, that the sodium content of a low-calorie, low-fat food has been reduced by 50%. In addition, "light in sodium" may be used for foods in which the sodium content has been reduced by at least 50%. The term <i>light</i> may still be used to describe such properties as texture and color, as long as the label explains the intent—for example, "light brown sugar" and "light and fluffy."</p> <ul style="list-style-type: none"> • Diet: A food may be labeled with terms such as <i>diet</i>, <i>dietetic</i>, <i>artificially sweetened</i>, or <i>sweetened with nonnutritive sweetener</i> only if the claim is not false or misleading. The food can also be labeled <i>low calorie</i> or <i>reduced calorie</i>. • Good source: <i>Good source</i> means that a serving of the food contains 10% to 19% of the Daily Value for a particular nutrient. If 5% or less it is a low source. • High: <i>High</i> means that a serving of the food contains 20% or more of the Daily Value for a particular nutrient.
Calories	Sodium	Other Terms
<ul style="list-style-type: none"> • Calorie free: fewer than 5 kcal per serving • Low calorie: 40 kcal or less per serving and, if the serving is 30 g or less or 2 tablespoons or less, per 50 g of the food • Reduced or fewer calories: at least 25% fewer kcal per serving than reference food 	<ul style="list-style-type: none"> • Sodium free: less than 5 mg per serving • Very low sodium: 35 mg or less per serving and, if the serving is 30 g or less or 2 tablespoons or less, per 50 g of the food • Low sodium: 140 mg or less per serving and, if the serving is 30 g or less or 2 tablespoons or less, per 50 g of the food • Light in sodium: at least 50% less per serving than reference food • Reduced or less sodium: at least 25% less per serving than reference food 	 <ul style="list-style-type: none"> • Organic: Federal standards for organic foods allow claims when much of the ingredients do not use chemical fertilizers or pesticides, genetic engineering, sewage sludge, antibiotics, or irradiation in their production. At least 95% of ingredients (by weight) must meet these guidelines to be labeled "organic" on the front of the package. If the front label instead says "made with organic ingredients," only 70% of the ingredients must be organic. For livestock, the animals need to be allowed to graze outdoors and as well be fed organic feed. They also cannot be exposed to large amounts of antibiotics or growth hormones. • Natural: The food must be free of food colors, synthetic flavors, or any other synthetic substance.
Fiber	Other Terms	The following terms apply only to meat and poultry products regulated by USDA.
<ul style="list-style-type: none"> • High fiber: 5 g or more per serving. (Foods making high-fiber claims must meet the definition for low fat, or the level of total fat must appear next to the high-fiber claim.) • Good source of fiber: 2.5 to 4.9 g per serving • More or added fiber: at least 2.5 g more per serving than reference food 	<ul style="list-style-type: none"> • Fortified or enriched: Vitamins and/or minerals have been added to the product in amounts in excess of at least 10% of that normally present in the usual product. Enriched generally refers to replacing nutrients lost in processing, whereas fortified refers to adding nutrients not originally present in the specific food. • Healthy: An individual food that is low fat and low saturated fat and has no more than 360 to 480 mg of sodium or 60 mg of cholesterol per serving can be labeled "healthy" if it provides at least 10% of the Daily Value for vitamin A, vitamin C, protein, calcium, iron, or fiber. • Light or lite: The descriptor <i>light</i> or <i>lite</i> can mean two things: first, that a nutritionally altered product contains one-third 	<ul style="list-style-type: none"> • Extra lean: less than 5 g of fat, 2 g of saturated fat, and 95 mg of cholesterol per serving (or 100 g of an individual food) • Lean: less than 10 g of fat, 4.5 g of saturated fat, and 95 mg of cholesterol per serving (or 100 g of an individual food)
Fat		
<ul style="list-style-type: none"> • Fat free: less than 0.5 g of fat per serving • Saturated fat free: less than 0.5 g per serving, and the level of <i>trans</i> fatty acids does not exceed 0.5 g per serving • Low fat: 3 g or less per serving and, if the serving is 30 g or less or 2 tablespoons or less, per 50 g of the food. 2% milk can no longer be labeled low fat, as it exceeds 		

Many definitions are from FDA's *Dictionary of Terms*, as established in conjunction with the 1990 Nutrition Education and Labeling Act (NELA). g = grams; mg = milligrams



The nutrition information on the food labels on these three products can be combined to indicate nutrient intake for a peanut butter and jelly sandwich.

Currently, FDA limits the use of health messages to specific instances in which there is significant scientific agreement that a relationship exists between a nutrient, food, or food constituent and the disease. The claims allowed at this time may show a link between the following:

- A diet with enough calcium and a reduced risk of osteoporosis
- A diet low in total fat and a reduced risk of some cancers
- A diet low in saturated fat and cholesterol and a reduced risk of cardiovascular disease (typically referred to as heart disease on the label)
- A diet rich in fiber—containing grain products, fruits, and vegetables and a reduced risk of some cancers
- A diet low in sodium and high in potassium and a reduced risk of hypertension and stroke
- A diet rich in fruits and vegetables and a reduced risk of some cancers
- A diet adequate in the synthetic form of the vitamin folate (called folic acid) and a reduced risk of neural tube defects (a type of birth defect)
- Use of sugarless gum and a reduced risk of tooth decay, especially when compared with foods high in sugars and starches
- A diet rich in fruits, vegetables, and grain products that contain fiber and a reduced risk of cardiovascular disease. Oats (oatmeal, oat bran, and oat flour) and psyllium are two fiber-rich ingredients that can be singled out in reducing the risk of cardiovascular disease, as long as the statement also says the diet should also be low in saturated fat and cholesterol.
- A diet rich in whole-grain foods and other plant foods, as well as low in total fat, saturated fat, and cholesterol, and a reduced risk of cardiovascular disease and certain cancers
- A diet low in saturated fat and cholesterol that also includes 25 grams of soy protein and a reduced risk of cardiovascular disease. The statement “one serving of the (name of food) provides _____ grams of soy protein” must also appear as part of the health claim.
- Fatty acids from oils present in fish and a reduced risk of cardiovascular disease
- Margarines containing plant stanols and sterols and a reduced risk of cardiovascular disease (see Chapter 5 for more details on plant stanols and sterols)

A “may” or “might” qualifier must be used in the statement.

In addition, before a health claim can be made for a food product, it must meet two general requirements. First, the food must be a “good source” (before any fortification) of fiber, protein, vitamin A, vitamin C, calcium, or iron. The legal definition of “good source” appears in Table 2-9. Second, a single serving of the food product cannot contain more than 13 grams of fat, 4 grams of saturated fat, 60 milligrams of cholesterol, or 480 milligrams of sodium. If a food exceeds any one of these requirements, no health claim can be made for it, despite its other nutritional qualities. For example, even though whole milk is high in calcium, its label can’t make the health claim about calcium and osteoporosis because whole milk contains 5 grams of saturated fat per serving.

In addition, the product must meet criteria specific to any health claim being made. For example, a health claim regarding fat and cancer can be made only if the product contains 3 grams or less of fat per serving, which is the standard for low-fat foods.

Another Bite

In December 2002, FDA created three new preliminary classes of health claims. The agency announced that it would now allow such health claims for foods based on incomplete scientific evidence as long as the label qualified it with a disclaimer such as “this evidence is not conclusive.” These preliminary health claims haven’t shown up on many foods at this time (fish and nuts such as walnuts have been some of the first examples). These claims also cannot be used on foods considered unhealthy (review Table 2-11 for the definition of healthy with regard to a food).

Overall, claims on foods fall into one of four categories:

- Health claims—closely regulated by FDA
- Preliminary health claims—regulated by FDA but evidence may be scant for the claim
- Nutrient claims—closely regulated by FDA (review Table 2-11)
- Structure/function claims—as discussed in Chapter 1, these are not FDA approved or necessarily valid



Eating fish at least twice a week contributes to overall health.

Concept Check

The Nutrition Facts panel on a food label provides key information for helping track one's food intake. Nutrient quantities are compared with the Daily Values and expressed on a percentage basis (% Daily Value). This information can be used to either increase or reduce intake of specific nutrients. Health claims on food labels are closely regulated by FDA. Fruits, vegetables, whole-grain breads and cereals, soy, and good sources of calcium are prominent among the foods that can make specific health claims.

Canadian food labels use a slightly different group of health claims and label descriptors (see Appendix B).

Epilogue

The tools discussed in Chapter 2 greatly aid in menu planning. Menu planning can start with MyPyramid. The totality of choices made within the groups can then be evaluated using the Dietary Guidelines. Individual foods that make up a diet can be examined more closely using the Daily Values listed on the Nutrition Facts panel of the product. For the most part, these Daily Values are in line with the Recommended Dietary Allowances and related nutrient standards. The Nutrition Facts panel is especially useful in identifying nutrient-dense foods—foods that are high in a specific nutrient, such as the vitamin folate, but low in comparison with the relative amount of calories provided—as well as foods that fill you up without providing a lot of calories. The latter are described as foods with low energy density. Generally speaking, the more you learn about and use these tools, the more they will benefit your diet.

The **Exchange System** is a final menu-planning tool. This tool organizes foods based on calorie, protein, carbohydrate, and fat content. The result is a manageable framework for designing diets, especially for treatment of diabetes. For more information on the Exchange System see Appendices C and D.

Summary

1. *Variety, balance, and moderation* are three watchwords of diet planning.
2. Nutrient density is a useful concept. It reflects the nutrient content of a food in relation to its calorie content. Nutrient-dense foods are relatively rich in nutrients, in comparison with calorie content.
3. Energy density of a food is determined by comparing calorie content with the weight of food. A food that is rich in calories but weighs relatively very little, such as nuts, cookies, fried foods in general, and most snack foods (including fat-free brands), is considered energy dense. Foods with low energy density include fruits, vegetables, and any food that incorporates lots of water during cooking, such as oatmeal.
4. A person's nutritional state can be categorized as *desirable nutrition*, in which the body has adequate stores for times of increased needs; *undernutrition*, which may be present with or without clinical symptoms; and *overnutrition*, which can lead to vitamin and mineral toxicities and various chronic diseases.
5. Evaluation of nutritional state involves analyzing background factors, as well as anthropometric, biochemical, clinical, dietary, and economic assessments. It is not always possible to detect nutritional inadequacies via nutrition assessment since symptoms of deficiencies are often nonspecific and may not appear for many years.
6. MyPyramid is designed to translate nutrient recommendations into a food plan that exhibits variety, balance, and moderation. The best results are obtained by using low-fat or fat-free dairy products; incorporating some vegetable proteins in the diet in addition to animal-protein foods; including citrus fruits and dark green vegetables; and emphasizing whole-grain breads and cereals.
7. Dietary Guidelines for Americans have been issued to help reduce chronic diseases. The guidelines emphasize eating a variety of foods; performing regular physical activity; maintaining or improving weight; moderating consumption of fat, *trans* fat, cholesterol, sugar, salt, and alcohol; eating plenty of whole-grain products, fruits, and vegetables; and safely preparing and storing foods, especially perishable foods.
8. Recommended Dietary Allowances (RDAs) are set for many nutrients. These amounts yield enough of each nutrient to meet the needs of healthy individuals within specific gender and age categories. Adequate Intake (AI) is the standard used when not enough information is available to set a more specific RDA. Estimated Energy Requirements (EERs) set calorie needs for both genders at various ages and physical activity patterns. Tolerable Upper Intake Levels (Upper Levels or ULs) for nutrient intake have been set for some vitamins and minerals. All of the many dietary standards fall under the term *Dietary Reference Intakes (DRIs)*. Daily Values are used as a basis for expressing the nutrient content of foods on the Nutrition Facts panel and are based for the most part on the RDAs.
9. Food labels are a useful tool to track your nutrient intake and learn more about the nutritional characteristics of the foods you eat. Any health claims listed must follow criteria set by FDA.

Study Questions

1. Describe the philosophy underlying the creation of MyPyramid. What dietary changes would you need to make to meet the pyramid guidelines on a regular basis?
2. Trace the progression, in terms of physical results, of a person who went from an overnourished to an undernourished state.
3. How could the nutritional state of the person at each state in question 2 be evaluated?
4. Describe the intent of the Dietary Guidelines for Americans. Point out one criticism for its general application to all North American adults.
5. Based on the discussion of the Dietary Guidelines for Americans, suggest two key dietary changes the typical North American adult should consider making.
6. How do RDAs and Adequate Intakes differ from Daily Values in intention and application?
7. How would you explain the concepts of nutrient density and energy density to a fourth grade class?
8. Nutritionists encourage all people to read labels on food packages to learn more about what they eat. What four nutrients could easily be tracked in your diet if you read the Nutrition Facts panels regularly on food products?
9. Explain why consumers can have confidence in FDA-approved health claims on food packages.
10. Relate the importance of variety in a diet, especially with regard to fruit and vegetable choices, to the discovery of various phytochemicals in foods.

Further Readings

1. ADA Reports: Position of the American Dietetic Association: Functional foods. *Journal of the American Dietetic Association* 104:814, 2004.
Functional foods are foods that have health-promoting properties beyond those provided by nutrient content alone. The many potential benefits of functional foods are described in the article. Still, since foods naturally contain numerous different nutrients and phytochemicals, an important focus is to consider any functional food to be a part of an otherwise healthy diet, especially one rich in fruits and vegetables.
2. Barr SI and others: Planning diets for individuals using the Dietary Reference Intakes. *Nutrition Reviews* 61:352, 2003.
This article describes appropriate uses of the Recommended Dietary Allowances, Adequate Intakes, and Tolerable Upper Intake Levels. Dietary intakes from individuals is best evaluated with the Recommended Dietary Allowances and Adequate Intakes.
3. DeBoer SW and others: Dietary intake of fruits, vegetables, and fat in Olmsted County, Minn. *Mayo Clinic Proceedings* 78:161, 2003.
Upper Levels should not be exceeded on a chronic basis.
Most of the adults in this diet survey consumed less than the recommended amounts of fruits and vegetables and more fat than is recommended. Efforts are needed to convince adults in general to follow a healthier diet.

4. Food and Nutrition Board: *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*. Washington DC: National Academy Press, 2002.
This report provides the latest guidance for macronutrient and energy intakes. With regard to calorie intake in adulthood, this should generally match energy output so weight maintenance is achieved.
5. Hasler CM: Functional foods: Benefits, concerns, and challenges—A position paper from the American Council on Science and Health. *Journal of Nutrition* 132:3772, 2002.
We now know that our diet and its constituents from both plant and animal sources provide more than the essential nutrients such as protein and vitamins, namely a variety of phytochemical and other components that also contribute to health. Foods rich in specific phytochemicals are often termed functional foods. This article lists a variety of phytochemicals under study, as well as current approved health claims for food labels.
6. Is your diet up-to date? *Consumer Reports on Health* 15(1):1, 2003.
A healthful diet is one that is rich in whole grains, produce, and lean protein sources, as well as low in saturated fat, trans fat, and salt. In addition, plant oils are the preferred source of fat.
7. Kral TVE and others: Combined effects of energy density and portion size on energy intake in women. *American Journal of Clinical Nutrition* 79: 962, 2004.
The combination of increasing portion size and increasing energy density resulted in a greater food intake in the women in this study. The researchers suggest that both factors may be contributing to the excess calorie intake seen in some adults.
8. Liebman B: Claims crazy: Which ones can you believe? *Nutrition Action Healthletter* 30(5):1, 2003 (June).
Consumers can rely on the accuracy of the various health claims approved by FDA. Structure/function claims and the forthcoming preliminary health claims (i.e., those that must carry a disclaimer concerning FDA approval) should be viewed cautiously.
9. Liebman B: Bigger meals: smaller waists. *Nutrition Action HealthLetter* p. 1 June 2005.
The article contains a discussion on energy density and practical applications to a daily diet.
10. Marcus JB: New age foods for disease prevention. *Today's Dietitian*, p. 24, May 2003.
Fruits, vegetables, nuts, and whole grains are good sources of phytochemicals. Dietary guidance should be based on consuming these foods, and ideally in the whole state.
11. Meadows M: Healthier eating. *FDA Consumer* p. 10 May-June 2005.
The latest Dietary Guidelines for Americans (2005) are reviewed. The article provides practical advice to put these guidelines into action—a task too few adults are doing well.
12. Mitka M: Government unveils new food pyramid. *Journal of the American Medical Association* 293:2581, 2005.
Both the pros and cons of MyPyramid are raised by nutrition and medical experts. The biggest criticism is that the tool is practically useless unless a person logs on to the MyPyramid website to find out the details regarding the diet plan.
13. Rebuilding the pyramid. *Tufts University Health & Nutrition Letter* p. 1, June 2005.
The latest nutrition advice from MyPyramid is discussed. How to apply the recommendations to every day life is highlighted.
14. Reeves MJ and Rafferty AP: Healthy lifestyle characteristics among adults in the United States, 2000. *Archives of Internal Medicine* 165:854, 2005.
Few adults (about 3% of those in the survey) are following all of the four keys to a healthy lifestyle. The keys are nonsmoking, maintaining healthy weight, consuming at least a combination of at least 5 fruit and vegetable servings per day, and performing at least 30 minutes of physical activity 5 days or more per week.
15. Revised dietary guidelines to help Americans live better lives. *FDA Consumer*, p. 18, March–April 2005.
The latest Dietary Guidelines for Americans are summarized in simple terms. A figure providing practical advice concerning food choices is included.
16. Rimm EB and Stampfer MJ: Diet, lifestyle and longevity—the next steps. *Journal of the American Medical Association* 292:1490, 2004.
The authors discuss recent studies that show a benefit on longevity by following a healthy diet. Such a plan is effective in reducing cardiovascular disease and cancer risk—two important diseases that eventually affect many older adults.
17. Stampfer JM and others: Primary prevention of coronary heart disease in women through diet and lifestyle. *The New England Journal of Medicine* 343:16, 2000.
Women who consume a varied diet (one that is rich in fiber, includes some fish, and is low in fried foods and animal fat), avoid overweight, drink small amounts of alcohol, exercise on a daily basis for about 30 minutes, and avoid smoking reduce their risk of heart attack by over 80%, compared to other women.
18. Uncle Sam's diet book. *Tufts University Health & Nutrition Letter* p. 1, March 2005.
Implementation of the latest Dietary Guidelines for Americans is discussed. The authors suggest even small changes that conform to this plan provide health benefits.
19. Willett WC: *Eat, drink, and be healthy*. New York: Simon & Schuster, 2001 (or Willett WC, Stampfer MJ: Rebuilding the pyramid. *Scientific American*, p. 64, January 2003).
The diet plan proposed emphasizes whole grains, plant oils, vegetables eaten daily; fruits at least 2 to 3 times per day; nuts and legumes 1 to 3 times per day; fish, poultry, and eggs eaten 0 to 2 times per day; dairy products or calcium supplements one to two times per day; and little use of red meat, butter, white rice, white bread, potatoes, pasta, and sweets. Regular physical activity and weight control is also recommended, as is alcohol intake in moderation (if of legal age) and a balanced multivitamin and mineral supplement for most people.

I. Does Your Diet Meet Nutrient Needs, MyPyramid Recommendations, and the Dietary Guidelines?

Complete either Part I or Part II. Then complete Parts III, IV, and V. (For help in following the instructions for this activity, see the sample assessment in Appendix E.)

Part I

Manual Diet Analysis

- A. Take the information from the 1-day food-intake record you completed in Chapter 1 and record it on the blank form provided in Appendix E or by your instructor. Be sure to record the food or drink ingested and the amount (e.g., weight) consumed. Note: Your instructor may require you to keep the food record for more than 1 day.
- B. Review the various nutrient standards on the inside cover of this book and choose the appropriate recommendations for your gender and age. Write the appropriate value for each nutrient on the line on the form labeled "Nutrient Need."
- C. Look up the foods and drinks that you listed on the form in the food composition table, Appendix J. Record on the form the amounts of each nutrient and the calorie content, based on the serving size and the number of servings you ate. For example, if you drank 2 cups of milk and the serving size listed in Appendix J is 1 cup, double all nutrient values as you record them. If the food is not listed, choose a substitute, such as cola for root beer.
- D. For each food and drink, add the amounts in each column and record the results on the line labeled "Totals."
- E. Compare the totals to your nutrient needs. Divide the total for each nutrient by the specific amount and multiply that by 100. Record the result on the line labeled "% of Nutrient Needs."

Part II

NutritionCalc Plus CD Diet Analysis

(See accompanying User's Guide for further details. Also be sure to keep these analysis reports for activities in subsequent chapters.)

1. Open the program and select Create a New Profile, Enter your personal information (e.g., gender, age, weight).
2. View/print your RDAs and related nutrient goals on your Profile screen.
3. Select the Day 1 Intake icon and begin entering foods based upon the 1-day food intake record you compiled in Chapter 1. Be sure to enter each food and drink and the specific amount you consumed.
4. Select the following Report icons to view/print information on your nutrient intake for Day 1;
 - a. Bar Graph: displays the nutrient values from your food list as a percentage of the goals defined in your Profile.
 - b. Spreadsheet: calculates the total kcals and key nutrients for each food in your intake list by day.

NutritionCalc Plus Online Diet Analysis

(See accompanying User's Guide for further details. Also be sure to keep these analysis reports for activities in subsequent chapters.)

1. Log on to nutritioncalc.mhhe.com, register your passcode (found on inside cover of User's Guide), and select the Profile icon. Enter your personal information (e.g., gender, age, weight).
2. View/print your RDAs and related nutrient goals on your Profile screen.
3. Click on Intake icon, select Day 1, and begin entering foods based upon the 1-day food intake record you compiled in Chapter 1. Be sure to enter each food and drink and the specific amount you consumed.
4. Click on the Reports icon to view/print the following reports from the list on the left:
 - a. Bar Graph: displays the nutrient values from your food list as a percentage of the goals defined in your personal Profile.
 - b. Spreadsheet: calculates the total kcals and key nutrients for each food in your intake list by day.

Part III

Evaluation of Nutrient Intakes as a Percentage of Nutrient Needs

Remember that you don't necessarily need to consume your estimated nutrient needs every day. A general standard is meeting needs averaged over 5 to 8 days. It is best not to exceed the Upper Level (if set) over the long term to avoid potential toxic effects for some nutrients.

- A. For which nutrients did your intakes fall below estimated nutrient needs (i.e., less than 70% of the RDA/AI)?
- B. For which nutrients did you exceed the Upper Level (if set)?
- C. What dietary changes could you make to correct or improve your dietary profile? If you're not sure, Chapters 4 through 9 will help guide your decisions.

Part IV

MyPyramid Assessment

Using the same food-intake record used in Part I or II, place each food item in the appropriate group of the MyPyramid chart in Appendix E. Indicate how many servings it contributes to each group based on the amount you ate (see page 47 for serving sizes). Many of your food choices may contribute to more than one group. For example, toast with soft margarine contributes to two categories: (1) grains group; and (2) oils group. After entering all the values, add the number of servings consumed in each group. Finally, compare your total in each food group with the recommended number of servings by www.MyPyramid.gov. Enter a minus sign (–) if your total falls below the recommendation or a plus sign (+) if it equals or exceeds the recommendation.



Part V

Further Diet Evaluation

Do the weaknesses, if any, suggested in your nutrient analysis (see Part III) correspond to missing servings in the MyPyramid food guide? If so, consider changing your food choices based on your MyPyramid to help improve your nutrient profile. If yes, indicate a specific plan to better meet your MyPyramid recommendations. There are many tips provided on the MyPyramid website. You can perform the same diet comparison using MyPyramid Tracker at www.MyPyramid.gov.

- Go to MyPyramid Tracker and scroll down to Access. Select one of the log in links (New User Registration, Existing User Registration, Check It Out-No registration).
- Enter your age, gender, activity, height, and weight.
- Select "Proceed to Food Intake." Enter your food items from your 1-day food record. Select "serving size" and "quantity." Save after each entry is complete. After entering all of your foods and quantities, select "Save and Analyze."
- Choose "MyPyramid Recommendations." For each group, record your "Pyramid Stats," including your equivalent for each group and the recommended equivalent for each group. Also record the percent recommendation for each group from the Percent Table at the bottom.
- Compare your totals in each food group with the recommended number of servings (equivalents). Again, do you need to change your food choices based on this analysis?

II. Applying the Nutrition Facts Label to Your Daily Food Choices

Imagine that you are at the supermarket looking for a quick meal before a busy evening. In the frozen food section, you find two brands of frozen cheese manicotti (see labels a and b). Which of the two brands would you choose? What information on the Nutrition Facts label in the figure contributed to this decision?



Nutrition Facts			
Serving Size 1 Package (260g)			
Servings Per Container 1			
Amount Per Serving			
Calories	390	Calories from Fat 160	
% Daily Value*			
Total Fat	18g		27%
Saturated Fat	9g		45%
Trans Fat	2g		**
Cholesterol	45mg		14%
Sodium	880mg		36%
Total Carbohydrate	38g		13%
Dietary Fiber	4g		15%
Sugars	12g		
Protein	17g		
Vitamin A 10% • Vitamin C 4%			
Calcium 40% • Iron 8%			
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9 • Carbohydrate 4 • Protein 4			
**Intake of <i>trans</i> fat should be as low as possible.			

(a)

Nutrition Facts			
Serving Size 1 Package (260g)			
Servings Per Container 1			
Amount Per Serving			
Calories	230	Calories from Fat 35	
% Daily Value*			
Total Fat	4g		6%
Saturated Fat	2g		10%
Trans Fat	1g		**
Cholesterol	15mg		4%
Sodium	590mg		24%
Total Carbohydrate	28g		9%
Dietary Fiber	3g		12%
Sugars	10g		
Protein	19g		
Vitamin A 10% • Vitamin C 10%			
Calcium 35% • Iron 4%			
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Potassium		3,500mg	3,500mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9 • Carbohydrate 4 • Protein 4			
**Intake of <i>trans</i> fat should be as low as possible.			

(b)