

## KEY CONCEPT

Each of the food components plays an important role in maintaining health.

- Carbohydrates are the body's primary source of fuel for energy.
- Proteins are necessary for growth and to repair and build tissues.
- Fats are used to store energy, insulate body tissues, and transport fat-soluble vitamins through the blood-stream.
- Vitamins do not provide energy, but are needed to help use the energy from other nutrients.
- Minerals are necessary for growth, maintenance, and repair of tissues and bones.
- Water is the most important nutrient.
- Fiber aids in maintaining the health of the digestive tract.

There are two types of fiber: soluble and insoluble. *Soluble fiber* is found in fruits, oats, barley, legumes, and psyllium seed. It dissolves in fluids in the large intestine and helps to lower cholesterol levels, which may reduce the risk of coronary heart disease. *Insoluble fiber* is found in some fruits and vegetables, whole grains, and wheat bran. This type of fiber does not dissolve in the fluids of the large intestine, but instead soaks up water to add bulk. This helps prevent constipation by making it easier for the intestines to eliminate waste.

There is no daily reference value (DRV) for fiber. It is suggested that the diet consist of approximately 25 grams of fiber each day. Table 8-4 highlights the fiber found in common foods.

## DAILY VALUES

In 1973, the United States Food and Drug Administration introduced the Recommended Daily Allowances (RDAs) as reference values for vitamins, minerals, and protein in voluntary nutrition labeling. In



**Table 8-4 Fiber Content in Popular Foods**

<b>FOODS HIGH IN INSOLUBLE FIBER</b>	<b>SERVING SIZE</b>	<b>GRAMS</b>
Banana	1 small	0.7
Bran cereal (100%)	1/2 cup	9.7
Broccoli	1 cup	4.0
Carrot	1 medium	2.3
Peas	1/2 cup cooked	3.2
Popcorn	3 cups	2.0
Potato, baked with skin	1 medium	3.6
Prunes	1 cup cooked	14
Raisin bran cereals	3/4 cup	4.8
Spinach	1/2 cup cooked	2.0
Whole-wheat bread	1 slice	1.9
<b>FOODS HIGH IN SOLUBLE FIBER</b>	<b>SERVING SIZE</b>	<b>GRAMS</b>
Apple	1 medium	3.0
Banana	1 small	0.6
Broccoli	1/2 cup cooked	1.6
Lentils, cooked	1/2 cup	3.7
Oat bran	1/3 cup	4.9
Pear	1 medium	4.3
Peas	1/2 cup cooked	2.0
Popcorn	3 cups	0.8
Strawberries	1 cup	3.9

**Daily Value (DV)** The percentage per serving of each nutritional item listed on new food labels, based on a daily intake of 2,000 kcal.

1994, the RDA table was replaced with the **Daily Value (DV)** guide to help consumers use food label information in planning their overall diet. Table 8-5 outlines the daily values for nutrients we need.

The DVs are actually two sets of reference values for nutrients: Daily Reference Values (DRVs) based on the National Academy of Sciences' 1998 Recommended Dietary Allowances, and Dietary Reference Intakes (DRIs). The Daily Value term is what the government uses in food labeling. The change from RDAs to DVs is the government's effort to help the public observe and comprehend nutrition information easily, and understand its significance to a healthy daily diet.

DRVs for the energy-producing nutrients (fat, carbohydrate, protein, and fiber) are based on the number of calories consumed per day. For labeling purposes, 2,000 calories has been established as the reference for calculating percent Daily Values. This makes it easier for



Table 8-5 United States Food and Drug Administration Daily Values

DAILY REFERENCE VALUES (DRVs)		DIETARY REFERENCE INTAKES (DRIs)	
Food Component	DRV	Nutrient	Amount
fat	65 grams (g)	vitamin A	5,000 International Units (IU)
saturated fatty acids	20 g	vitamin C	60 milligrams (mg)
cholesterol	300 milligrams (mg)	thiamin	1.5 mg
total carbohydrate	300 g	riboflavin	1.7 mg
fiber	25 g	niacin	20 mg
sodium	2,400 mg	calcium	1.0 gram (g)
potassium	3,500 mg	iron	18 mg
protein*	50 g	vitamin D	400 IU
		vitamin E	30 IU
		vitamin B <sub>6</sub>	2.0 mg
		folic acid	0.4 mg
		vitamin B <sub>12</sub>	6 micrograms (mcg)
		phosphorus	1.0 g
		iodine	150 mcg
		magnesium	400 mg
		zinc	15 mg
		copper	2 mg
		biotin	0.3 mg
		pantothenic acid	10 mg

\*DRV for protein does not apply to certain populations. Dietary Reference Intake (DRI) for protein has been established for these groups: children 1 to 4 years, 14 g; infants under 1 year, 14 g; pregnant women, 60 g; nursing mothers: 65 g.

consumers to calculate their individual nutrient needs. DRVs for the energy-producing nutrients are always calculated as follows:

- fat based on 30% of calories
- saturated fat based on 10% of calories
- carbohydrate based on 60% of calories
- protein based on 10% of calories (the DRV for protein applies only to adults and children over the age of four; DRIs for protein for special groups have been established)
- fiber based on 11.5 g of fiber per 1,000 calories

Thus, someone who consumes 3,000 calories a day—a teenage person, for example—would have a recommended fat intake of 100 g or 20 teaspoons per day:

$$0.30 \times 3,000 = 900$$

$$900 \text{ (calories)} \div 9 \text{ (calories per g of fat)} = 100 \text{ g}$$

The DRVs for cholesterol, sodium, and potassium, which do not contribute calories, remain the same whatever the calorie level.

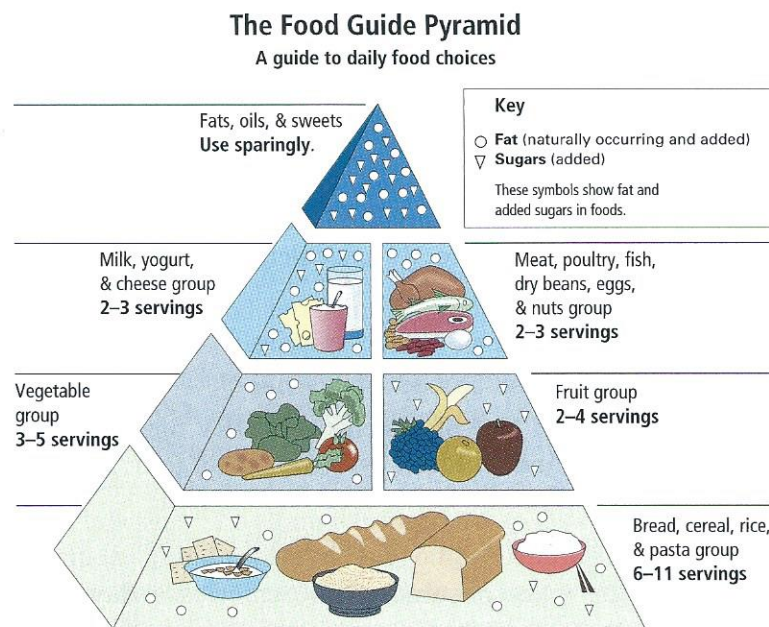
Because of the links between certain nutrients and certain diseases, DRVs for some nutrients represent the uppermost limit that is considered desirable. Eating too much fat or cholesterol, for example, has been linked to an increased risk of heart disease. Too much sodium can raise the risk of high blood pressure in some people. Therefore, labels will show DVs for fats and sodium as follows:

- total fat: less than 65 g
- saturated fat: less than 20 g
- cholesterol: less than 300 mg (milligrams)
- sodium: less than 2,400 mg

**Food Guide Pyramid** An outline for making food selections based on the government's dietary guidelines.

## FOOD GUIDE PYRAMID

The **Food Guide Pyramid** was designed by the United States Department of Agriculture (USDA) and supported by the Department of Health and Human Services (HHS) as an easy way to show the groups of foods that make up a good diet (Figure 8-6). The pyramid is based on research the USDA compiled on foods Americans eat and what nutrients are in these foods.



**Figure 8-6** Food Guide Pyramid. (Courtesy of the USDA and DHHS, 1992. *The food guide pyramid: A guide to daily food choices*. Leaflet no. 572, Washington, D.C.)