

2

Nutrients:

Building

Blocks of

Health

Health

Objectives

After reading this chapter, you will be able to

- explain what each nutrient does for your body.
- list food sources of each nutrient.
- describe ways to improve your nutrient intake.
- discuss the use of nutrient supplements.

New Terms

calorie: a measure of the energy value of food.

gram: a measure of weight.

carbohydrates: nutrients that provide energy. They are found in every food of plant origin. Sugars, starch, and fiber are types of carbohydrates.

fats: nutrients used to supply calories to the body.

proteins: a type of nutrient needed for growth and repair of the body. Proteins are made of amino acids.

vitamins: organic substances needed by the body for function, growth, and repair.

minerals: inorganic substances that are needed for function, growth, and repair of the body.

phytochemicals: compounds that work together with vitamins, minerals, and fiber to promote good health.

antioxidants: substances that protect the cells from damage that can be caused by oxygen.

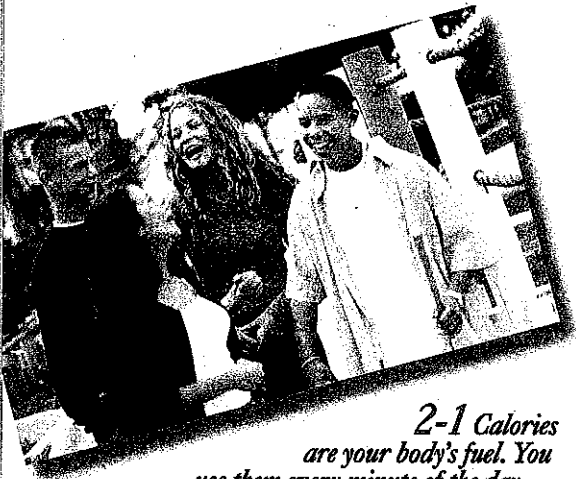
dietitian: a nutrition expert.

Dietary Reference Intakes (DRIs): a set of guidelines for the amounts of many nutrients needed each day.

Every living thing, including plants, animals, and you, needs food to survive. Foods are as diverse as the plants and animals that eat them. Oak trees and other plants get their food from the soil and rain. Blood is food to mosquitoes. Some animals, like leopards, sharks, and snakes, eat mostly meat. Foods from plants, like berries, lettuce, and wheat, are food to many other animals. The babies of many animals consume mostly milk. Food for many humans includes a combination of plants, meat, eggs, and milk. Foods provide the calories and nutrients every living thing needs to grow and stay healthy.

Calories, Your Body's Fuel

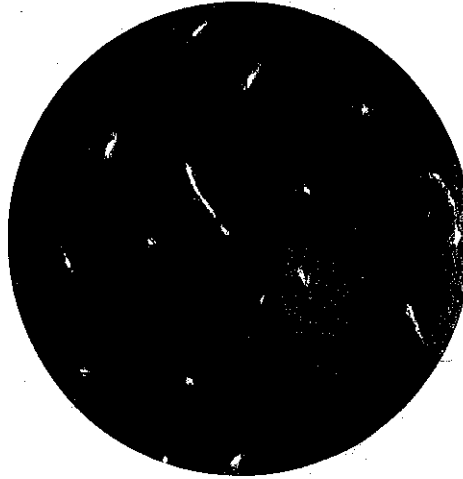
Calories are the fuel that keeps your body running, 2-1. You can only get them from food. A **calorie** is a measure of the energy value of food. You burn calories, much like a car burns gasoline, to keep running. Every time you walk or when your heart beats, you burn calories. You also



2-1 Calories are your body's fuel. You use them every minute of the day.

burn calories as your body grows, replaces worn out cells, heals wounds, digests food, and keeps itself warm.

Calories are not nutrients, but some nutrients provide calories. Carbohydrate, protein, and fat are the three nutrients that supply calories. Fat is the richest source of energy in your diet. That's because each gram of fat provides nine calories. One gram of carbohydrate or protein supplies four calories. A **gram** is a measure of weight. A small jelly bean or a raisin each weighs about one gram, 2-2.



2-2 A small jelly bean weighs about one gram.

Nutrients, Your Body's Building Blocks

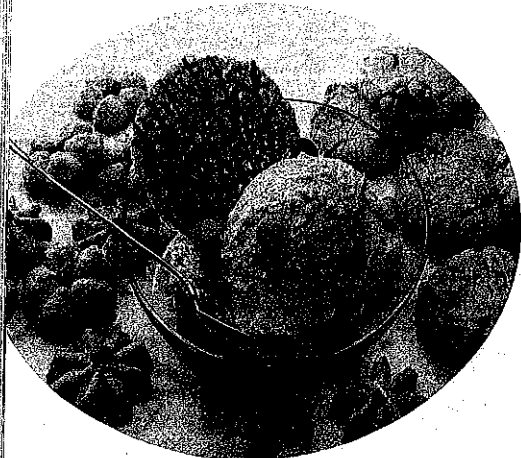
Nutrients are the body's building blocks. They are chemical compounds found in foods. They keep your body running smoothly. Nutrients are used for

You may have heard that honey is the most nutritious sugar. Actually, no sugar is better for you than any other. However, some foods that supply sugar may be better for you than others. For instance, sugars are a natural part of fruits, milk, cereals, and dry peas and beans. These foods not only contain sugar; they provide many other nutrients, too.

Sugars are added to pies, cakes, cookies, candies, and many breakfast cereals. Many people like the sweet taste that sugar provides, 2-5. However, adding sugar only increases calories. It does not furnish other nutrients. If you eat foods with added sugar often, you may not be getting enough of the other nutrients you need. You may get more cavities, too.

Starch

Starch is a very important source of calories. Breads, cereals, and dried peas and beans are rich sources of starch. Vegetables such as potatoes and corn are other rich sources of starch. Starch and



2-5 Sugary foods taste sweet, but they add many calories to your diet.

sugar supply the same number of calories per gram, but foods high in starch also supply many other nutrients. For instance, breads and cereals provide thiamin, riboflavin, niacin, folic acid, and iron. Dried peas and beans furnish protein. Potatoes contain vitamin C.

Some people think foods that are rich in starch are fattening. In fact, they are no more fattening than proteins or sugar. Often, though, starch-rich foods are served with fats such as butter or oil. It's the fats that pile on the calories. For example, a slice of bread has about 70 calories. If you butter it, you add 50 calories or more. A potato has only about 100 calories. If you slice it and fry it in oil to make French fries, the calories jump to 350 or higher.

Fiber

Fiber is the parts of plants that humans cannot digest. This carbohydrate does not furnish calories. It helps move waste through your digestive system and helps prevent constipation. A diet high in fiber may help prevent heart disease and certain types of cancer, too.

Dried peas and beans and whole-grain breads and cereals are the richest sources of fiber. Vegetables and fruits, especially their skins, also provide fiber. The way a food is prepared can affect the amount of fiber it contains, 2-6. For instance, an unpeeled apple has more fiber than either a peeled apple or applesauce. Apple juice has even less fiber. The less the food looks like it did when harvested, the less fiber it is likely to have.

You may have seen fiber supplements for sale in stores. Foods, not supplements, are the best sources of fiber. That's because foods contain several types of fiber, and each type works a little differently in

more fat, saturated fat, and cholesterol than is healthy.

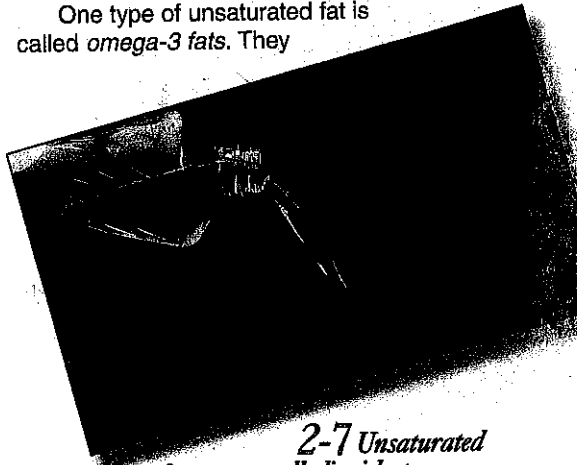
Saturated Fat and Unsaturated Fat

Both saturated fat and unsaturated fat provide the same number of calories per gram. They differ in the way they act in the body. *Saturated fat* causes the level of cholesterol in the blood to rise higher than normal. This increases your chances of developing heart disease. *Unsaturated fat* does not cause blood cholesterol levels to rise.

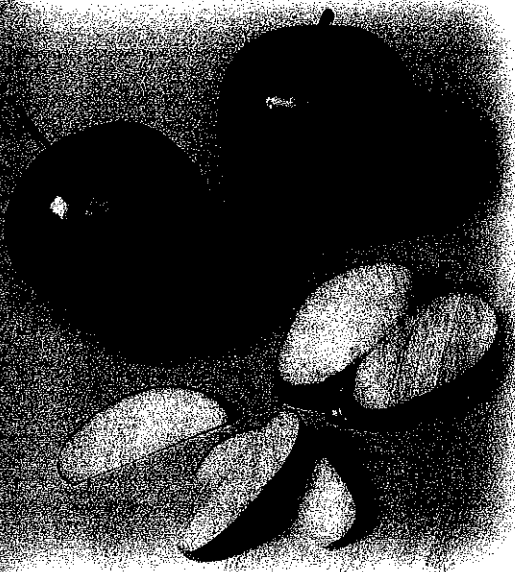
The main source of saturated fat is foods of animal origin. Butter, lard, and the fat on meat are examples. Only a few foods of plant origin contain mostly saturated fat. They are coconut oil and palm oil. Saturated fat is usually solid at room temperature.

Foods of plant origin contain mostly unsaturated fat. Corn, soy beans, sunflower seeds, olives, peanuts, and nuts are rich sources. The only food of animal origin that contains mostly unsaturated fat is fish. Unsaturated fat tends to be liquid at room temperature, 2-7.

One type of unsaturated fat is called *omega-3 fats*. They



2-7 Unsaturated fats are usually liquid at room temperature.



2-6 Boost your fiber intake by eating whole pieces of fruit, including the skin.

the body. Also, foods contain nutrients that your body needs.

Fats

The main function of **fats** is to supply calories. Fats also add flavor to food and provide some vitamins. Fats satisfy your hunger, too. That's because it takes more time to digest fats than any other nutrient. The longer it takes to digest a food, the longer it takes you to feel hungry again.

Fat is found in many foods. The richest sources are meat, poultry, eggs, milk products, nuts, seeds, and vegetable oils. Snack foods and pastries often are high in fat, too.

Fats can be put into two groups, unsaturated and saturated fat. *Cholesterol* is a fat-like substance. Many Americans eat

HEALTH ALERT

The Heart Beat

There is a vicious killer stalking the United States. Here are the clues:

- It claims the lives of nearly half the people in the United States.
- Many victims are chosen when they are teens or even younger.
- Many people don't know they will be victims until they are 40 or 50 years old.

Doctors call this killer arteriosclerosis (ar-TEER-ee-oh-scler-OH-sis). Some call it heart disease. Heart disease takes years to develop. It begins when soft deposits of fats begin to build up in the lining inside your blood vessels. These deposits look like white streaks. Many people have fatty streaks before they are 18 years old.

The fatty streaks are mostly cholesterol. As you get older, the streaks can get thicker and become hard. The more cholesterol in the blood, the faster the streaks can thicken. Over time, the fatty streaks make the opening in the blood vessel smaller. The heart has to work harder to push blood through the narrowed blood vessels. This also causes blood pressure to rise.

The blood vessels may become so narrow that blood can hardly pass through them. Cells rely on blood to bring them oxygen and nutrients. If blood can't get through the blood vessels, the cells die in

a few minutes. When blood can't reach the heart, a heart attack occurs. Part of the heart dies. A stroke occurs when blood can't reach the brain. Part of the brain dies. If too much of the heart or brain dies, the person dies.

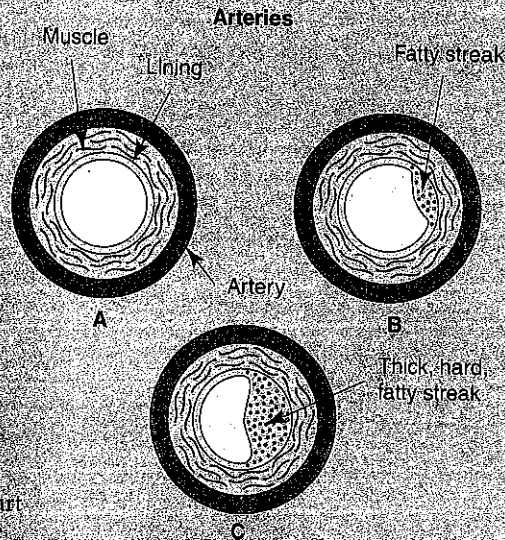
There is some good news about this killer, though. You can do something about it. To reduce your chances of having a deadly heart attack or stroke, don't let those fatty streaks get thicker. The time to start is now. Don't wait until your blood vessels are damaged. Here are some tips to elude this killer.

- Get plenty of exercise. This helps you control your weight and gives your heart a workout. Shoot for at least 60 minutes of activity on most days.
- Control your weight. You are less likely to develop heart disease if you are not overweight. Keeping your weight down also helps reduce your chances of having high blood pressure and certain cancers.
- Have your blood pressure checked yearly. Your chances of being a victim increase when blood pressure is too high.

- Ask your doctor how often you should have your blood cholesterol checked. High blood cholesterol levels are a risk factor.
- Limit your intake of saturated fats including *trans* fats.
- Eat more fiber. Fiber can help remove cholesterol from your blood.
- Don't smoke. Smokers are more likely to be heart disease victims than nonsmokers. Smoking also increases your chances of developing lung cancer.
- Be extra careful if you are a male or related to a heart disease victim. Males are more likely to have heart disease than females. That doesn't let females off the hook. Anyone can be related to a heart disease victim. If a parent or grandparent had heart disease, you have a greater chance of developing it, too.

Just because you can't change your gender or family background doesn't mean you have to be a victim. It just makes it even more important for you to use your know-how to elude this killer. The sooner you get started, the better!

*A: This is a normal, healthy artery.
B: Fatty streaks have begun to form in the lining of the artery. C: Fatty streaks have become thick and hard. Blood flow becomes restricted.*



provide many important health benefits. They are needed by babies and small children for normal brain and heart development. Everyone needs them for normal vision. They help control blood pressure,

body temperature, and blood clotting. They also help the immune system work to keep us well. Omega-3 fats help protect the body from health problems like heart disease and arthritis.

Omega-3 fats are vital for good health, but your body can make only small amounts. Many nutrition experts believe that you need to make a special effort to include these fats in the diet. Walnuts, flax seeds, canola oil, and fatty fish like sardines, tuna, salmon, and lake trout are rich in omega-3s. See 2-8. You also can buy omega-3 enriched eggs. These eggs are laid by hens that have been fed flax seed. They have more than 10 times the amount of omega-3 fat found in regular eggs. Animal scientists are changing the diets of cattle, lambs, and other animals to see if they can increase the omega-3 fat in their meat and milk.

Some unsaturated fats are altered in a way that increases the amount of saturated fat they have. *Hydrogenation* (*hi-DRAH-gen-a-shun*) is the process that turns an unsaturated fat into a saturated

one. For example, hydrogenation causes liquid, unsaturated vegetable oil to become a solid, saturated fat known as margarine or shortening.

The type of saturated fat formed by hydrogenation is called *trans fat*. *Trans fat* increases your risk for heart disease. A small amount of *trans fat* is naturally found in dairy products and some meats. Most of the *trans fat* you eat is found in foods made with shortening and margarine, 2-9. These foods include crackers, cookies, snack foods, and foods fried in shortening. Nutritionists believe that you should limit the amount of *trans fats* you eat. Many food companies are changing their recipes so that they don't use *trans fats*. You can check the Nutrition Facts label to see if a food has any *trans fats*.



2-8 This salmon is high in omega-3 fats.



2-9 This chemist is creating a way to make margarine with no trans fats.

Cholesterol

Cholesterol is a fatlike substance that is vital for life. Every cell in your body contains cholesterol. It forms cell walls and is used to make many body compounds. Your body can make all the cholesterol it needs. You do not need to have any cholesterol in your diet.

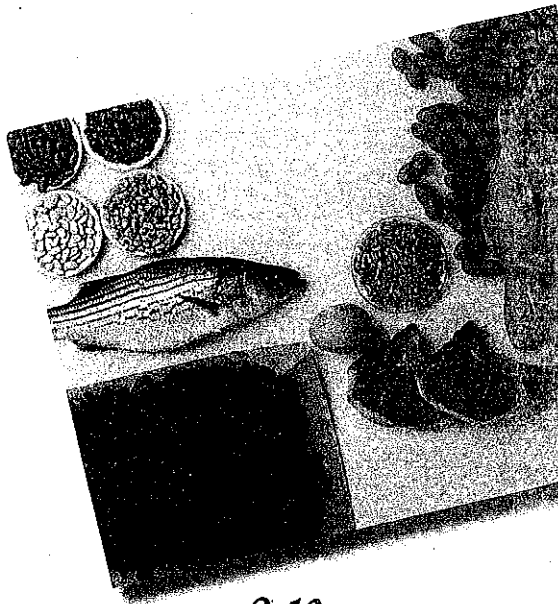
Cholesterol is found in all foods of animal origin. Meat, fish, poultry, eggs, and milk contain cholesterol. There is no cholesterol in fruits, vegetables, nuts, seeds, or any other foods of plant origin.

Proteins

Proteins are needed for growth and repair of the body. You use proteins to build new cells and to repair or replace worn out or injured cells. Foods of animal origin, such as meats, fish, poultry, eggs, and milk, are rich sources of proteins. Breads, cereals, nuts, seeds, and dried peas and beans are foods of plant origin that are rich in proteins. See 2-10.

Your body digests the proteins you eat and breaks them into smaller parts called *amino acids*. Then, it reassembles the amino acids to make skin, muscles, and other body parts. This process is like taking apart a house made of bricks and then reusing the bricks to build a sidewalk.

There are 20 amino acids. Your body can make some of them out of others, but it cannot make all of them. The amino acids it cannot make must be supplied by the foods you eat. Foods of animal origin contain all the amino acids you need. These foods are called *complete proteins*. All foods of plant origin, except soybeans, are called *incomplete proteins*. That is because they contain most of the amino acids you need, but not



2-10 *These foods are rich sources of proteins.*

all of them. Soybeans contain all the amino acids needed. You can make foods of plant origin into complete proteins by combining them with each other. To learn more about combining proteins, see *Going Vegetarian* in Chapter 23.

Many Americans eat much more protein than they need. Any protein not needed for growth and repair is used for energy, or it's stored in the body as fat. Extra protein is not stored as muscle. Many people living in other parts of the world, especially in Africa and Asia, get too little protein. A low-protein diet causes stunted growth. Also, wounds heal slowly and infections are common. A very low-protein intake could even cause death.

Water

Only air is more important than water. You could only live a few minutes without air. You could only live a few days without water. Your body contains more water than anything else. Of every 10 pounds of body weight, six or seven pounds are water. Water is found in all of your cells. It makes up three-quarters of every muscle and brain cell. Half of many other cells are water. Blood is mostly water.

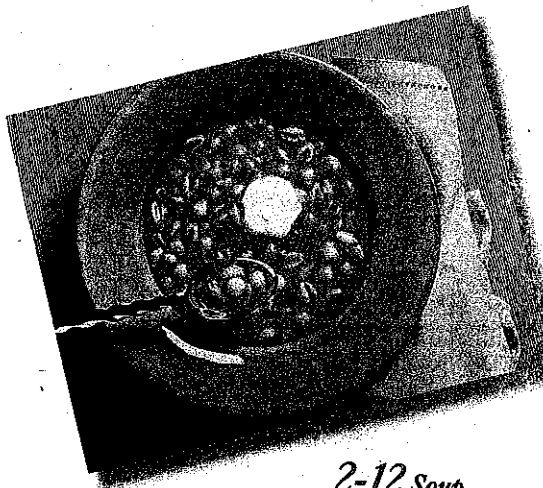
Water has many functions. In blood, water carries nutrients to the cells. The water in sweat cools you when you get hot. The water in urine washes harmful wastes out of your body. Water moistens the air you breathe. (Did you ever notice how the tiny water droplets in your breath condense into a fog on a cold day?) Water keeps your skin soft and elastic. It lubricates your joints and keeps them working smoothly. It protects your body by acting as a shock absorber. Water is a very important nutrient.

Each day, you lose eight cups of water in urine, sweat, and air you exhale. To replace the water lost, you need to drink eight cups of water daily. If you exercise or live in a hot climate, you will need more than eight cups, 2-11. Don't wait until you are thirsty to drink water. Thirst is a signal that the water level in your body is already too low. When you do feel thirsty, drink a cup more than your thirst tells you to drink.

Soups and beverages such as juice, milk, and caffeine-free soft drinks are good sources of water, 2-12. Foods supply water, too. For example, lettuce is 90 percent water and oranges are 80 percent water. Even meats are half water. Coffee, tea, colas, and other beverages that contain caffeine are not as helpful for meeting your need for water. Sugary drinks also are not as helpful at meeting your water needs. That's because caffeine and sugar cause you to lose more water than normal in your urine.



2-11 Beverages are a great source of water. Be sure to drink extra water when you exercise.



2-12 Soup adds water to your diet.

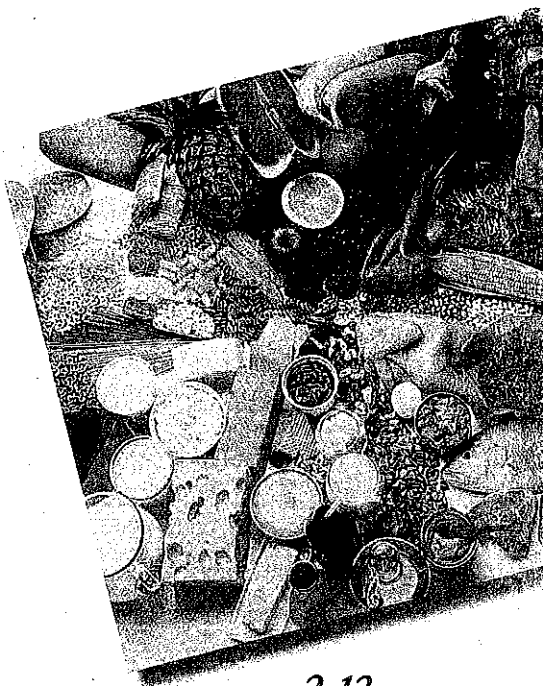
Some people try to limit their water intake. They may think it is a good way to lose weight. Instead, they will feel weak, hot, and achy. Harmful wastes will build up in their bodies. Lost weight will be regained as soon as they drink water again. Any time people restrict water intake, they put their lives in danger.

Vitamins and Minerals

Vitamins and minerals are needed in tiny amounts. All the vitamins and minerals you need in a day combined weigh less than a dime. This amount seems especially small when compared to other nutrients. For instance, you need 25 times more protein and 150 times more carbohydrate each day. The amounts of vitamins and minerals you need may be small, but they are so necessary that you cannot live without them.

Vitamins and minerals are used in many of the body's chemical reactions. They help keep body processes working normally and are needed for growth and repair of the body. For example, vitamin A helps you see in dim light. The minerals calcium and sodium help keep body water in balance. Minerals also can become part of body tissues. For instance, calcium becomes part of bones and teeth. Iron is part of red blood cells. Neither vitamins nor minerals supply calories.

Vitamins and minerals are found in many different foods. Almost all foods contain some of these nutrients, 2-13. Vitamins are either water-soluble or fat-soluble. *Water-soluble vitamins* dissolve in water. They include the B vitamins and vitamin C. Thiamin, riboflavin, niacin, and folic acid are some of the 13-vitamins. *Fat-soluble vitamins* dissolve in fat. Vitamins A,



*2-13 Vitamins
and minerals are found in
a wide variety of foods.*

D, E, and K are fat-soluble vitamins. Any fat-soluble vitamins your body does not need right away can be stored for use later. Extra water-soluble vitamins are not stored. They are washed away in body wastes. The functions and sources of each vitamin are listed in 2-14.

If your diet contains more minerals than your body needs, it can store many of them. Extra amounts of other minerals cannot be stored. They pass out of the body in body wastes. The functions and sources of minerals are listed in 2-15.

2-14 *Vitamins perform many functions in the body. Rich sources of these vitamins can be provided in a nutritious diet.*

Vitamins		
Vitamin	Major Functions	Some Rich Sources
Vitamin A	Helps keep skin healthy Needed for normal vision	Deep yellow or orange fruits and vegetables, dark green vegetables, milk products, eggs
Thiamin, Riboflavin, and Niacin	Help release energy stored in foods Help build body tissue Help keep skin, hair, muscles, and nerves healthy	Whole-grain and enriched breads and cereals; meat; fish; poultry; eggs; milk; cheese
Folic acid	Used to make red blood cells Helps form cells	Whole-grain and enriched breads and cereals; dark green vegetables; dried beans and peas; bananas; mushrooms; oranges
Vitamin B12	Used to make red blood cells Helps keep nerves healthy	Foods of animal origin such as meat, fish, chicken, milk, cheese, eggs
Vitamin C	Helps keep gums and blood vessels healthy Helps wounds and bruises heal Used to make many body compounds	Citrus fruits, berries, melons, peppers, cabbage, potatoes, tomatoes, dark green vegetables
Vitamin D	Aids in bone and tooth formation Helps heart and nerves work normally	Fish, eggs, milk products, sunlight
Vitamin E	Protects blood and lung cells	Nuts, vegetable oils, dark green vegetables, breads, cereals
Vitamin K	Used to clot blood	Dark green vegetables, cauliflower, fruit, milk products, breads, cereals

Vitamins and Minerals of Concern in U.S. Diets

Most diseases caused by low intakes of vitamins and minerals are rare in the United States. *Iron deficiency anemia* is a common

disease caused by a low intake of a nutrient. Many people, especially children, teenagers, and adult women, suffer from anemia.

2-15 Minerals are part of bones, tissues, and body fluids. Rich sources of minerals should be included in meals and snacks.

Minerals		
Mineral	Major Functions	Some Rich Sources
Iron	Used to build red blood cells Helps blood carry oxygen Helps cells use oxygen	Red meat, breads, cereals, dark green vegetables
Calcium	Used to build bones and teeth Helps muscles relax Balances body water	Milk products; dark green vegetables; almonds; calcium-fortified orange juice; fish with soft, tiny bones
Sodium	Helps nerves and muscles function Balances body water	Table salt, sauces, gravies, pickles, processed meat, soy sauce, many seasonings
Potassium	Helps nerves and muscles function Balances body water	Fruits and vegetables, milk products, meat, dried beans
Magnesium	Helps body make new cells Helps nerves and muscles work normally	Dark green vegetables, nuts, dried peas and beans
Phosphorus	Helps build bones and teeth Helps cells release energy from nutrients	Milk products, meat, fish, poultry, eggs, nuts, dried peas and beans
Zinc	Helps body grow and mature Helps body heal wounds and fight infections Needed for normal taste sensations	Seafood, meat, dried peas and beans, nuts

These same people also tend to not get enough calcium, zinc, vitamin C, and folic acid. Sometimes, as in the case of sodium, too much of a nutrient can cause problems.

Iron

Most of the *iron* in your body is found in red blood cells. Its job is to carry oxygen to body cells and remove carbon dioxide. People with iron deficiency anemia do not

get enough iron in their diets. They feel tired and run down because their cells aren't getting enough oxygen. It takes them longer to heal and fight infections.

Iron is supplied by foods of animal origin, such as meat, fish, and chicken. It also is supplied by foods of plant origin, such as breads, cereals, and dark green

vegetables, 2-16. Your body absorbs more iron from animal sources than from plant sources. More iron is absorbed from plant sources if you eat these foods with meat and foods rich in vitamin C.

Calcium

Calcium is needed to build bones and teeth. It also is needed to transmit nerve signals and contract muscles. A diet low in calcium may lead to a painful disease called *osteoporosis*. This disease causes bones to wear away, become brittle, and break easily. Just getting out of bed or being hugged can result in broken bones. Osteoporosis takes years to develop. It cannot be cured, but you can prevent it by eating a calcium-rich diet and exercising throughout your life. This will help keep your bones strong and not let them wear away.

The best sources of calcium are milk, cheese, yogurt, and other milk products, 2-17. Fish with tiny bones you can eat, such as sardines, are rich sources, too. Dark green vegetables, like spinach and broccoli, also provide some calcium.

Zinc

Zinc is a mineral needed for normal body growth and repair. Too little zinc in the diet causes stunted growth. It also delays



2-16 *Broccoli is a dark green vegetable. Spinach, collard greens, and kale are other dark green vegetables.*



2-17 *Milk and foods made with milk are rich in calcium.*

the teenage growth spurt. Wounds heal slowly and the sense of taste is lost when zinc is lacking in the diet. The best sources of zinc are seafood and meat. Cereals and dry peas and beans supply some zinc, too.

Vitamin C

Most people have heard the claim that vitamin C helps prevent or cure the common cold. Unfortunately, scientific experiments show that vitamin C has no proven effect on the common cold. Don't give up your orange juice, though. *Vitamin C* is a vital part of several body compounds. It helps your body heal wounds and keeps your gums healthy.

Vitamin C is found mainly in fruits and vegetables. Citrus fruits, such as oranges, grapefruit, and lemons are rich sources of vitamin C. Berries and melons are other fruits rich in vitamin C. Vegetables high in vitamin C include peppers, tomatoes, cabbage, and dark green vegetables.

Folic Acid

Folic acid is sometimes called *folate*. This B-vitamin is used to build strong, healthy blood. It also is needed to fight infections. Normal growth cannot occur if intake is low. Too little folic acid in your diet can cause you to feel tired and run down.

This vitamin also helps prevent brain and spine birth defects. These defects are called *neural tube defects*. A baby born with a neural tube defect may be missing part of the brain. The spine may not have closed normally causing a condition called *spina bifida*. The baby is often mentally handicapped. Folic acid may prevent heart, face, arm, and leg birth defects, too. Many women do not get enough of this vitamin. To prevent these birth defects, a woman needs to plan ahead. She should get 400 micrograms of folic acid each day starting at least one month before becoming pregnant. The best plan is to get enough folic acid daily even if a woman isn't planning to start a family. To have the healthiest baby possible, she needs to pay close attention to her diet. Rich sources of folic acid are whole-grain and enriched breads and cereals, 2-18. Other rich sources are bananas, oranges, dark green vegetables, and beans. Vitamin supplements also can provide folic acid.

Sodium

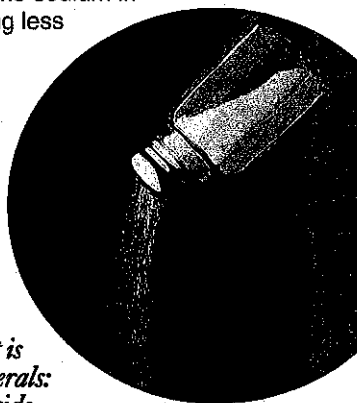
Sodium is a mineral that performs many vital functions. For example, sodium maintains the body's water balance. It also helps muscles to relax and nerves to transmit messages to the brain. Having enough sodium in the diet is important, but too much may cause the pressure inside your blood vessels to rise dangerously high. Many Americans tend to get too much sodium.

The main source of sodium in your diet is salt, 2-19. Sodium combines with another mineral called chloride to make



2-18 *Whole-grain bread is packed with folic acid.*

salt. So, any time you sprinkle salt on your food, you increase your sodium intake. Sodium occurs naturally in some foods and is added to others. Foods with the most sodium added to them are pickled foods, processed meats like ham and bologna, snack foods, and canned vegetables. Seasonings such as soy sauce, garlic salt, and onion salt also are packed with sodium. You can reduce the sodium in your diet by eating less of these foods.



2-19 *Table salt is made of two minerals: sodium and chloride.*

Phytochemicals

In addition to nutrients, fruits, vegetables, nuts, whole-grain breads and cereals, and tea contain **phytochemicals**. This term is pronounced "fight-o-chemicals." *Phyto* means plant in Greek. These compounds work together with vitamins, minerals, and fiber to promote good health. They are sometimes called phytonutrients. Foods that are rich in phytochemicals are called *functional foods*.

Studies show that phytochemicals can help reduce the chances of having certain health problems like heart disease, cancer, and cataracts. Some protect the body by boosting the work of the immune system. Others help protect you from harmful bacteria that can cause stomach ulcers and bladder infections. Still others are antioxidants.

Antioxidants are substances that protect the cells from damage that can be caused by oxygen (*anti*=against; *oxidant*=oxygen). It may seem odd that oxygen could hurt you. However, when your body burns calories, it creates a form of oxygen called *free radicals*. Free radicals zing around the body attacking healthy cells. They can damage cells and cause tumors to grow. Eating plenty of antioxidants helps prevent damage caused by free radicals.

There are more than 1000 phytochemicals. Phytochemicals in fruits and vegetables are related to their color. Each color offers a unique blend of phytochemicals. Eating many different colors of fruits and vegetables will provide your body with a wide range of phytochemicals. Only plants, not pills or supplements, can give you these compounds in the right combinations.

Supplements and You

Eating a nutritious diet can provide all the nutrients in the amounts most people need for good health. Usually, only people who are sick, injured, or known to have a nutrient deficiency need *nutrient supplements*. Women who are expecting a baby also need supplements. Older adults may need a supplement, too. Many people who take nutrient supplements often do not need to take them.

If you are thinking about taking a nutrient supplement, keep in mind that it is not a shortcut to good health and nutrition. No supplement can counteract a poor diet. Nutrient supplements can be costly, too. Foods usually cost less than supplements. Foods provide more nutrients that your body absorbs better than those in supplements. Foods taste better, too.


Overdosing on vitamins and minerals in food is highly unlikely. However, large doses of supplements can be wasteful and dangerous. For instance, large doses of water-soluble vitamins will be lost in your urine. Large doses of fat-soluble vitamins and certain minerals can build up, damage your body, or even kill you. You can overdose on supplements. Many vitamins and minerals have an *upper limit of safety*. The upper limit is the most you should take. It is not the level you should try to reach. Taking amounts higher than the upper limit is likely to hurt you.

If you think you need a nutrient supplement, check with your doctor first, 2-20. Discuss your diet and nutrient concerns. Ask your doctor to refer you to a dietitian. A **dietitian** is an expert in nutrition and can help you choose a supplement that is

Are You Getting All the Nutrients You Need?

How can you tell if you are getting enough nutrients from the foods you eat? Nutrition experts have developed tools that can help you discover the answer to that question. One tool is the **Dietary Reference Intakes (DRIs)**. The DRIs are a set of guidelines for the amounts of many nutrients needed daily. There are many categories of DRIs, based on age and gender. The DRIs for teens are shown in 2-21.

To determine the amount of each nutrient you eat, you can read the nutrition labels on food packages or use the *Food Composition Table* in the Appendix of this text. The next chapter will tell you about two other very useful tools that can help you be sure your diet is nutritious. These tools are the MyPyramid and the Dietary Guidelines.



2-20 Many nutrient supplements are available. Talk to your doctor before deciding to use supplements.

right for you. The safest choice usually is a multi-vitamin and mineral supplement that contains no more than 100 percent of your daily need. If supplements are needed, be sure to follow the directions on the label and take them with food.

2-21 To make sure you are getting all the nutrients you need, it is important to meet the DRIs for your age group and gender.

Dietary Reference Intakes for Teens

	Vitamin A µg*	Vitamin C mg†	Vitamin B ₆ mg	Folate µg	Vitamin B ₁₂ mg	Calcium mg	Iron mg	Zinc mg
Females								
Ages 9-13	600	45	1.0	300	1.8	1,300	8	8
Ages 14-18	700	65	1.2	400	2.4	1,300	15	9
Males								
Ages 9-13	600	45	1.0	300	1.8	1,300	8	8
Ages 14-18	900	75	1.3	400	2.4	1,300	11	11

* 1 µg* (microgram) is equal to one-millionth ($1/1,000,000$) of a gram.

† 1 mg (milligram) is equal to one-thousandth ($1/1,000$) of a gram.