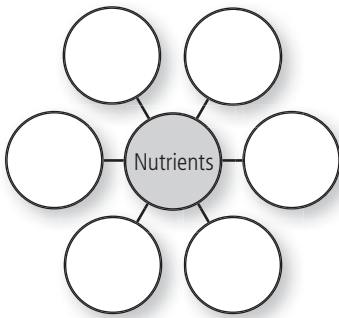


BIG Idea

Each nutrient in your diet plays a unique and essential role in keeping you healthy.

Study Coach

Cluster Chart Draw a circle and label it "Nutrients." Draw circles around it and use these to define and describe this term. As you read, continue filling in the chart with more details.



READING CHECK

1. Contrast How are carbohydrates, proteins, and fats different from other types of nutrients?

● Before You Read

Sometimes figuring out what to eat can be a challenge. Do you know what nutrients your body needs to function properly? On the lines below, describe what you think a healthy diet should include. Revise your list as you read.

● Read to Learn

Giving Your Body What It Needs

Everything you eat contains nutrients. There are six types of nutrients. Three of these—carbohydrates, proteins, and fats—are sources of energy. The other three—vitamins, minerals, and water—do not provide energy. These three perform other functions in the body. ✓

What are carbohydrates?

Carbohydrates are starches and sugars found in foods. Carbohydrates provide your body's main source of energy. Each gram of carbohydrate provides four calories of energy. About 45 to 64 percent of your daily calories should come from carbohydrates.

Types of Carbohydrates

There are three different types of carbohydrates: simple, complex, and fiber. Simple carbohydrates are sugars, such as fructose (found in fruits) and lactose (found in milk). Sugars occur naturally in fruits, dairy products, honey, and maple syrup. Sugars are also added to processed foods. These include cold cereals, bread, and other bakery products.

Complex carbohydrates, or starches, are made up of long chains of sugars linked together. Common sources of starch include grains, bread, pasta, beans, and potatoes.

The last type of carbohydrate is fiber. **Fiber** is a tough complex carbohydrate that the body cannot digest. It moves waste through your digestive system. Eating foods high in fiber can help you feel full and prevent you from overeating. A high intake of fiber may also reduce the risk of cancer, heart disease, and type 2 diabetes. Teen females should eat 26 grams of fiber daily, and teen males should eat 38 grams daily. Good sources of fiber include fruits and vegetables, whole grains, nuts, seeds, and legumes.

The Role of Carbohydrates

Your body uses carbohydrates by breaking them down into their simplest forms. Most of the carbohydrates you eat are turned into a simple sugar called glucose. Glucose is the main source of fuel for the body's tissues. Your body can store glucose to be used later. ✓

What are proteins?

Proteins are nutrients that build and maintain cells and tissues. They are made up of chemicals called amino acids. Each gram of protein provides four calories of energy.

Types of Proteins

Your body uses about 20 amino acids. You produce all but nine of these amino acids. These nine are called essential amino acids because the body must get them from food. The rest are known as nonessential amino acids.

Proteins from animal sources and from soy contain all nine essential amino acids. They are known as “complete” proteins. Proteins from plant sources are usually missing one or more of the essential amino acids. You can get all the essential amino acids by eating a variety of plant-based foods. Examples of these foods are grains, nuts, seeds, and legumes.

The Role of Proteins

Your muscles, bones, skin, and internal organs are all constructed of protein. Your body uses protein to help it grow and maintain all body cells.

Proteins also do a variety of other jobs in the body. To meet the body's needs, teen males should consume about 52 grams of protein per day. Teen females should consume 46 grams per day. Between 10 and 15 percent of your total daily calories should come from protein.



Think it Over

- 2. Explain** How can eating foods high in fiber help prevent overeating and weight gain?



READING CHECK

- 3. Explain** How does your body use carbohydrates?

What are fats?

Your body needs a certain amount of fat to perform its basic functions. However, consuming too much fat can lead to weight gain. Each gram of fat provides nine calories of energy.

Types of Fats

Dietary fats are made up of fatty acids. Essential fatty acids are fatty acids that the body needs but cannot produce on its own. The fat in all foods is a combination of saturated and unsaturated fats:

- **Unsaturated fats.** Vegetable oils, nuts, and seeds tend to contain larger amounts of unsaturated fats. Eating unsaturated fats in small amounts may actually help lower your risk of heart disease.
- **Saturated fats.** This type of fat is found mostly in animal-based foods such as meat and dairy products. A few plant oils (palm, coconut, and palm kernel) also contain high levels of saturated fats. Eating too many saturated fats may increase your risk of heart disease.
- **Trans fats.** These fats are formed by a process called hydrogenation. In this process, vegetable oil is made into a solid. As it hardens, fat becomes more saturated. Trans fats can be found in stick margarine, many snack foods, and packaged baked goods. Trans fats can harm your health by raising your total blood cholesterol level. ✓



READING CHECK

4. Explain Why are unsaturated fats better for your health than saturated fats?

The Role of Fats

Essential fatty acids are needed for brain development and blood clotting. They also help maintain healthy skin and hair. Your body relies on fats to absorb and transport fat-soluble vitamins (A, D, E, and K) through the bloodstream.

The calories from fats that your body does not use right away are stored as body fat. Stored fat provides insulation for the body. However, carrying too much body fat increases the risk of health problems.

In addition, saturated fats can increase the levels of a waxy, fatlike substance in your blood. This substance is known as **cholesterol**. Cholesterol is needed to create cell walls, certain hormones, and vitamin D. However, excess cholesterol in your blood can build up in the arteries. This raises your risk of heart disease. Experts recommend that teens get no more than 25 to 35 percent of their calories from fats. Limit your intake of saturated fats to less than 10 percent of your total calories. ✓

What are vitamins?

Vitamins are compounds found in food that help regulate many body processes. See the table on page 122 for a list of vitamins and their roles in the body.

Vitamin C, folic acid, and the B vitamins are water soluble. They dissolve in water and pass easily into the bloodstream. Any extra amounts of these vitamins are removed by the kidneys. Fat-soluble vitamins (A, D, E, and K) are stored in body fat for later use. If consumed in large amounts, these vitamins can build up in the body and become harmful. ✓

What are minerals?

Minerals are elements found in food that are used by the body. Your body cannot produce minerals, so it must get them from food. The table on page 123 lists some of the minerals your body needs and how it uses them.

The mineral calcium is important for bone health. Eating enough foods with calcium can reduce your risk of developing bone diseases and disorders. **Osteoporosis** is a condition in which the bones become fragile and break easily. This disease is most common in women over the age of 50. However, eating plenty of calcium-rich foods as a teen can protect your health in the future.



READING CHECK

6. Explain Should you try to cut all fats out of your diet? Why or why not?



READING CHECK

7. Contrast What is the difference between water- and fat-soluble vitamins?

Vitamin/Amount Needed Per Day by Teens Ages 14 to 18	Role in Body	Food Sources
Fat-Soluble Vitamins		
A Teen female: 700 mcg Teen male: 900 mcg	needed for night vision; helps produce white blood cells; regulates cell growth; helps repair bones and tissues; aids immunity; maintains healthy skin and mucous membranes	carrots, sweet potatoes, tomatoes, cereals, leafy green vegetables, fish, liver, dairy products, egg yolks
D (calciferol) Teen female: 5 mcg Teen male: 5 mcg	helps body use calcium and phosphorus (needed for building bones); aids immunity; helps regulate cell growth	cereals and dairy products, fatty fish such as salmon and tuna Note: Your skin naturally produces vitamin D when exposed to sunlight.
E Teen female: 15 mg Teen male: 15 mg	protects cells from damage; aids blood flow; helps repair body tissues	fish, milk, egg yolks, vegetable oils, fruits, nuts, peas, beans, broccoli, spinach, cereals
K Teen female: 75 mcg Teen male: 75 mcg	essential for blood clotting, aids bone growth	leafy green vegetables, vegetable oils, cheese, broccoli, tomatoes
Water-Soluble Vitamins		
B₁ (thiamine) Teen female: 1.0 mg Teen male: 1.2 mg	helps the body use carbohydrates for energy; promotes nervous system health	enriched and whole-grain cereal products, lean pork, liver
B₂ (riboflavin) Teen female: 1.0 mg Teen male: 1.3 mg	helps the body process carbohydrates, proteins, and fats; maintains healthy skin	lean beef, pork, organ meats, legumes, eggs, cheese, milk, nuts, enriched grain products
B₃ (niacin) Teen female: 14 mg Teen male: 16 mg	helps body process proteins and fats; maintains health of skin, nervous system, and digestive system	liver, poultry, fish, beef, peanuts, beans, enriched grain products
B₆ Teen female: 1.2 mg Teen male: 1.3 mg	helps body use proteins and fats; supports immune and nervous systems; helps blood carry oxygen to body tissues; helps break down copper and iron; prevents anemia; helps maintain normal blood sugar levels	organ meats, pork, beef, poultry, fish, eggs, peanuts, bananas, carrots, fortified cereals, whole grains
B₁₂ (cobalamin) Teen female: 2.4 mcg Teen male: 2.4 mcg	maintains healthy nerve cells and red blood cells; helps form genetic material in cells; prevents anemia	liver, fish, poultry, clams, sardines, flounder, herring, eggs, milk, other dairy foods, fortified cereals
C (ascorbic acid) Teen female: 65 mg Teen male: 75 mg	protects against infection; promotes healthy bones, teeth, gums, and blood vessels; helps form connective tissue; helps heal wounds	citrus fruits and juices, berries, peppers, tomatoes, broccoli, spinach, potatoes
Folic acid (folate) Teen female: 400 mcg Teen male: 400 mcg	helps body form and maintain new cells; reduces risk of birth defects	dark green leafy vegetables, dry beans and peas, oranges, fortified cereals and other grain products

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Mineral/Amount Needed Per Day by Teens Ages 14 to 18	Role in Body	Food Sources
Calcium Teen female: 1,300 mg Teen male: 1,300 mg	forms bones and teeth; aids blood clotting; assists muscle and nerve function; reduces risk of osteoporosis	dairy products, calcium-fortified juice, calcium-fortified soy milk and tofu, corn tortillas, Chinese cabbage, broccoli, kale
Phosphorus Teen female: 1,250 mg Teen male: 1,250 mg	produces energy; maintains healthy bones	dairy products, peas, meat, eggs, some cereals and breads
Magnesium Teen female: 360 mg Teen male: 410 mg	helps muscle and nerve function; maintains regular heartbeat; aids in bone growth and energy production	meat, milk, green leafy vegetables, whole grains, nuts
Iron Teen female: 15 mg Teen male: 11 mg	Helps blood cells carry oxygen; supports immune system	meat, poultry, beans, grain products ✓

Is water a nutrient?

You may not think of water as a nutrient, but it is essential to your body. All of your body cells contain water. Water's functions include:

- Moving food through the digestive system.
- Aiding chemical reactions in the body.
- Transporting nutrients and removing wastes.
- Storing and releasing heat.
- Cooling the body through perspiration.
- Cushioning the eyes, brain, and spinal cord.
- Lubricating the joints.

Teen females need about 9 cups of fluids a day, and teen males need about 13 cups a day. About 20 percent of your total daily water intake comes from the foods you eat. Drinking fluids with your meals and when you feel thirsty will give your body all the water it needs.

If you are very active, you will need even more water to replace what your body loses when you sweat. Drink extra water before, during, and after exercise. Do this even if you do not feel thirsty. You should also drink extra water in hot weather to prevent dehydration. Limit your consumption of coffee, tea, and soft drinks that contain caffeine. These can actually make you more dehydrated. ✓



READING CHECK

- 8. Describe** Which foods are good sources of the mineral iron?



READING CHECK

- 9. Explain** When should you make sure to drink extra water?
