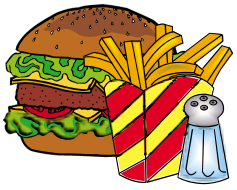
Unit 4: Nutrition: Food for Life

Introduction

Thousands of years ago, human beings had very little choice in their **diets**, or the foods they ate each day. They ate whatever foods they could find or catch. Even today, many people throughout the world cannot choose their diets.

Most Americans, however, can choose the foods they eat. Unfortunately, many of us do not choose healthy diets. A *healthy diet* includes foods that provide us with enough *energy* to perform well throughout the day—in school, in sports, while studying, and on the job. A healthy diet will help us look our best. We will not carry too much or too little fat. Our hair will shine and our eyes will be clear and bright. When we eat a healthy diet, we provide our bodies with the substances they need to grow and repair themselves. Healthy food gives our bodies a chance to resist infections and diseases. A diet of healthy food will even help us *feel* better about ourselves and others.

A healthy diet provides our bodies with the substances they need to grow and repair themselves.



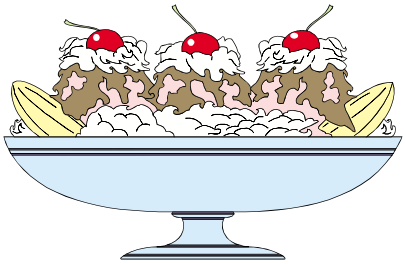
We sometimes make unhealthy food choices from a lack of knowledge.

If eating a healthy diet is so important to how we perform and feel, why do so many Americans eat a diet of unhealthy food? One reason many of us make unhealthy choices is a lack of knowledge. Unless we have the knowledge to guide us in our food choices, we are apt to choose what is quick and *convenient*. We grab a greasy hamburger from a fast-food restaurant. We eat junk food from the convenience store on our way home from school. We sit down at a restaurant and stuff ourselves with fatty foods and sodas that

give us too many **calories** and too few of the healthy substances our bodies need to develop and perform well. Even when we prepare foods at home, we often create a meal that satisfies our hunger but does not satisfy our health needs.

Many of us have grown up finding satisfaction in fatty foods or in foods that have little nutritional value. Eating these foods has become a habit. Like any habit, this will take some effort to change. When we make a habit of eating pasta and rice and fruits and vegetables, we begin to enjoy the taste of these foods. And we begin to enjoy the way these foods make us feel.

Fortunately, a healthy diet does not exclude the rich taste of ice cream or the pleasure of eating a slice of chocolate cake. These kinds of foods can have a place in our diets. But in a healthy diet, these foods are eaten occasionally and in addition to more nutritious foods. Almost every food can have its time and place in our diets.



Almost every food can have its time and place in our diets.

Food: Much More Than Just Filling and Tasty

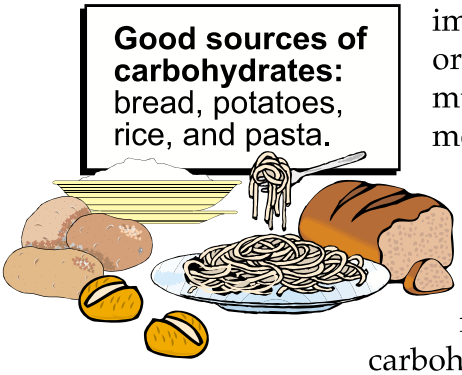
Food can do much more than satisfy our hunger and provide enjoyable taste. Food also provides us with **nutrients**. Nutrients are the substances found in food that the body must have to grow, repair itself, and use as fuel for energy.

Food contains six different groups of nutrients: **carbohydrates**, **proteins**, **fats**, **vitamins**, **minerals**, and *water*. Carbohydrates, proteins, and fats provide the energy we need. They also produce heat so our bodies can maintain a normal temperature. Vitamins and minerals help the body release the energy in carbohydrates, fats, and proteins. Water is the body's most vital nutrient. Although we can survive for weeks without food, we will die in a few days without water.

Any food that you eat will provide you with some or all of these nutrients. However, a nutritious diet will provide the right amount of each of these nutrients to make you look and feel good.

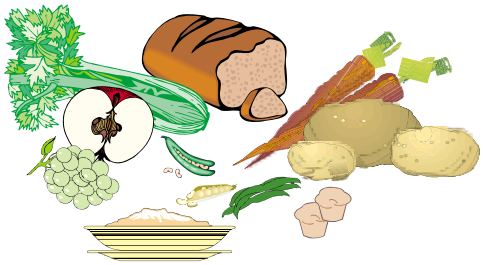
Carbohydrates: The Main Source of Energy in a Healthy Diet

Carbohydrates are the body's *main* source of energy in a healthy diet. The body quickly digests carbohydrates in foods and converts them into a form of energy called **glucose**. Glucose is a sugar and one of the fuels our body uses. Whatever glucose is not needed immediately as fuel is turned into glycogen or fat. Glycogen is stored in our liver and muscles until the body sends out a call for more fuel. Glycogen is then turned back into glucose and used as the body's fuel.



Carbohydrate foods should make up most of our diets. There are two kinds of carbohydrates: starches and sugars. *Starches* come from vegetables and grains. Some of the more common foods that contain starches are potatoes, corn, rice, and wheat. Other good sources of starch include whole-grain bread such as whole-wheat bread, and whole-grain cereal such as oatmeal. Pasta like spaghetti and the beans in tacos and burritos are also starches and good sources of carbohydrates. Starches not only provide fuel for the body, but they also provide many necessary *vitamins* and *minerals*.

Many carbohydrates are also a good source of **fiber**. Fiber is also called *bulk* or *roughage*. Fiber is not digested by the body. Instead, it helps to make digested food in the intestines pass out of the body as stool. We need about 20-30 grams of fiber in our daily diets to keep our digestive tract healthy. Without enough fiber in our systems, we experience constipation, hemorrhoids, and other discomforts. However, too much fiber can cause diarrhea or even block our digestive tract.

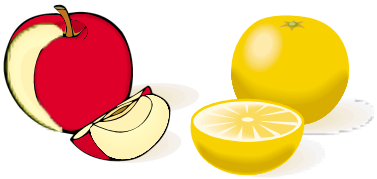


Good sources of fiber include fruits and potatoes with their skins, wheat bread, bran, celery, other stringy vegetables, and beans.

How much fiber we get from foods containing fiber depends on the form in which we eat them. An apple is a good source of fiber. In comparison,

apple juice has no fiber. A potato with its skin is a good source of fiber. But potato chips have little or no fiber. The less a food is processed, the more fiber it will have. Other good sources of fiber include fruits with their skins, wheat bread, bran, celery, other stringy vegetables, and beans.

Unlike starches, some forms of sugar provide only fuel. Common table sugar that we sprinkle on our cereal or eat in "sweets," such as candy bars, doughnuts, or muffins, does not provide us with many vitamins, minerals, or fiber. The sweetness we taste in an apple or orange is also a sugar. However, fruits also provide our bodies with some very important vitamins and minerals.

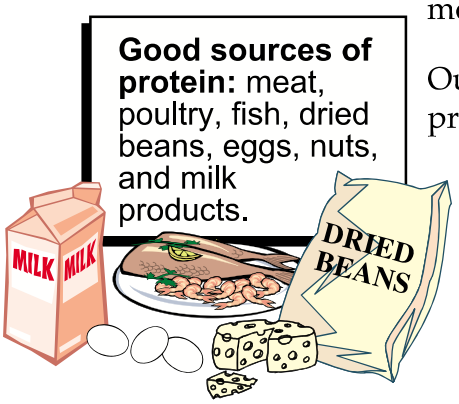


The sweetness we taste in an apple or orange is also a sugar.

Protein: The Nutrient That Helps Us Grow and Repair

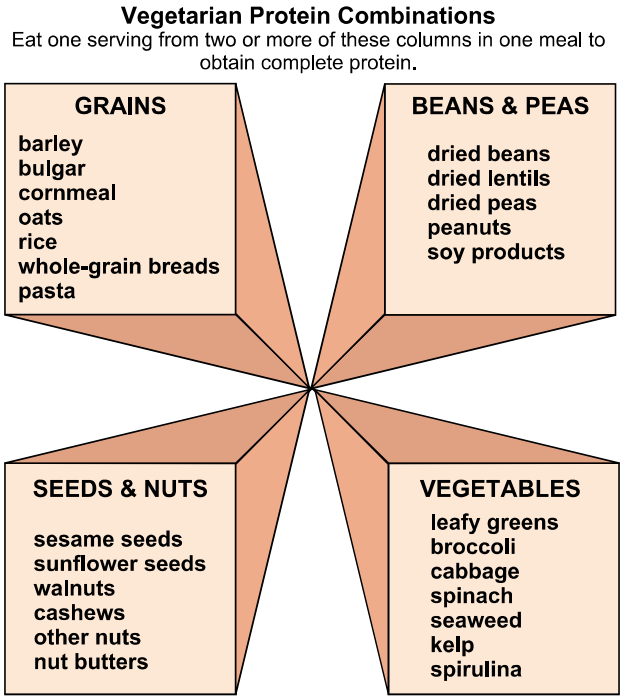
The body uses *proteins* to make and repair all of its tissues and many other body parts. Proteins are used by the body to build and repair muscle, blood, hair, skin, nails, and internal organs. If the body does not get enough protein, it will not grow. Muscles, hair, nails, skin, and many other parts of the body will weaken. Children who do not get enough protein can develop mental disabilities. Protein helps to provide energy. Anyone who suffers from a lack of protein may experience fatigue and a weakened immune system.

Because protein helps the body grow and develop, we need more protein during our growth periods. Children and teenagers, for example, need more protein than full-grown adults.



Our bodies are able to produce some of the proteins they need. However, the rest of the proteins we need must come from food. Animal products such as cheese, eggs, fish, meat, milk, or poultry provide us with *complete* protein. Any *one* of these foods supplies us with the right kind of protein.

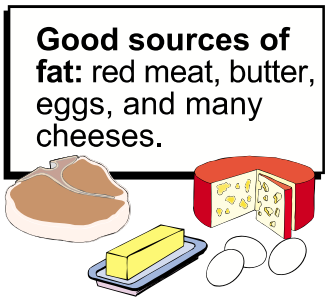
Foods that are grown, such as grains, beans, nuts, seeds, and vegetables are *incomplete* proteins. Eating only one of these foods will not provide the body with the protein it needs. Each of these foods must be eaten in *combination* with another food to produce the right kind of protein. Eating rice and beans together, for example, will provide complete protein. Peanut butter and bread or macaroni and cheese are other combinations that provide complete protein. Vegetarians, in particular, need to be sure they eat the right combinations of foods to get adequate and *complete* protein.



The body loses protein every day. Therefore, we need to eat a complete protein food or the right combination of foods every day to meet our protein needs. However, any extra protein we eat is stored as fat in the body. As is true of all nutrients, too much protein will have some unhealthy effects.

Fat: A Necessary Nutrient—In Moderation

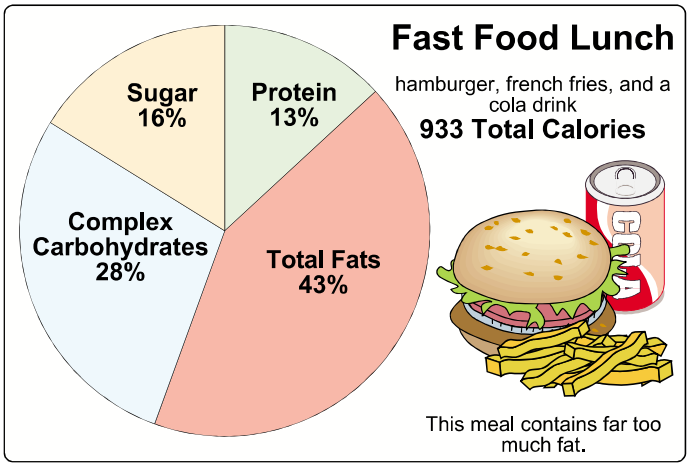
Recently, *fat* has gotten a bad name. It is true that eating too much fat or carrying too much on the body is not healthy. But like every nutrient, fat is an important and *necessary* part of our diet.



Fat is a major source of fuel. Almost every part of the body can use fat as energy. Fat is an essential nutrient for the health of every cell in the body. Fat also insulates the body, much like a warm jacket. Without fat on our bodies, we

would have a difficult time keeping warm in cold weather. Fat also pads the body against injury in a fall. Without fat, we would suffer from far more bruises and breaks than we do. Fat also cushions our organs such as the liver and pancreas.

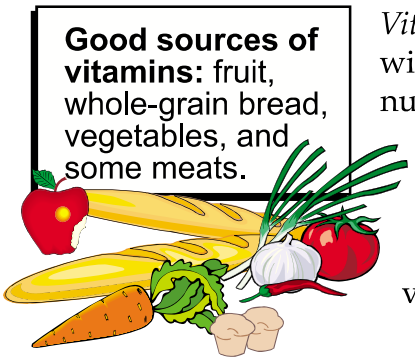
As you can see, we wouldn't perform very well if we didn't eat some fat. However, there are better and worse kinds of fats. *Saturated fats* come mainly from animal products. Foods that are high in saturated fats include dairy products (whole milk, butter, and cheese), bacon, sausage, lunch meats, hot dogs, hamburgers, steak, and palm oil (used in many junk foods). The body uses saturated fats to make *cholesterol*. Although some cholesterol is necessary for good health, excess cholesterol will clog arteries and put a strain on the body. Too much cholesterol can lead to heart disease, artery disease, and strokes.



typical fast food lunch

Unsaturated fats come from vegetables, nuts, and seeds, as well as from animals that swim or fly such as fish, chicken, turkey, and duck. A healthy diet includes foods with unsaturated fats rather than saturated fats.

Vitamins and Minerals: The Helper Nutrients



Vitamins and *minerals* do not supply the body with energy. However, without these essential nutrients, the body could not carry out many of its necessary functions. These substances are *helper nutrients*—they *help* the body do its work. We can get enough vitamins and minerals in our diets simply by eating a variety of healthy foods.

The charts on pages 121-124 list the vitamins and minerals you need to keep your body operating efficiently and to keep you feeling healthy. The charts list which foods provide these nutrients. The charts also describe the function of each essential vitamin and mineral, as well as what happens to the body when it does not get enough of each one.

Water-Soluble Vitamins

Vitamin	Function*	Sources*	Deficiency*
B_1 thiamine	• changes glucose into energy or fat • assists with normal appetite and digestion • promotes healthy nervous system and heart • prevents nervous irritability	lean pork, liver, whole grain or enriched breads, cereals, dried beans, legumes, nuts	• beriberi—inflamed nerves • muscle weakness • heart problems • leg cramps • mental confusion
B_2 riboflavin	• assists with nerve cell function • aids in a healthy appetite • aids in producing energy from carbohydrates, protein, and fats • promotes healthy skin and eyes	liver, eggs, milk, whole-grain products, enriched breads, cereals, pasta, green leafy vegetables, spinach, dried beans	• cheilosis—skin sores on nose and lips, sensitive eyes • visual disturbances • sore, red tongue
B_3 niacin	• aids in normal metabolism • aids in normal digestion and appetite • promotes healthy nervous system and skin • helps in production of energy	red meats, organ meats, poultry, fish, milk, enriched breads and cereals, peanut butter	• pellagra—soreness on mouth • diarrhea • irritability • depression
B_6 pyridoxine	• aids in normal carbohydrate, protein and fat metabolism • aids in formation of blood cells	red meats, liver, fish, whole-grain products, green leafy vegetables, bananas	• anemia—too few red blood cells • dermatitis • kidney stone formation • nervous disturbances
B_{12}	• aids in production of red blood cells and normal growth • aids in normal cell function	lean meats, liver, egg products, milk, cheese	• pernicious anemia • stunted growth
folacin or folic acid	• aids in formation of hemoglobin in red blood cells • aids in production of genetic material • reduces risk of birth defects	lean beef, liver, green vegetables, broccoli, whole-grain products, legumes, nuts	• anemia • diarrhea
pantothenic acid B-complex	• assists with energy release from carbohydrates, protein, and fats • assists in production of some hormones	liver, poultry, eggs, milk, cheese, whole-grain cereals and breads, green vegetables, nuts	• none noted
biotin B-complex	• aids in normal metabolism of carbohydrates and some other B vitamins	organ meats, egg yolks, green vegetables	• hair loss • skin disorders
C ascorbic acid	• helps with formation of connective tissue • protects against infection • helps wounds heal • promotes healthy teeth and gums • aids in body's use of iron • maintains elasticity and strength of blood vessels	green vegetables, broccoli, cabbage, peppers, potatoes, tomatoes, citrus fruits, melons, strawberries	• scurvy–slow wound healing • loose teeth • gum disease • frequent bruising

**Not all functions, sources, or deficiencies are listed.*

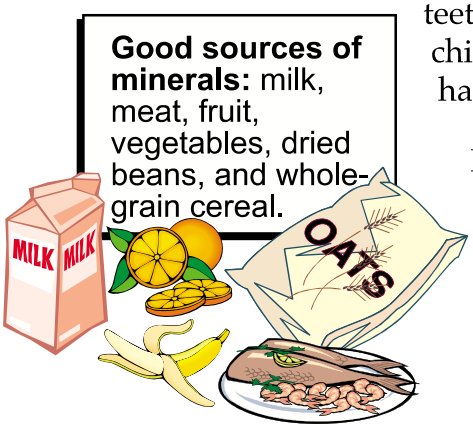
Without vitamins the body can suffer tragic effects. A lack of vitamin A, for example, can cause blindness. A lack of vitamin C can cause gum disease and loss of teeth. On the other hand, taking too much of a vitamin can also damage our health. Vitamins, like all nutrients, must be taken in the right amounts to achieve good health.

Fat-Soluble Vitamins

Vitamin	Function*	Sources*	Deficiency*
A	• maintains skin tissues • strengthens tooth enamel • aids in formation of bone and mucous membranes • keeps eyes moist • helps eyes adjust to darkness	liver, milk and dairy products, yellow and dark leafy green vegetables, carrots, sweet potatoes, yams, and deep-orange fruits	• night blindness • failure of bone growth • rough skin and drying of mucous membranes
D	• promotes normal growth • aids use of calcium and phosphorus in building healthy bones and teeth	liver, beef, salmon, sardines, tuna, fish-liver oils, fortified milk and cereals, egg yolk, exposure to sunlight	• rickets—inadequate growth of bones and teeth • bowed legs • soft bones in adults • poor teeth
E	• prevents destruction of red blood cells • helps certain enzymes to work • helps form red blood cells, muscles, and other tissues	wheat germ, dark green vegetables, vegetable oils, legumes, nuts	• breakdown of red blood cells, causing anemia
K	• assists with blood clotting • assists in regulating blood calcium level	liver, eggs, broccoli, spinach, cabbage, vegetable oils, potatoes, tomatoes	• slow clotting of blood • hemorrhage

**Not all functions, sources, or deficiencies are listed.*

Two of the most important minerals for growing teenagers are calcium and iron. Calcium helps the body grow and maintain strong bones and teeth. A shortage of calcium during childhood and adolescence can lead to having weak and fragile bones in later life.



Iron helps the body grow and resist diseases. Too little iron can lead to anemia, a disorder that leaves a person feeling weak. Iron deficiency can easily occur in girls and women, who lose iron when they menstruate.

Too much of a mineral can be harmful. For example, too much sodium, or salt, can lead to high blood pressure.

Nutritionists and scientists, on behalf of the United States government, have suggested the amounts we need of each vitamin and mineral. Their suggested amounts are known as the *Recommended Daily Allowance* or **RDA**.

Minerals

Mineral	Function*	Sources*	Deficiency*
calcium	• maintains strong bones and teeth • aids nervous system • aids regular heartbeat • aids in the transmission of nerve cell impulses • aids in blood clotting	sardines, salmon, milk and dairy products, dark leafy green vegetables, dried beans, peanuts	• osteoporosis—thin bones • rickets—inadequate growth of bones and teeth
chlorine	• aids in maintenance of water balance • helps liver function in waste removal	table salt, high salt meats (ham), kelp, some cheese, crackers, olives	• loss of teeth • loss of hair
copper	• enables normal production of hemoglobin • enables normal production of bone • enables normal production of melanin involved in skin color	liver, shellfish, whole-grain products, vegetables, potatoes, kidney beans, legumes, nuts	• anemia • drop in HDL cholesterol (good cholesterol)
iodine	• enables production of thyroid hormone • improves mental alertness and energy • promotes growth • helps maintain proper water balance • promotes healthy teeth, hair, skin, and nails	iodized salt, seafood, kelp, vegetables grown in iron-rich soil	• goiter • hypothyroidism
iron	• enables formation of red blood cells • aids in growth • gives you energy • promotes resistance to disease • enables red blood cells to carry oxygen to all parts of the body	red meat, liver, shellfish, egg yolk, whole-grain products, dark green vegetables, legumes, peanuts, dried fruits, raisins	• anemia—too few red blood cells • fatigue
magnesium	• enables chemical reactions during metabolism • prevents calcium deposits and gallstones • aids in bone growth and muscle contraction • promotes healthy teeth	milk, dairy products, dark green leafy vegetables, seeds, grapefruit, lemons, apples	• depression • nervousness • sleeplessness • sensitivity to noise
manganese	• aids in enzymes for synthesis of cholesterol • aids in formation of urea • enables growth of cartilage and bone tissue • aids in normal function of nervous tissue • enables metabolism of carbohydrates, proteins, and fats	liver, kidney, whole-grain products, leafy green vegetables, legumes, nuts, fruits	• asthma • carpal tunnel syndrome • tendonitis • nerve damage

**Not all functions, sources, or deficiencies are listed.*

Minerals chart continued on following page.

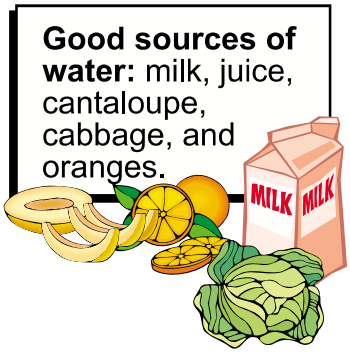
Minerals Continued

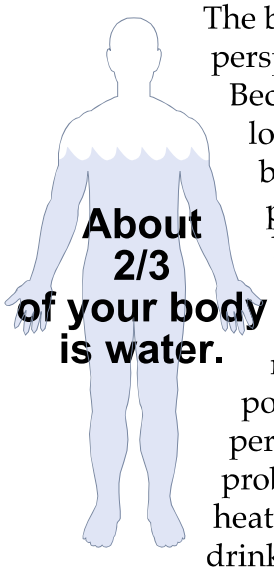
Mineral	Function*	Sources*	Deficiency*
phosphorus	• enables normal structure of bones and teeth • promotes growth and repair of cells • plays a role in normal metabolism • helps in maintaining regular heartbeat	liver, meats, poultry, fish, eggs, milk, cheese, whole-grain products, broccoli, dried beans, legumes, nuts	• rickets
potassium	• helps maintain normal metabolism • helps maintain normal nerve and muscle function • regulates body's water balance and heartbeat • sends oxygen to brain to aid in clear thinking • helps regulate blood pressure	meats, poultry, fish, eggs, milk, vegetables, dried beans, legumes, peanut butter, potatoes, bananas, citrus fruits, dried fruits	• low blood sugar • edema—retaining water
sodium	• enables proper water balance in cells and tissues • prevents heat prostration • aids in proper nerve cell and muscle function	table salt, soy sauce, high salt meats (ham), kidney, shellfish, cheeses, carrots, beets, crackers	• difficulty digesting carbohydrates
sulfur	• fights bacterial infections • aids in healthy hair, skin, and nails • works with B vitamins in metabolism	lean beef, fish, milk, cheese, eggs, barley, oatmeal, cabbage, beans, legumes, nuts, dried fruits	• not known
zinc	• enables several digestive enzymes • plays a role in respiration, and bone and liver metabolism • aids healing of wounds • promotes growth and mental alertness • aids in decrease of cholesterol • promotes cell reproduction and repair	meats, poultry, shellfish, milk, eggs, wheat germ	• hardening of the arteries

**Not all functions, sources, or deficiencies are listed.*

Water: Drink to Your Health

Water is not considered a food. It is, however, an essential nutrient. Water is necessary for all body processes. Water is part of our blood. It helps deliver nutrients to all parts of the body. We wouldn't be able to digest food without water. We also wouldn't be able to get rid of waste in our body without water. By perspiring, or sweating, we are able to maintain our body temperature.





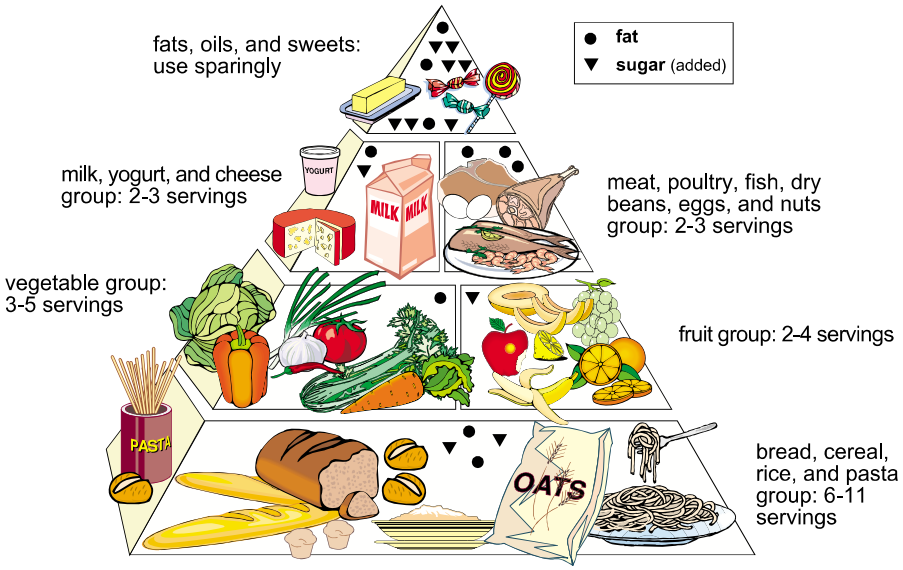
The body loses water every day. We lose water through perspiration and urine, and, when we exhale, our breath. Because water is so important to the health of the body, lost water must be replaced. A loss of 10 percent of your body's total water can cause health problems. A 20 percent loss can cause death. To replace the water your body loses, drink at least eight to 10 eight-ounce glasses of water a day. Those of us who perspire heavily or who exercise often in the hot Florida sun need to drink even more water. The *electrolytes* sodium, potassium, and chloride can be lost through heavy perspiration. The proper balance of electrolytes prevents problems resulting from dehydration, such as cramping, heat exhaustion, and heat stroke. It is a good practice to drink before, during, and after exercise. **Remember:** Do not let thirst be your guide. By the time you feel thirsty, your body is already low on water.

Developing a Nutritious Diet: The Food Guide Pyramid

Although the body is much more complex than a machine, it does have some similarities. The body must be taken care of to work well. Many Americans are very choosy about what kind of oil they put in their cars. They use a high-octane gas because they want their cars to have that extra zip as they roll down the highways. Unfortunately, some of those same Americans are not as choosy about the food they put in their bodies. Eating food that provides the right nutrients is one of the most important ways to keep our bodies running smoothly.

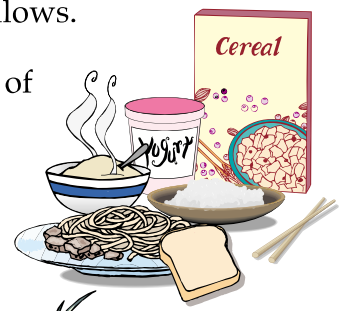
The Food Pyramid: A Guide to a Healthy Diet

The United States Department of Agriculture (USDA) and the United States Department of Health and Human Services have developed guidelines to help Americans choose a **balanced diet**. The Food Guide Pyramid was developed as a general guide of what to eat each day. The Food Guide Pyramid is an easy-to-follow guideline that shows how many servings from each of the five food groups we should eat every day. The pyramid recommends that whole grains such as bread, cereal, rice, and pasta make up the largest part of our diets. A healthy diet should include 6-11 servings of whole grains each day. The pyramid also recommends 3-5 servings of vegetables and 2-4 servings of fruits to help increase our carbohydrate and fiber intake. The pyramid recommends eating only 2-3 servings of dairy products and lean meat, fish, poultry, or nuts. Fats, oils, and sweets are not part of a food group. They should be eaten sparingly.

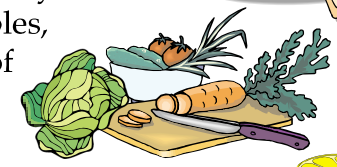


The Food Guide Pyramid

A *serving size* for food from each food group is as follows.

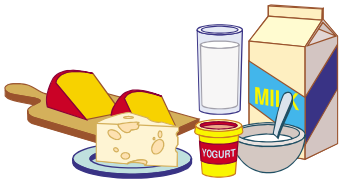


- Bread, cereal, rice, and pasta group: one slice of bread; ½ cup of cooked cereal, rice, or pasta; one ounce of ready-to-eat cereal; ½ of a bagel or English muffin

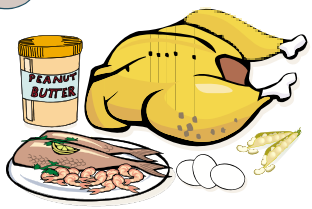


- Vegetable group: one cup of raw, leafy vegetables; ½ cup of other vegetables, cooked or chopped raw; ¾ cup of vegetable juice

- Fruit group: one medium apple, banana, orange, or ½ grapefruit; ½ cup of canned fruit; ¾ cup of juice



- Milk, yogurt, and cheese group: one cup milk or yogurt; 1½ ounces of natural cheese; 2 ounces of processed cheese



- Meat, beans, eggs, or nuts group: two to three ounces of cooked lean meat, poultry, or fish; one egg, ½ cup of cooked dried beans, or two tablespoons of peanut butter

By following this chart, we will also get the right percentages of carbohydrates, proteins, and fats. Most nutritionists recommend that 50-60 percent of our total daily calories come from carbohydrates, no more than 30 percent from fat, and 10 percent from protein. **Remember:** A gram of fat contains more than twice the number of calories as does a gram of carbohydrate. We often reach our recommended fat intake much sooner than we think.

Calories: The Measure of Energy

Most of us think of calories as something in food that makes us fat. When we eat foods with too many calories, we gain weight. When we eat foods with fewer calories, we gain less weight or lose weight. In a sense, this is true.

Most of us think of calories as something in food that makes us fat.

But another way of thinking about calories is to see them as units of energy. A calorie is a measure of the energy in foods. No matter what kind of food a calorie comes from, a calorie supplies your body with the same amount of energy.

Think of the calories you eat as energy you take in. Think of the work (or play) your body does as energy you spend. Then see your body as reflecting the sum of this energy equation. If you take in more calories than you expend, your body will gain weight. If you spend more calories than you take in, your body will lose weight. If you take in as many calories as you expend, your body will maintain its weight.

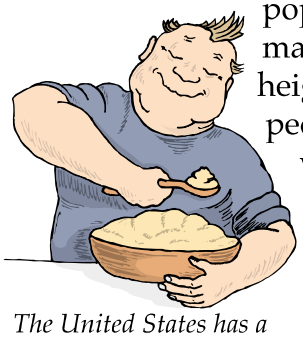
The average teenage girl needs about 2300 calories a day. The average teenage boy needs about 2700 calories a day. If you are very active and exercise strenuously, your body will need more calories to balance the energy equation. If you do not exercise and spend your time sitting or walking slowly, your body will need fewer calories to balance the energy equation.

To figure the calorie content of a food, you first must know its weight. Most foods are measured in grams or ounces. (Twenty-eight grams equals one ounce.) One gram of fat supplies nine calories. One gram of carbohydrate or protein supplies four calories. You can eat twice as many grams of carbohydrates or proteins than of fats and still take in fewer calories.

The difference between eating fat or carbohydrates does not stop there. When we eat fat, the body uses very little of it before storing it in our body. In other words, the body does not use very much energy to turn the fat in foods into fat in our bodies. On the other hand, when we eat more carbohydrates than our bodies need, our bodies have to work hard to store the extra carbohydrates in our bodies. The body uses one-quarter of the calories in extra carbohydrates, turning them into glycogen or fat stores for later use. The math of fats and carbohydrates is easy. Eat nine calories too many of fat and you store almost nine calories in your body. Eat four calories too many of carbohydrates and you store only three calories in your body. **Remember:** You also gain fiber and other essential vitamins and minerals when you eat carbohydrates.

Focusing on Health: Body Weight and Body Composition

Look around: few people you see would claim that they are happy with their weight. Most Americans believe they are overweight. Most nutritionists and scientists would agree. The United States has a large population of overweight people. Many of us want to match the weight we find listed for our height on the height/weight chart at the doctor's office. But most people would be surprised to find out that they can weigh more than this chart suggests and still not be fat. In addition, they may weigh less than this chart suggests and still be fat.



The United States has a large population of overweight people.

Our weight according to a scale is not as important to our health as is our **body composition**. *Body weight* is the number of pounds we register when we step onto a scale. *Body composition* is the percentage of *body weight* that is fat compared to the percentage of *lean body tissue*. Lean body tissue is made up of our muscles, bones, and other tissues and organs. Fat is made up mostly of the flabby and untoned tissue we can pinch on our bodies.

Athletes and body builders often are overweight according to height-weight charts. However, they may have very low body fat. Some athletes have less than 10 percent or even five percent body fat. A fashion model, on the other hand, may be underweight according to a chart. But she may be storing too much body fat on her thin frame. She may have 30 percent or even 40 percent body fat.

Trying to weigh a certain number of pounds will not insure health or fitness. We should focus, instead, on the ratio of lean body tissue to fat on our bodies.

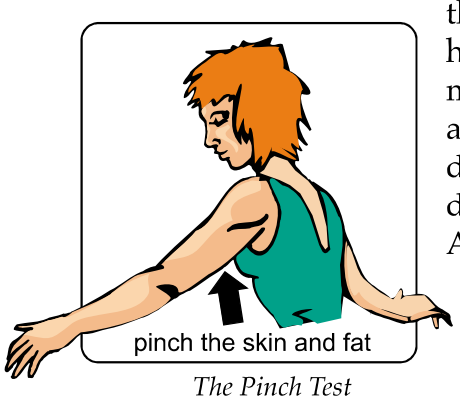
Acceptable Ranges for Percent Body Fat*

Age	Male	Female
13	10-25%	17-32%
14	10-25%	17-32%
15	10-25%	17-32%
16	10-25%	17-32%
17	10-25%	17-32%
17+	10-25%	17-32%

** calculated from triceps and skinfold measurements*

Your body fat can be measured by health-care professionals. Although they can only estimate your body fat, their measurements are close to exact. There are also some simple tests you can perform to see if you are carrying too much fat.

The Pinch Test. Pinch the skin and fat at the back of either arm with the thumb and forefinger of the other hand. (Or have a friend help you with this measurement.) As you remove your thumb and forefinger, be careful to maintain the distance between them. Then measure the distance between the thumb and forefinger. A measure of more than an inch means that you are **overfat**. That means you have more than the recommended percentage of body fat.



The Pinch Test

Overfat: A Health and Social Problem

When we are overfat, we stress our bodies. For every five pounds of extra weight you carry, your body needs four more miles of blood vessels. This makes the heart work too hard and can lead to heart disease. Extra fat can cause or make worse all of the following: high blood pressure, strokes, certain cancers, diabetes, breathing problems, and problems during pregnancy. It can also lead to a shortened life expectancy.

When we are overfat, we should reduce the fat in our diets and begin an exercise program to burn the fat on our bodies. A person who is extremely overfat is called *obese*. **Obesity** is considered a disease and kills 300,000 Americans each year. Six out of 10 American adults, or about 120 million people, are overweight or obese. For adolescents ages 12 to 19, the percentages are 30.4 overfat and 15.5 obese.

A person who suffers from obesity has an excessive amount of body fat and a *body mass index* (BMI) over 30 for his or her age, healthy weight, and height. The body mass index is a method used to estimate body fat by taking into account your age, sex, height, and weight.

Obese people often suffer from low self-esteem. They may find it difficult to make friends, to date, or to find proper-fitting clothes. They may even have trouble finding a job. Because their health is at risk, insurance companies may charge them higher premiums for insurance.

Underfat: Too Lean for Our Own Good

It is also possible that we may be **underfat**, or carry too little fat on our bodies. Fat is a necessary nutrient in our diets and a necessary part of our body composition. Too low a percentage of body fat on our bodies means we have a low store of energy. Should we be unable to eat, we would not survive for very long. Girls and women need a certain percentage of fat on their bodies to menstruate. People with too low a percentage of body fat should increase their fat intake.

Improving Body Composition: Dieting and Exercising

If you carry too much fat on your body, you should begin a common-sense program to lower your body fat and increase lean body mass. Any good program contains two components: dieting and exercising.

Many people who have lost weight have done so by reducing their food intake. Although it is true that eating less food will make you weigh less, you may end up losing lean tissue rather than fat

Burning Calories

Activity	Calories Burned per Hour at Approximate Weight		
	75 lbs	100 lbs	150 lbs
Aerobic class	300	336	360
Bicycling, 6 mph	135	160	240
Bicycling, 12 mph	225	270	410
Inline skating	162	216	324
Jogging, 5.5 mph	365	440	660
Jogging, 7 mph	510	610	920
Jumping rope	415	500	750
Running in place	360	430	650
Running, 10 mph	710	850	1280
Swimming, 25 yds/min	155	185	275
Swimming, 50 yds/min	270	325	500
Tennis (singles)	220	265	400
Walking slowly, 2 mph	125	160	240
Walking moderately, 3 mph	175	210	320
Walking briskly, 4.5 mph	245	295	440
Weightlifting	225	300	450

When you drastically reduce your calorie intake, your body begins to think it is starving. To protect itself, your body will begin to burn its own muscle tissue. Muscle is what you want to save and increase, not lose!

A far more effective plan combines moderate diet with exercise. Set a reasonable goal. To lose a pound of fat you must burn 3500 calories more than you eat. If you burn an extra 500 calories a day for a week, you will have lost a pound of fat.

Choose an exercise that burns 200 or 300 calories. Exercise at least three or four times a week. Jogging, walking briskly, or bicycling are all good activities for burning calories. When you exercise, 50 percent to 60 percent of the energy you burn comes from body fat.

On the days you work out, eat 200 or 300 fewer calories than you would to maintain your present weight. On the two or three days a week that you don't work out, reduce your food intake by 500 calories. At the end of a week, you can say good-bye to a pound of weight.

See the chart below to figure out approximately how many calories a day you can eat to maintain your weight. Multiply the number of pounds you weigh by the number for the level of physical activity you maintain. This will give you an estimated calorie intake per day.

Calculating Caloric Needs the Easy Way

For **sedentary people**:

Weight x 14 = estimated calorie per day

For **moderately active*** **people**:

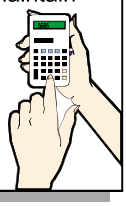
Weight x 17 = estimated calorie per day

For **active**** **people**:

Weight x 20 = estimated calorie per day

Example: Mary weighs 130 pounds. Her activity level is moderate. Mary needs 2210 calories to maintain her weight.

130 pounds
x 17
2210 total calories



Physical Activity		
Sedentary	**Moderate**	**Active**
Examples of Activity	**Examples of Activity**	**Examples of Activity**
reading sitting driving eating watching TV	walking playing piano bicycling (easy) cleaning your room	boxing rowing basketball running mountain climbing

* moderately active—3-4 aerobic sessions per week
** active—5-7 aerobic sessions per week

A simple diet and exercise plan such as the one described on the previous page has two benefits: (1) You will lose weight without making your life miserable; and (2) It's a plan you can continue for the rest of your life!

Many people who diet go for the quick fix. They starve themselves because they want to lose their excess weight *today*. Studies show that these dieters may lose weight, but they do not keep the weight off. They end up on yo-yo diets—they lose weight and then gain it back quickly. Researchers have discovered that people on yo-yo diets actually make it difficult for their bodies to lose weight. Their bodies begin to hold on to calories rather than try to survive on so few calories. And remember: these people lose very little fat—the weight they lose is mostly muscle.

If you become desperate to lose weight quickly, there are plenty of other diet plans that people will sell you. You can buy diuretics, or pills that make you lose water weight. You may show a loss of weight on the scale, but you will have lost precious water from your body, and you will regain the water in time. You can also buy diet pills to lessen your appetite. You will experience stress and some other harmful effects from these pills. When you stop taking these pills, you still will have to change the only thing that will help you lose weight and fat and stay healthy: your behavior! Only by changing your behavior—eating less fat and exercising more—can you accomplish your weight and body composition goals.

Controlling Weight: Tips on Making the Right Food Choices

If we are trying to reduce our fat and calorie intake, or even if we just want to maintain our present body composition and weight, we can develop some helpful habits.

- Avoid situations that trigger your need to overeat or to eat fatty foods.

- Do not completely eliminate foods you love, such as chocolate or cheesecake. Depriving yourself leads to diet failure and over-indulging. Instead, reduce the amount of your favorite fatty foods. Rather than eating them three times a week, eat them only twice in smaller portions.

- Reduce the size of your portions. Learn to enjoy every bite rather than gulping it down. Chew your favorite foods *slowly*—as if they were a rare treat.

- Eat plenty of carbohydrates and fiber, and drink lots of water. Don't ignore your nutritional needs by eating empty-calorie foods, or foods with few or no calories.

- Make changes in your diet gradually. Don't decide that you are going to remake your diet overnight. Gradual changes are the ones you will stick with.

- Choose whole grains, vegetables, and fruits rather than red meats and other fatty foods. The more fiber-rich foods you eat, the more satisfied you will feel. Learn to order foods without the fats that often accompany them. Eat potatoes plain or with just a touch of butter rather than smothered in gravy, butter, cheese, and sour cream.

- Avoid fried foods. Instead, eat foods that have been grilled, roasted, broiled, baked, or microwaved.

- Reduce or eliminate your red meat intake. Instead, eat tuna, chicken (but not fried chicken), turkey, and fish. Trim the fat from meat and pull the skin off poultry. Choose low-fat or nonfat milk, yogurt, and cheese.

- Eat meals regularly. If you can, eat four or five smaller meals throughout the day. Eating smaller meals more often will keep your energy level high. When you skip meals, hunger will eventually drive you to *binge*, or eat too many calories all at once.

Understanding Food Labels: What's Inside This Package Anyway?

The United States government has passed laws to help consumers understand the contents of packaged foods. Labels on packaged or canned foods must clearly identify the product.

The back of most packages shows a list of ingredients. It lists ingredients in order of *decreasing* amounts. There is a greater amount of the *first* listed ingredient than of any other ingredient listed, and so on. So, for example, if sugar appears near the top of the list of ingredients, that particular food is probably high in sugar.

INGREDIENTS: SUGAR, CORN SYRUP SOLIDS, PARTIALLY HYDROGENATED VEGETABLE OIL, COCONUT, CANOLA, DAIRY PRODUCT SOLIDS, COCOA PROCESSED WITH ALKALI, NONFAT MILK, CELLULOSE GUM, SALT, SODIUM CASEINATE, DIPOTASSIUM PHOSPHATE, SODIUM SILICOALUMINATE, MONO-AND DIGLYCERIDES, GUAR GUM, ARTIFICIAL VANILLA FLAVOR.

Sugar appears first on the list of ingredients.

Recently, special *diet foods* have flooded food stores. The government has restricted the use of certain terms on packaging. A food labeled *low calorie* cannot contain more than 0.4 calories per gram. A food labeled *reduced-calorie* must have at least one-third fewer calories than similar foods. Any food that is *artificially sweetened* must list those artificial sweeteners on the label.

The label must include any *additives* or *preservatives* in the food. An additive is a chemical that has been added to the food. These chemicals are used to improve taste, add color, or replace or add vitamins. Preservatives are used to keep food from spoiling.

A *fortified* food has had vitamins added to it. An *enriched* food has had vitamins added to it to replace those lost in processing.

Many labels also include the following nutritional information:

Serving Size:	the amount the manufacturer considers to be a normal portion; portions are often listed in ounces
Servings per Can:	the number of serving sizes, or portions, in the package or can

Calories: the number of calories found in one serving size, or portion

Protein: the amount of protein in one serving size, or portion; this amount is usually listed in grams

Carbohydrate: the amount of carbohydrates in one serving size, or portion; this amount is usually listed in grams

Fat: the amount of fat in one serving size, or portion; this amount is usually listed in grams

Cholesterol: the amount of cholesterol in one serving size, or portion; this amount is usually listed in grams

Sodium: the amount of sodium, or salt, in one serving size, or portion; this amount is usually listed in grams

Dietary Fiber: the amount of fiber in one serving size, or portion; this amount is usually listed in grams.

Labels often include the *percentage of United States Recommended Daily Allowance (USRDA)*. For example, if the label states *Thiamine … 12%*, then one serving of the food will provide 12 percent of the thiamine recommended for your daily diet by the government.

Food Fallacies: Separating Mistaken Ideas from the Truth

It is both interesting and surprising to see just how many **fallacies**, or mistaken ideas, many of us have about food and weight control. In spite of how important food is to our health, we still may not be sure what to believe. Here are several of the most commonly believed *fallacies*, followed by the *facts*.

Fallacy: I can just go on a *fad diet* to lose weight.

Fact: Fad diets are diets that promise fast weight loss. They may help you to lose weight temporarily, but the weight is usually gained back. Only a lifetime commitment to eating low-fat healthy foods and getting regular exercise can make you healthy and fit.

Fallacy: Certain foods, diet pills, or *diuretics* can help burn fat calories and help me lose weight.

Fact: No foods burn fat. Diuretics are drugs that increase the amount of fluid lost through urine. Diet pills or diuretics may help you to lose water weight. However, pounds lost from water weight are not body fat and will return quickly.

Fallacy: *Sugary foods* are a good source of quick energy.

Fact: Sugary foods may give you an immediate energy boost, but it is short-lived. The rise in blood sugar is followed by feelings of hunger, irritability, and sleepiness.

Fallacy: Adding more *protein* to my diet will help build muscle.

Fact: A balanced diet supplies plenty of protein for muscle growth. An excessive amount of protein is stressful to the kidneys. Like excess fat or carbohydrates in the diet, too much protein will be stored as fat.

Fallacy: *Fasting*, or skipping meals, will help me to lose weight.

Fact: Abstaining from food, or fasting, will not help you to lose fat weight. When you skip meals, your body is forced into a starvation mode. It will use up important calorie-burning muscle tissue to survive. Your body will slow down and begin to store fat even more efficiently than before.

Fallacy: *Vitamins* will give me more energy.

Fact: Vitamins do not supply energy. They only help the body to use energy. Energy is supplied by food in the form of calories. Vitamin supplements may be helpful for individuals with special needs. However, for an average, healthy person, a well-balanced diet supplies enough vitamins.

Fallacy: Overfat people eat more than lean ones.

Fact: Not necessarily. Overfat people often eat less than lean individuals. Their bodies, however, have adjusted to a low-calorie intake. When they do overeat, they easily gain weight.

Fallacy: *Muscle cramps* indicate a lack of salt intake.

Fact: Muscle cramping is most often a result of severe water loss from sweating or over-exercising. Salt tablets can worsen this condition by drawing more water out of the muscles and into the stomach.

Fallacy: You only burn a lot of calories during *exercise*.

Fact: Exercise helps make your body a better fat-burning machine. Regular exercise helps you to burn a high rate of calories at all times of the day, not just during exercise.

Fallacy: *Exercise* increases your appetite.

Fact: Exercise actually lessens your appetite temporarily. Exercise helps regulate your calorie intake.

Fallacy: Breads, rice, pasta, and other *carbohydrates* are fattening.

Fact: Whole-grain carbohydrates such as bread, pasta, rice, and cereal have less than half the calories of fat. They are the best source of energy, especially during physical activity. These foods become fattening when we add fat to them.

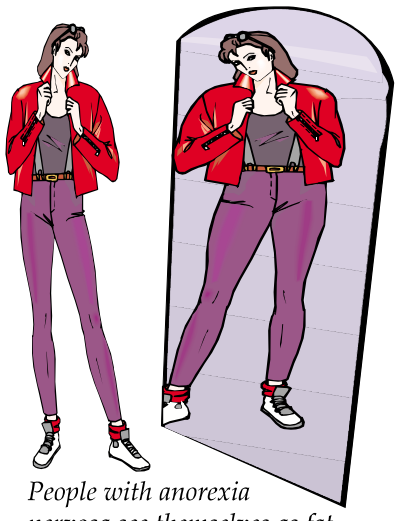
Eating Disorders: When Food Becomes an Enemy

Most Americans do not have a perfect relationship with food. On the one hand, we really enjoy food. We look forward to eating a tasty meal with good company. On the other hand, we know that sometimes we eat too much or we eat the wrong foods. Although it is an imperfect relationship, it isn't a distracting or dangerous problem in our everyday lives.

Unfortunately, more than a million Americans suffer from eating disorders. Their relationship with food is an everyday problem that is a danger to their health.

One type of eating disorder is **anorexia nervosa**. This disorder is also called *starvation sickness*. Its victims are usually teenage girls. They refuse to eat or eat too few calories and nutrients to maintain their health. They continue to lose weight because no matter how thin they are, they still see themselves as fat.

Some victims of anorexia nervosa have died from starvation. Many others suffer from constant health problems. The human body cannot achieve or maintain health on too few calories.

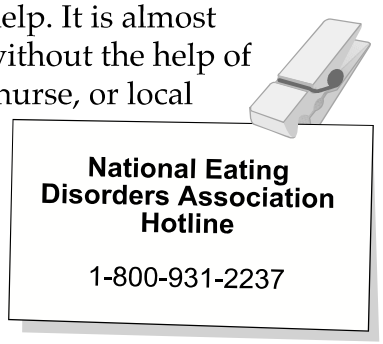


People with anorexia nervosa see themselves as fat.

Bulimia is another eating disorder that many people, especially teenage girls, suffer from. Victims of bulimia constantly think about food. They go on *eating binges*—sometimes every day or two. During an eating binge, they will eat thousands and thousands of calories very quickly, and usually in secret. The foods they eat are usually sweets—cookies, cakes, ice cream. After a binge, they force themselves to vomit or use laxatives to get rid of the food before it is digested. Sometimes they starve themselves following a binge.

Bulimia can cause serious health problems. Victims can suffer from kidney damage, abnormal heartbeat, and an imbalance in body fluids. They also irritate their throats from vomiting and may develop an infection of the throat and surrounding area. Severe tooth decay is also a result of repeated vomiting.

People who suffer from eating disorders need help. It is almost impossible to recover from an eating disorder without the help of a professional. Victims should see their doctor, nurse, or local health clinic. For more information on eating disorders, call the National Eating Disorders Association hotline at 1-800-931-2237.



Summary

Many Americans do not choose healthy *diets*. The food we eat often contains empty *calories* or too many calories. We should choose a diet that contains the right combination of *nutrients* to help the body grow, repair itself, and fuel itself.

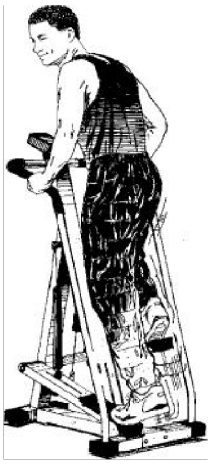
Food contains six different groups of nutrients: *carbohydrates*, *proteins*, *fats*, *vitamins*, *minerals*, and *water*. Carbohydrates are the body's main source of energy in a healthy diet. Proteins are used by the body to build and repair muscle, blood, hair, skin, nails, and internal organs. Protein is especially important during growth periods such as adolescence. Although fat is often thought of as a bad or unhealthy nutrient, it is an important and necessary part of a healthy diet. Fat is a major source of fuel for energy and necessary for the health of every cell in the body. However, too much fat can cause the body to be *overfat*, or carry too much fat.

Vitamins and minerals do not supply the body with energy. These "helper nutrients" help the body carry out many of its necessary functions. Water is not a "food," but it is an essential nutrient. Water is necessary for all body processes.

To help us select a healthy diet, the United States Department of Agriculture (USDA) has developed the Food Guide Pyramid. The Food Guide Pyramid is a chart that shows how much of the different types of foods we should eat for a *balanced diet*.

Most of us think of calories as something in foods that make us fat. Another way of thinking about calories is to see them as units of heat that measure the energy available in foods. A calorie supplies the body with a certain amount of energy.

Too many Americans are overweight. However, more important than weight is our *body composition*. Our "body weight" is the number of pounds we weigh on a scale. Our "body composition" is the percentage of *body weight* compared to the percentage of *lean body tissue*. Many athletes and other people with healthy bodies weigh more than a height/weight chart in a doctor's office would recommend. But they have a low percentage of body fat. Some people are *underfat* and carry too little fat on their bodies. Not being overfat or underfat is more important to our health than how much we weigh.



To change our body composition and reduce our body fat, we should combine a reduced-calorie diet and exercise. We should not starve ourselves or go on a diet that gets rid of pounds very quickly. These diets are not healthy and will not help us maintain the right weight and body composition. Instead, develop a diet and exercise program you can continue for the rest of your life.

Food labels list the ingredients in packaged foods. Food labels also tell us how a food was prepared. The list shows the ingredients in order of *decreasing* amounts.

Some people suffer from eating disorders. *Anorexia nervosa* is an eating disorder in which victims starve themselves. They believe they are overweight—no matter how thin they become. *Bulimia* is an eating disorder in which victims eat many calories at a time, or "binge," and then rid their body of the food before it is digested. Both of these eating disorders cause physical and psychological harm. Victims need professional help to overcome these diseases.