

Cholesterol

Cholesterol is a natural chemical the liver makes to build cell membranes and brain and nerve tissues and to aid in hormone production. The liver makes all the cholesterol the body needs, but the typical diet also contains cholesterol. Too much cholesterol in the bloodstream increases the risk of heart disease. Cholesterol levels can rise as a result of eating too many high-cholesterol foods or eating a diet high in fat that stimulates the body to produce cholesterol. Dietary sources of cholesterol include egg yolks, meat (especially organ meats), some shellfish, and whole-milk dairy products. Plant foods do not contain cholesterol.

In order to travel through the bloodstream, cholesterol must attach itself to certain proteins. This combination of cholesterol and protein forms a lipoprotein. Low-density lipoproteins (LDL) and high-density lipoproteins (HDL) are the two most important lipoproteins. High levels of LDL cholesterol in the blood increase the risk of fatty deposits in the arteries, which in turn increases the risk of heart attack or stroke. For this reason, LDL cholesterol is often referred to as "bad" cholesterol. Elevated HDL cholesterol levels, on the other hand, seem to have a protective effect against heart disease. As a result, HDL cholesterol is often called "good" cholesterol.

Experts recommend that you eat less than 300mg of cholesterol per day. It is also recommended that you keep your total blood cholesterol level below 200 and your HDL cholesterol level at 40 or higher.

Display Tip

Instructors find that their test tube presentations benefit from placing a dark piece of paper behind the test tubes for better viewing.

Minitext

Fat Facts: Snack Foods

Reading food labels helps us to make informed choices and to limit certain foods. Although selecting healthy snack foods can be challenging, it is possible. One of the keys to eating smart is understanding the relationship among calories, fat, and cholesterol. The chart below provides the information needed to make the best choice for you.

FOOD	CALORIES	FAT (grams)	CHOLESTEROL (mg)
Oatmeal Raisin Cookie	200	8	15
Peanut Butter Cups (2)	230	13	0
Fudge Brownie	270	13	15
Apple (medium)	80	0.5	0
Fruit Roll-Up	50	1	0
Pudding Cup	150	5	0
Buttered Popcorn (2 cups popped)	150	8	0
String Cheese (1 stick)	80	6	20
Trail Mix (1/2 cup)	350	22	0
Ice Cream Sandwich	160	6	10

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Snack Food Basics

Almost everyone snacks. Some snack foods can be unhealthy because they provide little nutritional value and lots of calories, fat, or cholesterol. However, snacks can be good for us if we make healthy choices. They can be a source of important nutrients and energy, and they can help prevent overeating on less nutritious foods. Limiting snacks with excess calories, fat, and cholesterol is a large part of making healthy snack food choices.

Making Healthy Snack Food Choices

1. Don't use snacks as an excuse to choose foods high in fat and sugar. Instead, see them as an opportunity to get vitamins and minerals that you might have missed during your meals.
2. Choose snacks that have complex carbohydrates and fiber. They provide immediate and long-lasting energy.
3. Think about alternatives. For example, popcorn can be a healthy snack, but when it is buttered and popped in oil, it contains more fat and calories. On the other hand, unbuttered popcorn and air-popped popcorn can offer a great taste with fewer calories and much less fat.
4. Be creative, and select snacks from a variety of foods. Add peanut butter to celery, low-fat dip to fresh vegetables, or ricotta cheese and fresh fruit to rice cakes.

Choose:

- fresh fruits and vegetables
- low-fat cheese
- dry whole-grain cereal
- fat-free pudding
- pretzels
- baked chips
- low-fat yogurt

Limit:

- candy
- cookies
- snack cakes
- doughnuts
- fried chips
- sweetened fruit juices

Fat Facts

What Is Fat?

Fat is an essential nutrient for the human body. All people need some fat in their bodies as well as in their diets.

- Fat supplies energy and essential fatty acids and is important for growth and development.
- A layer of fat beneath the skin helps to insulate the body from cold.
- Fat surrounds the different organs in the body to protect them from injury.
- Fat carries the fat-soluble vitamins A, D, E, and K and promotes their absorption in the intestines.
- Fat gives taste and consistency to foods and helps us to feel full so that we stop eating.

However, our bodies need only a small amount of fat each day, and most people get far more fat in their diets than they need. Too much fat can have negative effects on your health. Fat is high in calories—it provides 9 calories per gram, compared with 4 calories per gram for carbohydrates or protein. As a result, a diet high in fat can contribute to excessive body weight. In addition, high levels of dietary fat are linked to an increased risk of heart disease and certain types of cancer.

Types of Fatty Acids

There are three main types of fatty acids: **saturated**, **monounsaturated**, and **polyunsaturated**. The number of hydrogen atoms on the fat molecule determines what kind of fat it is. This distinction is important because the different types of fat affect our health differently. Saturated fatty acids are primarily found in foods of animal origin (including meat, butter, cheese, and milk) as well as in some tropical oils such as coconut oil and palm oil. Monounsaturated and polyunsaturated fatty acids are found mainly in foods of plant origin and some seafoods. Olive and canola oils are good sources of monounsaturated fat; most other kinds of vegetable oils, nuts, seeds, and fish are rich in polyunsaturated fat.

Many food manufacturers use a process known as hydrogenation to extend the shelf life of products made with polyunsaturated fat. This process can also make foods crispier, smoother, or softer. Hydrogenation changes the chemical structure of polyunsaturated fat. The result is called **trans fat**. Trans fatty acids are found in many processed foods, most notably french fries, doughnuts, vegetable shortening, stick margarine, chips, popcorn, cookies, and crackers. A product contains trans fat if the words "partially hydrogenated" or "vegetable shortening" appear in the list of ingredients on its label. Products that list these ingredients as one of the first few on the label are likely to be high in trans fat.

A diet high in saturated fat or trans fat increases the risk of heart disease because these fats contribute to high blood cholesterol and obesity. Both kinds of unsaturated fats—monounsaturated and polyunsaturated—reduce blood cholesterol when they take the place of saturated fat in the diet. **Omega-3** and **omega-6** fatty acids (two types of polyunsaturated fatty acids) may have additional benefits. Omega-3 fatty acids are found in fish such as salmon and mackerel as well as in soybean and canola oil; omega-6 fatty acids, such as linoleic acid, are found in corn, soybean, and safflower oil. Both omega-3 and omega-6 fatty acids have been shown to lower cholesterol levels in the blood.

Experts recommend that your total fat consumption be less than 30% of the calories you eat, with saturated fat accounting for no more than 10% of your total daily intake of calories.