

From Apples to Energy

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Calories

Keep a Body Going

Food is a source of energy, and the energy in food is measured in calories. When people talk about calories, they're really talking about the potential energy the body can take from food. Different foods have different amounts of calories. This means that they have different amounts of potential energy for humans.



Energy to Live and Grow

For scientists, the term *calories* doesn't only apply to food. Calories are a measurement of heat energy. Anything that contains potential heat energy contains calories. Peanuts contain calories. So does a gallon of gas. According to the *New Oxford American Dictionary*, a calorie is the energy needed to raise the temperature of one gram of water by one degree Celsius.

French chemist Nicolas Clément is thought to have come up with the concept of the calorie around 1819. The word calorie comes from the Latin word for heat, *calor*.

For most nonscientists, though, the word *calories* refers to food energy. Calories give people what they need to stay alive. Bodies use the energy in food much the same way a car uses gas. Filling up with high quality food at regular intervals ensures that bodies continue to run. Stop fueling bodies with calories and they will “run out of gas.” Starvation can set in.

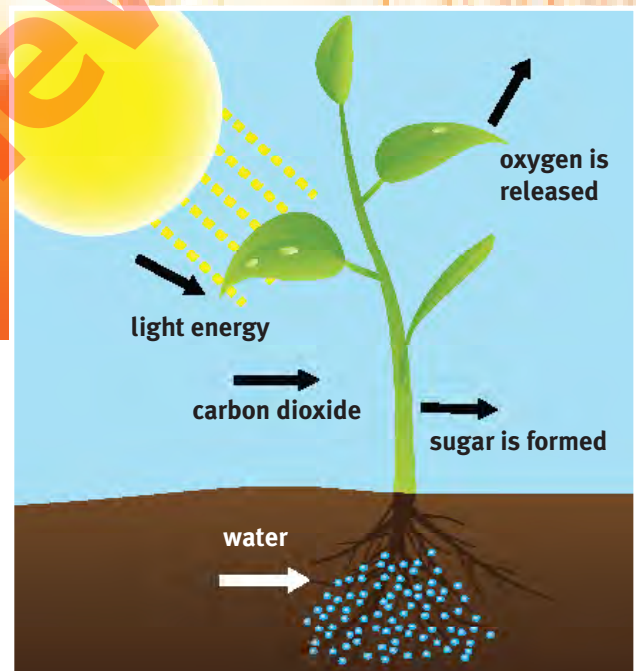
Peanuts and gasoline both contain calories, or potential heat energy. ▼





It Starts with the Sun

Most of the energy contained in food began as sunlight, or solar energy. Plants grow by absorbing solar energy. They use that energy to turn carbon dioxide and water into sugar, or potential energy. This process is called photosynthesis. Sugar produced by photosynthesis fuels the growth of all the plants, fruits, vegetables, and grains that animals and humans consume.



PHOTOSYNTHESIS

This diagram shows how plants use energy from the sun to make sugar. Oxygen is also produced during the photosynthesis process. This is a major reason why plants are so important to humans and the environment.

The food energy in a steak can be traced back to the grass eaten by the cow the steak came from. The energy stored in that grass was created using sunlight, through photosynthesis.

In the same way, the energy in gas comes from solar energy through photosynthesis. Gas is made from oil, and oil formed from the remains of plants and animals that died millions of years ago. Those dead plants used photosynthesis to convert sunlight to potential energy. That potential energy is still contained in the oil.



The energy
in all of
these things
begins with
sunlight.



Starvation

A severe or complete lack of calories is called starvation. Calories provide the body with the energy it needs to run. If no calories or too few calories are consumed, the body will stop working properly. Without a basic amount of calories every day, growth stops. Muscles become weak and inefficient. Eventually the heart stops beating, the lungs cease breathing, and the brain quits thinking.

Starvation and its effects vary from person to person depending on circumstances. Starvation isn't sudden. It happens over a long period of time in which someone eats little to no food. Unfortunately, across the globe, many people are at risk of starvation. They simply do not get enough to eat.

Calorie Needs

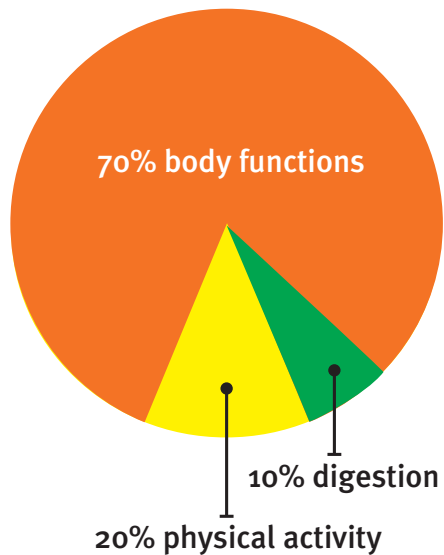
The number of calories people need every day depends on their age, gender, and level of daily activity. There are three main uses of calories in the body. The first and largest use is simple existence. About 70 percent of a person's calories are used for basic life functions, such as breathing, blood circulation, and cell growth.

The second use is digestion. Digestion is the process by which people actually get the energy they need from food. However, the digestion process itself requires calories to run. Digestion accounts for about 10 percent of the calories a body burns.



Fighting the Force

Physicists define energy as the ability to do work. To a physicist, work is resisting—or moving something against—a force. Here on Earth, humans are constantly “working” because they are resisting the force of gravity. When a girl stands up straight, she is using energy to do the work of resisting the force of gravity.








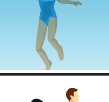


The third use, physical activity, accounts for about 20 percent of calories burned. The National Institutes of Health divides daily physical activity levels into three general categories: inactive, active, and very active.

An inactive person expends **only** the energy required for daily life. An active person uses around the amount of energy required to walk quickly for about 2 to 5 kilometers (1 to 3 miles) per day. A very active person expends the amount of energy that would be needed to play soccer for a half an hour, or to walk quickly for about 5 kilometers (3 miles) or more daily.

The less active people are, the less fuel, or calories, they will use. Consuming more calories than the body needs leads to weight gain. Consuming fewer calories than the body needs leads to weight loss.

How Many Calories?

Healthy eating and fitness are the keys to healthy bodies. Here's a chart of the estimated average number of calories burned during a variety of activities.

Activity		Calories burned per hour
	playing soccer	400
	playing computer games	60
	reading	60
	riding a bike	450
	sleeping	40
	swimming	360
	walking	240
	watching TV	50