

How the body uses carbohydrates, proteins and fats

To eat healthier, it helps to understand how your body processes the foods you eat.

The human body is good at making do with whatever type of food is available. Our species has survived and evolved even when food was scarce and unpredictable. Imagine if you had to depend on hunting a woolly mammoth or stumbling upon a berry bush for sustenance!

Today, calories are cheap and plentiful—perhaps too much so. We can make better eating choices when we understand what the three basic macronutrients do.

From the moment a bite of food enters your mouth, the nutrition within it starts to be broken down for use by your body. This process, called metabolism, transforms food into nutrients the body needs to function.

The body uses proteins, carbohydrates and fats in different ways. If all three nutrients are abundant in the diet, carbohydrates and fats are used mainly for energy while proteins help make hormones, muscle and other proteins.

Proteins

Proteins in food are broken down into pieces called amino acids. The body uses them to build new proteins with specific functions, such as starting chemical reactions, helping cells communicate or transporting things within the body. When there is a shortage of fats or carbohydrates in the diet, proteins can also be used for energy.

Fats

Fats typically provide more than half of the body's energy needs. Fats from food get broken down into fatty acids, which travel in the blood to energy-hungry cells. Fatty acids that aren't needed right away are packaged in bundles called triglycerides and stored in fat cells, which have unlimited capacity.

Carbohydrates

Carbohydrates, on the other hand, can only be stored in limited quantities, so the body is quick to use them for energy.

The carbohydrates in food get broken down into glucose or a sugar that is easily converted to glucose. Glucose enters the circulatory system, causing blood sugar (blood glucose) levels to rise. This signals the pancreas to release insulin, which helps

cells absorb the glucose for energy. The body's cells use glucose more readily than fat during a meal, which is why your blood sugar level rises after eating.

Once the cells have enough glucose, the liver stores some of the excess for use between meals in case blood sugar levels fall below a certain point. If there is leftover glucose beyond what the liver can hold, it can be turned into fat for long-term storage so none is wasted. When carbohydrates are scarce, the body runs mainly on fats. If it needs more energy than what it gets from fats in the diet, the body must use some of its fat tissue for energy.

While fats are a welcome source of energy for most of the body, some cells, such as brain cells, have special needs. They can't run on fatty acids directly, so under low-carbohydrate conditions, these finicky cells need the body to make fat-like molecules called ketone bodies. This is why a very-low-carbohydrate diet is sometimes called "ketogenic." (Ketone bodies are also related to a dangerous complication of diabetes called ketoacidosis, which can occur if insulin levels are too low.)

Ketone bodies alone could provide enough energy for the parts of the body that can't use fatty acids, but some tissues still need at least some glucose, which isn't normally made from fat. Instead, glucose can be made in the liver and kidneys using protein from elsewhere in the body. But if enough protein is not provided by the diet, the body starts breaking down muscle cells.

The bottom line

- Proteins get broken down into amino acids, which are the building blocks of the body.
- Fats get broken down into fatty acids for energy. Extra is stored in fat cells.
- Carbs get broken down into glucose for energy. Extra is stored in the liver.
- You need all three nutrients in a healthy diet, because the body cannot produce them on its own.

Learn more about [carbs and how they affect your blood sugar](#).