

Nutrition (Carbohydrates)

What are carbohydrates?

When most people hear the word “carbohydrates”, they think about foods that are starchy (bread, pasta, and rice) or are sugary (sweets, biscuits, and cake). When scientists talk about carbohydrates, they talk about specific types of molecules.

Carbohydrates are one of four major organic molecules; the other three are proteins, lipids (fats), and nucleic acids.

Carbohydrates are made up of carbon, hydrogen, and oxygen.

What are the functions of carbohydrates?

- Energy production
- Energy storage
- Building macromolecules
- Sparing protein
- Assisting in lipid metabolism

Carbohydrates are sometimes referred to as **saccharides**. The different types of carbohydrates all have the word "saccharide" in them.

- **Monosaccharides** are the simplest form of carbohydrates. They include sugars such as glucose and fructose. Monosaccharides often taste sweet and dissolve in water. Glucose is a common carbohydrate found in plants and is the main product of photosynthesis.
- **Disaccharides** are formed from two Monosaccharides. They are also known as sugars such as sucrose and lactose. Lactose is the carbohydrate found in milk.
- **Oligosaccharides** are formed from a small number (usually three to six) of monosaccharides.
- **Polysaccharides** are long carbohydrate molecules. They are often called complex carbohydrates.

Scientists classify carbohydrates as either simple or complex, depending on how many sugar molecules they contain.

Simple carbohydrates have one or two sugar molecules and include glucose, fructose, sucrose, and lactose. Simple carbohydrates naturally occur in:

- fruits
- fruit juices
- milk
- milk products

Complex carbohydrates contain longer, more complex chains of sugars. They include oligosaccharides and polysaccharides. Complex carbohydrates also contain fibre and starch. Examples of complex carbohydrates include:

- whole grains, including some types of bread, cereal, pasta, and rice
- peas and beans
- vegetables and fruits

Refined carbohydrates are foods that have gone through processing that removes some of their ingredients, such as fiber and minerals. These carbohydrates include sweeteners and high fructose corn syrup, which manufacturers often add to processed foods. Examples of refined carbohydrates include:

- white bread, pasta, and rice
- processed breakfast cereals
- cakes, sweets, and baked goods
- sweeteners and high fructose corn syrup

How does the body process carbohydrates?

The body breaks down carbohydrates into glucose to use them as:

- a steady source of energy for bodily functions
- a quick and instant source of energy when exercising
- a reserve of energy that the body stores in the muscles or liver and releases when necessary

If the body does not need to store any more energy, it converts glucose to fat, which can lead to weight gain.

Glucose can be damaging and therefore cannot stay in the bloodstream. The pancreas releases insulin after eating to help transport the glucose to cells around the body. Insulin regulates a person's blood sugar levels and stops them from getting too high. A diet with a lot of sugary food could lead to health issues such as obesity and diabetes as the body becomes very reliant on the pancreas to produce more and more insulin.

How do I consume carbohydrates healthily?

Everyone processes food differently, and depending on how active a person is, they may metabolise carbohydrates more quickly than others.

Simple and refined carbohydrates, such as sugary snacks and beverages, give the body a quick burst of energy but do not keep a person full.

Complex carbohydrates, such as brown rice, whole grain bread, and vegetables, release energy more slowly and also keep a person fuller for longer.