Carbohydrate Fact Sheet

Carbohydrates are one of three macronutrients found in food. While the word has come to be used as an umbrella term meaning foods that are rich in carbohydrates, the literal definition of the word refers to the carbohydrate molecule itself. A potato, for example, is not a carbohydrate; a potato is a food that contains carbohydrates.

How Do They Work In the Body?

Carbohydrates are metabolized (chemically broken down) and used as the body's main energy source, and they can be used by all body tissues. For example, the digestive system converts carbohydrates into simple sugars like glucose (blood sugar) that are used to power the brain. While using carbohydrates for energy, the body can use other macronutrients for other jobs, such as protein for tissue growth and repair. Other important points about carbohydrates include:

- Brain, kidney, muscle, and heart functions depend primarily on certain types of carbohydrates.
- Carbohydrates help synthesize nonessential amino acids.
- The energy produced by carbohydrates is 4 calories per gram (in comparison, protein is the same at 4 calories per gram, and fat is 9 calories per gram).
- Indigestible carbohydrates, in the form of fiber, are necessary for gut health and a variety of health-promoting functions in the body.

Common Food Sources

Common whole food sources for carbohydrates are fruits, vegetables, nuts, whole grains, milk, seeds, and legumes. You may have heard processed or refined foods referred to as "refined carbohydrates," although it is the food that undergoes the refining or processing; the carbohydrate molecules themselves are not refined. Refined foods have been processed to remove the fiber, reducing nutritional value and concentrating calories. These refined foods are often combined with additional fats, thus changing them substantially from anything found in nature. Compare, for example, kernels of whole wheat grain with a donut.

Types of Carbohydrates

The three main types of carbohydrates are sugar, starch, and fiber. They're designated as simple or complex, depending on their chemical structure. Explore the table below to learn more.

Carbohydrate	Structure	How Do They Affect the Body?	Occurrence
Simple *(Sugars)* • **Monosaccharides** (glucose, fructose, and galactose) • **Disaccharides** (sucrose, lactose, and maltose)	Simple carbohydrates are composed of one (monosaccharide) or two (disaccharide) sugar molecules.	• When supplied by whole foods that contain many other nutrients, they provide a natural source of quick energy. • When supplied by processed foods, they cause a rapid rise in blood sugar.	They occur naturally in whole fruits and vegetables, combined with fiber and other nutrients. They are concentrated in processed foods such as table sugar, fruit juice, and corn syrup, since the fiber, water, and other nutrients have been removed.
Complex *(Starch and fiber)* • **Polysaccharides** (includes pectin, cellulose, hemicellulose, beta-glucan, and natural gums)	Complex carbohydrates (polysaccharides) are composed of three or more sugar molecules.	• Complex carbohydrates are bigger and are therefore broken down more slowly than simple carbohydrates. • Plant starches occur naturally with a complement of other important nutrients. • They provide longer-lasting energy and, along with the indigestible dietary fiber, contribute to satiety (feelings of fullness after eating). • Fiber is also integral to the smooth working of the intestinal tract and the elimination of toxins and cholesterol.	Rich sources are: • Vegetables • Legumes • Whole (unprocessed, unrefined) grains • Whole fruits