

Complex vs. Simple vs. Refined Carbohydrates: What's the Difference?

Learn which carbs to skip and add to your diet with this guide.



By K. Aleisha Fetters, Contributor Feb. 1, 2019, at 10:36 a.m.

WHETHER YOU'RE TRYING to lose weight, manage your blood sugar levels or reduce your risk of cardiovascular disease, you've probably heard the adage that focusing on whole or complex carbs and cutting down on refined ones can help you achieve your goals.

"Carbohydrates often get a bad rap, but each type affects the body differently and many types and sources are beneficial to health," explains Holly Herrington, a registered dietitian and certified diabetes educator at Northwestern Memorial Hospital in Chicago. Knowing the differences between each type of carbohydrate is vital to making smarter, healthier decisions with your nutrition.



[Fruits and vegetables are examples of healthy whole carbohydrates that contain beneficial vitamins and minerals.]

What's a Carbohydrate, Anyway?

Carbohydrates are one of three macronutrients – along with protein and fat – that the body needs in large supply for optimum health, Herrington says. Carbohydrates refer to the sugars, starches and fibers that are found in grains, fruits, vegetables and dairy, as well as soda, candy and other sweets.

Carbohydrates contain 4 calories per gram, with digestion converting carbs into blood glucose, which the body can use for fast-acting energy, Herrington explains. Excess carbohydrates delivered to the liver and muscles can be stored as glycogen, fueling the body when blood glucose levels run low or during exercise.

When teasing out the different types of carbohydrates, it's important to familiarize yourself with whole versus refined and complex versus simple carbohydrates. Read on to learn about the nutritional pros and cons of the different types and sources of carbohydrates and develop a healthy dieting approach for your goals.

Whole Carbohydrates

Whole carbohydrates are carb-containing foods that exist in a relatively natural state. These include both whole foods such as fresh fruits, vegetables, beans and barley, as well as foods that have been minimally processed for freshness or safety, such as frozen or canned vegetables, yogurt, milk and whole-grain bread and pasta.

Whole grains, specifically, are grains that contain all of their original parts: bran, germ and endosperm. "The bran is the outer skin of the kernel. It contains antioxidants, B vitamins and fiber," says Tara Gidus Collingwood, an Orlando-based registered dietitian. "The germ is the embryo, which contains B vitamins, some protein, minerals and healthy fats. The endosperm is the germ's food supply, which provides the essential energy so that the plant can grow, and it contains starchy carbohydrates, protein and small amounts of vitamins and minerals." Since all three parts of the grain remain intact in whole grains, including whole-grain bread and pasta, whole grains are nutrient-dense and associated with improved health. Look for "whole grain" on the ingredients label for the healthiest carb option.

Highly Processed and Refined Carbohydrates

While most foods are processed in some way, highly processed carbohydrates refer to food sources that have undergone extensive manipulation and do not contain many of their original nutrients.

"Refined grains refer to a grain that is missing one or more of its three key parts," Gidus Collingwood says. "Typically, it is milled, which removes the bran and germ. This means that many B vitamins, fiber, protein, minerals and healthy fats are removed, and the starchy endosperm is left. The removal of the bran and germ gives the refined grains a fine texture and improves the shelf life." Stripped of fiber, protein and fat, refined grains are rapidly digested so that glucose enters the bloodstream more rapidly. This can contribute to blood sugar and insulin spikes. Meanwhile, a lack of other vitamins and minerals means that the foods don't provide much nutritional benefit, she says. For this reason, some refined grains have vitamins and minerals added back in during food manufacturing process.

Refined grains include white flour, white rice and white bread; other highly processed carbohydrate sources include soda and candy.

Complex Carbohydrates

Often equated with starchy foods, the term "complex carbohydrates" refers to the molecular structure of a carbohydrate that is both long and complex. Complex

carbohydrates contain three or more (and up to the thousands of) sugar molecules, and are called polysaccharides.

Because of their complex structure and long molecular chains, complex carbohydrates take a fair amount of work for your body to break down. "These types of carbs keep you fuller longer and release a slower rate of glucose into your bloodstream," Herrington says. "Complex carbs are found in foods like grains, oats, legumes and sweet potatoes," she adds. Sources of complex carbs are typically rich in vitamins, minerals and fiber.

Fiber is a unique type of complex carbohydrate that the body does not break down into sugars for energy as it does with other kinds of carbs. Rather, fiber passes through your digestive system intact, improving digestion and heart health and encouraging healthy weight loss.

However, it's important to realize that complex carbohydrates include all starches, regardless of whether they are whole or refined – or their fiber content.

"Opting for the whole-grain option over a refined grain, although they are both complex, would have more health benefits," Gidus Collingwood says.

Simple Carbohydrates

Simple carbohydrates are carbohydrate molecules that contain only one or two sugar molecules. Monosaccharides contain one sugar molecule as well as fructose (found in fruit as well as added sweeteners) and galactose (found in dairy). Disaccharides contain two sugar molecules and include sucrose, also known as table sugar, lactose (found in dairy) and maltose (found in beer and some vegetables, such as sweet potatoes, edamame and broccoli).

Obviously, some of these sources are healthier than others. For example, fruits and vegetables contain beneficial vitamins and minerals including fiber, while dairy is an excellent source of calcium, vitamin D and protein. Sucrose and high-fructose corn syrup, which is derived from fructose, however, contain no real nutritional value and are often referred to as containing "empty calories," Gidus Collingwood explains.

"Consumers should be aware that not all simple sugars are bad for them," Herrington says. Focus on getting your bulk from whole, natural sources, and keeping sugars to a minimum for a well-balanced diet.