HEALTH BASICS

Carbohydrates

Carbohydrates are sugars, starches, and fiber that affect energy, digestion, and blood glucose.

WHAT IT IS
Sugars, starches, and fiber in food and drinks

WHERE IT COMES UP
Food labels, meal planning, and blood glucose results

WHY IT MATTERS
Supplies energy and affects digestion and blood glucose

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Primary care clinician or registered dietitian

HOW IT IS CHECKED
Label grams and blood glucose tests for related effects

Overview

Carbohydrates are one of the main nutrient groups in food. The others include protein and fat. Your body can use carbohydrates for energy, but different carbohydrate-containing foods have different effects on health.

The main forms are sugars, starches, and fiber. Sugars and starches can be broken down into smaller sugar molecules. Fiber is not fully digested by the human digestive system.

Carbohydrates occur naturally in foods such as fruit, vegetables, grains, beans, lentils, and milk. They are also added to foods and drinks as sugar, syrups, or processed starches.

A food is not automatically healthy or unhealthy because it contains carbohydrates. A bowl of lentils and a sugary drink both contain carbohydrate, but they differ greatly in fiber, nutrients, structure, and how quickly they are consumed.

Your carbohydrate needs are personal. They can be affected by your overall energy needs, activity, culture, food preferences, digestive health, and conditions such as diabetes. There is no single carbohydrate amount that suits everyone.

How it works

During digestion, enzymes break most sugars and starches into simple sugars. Glucose is the main sugar used by the body's cells for energy.

Glucose enters the bloodstream after a meal. The pancreas releases insulin, a hormone that helps glucose move from the blood into many cells. The liver and muscles can store some glucose as glycogen for later use.

Fructose, found naturally in fruit and in some sweeteners, and galactose, which comes from milk sugar, are handled mainly by the liver after absorption.

Fiber works differently. Some fiber adds bulk to stool and helps it move through the bowel. Other fiber can be fermented by bacteria in the large intestine. This produces substances that support the cells lining the colon. Fiber can also slow digestion and affect how quickly glucose enters the blood.

The speed of digestion is influenced by more than the number of carbohydrate grams. Food structure, fiber, fat, protein, cooking, processing, portion size, and the rest of the meal all matter.

The glycemic index ranks carbohydrate foods by how quickly they raise blood glucose under test conditions. Glycemic load also considers the amount eaten. These measures can provide useful context, but they do not describe a food's full nutritional value or predict every person's response.

Why it matters for your health

Carbohydrates are an important source of energy, especially for the brain and working muscles. Carbohydrate-rich foods can also provide fiber, vitamins, minerals, and other useful plant compounds.

Whole grains, beans, lentils, vegetables, and whole fruit generally provide more fiber and nutrients than highly refined products. Refining removes parts of a grain and often reduces its fiber content.

Sugars naturally present in intact fruit or plain milk come with other nutrients. Added sugars are put into a product during preparation or manufacturing. "Free sugars" is a broader term that includes added sugars as well as sugars in honey, syrups, and fruit juices.

Frequent exposure to free sugars can contribute to tooth decay. Sugary drinks can also provide substantial energy without being as filling as solid foods.

The overall pattern matters more than labeling every carbohydrate as "good" or "bad." Useful

points to consider include:

- The amount and type of fiber
- Whether the food is whole, minimally processed, or highly refined
- Added or free sugar content
- Portion size and how often the food is eaten
- Other nutrients in the meal

What can go wrong

Carbohydrates are not an illness, but they relate to several health conditions and situations.

In diabetes, the body does not produce enough insulin, does not use insulin effectively, or both. Carbohydrates can raise blood glucose after eating, so some people with diabetes count carbohydrate grams or monitor their glucose response. Diabetes is not simply caused by eating carbohydrates.

Hypoglycemia means blood glucose is too low. It can occur in people using certain diabetes medicines and in some other medical situations. It is not a routine effect of eating too few carbohydrates for one meal. Repeated low readings need clinical review.

Lactose intolerance occurs when the small intestine does not make enough lactase, the enzyme that digests lactose. Lactose is the natural carbohydrate in milk. Many people with lactose intolerance can tolerate some dairy foods, but individual tolerance differs.

Celiac disease is an immune reaction to gluten, a protein found in wheat, barley, and rye. It is not an allergy to carbohydrates, and it does not require avoiding all carbohydrate foods.

Some short-chain carbohydrates called FODMAPs are poorly absorbed in the small intestine. They may worsen bloating, pain, or altered bowel habits in some people with irritable bowel syndrome. A low-FODMAP diet is a structured, usually temporary process rather than a general healthy-eating plan.

A pattern low in fiber may contribute to constipation. Large or sudden increases in fiber can also cause gas or discomfort, particularly without enough fluid.

Arrange routine follow-up if you have repeated digestive problems after particular foods, unexpected blood glucose results, difficulty meeting nutritional needs, or questions about carbohydrate counting. A clinician can decide whether tests or a dietitian referral would be useful.

Severe hypoglycemia is an emergency. Call emergency services if someone is unconscious,

having a seizure, severely confused, or unable to swallow safely. Do not give food or drink by mouth to someone who cannot swallow.

What you can do

You do not need to measure carbohydrates unless there is a practical reason, such as diabetes meal planning, sports nutrition, or investigating a digestive concern.

On packaged foods, check the serving size and total carbohydrate rather than looking only at sugar. Total carbohydrate generally includes sugars, starches, and fiber. The listed parts may not add up to the total because starch may not appear separately and labeling rules differ by country.

You can also:

"Net carbs" is not a consistently defined scientific or labeling term. Manufacturers may calculate it by subtracting fiber or certain sugar alcohols from total carbohydrate. If carbohydrate counting affects medication or glucose management, ask which label value to use.

Blood glucose and HbA1c tests measure glucose regulation, not how many carbohydrates you eat. HbA1c estimates average blood glucose over the previous few months. These tests may be appropriate when a clinician is assessing diabetes or monitoring an existing diagnosis.

- Compare fiber and added-sugar information on similar products
- Keep a food and symptom record for recurring digestive concerns
- Record glucose readings as instructed if you already monitor diabetes
- Ask whether to count total carbohydrate or another value
- Ask a registered dietitian before making a highly restrictive diet change

Common questions

Are carbohydrates the same as sugar?

No. Sugar is one type of carbohydrate. Starches and fiber are also carbohydrates.

Do carbohydrates always raise blood glucose?

Digestible sugars and starches usually affect blood glucose, but the size and timing of the change differ. Fiber has a smaller direct effect because it is not fully digested. The meal, portion, activity, medicines, and individual metabolism also matter.

Do I need to avoid bread, rice, or potatoes?

Not automatically. Portion size, preparation, fiber content, and the rest of your eating pattern are relevant. A medical condition may change which choices work for you.

Is fruit too high in sugar?

Whole fruit contains natural sugars, along with fiber, water, vitamins, and minerals. Fruit juice has less intact structure and is easier to consume quickly. Individual advice may be needed for glucose management or digestive conditions.

Is gluten-free the same as carbohydrate-free?

No. Gluten is a protein. Gluten-free foods can still contain carbohydrates from rice, corn, potatoes, sugar, or other ingredients.

Should everyone count carbohydrate grams?

No. Counting can help some people with diabetes or specific nutrition goals, but it is not required for everyone. Looking at food quality and overall eating patterns may be more useful for routine choices.

Sources

- World Health Organization. Carbohydrate intake for adults and children . WHO guideline, 2023.
- US Food and Drug Administration. How to Understand and Use the Nutrition Facts Label .
- National Institute of Diabetes and Digestive and Kidney Diseases. Diabetes Diet, Eating, and Physical Activity .
- National Academies of Sciences, Engineering, and Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids . National Academies Press, 2005.
- Reynolds A, Mann J, Cummings J, Winter N, Mete E, Te Morenga L. Carbohydrate quality and human health: a series of systematic reviews and meta-analyses 31809-9). The Lancet . 2019;393(10170):434-445.