

Carbohydrates: Complex, Simple, and Added Sugar Defined

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Carbohydrates, or carbs, are one of the three macronutrient food groups important for a balanced diet. Carbs serve as our body's - and brain's - preferred source of energy when broken down to glucose (a type of sugar) to be absorbed.¹

There are some fundamental differences between types of carbohydrates and how those foods impact our bodies and our health. Let's review some of these key differences.

Complex Carbohydrates

Whole-food carbohydrates, known as complex carbohydrates, preserve essential nutrients like dietary fiber. **Dietary fiber** is important for supporting gut health, keeping our bowels moving, and slowing our digestion. Slower digestion often results in feeling full and more satisfied after meals. Fiber-rich carbohydrates also are absorbed in our bloodstream at a slower pace. For those managing blood sugar levels, consistently eating food sources rich in dietary fiber as part of a meal helps you avoid large spikes in blood sugar.¹

Food sources of **complex carbohydrates** include:

- **Whole grains** such as whole wheat flour, oats (steel cut and rolled), millet, buckwheat, amaranth, brown and wild rice, quinoa
- **Vegetables (non-starchy)** like spinach, broccoli, cauliflower, bell peppers, Brussel sprouts, cucumbers, carrots, okra, celery, green beans, mushrooms, artichoke, asparagus, onion, eggplant, lettuce, bok choy, collard greens, chili peppers
- **Vegetables (starchy)** like potatoes (russet, yellow, red, purple, sweet, yams), corn, green peas, beans (black, kidney, garbanzo, lentil, lima) and bean-based pastas, edamame
 - *Tip: when it comes to foods like potatoes, it's not about avoidance, but about how we prepare them and the portion size we choose! Choose baked and roasted over deep fried, and stick with herbs, spices, garlic, extra virgin olive oil, or avocado oil, instead of loading up on butter and cheese.*
- **Fruits** such as berries, melon, apples, pears, mango, banana, peaches, grapes, kiwi, oranges, nectarines, passion fruit, plums, cherries, pineapple, avocado (yes,

it's a fruit!), tomato (also a fruit, technically!), guava, pomegranate, papaya, grapefruit.

Simple or Refined Carbohydrates

Simple or refined carbohydrates are the result of removing fiber and other important nutrients and primarily for taste preferences. These foods include white breads, pasta, desserts, breakfast cereals (and granolas!), french fries, dried fruits, sweetened yogurt, and sugar-sweetened beverages.

These types of carbohydrates are rapidly absorbed into the bloodstream, and ignite the pleasure center of our brain but do little for us nutritionally. Refined carbohydrates are commonly found in **ultra-processed foods** - a usual culprit for indulgence.

What are ultra-processed foods?

Ultra-processed foods are incredibly altered by manufacturers from what once was their original state. These foods are changed by adding additives to extend shelf life, dyes to make the food look more appealing, and **refined carbohydrates, added sugar**, and trans fats for taste and mouthfeel. All of these processing techniques may lead to continued interest in buying them, but unfortunately to the detriment of our long-term health.²

Unfortunately, over 70% of the U.S. food supply is made up of ultra-processed foods, so it's hard to avoid them.³ But the best way to limit eating ultra-processed foods is to spot suitable and affordable alternatives. The first step is to identify sources of refined carbohydrates and added sugars.

Food sources for **simple or refined carbohydrates**:

- **White flour** products like white breads, pastas, tortillas
- **Breakfast cereals** like sweetened oatmeal or quick oats, commercial cereals like Lucky Charms and Cocoa Puffs, granolas
- **Snack foods** like white flour crackers, potato chips, tortilla chips, snack mixes, buttered popcorn, granola bars, pretzels, fruit snacks, frozen snacks like pizza rolls
- **Sweetened beverages** such as soda, fruit juice, sports drinks, sweetened coffee drinks, sweetened energy drinks, sweet tea, lemonade, smoothies*
- **Fast food** and fried foods such as french fries, tater tots, onion rings, pizza
- **Desserts** like cookies, cakes, muffins, pastries
- **Condiments** like jam and jellies, teriyaki sauce, ketchup, honey mustard, sweet relish, flavored salad dressings such as raspberry vinaigrette

- **Dairy products** like sweetened yogurt, ice cream, and chocolate milk

*Smoothies from retail chains like Jamba Juice or Smoothie King often have added sugar (added juice or sugar-sweetened fruit). Making a smoothie at home with whole fruit can help bypass some added sugar!

Added Sugar

Over time, eating and drinking too much added and concentrated sweets may contribute to the development of chronic conditions.^{3,4} Common foods and beverages, such as desserts, sodas, fruit juice, sports drinks, breakfast cereals, and more, contain high amounts of added sugar.

Within the nutrition label, you may have noticed both **total sugars** and **added sugars** listed. If you're feeling confused about what they mean and which matters most, you're not alone. Let's first summarize the key differences between the two.

- **Total sugars** include **naturally occurring sugars** found in nutrient-dense foods like fruits and whole grains, so it's not as helpful a guide when it comes to reducing added sugars.
- **Added sugar** is the sugar **added after processing** the food, and doesn't include sugars found in nutrient-dense foods like fruits and whole grains.

So based on what each represents, it's important to focus on **added sugars** alone. For those with a previous diagnosis of diabetes, you may also be focused on **total carbohydrates** in addition to **added sugar**. But unless advised to do so by a healthcare provider, it's unnecessary to focus on total carbohydrates.

Nevertheless, it's recommended for everyone to **limit added sugars** as much as possible, given the potential added sugars have for health concerns.⁵ Many packaged foods, like baked goods, desserts, sweets, and sugar-sweetened beverages, contain added sugar.

Other than knowing the common food sources containing added sugar, how do you spot it on a nutrition facts label? Here are a few tips to get you started:

1. Read the ingredients section of the nutrition facts label and look for terms like *"cane sugar, brown sugar, brown rice syrup, glucose, fructose, high fructose corn syrup, dextrose"*
2. Check the % Daily Value (%DV) for added sugar. If it's **at least 20% DV**, it's best to avoid it.

Added sugar sources to watch out for include:

- Maple syrup
- Brown rice syrup
- Cane sugar
- Brown sugar
- Honey
- Agave syrup
- Coconut sugar

The sample nutrition label below is a beverage product with greater than 20% DV in added sugar and thus is best avoided.

Sample Label

Nutrition Facts	
8 servings per container	
Serving size 8 fl oz (240mL)	
Amount per serving	
Calories	110
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 27g	10%
Dietary Fiber 0g	0%
Total Sugars 25g	
Includes 23g Added Sugars	46%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 40mg	0%
<small>* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	



The Importance of Dietary Fiber

As we've already learned, dietary fiber is key for a number of reasons when it comes to our health. Dietary fiber supports gut health, keeps us regular, and promotes fullness after eating a meal.

There are two types of dietary fiber: soluble and insoluble. Soluble fiber is a gel-like substance that slows down digestion, whereas insoluble fiber helps stool move through the GI tract and out of the body. Our diet should include both types of fiber, however; for

those with GI disorders like irritable bowel syndrome⁶ or inflammatory bowel disease,⁷ increasing soluble fiber may be helpful when addressing symptoms.

Want to add more soluble fiber to your diet? Check out our [dietary fiber guide](#) for more!

Sources:

1. Holesh JE, Aslam S, Martin A. Physiology, Carbohydrates. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; May 12, 2023.
2. Pagliai G, Dinu M, Madarena MP, Bonaccio M, Iacoviello L, Sofi F. Consumption of ultra-processed foods and health status: a systematic review and meta-analysis. *Br J Nutr*. 2021;125(3):308-318. doi:10.1017/S0007114520002688
3. Menichetti, G., Ravandi, B., Mozaffarian, D. *et al*. Machine learning prediction of the degree of food processing. *Nat Commun* 14, 2312 (2023). <https://doi.org/10.1038/s41467-023-37457-1>
4. Malik VS, Hu FB. The role of sugar-sweetened beverages in the global epidemics of obesity and chronic diseases. *Nat Rev Endocrinol*. 2022;18(4):205-218. doi:10.1038/s41574-021-00627-6
5. Huang Y, Chen Z, Chen B, et al. Dietary sugar consumption and health: umbrella review. *BMJ*. 2023;381:e071609. Published 2023 Apr 5. doi:10.1136/bmj-2022-071609
6. Chey WD, Hashash JG, Manning L, Chang L. AGA Clinical Practice Update on the Role of Diet in Irritable Bowel Syndrome: Expert Review. *Gastroenterology*. 2022;162(6):1737-1745.e5. doi:10.1053/j.gastro.2021.12.248
7. Levine A, Rhodes JM, Lindsay JO, et al. Dietary Guidance From the International Organization for the Study of Inflammatory Bowel Diseases. *Clin Gastroenterol Hepatol*. 2020;18(6):1381-1392. doi:10.1016/j.cgh.2020.01.046