Carbohydrates and Carbohydrate Counting

What Are Carbohydrates?

Carbohydrates are simply chains of single sugar molecules hooked together. Simple carbohydrates consist of one or two sugar molecules. Some well-known simple carbohydrates found in common foods include lactose (milk sugar) and sucrose (white table sugar). Carbohydrates can also be chains of more than two, even thousands, of sugar molecules like starch and fiber. These are called complex carbohydrates. The more fiber in the food, the more complex the carbohydrate.

How Do Carbohydrates Function?

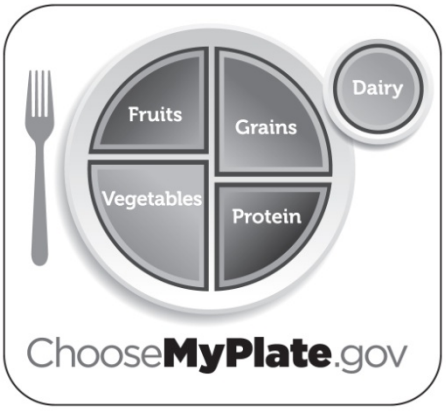
Carbohydrates are used by the body for energy. The blood carries carbohydrate in the form of glucose to all of the body cells where it is used to fuel body processes. The body can store some extra carbohydrate in the liver as glycogen. It can also change extra carbohydrate to fat and store it for later use. Your body breaks down both sugars and starches into glucose. The total amount of carbohydrate in food is more important than the type.

Carbohydrates and Diabetes

Carbohydrates have a stronger effect on blood sugar level following a meal or snack than the other energy nutrients: protein and fat. Starch is converted to glucose almost as quickly and completely as sugar. Because of that, sugar and starch have a similar effect on blood sugar. The more carbohydrate you eat at any one time, the higher your blood sugar is likely to be.

Where Are Carbohydrates Found?

Carbohydrates are found in almost all foods. Exceptions are meats and fats. Main sources are **grain** foods, **fruits**, starchy **vegetables** like beans and potatoes, **dairy** foods like milk and yogurt, and even **meat substitutes** like beans and peas. All of these foods can fit into a healthy diet. If you have diabetes, you need to keep track of the carbohydrate foods you eat each day. Try to eat only the amount of carbohydrates your doctor tells you to eat.



How Much Carbohydrate Do You Need?

Your doctor or dietitian should have told you how much carbohydrate you should have in a day. He or she may have told you the ***number of grams*** of carbohydrates, or he/she may have told you the **number of servings** of carbohydrate foods (also referred to as ***"carbs")*** you should have daily. Always follow the advice of your health care provider.

As a general rule, about half of your calories should come from carbohydrates. If you are a sedentary woman, your doctor might tell you to eat 180-225 *grams* of carbohydrate a day, depending on your calorie needs. Or, he or she may have told you to eat 12-15 *servings* of carbohydrate foods (*"carbs").* Either way, it is about the same amount of carbohydrate.

How Do You Count Carbohydrates?

Carbohydrates can be measured in *grams* or *servings ("carbs")*. Some people think it is easier to count servings of carbohydrates *("carbs")* rather than grams of carbohydrates. In carbohydrate counting we count *"carbs".* Like the exchanges, **each *"carb"* has approximately 15 grams of carbohydrate.** If your doctor told you a certain number of grams of carbohydrate to eat in a day, and you want to convert it to "carb" servings, divide the total *grams* of carbohydrate by 15. As an example, if your doctor told you to eat 200 *grams* of carbohydrate a day, divide that by 15 and you will get 13.3 *"carbs"*. So you could have 13 *servings* of carbohydrate foods spread throughout the day.

If you use the exchange list system, you can easily convert your exchanges to "carbs" (see below) and you can interchange the starch, fruit, and milk groups. Here is how that fits with carb counting:

1 starch exchange = 15 grams of carbohydrate = 1 "carb"
1 fruit exchange = 15 grams of carbohydrate = 1 "carb"
1 milk exchange = 12 grams of carbohydrate = 1 "carb"
1 non-starchy vegetable exchange = 5 grams of carbohydrate = 1/3 "carb"
1 starchy vegetable exchange = 15 grams of carbohydrate = 1"carb"

The Dietary Guidelines for Americans provide suggestions to for healthy eating that will lower the risk for chronic disease and promote health. The latest edition of the Dietary Guidelines for Americans recommends the following amounts of food from each of the major food groups:

How much food from each food group is right for you?*

	Less Active Women, Older Adults	Children, Teen Girls, Active Women, Less Active Men	Teen Boys, Active Men
Calories	About 1,600	About 2,200	About 2,800
Grains Group	5 oz.** (5 carbs)	7 oz.** (7 carbs)	10 oz.** (10 carbs)
Vegetable Group* **	2 cups (2-4 carbs)	3 cups (3-6 carbs)	3.5 cups (3.5-7 carbs)
Fruit Group	1.5 cups (3 carbs)	2 cups (4 carbs)	2.5 cups (5 carbs)
Dairy Group	3 cups (3 carbs)	3 cups (3 carbs)	3 cups (3 carbs)
Protein Group** **	5 oz. (no carbs)	6 oz. (no carbs)	7 oz. (no carbs)

*Based on Dietary Guidelines for Americans 2010 ** At least half of these servings should be whole grain foods. *** Depends on type of vegetable chosen. **** Depends on choice – plant sources of protein contain carbohydrates.

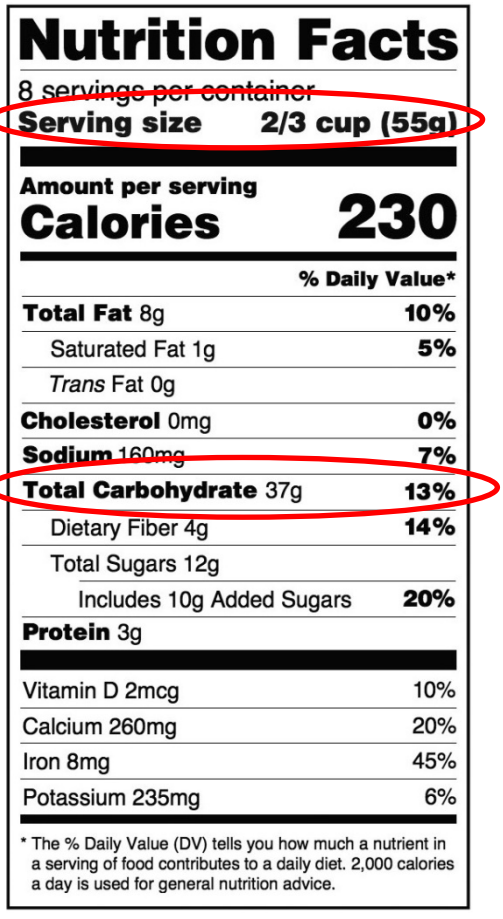
The shaded food groups above provide "carbs". If you add up the servings of "carbs" for 1,600 calories, you get 13 -15 "carbs" depending on the type of vegetables you choose (non-starchy vegetables count as 1/3 of a "carb" while starchy vegetables count as 1 "carb"). Following this pattern will provide you with about half of your calories from carbohydrates. If we do the math: 13 "carbs" times 15 grams = 195 total grams of carbohydrate. Each gram of carbohydrate has 4 calories, so 195 times 4 = 780 calories which is about half of 1,600 calories and right on target for getting half of your calories from carbohydrates.

Food Facts Can Help

One of the best tools for counting "carbs" is the Nutrition Facts food label. Look at the serving size. This number tells you how much of the food makes a serving. The amounts of calories and nutrients in the food are based on the serving size. If you eat twice the serving size, you will get twice the calories and nutrients.

Focus on the bold line that shows "Total Carbohydrates". Since your body breaks down all digestible carbohydrates into glucose, pay attention to the total amount, not just those that are "sugars". In this example, there are 37 grams of carbohydrates in a serving. How many "carbs" is that?

37 divided by 15 equals 2.46. So a serving of this food is approximately 2½ "carbs".



Nutrition Facts

8 servings per container

Serving size **2/3 cup (55g)**

Amount per serving

Calories **230**

	% Daily Value*
Total Fat 8g	**10%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
Total Carbohydrate 37g	**13%**
Dietary Fiber 4g	**14%**
Total Sugars 12g	
Includes 10g Added Sugars	**20%**
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%

* 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.

Planning Meals and Snacks

It is a good idea to eat about the same type and amount of food at each meal and snack. This will help keep a steady amount of glucose going into your blood. The Plate Method is a good way to plan consistent meals and snacks. When planning your meals, think in terms of a plate or a place setting. Half of your plate should contain vegetables. One fourth should be grain foods or starches and one fourth should be meat or protein foods. Add to this a serving of fruit and a serving from lowfat dairy food. You will have a balanced meal that contains four to five "carbs" depending on the type of vegetables you choose. If you follow this pattern throughout the day, you will get about 12 -15 "carbs" in three meals. You may skip the meat and vegetables at breakfast if you are not used to eating these foods in the morning.

You may wish to have between-meal and bedtime snacks. For carbohydrate, choose a food from the grain/starch, fruit, vegetable or milk group. A little protein or fat with the carbohydrate food helps keep your blood sugar from rising too fast. Good choices would be lean meat, peanut butter or low-fat cheese or yogurt. Depending on the type and number of snacks you have, snacks may add another 2-3 carbohydrates to your daily total.