

## **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. 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.

Here is a list of several types of foods that supply carbohydrates to our diets:

- grains
- breads/crackers
- cereals/pasta
- rice
- cookies/cakes/pies
- potatoes
- fruit/fruit juice
- milk/yogurt
- ice cream/frozen desserts
- regular soda pop
- jam/jelly/preserves
- honey/syrup/molasses
- sugar-sweetened beverages
- table sugar
- candy
- beans and peas
- corn

The foods that supply the most carbohydrates to our diets are found in grains, vegetables, and fruits. We also get some carbohydrates from milk and other dairy foods.

### ***How Much Carbohydrate Do You Need?***

Your doctor or dietitian should have told you how much carbohydrate you should have in a day. Always follow the advice of your health care provider. As a general rule, about half of your calories should come from carbohydrates. For example, 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 also referred to as "carbs."

### ***How Do You Count Carbohydrates?***

There are many tools available to help you count carbohydrates. If you use the exchange system, you can easily convert your exchanges to carbs (see below) and you can interchange the starch, fruit, and milk groups.

**1 CARB** (also known as a **carb choice** or **carb serving**) = **15 grams of carbohydrate**

### ***Exchanges***

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 "other carbohydrate" exchange = 15 grams of carbohydrate = 1 carb; 1 non-starchy vegetable exchange = 5 grams of carbohydrate = 1/3 carb

To determine the number of carbohydrate servings, or carbs, you should have in a day, divide your total grams of carbohydrate by 15 grams per carb. As an example, if your physician told you to eat 200 grams of carbohydrate a day, divide that by 15 grams per carb and you will get 13.3 carb servings or carbs.

The Dietary Guidelines for Americans provide suggestions for healthy eating that will lower the risk for chronic disease and promote health. The sixth edition of the Dietary Guidelines for Americans (2005) recommends the following amounts of food from each of the major food groups:

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

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

\* Based on Dietary Guidelines for Americans 2005 \*\* At least half of these servings should be whole grain foods.

\*\*\* Depends on type of vegetable chosen

The shaded food groups 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.

***Use the Food Label***

One of the best tools for counting carbs is the Nutrition Facts food label. Focus on the bold line that shows "Total Carbohydrates." Since your body breaks down all digestible carbohydrates into glucose, you must pay attention to the total amount, not just those that are "sugars."

Look at the **servicing size**. This number tells you how much of the food makes a serving. The amounts of calories and nutrients (such as carbohydrates) in the food are based on the serving size. If you eat twice the serving size, you will get twice the calories and nutrients (such as carbohydrates).

<b>Nutrition Facts</b>	
Serving size: 1/2 cup (192g)	
Servings Per Recipe 4	
<b>Amount Per Serving</b>	
<b>Calories</b> 131	Cal. from Fat 70
<b>% Daily Value*</b>	
<b>Total Fat</b> 8g	<b>10%</b>
Saturated Fat 1g	<b>4%</b>
Trans Fats 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 597mg	<b>25%</b>
<b>Total Carbohydrate</b> 13g	<b>4%</b>
Dietary Fiber 2g	<b>8%</b>
Sugars 1g	
<b>Protein</b> 3g	
Vitamin A 4%	Vitamin C 10%
Calcium 4%	Iron 6%
*Percent Daily Values is based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	

Since people with diabetes have a higher risk for heart disease, you also want to look at **fat, saturated fat, Trans fat, cholesterol** and **sodium**. You want the % Daily Value for these nutrients to have lower % Daily Value numbers. Foods with 5% Daily Value or less for fat, saturated fat, cholesterol and sodium are low in those nutrients.

Look at the **total carbohydrate**. That is the important number. Many people just look at the sugars, but overall it is total carbohydrate that matters. This example has 13 grams of total carbohydrate in a serving, so it would be counted as 1 carb.

### ***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 low-fat serving from the milk group. You will have a balanced meal that contains four to five servings of carbohydrates (15 grams of carbohydrate per serving) depending on the type of vegetables you choose. If you follow this pattern throughout the day, you will get about 12 -15 carbs (15 grams of carbohydrate per carb) 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 going up 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.

