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Carbohydrates

Carbohydrates are one of the main nutrients in our diet. They help provide energy for our body. There are three main types of carbohydrates found in foods: sugars, starches, and fiber.

People with diabetes often need to count the amount of carbohydrates they eat to ensure a consistent supply throughout the day as well as to help choose mealtime doses of insulin.

Function

Your body needs all three forms of carbohydrates to function properly.

Sugars and most starches are broken down by the body into glucose, which then circulates in the blood to be used as energy.

Fiber is the part of food that is not broken down by the body. There are two types of fiber. Insoluble fiber adds bulk to your stools so you stay regular. Soluble fiber helps lower cholesterol levels and can help improve blood glucose control. Both types of fiber can help you to feel full and stay at a healthy weight.

Food Sources

Many foods contain one or more types of carbohydrates.

SUGARS

Sugars, or simple carbohydrates, occur naturally in these nutrient-rich foods:

- Fruits
- Milk and milk products

Some foods have added sugar. Many packaged and refined foods contain added sugar. These include:

- Candy
- Cookies, cakes, and pastries
- Regular (non-diet) carbonated beverages, such as soda
- Heavy syrups, such as those added to canned fruit

Refined grains with added sugar provide calories, but they lack vitamins, minerals, and fiber. Because they lack nutrients, these foods provide "empty calories" and can lead to weight gain. Try to minimize your intake of foods with added sugars.

STARCHES

Starches are also called complex carbohydrates. These nutrient-rich foods are high in starch (many are also high in fiber):

- Canned and dried beans, such as kidney beans, black beans, pinto beans, black-eyed peas, split peas, and garbanzo beans
- Starchy vegetables, such as potatoes, corn, green peas, and parsnips
- Whole grains, such as brown rice, oats, barley, and quinoa

Refined grains, such as those found in pastries, white bread, crackers, and white rice also contain starch. However, they lack B vitamins and other important nutrients unless they are marked "enriched." Foods made with refined or "white" flour also contain less fiber and protein than whole-grain products and do not help you feel as satisfied.

FIBER

High-fiber foods include:

- Whole grains, such as whole wheat and brown rice as well as whole-grain breads, cereals, and crackers
- Beans and legumes, such as black beans, kidney beans, and garbanzo beans
- Vegetables, such as broccoli, Brussels sprouts, corn, and potato with the skin
- Fruits, such as raspberries, pears, apples, and figs
- Nuts and seeds

Most processed and refined foods, enriched or not, are low in fiber.

Side Effects

Eating too many carbohydrates in the form of processed, starchy, or sugary foods can increase your total calorie intake, which can lead to weight gain. It can also lead you to not consume enough fat and protein.

Severely restricting carbohydrates can cause ketosis. This is when the body uses fat for energy because there are not enough carbohydrates from food for the body to use for energy.

Recommendations

It is best to get most of your carbohydrates from whole grains, dairy, fruits, and vegetables rather than refined grains. In addition to calories, whole grain foods provide vitamins, minerals, and fiber.

By making smart food choices, you can get the full range of healthy carbohydrates and plenty of nutrients:

- Choose a variety of foods including whole grains, fruits and vegetables, beans and legumes, and low-fat or non-fat dairy products.
- Read labels on canned, packaged, and frozen foods to avoid added sugar, salt, and fat.

- Make at least half of your grain servings per day from whole grains.
- Choose whole fruits and 100% fruit juices with no added sugar. Make at least half of your daily fruit servings from whole fruits.
- Limit sweets, sugar-sweetened beverages, and alcohol. Limit added sugars to less than 10 percent of your calories per day.

Here is what is considered "1 serving" of carbohydrate-rich foods according to the USDA (www.myplate.gov [<https://www.myplate.gov>]):

- Starchy vegetables: 1 cup (230 grams) mashed potato or sweet potato, 1 small ear of corn.
- Fruits: 1 medium-sized fruit (such as an apple or orange), $\frac{1}{2}$ cup dried fruit (95 grams) 1 cup 100% fruit juice (240 milliliters), 1 cup berries (or about 8 large strawberries).
- Breads and cereals, grains, and beans: 1 slice of whole-grain bread; 1/2 cup (100 grams) of cooked brown rice, pasta, or cereal; 1/4 cup cooked peas, lentils, or beans (50 grams), 3 cups popped popcorn (30 grams).
- Dairy: 1 cup (240 milliliters) of skim or low-fat milk or 8 ounces (225 grams) plain yogurt.

The food guide plate recommends filling half of your plate with fruits and vegetables, and one-quarter of your plate with grains, at least half of which are whole grains.

Here is a sample 2,000-calorie menu with healthy carbohydrate choices:

BREAKFAST

- 1 cup (60 grams) shredded wheat cereal, topped with 1 tbsp (10 grams) raisins and one cup (240 milliliters) fat-free milk
- 1 small banana
- 1 hard-boiled egg

LUNCH

Smoked turkey sandwich, made with 2 ounces (55 grams) whole-wheat pita bread, 1/4 cup (12 grams) romaine lettuce, 2 tomato slices, 3 ounces (85 grams) sliced smoked turkey breast.

- 1 teaspoon (tsp) or 5 milliliters (mL) mayonnaise-type salad dressing
- 1 tsp (2 grams) yellow mustard
- 1 medium pear
- 1 cup (240 milliliters) tomato juice

DINNER

- 5 ounces (140 grams) grilled top loin steak
- 3/4 cup (190 grams) mashed sweet potato
- 2 tsp (10 grams) soft margarine
- 1 cup (30 grams) spinach salad
- 2 ounce (55 grams) whole-wheat dinner roll

- 1 tsp (5 grams) soft margarine
- 1 cup (240 milliliters) fat-free milk
- 1 cup (240 milliliters) unsweetened applesauce

SNACK

- 1 cup (225 grams) low-fat plain yogurt with strawberries on top

Alternative Names

Starches; Simple sugars; Sugars; Complex carbohydrates; Diet - carbohydrates; Simple carbohydrates

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