



# Carbohydrate Basics

Carbohydrates have a number of important functions, and eliminating them from the diet can have serious health consequences.

## Functions of Carbohydrates

Carbohydrates are the body's primary fuel source. The body processes carbohydrates into glucose. Glucose travels through the bloodstream and is stored in the liver and muscles until it is used for energy. The muscles prefer carbohydrates, and the brain requires them. Americans are currently advised to consume at least 130 grams of carbohydrates per day.

In fact, carbohydrates are so crucial to the body that if you severely restrict or eliminate them, your body will begin to make them! The problem is that it will do that by breaking down muscle and other protein-containing tissues, such as your heart and other vital organs (a process known as "gluconeogenesis").

## Types of Carbohydrate

Carbohydrates are broadly classified as simple or complex, based on chemical structure.

**Simple carbohydrates**, as their name implies, have a simple chemical structure consisting of one or two molecules. Examples include the monosaccharides – glucose, fructose, galactose – and the disaccharides – sucrose, lactose, and maltose.

**Complex carbohydrates**, such as starch, glycogen and fiber, have a more complex chemical structure, containing two or more molecules linked together.

**Fiber** is a unique type of carbohydrate. It is not digested or absorbed, so—unlike other carbohydrates – it does not give the body energy. Fiber is found only in plant foods: fruits, vegetables, nuts and seeds. One good source of

fiber is a medium potato eaten with the skin (3 grams); meats, poultry, fish, eggs, fats and oils have no fiber. Health benefits of fiber include:

- Lowers blood cholesterol levels and may decrease risk of heart disease
- Maintains bowel regularity
- May decrease risk of colon cancer
- May aid in weight loss

## Carbohydrates for Health

The USDA's Food Guide Pyramid and leading health organizations, such as the American Cancer Society, advocate a diet based on carbohydrate foods (1). Foods that are high in carbohydrate include fruits, vegetables and grains; dairy products provide carbohydrate as well as protein. Below is a list of the carbohydrate content of some common foods:

Food	Carbohydrate (grams) <sup>2,3</sup>
Banana (1 medium)	29
Orange (1 medium)	21
Broccoli (1 medium stalk)	8
Potato (1 medium)	26
Whole wheat bread (2 slices)	24
Brown rice (1/2 cup)	22
Nonfat milk (1 cup)	12

Some people hold the misconception that they need to cut down on carbohydrates to manage body weight. But mainstream science advises that excess calories are to blame for weight gain, regardless of what foods they come from. Those calories come from three sources: carbohydrates, proteins and fats. Fats contain the most – 9 calories per gram; protein and carbohydrates each contain 4 calories per gram.

Depriving yourself of carbohydrate from vegetables, like potatoes, denies your body of

essential nutrients. One medium-sized potato, for example, contains zero fat and cholesterol for a satisfying 100 calories. Eaten with the skin, the potato is an excellent source of vitamin C and potassium and a good source of fiber.

Practice common sense when selecting carbohydrate foods. Foods from all macronutrient categories are welcome in a healthy eating plan – so long as portion sizes match the body's needs. Carbohydrate is required for meeting the energy demands of daily life and to fuel physical activity, an essential component of a healthy lifestyle.

- 1) American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention. Available at: <http://www.cancer.org/>. Accessed April 1, 2004.
- 2) USDA National Nutrient Database for Standard Reference, Release 16.
- 3) Pennington JAT. *Documentation for the 1995 Nutrition Labeling Values for the 20 Most Frequently Consumed Raw Fruits, Vegetables, and Fish*. Washington, D.C.: Food and Drug Administration; October 1995, revised June 1996.

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