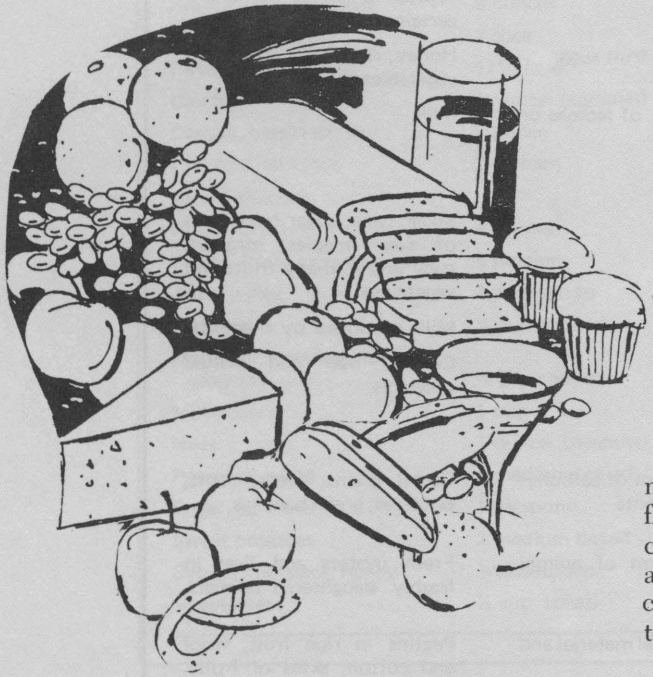


# FACT SHEET

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## CARBOHYDRATES

Mary K. Sweeten\*

Plant carbohydrates provide about one half of the calories in diets in the United States. In many parts of the world, carbohydrates from cereal grains supply 70 to 80 percent of the calories, mainly because they are plentiful and economical. Carbohydrates are generally thought of as supplying energy and little else. Recent research, however, has shown that carbohydrates may perform other important functions.

### Carbohydrate Classification

Dietary carbohydrate is made up of a variety of forms as shown in Table 1. The first form is that of simple sugars. Carbohydrates must be reduced to the simple form before they can be utilized by the body. Glucose is the most important simple sugar in the blood and cell metabolism. Fructose, found in honey, is also of importance.

The next important classification of carbohydrates is the disaccharides, a continuation chemically of two simple sugars. Sucrose, commonly known as table sugar, is the most important disaccharide. It may be purchased as either cane or beet sugar.

The third group of carbohydrates consists of polysaccharides made by the combination of five or

more simple sugars. Starches in wheat kernel and flour are polysaccharides. Cellulose, another polysaccharide, furnishes bulk or fiber to the diet. Starches and sucrose are the main carbohydrates in diets, comprising together more than 80 percent of the total.

### Functions of Carbohydrate in the Body

Carbohydrates in the form of glucose provide energy for body processes and to support activity and growth. Some carbohydrate is stored in the muscles and liver as glycogen and some may be stored as adipose (fatty) tissue for an energy reserve.

Carbohydrates save proteins by supplying energy, thereby sparing protein for tissue building and repair as well as for other special jobs. Diets low in carbohydrate may not supply enough energy foods. Then protein is broken down and used as energy instead of building body tissues.

Cellulose is not used as a source of energy. It does perform a vital regulatory function. This indigestible form of carbohydrate provides bulk and aids in the digestion of food in the bowels. Recent research has shown the important role of dietary fiber in nutrition and health. A relationship between a deficiency of dietary fiber and specific chronic diseases (such as cancer of the bowel) has been indicated.

Carbohydrates also help the body to use fats efficiently. Starches and cellulose aid normal use of fat in the body and may control the amount of cholesterol in the blood. This is of importance in the United States because dietary studies show that during the last 50 years there has been a steady decrease in the intake of starches and a steady increase of sugar intake in the diet.

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Table 1. Classification of Carbohydrates

Classes of Carbohydrate	Common Name	Food Source
Monosaccharides — single or simple sugars		
Glucose	Dextrose, grape or corn sugar	Sugar in sweet fruits (grapes) vegetables (sweet corn) and certain roots
Fructose	Levulose or fruit sugar	Honey, ripe fruits and many vegetables
Galactose	Component of lactose or milk sugar	Milk
Disaccharides — double sugars		
Sucrose	Table sugar	Sugar cane, sugar beets, sap of sugar maples, sorghum cane and in many fruits and vegetables
Lactose	Milk sugar	Milk produced by mammals
Maltose	Malt sugar	Cereals, beer and malted products
Polysaccharides — five or more simple sugars combined		
Starch	Storage form of carbohydrates in plants	Cereal grains, seeds, roots, potatoes, green bananas
Glycogen	Storage form of animal starch	Fresh oysters and liver in freshly slaughtered animals.
Cellulose	Plant skeletal material and fiber	Pectins in ripe fruit, wool and cotton, skins of fruits, coverings of seeds and structural parts of edible plants

### Food Sources of Carbohydrates

The major sources of starches in the diet are grains (wheat, oats, corn and rice), grain products (flour, spaghetti, macaroni, noodles, grits, bran, breads and breakfast cereals), potatoes, sweet potatoes and dry beans and peas. These foods provide starch and other important nutrients.

Most other vegetables, fruits and fruit juices contain smaller amounts of carbohydrates. In vegetables, this is mainly in the form of starches; in fruits, in the form of sugar. Table 2 shows the carbohydrate content of some common foods.

Fruits, vegetables and whole grain cereals provide bulk or roughage. Some vegetables, such as broccoli, brussel sprouts, cabbage, beets, cauliflower, sweet potatoes, carrots, berries, tomatoes, eggplant and squash have a high fiber content.

Milk and milk group foods also provide carbohydrates in the form of lactose or milk sugar. Each cup of milk provides about 12 grams of carbohydrates or 48 calories of carbohydrate. (One gram of carbohydrate provides four calories.)

Concentrated sweets (sugars, syrups, candies, jams, jellies, honey, molasses, cane and beet sugars) are major sources of carbohydrates in the diet because they are often added to sweeten food. Avoid too many concentrated sweets. Sugar should not displace other foods necessary for building tissues and regulating body processes.

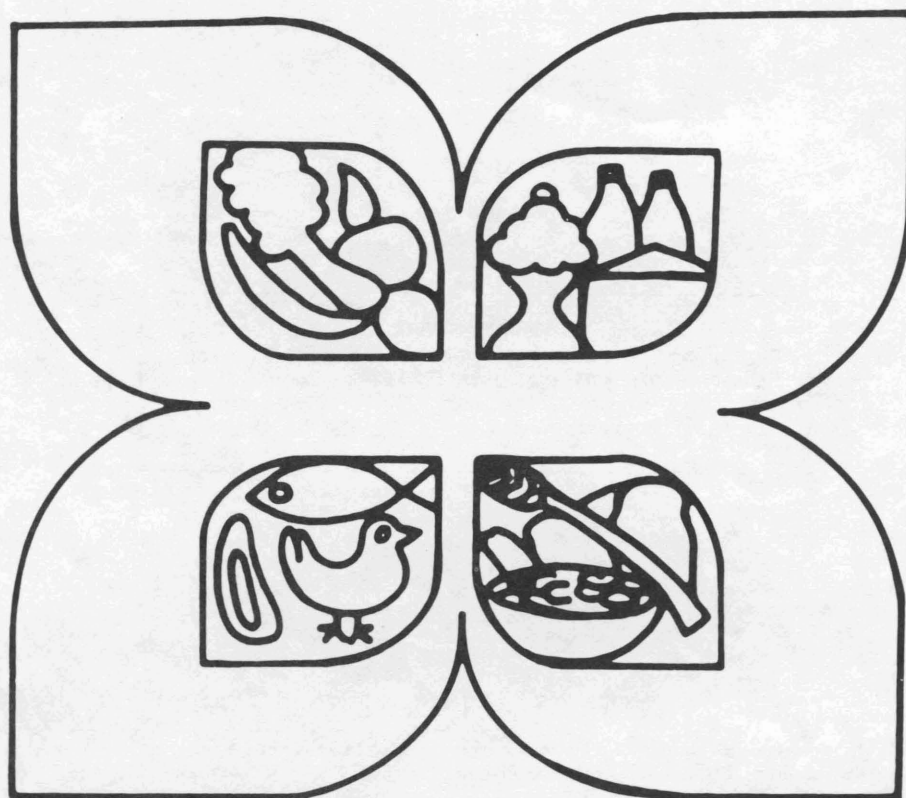
### Need for Carbohydrates

The 1973-74 Recommended Dietary Allowance, Food and Nutrition Board, National Academy of Sciences, has no specific dietary recommendation for daily carbohydrate levels. The minimum dietary energy level from the diet suggested is 500 calories per day. Levels of intake vary widely in different parts of the world. In the United States less than half of the calories are from carbohydrates.

Eat recommended amounts of foods from the Daily Food Guide every day to insure that your body is supplied with the proper amounts of all nutrients necessary for good health, including carbohydrates.

Table 2. Carbohydrate Content of Common Foods

Food	Measure	Per Serving Portion		Per 100 Grams of Food gm
		Weight gm	Carbo-hydrate gm	
Beverages, carbonated	8 ounces	240	21-28	8-12
Breads, all kinds	1 slice	23	12	48-56
Cake, plain and iced	1/16 layer	100	59	49-62
Candy	1 ounce (caramel)	30	22	47-97
Cereals, breakfast, dry	1 ounce	30	22	60-85
Crackers, all kinds	2 graham	14	10	60-80
Flour, all kinds				71-80
Fruits, dried	4 prunes	32	18	67-75
Fruits, fresh, unsweetened	1 portion		10	4-23
Jams, jellies	1 tablespoon	20	14	70
Legumes	½ cup cooked	130	30	60-62 (dry)
Macaroni, noodles, rice, spaghetti	½ cup cooked	70	16	73-75 (dry basis)
Milk, cow's	1 cup	244	12	5
Nuts	1 ounce (peanuts)	30	7	11-24
Potatoes, white	1 medium boiled	122	18	17 (raw)
Sugar, all kinds	1 teaspoon	4	4	100
Sweet potatoes	1 medium baked	110	36	26 (raw)
Syrups, molasses, honey	1 tablespoon	20	15	55-75
Vegetables	½ cup (peas)	80	10	4-20



## References

Robinson, Corinne H., *Fundamentals of Normal Nutrition*, Macmillan Company, New York, 1968.

"Carbohydrates Keep You Going," *What's New in Home Economics*, December, 1968.

*Family Fare — A Guide to Good Nutrition*, H&GB No. 1, 1973.

"Nutrition and the M.D.," Volume 1, No. 6, April 1975.

### Food Sources of Carbohydrates

The major sources of starches are the wheat, corn, rice, and oat flours, granular products, spaghetti, macaroni, noodles, grits, farina, breakfast cereals, potatoes, sweet potatoes, beans and peas. These foods provide important nutrients.

Most other vegetables contain smaller amounts of carbohydrates, this is mainly in the form of sugar. Table 2 lists the carbohydrate content of some common foods.

Fruits, vegetables and whole grains are good sources of bulk or roughage. Some vegetables such as Brussels sprouts, cabbage, beets, carrots, potatoes, carrots, berries, tomatillos, and squash have a high fiber content.

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