

Sugar by Many Other Names

Sugars are carbohydrates made up of one or more molecules. **Glucose, fructose** and **galactose** are single molecule sugars (monosaccharides) that occur naturally or through manufacturing processes. **Sucrose, lactose** and **maltose** are double molecule sugars (disaccharides) made up of various combinations of glucose, fructose and galactose and they also occur naturally or through manufacturing processes. Starches consist of multiple sugar molecules (polysaccharides) that allow plants to store excess sugar. Normal digestion and manufacturing processes break these starches into simpler forms of sugar.

Our bodies require glucose as fuel and all cells in our body can metabolize this sugar into energy. Ribose and deoxyribose are sugars that make up our RNA and DNA. Our bodies process and recombine the foods we eat to make these essential sugars. The following list defines many common foods and food additives containing sugar.

Agave nectar or **agave syrup** is commercially produced from several species of agave plants. Agave nectar is sweeter than honey and thinner in consistency. Agave nectar consists primarily of *fructose* and some *glucose*. The exact percentages vary from vendor to vendor.

Brown rice syrup is made by fermenting cooked rice with enzymes (usually from dried barley sprouts) to break down the starches, then straining off the liquid and reducing it by cooking until the desired consistency is reached. The final product is 45% *maltose*, 3% *glucose*, and 52% maltotriose (a trisaccharide made up of three *glucose* molecules).

Brown sugar consists of sugar crystals contained in molasses syrup with natural flavor and color made from sugar cane. Some refiners make brown sugar by adding syrup to refined white sugar. It is 91% to 96% *sucrose*.

Cane sugar, cane crystals and **evaporated cane juice** come from the processing of sugar cane into the white crystal we know as table sugar, 100% *sucrose*.

Confectioner's sugar, or powdered sugar, consists of finely ground *sucrose* crystals mixed with a small amount of cornstarch.

Corn syrups, corn sweeteners and **crystalline fructose** are produced by the action of enzymes and/or acids on cornstarch, splitting that starch into sugar components. They contain between 42% to 98% *fructose*. Dextrose, water and trace minerals comprise most of the remaining ingredients.

Dextrose, a form of *glucose*, is commercially made from corn starch by the action of heat and acids, or enzymes. It is sold blended with regular sugar.

FRUCTOSE consists of one sugar molecule found naturally in honey and fruits, such as apples, grapes and peaches. Fructose has a much sweeter taste than sucrose. Fructose

requires the liver to metabolize it into usable energy for the body. A synthesized version of fructose, refined by the food industry decades ago, created a product known as high fructose corn syrup.

Fruit juice concentrates made from dehydrating fruit juices and using them as sweeteners contain primarily *fructose*.

GALACTOSE is a single molecule sugar that occurs naturally in the body and combines with *glucose* to form *lactose*, the sugar found in milk.

GLUCOSE is a single molecule sugar occurring naturally in all living organisms and used by all of them as fuel for life. Manufacturers create glucose by processing starches from a wide variety of plants including corn, maize, rice, wheat, cassava, corn husk and sago.

High-fructose corn syrup (HFCS) is a sweetener made from cornstarch. The amounts of *fructose* vary with the manufacturer. An enzyme-linked process increases the fructose content, thus making HFCS sweeter than regular corn syrup.

Honey is an invert sugar formed by an enzyme from nectar gathered by bees. Honey contains *fructose*, *glucose*, *maltose* and *sucrose*.

Invert sugar is a mixture of *glucose* and *fructose*. Invert sugar is formed by splitting sucrose in a process called inversion. This sugar prevents crystallization of cane sugar in candy making.

LACTOSE, or milk sugar, is a double molecule sugar consisting of *glucose* and *galactose*. It occurs naturally in the milk of mammals. Lactose is manufactured from whey and skim milk for commercial purposes, primarily used in the pharmaceutical industry.

MALTOSE is a double molecule sugar consisting of two *glucose* molecules. It occurs naturally in the fermentation of barley grains and through caramelizing (heating sugar until it turns brown). The body breaks maltose into glucose very easily and rapidly.

Malt syrup is made from sprouting, fermenting and caramelizing grains such as barley, and wheat. The primary sweetener in these syrups is *maltose*. They also contain starch and a little protein.

Maple syrup and sugar is made by boiling the sap of the sugar maple tree. This sweetener contains mostly *sucrose* with small variable amounts of *glucose* and *fructose*.

Molasses is produced as a by-product of processing of sugar cane. The quality of molasses depends on the maturity of the sugar cane, the amount of sugar extracted, and the method of extraction. **Blackstrap molasses** contains the least amount of sugar as well as trace amounts of vitamins and significant amounts of calcium, magnesium,

potassium, and iron; one tablespoon provides up to 20% of the daily value of each of those nutrients

Raw sugar consists of coarse, granulated crystals of *sucrose* formed from the evaporation of sugar cane juice. Raw sugar contains impurities and cannot be sold in grocery stores due to FDA regulations.

Sweet sorghum syrup or **sorghum molasses** is made from sorghum (in the same grass family as sugar cane) in much the same way molasses is made from sugar cane and sugar beets.

Sucanat and **Rapadura** are brand names for a variety of whole cane sugar extracted by mechanical processes, heated, and cooled, forming small brown grainy crystals of pure dried sugar cane juice. These brown crystals, similar to **panela** and **muscovado**, retain their molasses content.

SUCROSE, or table sugar, comes from sugar cane or sugar beets. It consists of two simple sugars, *glucose* and *fructose*. It is about 99.9% pure and sold in either granulated or powdered form.

Turbinado sugar is raw sugar that goes through a refining process to remove impurities and most of the molasses. It is edible if processed under proper conditions; however, some samples in the past contained trace contaminants.