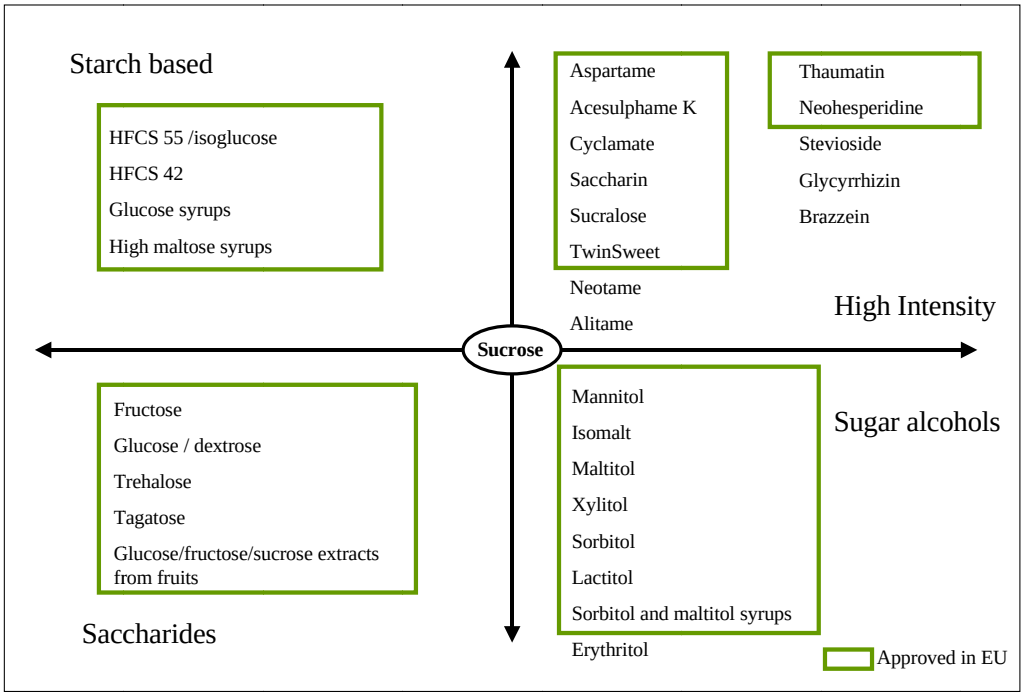
Glucose $C_6H_{12}O_6$, also known as D-glucose, dextrose, or grape sugar) is a simple sugar (monosaccharide) and an important carbohydrate in biology. Cells use it as the primary source of energy[2] and a metabolic intermediate. Glucose is one of the main products of photosynthesis and starts cellular respiration.

Glucose exists in several different structures, but all of these structures can be divided into two families of mirror-images (stereoisomers). Only one set of these isomers exists in nature, those derived from the "right-handed form" of glucose, denoted D-glucose. D-glucose is often referred to as dextrose. The term dextrose is derived from *dextrorotatory glucose*.[3] Solutions of dextrose rotate polarized light to the right. Starch and cellulose are polymers derived from the dehydration of D-glucose. The other stereoisomer, called L-glucose, is hardly found in nature.

The name "glucose" comes from the Greek word *glukus* (γλυκύς), meaning "sweet". The suffix "-ose" denotes a sugar. The name "dextrose" and the 'D-' prefix come from Latin *dexter* ("right"), referring to the handedness of the molecules.

Industrial use

In industry, glucose is used as a precursor to make vitamin C in the Reichstein process, to make citric acid, gluconic acid, bio-ethanol, polylactic acid, sorbitol and using as sweetener



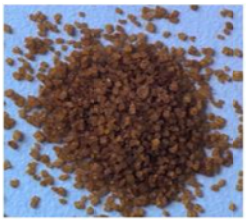
Starch sugars

Starch can be hydrolyzed into simpler carbohydrates by acids, various enzymes, or a combination of the two. The resulting fragments are known as dextrins. The extent of conversion is typically quantified by *dextrose equivalent* (DE), which is roughly the fraction of the glycosidic bonds in starch that have been broken.

These starch sugars are by far the most common starch based food ingredient and are used as sweetener in many drinks and foods. They include:

- Maltodextrin, a lightly hydrolyzed (DE 10–20) starch product used as a bland-tasting filler and thickener.
    - Various glucose syrups (DE 30–70), also called corn syrups in the US, viscous solutions used as sweeteners and thickeners in many kinds of processed foods.
    - Dextrose (DE 100), commercial glucose, prepared by the complete hydrolysis of starch.
    - High fructose syrup, made by treating dextrose solutions with the enzyme glucose isomerase, until a substantial fraction of the glucose has been converted to fructose. In the United States, high fructose corn syrup is the principal sweetener used in sweetened beverages because fructose has better handling characteristics, such as microbiological stability, and more consistent sweetness/flavor. One kind of high fructose corn syrup, HFCS-55, is typically sweeter than regular sucrose because it is made with more fructose, while the sweetness of HFCS-42 is on par with sucrose.
- Sugar alcohols, such as maltitol, erythritol, sorbitol, mannitol and hydrogenated starch hydrolysate, are sweeteners made by reducing sugars.

The Sucrose-based family	The Starch-based family
Beet sugars	*Glucose syrups*
Cane sugars	*Glucose/dextrose*
Invert sugar	*High Fructose Corn Syrup*
Fructose	*Isoglucose*



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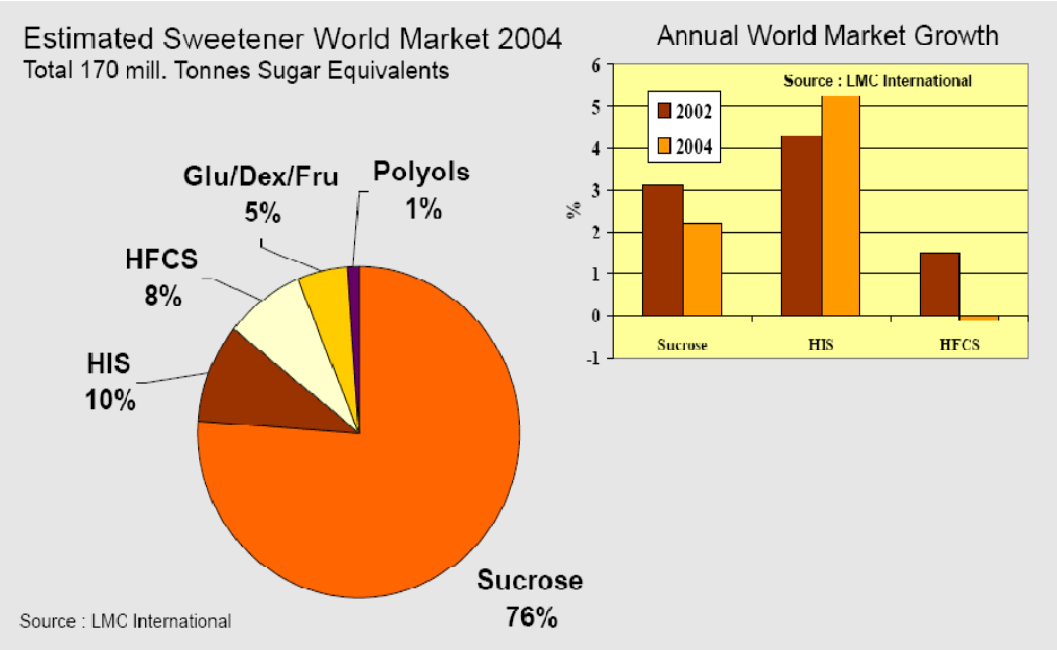
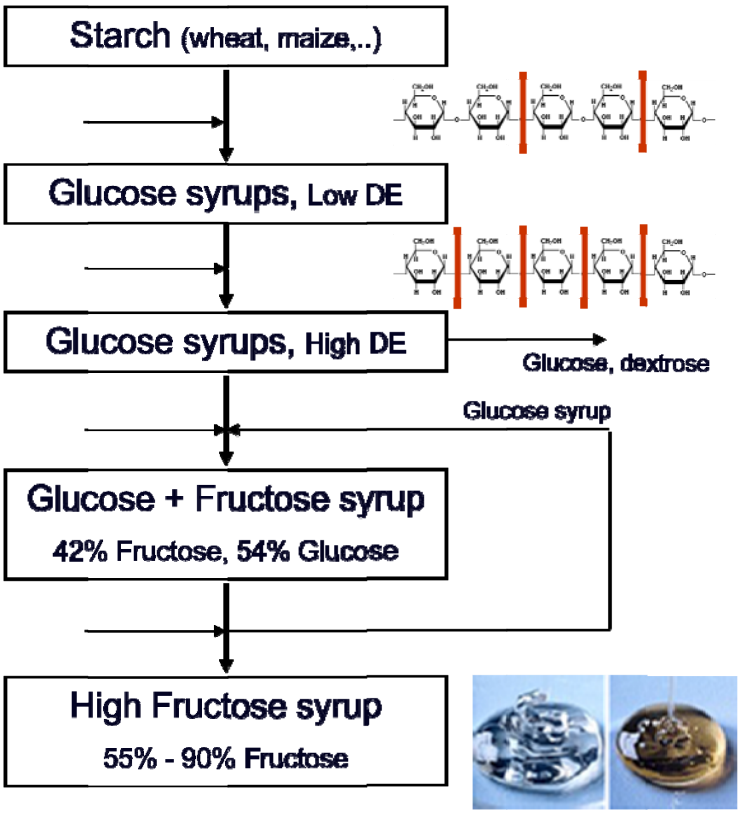


Production Process



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