The different types of SWEETENER in food

These days there is a lot of confusion around sugars and sweeteners. There are now numerous alternatives to regular table sugar, and many different claims are being made about each of these alternative sweeteners. This information is designed to help inform you about the basic facts on some of the most popular caloric and non-caloric sweeteners now available, and help you choose what is right for you.

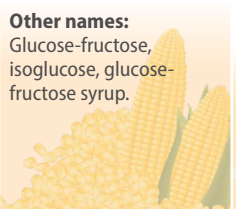
As a comparison, it's good to note that regular table sugar (pure sucrose) has a GI of 65 (medium) and provides 17kJ/g.

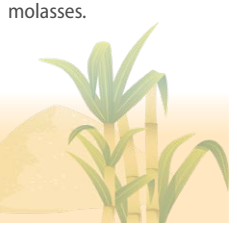
NUTRITIVE

AGAVE SYRUP	COCONUT SUGAR	DATE SUGAR	DEXTROSE	FRUIT JUICE CONCENTRATE	HIGH FRUCTOSE CORN SYRUP (HFCS)	HONEY	MAPLE SYRUP	MOLASSES
Source: Agave Plant	Source: Flower of the coconut plant	Source: Dates	Source: Starch	Source: Fruit varieties	Source: Corn	Source: Nectar collected by bees	Source: Sap of the maple tree	Source: Sugarcane plant
Sugars: Fructose (55-90%), glucose	Sugars: Sucrose, glucose, fructose	Sugars: Glucose, fructose, sucrose	Sugars: Glucose	Sugars: Sucrose, glucose, fructose	Sugars: Fructose (55% or 42%), glucose (45% or 58%)	Sugars: Sucrose, glucose, fructose	Sugars: Sucrose, glucose, fructose	Sugars: Sucrose, glucose, fructose
Energy (K/g): 22	Energy (K/g): 17	Energy (K/g): 12	Energy (K/g): 17	Energy (K/g): ~17	Energy (K/g): 12	Energy (K/g): 24	Energy (K/g): 15	Energy (K/g): 17
GI: 19-28	GI: 54	GI: 39-45	GI: 100	GI: Unknown	GI: 55-66	GI: 32-87	GI: 54	GI: Unknown
SWEETNESS COMPARED TO SUGAR:								
30-40% sweeter	= sweetness	↓ less sweet	25% less sweet	↓ less sweet	120-160 times sweeter	↑↓ Variable	↓ slightly less sweet	25-50% less sweet
Production: The leaves of the agave plant are cut to reveal the 'heart', which is crushed to extract the sap. The sap is then filtered, heated and treated enzymatically to covert the fructans to fructose and glucose.	**Production:** Made from the sap of the coconut blossom. The sap is collected and boiled down to a thick syrup which is then cooled to form blocks and beaten into granulated sugar.	**Production:** Made from powdering dried dates. Commercial varieties may have a flowing agent added to help reduce clumping in the packet.	**Production:** Whilst the starch can come from any kind of plant, dextrose is most commonly produced from cornstarch. The process involves the enzymatic breakdown of the starch polymers to single glucose units, which is not dissimilar to how our bodies breakdown starch.	**Production:** Made by evaporating most of the water from the fruit puree, concentrating the natural sugar content.	**Production:** Corn syrup is made from corn-starch. The corn-starch is processed enzymatically by glucose isomerase to convert some of the glucose into fructose. To develop HFCS, this process is taken further to convert more glucose.	**Production:** Produced by bees, honey is harvested by bee keepers and then filtered/ processed commercially. Taste/colour/flavour all depend on the types of flowers the bees have collected nectar from. Basic commercial honey tends to be a mix of different nectars to help ensure consistency in flavour.	**Production:** The maple tree is 'tapped' so the sap can be collected in buckets that hang on the tree. The sap is then boiled to reduce the water content, concentrating the sugars.	**Production:** Molasses is the 'spin off' during the refining of sugar crystals. It is essentially spun off the raw sugar in a centrifuge. The first spin produces light molasses whilst the later spins produces the darker molasses versions. Blackstrap molasses is the product produced from the final spin.
Comments: It typically takes seven years for the sugar content to reach a reasonable level.	**Comments:** It is considered a partially refined sugar and is similar in colour, flavour and sweetness as brown sugar.May retain a small amount of micronutrients.	**Comments:** Date sugar looks a lot like brown sugar, however cannot simply replace brown sugar in recipes as it does not dissolve in water or melt, therefore does not incorporate well into mixtures.	**Comments:** Most commonly used in beer making.	**Comments:** Can contain traces of vitamins and minerals.	**Comments:** Whilst common in the US, corn syrup is rarely used in the Australian food supply. The higher fructose variety is often used in soft drinks whilst the lower fructose version is used more in cakes.	**Comments:** GI ranges dependant on where the honey has been collected. Commercial honey blends tend to be high GI (>70).	**Comments:** Contains traces of organic acids, vitamins and some minerals, however not at a nutritionally significant level.	**Comments:** May contain trace amounts of iron, calcium and phosphorus.
Other names: Agave syrup, agave nectar.	**Other names:** Coconut blossom sugar, coconut palm sugar, coco sap sugar, coco sugar.	**Other names:** Date syrup, date molasses.	**Other names:** Glucose (D-glucose).	**Other names:** Fruit concentrates.	**Other names:** Glucose-fructose, isoglucose, glucose-fructose syrup.	**Other names:** Various types dependant on the plant variety nectar has been collected from.	**Other names:** N/A	**Other names:** Treacle, blackstrap molasses.





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Information adapted from: The Ultimate Guide to Sugars and Sweeteners: discover the taste, use, nutrition, science and lore of everything from agave nectar to xylitol. Alan Barclay,Philippa Sandall, and Claudia Schwide-Slavin. 2014. The Experiment,New York.

NUTRITIVE

PALM SUGAR
Source: Blossom bearing spikes of several palm varieties

Sugars: Sucrose, glucose, fructose

Energy (K/g): 17 | GI: Moderate

= sweetness

Production:
The blossom baring spikes are tapped to drain the sweet sap. Predominantly it is the sugar palm, coconut palm and the date palm.
The sap is collected twice a day and boiled to reduce it to a thick syrup. This is then either cooled into blocks or beaten into granules.

Comments:
May contain traces of vitamins and minerals.

Other names:
Jaggery.

PANELA
Source: Sugarcane plant

Sugars: Sucrose, glucose, fructose

Energy (K/g): 17 | GI: Moderate

= sweetness

Production:
Considered non-centrifugal sugar, the juice from the sugarcane is extracted via crushing and is then boiled down to a thick syrup. It is either left to form solid lumps or beaten to form granules.

Comments:
May contain traces of vitamins and minerals.

Other names:
Rapadura, evaporated cane juice, raw cane sugar.

RICE MALT SYRUP
Source: Rice

Sugars: Glucose, maltose, maltotriose

Energy (K/g): 12 | GI: 98

70% as sweet

Production:
Commercial preparation involves removing the hemicellulose, protein and lipid fractions from the brown rice to produce rice dextrin. The rice dextrin then goes through further steps to convert polysaccharides to predominantly monosaccharides carbohydrates which are concentrated to the desired water content.

Comments:
A mild flavoured sweetener, also known as a maltosebased sweetener.

Other names:
Brown rice syrup.

NONNUTRITIVE

ASPARTAME
Source: N/A

Sugars: N/A – Non-nutritive sweetener

Energy (K/g): 0 | GI: N/A

150-250 times sweeter

Production:
Aspartame is a methyl ester of aspartic acid/ phenylalanine dipeptide. Typically aspartame is made through chemical synthesis.

Comments:
Breaks down in the body to aspartic acid, phenylalanine and a small amount of methanol.

Brand name/s:
NutraSweet.

MONK FRUIT (COMMERCIAL)
Source: Monk fruit (a small melon)

Sugars: Mogrosides

Energy (K/g): 0 | GI: N/A

200-400 times sweeter

Production:
Monk fruit naturally contains sucrose, glucose and the high-intensity sweetener mogroside. Extracting the mogrosides involves crushing the fruit, adding water, filtering and spray drying.

Comments:
It is challenging stevia as the next 'natural' high intensity sweetener as it is heat stable, acid stable and soluble in water.

Other names:
Luo Han Guo.

POLYOLS
Source: Organic compounds typically derived from sugars

Sugars: N/A – Non-nutritive sweetener

Energy (K/g): 8 | GI: N/A

25% as sweet

Production: Whilst polyols can occur naturally, most are produced industrially from sugars (pentoses and hexoses). To obtain sorbitol, xylitol and lacticol sugars are hydrogenated with a nickel catalysts. Erythritol is made through fermentation of glucose and sucrose.

Comments: Polyols are considered tooth friendly, however excess consumption may have a laxative effect. This is because the body treats them more like dietary fibre than sugars.

Other names: Sugar alcohols, polyhydric alcohols, polyalcohols, alditols, malitol, mannitol, sorbitol, erythritol, xylitol.

SACCHARIN
Source: N/A

Sugars: N/A – Non-nutritive sweetener

Energy (K/g): 0 | GI: N/A

300-500 times sweeter

Production:
Saccharin is a sodium salt, made through the oxidation of o-toluenesulfonamide and/or phthalic anhydride.

Comments:
It can provide a bitter or metallic aftertaste. Saccharin crosses the placenta and is secreted in breast milk. It is not metabolized in the body, instead excreted in the urine.

Brand name/s:
Sucaryl.

STEVIA
Source: Stevia plant

Sugars: N/A – Non-nutritive sweetener

Energy (K/g): 0 | GI: N/A

500 times sweeter

Production: The leaves are boiled, then the liquid is passed through a resin and washed in alcohol to release the glycosides. These are then re-crystallised to produce the commercial product. The steviol glycosides molecules in the leaves provide the sweet taste. Seven glycosides have been extracted, the two most commonly used are stevioside and rebaudioside A.

Comments: Stevia can leave a bitter aftertaste. Predominantly used in beverages, although also found in some 'low-sugar' foods. Can be challenging to replace all the sugar with stevia as it loses sugar's bulking, browning and aeration properties.

Other names: Native, Naturals, Canderel green, Fructevia.

SUCRALOSE
Source: Sucrose

Sugars: N/A – Non-nutritive sweetener

Energy (K/g): 0 | GI: N/A

400-600 times sweeter

Production:
Manufacture occurs through chlorination of sucrose in a multistep synthesis.

Comments:
When combined with maltodextrins (used as bulking agents) there is a small contribution to energy. It is also stable in heat, so can be used in baking.

Brand name/s:
Splenda.