The different types of sweeteners 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 calorific 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 has a GI of 65 (medium) and provides 17kJ/g.

<table>
<thead>
<tr>
<th>Sweetener</th>
<th>Source</th>
<th>Sugars</th>
<th>Energy (kJ/g)</th>
<th>GI</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agave</td>
<td>Agave Plant</td>
<td>Fructose (55-90%), glucose</td>
<td>22</td>
<td>19-28</td>
<td>1-2 times sweeter</td>
</tr>
<tr>
<td>Coconut sugar</td>
<td>Flower of the coconut plant</td>
<td>Sucrose, glucose, fructose</td>
<td>17</td>
<td>54</td>
<td>Less sweet, less sweet, slightly less sweet, sweeter</td>
</tr>
<tr>
<td>Date sugar</td>
<td>Dates</td>
<td>Glucose, fructose, sucrose</td>
<td>12</td>
<td>39-45</td>
<td>Slightly less sweet, sweeter</td>
</tr>
<tr>
<td>Dextrose</td>
<td>Starch</td>
<td>Glucose</td>
<td>17</td>
<td>100</td>
<td>120-160 times sweeter</td>
</tr>
<tr>
<td>Fruit juice concentrate</td>
<td>Fruit varieties</td>
<td>Glucose, fructose, sucrose</td>
<td>~17</td>
<td>Unknown</td>
<td>Variable</td>
</tr>
<tr>
<td>High fructose corn syrup (HFCS)</td>
<td>Corn</td>
<td>Fructose, glucose</td>
<td>17</td>
<td>55-66</td>
<td>Slightly less sweet</td>
</tr>
<tr>
<td>Honey</td>
<td>Nectar collected by bees</td>
<td>Fructose, glucose</td>
<td>17</td>
<td>32-87</td>
<td>1-2 times sweeter</td>
</tr>
<tr>
<td>Maple syrup</td>
<td>Sap of the maple tree</td>
<td>Sucrose, glucose, fructose</td>
<td>17</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Molasses</td>
<td>Sugarcane plant</td>
<td>Sucrose, glucose, fructose</td>
<td>17</td>
<td>55-60</td>
<td>1-2 times sweeter</td>
</tr>
</tbody>
</table>

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.

Comments: It typically takes seven years for the sugar content to reach a reasonable level.

Other names: Agave syrup, agave nectar.

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.

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.

Other names: Coconut blossom sugar, coconut palm sugar, coco sap sugar, coco sugar.

Production: Made from powdering dried dates. Commercial varieties may have a flowing agent added to help reduce clumping in the packet.

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.

Other names: Date syrup, date molasses.

Production: Whilst the stach 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.

Comments: Most commonly used in beer making.

Other names: Glucose (D-glucose).

Production: Made by evaporating most of the water from the fruit puree, concentrating the natural sugar content.

Comments: Can contain traces of vitamins and minerals.

Other names: Fruit concentrates.

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.

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.

Other names: Glucose-fructose, isoglucose, glucose-fructose syrup.

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.

Comments: Contains traces of organic acids, vitamins and some minerals, however not at a nutritionally significant level.

Other names: N/A

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.

Comments: May contain trace amounts of iron, calcium and phosphorus.

Other names: Treacle, blackstrap molasses.
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#### Caloric

<table>
<thead>
<tr>
<th>Palm Sugar</th>
<th>Panela</th>
<th>Rice Malt Syrup</th>
<th>Aspartame</th>
<th>Monk Fruit (Commercial)</th>
<th>Polyols</th>
<th>Saccharin</th>
<th>Stevia</th>
<th>Sucralose</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI: ~55</td>
<td>GI: ~65</td>
<td>GI: 98</td>
<td>GI: N/A</td>
<td>GI: N/A</td>
<td>GI: 8</td>
<td>GI: N/A</td>
<td>GI: N/A</td>
<td>GI: N/A</td>
</tr>
</tbody>
</table>

**Comments:**
- Slightly less sweet
- 70% as sweet
- 150-250 times sweeter
- 200-400 times sweeter
- 60-70% less sweetener
- 300-500 times sweeter
- 200 times sweeter
- 400-600 times sweeter

**Other names:**
- Rapadura, evaporated cane juice, raw cane sugar.
- A mild flavoured sweetener, also known as a maltose-based sweetener.
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- Luo Han Guo.
- Brown rice syrup.
- Native, Naturals, Canderel green, Frucetia.

**Production:**
- The blossom bearing 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.
- 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.
- Commercial preparation involves removing the hemioleotulose, 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.
- Aspartame is a methyl ester of aspartic acid/phenylalanine dipeptide. Typically aspartame is made through chemical synthesis.
- Saccharin is a sodium salt, of o-toluenesulfonamide and/or phthalic anhydride. Made through the oxidation of phenylhydroxylamine.

**Comments:**
- May contain traces of vitamins and minerals.
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- Saccharin crosses the placenta and is metabolized in the body, instead excreted in the urine.
- Saccharin 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, binding and aeration properties.

**Other names:**
- Jaggery.
- Stevioside and rebaudioside A.
- Rebaudioside A.
- Steviol glycosides. 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.

**Production:**
- Manufacture occurs through chlorination of sucrose in a multistep synthesis.
- 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:**
- Jaggery.
- Nudin.
- Native, Naturals, Canderel green, Frucetia.

**Saccharin:**
- Non-nutritive sweetener. It is not metabolized in the body and has a bitter or metallic aftertaste. Saccharin crosses the placenta and is not metabolized in the body, instead excreted in the urine.
- Saccharin is a sodium salt, made through the oxidation of o-toluenesulfonamide and/or phthalic anhydride.

**Stevia:**
- This is because the body treats them more like dietary fibre than sugars.
- 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.

**Sucralose:**
- Manufacture occurs through chlorination of sucrose in a multistep synthesis.
- 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.