

Table Sugar (Sucrose), Sorbitol and Fructose

Sucrose (Table sugar) and diabetes: Sucrose (cane sugar) is mostly digested in the small intestine by the enzyme sucrase, (which is made by the lining of your small intestine). Sucrase splits sucrose into glucose and fructose. The glucose is absorbed directly into your bloodstream, where it raises blood sugar quickly and stimulates the release of insulin which acts like a key to your body's cells for using the blood sugar as energy. The fructose component of sucrose has to be converted into glucose by your liver before your body can use it for energy. With diabetes, the body doesn't make enough insulin or can't use it as well as it should. When there isn't enough insulin or cells stop responding to insulin, too much blood sugar stays in your bloodstream and over time this can cause serious health problems, such as heart disease, vision loss, and kidney disease.

Sweeteners: These are sugar substitutes that are added to food and provide a sweet taste like that of normal conventional sugar while containing significantly less food energy (kilojoules or calories) than sugar. There are two main types of sweeteners used in the food and beverage industry: fructose and sugar alcohols (e.g. xylitol, erythritol and sorbitol).

1. **Sorbitol:** is a sugar alcohol that may be useful as an alternative to sugar for people with diabetes as it significantly reduces the rapid rise in blood glucose and the insulin response associated with the ingestion of glucose. This occurs as sorbitol is not fully digested in your small intestine and what remains of the compound from there moves into the large intestine where it's instead fermented, or broken down by bacteria, resulting in fewer calories being absorbed.

Sorbitol's have a structure similar to that of sugars but contains an alcohol molecule, so they taste sweet but are not absorbed and metabolized in the same way as sugar. Sorbitol also occurs naturally and is found in dried fruit (prunes and raisins) and fresh fruit (avocado pears, apples and pears), beer, and wine. However, it can also be manufactured synthetically using glucose as a starting point. Sorbitol is commonly used in diet products, chewing gum, candy, frozen ice treats, and some medicines (such as syrups for fevers and colds). As Sorbitol contains approximately two-thirds of the calories of table sugar and provides about 60% of the sweetness, it commonly used to sweeten low-calorie foods - an added spin-off with sorbitol is that it does not cause tooth decay.

2. **Fructose:** A natural occurring sugar that is usually found together with two other sugars -- glucose and sucrose - in honey and fruit, fruit juice, and high fructose corn syrup. It is also found in soda drinks and fruit drinks. Fructose has to be converted into glucose by your liver before your body can use it for energy. The new glucose is then absorbed directly into your bloodstream from the small intestine, altogether a slower process. Thus, it raises blood sugar levels more gradually than sucrose and does not appear to immediately affect insulin levels.

However, Fructose in processed foods and beverages has been linked to several negative health effects, including obesity, type 2 diabetes, insulin resistance, and fatty

liver disease. Consuming fructose may also increase feelings of hunger and sugar cravings.

3. **Caution:** Both Fructose and Sorbitol can cause gas, abdominal bloating and pain, and diarrhoea in people who have fructose or sorbitol intolerance.

Individuals with hereditary fructose intolerance are born without the protein, called Adolase B, necessary to digest fructose. Heredity fructose intolerance symptoms can begin in infancy when a child is given baby formula or baby food containing fructose. The signs of hereditary fructose intolerance can be quite severe and may include convulsions, poor feeding, excessive sleepiness, jaundice, vomiting and irritability.

Sugar alcohols (e.g. Sorbitol) are not fully absorbed by the body but can cause significant gastrointestinal distress in some, not all individuals. Symptoms of a sorbitol intolerance include bloating, discomfort, gas, diarrhoea and abdominal pain. Sugar alcohol intolerance frequently co-occurs with irritable bowel syndrome.

Compiled from various sources by Bruce Milne, 14.08.2023