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Can This Natural Sweetener Lower Blood Sugar?

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STORY AT-A-GLANCE -

- Sugar is a carbohydrate, but most of the allulose you consume is excreted by the kidneys before it is metabolized, leaving you with few calories. It may also help lower your blood sugar
- Sucrose (white table sugar) and high-fructose corn syrup (HFCS) are two of the more common sweeteners derived from plant sources; both negatively affect metabolism, but HFCS has significantly worse effects than white sugar
- HFCS is cheaper and 20% sweeter than sugar, and thus more cost effective for food manufacturers. The FDA recently exempted allulose from being listed as an added sugar in processed foods
- Artificial sweeteners like Splenda may lower your gut bacteria, increase your intestinal pH and accumulate in fat cells; Splenda is linked to leukemia and aspartame (Nutrasweet) is linked to insulin intolerance

Many people have a sweet tooth. For some, it can become an addiction,[1] fueled by a food industry that continually creates an abundance of highly palatable, inexpensive, ultraprocessed foods. As some companies cash in on a market for lab-created, low-calorie sweeteners, one natural sweetener may help curb your sweet tooth without raising your blood sugar. In fact, it may have the opposite effect.

While manufacturers seek out "perfectly engineered food,"[2] the incidence of obesity[3] and obesity-related health conditions[4] has skyrocketed. Type 2 diabetes is one of the

obesity-related conditions that has a significant impact on many of your bodily systems.

People with **diabetes** have a higher risk of also having heart disease, stroke, glaucoma, kidney disease and high blood pressure.[5] It would make sense if the incidence of diabetes and obesity goes down, you could have a positive impact on these conditions that contribute to at least five of the top 10 leading causes of death.[6]

The obesity epidemic is one of the most important global public health challenges. Obesity was linked with 4.7 million premature deaths worldwide in 2017[7] and according to the National Diabetes Statistics Report, 34.2 million people, or 10.5% of the U.S. population, has diabetes.[8] By using this sweetener you may reduce your risk of insulin resistance, a primary symptom of diabetes.

Not All Sugar Is Created Equally

Sugar is a carbohydrate[9] found in fruits and vegetables and added to food products. Added sugars are usually sucrose (table sugar) and high-fructose corn syrup (HFCS). Once digestion has started in the stomach, sugars break down into one of three monosaccharides from which other sugars are formed.

These include glucose, fructose and galactose. Glucose is one of the main compounds found in sucrose, lactose and maltose. These are disaccharide sugar compounds commonly found in foods. Fructose is the main type of sugar found in fruits and vegetables and galactose is found mostly in dairy products.

In the West, the most used plant-based sweeteners are sucrose and HFCS, a sweetener made from corn. Evidence shows us that no matter what type of sugar you are consuming, it has a significant effect on your metabolism, even in the healthiest people.

Sugar hides under as many as 61 different names in 74% of processed food products[10] and while there are copious numbers of studies over decades demonstrating the damage it does to your health, the industry has managed to bury the evidence and claim it has little to no effect on your health or your weight.

In one 12-week study,[11] researchers demonstrated men who ate 650 calories a day of sugar had higher levels of fat in their blood and liver. Interestingly, the researchers separated the two groups into those who had evidence of nonalcoholic fatty liver disease (NAFLD) and those who did not. During the study, each participant followed both diets for 12 weeks.

Lead researcher Bruce Griffin, Ph.D., from the University of Surrey, commented on the results saying,[12] "Our findings provide new evidence that consuming high amounts of sugar can alter your fat metabolism in ways that could increase your risk of cardiovascular disease."

Sugar can also affect your brain, mood and behavior. Several studies have found an association between a rising intake of sugar and an increase in rates of depression.[13,14,15]

Sugar stimulates the release of dopamine,[16] which is a neurotransmitter that plays a role in many important pathways, many of which affect your mood. This is why sugar feels so good and why manufacturers use it to drive your behavior. But, like other addictive drugs, sugar is not healthy.

Allulose Natural Sweetener Has Unique Action on Blood Sugar

One natural sweetener option is Astrea Allulose. Although the market in Japan is significant,[17] it is a relatively little-known alternative sweetener in the West. Allulose is found in small quantities in some fruits such as figs, jackfruit and raisins and was given a generally regarded as safe (GRAS) food designation by the FDA.[18]

Allulose is a monosaccharide sugar that differs from fructose only at one of the carbon atoms.[19] This one change makes a world of difference in the way the molecule acts in the body. It is functionally a carbohydrate and mostly absorbed in the small intestines. However, the majority of allulose is excreted by the kidneys before it is metabolized.[20]

This means that most of the calories you consume from allulose are excreted through your kidneys before being metabolized. It has only been recently that the FDA[21]

differentiated allulose from sucrose or HFCS on nutrition labels. Before this, anytime it was added to a processed food, it was simply listed as an added sugar.

Therefore, there was little incentive to include allulose in products. Since allulose has 95% fewer calories than sucrose,[22] the FDA allowed manufacturers to exclude it from the total and added sugar counts on nutrition labels.[23]

The percentage of the monosaccharide that is not metabolized does not contribute to energy or caloric intake. In one animal study, researchers found allulose[24] contributes a fraction of 1% of the energy of sucrose.[25]

The researchers called the energy value "effectively zero" and suggested that this "rare sugar providing zero energy … may be useful in sweeteners for obese people as an aid for weight reduction."[26]

In addition to contributing little to no calories, allulose elicits a physiological response in the body that may lower your blood glucose[27] and reduce abdominal fat[28] and fat accumulation around the liver.[29,30] This may reduce the rising number of people who have **NAFLD**. Allulose can also decrease insulin resistance[31] and reduce the potential risk for Type 2 diabetes.[32]

Natural Compound May Reduce Glucose With Few Side Effects

In an analysis of 40 human trials,[33] allulose demonstrated the ability to significantly reduce after-meal insulin response, which the researchers believe "lead to modest improvements on postprandial glucose and insulin regulation."[34]

Another study[35] engaged 30 people who did not have diabetes. They were given a loading dose of sucrose and then randomized to receive 2.5, 5, 7.5 or 10 grams of allulose. Plasma glucose and insulin levels were measured at 30, 60, 90 and 120 minutes after ingestion. The researchers found that in a dose-dependent manner, allulose reduced plasma glucose and insulin levels.

In other words, allulose not only contributes very little to caloric intake or blood glucose, but it also may help to improve insulin regulation. While there are not yet allulose-specific human studies regarding safety, animal studies[36] have not found toxicity even at high doses.

In one nonrandomized controlled trial[37] using 30 healthy individuals within a normal BMI range, researchers discovered individuals experienced gastrointestinal (GI) symptoms when the dose reached 0.4 grams per kilogram of body weight (g/kg*BW). Gastrointestinal tolerance testing did not indicate severe diarrhea or other symptoms until the dose read 0.5 g/kg*BW.

The researchers suggest that based on their results a maximum single dose should not be over 0.4 g/kg*BW.[38] This means a person who weighs 160 pounds could eat 29 grams of allulose in one serving, which is equivalent to 7.25 teaspoons of sugar, without experiencing GI symptoms.

While there is no immediate toxic effect on the body, evidence does suggest that consistent use may affect the weight of your kidneys and liver, the two organs through which the natural sweetener passes. In a study published in 2019,[39] researchers noted that using allulose can prevent **obesity**, but continuous consumption may increase the weight of the liver and kidneys "without apparent pathological and functional abnormalities."

The study investigated the potential these parameters could change after the participant no longer consumed allulose. Using an animal model, the researchers fed allulose for four weeks and then a controlled diet without allulose for another 10 weeks. At the end of four weeks the weights of the liver and kidney were higher, but the difference disappeared after the animals were no longer fed allulose.[40]

High-Fructose Corn Syrup Is Worse Than White Sugar

HFCS, aka corn sugar, is another common form of sugar found in processed foods. While it's often cited interchangeably with fructose, actually HFCS and fructose are not the same. Fructose is a simple sweetener found naturally in many fruits and

vegetables.[41] HFCS, on the other hand, is artificially produced from corn, through a process that involves first turning it into corn starch and then back into a mixture of fructose and glucose.[42]

But whether it's simple fructose or HFCS, there is evidence to show this type of sugar causes greater damage than simple glucose or table sugar. This is because fructose does not act like glucose in your body.

In one study,[43] a group of postmenopausal overweight or obese women consumed fructose beverages with their meals for 10 weeks. The data showed this practice increased fasting glucose and reduced the insulin response. The researchers concluded that the "present results suggest that long-term consumption of diets high in fructose could lead to an increased risk of CVD [cardiovascular disease]."[44]

Unfortunately, because HFCS is cheaper and 20% sweeter than regular table sugar, it's used by many food and beverage manufacturers, and it has been shown through numerous studies that it not only can contribute to impaired glucose tolerance,[45] cardiovascular disease and diabetes, but also can disrupt your sense of hunger and satiety.[46]

In regard to diabetes, with one global analysis of 43 countries,[47] researchers found in areas where HFCS was highly available, the prevalence of diabetes was 20% higher. The results suggested that increased consumption of HFCS increased the risk of Type 2 diabetes, which was independent of obesity.

In another study,[48] men and women were given 24 ounces of either a HFCS- or sucrose-sweetened **beverage**. Blood and urine samples were collected over six hours and a variety of metabolic biomarkers were measured. The researchers found that HFCS led to significantly different acute metabolic effects than sucrose.

Initially, experts thought fructose would be a better choice because it has a low glycemic index. However, only the liver can metabolize fructose.[49] And, as mentioned, consuming fructose also increases your appetite, which ultimately contributes to obesity, diabetes and NAFLD.[50]

The Toxic Effects of Artificial Sweeteners

Many sweeteners have side effects, and those from artificial sweeteners are more toxic than others. Research in 2008[51] revealed that sucralose, also known as Splenda, reduces your gut bacteria by 50% and increases the pH level in your intestines. A study[52] from 2018 found sucralose is metabolized and accumulates in fat cells.

Research published in 2016 from the Ramazzini Institute linked Splenda to leukemia.[53] Not long after this study was published in a peer-reviewed journal, the company engaged public relations firm Ketchum, notorious for its close work with Monsanto and promotional work for genetically engineered crops.

It appears the marketing ploy worked, as the company reduced the impact of the scientific evidence. By 2017, market research showed the market size for Splenda was valued at $697.4 million and was projected to increase 3% through 2025.[54] North America and Asia-Pacific accounted for the majority of the market share.

Originally, it was hoped that artificial sweeteners would help curb cravings for sweets in people who have diabetes. Yet, in one study[55] using health participants it took only two weeks for the artificial sweetener to trigger adverse effects on blood sugar levels, which lead study author Richard Young from the University of Adelaide commented on in a press release:[56]

> *"This highlights the potential for exaggerated post-meal glucose levels in high habitual NAS [noncaloric artificial sweeteners] users, which could predispose them to developing Type 2 diabetes."*

Artificial sweeteners may also increase your risk of weight gain, obesity, metabolic syndrome and other related problems like Type 2 diabetes by inducing "metabolic derangements," according to a report published in the journal Trends in Endocrinology and Metabolism.[57]

Further research found aspartame (NutraSweet), another artificial sweetener, is associated with greater glucose intolerance in people with obesity.[58] These are only

some of the side effects of artificial sweeteners, which increase your risk of challenging health conditions and are not a safe alternative to table sugar.

You can find more information about Splenda in "**Beware the Latest 'Diet' Fad: Artificial Sweeteners Fortified With Vitamins and Minerals**" and "**Research Reveals Shocking Information About Sucralose (Splenda) Side Effects**."

The article "**Top 8 Tips to Optimize Your Blood Sugar Level**" lists some of the top ways you can take control of your health and reduce your risk of diabetes. The following articles offer some dietary suggestions that may help your body regulate glucose:

- **Garlic Supports Healthy Blood Sugar**
- **These Herbs and Spices Can Help Deter Diabetes**
- **Seven Reasons You Should Drink Moringa Tea**

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