HEALTH BASICS

Sweeteners - sugar substitutes

Sugar substitutes are ingredients that sweeten foods and drinks with less sugar.

WHAT IT IS
Ingredients that provide sweetness in place of sugar

WHERE IT COMES UP
Food labels, drinks, medicines, cooking and diabetes care

WHY IT MATTERS
Changes sugar, calorie, dental and blood glucose exposure

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
A dietitian, pharmacist or primary care clinician

HOW IT IS CHECKED
Food labels; no medical test is usually needed

Overview

Sugar substitutes are ingredients used to make foods, drinks and medicines taste sweet. They are also called sweeteners, artificial sweeteners, non-sugar sweeteners or low-calorie sweeteners. These terms do not always mean exactly the same thing.

Some substitutes are much sweeter than table sugar, so only a small amount is needed. Examples include aspartame, sucralose, saccharin, acesulfame potassium, steviol glycosides and monk fruit extracts.

Another group is called sugar alcohols, or polyols. Despite the name, they do not contain drinking alcohol. Examples include sorbitol, xylitol, maltitol and erythritol. They are usually less sweet than high-intensity sweeteners and can still provide carbohydrate or calories.

Sugar substitutes are not a disease, diagnosis or treatment. Whether they are useful depends on what they replace, how much you consume and your individual health needs.

How it works

Ordinary sugar provides sweetness and carbohydrate. Your digestive system breaks most

sugars down into smaller molecules, including glucose. Glucose enters the bloodstream and can be used for energy.

High-intensity sweeteners activate sweetness receptors on the tongue but are used in very small amounts. Most add little or no carbohydrate to a serving. Different sweeteners are handled differently by the body: some are absorbed and broken down, while others pass through largely unchanged.

Sugar alcohols are partly or poorly absorbed in the small intestine. They generally affect blood glucose less than the same amount of ordinary sugar, but the effect is not always zero. The rest may reach the large intestine, where gut bacteria can break it down.

Food manufacturers may blend several sweeteners to improve taste or make a product suitable for cooking. Some products also contain starches, flour, fruit concentrates or fat. As a result, a "sugar-free" product is not automatically free from calories or carbohydrate.

Regulators assess food additives and set acceptable daily intake levels where appropriate. An acceptable daily intake is an amount that can be consumed every day over a lifetime without an appreciable health risk. It is a safety limit, not a recommended target and not a boundary where a single extra serving is expected to cause harm.

Why it matters for your health

Replacing a sugary food or drink with a lower-sugar option can reduce added sugar intake. It may also reduce calories if the replacement contains less energy and you do not make up the difference elsewhere.

This can be useful when managing blood glucose. However, the whole product matters. A biscuit made with a sugar substitute may still contain carbohydrate from flour, for example. Sweeteners do not treat low blood glucose, and a diet drink may not provide the carbohydrate needed for that situation.

Frequent exposure to ordinary sugars supports the bacteria involved in tooth decay. Non-sugar sweeteners are generally not fermented by mouth bacteria in the same way. Replacing sugary drinks or sweets may therefore reduce one source of dental risk, although brushing, fluoride and dental care remain important.

Evidence about long-term weight and health effects is less straightforward. Clinical trials often show modest benefits when sweeteners directly replace sugar and calories. Observational studies sometimes find links between high sweetener intake and conditions such as type 2 diabetes or cardiovascular disease, but these studies cannot reliably show cause and effect. People at higher health risk may already be more likely to choose diet products.

The World Health Organization advises the general population not to rely on non-sugar sweeteners as a long-term weight-control strategy. This conditional recommendation concerns long-term health outcomes, not whether approved sweeteners are toxic at permitted intakes. It also does not apply to people who already have diabetes.

What can go wrong

Sugar alcohols can draw water into the bowel and be fermented by gut bacteria. Larger amounts may cause bloating, wind, abdominal discomfort or diarrhoea. People with irritable bowel syndrome may be particularly sensitive to certain polyols.

Aspartame contains phenylalanine. People with phenylketonuria, usually shortened to PKU, cannot process phenylalanine normally and must limit it carefully. Foods containing aspartame carry a phenylalanine warning in countries where labelling rules require one.

A "no added sugar" or "sugar-free" claim can be misunderstood. The product may still contain naturally occurring sugars, other carbohydrates, calories or ingredients that affect blood glucose. It may also be high in saturated fat or salt.

Sweeteners can support lower-sugar choices, but they do not make an otherwise unbalanced diet nutritious. Drinks and snacks that taste very sweet may also maintain a preference for intense sweetness, although the practical importance of this is uncertain.

Serious reactions to approved sweeteners are uncommon. Seek emergency help for breathing difficulty, swelling of the face or throat, fainting, or other signs of a severe allergic reaction after eating any food. Persistent diarrhoea, abdominal discomfort or difficulty managing blood glucose usually calls for routine follow-up rather than emergency care.

What you can do

There is no medical test that tells you which sweetener is best. You can make a practical choice by checking the whole product rather than focusing on one claim.

If you have no dietary restriction, digestive problem or concern about sugar intake, you may not need to do anything. Water and unsweetened foods are reasonable options when you do not need extra sweetness.

Speak with a pharmacist about sweeteners in liquid medicines, chewable tablets or powders. A primary care clinician or dietitian can help if label information is difficult to apply to diabetes, PKU or ongoing digestive problems.

- Read the ingredient list for named sweeteners and sugar alcohols
- Check total carbohydrate, total sugars and added sugars where listed
- Compare calories and serving sizes between similar products
- Keep a food and symptom record if polyols seem to upset your bowel
- Ask a dietitian how sweetened products fit your diabetes or nutrition plan
- Check medicines and supplements if you need to avoid phenylalanine

Common questions

Are sugar substitutes healthier than sugar?

Not automatically. They can reduce sugar or calories when they genuinely replace them. Their value is smaller if the product remains high in calories, refined starch, saturated fat or salt.

Do sugar substitutes raise blood glucose?

High-intensity sweeteners usually have little direct effect because very small amounts are used. Sugar alcohols and other ingredients in the product may have an effect. Use the total carbohydrate information and your agreed glucose-monitoring plan rather than relying only on a "sugar-free" label.

Does "natural" mean safer?

No. "Natural" describes a source or marketing category, not the level of evidence or risk. Plant-derived and manufactured sweeteners both require appropriate safety assessment.

Does aspartame cause cancer?

In 2023, the International Agency for Research on Cancer classified aspartame as "possibly carcinogenic," based on limited evidence about whether it could cause cancer. A separate food-safety assessment by the Joint FAO/WHO Expert Committee on Food Additives found that the available evidence was not convincing enough to change its established acceptable daily intake. Hazard classifications describe whether something might cause harm under some circumstances; they do not show the risk from a person's usual exposure.

Are sweeteners safe during pregnancy or for children?

Approved sweeteners have been assessed for their permitted food uses, but they are not necessary parts of the diet. During pregnancy or childhood, the overall quality of foods and drinks remains more important than choosing a particular sweetener. Ask a dietitian or relevant clinician if sweetened products make up a large part of the diet or if PKU is present.

Sources

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