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WEIGHING REAL AND ARTIFICIAL SUGAR

The difference between artificial sweeteners and sugar

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When artificial sweeteners entered the US market in the 1950s, food manufacturers made a big claim: That they could satisfy the American sweet tooth without the negative health effects — and calories — of sugar.



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Today, artificial sweeteners and other sugar substitutes have become ubiquitous in the food supply, showing up in a slew of products including diet sodas, sliced bread and low-sugar yoghurts — not to mention your morning coffee.

But questions about sugar substitutes have been swirling for decades, with scientists and public health officials suggesting they might come with certain health risks of their own. The research on how sugar substitutes affect our bodies is preliminary, complex and sometimes contradictory.

“They haven’t been studied as much as they should be in humans,” said Dr Dariush Mozaffarian, a cardiologist and director of the Food is Medicine Institute at Tufts University.

That leaves us with many questions about how to weigh their potential benefits and risks. Here’s what we know.

baked goods and frozen desserts. Many are also sold as stand-alone products, in powder or liquid form.

SUGAR SUBSTITUTES ARE GROUPED ACCORDING TO HOW THEY’RE MADE

— Artificial sweeteners are synthetic food additives that are 200 to 20,000 times sweeter than table sugar, according to the Food and Drug Administration. Since the 1970s, the agency has approved six of them: aspartame (sold under the brand names NutraSweet and Equal), sucralose (Splenda), saccharin (Sweet’N Low), acesulfame potassium (Sweet One, Sunett), neotame (Newtame) and advantame.

— Plant- and fruit-based sweeteners are made from the leaves or fruits of certain plants and are at least 100 times sweeter than sugar, according to the FDA. They include extracts from the stevia plant (*Truvia*, *Pure Via*, *Enliten*) and from monk

bohydrates) than sugar. They have names like sorbitol, xylitol, mannitol and erythritol and are naturally found in certain fruits and vegetables like pineapples, prunes and mushrooms. The kind used in packaged products are synthetically produced and permitted by the FDA for use as sugar substitutes.

WHAT ARE THE POTENTIAL BENEFITS AND RISKS?

There is some evidence that if you regularly drink sugar-sweetened beverages like sodas and sweet teas, switching to diet versions may help you lose a little weight — as long as you don’t consume more calories from other sources, said Maya Vadiveloo, an associate professor of nutrition at the University of Rhode Island.

In one 2022 review of 12 randomised clinical trials, most lasting six months or less, researchers concluded that substituting sugar-sweetened beverages with low- or no-calorie sweetened beverages could lead to some weight loss — about 1kg, on average — in adults who are overweight or obese and who have (or are at risk for) diabetes.

Dr Kael Nadolsky, an endocrinologist and assistant clinical professor at the Michigan State University College of Human Medicine, said he’s seen that amount of weight loss, and

of Public Health.

But to completely resolve these issues of cause and effect, scientists would need to design studies that directly measure how sugar substitutes affect human health in the long term, said Marion Nestle, an emerita professor of nutrition, food studies and public health at New York University. And that research is practically impossible to do. “You can’t lock people up long enough to feed them one or another artificial sweetener and see what happens,” she said.

Still, some (but not all) well-controlled animal studies and small human experiments, which can show cause and effect, have shown hints of how certain sweeteners

the goal is to minimise your consumption of both over the long term.

Vadiveloo agreed, suggesting ways to gradually reduce both added sugars and sugar substitutes in your diet.

To cut back on regular or diet soda, you might try seltzer sweetened with a small amount of fruit juice, she suggested, or instead of buying sweetened yoghurt, try topping plain yoghurt with fruit and a little honey.

Years ago, Vadiveloo took her coffee with Splenda, but she slowly reduced the amount she used. “Now I just take my coffee with milk, and I don’t miss the sweetness,” she said. © 2024 THE NEW YORK TIMES COMPANY

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“They haven’t been studied as much as they should be in humans,” said Dr Dariush Mozaffarian, a cardiologist and director of the Food is Medicine Institute at Tufts University.

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WHAT IS A SUGAR SUBSTITUTE?

The term includes a range of substances that taste sweet but lack the calories found in sugar. They are sometimes hundreds to tens of thousands of times sweeter than sugar, so a little goes a long way.

They’re used to sweeten many “sugar-free” and “diet” foods and drinks, including energy drinks, chewing gum, candies, baked goods and frozen desserts. Many are also sold as stand-alone products, in powder or liquid form.

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— Plant- and fruit-based sweeteners are made from the leaves or fruits of certain plants and are at least 100 times sweeter than sugar, according to the FDA. They include extracts from the stevia plant (Truvia, Pure Via, Enliten) and from monk fruit. Thaumatin, a less common low-calorie sweetener sold under the brand name Talin, is made from the West African katemfe fruit. The FDA generally recognises these sweeteners as safe, so manufacturers can add them to foods and drinks.

— Sugar alcohols, which are neither sugars nor alcohols, are a type of carbohydrate that tastes sweet but has fewer calories (and carbohydrates) than sugar. They have names like sorbitol, xylitol, mannitol and erythritol and are naturally found in certain fruits and vegetables like pineapples, prunes and mushrooms. The kind used in packaged products are synthetically produced and permitted by the FDA for use as sugar substitutes.

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Dr Karl Nadolsky, an endocrinologist and assistant clinical professor at the Michigan State University College of Human Medicine, said he's seen that amount of weight loss, and often more, in many of his patients when they switch to diet beverages.

But longer-term studies on sugar substitutes have found no weight loss benefits, and even some harms. For this reason, the World Health Organization recommended in 2023 that people avoid using sugar substitutes for weight control or better health, citing research that linked them to greater risks of health concerns like Type 2 diabetes, cardiovascular disease, obesity and earlier death.

The sugar alcohols erythritol and xylitol have also been associated with a greater risk of heart attack and stroke.

It's hard to draw firm conclusions from studies on diet and health. This type of research is observational, meaning it can link the consumption of sugar substitutes with certain health effects, but it can't prove cause and effect, said Valisa E. Hedrick, an associate professor of nutrition at Virginia Tech. It's possible that diet soda drinkers are simply less healthy to begin with, she explained. Or perhaps other ingredients in the foods or drinks are responsible for causing harm.

Many scientists have tried to account for these limitations and still found consistent links between the sweeteners and health issues, said Dr Jim Krieger, a professor emeritus at the Uni-

versity of Washington School of Public Health.

But to completely resolve these issues of cause and effect, scientists would need to design studies that directly measure how sugar substitutes affect human health in the long term, said Marion Nestle, an emeritus professor of nutrition, food studies and public health at New York University. And that research is practically impossible to do. “You can’t lock people up long enough to feed them one or another artificial sweetener and see what happens,” she said. Still, some (but not all) well-controlled animal studies and small human experiments, which can show cause and effect, have shown hints of how certain sweeteners might lead to health problems, Krieger said. Some research has found that sugar alcohols can increase the risk of blood clotting, and therefore the risk of heart attack and stroke, and that other sugar substitutes can change the gut microbiome and impair blood sugar control.

THE TAKEAWAY

Enough research has raised concerns about sugar substitutes to warrant a closer look, said Dr Eran Elinav, an immunologist and microbiome researcher at the Weizmann Institute of Science in Israel who has studied them. In the meantime, “the jury is still out” on whether they’re harmful, he said, or if certain sugar substitutes are safer than others.

Too much sugar, on the other hand, is unquestionably harmful to health, Elinav said, with research linking it to greater risks of Type 2 diabetes, heart disease and obesity. The American Heart Association recommends that women consume no more than 25g of sugar per day, and men no more than 36g per day. A can of Coca-Cola contains 39g of sugar.

Given those known harms, it’s better to choose artificially sweetened beverages like diet sodas over regular ones if you drink them every day, Mozaffarian said. But, he added, the goal is to minimise your consumption of both over the long term.

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