International Sweeteners Association

Low/no calorie sweeteners and sweet taste

HIGHLIGHTS

Humans have a natural preference for sweetness. Science shows that eating sweet foods doesn't make people like them more or crave more sweetness, rejecting the so-called "sweet tooth" hypothesis.

Low/no calorie sweeteners can help people lower sugar and energy intake without giving up sweet taste.



Humans are born with an innate preference for sweet taste. From early infancy, sweetness signals energy-rich foods and is associated with pleasure and reward. Newborns display positive responses to sweet stimuli and rejection of bitter tastes, reflecting evolutionary pressures to seek high-energy foods while avoiding potentially harmful bitter substances. This biological predisposition once played a critical survival role, guiding our ancestors toward nutrient-dense sources such as fruits in environments where food scarcity was common. [1]

In today's world, however, modern food environments are characterised by an abundant and often excessive availability and consumption of energy and sugars, which are linked to a higher risk of obesity and related chronic diseases. As a result, public health authorities globally emphasise the importance of reducing added sugar consumption as part of a healthier dietary pattern.[2,3]

Health organisations worldwide have recommended lower consumption of free sugars to



5-10 %

of total calorie intake.

The "Sweet Tooth" Hypothesis

At the same time, there is often guidance to reduce our overall dietary exposure to sweet taste, not just sugar intake. A prevailing narrative in nutrition policy suggests that frequent consumption of sweet-tasting foods increases preference for sweetness, often called the *"sweet tooth"* hypothesis, which in turn promotes greater sugar intake and weight gain. However, this notion is not supported by scientific evidence.[4]

Reviews of human clinical studies show **no support for the idea that exposure to sweet-tasting foods drives an increased liking for sweetness**.[4,5] Notably, recent clinical research confirms that long-term exposure to either a low- or high-sweetness diet does not affect liking, preference, or intake of sweet-tasting foods.[6,7] In the short-term, when people consume sweet foods or beverages, their immediate desire for sweetness often decreases, a phenomenon known as *"sensory-specific satiety"*.[8] These findings apply to both sugars and low/no calorie sweeteners, and to both adults and children.

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The challenge of reducing sugar intake

While the need to limit sugar intake is widely recognised, human preference for sweetness can make abrupt dietary changes towards sugar reduction difficult to sustain. Many people struggle to give up sweet-tasting foods, leading to cycles of restriction and relapse. This is where low/no calorie sweeteners can play a useful role. They provide a sweet taste but with little to no caloric contribution. By replacing added sugars in foods and beverages, they allow individuals to enjoy sweetness while reducing overall energy intake.[9]

The role of low/no calorie sweeteners

Low/no calorie sweeteners can support adherence to a healthy, low-sugar diet.[10] Eliminating or drastically reducing sweetness from the diet may not be realistic. Instead, maintaining some level of sweetness in the diet can make healthier eating patterns more sustainable over the long term. In this sense, low/no calorie sweeteners can act as a practical dietary tool that bridges the gap between nutritional guidelines and real-world behaviour. Their use can support gradual dietary improvements and help individuals achieve a more balanced relationship with sweet taste.

There has been ongoing debate about whether the use of low/no calorie sweeteners might perpetuate a "sweet tooth" or increase cravings for sweet foods. This notion suggests that exposure to sweetness without calories could disrupt appetite regulation or reinforce a preference for sweet-tasting foods. However, current scientific evidence does not support this claim.[8,9]

A deep dive into clinical evidence

Recent randomised controlled trials (RCTs) in both adults and children show no support for the "sweet tooth" hypothesis.

The Sweet Tooth trial, a large six-month RCT in 180 adults, showed that **sweet taste preferences remained stable regardless of low, regular, or high exposure to sweet foods and drinks over the study period**.[6] Participants showed no changes in how much they liked sweet tastes or in their perceived sweetness intensity, regardless of diet. Measures of eating behaviour, calorie intake, body weight, and metabolic health also did not differ between groups. Participants naturally reverted to baseline levels of sweet intake after the study ended.

Recent studies from the Monell Chemical Senses Center show similar results. Findings from an RCT in adults show no significant effect of a low-sugar diet on perceived sweetness intensity or preferred sucrose concentration.[7] An RCT in children showed that a four-month intervention with lower-sugar snacks, alongside caregiver education, reduced added sugar intake in preschoolers but did not affect their most preferred sucrose concentration.[11] Children continued to prefer the same high levels of sweetness at the end of the study as they did at the beginning, consistent with earlier findings.[12]

Low/no calorie sweeteners and appetite regulation

Many randomised controlled clinical trials show that low/no calorie sweeteners do not increase overall appetite or lead to greater energy intake compared to sugar. In fact, when used as a substitute for sugar, they are often associated with reduced calorie consumption, which may support weight control over time.[9]



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