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Artificial Sweeteners

Artificial sweeteners are ingredients that do not occur naturally and provide an intense sweet taste with no calories. They are commonly found in ultra-processed foods labeled as diet-friendly or sugar-free, often replacing sugar or other caloric sweeteners. While artificial sweeteners can help people reduce their sugar intake, these ingredients are linked to potential harmful health effects. Natural non-caloric sweeteners are generally preferred over artificial options.

Artificial Sweeteners and Weight Loss

The World Health Organization (WHO) advises against consuming artificial sweeteners for weight loss based on a lack of evidence that these sweeteners support weight loss and research showing potential harmful health effects.[5]

The History of Artificial Sweeteners

Food manufacturers began developing artificial sweeteners and marketing them as healthy alternatives to refined sugar in 1879.[1] These sugar substitutes became increasingly popular in the 1960s and are still widely used today, particularly in ultra-processed beverages and foods. The Food and Drug Administration (FDA) endorses the safety of artificial sweeteners,[2] but some research links artificial sweeteners to harmful health effects.[3,4]

Acceptable Daily Intake (ADI) of Artificial Sweeteners

Before an artificial sweetener is approved by the FDA, an acceptable daily intake (ADI) is established based on toxicity research. The ADI is the amount of an artificial sweetener considered safe to consume each day.[2] While this is important information, studies still show associations between some artificial sweeteners and harmful health effects even when they are consumed within the ADI.[3,4]

The FDA-approved ADIs for artificial sweeteners in the U.S. include:[2]

- **Aspartame:** 50 mg/kg body weight per day
- **Acesulfame potassium:** 15 mg/kg body weight per day
- **Sucralose:** 5 mg/kg body weight per day
- **Neotame:** 0.3 mg/kg body weight per day
- **Advantame:** 32.8 mg/kg body weight per day
- **Saccharin:** 15 mg/kg body weight per day

Types of Artificial Sweeteners

In the United States, several artificial sweeteners are approved for use in food. The following table lists these sweeteners, common brands, and the types of products in which they are found.

Artificial Sweetener
Acesulfame-K or Ace-K (acesulfame potassium) • 200 times sweeter than sugar[6] • Associated brand names: Sunett, Sweet One, Swiss Sweet. Ace-K is also included in artificial sweetener blends, such as Equal (a blend of Ace-K and aspartame). • Food usage: diet and "sugar-free" foods and drinks, pastries, ultra-processed foods • Acesulfame-K is associated with an increased risk of cardiovascular disease,[3,7] cancer,[4] and potentially harmful effects on gut health.[8,9] When a pregnant woman consumes Ace-K, it may be transmitted to her baby through amniotic fluid.[10] It is also transmitted through breastmilk,[11] and the effects on infants are unclear.
Advantame • 20,000 times sweeter than sugar[12] • Associated brand names: none • Food usage: diet and "sugar-free" foods and drinks, ultra-processed foods • There is little research linking advantame to harmful health effects.[13]
Aspartame • 180-250 times sweeter than sugar[14] • Associated brand names: Equal, NatraTaste • Food usage: chewing gum, diet and "sugar-free" foods and drinks, ready-to-drink and instant tea and coffee, pudding, yogurt • Aspartame is associated with an increased risk of strokes,[3] cancer,[4] and weight gain,[15] and changes in gut bacteria.[16] Aspartame contains phenylalanine, making it toxic for people with phenylketonuria.
Cyclamate • 30-40 times sweeter than sugar[12] • Associated brand names: Sugar Twin (Canada), Sweet N' Low (Canada) • Food usage: diet and "sugar-free" foods and drinks, baked goods, "light" yogurt • Cyclamate was banned in the U.S. in 1970 due to concerns about its safety.[17] It is still used in some other countries, including Canada and members of the European Union. • In animal studies, cyclamate is associated with an increased risk of cancer.[18]
Neotame • 8,000 times sweeter than sugar[12] • Associated brand names: Newtame • Food usage: baked goods, diet and "sugar-free" foods and drinks, ultra-processed foods • In animal studies, neotame is associated with harmful effects on gut bacteria.[19,20]
Saccharin • 300 times sweeter than sugar[12] • Associated brand names: Sweet N' Low, Sugar Twin, Necta Sweet • Food usage: baked goods, candy, diet and "sugar-free" foods and drinks, salad dressing, soda, chewing gum • Non-food usage: lip gloss, mouthwash, toothpaste, medications, vitamin supplements • Saccharin is associated with an increased risk of cardiovascular disease,[7,21] potentially harmful effects on gut bacteria,[16] and impaired blood sugar control.[16] Early research also links it to increased oxidative stress, an imbalance between antioxidants and unstable molecules that can damage the body.[22,23]

Health Claims on Packaged Foods Containing Artificial Sweeteners

Artificial sweeteners are commonly found in packaged foods with the following health claims:

- "Diet"
- "Sugar-free"
- "Low-carb"
- "Keto-friendly"
- "Zero sugar"

Artificial Sweetener (continued)
Sucralose • 600 times sweeter than sugar[12] • Associated brand names: Splenda • Food usage: baked goods, frozen dairy desserts, fruit juice, gelatin, soda, chewing gum • Sucralose is associated with an increased risk of coronary heart disease[3] and impaired blood sugar control.[24]

A Note About Stevia

Stevia is a natural, no-calorie sweetener. It is made from the *Stevia rebaudiana* plant, but packaged stevia is sometimes mixed with artificial sweeteners like sucralose. If you use stevia, look for brands that contain just stevia leaf extract.

Image courtesy of 123RF

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