

# Nutrition and Health Info Sheet

# Nonnutritive Sweeteners

*For Health Professionals*

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## What is a nonnutritive or alternative sweetener?

Commonly referred to as artificial sweeteners, nonnutritive or alternative sweeteners serve as a minimal to no-calorie alternative to table sugar, or sucrose. These sweeteners do not provide any nutrients to the body, so they are considered nonnutritive; certain sweeteners, such as stevia, are not considered artificial as they are naturally occurring.<sup>1</sup> Compared to sucrose, nonnutritive sweeteners have a higher intensity of sweetness; as a result, less is required to get the same overall level of sweetness. They are sometimes referred to as high-intensity sweeteners.<sup>1,2</sup>

## What is the difference between added sugars and nonnutritive sweeteners?

The main difference between added sugars and nonnutritive sweeteners is in the intensity of sweetness and number of calories found in each. Nonnutritive sweeteners are generally used to replace some or all added sugar in products in order to reduce the numbers of calories that food or beverage contains.

In the U.S., more than 13 percent of daily calories consumed are from added sugars, adding approximately 270 calories to the diet through soft drinks, fruit drinks, processed foods, baked goods, dairy ice creams, jams, syrups, and candies. According to the Dietary Guidelines for Americans 2015-2020, no more than 10 percent of total calories consumed should be from added sugars.<sup>2</sup> The Dietary Guidelines suggests managing added sugar intake by using nonnutritive sweeteners in place of sugar.



## What are some examples of nonnutritive sweeteners?

The table below includes common nonnutritive sweeteners, their brand names, and values for the Acceptable Daily Intake (ADI) published by the FDA.<sup>1,3</sup>

Artificial Sweetener	Brand Name	Relative sweetness to sucrose	Calories (kcal) per 1 g packet	ADI* (mg/kg bw/d)
Acesulfame-K	Sunett, Sweet One	200 times sweeter	0 kcal	15
Advantame	Advantame	20,000 times sweeter	0 kcal	32.8
Aspartame	Equal, NutraSweet	180 times sweeter	4 kcal	50
Neotame	Newtame	7,000-13,000 times sweeter	0 kcal	0.3
Saccharin	Sweet'N Low, Necta Sweet	300 times sweeter	3 kcal	15
Stevia	Stevia	300 times sweeter	0 kcal	N/A
Steviol Glycosides	Truvia, PureVia, Enliten	200-400 times sweeter	0 kcal	4
Sucralose	Splenda	600 times sweeter	3 kcal	5

\*ADI based on a 132 lb. (60 kg) individual

**Acesulfame-K:** This sweetener is commonly found in frozen desserts, beverages, and baked goods. Proven to be stable under high temperatures, the sweetness remains the same throughout baking. The FDA has approved its use as a flavor enhancer as well as a general-purpose food sweetener. In a product's ingredient list it will appear as one of the following: acesulfame potassium, acesulfame K, or Ace-K.<sup>2</sup>

**Advantame:** This sweetener is used primarily in baked goods due to its stability under high temperatures. The FDA has approved its use as a flavor enhancer as well as a general-purpose food sweetener.<sup>2</sup>

**Aspartame:** This sweetener was approved by the FDA as a "tabletop sweetener," as it is commonly used to sweeten beverages and breakfast cereals. On the ingredient list, it will appear as aspartame, but consumers may more readily recognize it by the brand names Equal or Nutrasweet. Although approved for the general population, those with phenylketonuria (a hereditary disease that causes phenylalanine to reach toxic levels in individuals), are encouraged to consume little to no aspartame. Phenylalanine is a main component in aspartame.<sup>2</sup> Foods containing aspartame are labelled with the following disclaimer "Phenylketonurics: Contains Phenylalanine."

**Neotame:** This sweetener has been approved for its use as a flavor enhancer as well as a general-purpose food sweetener. It will appear in ingredient lists as neotame, but consumers may know it as Newtame, the brand name found in multiple baked goods.<sup>2</sup>

*Saccharin*: This sweetener is commonly found in beverages, fruit drinks, as a sugar alternative for use in baking, and in processed foods. Approved for its use as a flavor enhancer as well as a general-purpose food sweetener, it will be listed as saccharin on ingredient lists. Consumers may recognize the following saccharin brand names: Sweet and Low, Sweet’N Low, and Necta Sweet.<sup>2</sup>

*Stevia and Steviol Glycosides*: The sweeteners marketed as stevia in the US contain the steviol glycoside, Rebaudioside A, a highly purified compound extracted from the stevia plant. This steviol glycoside resembles the taste of sucrose, with no added calories.<sup>4</sup> The stevia leaf and crude or highly-concentrated extracts from the stevia plants are not considered Generally Regarded as Safe (GRAS) by the FDA. Consumers will find steviol glycosides in products with the following brand names: Stevia, Truvia, PeerVia and Enliten.<sup>2</sup>

*Sucralose*: This sweetener is commonly known on the market as Splenda. Approved by the FDA for use in baked goods, beverages, chewing gum, and frozen dairy desserts, it is used as a general-purpose sweetener.<sup>2</sup>

### **Are there health implications of consuming nonnutritive sweeteners?**

*Sucralose and Leukemia*: Although sucralose has been accepted for use in all categories of food and beverage by the FDA, some studies have shown that high consumption may induce leukemia in mice. Results are conflicting however, as Soffritti *et al* showed a correlation between high sucralose consumption and hematopoietic neoplasias, which was not found in the prior study by Mann and colleagues.<sup>8,9</sup> It should be noted that adverse health effects of large doses of nonnutritive sweeteners in animal models cannot be generalized to humans consuming much smaller doses.

*Nonnutritive Sweeteners and Weight Loss*: The American Heart Association and American Diabetes Association have concluded that nonnutritive sweeteners may have the potential to aid in weight loss if subjects do not compensate for the decrease in calories by consuming other high calorie foods in later meals. Research on this topic has yielded conflicting results.<sup>10</sup> Some studies show increased weight gain, increased BMI, and risk of obesity in subjects consuming nonnutritive sweeteners vs. normal sugars.<sup>11,12</sup> However, as many factors impact food choice and metabolism it is difficult to isolate the effect of a single food component or ingredient, such as nonnutritive sweeteners, on weight loss or gain.

*Diet sodas and Diabetes*: In an observational study investigating the effects of daily consumption of diet drinks, results indicated an increased incidence of developing type II diabetes or metabolic syndrome among consumers compared to those who did not consume diet sodas. This result was attributed to the increased consumption of nonnutritive sweeteners. However, more research is needed as causes of diabetes are complex and are influenced by diet, exercise,



genetics, and environmental factors. Additionally, correlative results cannot be interpreted as causative results, and further studies would be necessary to corroborate this result.<sup>13</sup>

## How much is too much?

Since there is conflicting scientific literature, the FDA encourages limiting daily consumption of each sweetener to the ADI.<sup>2</sup> Furthermore, these sugar substitutes should be seen as alternatives to the caloric addition of sucrose and other caloric sweeteners. Consulting healthcare professionals for long-term usage of these sweeteners is encouraged to assist with weight control as well as energy intake.

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