

# *Saccharin*



# Saccharin

Saccharin was discovered over a century ago and has been used as a non-caloric sweetener in foods and beverages for more than 100 years. Consumers and the doctors, dentists and dietitians who counsel them have overwhelmingly supported its benefits.



## HISTORY

Discovered in 1879, saccharin has been used to sweeten foods and beverages without calories or carbohydrates for over a century. Its use was considerable during the sugar shortages of the two world wars, particularly in Europe. For many people, saccharin is an integral part of their lifestyle. It is particularly important to those whose diets require a restriction of caloric or carbohydrate intake, such as persons with diabetes. Most health practitioners favor using non-caloric sweeteners like saccharin in weight reduction and for people with diabetes.



## AVAILABILITY & USE

Research also has shown that health professionals believe saccharin is especially beneficial to obese individuals and persons with diabetes. Additionally, research indicates that saccharin may help to reduce risk of dental caries.

Saccharin continues to be important for a wide range of low-calorie and sugar-free food and beverage applications. It is used in such products as soft drinks, tabletop sweeteners, baked goods, jams, chewing gum, canned fruit, candy, dessert toppings and salad dressings. Additionally, saccharin is used in health and beauty products including tooth pastes, mouthwash, hygiene/cosmetic products, vitamins and pharmaceuticals. Most consumers are familiar with saccharin as the main ingredient in Sweet'N Low in the familiar pink package.

The current availability of saccharin and other low-calorie sweeteners, such as aspartame, acesulfame potassium, neotame and sucralose, allows manufacturers to utilize a “multiple sweetener approach” – using the most appropriate sweetener, or combination of sweeteners, for a given product.

Blending a variety of low-calorie sweeteners provides products with increased stability, improved taste, lower production costs and more choices for the consumer. Additionally, blending saccharin with one or more low-calorie sweeteners can result in sweetness synergy (the resulting sweetness is greater than the sum of the sweetness of the individual sweeteners), which can decrease the total amount of sweetener needed and improve the overall sweet taste profile.

## BENEFITS

- Saccharin is useful for people trying to control their weight. Saccharin may assist in weight management, control of blood glucose and prevention of dental caries. Replacing full-calorie products with saccharin may help promote modest weight loss and may facilitate long-term maintenance of weight loss.
- Saccharin may be useful for people with diabetes. Saccharin produces no glycemic response and may help control caloric intake. Saccharin is both calorie and carbohydrate free. Saccharin has been deemed appropriate for medical and nutrition therapy (MNT) for people with diabetes, and dietetic professionals may incorporate saccharin into the individualized meal plans of their patients who have diabetes.
- Saccharin has a long history (more than 100 years) of safe use.
- Saccharin contributes no calories to the diet because it is not metabolized by the human body. (It is excreted in the same form it is ingested.)





- Saccharin is 300-500 times sweeter than sucrose. It has the ability to synergize the sweetening power of both nutritive and nonnutritive sweeteners, and its sweetening power is not reduced with heating. These factors make saccharin an excellent food additive in manufactured products. During such blending of sweeteners, saccharin is known to provide stability to maintain the product's sweetness over a prolonged period of time. Saccharin also has a long shelf life.
- As a tabletop sweetener, saccharin is available in granular and liquid form, and is sold in single-serving and bulk packages. In the granular forms, bulking agents are used to standardize serving sizes so that each single-serving package always provides the sweetness equivalent to two teaspoons of sugar. In the liquid form, water is used as a bulking agent for standardizing the sweetness. Brown sugar varieties of saccharin sweeteners are also available.
- Saccharin is useful for consumers who want to create lower-calorie, lower-sugar versions of their favorite recipes. Because saccharin is heat stable it is a good choice for use in cooking, baking and canning/preserving. Depending on the type of recipe being modified, saccharin may be used to replace 50-100 percent of the sugar without sacrificing taste or other aspects of palatability.

## SAFETY

Saccharin has been the subject of extensive scientific research. It is one of the most studied ingredients in the food supply. Although the totality of the available research indicates saccharin is safe for human consumption, there has been controversy over its safety. The basis for the controversy rests primarily on findings of bladder tumors in some male rats fed high doses of sodium saccharin.

Considerable saccharin research, however, indicates safety at human levels of consumption. In addition, the level of human consumption of saccharin is very small compared to the levels used in rat studies. Further, although past research found increased risk of bladder tumors in male rats ingesting high amounts of saccharin, additional research has discovered that the mechanism by which the tumors developed was specific to male rats and does not apply in humans. The average user of saccharin ingests less than one ounce of the sweetener each year.

The following scientific data demonstrates the safety of saccharin:

- Extensive research on human populations has established no association between saccharin and cancer. More than 30 human studies have been completed and indicate saccharin's safety at human levels of consumption. These studies include multiple generations of saccharin users.
- In 14 single-generation animal studies involving several species of animals, saccharin did not induce cancer in any organ, even at exceptionally high dose levels.
- Saccharin is not metabolized (it passes through the body unchanged) and does not react with DNA (nucleic acid present in all living cells).
- Saccharin is approved in more than 100 countries around the world and has been determined to be safe by regulatory agencies around the world, including the U.S. Food and Drug Administration (FDA), Health Canada, the European Food Safety Authority (EFSA) and the Joint Expert Committee on Food Additives (JECFA) of the World Health Organization (WHO).

In summary, research conducted over the past 25 years and a history of human use of over 100 years overwhelmingly demonstrates that saccharin does not cause cancer in humans.



## SACCHARIN'S SAFETY SUPPORTED

In July 1997, the U.S. National Institutes of Health announced that its National Toxicology Program (NTP) was reviewing data that could delist saccharin from the federal government's Report on Carcinogens. This review was prompted by the Calorie Control Council's request to have saccharin delisted from the report. According to the Council, saccharin's presence on the list was wrong, misleading to consumers, and not based on current science.

In the 1997 announcement, NTP noted that saccharin was never listed as a "known" carcinogen, and that recent human studies have shown no link between saccharin and bladder cancer. NTP reviewed saccharin under its new criteria that allow for the consideration of mechanistic data, which demonstrate the manner in which a tumor develops.

According to saccharin researcher Dr. Samuel Cohen, feeding of high doses of a sodium salt, including sodium ascorbate (vitamin C) and sodium saccharin, leads to alterations in the urine of male rats. Dr. Cohen, who has performed such mechanistic studies, says that these changes in urine may lead to the formation of bladder tumors. These sodium salts produce tumors only when administered at high doses and only in rats. Therefore, the mechanism by which the rats develop cancer is not present in humans.

"The lack of effect in mice, and more importantly in monkeys, combined with the strong epidemiological evidence from humans and our understanding of mechanism, strongly support the conclusion that exposure to saccharin does not pose a carcinogenic risk to humans," Dr. Cohen stated.

In May 2000, the NTP released the 9th edition of its Report on Carcinogens and announced that saccharin had been delisted. The final decision was based on the recommendation of NTP Director Dr. Kenneth Olden, and endorsed by the then U.S. Secretary of Health and Human Services Donna Shalala.



On December 21, 2000, the President signed federal legislation to remove the saccharin warning label that had been required on saccharin-sweetened foods and beverages in the U.S. since 1977. This legislation was a result of the National Toxicology Program’s delisting of saccharin.

The extensive research on saccharin has been reviewed by many in the scientific community and by health groups interested in low-calorie sweeteners. These reviews have led to significant statements in support of saccharin. The safety of saccharin is supported by regulatory and health agencies such as the American Medical Association, World Health Organization’s Joint Expert Committee on Food Additives, Health Canada, American Cancer Society, American Council on Science and Health and the Juvenile Diabetes Foundation.

## THE FUTURE

Consumer research shows that low-calorie foods and beverages have become part of the lifestyle of millions of men and women who want to stay in better overall health, control their weight, or simply enjoy the many low-calorie products available. With the growing popularity of light foods and beverages, saccharin will continue to play a significant role – confirming the world’s oldest low-calorie sweetener still has plenty of “new” in it, even after all these years.

For further information on saccharin, visit [www.saccharin.org](http://www.saccharin.org).





We use it in our iced tea, put it in our cereal and eat it in many reduced-calorie or sugar-free foods and beverages everyday... saccharin. The sugar substitute has been a part of our daily lives for more than 100 years and is used by millions of people to stay in better overall health and control weight. Saccharin also has been the subject of controversy almost since it was discovered, but now it is one of the most thoroughly tested food ingredients. In fact, saccharin's safety as an artificial sweetener is supported by 30 human studies, a century of use, the approval of the World Health Organization and 100 countries around the world, as well as leading health groups.

For more information on saccharin and comments from governments and independent health organizations about saccharin, visit [www.saccharin.org](http://www.saccharin.org).



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