



Key Questions
& Answers
About

Aspartame

What is aspartame?

Aspartame (L- α -aspartyl-L-phenylalanine methyl ester) is a low-calorie sweetener used to sweeten a wide variety of low- and reduced-calorie foods and beverages, including low-calorie tabletop sweeteners.

What is aspartame composed of?

Aspartame is composed of two amino acids, aspartic acid and phenylalanine, as the methyl ester. Amino acids are the building blocks of protein. Aspartic acid and phenylalanine are also found naturally in protein containing foods, including meats, grains and dairy products. Methyl esters are also found naturally in many foods, such as fruits and vegetables and their juices.

Why is aspartame used?

Aspartame is approximately 200 times sweeter than sugar, tastes like sugar, can enhance fruit flavors, saves calories and does not contribute to tooth decay. Products sweetened with aspartame can be useful as part of a healthful diet.



What types of products contain aspartame?

Aspartame is found in about 6000 products around the world, including carbonated soft drinks, powdered soft drinks, chewing gum, confections, gelatins, dessert mixes, puddings and fillings, frozen desserts, yogurt, tabletop sweeteners, and some pharmaceuticals such as vitamins and sugar-free cough drops.

How can you tell there is aspartame in a product?

In the United States, all food ingredients, including aspartame, must be listed in the ingredient statement on the food label. Aspartame containing products may also be identified by the information statement, “Phenylketonurics: Contains Phenylalanine,” on the package.

Can aspartame be used in cooking or baking?

Yes. Several tabletop sweeteners containing aspartame as the sweetening ingredient can be used in a wide variety of recipes. However, in some recipes requiring lengthy heating or baking, a loss of sweetness may occur; this is not a safety issue — simply the product may not be as sweet as desired. Therefore, it is best to use tabletop sweeteners with aspartame in specially designed recipes available from the manufacturers of these tabletop sweeteners. Aspartame tabletop sweeteners may also be added to some recipes at the end of heating to maintain sweetness.

How do foods and beverages sweetened with aspartame fit into healthful eating?

Health experts agree that eating well and being physically active are keys to a healthful lifestyle. To help people achieve a more healthful lifestyle, the U.S. government provides “Dietary Guidelines for Americans,” which encourages consumers to “Choose and prepare foods and beverages with little added sugars or caloric sweeteners.” The World Health Organization also recommends a number of dietary guidelines to combat increases in chronic diseases such as obesity, high blood pressure, cancer, and diabetes. One recommendation is to limit sugars added to some foods and beverages. As a sweetener, aspartame can reduce or replace the calories in foods and beverages while maintaining great taste, offering one simple step to help people move closer to achieving a more healthful diet. Simply substituting a can of diet soft drink for a regular soft drink saves about 150 calories; substituting a packet of low-calorie tabletop sweetener for two teaspoons of sugar three times daily (e.g., in coffee and tea and on cereal) saves about 100 calories a day; and 4-oz. of aspartame-sweetened pudding substituted for regular pudding saves 80 calories.



Can aspartame help people lose weight?

Yes. Studies have shown that foods and beverages sweetened with aspartame can be an effective “tool” as part of a weight management program. Aspartame, however, is not a drug and does not stimulate weight loss. It does help make possible good tasting low- or reduced-calorie foods and beverages for those who wish to control or decrease their caloric intake. Researchers at Harvard Medical School have concluded that aspartame “is a valuable adjunct to a comprehensive program of balanced diet, exercise and behavior modifications for losing weight.”

Is aspartame safe?

Yes. Aspartame has been tested for more than three decades, in more than 200 studies, with the same result: Aspartame is safe. In fact, the FDA Commissioner, upon approving aspartame, noted, “Few compounds have withstood such detailed testing and repeated, close scrutiny, and the process through which aspartame has gone should provide the public with additional confidence of its safety.”

Have other regulatory bodies reviewed aspartame’s safety?

Yes. In addition to FDA, aspartame has been reviewed and determined to be safe by the Joint Expert Committee on Food Additives (JECFA) of the Food and Agriculture Organization/World Health Organization, the Scientific

Committee on Food of the European Commission, and the regulatory bodies of over 100 countries.

Have independent health organizations reviewed the safety of aspartame?

Yes. The American Medical Association's Council on Scientific Affairs, the American Diabetes Association, and the American Dietetic Association (ADA) have reviewed research on aspartame and found it to be safe. In fact, the ADA's 2004 updated position paper states, "A comprehensive review of the safety of aspartame has recently been published. The review covers previous publications as well as new information that support the safety of aspartame as a food additive and negates claims of its association with a range of health problems..." Links to numerous other health organizations, which have confirmed the safety of aspartame, can be found at www.aspartame.org.

How was aspartame tested before it was approved for use in foods?



Aspartame is one of the most thoroughly studied ingredients in the food supply. It was tested in more than 100 scientific studies before the FDA approved it in 1981. The studies were conducted in laboratory animals and several subpopulations of humans, including healthy infants, children, and adults, lactating women, people with diabetes, obese individuals, and people who are carriers of the rare genetic disease phenylketonuria (PKU). Individuals with PKU cannot properly metabolize phenylalanine, one of aspartame's components. After approval, extensive additional research was done. The results further confirmed the safety of aspartame for the general population.

How is aspartame handled in the body?

Upon digestion, aspartame breaks down into three components (aspartic acid, phenylalanine and methanol), which are then absorbed into the blood and used in normal body processes. Neither aspartame nor its components accumulate in the body. These components are used in the body in the same ways as when they are derived from common foods.

Further, the amounts of these components from aspartame are small compared to the amounts from other food sources. For example, a serving of nonfat milk provides about 6 times more phenylalanine and 13 times more aspartic acid compared to an equivalent amount of diet beverage sweetened 100% with aspartame. Likewise, a serving of tomato juice provides about 6 times more methanol compared to an equivalent amount of diet beverage with aspartame.

What is methanol and is it a problem in consuming aspartame?

Methanol is a natural and harmless breakdown product of many commonly consumed foods. The methanol produced during the digestion of aspartame is identical to that which is provided in much larger amounts from many fruits, vegetables and their juices and is part of the normal diet. In fact, a glass of tomato juice provides about 6 times as much methanol as an equivalent amount of diet beverage sweetened with aspartame. Regardless of the source, after methanol is formed it is further broken down through normal body processes. Numerous scientific studies have shown that the amount of methanol one could consume from aspartame-containing foods and beverages could not reach harmful levels.



What is the Acceptable Daily Intake (ADI) of aspartame?

The ADI, expressed on a mg/kg body weight/day basis, is a very conservative estimate of the amount of a sweetener that can safely be consumed on a daily basis over a person's lifetime. The FDA has set the ADI for aspartame at 50 mg/kg of body weight/day. The ADI for aspartame is the equivalent of a 70 kg (154 lb.) person consuming about 20 cans of aspartame-sweetened beverage or about 100 sachets of tabletop sweetener with aspartame per day.

Is it safe to consume more aspartame than the ADI?

Yes. The ADI is an important regulatory concept, which is frequently misunderstood. The ADI is a conservative estimated safe exposure level, which anticipates continuous lifetime exposure. It should not be regarded as a specific point at which safety ends and possible health concerns begin. In fact, FDA has said it is not concerned that consumption occasionally may exceed the ADI.

How much aspartame would a person have to consume to reach the ADI?

A 150-pound adult would have to consume about 20 12-oz. diet carbonated soft drinks, or 33 8-oz. servings of powdered soft drink, or 42 4-oz. servings of gelatin, or 97 packets of tabletop sweetener each day to reach the ADI. A 50-pound child would have to consume about 6 12-oz. cans of carbonated beverage, or 11 8-oz. servings of powdered soft drink, or 14 4-oz. servings of gelatin, or 32 packets of tabletop sweetener each day to reach the ADI.

How much aspartame are people actually consuming?

Extensive market research has shown that aspartame consumption patterns for the general population and various subgroups are well below the ADI. Aspartame consumption by high-level consumers (90th percentile) in the general population, including children, is between 5% and 10% of the ADI. This means that 9 out of 10 people consume less than 10% of the ADI.

How much aspartame are children consuming?

Because of their smaller size, children consume proportionately larger amounts of all food ingredients than do adults in relation to their body weight. The 90th percentile aspartame consumption by children between the ages of two and five is only about 10% of the ADI. Children need calories to achieve proper growth and development, and parents should supervise their children's diet to avoid dietary excesses or nutritional deficiencies.



What is phenylketonuria (PKU) and why is there a statement regarding PKU on products sweetened with aspartame?

Phenylketonuria (PKU) is a rare inherited disease that prevents the essential amino acid phenylalanine from being properly metabolized. (An essential amino acid is required for normal growth, development, and body functioning and must be obtained from the diet, as the body cannot make it.) Because those with PKU cannot metabolize phenylalanine, it can accumulate in the body and cause health problems including mental retardation. In the U.S. and many other countries, routine screening for PKU is required for all newborns. In the U.S., about 1 in 15,000 babies is born with PKU. People with PKU are placed on a special diet with a severe restriction of phenylalanine from birth to adolescence or after. Women with PKU must remain on the special diet throughout pregnancy. Since individuals with PKU must consider aspartame as an additional source of phenylalanine, aspartame-containing foods must state “Phenylketonurics: Contains Phenylalanine” in the U.S.

Can women who are pregnant or breastfeeding consume aspartame?

Yes. The FDA and the Council on Scientific Affairs of the American Medical Association agree that women who are pregnant or breastfeeding can safely use aspartame. An American Academy of Pediatrics Committee on Nutrition task force also has concluded that aspartame is safe for both the mother and developing baby. Aspartame is broken down in the body to the same

components (phenylalanine, aspartic acid and methanol) eaten daily in common diets by pregnant and breast feeding women. Sufficient calories are important during pregnancy, and calories should come from foods that contribute to nutrient needs rather than from foods low in nutrients. The variety of foods and beverages sweetened with aspartame can help satisfy a pregnant woman's taste for "sweets" without adding extra calories, leaving room for more nutritious foods.

Can people with diabetes consume aspartame?

Yes. The American Diabetes Association states that aspartame is a safe and useful sweetener for people with diabetes. Aspartame makes food taste sweet and does not contribute calories or raise blood sugar levels. About 90 percent of people with diabetes use aspartame-sweetened products. Foods and beverages sweetened with aspartame offer people with diabetes a much wider variety of products from which to choose and greater flexibility in budgeting their total carbohydrate intake. Thus, it can help them follow nutrition recommendations and still enjoy good-tasting foods.



Does aspartame affect blood sugar control in people with diabetes?

No. Research shows that aspartame does not affect short-term or long-term blood sugar levels in people with diabetes. The American Diabetes Association states "Aspartame has been approved by the Food and Drug Administration, a governmental agency that conducts thorough scientific review to determine foods that are safe for public consumption. (We) follow FDA recommendations and recognize there is no credible scientific evidence linking aspartame to any health-related problems for people with diabetes."

Does aspartame cause adverse health effects?

No. The overwhelming body of scientific evidence clearly demonstrates that aspartame, even in amounts many times more than what people typically consume, is safe and not associated with adverse health effects. The FDA has investigated alleged complaints since 1982 and stated that there is no "reasonable evidence of possible public health harm" and "no consistent or unique patterns of symptoms reported with respect to aspartame that can be causally linked to its use." The trend for anecdotal reports of adverse effects from aspartame declined markedly over the years since the 1985 peak, when there were many unfounded allegations about aspartame in the media.

In 1984, the FDA commissioned the Centers for Disease Control (CDC) to review complaints which some consumers related to their use of aspartame. After a review of 517 complaints, the CDC found that the complaints “do not provide evidence of the existence of serious, widespread, adverse health consequences attendant to the use of aspartame.” The CDC further noted, “The majority of frequently reported symptoms were mild and are symptoms that are common in the general populace.”

In response to these complaints, numerous additional scientific studies were done by prominent researchers at major academic institutions; the results of these studies overwhelmingly demonstrate that aspartame is not associated with adverse health effects, including headaches, seizures, changes in mood, cognition or behavior, or allergic reactions.



Does aspartame cause allergic reactions?

No. Although a few people have claimed that they have experienced allergic-type symptoms related to consuming aspartame, these anecdotal reports are not confirmed by carefully controlled scientific studies done at the National Institutes of Health and at six major academic medical centers. The results of these studies done with people who were convinced that aspartame caused their allergic reactions clearly demonstrate that aspartame is not associated with allergic reactions.

A wide variety of foods can cause allergic reactions in some people. Those who suspect a food allergy should seek diagnosis and treatment from a qualified medical professional, such as a board-certified allergist. Self-diagnosis can delay treatment of a more serious medical problem.

Is there a relationship between aspartame and headaches?

No. A carefully controlled study was done at Duke University Medical Center with people who were convinced that aspartame caused their headaches. This study, which was published in the *New England Journal of Medicine*, demonstrated that aspartame does not cause headaches or migraines.

Headaches are one of the most common human complaints. Many factors can cause headaches, ranging from stress and sleep disturbances to physical illnesses. It is potentially dangerous to assume that a headache is related to aspartame, when the cause may be a serious physical or psychological condition.

Is aspartame safe for people with epilepsy?

Yes. The Epilepsy Institute of New York and the Epilepsy Foundation of America state that aspartame is safe for use by people with epilepsy. Numerous scientific studies were done in animals and in people who were convinced that aspartame caused their seizures and in children with epilepsy. The results of these studies demonstrate that aspartame does not cause or worsen seizures.

Does aspartame cause changes in mood, thought processes or behavior?

No. Well controlled scientific studies conducted by behavioral experts at a number of respected academic centers, including the Massachusetts Institute of Technology (MIT), Harvard Medical School, and Yale Medical School, demonstrate that aspartame has no effects on mood, behavior, or cognition, including memory loss.

Does aspartame affect children's behavior?

No. Numerous scientific studies were done at major institutions, including the National Institute of Mental Health, Yale University Medical School, and Vanderbilt University Medical School, to evaluate behavior in children given large amounts of aspartame. The results of these studies show that aspartame consumption does not cause behavioral changes in children, including those diagnosed with “hyperactivity” or with attention deficit disorder (ADD).

Does aspartame increase appetite or cause weight gain?

No. Changes in body weight are related to many factors such as diet, exercise and heredity. Products made with aspartame can help with weight control because they are lower in calories than their sugar-sweetened counterparts. Based on the overwhelming scientific evidence from numerous scientific studies, aspartame does not increase hunger, appetite, or food intake or cause weight gain.



Is there any relationship between aspartame and cancer or brain tumors?

No. Aspartame does not cause cancer according to the American Cancer Society, the FDA and the National Cancer Institute. Before the 1981 FDA approval of aspartame, it was extensively evaluated in four long-term and

lifetime studies in rodents which received enormous doses of aspartame, equal to the amount of aspartame in more than 1,000 cans of diet soft drink daily over a lifetime. There was no increase in brain tumors or any other type of cancer.

When aspartame is digested, the body breaks it down into its components, aspartic acid, phenylalanine and methanol, which are consumed in much greater amounts in common foods, such as milk, meat, dried beans, fruits and vegetables. The body handles the components from aspartame in the same way it handles them when derived from other foods. Aspartame does not enter the bloodstream and therefore cannot travel to essential organs including the brain. Thus, there is no physiological reason why aspartame could cause cancer.



Can aspartame affect vision?

No. Although scientists know that huge amounts of methanol can affect vision, only small amounts of methanol are formed when aspartame and many fruits, vegetables and juices are digested. In fact, a glass of tomato juice provides about six times as much methanol as an equal amount of a beverage sweetened with aspartame. During the digestion of aspartame in the gastrointestinal tract, the released methanol is then easily further metabolized by normal body processes in the same way as when methanol is derived from other dietary sources. Numerous scientific studies have shown that the methanol from aspartame does not accumulate in the body and thus cannot reach harmful levels.

Is it true that aspartame is an “excitotoxin?”

No. An “excitotoxin” is a substance that reportedly over-stimulates brain and nerve cells. Critics have falsely claimed that ingestion of aspartame may result in high blood levels of aspartic acid, which would circulate to the brain and kill nerve cells. However, extensive scientific research has shown that it is not possible for a person ever to consume enough aspartame in the diet – even over long periods of time – to result in high blood levels of aspartic acid.

Is there any truth to the negative information about aspartame on the Internet or in the media?

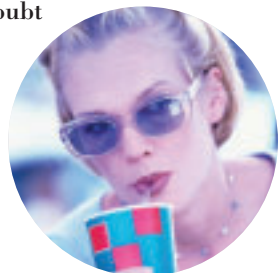
No. Allegations spread via the Internet and the media by a few individuals that aspartame may be associated with a myriad of ailments are not based on science. These have come to be called “urban myths.” Here is what the National Multiple Sclerosis Society had to say about such allegations:

“These stories claim that Aspartame is the cause of a variety of illnesses, including MS, lupus, Alzheimer’s disease, Parkinson disease, birth defects, Desert Storm syndrome, brain tumors, and seizures. However, please bear in mind the following:

- The claims are not documented;
- There is no evidence for “epidemics” of multiple sclerosis, lupus, and some of the other diseases as claimed in the articles;
- There is no evidence that authors of the claims have any scientific, medical, or academic credentials; nor is there any evidence that they have done any scientific research to support their claims; and
- No published, peer-reviewed scientific research exists that supports the claims being made in the articles.”

An October 2004 issue of the *British Medical Journal (BMJ)* carries an editorial concluding that aspartame has been “demonised unfairly” in sections of the press and on the Internet. The *BMJ* editorial states:

“Evidence does not support links between aspartame and cancer, hair loss, depression, dementia, behavioural disturbances, or any of the other conditions appearing in websites. Agencies such as the Food Standards Agency, European Food Standards Authority, and the Food and Drug Administration have a duty to monitor relations between foodstuffs and health and to commission research when reasonable doubt emerges...The Food Standards Agency takes public concerns very seriously and thus pressed the European Scientific Committee on Food to conduct a further review, encompassing over 500 reports, in 2002. It concluded from biochemical, clinical, and behavioural research that the acceptable daily intake of aspartame remained entirely safe-except for people with phenylketonuria.”



The safety of aspartame has been proven again and again, backed by more than three decades of research and over 200 scientific studies. Recently, several governments and expert committees carefully evaluated the Internet allegations and found them to be false, reconfirming the safety of aspartame. In addition, leading health authorities, such as the American Medical Association, the American Dietetic Association, and the American Diabetes Association, agree that aspartame is safe.

Is there a relationship between aspartame and multiple sclerosis?

No. The Multiple Sclerosis Foundation stated, “There is no evidence that aspartame in any way causes, provokes, mimics or worsens MS.” Further, an article published by The National Multiple Sclerosis Society stated, “Several websites and documents circulating on the Internet are making unsubstantiated claims about aspartame, an artificial sweetener used in many diet soft drinks and other foods.”

Is there a relationship between aspartame and Parkinson’s disease?

No. A scientific study done at Georgetown University has shown that aspartame has no effect on Parkinson’s disease (PD). Further, The National Parkinson Foundation, Inc., has concluded, “The cause of PD is unknown, PD existed before aspartame was invented, there is no evidence aspartame blocks the absorption of levodopa.” (Levodopa is the major drug used to treat PD.)

Is there a relationship between aspartame and Alzheimer’s disease?

No. In dispelling myths about Alzheimer’s disease, the Alzheimer’s Association concluded there was “no scientific evidence of a link between aspartame and memory loss.”

Is there a relationship between aspartame and lupus?

No. The Lupus Foundation of America has concluded that there is “no specific proof of an association with aspartame as a cause or worsening of SLE (systemic lupus erythematosus)” and “People with lupus should always consult with their physician before making any changes in their medical treatment, diet, exercise or other routine based on information received via the Internet or other sources lacking known credentials.”

For more information on aspartame and comments from governments and independent health organizations about aspartame, visit www.aspartame.org.



Calorie Control Council

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