The Straight Facts on Sweeteners

Sweeteners Play an Important Role in Our Food and Beverage Selection and Enjoyment.

Research shows that we are inherently drawn to sweet tastes – more than any other taste sensation. In fact, it is sweetness that directs newborn mammals toward safe and nourishing foods and drinks. Because of this, humans have sought sweet foods and drinks throughout history and sweetness continues to be a strong factor in our food and beverage selections. Today, our inherent desire for sweetness can be satisfied by a variety of regular, low- and no-calorie sweeteners.

Benefits of Sweeteners

- Studies show people consume more liquid when it's flavored, versus plain water.[1] This helps us consume greater amounts, making it easier to keep the body fully hydrated. Sweeteners help provide flavor to sparkling beverages. Most sparkling beverages, both regular and low- and no-calorie, contain between 85 percent and 99 percent water.
- Some sweeteners, such as table sugar and high fructose corn syrup, provide glucose. This simple sugar is the primary source of caloric fuel that your body uses for energy, and in fact, glucose is the primary fuel used by the brain.

Important to Remember

- It's important to remember that the energy obtained from food and beverages, such as the energy provided by table sugar and high fructose corn syrup, is measured in calories, and all calories count, including those that come from our beverages.
- All foods and beverages can fit into an active, healthy lifestyle that includes a sensible, balanced diet combined with regular physical activity.

The Straight Facts on Sweeteners (Cont.)

There Are Two Different Types of Sweeteners: Caloric Sweeteners and Low- and No-Calorie Sweeteners.

CALORIC SWEETENERS

Caloric sweeteners are nutritive sweeteners, and range from simple sugars – fructose and glucose – to common table sugar, molasses, honey, agave and high fructose corn syrup. They provide carbohydrate calories, which are fuel that supplies energy necessary for daily activities.

Table Sugar (Sucrose)

- Table sugar is made from sugar cane or sugar beets. Sucrose is the technical name for table sugar. It is often simply referred to as "sugar."
- Table sugar is a carbohydrate and provides 4 calories (17 kilojoules) per gram.
- Depending on the food in which it is used, table sugar can preserve, enhance the flavor of, or add color to food. In beverages, sugar gives a satisfying sensation and enhances taste.[2]
- The table sugar you use every day is identical to the sucrose naturally found in fruits and vegetables.[3]
- The amount of sugar and calories in sparkling beverages is about the same as the amounts found in many fruit juices. (Note: Juices often contain additional nutrients, such as important vitamins and minerals.)

High Fructose Corn Syrup (HFCS)

- HFCS is a carbohydrate sugar. It provides 4 calories (17 kilojoules) per gram.
- HFCS is made from corn and is used to sweeten most caloric sparkling beverages in the United States and some other countries.
- Different types of HFCS have different proportions of glucose and fructose. The HFCS most commonly used in beverages (HFCS-55) is about half fructose (55%) and half glucose (45%), very similar to table sugar, so they have nearly identical sweetness and are metabolized in a similar manner by the body.[4] Once consumed, the sugar carbohydrates from these sources (HFCS and sugar) are broken down into glucose and fructose before being absorbed into your bloodstream. After being absorbed, your body has no way of knowing whether the fructose or glucose came from sucrose, HFCS, honey or fruit.
- Depending on the food in which it is used, HFCS can preserve and enhance the flavor of food. In beverages, HFCS gives a satisfying sensation and helps maintain a consistent sweet flavor.[5]
- When it comes to satisfying your appetite, HFCS is as effective as table sugar. In fact, two 2007 studies comparing sparkling beverages sweetened with HFCS or sugar showed no difference in hunger, satiety or short-term energy intake.[6, 7]
- The American Medical Association recently confirmed that HFCS is no more likely to contribute to obesity than table sugar or other full-calorie sweeteners.[8]

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LOW- and NO-CALORIE SWEETENERS

Low- and no-calorie sweeteners – such as aspartame, sucralose and stevia extract – provide a sweet taste with few or no calories. Most low- and no-calorie sweeteners are several hundred times sweeter than caloric sweeteners, which means only a little bit is needed to replace a larger amount of sugar, HFCS or other caloric sweetener.

Research has shown that people who use low- and no-calorie, sugar-free foods and beverages have better quality diets.[9]

- A study of more than 9,000 adults found that people using low- and no-calorie, sugar-free foods and beverages consume more vitamins and minerals and eat fewer calories overall.[10]
- A consumer survey by the Calorie Control Council found that the number one reason people use low- and no-calorie sweeteners is to "stay in overall better health." Benefits include:
    - Low- and no-calorie sweeteners can help reduce energy intake when used in place of higher-calorie options.
    - Low- and no-calorie sweeteners help make reduced-calorie diets more palatable, which can help with long-term weight maintenance.[11]

The safety of low- and no-calorie sweeteners has also been extensively studied. Qualified scientific experts have established a safe level of consumption for these sweeteners called the Acceptable Daily Intake (ADI). The low- and no-calorie sweetener amounts actually used in foods and beverages, or Estimated Daily Intake (EDI), are far below ADI levels.[12]

Although low- and no-calorie sweeteners have been safely used and enjoyed by consumers all over the world for more than a century, some have tried to link them to cancer and other illnesses.

- The U.S. National Cancer Institute has concluded that low- and no-calorie sweeteners are not related to cancer risk in humans.[13]
- The American Dietetic Association says a range of both full-calorie and low- or no-calorie sweeteners can be safely enjoyed as part of a sensible, balanced diet.[14]
- The *Managing Sweetness* conferences, held with numerous experts around the globe, have clearly asserted that low-calorie and calorie-free sweeteners regulated by international health and food safety authorities are safe for all age groups, and are a good option for helping consumers to enjoy sweetness.[15, 16, 17]

The Straight Facts on Sweeteners (Cont.)

Acesulfame potassium (Ace-K or acesulfame K)[18]

- Ace-K is 200 times sweeter than table sugar, and because it is not metabolized by the body, it does not contribute calories to the diet.
- Ace-K blends well with other low-calorie sweeteners like sucralose and aspartame. Using blends in beverages not only helps give them a more sugar-like taste, but also reduces the total amount of low-calorie sweetener needed.
- The U.S. Food and Drug Administration (FDA), the Joint FAO/WHO Expert Committee on Food Additives (JECFA), and the Scientific Committee on Food of the European Union (SCF) reviewed the available research on ace-K and concluded that it is safe for use in foods and beverages.
- Products with ace-K can be found in about 90 different countries. It is used in thousands of foods and beverages, including tabletop sweeteners, desserts, puddings, baked goods, soft drinks, candies and canned foods.

Aspartame[19]

- Aspartame is 200 times sweeter than table sugar with no unpleasant aftertaste.
- Aspartame has been used by consumers around the world for over 30 years in more than 6,000 food and beverage products, ranging from sparkling beverages and chewing gum to gelatins and sugar-free cough drops.
- Aspartame is composed of two naturally occurring amino acids, aspartic acid and phenylalanine. Both of these amino acids are found naturally in protein-containing foods, such as dairy products, fruits, vegetables and their juices and meats.
    - These amino acids are the building blocks of protein and are metabolized normally by the body.*

      **Aspartame contains phenylalanine and should not be consumed by people with a rare genetic disorder called phenylketonuria. The regulations of most countries require that food and beverage products that contain aspartame carry a statement on the label alerting people with this condition to the presence of aspartame.*
- It is one of the most thoroughly researched food ingredients in use today.
    - Numerous scientific studies have confirmed its safety and it is permitted in more than 100 countries. Authorities that have approved aspartame include the U.S. Food and Drug Administration (FDA); the Agence Française de Sécurité Sanitaire des Aliments [French Food Safety Agency] (AFSSA); the Joint FAO/WHO Expert Committee on Food Additives (JECFA); and the European Food Safety Authority (EFSA).
    - The European Food Safety Authority (EFSA) reconfirmed the safety of aspartame in 2006 and in 2009. In 2010, EFSA once again reviewed the safety of aspartame and did not find any new evidence to question the safety of this ingredient.[20]

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Cyclamate[21]

- Cyclamate is 30 times sweeter than table sugar.
- Independent scientists of the Joint FAO/WHO Expert Committee on Food Additives (JECFA) have consistently affirmed the safety of cyclamate for use as a sweetener in foods and beverages.
- Discovered in 1937, cyclamate is permitted for use in foods and beverages in more than 50 countries worldwide, including Canada, Australia and Mexico.[22]
- Cyclamate is best used in beverages when blended with both aspartame and ace-K.[23]
- Cyclamate helps mask the aftertaste of other sugar substitutes like saccharin, improving the overall taste of foods and beverages containing this sweetener.

Erythritol[24]

- Erythritol is a natural sugar alcohol that is 60 percent to 70 percent as sweet as table sugar and has virtually no calories; it exhibits a clean sweet taste with a sugar-like sweetness perception.
- Erythritol is widely used in foods and beverages in the U.S., Japan, Mexico and Brazil; additionally, petitions have been submitted to governmental agencies around the world to expand its use.

Neotame[25]

- Neotame is a calorie-free sweetener that is 7,000 to 13,000 times sweeter than table sugar. It is often blended with aspartame and/or ace-K.
- Neotame is used in more than 1,000 foods and beverages worldwide.[26]
- Numerous scientific studies have been conducted to confirm the safety of neotame for all segments of the population, including children, pregnant and lactating women, and people with diabetes.[27]

Saccharin[28]

- Saccharin is a calorie-free sweetener that has been used in foods and beverages for over a century and continues to be widely used.
- Saccharin is 300 times sweeter than table sugar.
- Saccharin is permitted in more than 100 countries around the world.
- Saccharin is safe for all populations, including children, people with diabetes, and women who are pregnant or lactating.

Stevia Extract[29]

- Stevia extract is a zero-calorie, great-tasting sweetener from natural origins – the stevia plant. It is 200 times sweeter than table sugar.
- It does not provide carbohydrate calories and thus has no caloric impact on the foods and beverages in which it is used.

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- Stevia extract comes from the best-tasting part of the stevia leaf and is made using a process similar to that used to extract other natural flavorings, like vanilla, spearmint and cinnamon.
- The Joint FAO/WHO Expert Committee on Food Additives (JECFA) and The European Food Safety Authority (EFSA) determined that stevia-based sweeteners are safe for use in foods and beverages. Under the regulations of the U.S. Food and Drug Administration (FDA), stevia extract has Generally Recognized As Safe (GRAS) status.
- It has a long history of use in several countries, including Japan and Paraguay. It is permitted for use in many countries including the U.S., France, Mexico, Korea, Taiwan, China, Russia, Australia, Argentina, New Zealand, Colombia, Peru, Uruguay, Brazil, Switzerland and Malaysia. In Europe (except for France), stevia is permitted as a dietary supplement but is not yet permitted for use as a sweetener in foods and beverages. In France, stevia extract (rebaudioside A) is permitted for use as a sweetener of foods and beverages. In Canada, stevia extract is sold as a natural health product.

Sucralose[30]

- Sucralose, which is derived from sugar, is 600 times sweeter than table sugar and does not contribute calories to the diet.
- Numerous scientific studies conducted over a 20-year period have demonstrated the safety of sucralose. These studies have been independently reviewed by experts who have agreed that sucralose is safe for everyone, including pregnant and nursing women, children and people with diabetes.
- Sucralose was determined to be safe by an independent group of scientific experts at the Joint FAO/WHO Expert Committee on Food Additives (JECFA). In 1999, the U.S. Food and Drug Administration (FDA) expanded the uses for sucralose, approving it as a “general purpose” sweetener, which means it can be used in any food at Good Manufacturing Practice (GMP) levels.
- Sucralose is permitted for use in foods and beverages in more than 40 countries, including the United States, Canada, Australia and Mexico.

For more information about regular, low- and no-calorie sweeteners, visit The Coca-Cola Company’s Beverage Institute for Health & Wellness at www.thebeverageinstitute.org.

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