Life Is Sweet

Alternative sweeteners may seem like a good way to satisfy our taste for delicious treats without worrying about gaining weight, but the side effects of these sugar substitutes continue to cause concern.

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Whether the craving for sweets is occasional or regular, the fact is, many of us indulge in our favorite treats a little too often and in not-so-small amounts. And there are people for whom a meal isn't complete unless it's followed by dessert. This type of thinking may lead Americans to eat more dessert more frequently, which is what Technomic, a company specializing in food industry research, found when it recently surveyed 1,500 U.S. consumers.

Our powerful desire for sweets is one big reason why the food industry developed alternatives to white sugar. Some of these sweeteners, such as stevia, are derived from natural foods, while others, such as saccharin, are made in the lab. But all alternative sweeteners share a common goal: to satisfy our sweet tooth while preserving health.

But many nutritionists question the safety of sugar substitutes. What's more, there's an additional concern: Do these substances help or hurt weight management?

Some doctors on one side of the controversy believe many of these artificial, or non-nutritive, sweeteners can help to manage weight and lower blood sugar levels. But some say sugar substitutes may affect people's behavior and mood and possibly even be toxic.

Recently, results from several sizable studies that followed thousands of Americans for at least five to 10 years found that regularly consuming diet drinks put folks at a greater risk of becoming overweight or obese or developing type 2 diabetes or metabolic syndrome (a group of factors including high blood pressure, high blood sugar, unhealthy cholesterol levels and abdominal fat), which raises one's risk of heart disease and other health problems, such as diabetes and stroke.

Still, most experts agree that using sugar substitutes can be a useful tool in weight management. "The majority of studies comparing the effects of sugar substitutes on weight have shown that they may help you reduce calories and may even help you shed a few pounds," says the American Dietetic Association. "Using sugar substitutes in place of sugary foods and beverages may also help prevent unwanted weight gain."

But as with most things, artificial sweeteners have advantages and disadvantages. The list of

these sugar substitutes includes familiar names such as Splenda, Equal, Truvia and the oldest of this kind of alternative sweetener, saccharin.

A researcher at Johns Hopkins University first discovered saccharin in the late l800s after accidentally tasting the compound on his hand when he forgot to wash it off. At first, New York City doctors used the sweetener to treat headache and nausea and as a way to lose weight. Saccharin, which is 300 times sweeter than sugar, was eventually claimed by the food industry before slowly finding its way onto consumers' tables. The chemical compound is used in baked goods, jams, chewing gum, canned fruit, dessert toppings and salad dressings.

Then in l965, aspartame arrived. In 1981, the Food and Drug Administration (FDA) approved this sugar substitute, which is now one of the most common. It is 180 times sweeter than sugar and used in soft drinks or as a dry ingredient in gelatins.

When researchers produced another non-nutritive sweetener named acesulfame K, it enjoyed a unique advantage over previous sugar substitutes. Acesulfame K, which is 200 times sweeter than sugar, is excreted from the body in our urine, which means it's not absorbed. Subsequent studies have shown that the body expels 95 percent of acesulfame K. (The K is for potassium, a mineral naturally present in our bodies.)

Almost 20 years later, the FDA approved sucralose, a sweetener that starts its life as ordinary table sugar, or sucrose, but ends up being 600 times sweeter than the little white crystals. According to researchers, sucralose is made by changing the chemical makeup of sugar molecules. This results in an intensely sweet no-calorie sweetener that the body doesn't absorb. In addition, like acesulfame K, sucralose is heat stable and can be used for cooking and baking. It also has a long shelf life and retains its sweetness for an extended period of time.

The sugar substitute Neotame received FDA approval in 2002 and is made by the Nutrasweet Company. This food additive is a whopping 7,000 to 13,000 times sweeter than sugar and has no metallic aftertaste, which makes it an ideal sweetener for many foods. Neotame is found in many dairy products, baked goods, gums and beverages. But it's available only for commercial use.

Stevia, a sugar substitute that's 300 times sweeter than sugar, comes from the Stevia rebaudiana plant native to Central and South America. The alternative sweetener comes in two varieties, but only the purified form (Reb-A) received approval from the FDA in 2008 as a tabletop sweetener that could also be used in prepared foods.

But let's return to some big questions: Are artificial sweeteners bad for us, or are they the weapon we need to battle the bulge? Do these sweeteners signal fullness to the brain to stop us from overeating, or do they have no effect at all on our health?

"The fact is that human studies have been unclear as to whether artificial sweeteners have a positive or negative effect, and thus we're keen to understand what's happening in our bodies," says Chris Rayner, an associate professor at the University of Adelaide's School of Medicine in South Australia and a consultant gastroenterologist at the Royal Adelaide Hospital.

Rayner's colleague Richard Young, PhD, a senior postdoctoral researcher at the University of Adelaide's Nerve-Gut Research Laboratory, said more studies are needed to assess the long-term effects of artificial sweeteners in humans. But a recent study showed that among people who regularly consumed artificially sweetened drinks in high amounts, there's an increased risk of developing type 2 diabetes. The scientists believe that artificial sweeteners may interact with bacteria in the gut, "but so far no one's managed to determine the actual mechanisms through which these sweeteners act," Young says.

Meanwhile, the complaints about sugar substitutes have been ongoing since the chemical compound's discovery more than 100 years ago.

So far, the FDA has approved six non-nutritive sweeteners for people to use: acesulfame K, saccharin, aspartame, stevia, neotame and sucralose. Despite criticism and distrust of these sugar substitutes, there have been no documented adverse events related to their use, even when consumed in large amounts.

But the FDA warns pregnant women to avoid the use of aspartame because fetuses cannot break down the amino acids it contains.

In addition, the American Medical Association also advises pregnant women to avoid saccharin because fetuses cannot eliminate the sweetener quickly enough, which leads to it building up in infants' systems, along with potential long-term effects.

To date, the FDA has studied aspartame and saccharin the most. Both still generate concern fom the public. People want to know whether aspartame causes health problems. Thus far, however, researchers haven't found any "health problems clearly linked to the sugar substitute's use," says the American Cancer Society.

But doctors advise that we should still be careful using sugar substitutes because some people might be sensitive or allergic to certain components in these sweeteners. Although the FDA approved artificial sweeteners for the population in general, some individuals should avoid sugar substitutes. Those with phenylketonuria (PKU), a rare genetic disorder, should avoid aspartame because they cannot break down phenylalanine, an amino acid in it. Individuals may be able to use another sugar substitute composed of different chemicals, but they should check with a registered dietitian or doctor for guidance if unsure.

In conclusion, it appears that artificial sweeteners have limited effects on our wellness in the short term. But for people with pre-diabetes, diabetes or other chronic health conditions who regularly use large amounts of certain sugar substitutes, there might be any number of harmful effects.

Concludes Young, "This is why more research is needed."
