

Sweeteners

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We know that too much sweet stuff is bad for us. But, are some sweeteners better than others? More to the point, what counts as better does it come right down to calories, or are there other factors that affect a sweeteners overall impact on your health?

With so much nutrition information out there, it's hard to sort out fact from fiction. And, when it comes to artificial sweeteners and other sugar alternatives from Stevia to sucrose the health picture grows foggier, not clearer.

To understand which is a healthier choice, well take a look at the difference between natural sugars and artificial sweeteners. But first, you will need a quick understanding of the glycemic index.

What is the Glycemic Index (GI)?

The glycemic index (GI) is a system that ranks foods on a scale from 1 to 100, based on how slowly or quickly they increase your blood glucose levels (otherwise known as blood sugar).

Foods with a high GI give your body a surge of energy that peaks quickly and then dies off. Some examples of foods that rank high in the glycemic index include:

1. Sodas have a GI of approximately 63
2. Unsweetened apple juice is only marginally better at 41
3. Orange-flavoured Gatorade has a GI of 89
4. Frozen waffles have a GI of 76
5. White flour bread is only marginally better at 76
6. A white baguette has a whopping GI of 95

According to Harvard Health Publications, high GI foods have effects beyond the immediate peak and crash. Over the long-term, high blood glucose levels are toxic to your body, and can lead to blindness, kidney failure, and increased risk of heart disease.

Alternately, foods low on the glycemic index tend to release glucose slowly and steadily. This keeps you full for longer and doesn't result in an energy crash.

Ranking a foods GI doesn't tell the whole story if you click through to Harvard's report, you can learn how complex carbohydrates can slow the release of glucose in a rolled-oats apple muffin. Or, how juice, which has been stripped of all a fruits fiber, can cause a spike. But, for the purposes of comparing sweeteners, just remember that a high GI is one of the undesirable aspects of sweet stuff.

Which Sweeteners Are Natural?

Natural sugars are made from plants, including sugar from sugarcane, honey from pollen, maple syrup from trees, and stevia, from the stevia plant.

But natural doesn't mean that plant-based sweeteners don't have similar chemicals to artificial alternatives. White, granulated table sugar is sucrose, which is a combination of equal parts glucose and fructose.

Regular sugar has a lot of calories, and not so much nutritional value. It also has a high glycemic index (GI), meaning that eating sugar leads to a peak of energy followed by a crash hence the term sugar high.

Honey is also made up of glucose and fructose. But, not in equal proportions. Instead, honey is about 30% glucose and 40% fructose, with the remainder being mostly water.

Honey vs. Table Sugar: Which Is Healthier?

A teaspoon of honey has more calories than a teaspoon of sugar. However, it has some other benefits, including antioxidants that are good for your heart health.

Does that mean honey is healthier? We asked Nitin Kumar MD, a Harvard-trained and board-certified gastroenterologist and weight management expert, for clarification:

Refined honey and molasses are essentially not better than table sugar in terms of calories or glycemic load. Molasses is often processed with a sugar blend. Ultimately, honey and molasses can have some micronutrients missing from sugar, and they can add variety to your diet, but they are not significantly better for your health than table sugar.

Basically, aside from those antioxidants, there's nothing superior about honey when compared to table sugar. That is because our bodies cannot tell the difference we absorb them in the same way.

What About Stevia?

One product that is commonly mislabelled artificial is Stevia. It's made from the leaf of a South American stevia plant and, in its pure form, has zero calories.

How does Stevia give you a caloric free-pass?

According to Dr. Kumar, Stevia is poorly absorbed in the gastrointestinal tract. A study published in the medical journal *Appetite* reported that Stevia results in lower glucose and insulin levels (a good thing) after meals than sugar.

High-Fructose Corn Syrup: The In-Between Sweetener

What do we mean by in-between? A sweetener that are derived from something natural, but have been refined and processed in such a way that changes its chemical composition.

Take high-fructose corn syrup for example: Its made by adding enzymes to regular corn syrup that convert glucose into fructose making it sweeter.

In the United States, high-fructose corn syrup has been widely criticized for contributing to the obesity epidemic. But, there isn't any research that says high-fructose corn syrup is a direct cause.

The problem is that it's in so many processed foods. This includes foods like soda and candy, but also foods that you wouldn't expect to be packed full of added sweetener, like bread, cereal, and crackers. (Well share which foods to watch out for in just a bit.)

High-Fructose Corn Syrup vs. Table Sugar

High-fructose corn syrup is similar to table sugar in terms of calorie content and the way that its absorbed into the body.

The difference is that table sugar is made up of 50% fructose and 50% glucose. Whereas, high-fructose corn syrup is more like 55% fructose and 45% glucose. While 5% might not seem like much, fructose affects your body differently by converting to fat more easily than glucose. It's also not so great at telling your body that you are full, triggering you to consuming more of a sweetened food than you otherwise would.

Agave Nectar vs. High-Fructose Corn Syrup

Think agave nectar is a healthier choice? It has an even higher concentration of fructose up to 90%! More confusing, it's not actually a nectar, but a juice extracted from the core of the agave plant that is been heated and filtered to turn into sugars. Basically, this healthier-sounding alternative is anything but.

What Are Artificial Sweeteners?

There are a few different types of artificial sweeteners available, but they all have something in common: Artificial sweeteners are all hundreds, or even thousands, of times sweeter than table sugar.

The idea is that you only need a tiny bit to get the same taste as a teaspoon of sugar, so you would not be taking in as many calories in each serving.

Some of these products are totally artificial. Others, like Splenda, are made by tweaking the chemical structure of sucrose to make it sweeter. However, as illustrated by agave nectar high-fructose composition, natural does not automatically mean healthier.

What Are the Pros and Cons of Artificial Sweeteners?

Your body responds to artificial sweeteners differently than it does to table sugar. There have been studies into negative health effects, but not a lot of firm conclusions.

According to Dr. Barry Sears, a leading authority in anti-inflammatory nutrition and author of the New York Times bestseller, *The Zone*, artificial sweeteners can have some advantages: There are indications that they [artificial sweeteners] help in the reduction of excess body weight.

However, research does show that these products can lead to weight gain for a different reason:

Artificial sweeteners interact with sweet taste receptors in the tongue generating a far more powerful signal to the brain, says Dr. Sears. Although artificial sweeteners don't normally enter into the body, their signalling to the brain can cause a release of preformed insulin in the pancreas that may lower blood sugar levels.

Beyond triggering lowered blood sugar, artificial sweeteners can confuse your brain in a way that tempts you to eat more treats. That is because artificial sweeteners cue your brain into believing that calories are on the way, they often result in you consuming more sweet stuff, as you are never made to feel full.

Are Artificial Sweeteners Unsafe? YES!

According to Dr. Kumar, aspartame (found in NutraSweet and Equal) breaks down into components that are commonly found in food, and that its accepted as safe, except in people with phenylketonuria, an inherited disease in children.

Sucralose (Splenda) is a chlorinated sugar that largely passes out of the body unchanged. It's also accepted as safe, especially because it does not accumulate in fat.

All of these have studies showing safety in humans, but none has the mountain of safety data that we have for table sugar, says Dr. Kumar.

On the other hand, table sugar could be considered less safe than sweeteners given the increased calorie intake and effects on blood sugar.

Which Sweetener Is Actually Best for Your Body?

Unfiltered honey is marginally better for our health than sugar or high-fructose corn syrup, since it retains its natural enzymes, antioxidants, minerals, and some vitamins. However, honey still contains lots of sugar, so it's important to use it sparingly.

Another somewhat better option is date sugar, which also retains some nutrients from whole dates such as small amounts of fiber, calcium, potassium, and magnesium. Date sugar contains fewer calories than table sugar. However, its GI is unknown, and estimated to be close to that of whole dates and lower than table sugar (39 to 45).

The sweetener that continues to muddle the middle ground is Stevia. Some experts point to the plant-based sweeteners zero-calories to indicate that it's a clear winner for healthiest choice. However, as we mentioned above, studies also suggest that zero-calorie sweeteners, even natural ones like Stevia, can increase hunger and lead to weight gain, so moderation is key.

Agave Nectar Takes the Cake for Worst Sweetener You Can Choose

Despite having a super-low GI (around 20), Agave Nectars extremely high fructose content has experts concerned. That's because too much fructose may contribute to unhealthy changes in liver function, triglyceride levels, and insulin sensitivity. Fructose is also harder to digest especially for people with IBS than other sugars.

What About Artificial Sweeteners?

Dr. Kumar says, Artificial sweeteners can reduce your immediate calorie intake and glycemic load. Whether they ultimately result in weight loss is more controversial, but they appear to help. However, that does not mean you can just sprinkle artificial sweeteners with wild abandon.

Experts suggest that, while artificial sweeteners won't necessarily make you fatter than sugar when compared gram-for-gram, you do run the risk of over-consuming, since they never signal your brain to say enough.

Additionally, more new research has hinted that artificial sweeteners may mess with your guts microbes, the tiny organisms that live in your digestive system and help manage the ways your body breaks down and processes the stuff you eat. Like opening Pandora box, any changes to the guts microbiota may lead to widespread negative health consequences.

If you do prefer the taste of artificial sweeteners, be sure to add just a little bit when stirring some into your morning coffee.

Ultimately, says Dr. Kumar, for someone trying to control blood sugar and/ or lose weight, artificial sweeteners can have a role. The key, of course, is moderation.

Insofar as processed foods and beverages that boast zero calories? Experts agreed that there is no evidence artificial sweeteners are better than drinking Original Coke in all its full-sugar glory when watching your weight is a primary concern.

Where to Watch Out for Hidden Sugar?

In the end, reducing your consumption of all sweet things is generally better for your health, which is why we asked which foods were most likely to sneak too-high of sugar content into your diet.

Our experts pointed to sweetened beverages as American's biggest source of added sugar consumption, and suggested those watching their sugar intake switch to non-caloric sweeteners, such as Stevia, when sweetening up tea or coffee. (Of course, sticking to straight water or unsweetened tea was noted as preferable, but we all have to start somewhere.)

Dr. Kumar warns to watch for hidden excess sugar in cereal, salad dressing, canned fruit, toaster pastries, pudding, bottled tea, yogurt, energy bars. Additionally, he also points a finger at anything labelled fat-free, as sugars are often added to mask the taste of subtracted fat.

U.S. health agencies, including the U.S. Food and Drug Administration (FDA) continue to claim that artificial sweeteners are safe in the amounts typically consumed.

The Academy of Nutrition and Dietetics (AND) even went so far as to say a 150-pound adult can safely consume 17 [12-ounce] cans of soda or 97.4 packets of artificial sweetener containing aspartame daily and not be adversely affected".

The science, however, would seem to suggest otherwise. Research published in *Applied Physiology, Nutrition and Metabolism*, for instance, found aspartame intake is associated with greater glucose intolerance in people with obesity.

Glucose intolerance is a condition in which your body loses its ability to cope with high amounts of sugar, and it's a well-known precursor to type 2 diabetes. It also plays a role in obesity, because the excess sugar in your blood ends up being stored in your fat cells.

This means obese individuals who use aspartame may have higher blood sugar levels, which in turn will raise insulin levels, leading to related weight gain, inflammation and an increased risk of diabetes.

How Artificial Sweeteners Set the Tone for Weight Gain and Diabetes

Consuming artificial sweeteners causes a cascade of negative metabolic effects in your body. Research published in *PLOS One* found regularly consuming artificially sweetened soft drinks is associated with several disorders of metabolic syndrome, including:

1. Abdominal obesity
2. Insulin resistance
3. Impaired glucose intolerance
4. Abnormally elevated fats in the blood
5. High blood pressure

The study found drinking aspartame-sweetened diet soda daily increased the risk of type 2 diabetes by 67 percent (regardless of whether they gained weight or not) and the risk of metabolic syndrome 36 percent.

One way artificial sweeteners may increase diabetes risk is by altering your gut microbes. Research published in the journal *Nature* found, in fact, that artificial sweeteners induce glucose intolerance by altering gut microbiota.

Artificial Sweeteners May Induce Metabolic Derangements

Consuming artificial sweeteners also appears to interfere with your body's ability to count calories, with deleterious effects. In a report published in the journal *Trends in Endocrinology and Metabolism*, Susan Swithers, a professor of behavioural neuroscience at Purdue University in Indiana, wrote:

Accumulating evidence suggests that frequent consumers of these sugar substitutes may also be at increased risk of excessive weight gain, metabolic syndrome, type 2 diabetes, and cardiovascular disease.

Consuming sweet-tasting but non-caloric or reduced-calorie food and beverages interferes with learned responses that normally contribute to glucose and energy homeostasis.

Because of this interference, frequent consumption of high-intensity sweeteners may have the counterintuitive effect of inducing metabolic derangements.

Aspartame May Become More Toxic When Heated

When you buy an aspartame-sweetened soda, you have no way of knowing whether it was exposed to high temperatures during storage or transport, yet this could be an important factor in its toxicity.

An investigation conducted by the food risks assessment department of the centre for environmental and noospheric researches of the Armenian National Academy of Sciences recently looked into this factor, as temperatures in Yerevan, Armenia may exceed 95 degrees F.

Soft drinks, meanwhile, are often stored in open air wholesale warehouses, under direct sunlight or on hot asphalt. The study found that the safety of aspartame-sweetened soft drinks could not be guaranteed because of this improper storage exposing the drinks to high temperatures.

When aspartame is heated to above 86 degrees F (30 degrees C), free methanol is created. This would occur not only when aspartame-containing products are improperly stored but also when they are heated (e.g., as part of a diet “food” product such as gelatin).

Methanol breaks down into formic acid and formaldehyde in your body. Formaldehyde is a deadly neurotoxin. A U.S. Environmental Protection Agency (EPA) assessment of methanol states that methanol: “Is considered a cumulative poison due to the low rate of excretion once it is absorbed. In the body, methanol is oxidized to formaldehyde and formic acid; both of these metabolites are toxic.”

Artificial Sweeteners May Increase Depression Risk

Adverse neurological effects of artificial sweeteners have been suspected for some time. One study published in 2014 included nearly 264,000 U.S. adults over the age of 50 who were enrolled in an AARP diet and health study. At the outset of the study, the participants filled out a detailed dietary survey.

At a 10-year follow-up, they were asked whether they have been diagnosed with depression at any point during the past decade.

Those who drank more than four cans of diet soda or other artificially sweetened beverages a day had a nearly 30 percent higher risk of depression compared to those who did not consume diet drinks.

The researchers explained that aspartame may modulate brain neurotransmitters such as dopamine and serotonin. Even as far back as 1987, researchers had their suspicions that aspartame may be harmful to your brain. According to a review published in *Environmental Health Perspectives*:

The artificial sweetener aspartame (L-Aspartyl-L-phenylalanyl-methyl ester), is consumed, primarily in beverages, by a very large number of Americans, causing significant elevations in plasma and, probably, brain phenylalanine levels.

Anecdotal reports suggest that some people suffer neurologic or behavioural reactions in association with aspartame consumption.

Since phenylalanine can be neurotoxic and can affect the synthesis of inhibitory monoamine neurotransmitters, the phenylalanine in aspartame could conceivably mediate neurologic effects.

CSPI Says Avoid Splenda After Study Links It to Cancer

Research from the Ramazzini Institute, an independent non-profit organization, linked sucralose (brand name Splenda) to cancer, specifically leukemia.

The findings were first presented at a London cancer conference in 2012 and prompted The Center for Science in the Public Interest (CSPI) to downgrade Splenda from its safe category to one of caution.

In 2016, the study was published in a peer-reviewed journal, the *International Journal of Occupational and Environmental Health*, leading CSPI to downgrade Splenda from caution to avoid. The researchers fed mice Splenda beginning prenatally and continuing for their entire lifespan.

The mice were fed varying concentrations of the artificial sweetener: 0 ppm (parts per million), 500 ppm, 2,000 ppm, 8,000 ppm or 16,000 ppm. A significant increase in cancerous tumours was seen among male mice, and the risk increased along with the dose.

The risk of leukemia in male mice also significantly increased, especially at Splenda doses of 2,000 to 16,000 ppm. According to the study:

These findings do not support previous data that sucralose is biologically inert. More studies are necessary to show the safety of sucralose, including new and more adequate carcinogenic bioassay on rats. Considering that millions of people are likely exposed, follow-up studies are urgent.

After more than a decade, CSPI has finally gotten it right about Splenda in recommending that consumers avoid it. For the record, however, CSPI is generally an organization whose guidelines need to be taken with a grain of salt. For instance, while recommending that

people avoid artificial sweeteners like sucralose, aspartame and saccharin, they still consider drinking diet soda to be safer than drinking regular soda.

Splenda Tries to Save Its Tarnished Image by Hiring Monsanto PR Firm

Notorious PR firm Ketchum works closely with Monsanto and the biotech industry to promote genetically engineered (GE) crops and downplay the concerns surrounding genetically modified organisms (GMOs). The latest company to hire Ketchum as its PR AOR (agency of record) is Heartland Food Products Group for its artificial sweetener Splenda. Heartland acquired Splenda from McNeil Nutritionals, a subsidiary of Johnson & Johnson, in 2015.

Splenda's reputation could clearly use a boost, and who better to do so than Ketchum, a "disaster PR expert" that has done work for a number of politicians and world leaders with image problems, as well as corrupt governments around the world? Ketchum's first assignment will be the new product launch of Splenda Naturals, which are due out in October 2016. Splenda has tried to align itself with natural products before.

They previously used the slogan Made from sugar, so it tastes like sugar, which is misleading since Splenda is not natural nor does it contain elements of natural sugar.

Outsmart Your Sweet Cravings Naturally

Although they taste sweet, when it comes to your health it's clear that artificial sweeteners are sour. When a sweets craving strikes, resist the urge to reach for an artificially sweetened food or beverage and eat something naturally sour instead.

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