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## NUTRITION

## The science on sugar cravings and how to beat them

A combination of physical, psychological, and societal factors make us eat more sugar today than ever. Learn 5 ways to break the cycle of sugar cravings.





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Why are sugar cravings so powerful they often get compared to addiction? While glucose is fuel—your body can't function without it—added sugar in processed foods is hardly essential. In fact, limiting sugar intake is crucial to improving metabolic health. Yet even if you fully understand this, the allure of candy, ice cream, and sweetened drinks may seem impossible to resist. What's happening?

“Research has shown that sugar basically acts on the same reward pathways in the brain as cocaine and other street drugs, which is why so many people crave it so strongly,” says [Uma Naidoo](#), MD, director of Nutritional and Lifestyle Psychiatry at Massachusetts General Hospital.

## How Much Sugar Do We Really Eat?

Whether intense sugar cravings should be officially classified as an “addiction” is controversial among scientists. However, it's clear that a combination of physiological, psychological, and economic factors contribute to why people so frequently overdo the sweet stuff today. In the late 1700s, people consumed around six pounds of sugar a year. Today it's typical to ingest 150 pounds of total sugar per year, much of which comes from added sugar.

That's a problem for many reasons. Added sugar is a high-calorie, low-nutrient food, so it's easy to understand how the rise in its consumption dovetails with today's dual epidemics of obesity and Type 2 diabetes. Yet even if your weight is normal and you don't have a diagnosis of diabetes, excess sugar can cause problems by leading to frequent blood sugar spikes and dips, which can impact how you feel and also lead to long-term health problems.

## The Metabolic Connection

As blood glucose rises, your body tries to compensate by releasing extra insulin, but cells become less responsive to this hormone over time, and you can end up with insulin resistance. Elevated blood glucose levels and insulin resistance set the stage for a host of chronic conditions, including Type 2 diabetes, cardiovascular disease, and age-related cognitive problems (including Alzheimer's disease). Poor metabolic health can also play a role in various mental health issues such as depression and anxiety.

Excessive sugar consumption is closely tied to other side effects, including oxidative stress (or tissue-damaging free radicals within the body) and glycation (where glucose gets "stuck" to proteins within the body, causing problems).

The solution seems simple: Eat less sugar. But anyone who's tried to curb sugar cravings or quit cold turkey knows that's easier said than done. To tame your sweet tooth and beat sugar cravings for good, you have to overcome powerful environmental cues and brain circuitry that tells you to polish off that entire candy bar (and maybe go back for a second).

## The Nature and Nurture Behind Sugar Cravings

If you feel like you're living in a world that's compelling you—even cheering you on—to eat more sugar, you're not imagining it. We live in a society saturated with sugar, where highly processed foods (which often contain loads of added sugar, even if they don't taste sweet) comprise up to 60% of our calories. Highly processed foods also tend to be more affordable and easily accessible, which is a result of subsidies that support the production of crops that

often make their way into processed foods like corn, soy, and wheat. Plus, we've been conditioned from an early age to associate sweetness with happiness and comfort. Celebrating a birthday? Of course you're eating cake. Going through a breakup? Grab a pint of ice cream and a spoon.

Even if you're not trying to conjure a soothing emotion, cravings and habits go hand-in-hand. "If you always have a bowl of ice cream at 8 p.m. while you watch a TV show, you're going to crave ice cream when you watch TV at that time," says John Apolzan, PhD, assistant professor and nutrition scientist in the department of clinical nutrition and metabolism at Pennington Biomedical Research Center.

Like any ingrained habit, an association like "TV equals ice cream" is incredibly hard to break. Neuroscientists believe that's because, over time, paired thoughts and actions start traveling together along the same brain pathways.

A high-glucose meal only makes matters worse because it can lead to blood sugar spikes followed by substantial dips (a process called *reactive hypoglycemia*), which can increase appetite in subsequent meals.

## Your Brain's Response to Sugar Doesn't Help

Another reason why sugar's draw is so strong: You have to contend with your brain's reward system, which produces the feel-good neurotransmitter dopamine when exposed to sugar.

"Sugar cravings are mediated by the mesolimbic dopamine system, which is triggered by cues including smells, sights, and vivid imagery," says Kent Berridge, PhD, a professor of psychology and neuroscience at the University of Michigan. This system is a neural network that connects the brain's main dopamine-producing area (the ventral tegmental area, or VTA) with a structure called the nucleus accumbens, which is all about reward and pleasure.

According to Berridge, when you eat sugar, dopamine neurons in the VTA are activated and head toward the nucleus accumbens. Dopamine in that area then increases, strengthening brain pathways that will make you want to do it all over again.

Research suggests that consuming sugar also stimulates the release of hormones, including ghrelin, which is closely linked to increased cravings. That may be why, once you have that first sip of cola, cravings often intensify. Emerging animal research suggests that these cravings are mediated by a distinct neural circuit that starts in the gut and alerts the brain to the presence of sugar.

# The Stress Connection

While external cues—like the smell of fresh-baked cookies—clearly make the desire to consume sugar more powerful, one of the most significant triggers for sugar cravings is stress.

In the short term, sugary foods promote the production of serotonin, a chemical that aids mood regulation, in the brain. “Foods that are high in added sugar as well as simple carbohydrates [which are quickly broken down into sugar] increase insulin levels in the body, which allows tryptophan—a building block for serotonin—to enter the brain,” Naidoo explains. “Tryptophan is converted to serotonin in the brain, so there’s an initial calming effect.”

The catch, however, is that these hormonal changes are quickly followed by activation of the hypothalamic-pituitary-adrenal (HPA) axis—the connection between the hypothalamus, pituitary gland, and adrenal glands—which leads to the release of cortisol. (Excess sugar can also promote cortisol release through inflammation, or by increasing insulin, which elevates cortisol.) High stress, and perhaps even elevated cortisol, can lead you to eat more sugary foods, thus creating a vicious cycle.

## 5 Ways to Break the Sugar Cravings Cycle

There’s no scientifically proven way to retrain your brain to stop sugar cravings, but there are tactics you can take to lessen them. Some options worth exploring:

- **Limit exposure.** Don’t try to satisfy a food craving with “just a taste” of something; it will likely backfire by serving as a cue to eat more or reinforcing a previously established habit. Research shows people who follow a low-carb diet find that their sugar cravings eventually diminish—ditto for those who go on a very-low-calorie diet. The reason, says Apolzan (who has led some of this research), is that such diets essentially outlaw sugary foods, so the grip of conditioning to desire these foods lessens.
- **Give it time.** Research shows that when people cut way back on carbs (including sugar), cravings dissipate within weeks. Exactly how long it takes will vary from person to person, but four weeks seems average. According to Apolzan, even if you don’t follow a strict low-

carb diet—perhaps you occasionally eat whole grains and starchy vegetables but eliminate sugary processed foods—you should experience similar results.

- **Break the association.** If you always crave a sweet snack mid-afternoon while you're in your office, try taking a walk at that time, says Apolzan. You need to decondition yourself so that your brain no longer links that moment in your day with sugar.
- **Employ mindfulness.** When a craving hits hard, trying to resist it might not help. Instead, “allow the craving to happen; just notice it, feel it, and let it fade,” suggests Berridge, who adds that the craving might lessen after a few minutes. Mindfulness-Based Eating Awareness Training (MB-EAT) has been shown to help people with binge eating disorders but may also be helpful in stress-induced cravings. MB-EAT involves mindfulness meditation and guided mindfulness practices that help you become more aware of your emotional state and better equipped to manage these feelings so you can make conscious food choices. Mindfulness meditation is supported by a large body of research that shows regular practice prompts changes in the brain's structure and activity to help regulate the sympathetic nervous system, best known for its “fight or flight” response. Mindfulness practice helps slow your body's stress response so that the next time you crave chocolate in a stressful moment, you can pause, recognize the underlying feeling, and choose another option for comfort, such as a soothing cup of tea.
- **Strive for a balanced diet.** Eating ample fiber, protein, and healthy fat increases satiety, keeps blood sugar levels stable, and reduces sugar cravings. This might have to do with the physical feeling of fullness these foods provide. A 2020 study found that people who ate an average of 35g of fiber per day had better blood sugar markers than those who averaged just 19g. of fiber. High-fiber foods include beans, nuts, seeds, vegetables, fruits, or whole grains. Meanwhile, additional research shows eating fat alongside carbohydrates can


decrease the uptick in glucose after eating.

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