



Secrets of the body

What does sugar do to your body - and how can you avoid a slump?

We evolved to like energy-dense foods such as honey, but modern diets tend to include too much sugar. Here's how to make sure you eat the right amount, at the right time



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Sugar tastes great for good reason: we evolved to like it, back when honey was a hard-to-get, energy-dense treat and we spent half of our time running around after antelope. Now that it's much easier to get and we don't move as much, that sweet tooth is working against us: many of us are consuming far too much of it, and suffering from poor health as a result. But is there anything specifically bad about it beyond it providing too many calories and not enough nutrients?

■ This whole idea of trying to 'flatline' your glucose response that you see from some influencers is totally unnecessary

“When we taste sugar, the body starts reacting the moment sweetness touches the tongue,” says Dawn Menning, a registered dietitian who works with health app Nutu. “The brain recognises it as a quick source of energy and activates the reward system, releasing the feelgood chemical

dopamine that makes it so appealing.” Interestingly, not everyone tastes sugar in exactly the same way - in [2015, researchers compared](#) different types of siblings' perception of sugar and sweeteners, and found that identical twins were more similar to each other in their sweet taste perception than fraternal twins or non-twin siblings. They concluded that genetic factors account for about 30% of the variance in how sensitive people are to sweet tastes - but it's unclear whether that actually affects how much we eat.

Regardless, what happens after your first taste depends on the kind of sugar you're taking in: glucose, which is what you get from table sugar, most sweet treats and starchy carbohydrates, has slightly different effects from fructose, the type you'll commonly find in fruits and juices.

“Glucose causes the pancreas to release insulin, a hormone which - to put it in simple terms - is involved in removing that glucose from circulation and depositing it where it needs to go,” says Sarah Berry, professor of nutrition at King's College London and chief scientist at science and nutrition company Zoe. “That might mean that it's stored in the muscles or liver for energy as glycogen, or converted into fat.” Fructose, meanwhile, doesn't cause insulin to be released. “It's delivered directly into the liver, where, again it can be converted to glycogen - or again, if consumed in excess, is converted also into fat.”





When we eat sugar, the brain recognises it as a source of energy and releases the feelgood hormone dopamine. Photograph: Posed by models; Aire Images/Getty Images

Both types of sugar, when eaten in excess, can lead to an increase in the type of fat circulating in your blood known as triglycerides: they're essential for energy, but high levels can increase the risk for heart disease, stroke and pancreatitis. Fructose is more of a concern for people at risk of fatty liver syndrome, but glucose is an issue for people who have trouble regulating insulin. Which one you should be more concerned about, then, really depends on your other lifestyle choices and genetic predispositions.

“What we also know is if you have an insulin peak that's excessive and repeated day in and day out, then it can increase levels of inflammation,” says Berry. “That in itself isn't inherently bad because inflammation is happening all the time in our bodies - but if it's repeated and excessive, that's when we believe it becomes a problem.”

The sugar rush, incidentally, is a myth that has somehow persisted for decades: when researchers analysed a meta-analysis of studies on young people eating sugar back in 1995, they concluded that “sugar does not affect the behaviour or cognitive performance of children”, suggesting that “the strong belief of parents may be due to expectancy and common association”. More recently, a [2019 meta-analysis](#) found no mood-boosting effects from carbohydrates (including sugar), and noted that it “was associated with higher levels of fatigue and less alertness compared with [the] placebo within the first hour post-ingestion”. But even if our seemingly sugar-crazed darlings are actually just acting up in response to the placebo effect, or the fact that they're at a party, the other problem is what happens after the insulin peak goes away and we experience a corresponding dip.



A 2019 study found no mood-boosting effects from sugar. Photograph: Posed by model; Catherine Falls Commercial/Getty Images

“We know from [research that we’ve done with our Zoe Predict cohort](#) that if people have that dip, they feel more hungry, and they tend to consume 80 calories more at their next meal, and 320 calories more over the day,” says Berry. “So if you have a breakfast that’s just carbohydrate it’s very likely to cause you to have a dip and you’ll end up eating more later.”

This means that it’s not just how much sugar you eat: it’s about when you eat it, and how much. “We know blood sugar response is more favourable in the morning because you’re more insulin sensitive compared to the afternoon,” says Berry. “But our bodies are also better able to handle sugars if they’re being delivered as part of an overall balanced meal with heart-healthy fats and healthy proteins. By the way, this whole idea of trying to ‘flatline’ your glucose response that you see from some influencers is totally unnecessary: an increase in blood glucose is a normal physiological response to eating. We just need to make sure that it’s not excessive.”

The takeaway? As a nation, we definitely eat more sugar than we need or can use. A recent study released by the Oral Health Foundation found that

84% of us eat at least one sugary snack daily, with 79% consuming “up to” three every day. It’s a good idea to eat less, but there’s no need to demonise or cut it out entirely: just enjoy it in moderation, preferably not too late in the day, and ideally alongside some fibre, healthy fat or protein.

And if you’re tempted to skip this whole worrisome business by relying on sugar substitutes instead, that might not be the foolproof plan you’re hoping for. It was once thought that artificial sweeteners might cause your insulin to spike on their own or somehow “trick” your hunger hormones into making you famished, but neither of those things seem to be the case: actually, the problem happens in a different place.

“There’s [some emerging evidence](#) that sweeteners like saccharin and sucralose can affect your oral and gut microbiome,” says Berry. “More research needs to be done to understand if there are also subsequent effects on other health outcomes in the long term, such as blood pressure, insulin resistance, and body weight. But it’s not a get out of jail free card.” It’s also possible, according to [research published recently](#), that some sweeteners are actually converted to fructose in the body, triggering effects similar to regular sugar.

Until the results are in, get some sweetness from sugar instead – that’s what we’ve evolved to do. But remember: our paleolithic ancestors didn’t have access to as much as you, and they probably moved around a heck of a lot more.

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