

Diet soda and insulin spikes ^[1]

Dear Alice,

I have heard that the main reason why diet drinks, like a diet soda, can be bad on a diet, is that it can spike insulin levels and then your body expects sugar that it does not get. I have taken to the habit of only occasionally having diet drinks with meals, so that any increase in insulin is actually met with food in my system. My question is whether or not this is a good/workable strategy, or whether a diet soda is a diet soda no matter when you drink it and is therefore always a bad idea. Thank you for your time.

Answer

Dear Reader,

It doesn't seem like there's a short and sweet answer to your inquiry. Unfortunately, scientists still don't fully understand the influence of artificial sweeteners on the body's blood sugar and insulin responses. But, here's the skinny on pairing a meal with your diet soda: the evidence that connects artificial sweeteners to "insulin spiking" is limited. *In vitro* studies (a.k.a., test-tube studies of cells living outside the body) have shown that cells release more insulin when exposed to some artificial sweeteners. Increased insulin signals a cell to store more energy as fat (rather than use it as fuel), so this might partially explain the correlation between weight gain and artificial sweeteners. However, much more research on this is still needed, so it's difficult to say if eating a meal with your diet soda makes a difference either way.

Reader, you also mention you've heard that drinking diet soda might make your body expect sugar when it's really getting a calorie-free substitute. Although studies on humans show mixed results, researchers think that it could be a possibility because this is generally true in rats — animals predict the calorie content of a food based on how sweet it tastes (and fun fact: humans have sweet taste receptors in places other than their tongue, like the brain, pancreas, and gut!). But, when this arithmetic is off (like when you consume something very sweet, but it has few or no calories), some scientists think that your body might respond by increasing your appetite to make up the unexpected calorie difference with more food every time you taste something sweet (whether it's calorie-free or not). While it's still unclear if this is related to insulin regulation, artificial sweeteners have been shown to increase food intake and weight gain in rats because of this phenomenon. Whether this is the case for humans is still being debated — check out [Do diet colas increase appetite?](#)

[2] in the *Go Ask Alice!* archives for more on the evolving discussion.

Also, keep in mind that not all diet sodas are created Equal™: there are many different types of artificial sweeteners that can be used as food additives, including aspartame [3] (brand names: NutraSweet, Equal), saccharin [4] (brand name: Sweet'N Low), sucralose (brand name: Splenda), and acesulfame potassium (brand name: Sunett). More recently, alternative plant-based sweeteners such as stevia [5] or monk fruit have also become popular. Sugar alcohols are another type of sugar replacement which fall into an entirely different class of substitutes that include sorbitol, mannitol, and xylitol, which you may have seen on packets of sugar-free chewing gum. Each of these sugar substitutes is chemically unique, which means it's also possible that they could each affect the body in different ways. Unfortunately, that's where the research falls flat — there just isn't enough data to support any substantial claims regarding the short-term or long-term health effects of any one artificial sweetener. There is however, one notable exception: individuals with a genetic condition called phenylketonuria (or PKU), can't completely process aspartame. This means they must avoid all products sweetened with aspartame — soda or otherwise.

So, is it time you eighty-six that order of diet cola with your pizza? Like most sweet treats, the occasional diet soda is unlikely to be problematic for most people, and drinking your soda with a balanced meal is probably a better idea than replacing an entire snack or meal with just a diet soda. Just remember that “zero-calorie” isn't really a free pass — diet soda [6] isn't necessarily any healthier than regular soda, so if you sip, try to do so in moderation. But, if you're still worried about the unknown effects of artificial sweeteners, you can opt for unsweetened, sodium-free soda water in a variety of flavors (just be sure to check the label!) to get your bubbly fix. Or, for another low-calorie alternative, you could try infusing your water with fresh fruit or slices of cucumber or lemon. These could be great alternatives to your dose of diet fizz, with or without the pizza.

If you have any specific concerns regarding your blood sugar or insulin levels, consider making an appointment with a health care provider or a registered dietician who can answer any questions that might “pop” up. They can also evaluate your glucose and insulin levels and work with you to make the best choices for your unique dietary needs and preferences.

Alice!

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