

Does diet soda actually make you gain weight?

One psychologist says non-calorie sweeteners can make you "metabolically deranged"

By Trevor Butterworth | July 12, 2013



Are you "metabolically deranged"? According to Susan Swithers, a psychologist at Purdue University in Indiana, you might be if you consume diet foods and drinks. Though one might think that non-calorie sweeteners can satiate our desire for sweetness while saving us from the high cost of sugar — i.e. calories — Swithers contends that this may not be true.

COMMENTARY

Our brains may go, "Hey, I'm digging this guilt-free sweetness," but our bodies might well be responding, "Dude, where are my calories?" In short, our brain connects taste with the actual delivery of energy. If that energy isn't delivered, the means by which taste regulates what we eat — balancing calories in with calories out — is thrown out of whack, such that we end up consuming more energy and gaining weight.

Or so goes the theory. Swithers has been pushing it for a number of years, based upon her own research on non-nutritive sweeteners in rodents. She is, in many ways, the go-to academic if you want to write a counter-intuitive story about gaining weight from diet drinks, and she is [back in the news](#) because she has reiterated her theory for an "opinion" piece in the journal *Trends in Endocrinology and Metabolism*. Why is it an "opinion" piece? Because it is larded with "coulds" and "mights;" it isn't an actual study or experiment — or even a balanced weighing of the evidence. *Trends* is up front about that.

And yet, the news media and Twitterverse did not trouble its readers with this distinction: "The dark side of diet drinks" was, for instance, the headline used by [Fox News](#); "how diet soda makes you fat," tweeted [@DrAseemMalhotra](#), a cardiologist and "real" food enthusiast.

But the distinction is important for the following reasons: Swithers builds her argument mostly from observational studies with animals, and they are the weakest form of evidence to determine cause and effect. In fact, the inability to replicate observational studies on animals is so widespread that last year, the U.S. National Institute of Neurological Disorders and Stroke convened a workshop to discuss ways of tackling the problem. Its analysis was published in [Nature](#). And Stanley Young, assistant director of bioinformatics at the National Institute of Statistical Sciences, went so far as to say that "any claim coming from an observational study is most likely to be wrong," in a paper for [Significance](#), the journal of the Royal Statistical Society.

This doesn't mean that the observational studies cited by Swithers are "most likely to be wrong." It just means that we can't know if they are likely to be right until the results are replicated in a randomized control trial, a much more robust and reliable way of establishing cause and effect (though not foolproof, either).

And this leads us to the second problem: Because Swithers is writing an op-ed, she doesn't have to address and counter all the evidence from randomized control trials that disagree with her hypothesis. That's important because a major randomized control trial published last year in the [American Journal of Clinical Nutrition](#) specifically targeted the issue of whether replacing calorific drinks with diet beverages or water induced weight loss; it found that *both* did.

The authors — one of whom is a long time food industry scold — went so far as to write, "This strategy could have public health significance and is a simple, straightforward message." Swithers, however, just mentions this study in passing before moving on to say it might not be "always" the case. Another important randomized control trial [published last year](#) tested normal versus non-calorie soda in Dutch children and found the latter led to reduced weight gain and lower fat accumulation. Swithers acknowledges this finding but counters it with much older observational, which is to say weaker, study data.

This is the kind of argument you expect in an opinion piece; it's polemical. And that is why it is probably better to give more weight to recent randomized control trials showing weight loss in people who consume diet drinks than to a hypothesis about energy regulation based on a small number of rats eating chocolate pudding.