# It’s the Sugar, Folks

By [Mark Bittman](http://opinionator.blogs.nytimes.com/author/mark-bittman/) February 27, 2013 9:47 pm February 27, 2013 9:47 pm



Sugar is indeed toxic. It may not be the only problem with the Standard American Diet, but it’s fast becoming clear that it’s the major one.

[A study published](http://www.plosone.org/article/info%3Adoi/10.1371/journal.pone.0057873) in the Feb. 27 issue of the journal PLoS One links increased consumption of sugar with increased rates of diabetes by examining the data on sugar availability and the rate of diabetes in 175 countries over the past decade. And after accounting for many other factors, the researchers found that increased sugar in a population’s food supply was linked to higher diabetes rates independent of rates of obesity.

In other words, according to this study, it’s not just obesity that can cause diabetes: sugar can cause it, too, irrespective of obesity. And obesity does not always lead to diabetes.

The study demonstrates this with the same level of confidence that linked cigarettes and lung cancer in the 1960s. As [Rob Lustig](http://www.chc.ucsf.edu/coast/faculty_lustig.html), one of the study’s authors and a pediatric endocrinologist at the University of California, San Francisco, said to me, “You could not enact a real-world study that would be more conclusive than this one.”

The study controlled for poverty, urbanization, aging, obesity and physical activity. It controlled for other foods and total calories. In short, it controlled for everything controllable, and it satisfied the longstanding “[Bradford Hill](http://changingminds.org/disciplines/argument/types_reasoning/bradford_hill.htm)” criteria for what’s called medical inference of causation by linking dose (the more sugar that’s available, the more occurrences of diabetes); duration (if sugar is available longer, the prevalence of diabetes increases); directionality (not only does diabetes increase with more sugar, it decreases with less sugar); and precedence (diabetics don’t start consuming more sugar; people who consume more sugar are more likely to become diabetics).

The key point in the article is this: “Each 150 kilocalories/person/day increase in total calorie availability related to a 0.1 percent rise in diabetes prevalence (not significant), whereas a 150 kilocalories/person/day rise in sugar availability (one 12-ounce can of soft drink) was associated with a 1.1 percent rise in diabetes prevalence.” Thus: for every 12 ounces of sugar-sweetened beverage introduced per person per day into a country’s food system, the rate of diabetes goes up 1 percent. (The study found no significant difference in results between those countries that rely more heavily on high-fructose corn syrup and those that rely primarily on cane sugar.)

This is as good (or bad) as it gets, the closest thing to causation and a smoking gun that we will see. (To prove “scientific” causality you’d have to completely control the diets of thousands of people for decades. It’s as technically impossible as “proving” climate change or football-related head injuries or, for that matter, tobacco-caused cancers.) And just as tobacco companies fought, ignored, lied and obfuscated in the ’60s (and, indeed, through the ’90s), the [pushers of sugar will do the same now](http://www.motherjones.com/environment/2012/10/sugar-industry-lies-campaign).

But as Lustig says, “This study is proof enough that sugar is toxic. Now it’s time to do something about it.”

The next steps are obvious, logical, clear and up to the Food and Drug Administration. To fulfill its mission, the agency must respond to this information by re-evaluating the toxicity of sugar, arriving at a daily value — how much [added sugar](http://www.choosemyplate.gov/weight-management-calories/calories/added-sugars.html) is safe? — and ideally removing fructose (the “sweet” molecule in sugar that causes the damage) from the “generally recognized as safe” list, because that’s what gives the industry license to contaminate our food supply.

On another front, two weeks ago a coalition of scientists and health advocates led by [the Center for Science in the Public Interest petitioned the F.D.A.](http://www.cspinet.org/new/201302131.html) to both set safe limits for sugar consumption and acknowledge that added sugars, rather than lingering on the “safe” list, should be declared unsafe at the levels at which they’re typically consumed. (The F.D.A. has not yet responded to the petition.)

Allow me to summarize a couple of things that the PLoS One study clarifies. Perhaps most important, as a number of scientists have been insisting in recent years, all calories are not created equal. By definition, all calories give off the same amount of energy when burned, but your body treats sugar calories differently, and that difference is damaging.

And as Lustig lucidly wrote in “[Fat Chance,](http://www.us.penguingroup.com/nf/Book/BookDisplay/0%2C%2C9781594631009%2C00.html)” his compelling 2012 book that looked at the causes of our diet-induced health crisis, it’s become clear that obesity itself is not the cause of our dramatic upswing in chronic disease. Rather, it’s metabolic syndrome, which can strike those of “normal” weight as well as those who are obese. Metabolic syndrome is a result of insulin resistance, which appears to be a direct result of consumption of added sugars. This explains why there’s little argument from scientific quarters about the “obesity won’t kill you” studies; technically, they’re correct, because obesity is a marker for metabolic syndrome, not a cause.

The take-away: it isn’t simply overeating that can make you sick; it’s overeating sugar. We finally have the proof we need for a verdict: sugar is toxic.

**Correction: March 6, 2013**
Mark Bittman’s column on Thursday incorrectly described findings from a recent epidemiological study of the relationship of sugar consumption to diabetes. The study found that increased sugar in a population’s food supply was linked to higher rates of diabetes — independent of obesity rates — but stopped short of stating that sugar caused diabetes. It did not find that “obesity doesn’t cause diabetes: sugar does.” Obesity is, in fact, a major risk factor for Type 2 diabetes, as the study noted.

<http://opinionator.blogs.nytimes.com/2013/02/27/its-the-sugar-folks/> Note: 824 readers commented

Related: A researched argument on sugar as poison in Nature Magazine <http://www.nature.com/nature/journal/v482/n7383/full/482027a.html>