# Restricting sugar, not calories, found to improve youths' health

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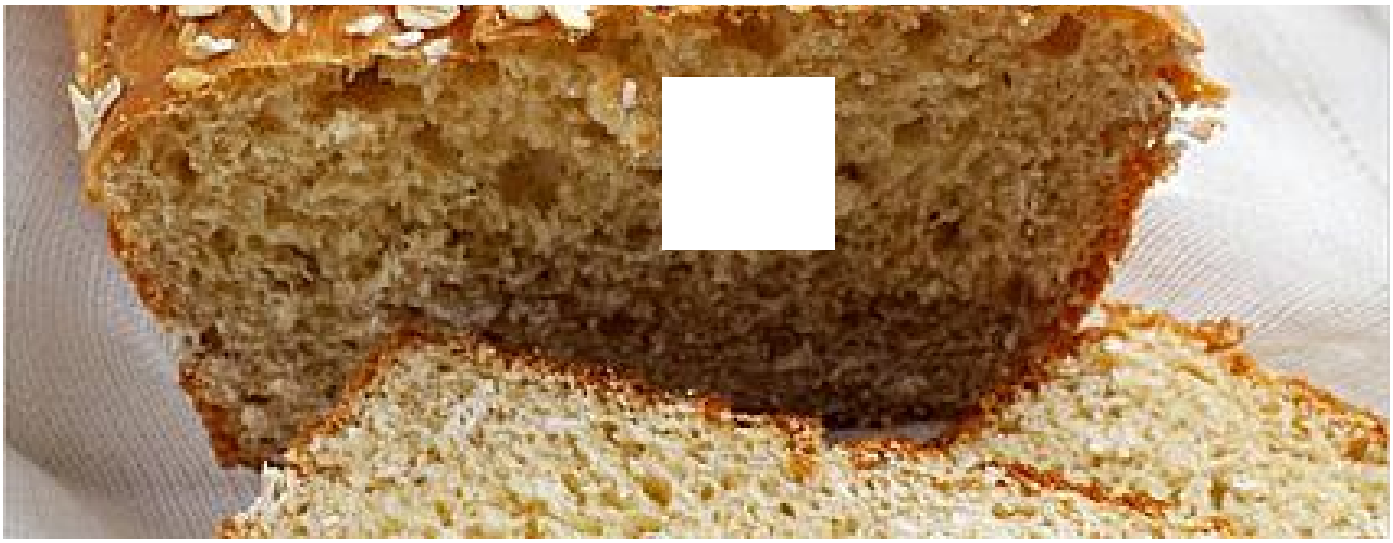
L.A. Boxing Club 2003, Los Angeles.

The health of obese kids can rapidly and dramatically improve just by taking sugar out of their diet for less than 10 days, a new study by researchers at UCSF and Touro University in Vallejo has found.

The researchers put 43 children and teenagers on a nine-day diet that severely restricted sugar without reducing calories, and virtually every measure of metabolic health — blood pressure, cholesterol and glucose levels — improved even though the participants didn't lose weight.



“What this is saying is that sugar is toxic because it’s sugar; not because it’s calories,” said Dr. Robert Lustig, pediatric endocrinologist at UCSF Benioff Children’s Hospital San Francisco and lead author of the study. “This proves conclusively, beyond a shadow of doubt, that a calorie is not a calorie.”

The study is part of a growing body of research showing the negative health effects of the roughly 22 teaspoons of sugar Americans eat or drink each day, mostly from sodas and processed foods. The increasing awareness of how sugar affects the body has prompted changes to the food industry, including labeling requirements and efforts to tax or legislate the size of sugary drinks. This year, Berkeley became the first city in the country to levy a tax on sugar-sweetened beverages.

Participants in the study, ages 9 to 18, were selected through a UCSF program that concentrates on improving metabolic health rather than reducing weight. The researchers limited recruitment to African American and Latino youths because those ethnic groups are at higher risk for metabolic syndrome, a cluster of conditions such as high blood pressure, heart disease and Type 2 diabetes.

The children were given nine days of food, including snacks and beverages, that restricted sugar, but allowed fruit, and substituted starch to maintain the same fat, protein, carbohydrate and calorie levels as their previously reported home diets. This reduced the average amount of total sugar the youths normally consumed from 28 percent to 10 percent of total calories. Within that number, the diet reduced fructose, which included the sugars in soda and sweets, from 12 percent to 4 percent of their diets.

**Consistent improvements**

After just nine days, diastolic blood pressure — the bottom number — decreased an average of five points, triglycerides (fat in the blood) dropped 33 points, LDL (the “bad” cholesterol) went down 10 points, and liver

function tests improved. In addition, fasting blood glucose went down five points and insulin levels were cut by a third.

“I was surprised we had such a consistent result from kid to kid. It’s very dramatic,” said Jean-Marc Schwarz, a professor in the College of Osteopathic Medicine at Vallejo’s Touro University and senior author of the paper.

The paper appeared online Tuesday and will be published in the February issue of the medical journal Obesity.

Officials from the Grocery Manufacturers Association, which represents the world’s largest food and beverage companies, criticized the study’s design and the results. They said the small sample size, which required participants to have at least one chronic metabolic disorder such as hypertension, made it “irresponsible” to apply the conclusions to the general population.

“The results as reported are simply impossible to interpret, particularly with regard to making public health recommendations,” Dr. Leon Bruner, the trade group’s chief science officer, said in a statement. “We agree that further research is needed in this area to determine long-term effects of the types of dietary changes recommended by the author, particularly since poorly constructed research like this does not offer any useful insights.”

Schwarz dismissed the criticism, saying the food industry is more interested in profits than science.

While surprised by the results, Schwarz said his previous research has indicated the body responds rapidly to short-term sugar reduction. He found similar results in a study released this year on a small group of normal to moderately overweight adult men.

**Seeing immediate results**

For the study, which was conducted from 2010 to 2014, researchers tailored the food plans to each child’s personal tastes. Participants were given meals and snacks they liked — far from health foods — but starches were substituted for sugars. For example, instead of teriyaki chicken, they got turkey hot dogs. Sweetened yogurt was replaced with baked potato chips and pastries with bagels. Sugary drinks, including fruit juice, were not allowed.

The purpose of the substitutions was to keep calories up and the participants’ weights stable so the researchers could isolate the effect of sugar on metabolic function. If the children had lost weight, the improvements in their blood sugar and other measures could be attributed to the weight loss, not the sugar restriction, Lustig and Schwarz said.

Lustig, president of the nonprofit Institute for Responsible Nutrition and the author of “Fat Chance,” a condemnation of processed sugar, said the data from this study will be used for future studies that will delve deeper into the causes of metabolic syndrome.

“We can’t prove sugar is the only cause of metabolic syndrome,” Lustig said. “But what this paper does show is sugar is a contributor and it’s modifiable. You can modify it today, and the benefits are immediate.”

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