Sugar: Just how bad is it?

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Genetic, environmental and dietary factors impact how we absorb glucose from complex carbohydrates, says professor George O'Doherty.

A couple of weeks ago, science writer Gary Taubes — author of the book “Why We Get Fat” — wrote an article for the New York Times magazine in which he analyzed the debate over whether sugar and high-fructose corn syrup is the dietary cause of chronic ailments such as heart disease, hypertension and cancer.

George O’Doherty, professor of chemistry and chemical biology at Northeastern University, considers the danger of consuming too much sugar.

Is sugar toxic?

This cannot be true. If sugar were toxic, then we would need to change our common definition of the word “toxic” or agree that everything is

toxic and just a question of dose. Clearly, a high-calorie diet high in sugar can lead to higher blood glucose levels, which in turn can lead to obesity and eventually diabetes. The question to ask is, is this news?

What makes sugar bad for you?

There are two main arguments. The more credible argument points out that high blood glucose concentrations can lead to a resetting of the appetite suppression mechanism and insulin response, which eventually causes obesity and diabetes.

The second, less convincing, argument begins with the fact that glucose and fructose can be metabolized through separate pathways that store energy in different ways. The good pathway uses glucose and leads to glycogen as the energy-storage molecule, and the bad pathway uses fructose and leads to fatty acid synthesis. This argument is fundamentally flawed because the two metabolic pathways are not independent. In fact, these pathways are reversible and interconnected at several levels. Thus, the body can compensate for a lack of sugar from one by using the other. As a result, the difference in these two pathways is only revealed when both glucose and fructose are present in abundance, which may be the case in “The Typical Western Diet.”

If you wanted to limit sugar intake, it would be more effective to reduce your consumption of fructose over glucose, by drinking less soda, for example. Of course, even this is a simplistic view. There are a lot of genetic, environmental and dietary factors that go into how we absorb glucose from complex carbohydrates that affect our total calorie intake and choice of diet.

How much sugar and carbohydrates do you recommend we consume each day?

As a general principal, we should think of less rather than more. In trying to reduce caloric intake, we should reduce fructose and sucrose followed by the more complex carbohydrates. Having said that, I am not arguing for the choice of a potato (carbohydrates) over a tomato (fructose/sucrose). Similarly, when you examine the long-term effects from years of exposure, you have to wonder whether fructose or a sugar substitute, like Sucralose, is better for you.

Provided by Northeastern University