Is fructose really that bad for you?



I remember a time in the 70s and 80s when I was just getting started in the field of nutrition when fructose was considered a harmless sweetener for diabetics. Marketed as “diabetic sugar,” fructose syrup was dispensed in clear plastic containers and consumed with impunity by persons with blood sugar problems.

The embrace of fructose as an alternative to glucose was fostered by the observation that it evoked a lower blood sugar response than other sweeteners. Fructose was found to have one of the lowest glycemic index (GI) values—20, as compared to glucose, and its disaccharide maltose—100 and 105 respectively.

One putative advantage of fructose was that it seemed to get “under the radar” of the body’s insulin responses. Fructose—unlike sucrose, glucose, malt sugars and starches—not requiring insulin for its metabolism, did not appear to stoke the insulin surges which could lead to insulin resistance, a pathway to metabolic syndrome and Type 2 Diabetes.

This led the American Diabetes Association to endorse fructose as a preferable alternative to other sugars from 1979 to 2001—albeit with a caution about high intakes.

All this changed in 2004 with the publication of a landmark review—one of the most frequently cited in nutrition literature—entitled “Consumption of high-fructose corn syrup beverages may play a role in the epidemic of obesity.”

The paper noted a striking concordance between the popularization of high fructose corn syrup as a sweetener—ubiquitous in sodas, sweetened fruit drinks, candies, and processed foods—and the incidence of obesity. The authors advanced the notion that fructose’s ability to circumvent insulin metabolism was actually a liability, causing it to elude the body’s natural satiety mechanisms.

A problem associated with high fructose consumption was “de novo lipogenesis” in the liver—literally the body’s ability to transform sugar into fat. In the liver this would lead to fatty liver; in the bloodstream it would generate high triglycerides; and the adipose tissue would store surplus body fat.

Moreover, it was found that fructose uniquely fed the uric acid synthesis pathway, leading to higher risk of gout. That’s why I caution patients with gout to not just avoid dietary purines from meats, but also excess fructose from soda, candy and fruit juice.

But fructose-phobia has gone a little too far. I vividly recall a patient who indignantly returned a bottle of zinc lozenges because each lozenge was sweetened with 3 grams of fructose (for reference, 1 medium apple has 12.6 grams of fructose).

So strong was the backlash against high-fructose corn syrup that the sugar industry

attempted to “rebrand” it as “corn sugar”—a move that was rejected in 2012 by the FDA.

Now, in a surprising reversal, this month’s edition of the authoritative American Journal of Nutrition offers a robust vindication of fructose. In a pair of articles, it was demonstrated that when fructose was substituted for glucose, it did not result in a rise in triglycerides. Moreover, fasting blood sugar was slightly lowered, as was hemoglobin A1C, a measure of long-term sugar control.

One explanation for these seemingly paradoxical results was that fructose is sweeter-tasting than glucose; thus, a smaller amount of fructose may suffice to satisfy a sweet-tooth.

Another possibility is that fructose appears to have a “catalytic” effect on sugar metabolism in the liver; it may help diabetics utilize sugar as fuel more efficiently. This is said to outweigh the tendency of fructose to generate fat.

How do we reconcile these disparate views of the healthfulness of fructose?

First, it must be kept in mind that humans are genetically programmed to consume moderate amounts of fructose in such “Paleo” foods as fresh fruit and even wild-gathered honey. But modern fruits that were not available to our ancestors are now systematically bred for sweetness. Domesticated vegetables—also revved-up versions of their prehistoric forerunners—like corn, sweet potatoes, carrots, snap peas and tomatoes, also deliver some fructose.

But by far the biggest sources of fructose in the modern diet are from sodas and processed foods like candy, cakes and cookies, sauces, jams, jellies and fruit spreads, dressings, and fruit juices. Even “natural” sweeteners like agave are laden with fructose. Keep in mind that while high-fructose corn syrup sounds bad, it only delivers slightly more fructose than table sugar, which is half fructose/half glucose. So switching to Coke made with “pure cane sugar” to avoid high fructose corn syrup won’t help you much.

It’s the relatively recent incorporation (since the 1970s) of cheap, corn-derived fructose in all manner of modern foods, resulting in a soaring per capita consumption of sugar calories, that may be responsible for fructose’s bad rap.

The problem may not be fructose per se, but with our overall high consumption of refined carbohydrates. The authors of the new exoneration of fructose admit

“ . . . when fructose supplements diets with excess calories compared to the same diets alone without the excess calories, it leads to weight gain and all of its downstream cardiometabolic disturbances, including an increase in fasting glucose, . . . insulin resistance, apolipoprotein B, [elevated] triglycerides, uric acid, and markers of non-alcoholic fatty liver disease.”

So you don’t need to avoid fructose as if it were a poison, but strive to keep your consumption to less than 35-50 grams per day (perhaps even less if you’re trying to lose weight by going very low-carb). That means 2-3 servings of fresh fruit per day are OK, but minimize honey, jams, jellies and fruit spreads, dried fruits, sodas, and fruit juice. Read labels to spot added high fructose corn syrup in such products as ketchup, relish, tomato sauce and salad dressings. Note that most breakfast cereals are laced with high-fructose corn syrup, in addition to delivering a jolt of rapidly-digestible starch.

(An exception where more stringent fructose avoidance is called for might

be fructose malabsorption—wherein sufferers experience gas, bloating, and diarrhea when consuming fructose-rich foods. This is usually diagnosed via a breath test, or alternatively, after a trial of strict fructose elimination relieves symptoms.)

It goes against the fundamental laws of nutrition that a single dietary component, like saturated fat, animal protein, or wheat, can be precisely targeted as a universal causal agent of human disease.

Thus: The fewer other forms of sugar, candy, pastry, ice cream, frozen desserts, and refined carbs you consume, the less damage, if any, a little dietary fructose will inflict.

