

ALL CALORIES ARE NOT CREATED

EQUAL by Ann Gerhardt, MD

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Bottom Line at the Top: High fructose corn syrup, now a nearly ubiquitous food sweetener, is bad for your health.

For years nutrition scientists said that a calorie is a calorie, and consuming too many or burning too few causes obesity. Bits of evidence refuting that axiom are trickling into nutrition science. For a long time research has focused on fat vs. carbohydrate, but hints that fructose (a sugar) contributes more than glucose (the 'bad' sugar in diabetes) to insulin resistance, fat and diabetes surfaced years ago. Scientists uncovered unsuspected effects of fructose on a variety of metabolic processes, which remained obscure pieces of information with unknown cause and effect until recently.

Now we know much more. We know that fructose increases enzymes (the worker-bee proteins of the body) that make fat. We know that fructose turns off at least three of the body's mechanisms to keep blood vessels open and flexible. We know that it affects hormones that reduce insulin's effectiveness. We know that eating excess fructose leads to high uric acid levels, which contribute to high blood pressure.

For those of you who think I've lost my marbles and am making this up, I may have lost my marbles, but I'm not making this up – A lot of this data is very recent and not widely disseminated yet. **All of these metabolic consequences of fructose feed into the Metabolic Syndrome, the constellation of abnormalities that eventually leads to diabetes, high blood pressure, obesity, abnormal cholesterol levels and heart disease.**

Fructose, a very common sugar molecule, constitutes half of sucrose in beet- or cane-derived table sugar. The other half is glucose. In addition to beet and cane, fructose occurs naturally in honey, fruit, maple syrup and corn. Fructose tastes sweeter than sucrose or glucose.

In 1957 Richard O. Marshall and Earl R. Kooi developed a process whereby an enzyme (glucose isomerase) turns corn sugar's glucose into fructose. The resulting 'high fructose corn syrup' (HFCS), with up to 90% fructose, tastes sweeter than table sugar. In 1971 Japanese researchers figured out how to mass produce HFCS, which made it very sweet *and* very cheap. Since the USDA subsidizes corn agriculture with price supports that foster over-production, we have sustained corn excess and a very cheap route for sugar to your stomach.

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HEALTHY CHOICES FOR MIND AND BODY

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HFCS entered the food chain in the mid-1970's. With sweeter sugar, food manufacturers don't need to use as much, making sugary food even cheaper to make. By the 1980's HFCS-sweetened sodas and juices had flooded the market. Food manufacturers switched to HFCS to sweeten any processed food. Big Gulps replaced 12 ounce Dixie cups. Even yogurt and tomato ketchup, two foods that I somehow thought would be 'pure,' contain HFCS.

The timing couldn't have been worse. Public health nutritionists, promoting very low fat diets to lower cholesterol, could not predict the effect of HFCS because it hadn't existed before. Sugars are part of the carbohydrate family, so high carb, sweet foods proliferated in the fat phobic 1980's, when everyone thought that carbs were 'good'. Contrary to the low fat promise, though, people's waistlines expanded rather than contracted.

It is no coincidence that the obesity epidemic and soaring rates of childhood diabetes and adult metabolic syndrome took off in the 1980's. The National Health and Nutrition Examination Survey, an ongoing project of the Centers for Disease Control, documents the dramatic ballooning of Americans' weight. The 1960-1962, 1971-1974 and 1976-1980 surveys produced consistent levels of obesity and healthy weights. In each of those surveys, about 12% of men and 17% of women were obese and about 46% of men and 53% of women were in the 'desirable' weight range.

That all changed with the 1988-1994 survey, in which obesity jumped to 21% in men and 26% in women, and kept on climbing to 27.5% in men and 25% in women in 1999-2000. The rates of overweight but not quite obese are even higher. Obesity is defined as having a Body Mass Index (BMI) greater than 30. BMI expresses weight in proportion to height. Desirable is 18-25.

What does this have to do with you? Everything, if you are diabetic, overweight, or hypertensive, or if you have friends or relatives with those problems. You might care that the childhood diabetes epidemic will affect Americans' productivity and longevity for years to come. If nothing

else, the growing public health consequences impact your insurance rates.

Your choice of soda vs. tea or milk just graduated from “empty vs. healthy calories” to “damaging vs. OK”.

Perhaps the most insidious aspect of fructose is that it drives its own consumption. Excess glucose tells the body “enough already!” and the enzyme that degrades it stops working, at least for a while. That doesn’t happen with fructose. Its enzymes turn on and the body churns any huge amount you give it into energy or fat. Unless those calories are burned during physical activity, most will end up around your middle before they cause disease that kills you.

A calorie is not a calorie, metabolically. Just like the total fat number doesn’t tell you how much ‘bad’ saturated and ‘good’ mono-unsaturated fat there is, carbohydrate and sugar totals doesn’t tell you the source of sugar. **Your food label-reading chore now must extend to the ingredients section.** You get to make a choice between cost and health when you see the words HFCS or high fructose corn syrup.