

Diet, nutrition & weight loss

High-fructose corn syrup

by *Marcelle Pick, OB/GYN NP*

Since the 1990's, virtually all non-diet soft drinks — including most popular fruit juices and sports drinks — have been sweetened with high-fructose corn syrup (HFCS). Corn sweeteners, primarily HFCS, have eclipsed regular sugar as the ingredient of choice for beverage and food manufacturers, with the exception of some few “micro-brewed” sodas.

What does this mean for your health? In small amounts, very little. But over time, and in large quantities, HFCS and other manipulated fructose sugars can undermine your metabolism, leading to [weight gain](#), high triglyceride levels, [type 2 diabetes](#), [hypertension](#) and obesity. Research continues to show that overconsumption of these altered sugars is a growing health hazard — at the same time food manufacturers make it increasingly hard to avoid them!



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The next time you're at the supermarket, pick up five random soft drinks — including juices and enhanced waters — and read the label. Chances are the first or second ingredient will be HFCS. Now for a real education, look at the labels of other items in which you would never expect to find any sweeteners, like ketchup, tomato sauce, cereal, and crackers. HFCS is everywhere; in one day it is entirely possible that 80% of the processed food you consume is chock-full of HFCS.

When I refer to HFCS, I mean commercially produced high-fructose corn syrup. HFCS starts as corn syrup, a liquid sweetener extracted from corn, which is then manipulated into a more practical form. The corn syrup is chemically altered by enzymatic processes to yield a different balance of *monosaccharides* (simple sugars) than that found in ordinary corn syrup. That chemical alteration changes the extracted corn syrup from a compound that is mainly glucose (a simple sugar), to one that is a mix of monosaccharides. Depending on which HFCS formulation a manufacturer of a given food product chooses to use, particular HFCS grades generally run between 42–55% fructose (though some can range as high as 90% fructose), with the remainder being glucose and other sugars.

When I refer to “sugar,” I mean regular table sugar, or sucrose. Sucrose is a *disaccharide*, which means that it is a compound sugar composed of two monosaccharides, in this case roughly 50% each of fructose and glucose. The sucrose we consume in the United States is commonly extracted from sugar cane and sugar beets.

Now, back to HFCS. Originally developed in Japan in the 1970's, HFCS consumption has been increasing ever since. In fact, as the use of sugar has decreased, the consumption of HFCS has increased in nearly direct proportions — most dramatically in the US foods market. One particular study in 2004 reported in the *American Journal of Clinical Nutrition* cites the increase in consumption of HFCS to be 1000% between 1970 and 1990. They calculated this to exceed any equivalent increase in consumption of any other food or food group. Talk about a “sugar rush”!

Furthermore, in studying this increase — and the nearly identically corresponding increase in obesity in the US — these researchers took into account the differences in the way the body responds to different sorts of sugars. Specifically, that “unlike glucose, fructose does not stimulate insulin secretion or enhance leptin production.” They postulate that dietary fructose may be contributing to American obesity issues because “insulin and leptin act as key afferent signals in the regulation of food intake and body weight.” In other words, this study proposes that because fructose doesn't trip our sense of satiety as sugar would, we are, perhaps, eating more sugars to compensate, and upping overall caloric intake in the process. Further, they extrapolate that because HFCS is usually higher in fructose than table sugar, HFCS can be correlated with parallel increases in obesity.

As one might expect, the HFCS industry is quick to defend its product, noting that many of the studies linking fructose with [weight gain](#) and other [troubling dietary habits](#) have focused on fructose in isolation, not on fructose in a composition such as HFCS. HFCS proponents also point out — rightly — that fructose is itself a naturally occurring sugar. It is present in nearly all fruits, many vegetables, and other foods, and in that respect, humans have been eating fructose for centuries.

Nevertheless, we're consuming way more fructose than ever, nearly all in the form of HFCS. Among the reasons for this are two important and highly commercial ones. First, HFCS tastes distinctively sweeter than an equivalent amount of regular sugar.

Relative Sweetness Scale
Sucrose=100

Compound	Rating
Sucrose	100
Fructose	140
High-fructose corn syrup	120–160
Glucose	70–80
Galactose	35
Maltose	30–50
Lactose	20

Perhaps more important from the manufacturers' standpoint, though, HFCS as a commodity is less expensive than sugar to produce and to buy. It's cheaper and the food manufacturers need to use less of it to make things even sweeter than they would be with the use of sugar.

As our tastebuds become more jaded, we lose sense of what we accept as “sweet enough,” so food manufacturers keep tinkering with sugars to produce consumables that are sweeter, and sweeter yet. But in this race our health is the big loser. We know that eating a lot of refined sugar, in any form, is highly inflammatory and can decrease [insulin sensitivity](#) as we get older. At the very least, HFCS is a hidden source of sugar that adds to our overall load — and most of the time we may be unaware we're eating it.

At worst, we have to ask ourselves this: how does altering our sense of satiety and satisfaction affect our biological [set point](#)? Does the looming role of HFCS in our diets relate to the alarming increase in the incidence and risk of obesity and type 2 diabetes in the US? So many studies are flying back and forth on this topic that more news is sure to come in the near future. In the meantime, however, I recommend that you read your labels carefully, consider how much HFCS you consume on a daily and weekly basis, and average it into your overall sugar intake. When you have the choice, go for whole, unsweetened beverages and foods and give your sweet tooth a break.

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