WHAT SCHOOL OFFICIALS AND PARENTS SHOULD KNOW ABOUT HIGH FRUCTOSE CORN SYRUP

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High fructose corn syrup and ADD/ADHD in children: Is there a link or is it a myth?

As a practicing pediatric nutritionist for 25 years, I have probably answered more questions about sugar and now high fructose corn syrup (HFCS), and a supposed link to hyperactivity/attention deficit disorder than you can imagine. People often assume that sugar causes hyperactivity because of all the nutritional myths and misinformation they've read or heard about.

First, let's set the record straight about what sugar and high fructose corn syrup are. Essentially they're the same. High fructose corn syrup is just another form of sugar. No better; no worse. Here's why: Regular table sugar, called sucrose, is made up of 50 percent glucose and 50 percent fructose. There are two types of high fructose corn syrup mainly used in foods and beverages: one is 55 percent fructose and the other is 42 percent fructose with the balance for both made up of primarily glucose, almost the same as regular table sugar. Glucose is how the body uses most of its carbohydrate energy and is the body's preferred energy source, so it breaks down and converts most carbohydrates into glucose. Fructose is a sugar found in most fruit (hence the name “fructose”) and the body can use it for energy, too.

As for carbohydrates and attention deficit hyperactivity disorder (ADHD), this myth got started back in the 1960s by a researcher at Harvard, who thought that sugar, certain food colorings and even certain nutritious whole foods caused ADHD in children. His studies tended to be extremely flawed and no other researchers could replicate his results. In fact, numerous other researchers over the past several decades showed no link at all between ADHD and sugar of any kind.

ADHD is a definable medical condition, but it’s not caused by sugar, high fructose corn syrup or any other form of sweetener. This is the conclusion of dozens of well-controlled studies.

In the scientific world, the sugar-ADHD issue has been largely put to rest, but individuals, and especially parents, have yet to get the memo. Why? All too often they see kids having foods and drinks containing high fructose corn syrup or sugar in situations where kids are likely to be active anyway. A relatable story: A mother attended a birthday party with her child and about a dozen 6-year-olds. Cake, ice cream and punch were served and the mother said, “The food had too much sugar in it and they’re running all over the place.” Actually, the kids were just a bunch of 6-year-olds at a birthday party acting their age. In this situation, it's not fair to point the finger at the sugars themselves but rather the amount of sugars provided, minimal limit-setting and the level of activity that were bound to create some chaos, regardless of diet.

High fructose corn syrup and other sugars may give you a quick burst of energy, but it is short-lived and relatively mild. Ironically, carbohydrates can actually increase the production of serotonin, a brain hormone that stimulates calmness and sleep.

Now, let’s be clear. All sugars still have calories, so keeping to a modest intake of foods with added sugar is key for children and adults alike. One way to consume sugars like high fructose corn syrup is when they help you consume foods your body already needs. So, let your child drink that low-fat chocolate milk! It’s a great example of using some added sugar or high fructose corn syrup that’s also providing important dairy benefits.
New studies appear in the scientific literature monthly claiming HFCS is the magic bullet causing obesity in America. Unfortunately, many of the new reports are simply poorly constructed experiments posing as solutions to a nonexistent problem.

Studies commonly use exaggerated doses of pure fructose fed to rats, cultured cells or human subjects. Subsequent reports that the study looked at the effects of “high fructose” are often misinterpreted or misreported as high fructose corn syrup. Institutions with public relations offices can generate significant misleading press coverage of this kind, causing considerable concern to the general public. To further complicate matters, food and beverage manufacturers have seized an opportunity to market high fructose corn syrup-free versions of their products that are promoted as “healthier” or more “natural” than their corn-sweetened counterparts. But that simply isn’t so.

Credible experts and scientific societies agree there’s no metabolic difference between high fructose corn syrup and sugar, leading the American Dietetic Association to confirm these two sweeteners are “indistinguishable” to the human body. And the American Medical Association noted that high fructose corn syrup and sugar have similar compositions and neither affects obesity or other conditions differently from the other.

To discern whether a new scientific study is pertinent to high fructose corn syrup or pointless, it’s important to evaluate the following:

**Experimental design** — randomized controlled studies contrast treatment groups with controls and are considered the gold standard in comparison with population-based epidemiological and ecological designs, which are more susceptible to confounding error and other forms of bias.

**Subjects tested** — human subjects are the gold standard in comparison with animals or cell cultures; the former are more costly to study, while the latter two are physiologically distant from humans, making extrapolation of data unreliable.

**Sugars compared** — high fructose corn syrup versus sugar is the best comparison, since (a) both sweeteners contain similar amounts of fructose and glucose, and (b) sugar is often erroneously characterized as a safer sugar. Fructose versus glucose is a poor comparison, because (a) humans don’t eat either one exclusively; (b) using just one simple sugar is not representative of caloric sweeteners in the diet; and (c) glucose alone would be a poor substitute for other caloric sweeteners.

**Levels tested** — the range of fructose encountered in the human diet is 5 percent to 17 percent of calories. Be wary of studies that use exaggerated fructose levels in human (25 percent to 50 percent of calories) and animal (60+ percent of calories) testing.

Knowing what to look for in a study’s design can help scientists, editors, health professionals, journalists and the public evaluate whether new research is pertinent or pointless.
There is overwhelming scientific evidence and agreement in the scientific community that high fructose corn syrup is not a unique cause of either obesity or diabetes.

Multiple scientific studies, as well as the findings from two major expert panels, have confirmed that by every measurement yet made in humans, high fructose corn syrup and sucrose (table sugar) are interchangeable or virtually or essentially identical, and that neither is a unique cause of obesity and diabetes. Both the American Medical Association and the American Dietetic Association have issued statements supporting this consensus.

High fructose corn syrup is utilized in two forms in many foods that we enjoy. Both of these forms are roughly equal proportions of fructose and glucose. Table sugar (sucrose) is also equal proportions of fructose and glucose. Both high fructose corn syrup and table sugar contain the same number of calories per gram, have the same sweetness, are absorbed the same way in the human body and have the same effects on the human body. Other “nutritive” sweeteners such as honey and maple syrup also contain roughly half fructose and glucose. More sucrose is consumed each year in the United States than high fructose corn syrup; worldwide nine times as much sucrose is consumed as high fructose corn syrup.

Weight gain and obesity are caused by consuming more calories than an individual burns. There are two types of diabetes. Type 1 (also called juvenile onset diabetes) is caused by the inability of the pancreas to make insulin. About 10 percent of diabetes is Type 1 diabetes. Type 2 diabetes (also known as adult onset diabetes) is caused when the pancreas cannot make an adequate amount of insulin to keep up with the body’s needs. About 90 percent of all diabetes is Type 2 diabetes. There is a strong association between Type 2 diabetes and obesity.

In the last 30 years, the average number of calories consumed by individuals in the United States has increased by 700 calories a day. This alone could have caused the obesity epidemic in the United States. While sweeteners such as high fructose corn syrup and sucrose contain calories, fat contains more than twice as many calories per gram as these nutritive sweeteners. In our diet, we consume three times as many calories from fat than from all of the sweeteners combined.

While high fructose corn syrup and sucrose both contain calories, both can be enjoyed in moderation and are not uniquely linked to obesity or to diabetes.
There is no scientific or professionally agreed upon quantity of sugar considered “too much.” Sugar, in general terms, is a carbohydrate.

Nutrition authorities recommend consuming a wide variety of foods from the five food groups to provide 55 percent of total daily calories from carbohydrates, 25 percent from protein and 20 percent from fats. Fruits, vegetables, grains, meat alternatives and dairy products provide sugars including lactose, fructose, sucrose and starch.

Too much sugar in the diet traditionally applies to added sugars such as those found in non-nutritive beverages, candy or foods also high in fat, such as ice cream, cookies or other desserts. When diets are evaluated by clinical nutritionists or registered dietitians, quality of food selection is determined based on typical patterns of eating. If desserts are selected frequently, such as twice daily over more nutrient-dense foods such as fruits or vegetables, dietitians likely would describe the eating pattern as excessive in sugar. Although no precise limit is defined, a diet like this appears excessive in foods containing sugar. A recommendation would be to reduce the number of desserts selected to three per week compared to two per day. The amount of sugar in the diet would be considerably reduced, but not eliminated. Most dietitians would agree that the diet would be improved and positively modified.

Moderation, according to the Food Guide Pyramid guidelines, refers to restraint and the avoidance of excesses, especially of food components such as fats, sugars, alcohol and sodium — ingredients that taken in excess are associated with suboptimal health outcomes or more specifically, chronic diseases such as cardiovascular disease, obesity, alcoholism and hypertension, or high blood pressure.

In general it appears that moderation to the average person means simply eating “less” of what he or she otherwise would enjoy more of. Examples of moderation include reducing the portion size of a favorite food, consuming the food with less frequency or eliminating a food entirely. Moderation does not only apply to higher calorie foods or beverages, but can also apply to any food or beverage consumed in excess that may contribute excess calories or be taking the place of other nutrient-dense foods missing in the diet.