

[IMAGE]

# **Weird Science: When Corn Sugar Becomes High-Fructose Corn Syrup**

By Dr. Claudia Anrig

The next time you're in the grocery store, look closely at the ingredient labels of your favorite foods. Chances are, high-fructose corn syrup (HFCS) will be near the top of the list, even in foods you never imagined could need it. With the corn industry hard at work convincing us that HFCS is nothing more than "corn sugar," let's take a look at high-fructose corn syrup and why - regardless of its name - you should be concerned about its ever-growing prevalence in the U.S. food supply.

Obesity rates for adults and children remain a growing concern. With the rate of obesity among adults reported to have doubled in the past 30 years and the rate among children tripling over the same amount of time, there are probably several factors that have led to these staggering statistics. We know that sedentary lifestyles and poor dietary choices are definite areas of concern. Research is also showing that the actual manufacturing and production of some food items that are prevalent in many diets could be a primary factor.

## **Redefining the Sweetness Scale**

In 1974, an article appeared in *Time* magazine that described the astonishment of the sugar producers when they noticed that sugar consumption was falling. The author of that article observed, "It was like telling them that people were breathing less air." A USDA report from 1997 stated that in 1970 sucrose (or table sugar) accounted for 83 percent of the sweeteners consumed by Americans, but by 1997, sucrose consumption relative to consumption of other sweeteners was down to 43 percent and HFCS consumption was up to 56 percent.

corn - Copyright © Stock Photo / Register Mark Regular, unaltered corn syrup is glucose, which measures 70-80 on what those in the sweeteners business call "the sweetness scale," and so could never be considered a true rival for sugar until it was genetically altered. Suddenly, as high-fructose corn syrup, it was a contender.

The existence of high-fructose corn syrup had a major influence on the sweetness scale. Refined or table sugar, sucrose, on the relative sweetness scale was always considered the highest you could get and thus measured 100. Suddenly there was something sweeter than sugar; high-fructose corn syrup measures 120-140 on the sweetness scale. It was less expensive to make, and so over the span of 30 years it began to replace sugar in the manufacturing of many processed foods and drinks.

The two standard high-fructose corn syrups sold today are 42 percent and 55 percent, meaning that 42 percent and 55 percent of the glucose has been chemically altered. The most commonly used in commercial production today is 42 percent and measures about 120 on the sweetness scale.

### **Modifying Mother Nature**

High-fructose corn syrup should be a concern if for no other reason than because it is made by genetically altering the basic chemical makeup of another product - corn syrup. This means that it is not a natural food item and therefore our body doesn't react to it like a natural food item.

Most carbohydrates containing sucrose, glucose and unaltered fructose cause our pancreas to create insulin. This in turn allows these sugars to be broken down into energy and then triggers our brain that we are full. High-fructose corn syrup, on the other hand, does not cause the pancreas to produce insulin. Additionally, while natural carbohydrates are digested normally, HFCS goes straight to the liver, where it is then treated like a chemical and turned to fat.

### **Mercury in HFCS?**

Another genuine concern regarding the consumption of high-fructose corn syrup was raised in a study published by the Minneapolis-based non-profit Institute for Agriculture and Trade Policy (IATP). David Wallinga, MD, the director of IATP's food and health program, asked a commercial lab to test 55 products that listed HFCS as first or second on their list of ingredients, meaning that HFCS was a leading ingredient in these products. "Overall, we found detectable levels of mercury in 17 of 55 samples, or around 31%," wrote Wallinga and colleagues.

### **HFCS and Weight Gain? The Debate Rages**

In a recent study from Princeton University, high-fructose corn syrup caused a more significant weight gain in laboratory animals than regular table sugar. This had many in the food and science industry upset and

claiming that the researchers were trying to demonize HFCS while absolving cane sugar of all responsibility for the obesity trends. In an article on CNN.com, author Elizabeth Abbott contends that both sides of the debate are in error because "neither of them is good for you." In other words, it's not a matter of which is good and which is bad; sugar in all forms will cause weight gain and should be consumed only in trivial amounts daily.

### **Too Much of a Sweet Thing**

While there may not be a definitive, proven connection (yet) between either high-fructose corn syrup or table sugar and the growing rate of obesity, the fact is that since 1977, more food items consumed contain sugar. Whether it is fructose, glucose, sucrose or high-fructose corn syrup, the average person consumes sugar at least once a day and likely many times a day. This was not the case 50 years ago. As the use of sweeteners in manufactured foods has increased, so has the prevalence of obesity.

Some items that not surprisingly include high-fructose corn syrup include most sugary cereals, toaster pastries, soft drinks, juice pouches and boxes, jams and jellies, salad dressings, sauces, ketchup, canned fruit, cookies and crackers. Some unexpected products that may contain HFCS include many canned ravioli and pasta meals, canned soups, peanut butter, bread, breakfast/snack bars, vegetable drinks, coffee and energy drinks.

### **The Bottom Line**

Be diligent in reading food labels more carefully. Even more than that, perhaps it's time to stop buying products with labels. If a product is packaged or has a label, it has often been altered from its original form in some way. We need to return to the basics, such as fresh vegetables, lean meats, fruits and grains. We need to eat - and feed our children - food in its most natural form - not packaged, not altered and not sweetened. Your doctor can provide you with more information about high-fructose corn syrup and help you and your family develop a healthy, natural dietary plan that avoids HFCS and other artificial, processed ingredients and foods.

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### **Where's HFCS? It's Everywhere**

Not surprisingly, foods that contain high-fructose corn syrup include most sugary cereals, toaster pastries, soft drinks, juice pouches and boxes, jams and jellies, salad dressings, sauces, ketchup, canned fruit, cookies

and crackers. However, did you know that many canned ravioli and pasta meals, canned soups, peanut butter, bread, breakfast/snack bars, vegetable drinks, coffee and energy drinks may also contain HFCS? In fact, check your pantry and you'll likely discover that most of your foods contain high-fructose corn syrup; even the ones with no business having any added sugar.

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## **The History of HFCS**

beaker - Copyright © Stock Photo / Register Mark Until 1957, high-fructose corn syrup (HFCS) didn't exist. That year, two researchers named Marshall and Kooi developed an enzyme called glucose isomerase that could work on corn syrup to rearrange the molecular composition of glucose and convert it to fructose. Glucose isomerase causes the isomerization, or rearrangement, of glucose. When natural glucose in corn syrup is converted to fructose, the syrup becomes sweeter. "High fructose" simply means that the percentage of fructose is higher.

The significance of being able to genetically alter corn syrup from a mildly sweet syrup to a profoundly sweet syrup was not lost on the corn growers, and it couldn't have come at a better time. In 1977, new tariffs and sugar quotas made the cost of importing sugar more burdensome. With the increase of sugar costs, production costs on new dietary staples rose significantly.

The producers of these items needed a more cost-effective alternative sweetener. In 1984, when soft-drink manufacturers like Coca-Cola and Pepsi began using high-fructose corn syrup, HFCS really jumped in terms of general acceptance. Production grew from about 3 million tons in 1980 to about 8 million tons in 1995.

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