

# Health Tips

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## Health Tip: Is all Sugar the Same?

### Part 2: "Nothing in Excess"---the Oracle at Delphi

Last week we looked at two sweetening agents, turbinado sugar and honey. Today we'll look at the more common sources of sweeteners, refined (table) sugar and high fructose corn syrup (HFCS). As we learned last week, honey and turbinado sugar have a similar composition in regard to their sugar components, with both consisting of approximately 50% glucose and 50% fructose. How does this differ from refined sugar or the ubiquitous HFCS---Is all sugar the same?

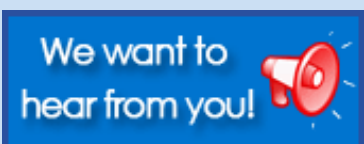


**Is refined sugar really "white death"?** Refined sugar is essentially 100% sucrose. Sugar cane and sugar beets are the main sources for this product. As we learned last week, sucrose is a disaccharide (two sugars), made up of equal parts glucose and fructose. The two molecules are chemically linked, but when sugar is digested in the intestine, it becomes 50 percent fructose and 50 percent glucose and is then absorbed into the bloodstream. Sound similar to what we learned about honey and turbinado sugar?

Consumption of sugar has been blamed on practically every ailment from varicose veins to cancer. Refined sugar's calories are relatively "empty" since eating sugar does not provide a significant amount of vitamins, minerals or fiber. There is no question but that Americans tend to over do it in regard to consumption of sugar, and this is partly to blame for the obesity epidemic and its attendant diseases such as hypertension and diabetes. Nevertheless, sugar is pure carbohydrate, an important nutrient that supplies energy to the body. It also plays a role in making some foods taste better and in satisfying our "sweet tooth". Research shows that sugars, including refined sugar, do not raise blood glucose any more quickly than do certain other carbohydrates, like potatoes, white rice or pasta.

The USDA food pyramid allows for added sugar in its "discretionary calories" allowance. This sugar could come from a number of sources such as candy, soft drinks, syrup and table sugar. The number of calories is variable, depending to some degree on level of physical activity, but generally amount to only a few hundred calories per day. Even the American Diabetes Association does not prohibit eating sugar, but instead advises diabetes to substitute sweets

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for other carbohydrates in their meal plan to keep the calorie count neutral. One of main problems with sugar is that it is added to many processed foods and it becomes difficult to keep up with the amount that we eat. The other problem is that we simply eat too much.



**High fructose corn syrup (HFCS) ----The cause of the obesity epidemic?** The name "high fructose corn syrup" was coined to distinguish it from pure corn syrup which is almost 100% glucose. HFCS is a mixture of fructose (usually 55%) and glucose (45%). This is roughly the same proportions as refined sugar which is 50% fructose and 50% glucose. The designation "high fructose" is

somewhat misleading, since it is handled differently by the body than pure fructose, and has lead to a great deal of confusion regarding its health risks.

HFCS is made by taking corn syrup (100% glucose) and enzymatically converting some of the glucose into fructose. HFCS is widely used by food manufacturers in soft drinks, canned fruits, jams and other food applications. HFCS has replaced sugar to a large degree in food processing since it is somewhat cheaper to produce than cane or beet sugar and it is easier to process into foods. HFCS 55, which is 55% fructose and 45% glucose, is about the same sweetness as sucrose.

HFCS has been blamed for a number of maladies in the U.S. population, in particular the obesity epidemic. It should be pointed out, however, that in most instances, HFCS is used instead of, not in addition to, refined sugar in foods and beverages. Furthermore, since the composition of monosaccharides is virtually the same as in refined sugar, it's hard to incriminate HFCS alone in this epidemic. A recent analysis of health issues pertaining to HFCS from the American Journal of Nutrition did find that high fructose intake can raise blood pressure, decrease insulin sensitivity, and lower glucose tolerance which would set the stage for the development of hypertension and diabetes. It should be remembered, however, that fructose is rarely eaten by itself, but is instead eaten in combination with glucose in sugar, honey or as HFCS. Consider also that many of the fruits that we consider healthy, such as bananas, apples, pears and raspberries contain around 50% fructose. The American Medical Association recently conducted a review of the literature and concluded that because the composition of HFCS and sucrose are so similar, particularly with regard to absorption by the body, it appears unlikely that HFCS contributes more to obesity or other conditions than does sucrose.

Concerns regarding HFCS persist. Is it appropriate to provide tax subsidies to produce corn in order to keep the prices low? Is consumption of a food that could have been derived from a genetically modified plant healthy? Is HFCS really a "natural" form of sugar considering the enzymatic process that is required to make it? Nutritionally, however, there seems to be very little difference between refined sugar and HFCS. In fact, as I have pointed out, all of the forms of sugar that we have considered are chemically similar. The increasing prevalence of high blood pressure and diabetes are likely to be tied to obesity from over consumption of calories in general, not to a specific type of sugar. Clearly, the 62.5 lbs. of HFCS and 58.5 lbs. of sugar that the average American consumes per year, violates the "nothing in excess" principle and is one of the major contributors to this epidemic.

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