

Mortality Resulting from Beverages with High Sugar Content. High Fructose Corn Syrup (HFCS) “Sweetener”: Profits over Health. The Ubiquitous Cost Saving Toxin

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There is an unseen culprit hiding in the shadows. It is a toxic poison contained in many of the foods and beverages that we commonly eat. A toxin that has been implicated in causing cancer, diabetes, heart disease, lowered cognitive function, addiction, depression, and obesity. The magicians and alchemists of the corporate food industry have cleverly disguised this ingredient and sing its praises. If you are waiting for mainstream media to undertake an in-depth investigative report on this topic, you will be waiting a long time.

Back in 2015 Tufts University’s department of nutritional sciences conducted a study published by the American Heart Association that documented the annual rates of global deaths directly due to over-consumption of beverages with high sugar content. The results estimated that 184,000 adults die annually from sugary drinks. Dr. Gitanjali at Tufts analyzed data documenting sugar-related deaths across 51 countries between 1980 and 2010. Deaths were compiled according to cardiovascular disease, diabetes and various cancers. Based upon the data, the study concluded that sugar contributed to 45,000 annual deaths from cardiovascular disease, 13,000 deaths from diabetic complications, and 6,450 deaths related to cancer.

Credit Suisse’s Research Institute published a scathing report that brought sugar’s health risks into sharper focus. The study revealed that upward to 40% of American healthcare expenditures could be directly tied to overconsumption of sugar in the average American diet. Today, the US’ national addiction to sugar contributes to \$1 trillion in healthcare costs annually, which includes coronary heart disease, diabetes and metabolic syndrome. There are numerous studies published in reliable peer-reviewed medical journals associating sugar with each of these life threatening diseases.

As far back as 1971, I began writing about the hazards of sugar. In 2002, my documentary *Seven Steps to Perfect Health* was premiered on PBS stations. During a special appearance on one station’s fund drive, I poured sugar out of a bag. The amount I poured equaled the number of teaspoons that an average American teenager consumes daily. My general counsel, David Slater, verified the quantity by proper measurement according to scientific food and diet data.

After the initial airing of this special, I was informed by the station’s program director that they could not rebroadcast the performance, even though it was the most successful program during the fund drive. I was informed that the station had received harsh criticism

from the sugar industry. The program director explained that the information I presented about sugar's dangers, even though I provided full scientific verification of the facts, ran up against the president of the station board Sharon Rockefeller. I was told she had received a phone call from a sugar-lobbying group representing soft drink makers and sugar manufacturers. Therefore the station made the decision to pull my program. I was never asked to return to the station. Not surprisingly, a subsequent investigation revealed Sharon Rockefeller sat on Pepsi's board at the time, one of America's largest manufacturers of sweetened soft drinks.

That was my first personal encounter with the political forces supporting sugar. I wrote letters to the sugar industry, the station board and Sharon Rockefeller contesting their suppression of my program and their claim that sugar was unrelated to the declining health of Americans. They were presented with dozens of peer-reviewed studies.

However in recent decades, the sweetener industry has undergone a dramatic transformation with the introduction and widespread adoption of high fructose corn syrup (HFCS) throughout our food system. This shift from traditional cane sugar, which dominated my criticism earlier, to fructose corn sugars has led to deep human health and environmental concerns due to its economic benefits for food manufacturers.

High fructose corn syrup was developed in the late 1960s by Japanese scientists who discovered a method to convert glucose from cornstarch into fructose using enzymes. This innovation was spurred by the need to find a cheaper and more versatile sweetener as an alternative to the more labor-intensive production of traditional cane sugar. HFCS is made by milling corn to produce cornstarch. The starch is then hydrolyzed into glucose by adding the enzyme alpha-amylase. Finally the glucose is further processed into fructose. The result is a syrup that typically contains 42-55 percent fructose, with the rest being glucose. Some methods can produce fructose as high as 90 percent.

Today, HFCS production has been so optimized that it has become the most cost-effective and efficient means to produce sweeteners. Monsanto's genetically modified Round-Up Ready corn, enabling the use of more toxic herbicides and pesticides, has now made HFCS the cornerstone of the sugar industry. However, the shift to HFCS has been fundamentally driven by economics and the agro-chemical industry and has absolutely nothing to do with creating a healthier sugar. Since corn is one of the most extensively cultivated crops in the United States, which is heavily subsidized by the government, it has provided an enormous, inexpensive supply of the raw material needed for HFCS production. In addition, the enzymatic conversion process can result in a high yield of sweetener from a relatively small amount of corn.

HFCS is now a ubiquitous ingredient that permeates our entire modern food supply. Starting in the 1980s, the introduction of HFCS has gradually displaced traditional sweeteners such as natural cane sugar, glucose and honey. According to the USDA, HFCS can cost up to 50% less than cane and other traditional sugars. This cost differential is particularly significant in industries where sweeteners constitute a major portion of production costs such as in soft drinks, artificial fruit juices, sweet baked goods, snack foods and candy, breakfast cereals, condiments and sauces, sweetened dairy products such as yoghurt and ice cream, and a large variety of processed canned and prepared meals. A study published in *American Journal of Clinical Nutrition* found that HFCS accounts for over 40% increase of caloric sweeteners added to foods and beverages.

Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity

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Screenshot from [American Journal of Clinical Nutrition](#)

Having a purview of the distribution of different sugars in the American diet helps to illustrate the dominance of HFCS in the food system. Approximately 45 percent of added sugars in the American diet come from HFCS and an additional 2 percent from pure fructose. Between 35-40 percent of sweeteners derive from sucrose, the common table sugar made from sugarcane and sugar beets — the latter now being genetically modified. The production process involves crushing the plant material to extract the juice, which is then purified, concentrated, and crystallized to produce table sugar.

Not to be confused with HFCS, corn syrup is largely glucose and represents about 10-15 percent of the nation's sugar intake. It is the most common sugar used in baked goods and candy. Lactose and galactose each account for about 4-5 percent of consumed sugars. However they are typically not added sugars to foods but naturally present in all dairy products.

Finally, honey, which at one time was a common food ingredient, today only accounts for about 1-2 percent of sweeteners. Moreover, according to FDA testing, a lot of commercial honey found in grocery stores has been adulterated with HFCS and other sweeteners, such sucrose derived from cane and GMO beet sugars and artificial honey-flavored imitators. A general estimate is that 20-30 percent of honey sold is impure.

Back in the 1970s and 1980s when I frequently railed publicly against the sugar industry and the health risks of processed table sugar that then completely dominated the food industry, I would never have imagined that sucrose would be gradually replaced by HFCS. This replacement accelerated after the emergence of genetically modified (GM) corn.

As noted above, the vast majority of HFCS produced in the United States, the world's larger corn producer globally, is derived from genetically modified (GM) corn. Estimates suggest that around 85-90% of the corn grown in the U.S. is genetically modified. Therefore it is reasonable to infer that approximately 85-90% of HFCS is derived from GM corn.

As many court cases and exposes of corruption in the agro-chemical industry have come to light, GM corn has dire implications for the production and consumption of HFCS, especially considering the associated health risks linked to the use of toxic herbicides such as glyphosate. Research has linked glyphosate to various health issues, including cancer.

A decade ago, the International Agency for Research on Cancer (IARC) classified glyphosate as a “probable human carcinogen”; today, it is no longer probable but a medical fact. Several studies have detected glyphosate residues in food products containing HFCS. A study published in *Environmental Health* found glyphosate residues in a variety of food products, highlighting the widespread contamination of the food supply with this herbicide. In addition to glyphosate’s carcinogenic potential, the toxin has also been shown to disrupt endocrine function and it has been implicated in gut dysbiosis, an imbalance in the gut microbiome. This disruption can lead to a range of health problems, including inflammatory bowel disease (IBD) and other gastrointestinal disorders. Research published in *Current Microbiology* indicates that glyphosate exposure can alter the composition of the gut microbiota, leading to adverse health outcomes.

HFCS and traditional sugars like table sugar differ significantly in their composition and metabolic effects. Sucrose is a disaccharide composed of equal parts glucose and fructose, while HFCS is a mixture of free glucose and fructose, with the fructose content higher than that in sucrose. This difference in composition affects how the body metabolizes these sugars. Briefly, HFCS poses more serious health risks than sucrose. The free fructose in HFCS is absorbed more rapidly than the bound fructose in sucrose, leading to quicker spikes in blood sugar and insulin levels. In addition, **the** high fructose content in HFCS places a greater burden on the liver, leading to increased fat production and storage, contributing to fatty liver disease and metabolic disorders. In contrast, the balanced glucose-fructose composition of sucrose is metabolized more evenly, posing lower risks. However, it is crucial to realize that excessive or even moderate consumption of any form of sugar can be detrimental to health.

Extensive research has linked the consumption of HFCS to a range of adverse health effects. Key among these is metabolic disorders and cardiovascular diseases. A study published in the *Journal of Clinical Endocrinology & Metabolism* found that high consumption of HFCS is associated with an increased risk of developing metabolic syndrome, which includes conditions such as obesity, insulin resistance, hypertension, and dyslipidemia. These conditions collectively elevate the risk of heart disease and stroke.

HFCS has been directly implicated in America’s obesity epidemic due to its high fructose content, which is metabolized differently than glucose. Fructose is primarily processed in the liver, where it can be converted into fat more readily than glucose. This process can lead to increased fat accumulation and insulin resistance, both of which are risk factors for obesity and type 2 diabetes. A study in the *American Journal of Clinical Nutrition* highlighted that high HFCS consumption is correlated with an increased risk of obesity and diabetes, particularly in children and adolescents.

HFCS intake also leads to non-alcoholic fatty liver disease (NAFLD). Unlike glucose, which is metabolized by all cells in the body, fructose is metabolized almost entirely in the liver. High levels of fructose overwhelms the liver’s capacity to process it, leading to fat accumulation and liver damage. Research published in *Hepatology* has shown a strong correlation between HFCS consumption and the progression to more severe liver diseases, such as cirrhosis and liver cancer.

Recent evidence reveals that HFCS has detrimental effects on cognitive function and mental health. Studies indicate that fructose impairs insulin signaling in the brain, which is crucial for maintaining cognitive functions. A study in the *Journal of Physiology* found that high-fructose diets can lead to insulin resistance in the brain, potentially increasing the risk of

neurodegenerative diseases like Alzheimer's. Additionally, high sugar diets, including those high in HFCS, have been linked to mood disorders, such as depression and anxiety, as detailed in a review in *Nature Reviews Neuroscience*.

HFCS and other fructose-rich sugars can have profound adverse effects on the gut and digestive system. These sugars are known to disrupt the normal functioning of the gastrointestinal tract, contributing to various digestive disorders and altering the gut microbiome. Fructose, unlike glucose, is not directly absorbed by the body. It requires a specific transporter, GLUT5, to be taken up by the intestinal cells. Fructose interferes with these transporters, leading to malabsorption. Unabsorbed fructose travels to the large intestine, where it undergoes fermentation by gut bacteria. This process produces gases such as hydrogen, carbon dioxide, and methane, which cause bloating, gas, and abdominal pain leading to malabsorption and the intestine's inability to absorb fructose efficiently.

The gut microbiome, a complex community of trillions of microorganisms living in the digestive tract, is crucial for maintaining digestive health, immune function, and overall well-being. High intake of fructose negatively affects this delicate balance. Studies have shown that diets high in fructose can lead to an imbalance in the gut microbiota composition. This imbalance is characterized by a decrease in beneficial bacteria such as Bifidobacteria and Lactobacilli and an increase in harmful bacteria like Clostridia and Enterobacteria.

A study published in *The American Journal of Clinical Nutrition* found that high fructose levels increase intestinal permeability, also known as "leaky gut." This condition allows harmful substances, such as toxins and bacteria, to pass from the gut into the bloodstream, triggering inflammation and contributing to the development of various diseases, including inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS). Inflammatory bowel disease, which includes conditions like Crohn's disease and ulcerative colitis, is exacerbated by promoting inflammation and altering the gut microbiota. A study in the journal *Gut* reported that reducing fructose intake improved symptoms in individuals with IBS, suggesting a direct link between fructose consumption and IBS symptom severity.

Finally we need to also consider the catastrophic effects of HFCS on children. Children are particularly vulnerable to the health risks associated with HFCS due to their higher consumption levels relative to their body weight. According to data from the CDC, the average American child consumes approximately 12-16 teaspoons of added sugars per day, a significant portion of which comes from HFCS. This high intake is largely driven by the consumption of sweetened beverages, snacks, and processed foods that are marketed specifically to children.

The high consumption of HFCS among children is a major contributor to the rising rates of childhood obesity and metabolic disorders. Studies have shown that children who consume high levels of sugary beverages and snacks are more likely to develop obesity, insulin resistance, and type 2 diabetes. A study published in *Pediatrics* found that children who consume sugary drinks daily are at a significantly higher risk of developing obesity compared to those who consume them less frequently.

There is also growing concern about the impact of HFCS on children's cognitive development and behavior. High sugar diets have been linked to attention deficit hyperactivity disorder (ADHD) and other behavioral issues in children. A study in the *Journal of Attention Disorders* found that excessive sugar consumption, including HFCS, exacerbates symptoms of ADHD and impair cognitive functions such as memory and learning.

A deeper look at the politics of the sugar industry reveals that huge sums are being doled out by the government to support and subsidize sugar companies. Writing for the *Wall Street Journal*, health journalist Alexandra Wexler explains that American taxpayers are currently responsible for shelling out \$280 million to cover the cost of loans from the USDA which sugar producers are unable to pay back. Given the undeniable evidence demonstrating the toxicity of HFCS and other commercial sugars and their enormous toll on the wellbeing of Americans, why is it that our health agencies and elected officials are not calling for an urgent overhaul of existing policies, which graciously support the domestic sugar industry to poison the population? Where is the outrage over bailing out the purveyors of what is likely the most dangerous staple in the American diet? For our answers we must follow the money-trail.

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