MERCOLA
Take Control of Your Health

High-Fructose Corn Syrup Linked to Speedier Tumor Growth

Analysis by Dr. Joseph Mercola | January 10, 2025

STORY AT-A-GLANCE

- High-fructose corn syrup (HFCS), a common sweetener, is produced from cornstarch and contains a higher proportion of fructose than table sugar
- Your liver processes fructose into lipids (fats), which are then used by cancer cells for growth, indirectly fueling tumor development
- Research showed that inhibiting the liver's ability to process fructose reduced circulating lipids and prevented fructose from promoting tumor growth
- Consuming whole fruits, with their natural fiber and nutrients, is a healthier way to consume fructose than through refined sugars like HFCS
- Reducing HFCS intake involves reading food labels, choosing whole foods, and limiting processed foods high in added sugars

Many everyday foods and drinks contain high-fructose corn syrup (HFCS), a common sweetener found in countless products. While it adds sweetness, growing research is uncovering a worrying connection between HFCS consumption and the growth of cancerous tumors. Understanding this link is necessary to make informed choices about what you eat and how you protect your health.

What Is High-Fructose Corn Syrup?

High-fructose corn syrup is made from cornstarch, which is broken down into a sugar called glucose. Then, enzymes are used to convert some of that glucose into another sugar called fructose. This process results in a syrup with a mixture of glucose and fructose. HFCS is similar to regular table sugar (sucrose), which is made of equal parts glucose and fructose bonded together.

However, HFCS typically has a slightly higher percentage of fructose. Think of it like this: if starch is a big Lego castle, the production process breaks it down into individual Lego bricks (glucose and fructose) and then reassembles them into a different configuration.

HFCS is incredibly widespread in our food supply. You'll find it in sodas, fruit juices, processed snacks, baked goods, breakfast cereals, condiments like ketchup and even many yogurts. It's used because it's a cost-effective way to add sweetness and improve the texture of many processed foods. If you walk down any grocery store aisle, you'll likely see HFCS listed on numerous food labels. It's important to be aware of how prevalent it is in the products you consume daily.

Your body processes HFCS differently than regular table sugar. When you eat glucose, it’s used for energy by almost all cells in your body. Fructose, on the other hand, is mainly processed in your liver. In your liver, fructose is converted into fat, a process called lipogenesis.

This is similar to how a car runs on regular gasoline (glucose) that any engine uses. Fructose is more like a specialized fuel that only one type of engine (the liver) processes. If that engine gets too much of this specialized fuel, it starts producing excess byproducts (fat).

The consumption of HFCS has increased significantly over the past few decades. This rise has coincided with growing concerns about health problems linked to high refined sugar intake in general. These issues include obesity, Type 2 diabetes, metabolic syndrome — a cluster of conditions that increase your risk of heart disease, stroke and diabetes — and now an increased risk of certain cancers.

How HFCS Fuels Tumor Growth

Cancer cells have a unique way of getting energy. They tend to prefer using glucose for energy production through a process called glycolysis, even when oxygen is available. This phenomenon is known as the **Warburg effect**. Because HFCS contains a high amount of fructose, which is converted into glucose, it provides cancer cells with more of the fuel they crave.

It's like normal cells are efficient hybrid cars that use both gas and electricity, while cancer cells are like gas-guzzling cars that only run on gas (glucose). HFCS provides them with a bigger supply of that gas. Further, since fructose is primarily processed by your liver, and when there's too much of it, your liver starts producing more fat, this increased fat production leads to a state of **chronic low-grade inflammation** and insulin resistance.

Both inflammation and insulin resistance are known risk factors for several types of cancer. A study published in Nature explored this connection, showing how dietary fructose promotes fat buildup in the liver. These fats, specifically lipids such as lysophosphatidylcholines (LPCs), are then transported to tumor cells, which use them for growth.[1]

The liver acts like a factory, and when it's overloaded with fructose, it creates excess "products" (fats) that cancer cells use as building blocks. This study found that the cancer cells themselves don't readily use fructose as fuel; instead, the liver converts it into these lipids that the cancer cells then use.[2]

Excessive fructose consumption also leads to inflammation and oxidative stress. Oxidative stress is an imbalance between harmful molecules called free radicals and your body's ability to counteract them. These factors damage DNA, which is the cell's instruction manual, and create an environment that's more favorable for tumor growth.

Imagine chronic inflammation as a small, smoldering fire constantly burning inside your body. This fire damages surrounding tissues and increase your risk of problems like

cancer. Research is also exploring links between HFCS consumption and specific types of cancer.

Some studies suggest a connection between high HFCS intake and increased risk or growth of colorectal cancer, for instance.[3] While many of these studies have been conducted in animal models or cell cultures, they raise important questions and highlight the need for more research in humans to fully understand the extent of this connection.

How Fructose Fuels Tumors Indirectly

The Nature study revealed a surprising mechanism by which fructose promotes tumor growth. The researchers found that fructose doesn't directly fuel cancer cells. Instead, it's your liver that plays a key role. When it processes fructose, it produces lipids, particularly LPCs, which are released into your bloodstream and travel to tumor cells.

Cancer cells need lipids to build their cell membranes, which are essential for growth and division. Instead of making these lipids themselves, many cancer cells prefer to take them up from their environment. The study found that LPCs, produced by the liver in response to fructose, provide an efficient way for cancer cells to get the lipids they need to thrive. It's like your liver is acting as a delivery service, providing essential building blocks to the growing tumor.

In the study, researchers discovered that liver cells, unlike the cancer cells they studied, possess the necessary machinery to process fructose. This processing leads to the production and release of LPCs. When these LPCs were administered directly to mice with tumors, it was sufficient to increase tumor growth.

Conversely, when the researchers inhibited the liver's ability to process fructose, it reduced circulating LPC levels and prevented fructose from promoting tumor growth.[4] This demonstrates how your liver acts as an intermediary, transforming fructose into a form that cancer cells readily use. This new understanding of how fructose influences

tumor growth could open up new avenues for developing treatments that target the interaction between healthy tissues and cancer cells.[5]

Fructose in Whole Foods vs. Refined Sugars

It's important to distinguish between fructose consumed in its natural form within whole foods and the isolated fructose found in sweeteners like high-fructose corn syrup. When fructose is separated from its natural food environment, as in HFCS, it contributes to significant metabolic problems. However, when you eat fructose as part of whole fruit, which also provides fiber, vitamins, minerals and other beneficial plant compounds (phytonutrients), it's much less of a concern.

Fruits are some of the healthiest foods you can eat. This is because they're packed with nutrients, and the fiber and phytochemicals they contain help regulate how your body absorbs and processes fructose. These components work together to moderate the impact of fructose on your metabolism. Think of it like this: the fiber in fruit acts like a buffer, slowing down the absorption of fructose into your bloodstream.

There's one main exception when fruit might cause problems: if your gut health is significantly compromised. This happens when the balance of bacteria in your gut (your microbiome) is disrupted, making it difficult for your body to handle the natural fibers in fruit.

This imbalance is caused by various factors, such as an overgrowth of pathogenic bacteria after beneficial microbes have been diminished by mitochondrial toxins or environmental stressors. The solution isn't to avoid fruit forever, but rather to work on restoring a healthy gut environment so your body is able to properly digest and benefit from whole, fibrous foods.

It's also worth noting that regular table sugar (sucrose) is half fructose, which is why consuming large amounts of it is metabolically problematic. An alternative like dextrose (pure glucose) is a "safer" carbohydrate choice because glucose doesn't carry the same

risks as isolated fructose. However, it's important to remember that all carbohydrates, including glucose, should be eaten in moderation.

While carbohydrates are essential for providing energy, eating large amounts of refined carbohydrates too quickly causes spikes in blood sugar and puts stress on your metabolism. In some cases, especially for people with severe food sensitivities or gut problems, slowly sipping a glucose solution throughout the day helps meet carbohydrate needs without causing large insulin responses or gut issues. However, this should be regarded as a short-term solution only.

Focusing on whole fruits as a source of fructose, maintaining a healthy gut microbiome by restoring mitochondrial function for optimal cellular energy, and being mindful of refined sugars — including avoiding HFCS — is key. This balanced approach supports metabolic health and helps avoid the pitfalls of isolated fructose and the excessive intake of refined carbohydrates.

How to Reduce Your HFCS Intake

One of the first steps to reducing HFCS intake is to **avoid processed foods** and become a savvy label reader. HFCS is usually listed clearly in the ingredient list of packaged foods. However, it's also important to be aware of other names that might indicate its presence, such as corn syrup, corn sugar and glucose-fructose syrup. By carefully checking labels, you'll be able to make more informed choices about what you buy and eat.

Luckily, there are many healthier alternatives to HFCS. Whole fruits provide natural sweetness along with important vitamins, minerals and fiber. Natural sweeteners like honey and maple syrup are also recommended, but make sure to choose pure varieties — not those with added HFCS.

It's also important to focus on reducing your overall intake of **refined sugars**. Instead of reaching for a soda, choose water or unsweetened tea. When making sauces or

dressings at home, you control the amount and type of sweetener used. Simple swaps like these make a big difference.

A balanced diet is important for overall health and cancer prevention. Eating plenty of **healthy carbohydrates** and an **appropriate amount of protein** provides your body with the nutrients it needs to function properly. It's about creating a healthy foundation that supports your body's natural defenses. Beyond diet, other lifestyle changes also play a role in cancer prevention.

Regular physical activity, maintaining a healthy weight, avoiding tobacco products and limiting **alcohol consumption** are all important factors. These choices, combined with a conscious effort to reduce HFCS intake by avoiding processed foods, empower you to take control of your health.

When you eliminate processed foods from your diet, you not only reduce your intake of HFCS but also another compound that's consumed in excess — **linoleic acid** (LA), which will further boost your health and reduce cancer risk.

Protecting Your Health Through Informed Choices

Research points to a concerning connection between high-fructose corn syrup and cancer growth. The Nature study revealed that fructose doesn't directly fuel cancer cells but instead works indirectly through your liver, which converts it into lipids that cancer cells readily use for growth.

While more research is needed, it's clear that making informed dietary choices is essential. By carefully avoiding processed foods, reading food labels, choosing healthier alternatives to HFCS and adopting a balanced lifestyle, you proactively protect your health. Ultimately, this leaves you empowered with knowledge and able to make choices that support your well-being.

Sources and References

- [1, 4] Nature 636, 737-744 (2024)

- [2, 5] Washington University in St. Louis, The Source, December 4, 2024
- [3] Science. 2019 Mar 22;363(6433):1345-1349