

Sugar

56 NAMES FOR SUGAR			
Barley malt	Dehydrated cane juice	Golden sugar	Molasses
Barbados sugar	Demerara sugar	Golden syrup	Muscovado
Beet sugar	Dextran	Grape sugar	Panocha
Brown sugar	Dextrose	High fructose corn syrup	Powdered sugar
Buttered syrup	Diastatic malt	Honey	Raw sugar
Cane juice	Diatase	Icing sugar	Refiner's syrup
Cane sugar	Ethyl maltol	Invert sugar	Rice syrup
Caramel	Free flowing brown sugars	Lactose	Sorbitol
Corn syrup	Fructose	Malt	Sorghum syrup
Corn syrup solids	Fruit juice	Maltodextrin	Sucrose
Confectioner's sugar	Fruit juice concentrate	Maltose	Sugar (granulated)
Carob syrup	Galactose	Malt syrup	Treacle
Castor sugar	Glucose	Mannitol	Turbinado sugar
Date sugar	Glucose solids	Maple syrup	Yellow sugar

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Sugar consumption has exploded over time, as has diabetes. For instance, in 1700 the average person consumed 4 pounds of sugar per year. In 1900 it was up to 90 pounds. In 2009 over half of Americans were having a half-pound of sugar per day, which is over 180 pounds/year. In 1893 diabetes occurred at the rate of under 3/100,000. Today the rate is 8,000/100,000 in the U.S. Roughly half of all adults in the U.S. have diabetes or prediabetes. Diabetes is also the most expensive healthcare condition in the U.S. now as to how much is spent - about 24% of our medical costs. (American Diabetes Association, Diabetes Care, "Economic costs of diabetes in the U.S. in 2017" March 2018)

What it does

Beyond the obvious issues that everyone knows about such as adding inches to our waistline and being a culprit for causing cavities, sugar has other health consequences. One is that higher levels of sugar intake lead to higher risk of heart disease. This can arise in part because sugar gets metabolized in the liver, and the carbs get converted into fat. More fat can lead to fatty liver disease which is a contributor to diabetes. And diabetes raises the risk of heart disease. Excess sugar can also overtax the pancreas until it breaks down, and that causes type 2 diabetes.

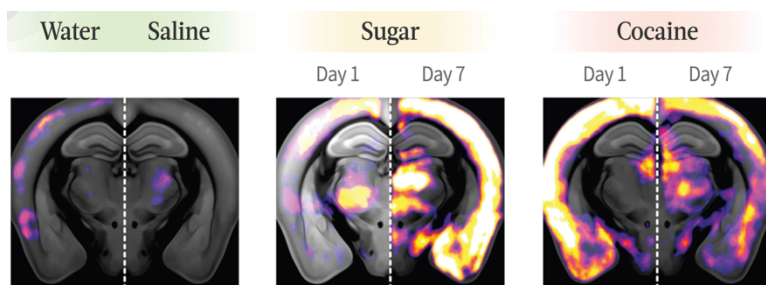
Too much sugar consumption also impacts the circulatory system and that can lead to impotence in men.

Excess sugar consumption can lead to developing resistance to leptin, the hormone that turns off appetite when satiety is reached, so people continue to eat and then gain weight. Blood pressure can increase from having too much sugar. One means for it to increase blood pressure is inhibiting the production of nitric oxide (NO) by increasing uric acid. NO helps dilate blood vessels. Inflammation and elevated triglycerides can result from a high sugar diet. Another way it can increase blood pressure is that higher sugar leads to higher insulin levels. And insulin inhibits the excretion of sodium which then leads to elevating b/p.

Development of cancer is another risk from having too much sugar. One study looking at more than 435,000 people ages 50-71 and who were followed for over 7 years found that added sugar consumption was associated with increased likelihood of esophageal cancer, pleural cancer, and

of the small intestine. (*International Journal of Cancer*, “Sugar in diet and risk of cancer in the NIH-AARP diet and health study” Nataša Tasevska et al, Jan. 2012).

High sugar consumption may also increase risk of depression possibly from impacting neurotransmitters and inflammation such as by causing a brief boost to serotonin but only to see it then crash after an hour or two leaving one feeling worse.



[Epoch Times](#), “How sugar changes your brain” 8/25/23

The brain images to the left show how it ‘lights up’ in similar ways from sugar and cocaine over the course of a week.

Excess sugar intake can also cause acute dopamine release and it ends up looking like alcohol or drug abuse as to getting a ‘high’ along with a subsequent ‘low.’

Another factor as to how sugar may cause depression is through brain inflammation by way of cytokines which are part of the immune system. Inflammatory cytokines have been linked to:

- ❖ Alzheimer’s
- ❖ anxiety
- ❖ bipolar disorder
- ❖ brain fog
- ❖ depression
- ❖ lack of focus
- ❖ memory loss
- ❖ schizophrenia
- ❖ stroke

A third potential mechanism for sugar triggering depression is through BDNF (brain derived neurotrophic factor). BDNF is a natural chemical found in the brain and has a lot of positive qualities to it. One of them is that it acts as an antidepressant, but sugar especially when combined with a lot of fat intake decreases BDNF production. Low BDNF levels are associated with a number of problems including

- ❖ addictions
- ❖ Alzheimer’s
- ❖ anxiety
- ❖ dementia
- ❖ depression
- ❖ eating disorders
- ❖ epilepsy

- ❖ obsessive-compulsive disorder
- ❖ 'chemo brain' (cognitive impairment from use of chemo for cancer)
- ❖ PTSD
- ❖ schizophrenia

Then there is anxiety. Eating sugary foods can cause blood sugar to spike. The body responds by releasing more insulin to lower blood sugar levels. But lower blood sugar triggers the adrenals to release stress hormones like cortisol, norepinephrine, and epinephrine - which are the ones involved with the flight-or-fight stress response, and which can ramp up anxiety. Low blood sugar can lead to various symptoms like feeling jittery, sweaty, pounding heart and feeling confused, which are like having an anxiety attack. However, sugary foods may cause anxiety without blood sugar issues arising according to some research.

And although this paper is on sugar, sugar substitutes are not any better. Chemicals like aspartame and sucralose can cause anxiety and depression too.

Sugar can also increase aging of the skin through something called advanced glycation end products (AGEs) which causes damage to collagen and elastin and so skin loses firmness and begins to sag.

Excess sugar can also lead to nonalcoholic fatty liver disease (NAFLD) which is now the most common liver disease in the world. (Hepatology, "Global epidemiology of non-alcoholic fatty liver disease - a meta-analytic assessment of prevalence, incidence and outcomes" Zobair Younossi, et al, 2015). One study found that among 5,900 adults who drank sugar-sweetened beverages daily they had a 56% higher risk of developing NAFLD compared to those who did not.

It can also cause non-alcoholic steatohepatitis (NASH, a scarring of the liver) that eventually cuts off blood supply which can then develop into cirrhosis and needing a liver transplant.

Still other effects of excess sugar consumption include damaging blood vessels in the kidney leading to higher rates of disease in it. Gout can arise by sugar raising uric acid level. High sugar intake is also linked to increased risk of dementia. Alzheimer's is sometimes called type 3 diabetes. The second biggest risk factor for developing Alzheimer's is diabetes or prediabetes (JAMA Neurology, "Diabetes mellitus and risk of Alzheimer disease and decline in cognitive function" Zoe Arvanitakis et al, May 2004) based on a study 824 Catholic nuns, priests and brothers done over a period of up to 9 years in the Religious Orders Study. The risk of developing Alzheimer's was 65% higher in those with diabetes than those without it.

Eating a lot of sugar can also cause joint pain due to inflammation being caused and it increases the risk of rheumatoid arthritis.

Then there is the gut bacteria in our GI tract which can have major impacts on our overall health such as affecting our mood such as being anxious or depressed, immune system, digestive health

(diarrhea, constipation, bloating, stomachaches, etc.), and cognition. In simple terms there are good and bad bacteria. High sugar intake increases the bad and decreases the good. The good bacteria make short-chain fatty acids (SCFA) that are vital for intestinal mucosal cells. They help support the gut's immune and barrier functions and help stimulate gut repair and thus alleviate gut inflammation. When consuming large amounts of sugar the SCFA are rapidly depleted. SCFA's are decreased in IBD patients. A high sugar diet also increases bad bacteria that carry lipopolysaccharides (LPS) that leads to inflammation and impairment of the inner lining of the intestines.

Recent research has found that high sugar intake causes intestinal inflammation including inflammatory bowel disease (IBD) which is widely regarded as the intestinal disorder most directly associated with sugar. This includes Crohn's and ulcerative colitis. Research (Clinical Gastroenterology & Hepatology, "Sugars and gastrointestinal health" Djésia Arnone et al, 12/10/21) found a direct correlation between high sugar consumption and increased risk of IBD.

A large European study involving over 366,000 adults (Inflammatory Bowel Disease, "Dietary patterns and risk of IBD in Europe: results from the EPIC study" Antoine Racine et al, Feb. 2016) found that people who consumed the largest amount of sugar and soft drinks had 1.68 times higher rate of ulcerative colitis compared to those who had the least. Another review (Nutrients, "Macronutrient intake and risk of Crohn's disease: systematic review and dose-response meta-analysis of epidemiological studies," Lirong Zeng et al, May 2017) showed that for every 10 additional grams of sugar consumed per day risk of Crohn's increased by about 1%. Fatty liver may develop too sugar consumption.

Another consequence of high sugar consumption is 'leaky gut' (dysbiosis) which means that toxic substances enter the bloodstream when they should not be permitted to do so. What then happens is the immune system recognizes these unwanted particles as something foreign triggering a response which can lead to an autoimmune disorder arising, or allergies. Leaky gut can also lead to what is called leaky brain which involves inflammation of it developing. Neuroinflammation of the brain damages it and is associated with Alzheimer's, other dementias, and mood disorders.

High sugar intake may also lead to pancreatic cancer, damage to the eyes, muscles and nerves, and colon cancer. One study done at the University of Edinburgh looked at over 4700 people as to colorectal patients and others who were in good health and controls. They found that 'high energy foods' such as sodas, chips, and baked good increased the odds of developing colorectal cancer. This does not prove causation. But it is also known that changing one's diet can significantly reduce the odds of developing this type of cancer. In a study involving stage 3 colon cancer patients it was found that people who had 2 or more sugar-sweetened drinks per day experienced a 67% increased risk of colon cancer recurrence or mortality compared tot hose who had less than 2 such drinks/month. For those patients not physically active and overweight the risk was 122%. (PLoS, "Sugar-sweetened beverage intake and cancer recurrence and survival in

CALGB 89803 (Alliance)" Michael Fuchs et al, Jun 2014). People who eat more fruits and vegetables have a lower risk of developing it.

Sugar also has nutritional impacts, such as on:

- ❖ vitamin C. High levels of glucose in the blood inhibit vitamin C being absorbed.
- ❖ vitamin D. High sugar intake and especially fructose causes an enzyme to be made that uses up stores of this vitamin. One national study in the US (NHANES, 2007-2010) found that about 94% of the population does not meet the daily requirement for this vitamin, so adding insult to injury by having too much sugar is not a good idea.
- ❖ magnesium. High sugar intakes decreases absorption of this mineral and causes the kidneys to excrete it faster. Magnesium has a role in stabilizing blood sugar and so a vicious cycle can result.
- ❖ calcium. Vitamin D plays a role in calcium being absorbed properly, so sugar impacting the vitamin takes a toll on calcium. Sugar also causes more calcium to be excreted.
- ❖ chromium, which is also involved in blood sugar regulation. High sugar intake causes more chromium excretion. One study found that having a diet consisting of 35% simple sugars led to chromium excretion increasing by 300%.
- ❖ lower testosterone levels by up to 25% in men. One study took 74 men (42 with normal blood sugar, 23 who were prediabetic, and 9 with type 2 diabetes) and gave them a 75 gram glucose solution. Of 66 men who were listed as having normal testosterone levels in a fasting state before the test, 10 became low in the hormone during the two hour test. One way sugar impacts testosterone is through its effects on the adrenal glands. Sugar taxes the adrenals and they are involved with the testes and ovaries which produce testosterone and estrogen.

Another issue to be aware of is why some people have a craving for sugar. This can include

- ❖ anemia
- ❖ stress
- ❖ blood sugar regulation difficulties
- ❖ insufficient amounts of various minerals such as magnesium, zinc, vanadium or chromium
- ❖ inadequate carb intake
- ❖ protein insufficiency
- ❖ lack of sleep
- ❖ depression, low mood

all of which could be causing other wide-ranging problems too. It is better to address the underlying issue vs. give in to the craving, have more empty calories, and cause other adverse consequences such as weight gain, potential diabetes, etc.

Where does your added sugar come from?

Rank	Food group	Proportion of average intake
1	Soda/energy/sports drinks	42.2%
2	Grain-based desserts	11.9%
3	Fruit drinks	8.5%
4	Dairy desserts	5.5%
5	Candy	5.0%
6	Ready-to-eat cereals	2.9%
7	Sugars/honey	4.1%
8	Tea	3.8%
9	Yeast breads	2.3%
10	Syrups/toppings	1.4%

Source: CDC, National Health and Nutrition Examination Survey, 2005–06.

Elevated blood sugar & diabetes

You also need to be aware that there is the sugar you ingest being a factor that can cause poor health. Plus, there are the drugs prescribed to you that can impact blood sugar and elevate it. For instance, the sulfonylurea drugs (e.g. Glipizide/Glucotrol, Glyburide/Micronase) deplete CoQ10 which reduces the body's ability to process carbs/glucose. This makes it harder to break down glucose you eat. It also impacts the ability to create energy to do stuff like exercising which is one means to burn glucose and lower the blood sugar level. Consequently, over the long run blood sugar goes up which is the opposite of what the drug is supposed to accomplish. Metformin depletes CoQ10, and vitamins B12 and folate which over time increases blood glucose.

Another class of drugs used for diabetes and weight loss is Semaglutide (e.g. Ozempic, Wegovy) which can inflame the pancreas, the organ involved insulin production and glucose metabolism so there is a price to pay here too. Pancreatitis can result.

A third class of drugs that impact blood sugar are diuretics (e.g. HCTZ, Lasix). They can deplete the B-vitamins, CoQ10, magnesium, and calcium. With insufficiencies among them they raise blood sugar. Antibiotics kill off good and bacteria in the microbiome. Such gut bacteria helps

regulate blood sugar. Some of the gut bacteria help make B-vitamins and with them killed off you become deprived of the B's needed to control blood glucose and can lead to diabetes and obesity (e.g. BMC Endocrine Disorders, "Use of antibiotics and risk of type 2 diabetes, overweight, and obesity: the cardiovascular risk in young Finns study and the national FINRISK study" Joel Nuotio et al, Nov. 2022). The more you use antibiotics the greater risk of the development of diabetes and obesity.

Another effect of antibiotic use is that 60% of vitamin K1 is produced by the gut microbiome. Vitamin K is involved with insulin sensitivity and glucose tolerance. People generally think of K1 as being just a blood clotting factor. But it also helps regulate blood glucose. So, kill off gut bacteria, reduce K1 levels, and blood sugar regulation suffers.

Chromium supplementation can help reduce blood sugar. Vitamin K1 has been found to be significantly lower in type 2 diabetes and had an inverse relationship to fasting glucose and insulin resistance. This suggests that boosting K1 may reduce fasting glucose and insulin resistance in type 2 diabetics. Its effects according some research had a greater effect than anything else on A1C and insulin regulation. (Journal of Nutritional Biochemistry, "Vitamin K1 inversely correlates with glycemia and insulin resistance in patients with type 2 diabetes and positively regulates SIRT1/AMPK pathway of glucose metabolism in liver of T2D mice and hepatocytes cultured in high glucose" Anjum Dihingia et al, Feb. 2018).

Other nutrients that have an impact on blood sugar regulation include vitamin A where a deficiency can cause pancreatic beta cell loss which can lead to insulin resistance, abnormal glucose metabolism, and type 2 diabetes. Vitamin A deficiency also contributes to type 1 diabetes due to beta cell issues along with antioxidant effects. Vitamin E deficiency has an impact inflammation that can increase insulin resistance and abnormal glucose metabolism which then may lead to type 2 diabetes. Vitamin B6 deficiency can contribute to insulin resistance and abnormal glucose metabolism too and type 2 diabetes. Vitamin C, B9 (folate) and B12 deficiency can lead to these same results. Niacin (B3) is needed to build the insulin receptor so a.

Thiamine (B1) is needed for optimum insulin secretion by the pancreatic beta cells. Diabetics tend to have lower thiamine levels. AGEs (advanced glycation end products) which are byproducts caused by excessive glucose not being properly broken down. They are very damaging to proteins and the vascular system. Thiamine supplementation has been proven to improve glucose tolerance fasting blood sugar. Many diabetics are on meds for blood pressure and cholesterol which leads to a reduction of B1, zinc which is involved with insulin production, along with interfering with CoQ10. So as said before, such an approach ends up causing the disease that doctors are trying to prevent. In the short term lab test results are improved while adversely impacting your health over a longer time frame.

Pregnant mothers who have nutritional deficiencies can cause problems for the child later in life such as increased risk for problems with blood sugar regulation and diabetes. Maternal supplementation with iron, zinc and folate can help reduce such risk.

Symptoms of deficiency

Even though the average American has a tremendous excess of sugar in their diet, it is possible to have too little. Hypoglycemia (low blood sugar) is a very real issue and probably most common in people who have diabetes or who are in the process of becoming diabetic. Symptoms of low blood sugar include:

- ❖ blurred vision
- ❖ rapid pulse
- ❖ mood swings
- ❖ unexplained, excessive fatigue
- ❖ pale skin
- ❖ severe headache
- ❖ nausea
- ❖ shakiness
- ❖ dizziness
- ❖ excessive sweating
- ❖ sudden nervousness
- ❖ tingling skin
- ❖ sleep disruptions
- ❖ difficulty concentrating
- ❖ seizures
- ❖ death is possible, rarely, if it drops too low and stays down for too long

Recommended daily dose.

The American Heart Association recommends that men have no more than 150 calories of added sugar per day (9 teaspoons), and that women have 100 calories (6 teaspoons). One 12 oz. can of Coke has 140 calories of added sugar. US dietary guidelines advise people to have less than 10% of their daily calorie intake be in the form of sugar, which for 2000 calories would be 12.5 teaspoons.

There is one redeeming issue to sugar which is what is basically thrown away from it. The byproduct of creating sugar is molasses which has considerable nutritional value.

There is

- ❖ light molasses, which results from the first boiling. It is the lightest in color and sweetest.
- ❖ dark molasses, which results from the second boiling. It is thicker, darker, and not as sweet.
- ❖ blackstrap molasses which results from the third boiling. It is the thickest and darkest in color, and has a more bitter taste. It is also the most concentrated with vitamins and minerals. It is also high in antioxidants.

There are also sulfured and unsulfured molasses. Sulfured contains sulfur dioxide which is a preservative. Sulfured tend to be less sweet while regular molasses and blackstrap involves

boiling the juice again and concentrates it. Blackstrap has more calcium, potassium, selenium, magnesium and niacin. One cup of blackstrap molasses contains

Calories	951
Protein	0 g
Fat	0.328 g
Carbs	245 g
Fiber	0 g
Calcium	672 mg
Iron	15 mg
Phosphorous	102 mg
Potassium	4800 mg
Sodium	121 mg
Zinc	0.9 mg
Thiamin	0.13mg
B-6	2.2 mg