



METABOLIC RESET



Sweet Tooth Bitter Truth

YOUR GUIDE TO SUGAR
AND IT'S IMPACT ON YOUR
HEALTH & AGING

ADD

ICT

ION

Table of Contents

Introduction	1.
What is Sugar?	2.
Natural vs. Added Sugar	4.
Artificial Sweeteners	5.
Health Risks	8.
Reading a Nutrition Label	13.
Common Misconceptions	14.
Names of Sugar	15.
Hidden Sources	17.
Alternatives and Swaps	19.

METABOLIC RESET



Your Ultimate Guide to Sugar

Introduction

Few would argue that added sugar intake in most industrialized countries is a significant problem. Over a year's time, this equates to almost 60 pounds of added sugar consumed. Not surprisingly, due to its low cost, sugar is used in many different ways and forms in many popular (and not so popular) food products.

- Today, the average adult living in the United States consumes about 22 teaspoons (or ~88 grams) of added sugar daily, including foods containing 'hidden' sources of sugar and believe to be 'healthy'.
- In the US, added sugars account for up to 17% of the total calorie intake of adults and up to 14% for children. That means, if a 2000 calorie diet is consumed, an adult would be consuming 340 calories in added sugar (alone); that's about 85 grams of sugar per day!
 - Perspective: Just one, 16 oz. can of soda contains 52 grams of sugar, which equates to more than 10% of your daily calorie intake (based on a 2000 calorie diet).
- It is well-established that excessive added sugar consumption negatively impacts the body and increases the risk for many chronic diseases including cardiovascular disease, diabetes, obesity, and cancer. Additionally, excess sugar intake has been associated with microbial alterations to the digestive system which, in turn, interferes with the gut's microbiome and inflammatory responses.
- It is estimated that high fructose corn syrup (HFCS) alone accounts for ~40% of all caloric sweeteners used in the United States.

what is sugar?

monosaccharides | glucose & fructose

Glucose is a monosaccharide that often combines with and creates other forms of sugar (e.g. sucrose, lactose). The body manufactures glucose when blood levels get too low.

Glucose supply can be routed to cells throughout the body and used for energy immediately, or it can be condensed and stored in the liver and muscle as glycogen for later use

Food sources:

- Fruit and fruit juice (especially bananas, oranges, grapes, and dates)
- Beets
- Carrots
- Honey



Fructose is the type of natural sugar found in smaller amounts in real foods such as fruit and vegetables. It is generally not something to worry too much about as part of a regular diet. Fructose is metabolized differently than when it is ingested in higher amounts from processed foods.

Fructose raises insulin less than glucose; however, fructose results in higher ghrelin levels, which boost rather than suppress appetite like insulin does. Fructose is processed almost solely by the liver.

Food sources:

- Fruit and fruit juice (especially mangoes, cherries, pears, and watermelon)
- Asparagus
- Artichokes
- Sugar snap peas
- Honey
- Agave nectar





what is sugar?

disaccharides | sucrose, lactose, & maltose

Sucrose is a disaccharide sugar comprised of fructose and glucose in a 1:1 ratio. Sucrose is also known as table sugar. Although it is found in fruit and other plants, sugar cane and sugar beets are the most popular sources for commercial production.

As a disaccharide, it is too large for the body to absorb. In the digestive tract, sucrose is broken down into glucose and fructose, which are absorbed separately into the bloodstream.

Food sources:

- Fruits
- Table sugar
- Molasses
- Coconut sugar
- Honey
- Maple syrup
- Any foods or beverages that contain added sucrose

Lactose contains one molecule of glucose and one molecule of galactose. It is the main sugar found in dairy foods. Similar to sucrose, lactose is broken down into monosaccharide components so they can be absorbed into the bloodstream.

Food sources:

- Milk
- Buttermilk
- Yogurt
- Ricotta cheese
- Cottage cheese
- Sour cream
- Whey

what is sugar?

disaccharides | sucrose, lactose, & maltose

Maltose is a disaccharide that contains two glucose molecules.

Maltose results from the breakdown of starch (a long chain of glucose molecules) in the digestive tract.

Although it is significantly less sweet (about half of glucose's sweetness), it is metabolized in the same way.

Food sources:

- Potatoes
- Sweet potatoes
- Corn
- Bread
- Pasta
- Beer
- Some breakfast cereals
- Processed foods



difference: added sugar VS natural sugar

According to the Department of Agriculture, "Added sugars are sugars and syrups that are added to foods or beverages when they are processed or prepared. This does not include naturally occurring sugars such as those in milk and fruits."

artificial sweeteners

Something to consider: Processed foods contain a much higher concentration of sugar in the form of ingredients such as HFCS without providing fiber, nourishing fats, or protein.

A great example is: A can of soda vs. a serving of fruit

The key difference:

- o Added sugar: Sugar that is added to foods during processing, cooking, or before eating.
- o Natural sugar: Sugar that is naturally found in whole, unprocessed foods such as fruits, vegetables, milk, etc.

artificial sweeteners

The following artificial sweeteners are allowed for use in the United States:

- o Aspartame
 - 200 times sweeter than table sugar
 - Sold under the brand names: NutraSweet, Equal, or Sugar Twin
- o Acesulfame potassium (aka acesulfame K)
 - 200 times sweeter than table sugar
 - Sold under the brand names: Sunnet or Sweet One
- o Advantame
 - 20,000 times sweeter than table sugar
- o Aspartame-acesulfame salt
 - 350 times sweeter than table sugar
 - Sold under the brand name: Twinsweet
- o Neotame
 - 13,000 times sweeter than table sugar
 - Sold under the brand name: Newtame

artificial sweeteners

artificial sweeteners (cont'd)

- o Sacchari
 - 700 times sweeter than table sugar
 - Sold under the brand names: Sweet'N Low, Sweet Twin, or Necta Sweet
- o Sucralose
 - 600 times sweeter table sugar
 - Sold under the brand name: Splenda

What's the issue here?

- o **Those who use artificial sweeteners** use may replace the lost calories through other sources, which may offset weight loss or health benefits.
- o **Artificial sweeteners may change the way** we taste food because of how potent they are vs. table sugar and high-fructose corn syrup. Overstimulation of sugar receptors from frequent use of these sweeteners may limit tolerance for more complex tastes. That means people may start to find less intensely sweet foods, such as fruit, less appealing and unsweet foods, such as vegetables, downright unpalatable.
- o **Artificial sweetener intake may prevent** associations of sweetness with caloric intake and we may tend to choose sweet food over nutritious food (which may lead to weight gain).

artificial sweeteners

A note | on stevia

o Also called *Stevia rebaudiana*, is a plant that is a member of the chrysanthemum family, a subgroup of the Asteraceae family (ragweed family).

There's a big difference between the stevia you buy at the grocery store and the stevia you may grow at home.

o Stevia products found on grocery store shelves, such as Truvia (a blend of Reb-A and erythritol) and Stevia in the Raw (blend of Reb-A and dextrose or maltodextrin) **don't contain** whole stevia leaf.

- They're made from a highly refined stevia leaf extract called rebaudioside A (Reb-A). In fact, many stevia products have very little stevia in them at all.

- Reb-A is about 200 times sweeter than table sugar.

o Sweeteners made with Reb-A are considered "novel sweeteners" because they're blended with different sweeteners, such as erythritol (a sugar alcohol) and dextrose (glucose).





sugar side effects

SIDE EFFECTS & HEALTH RISKS | associated with sugar intake

Associations between increased risk of diabetes, heart disease, obesity, cancer, high blood pressure, cognitive disorders (e.g. dementia, Alzheimer's, etc.) and other conditions entailing impaired immune function and added sugar intake have been established.

o **Brain**

- Excessive sugar consumption has the power to change the brain's reward system by releasing dopamine and other endorphins.
- Studies have discovered that added sugar (glucose and fructose) may influence eating behaviors through activating.
- High-sugar diets can lead to impaired memory and have been linked to an increased risk of dementia.

o **Pancreas/Endocrine system**

- When we ingest sugar, our blood glucose spikes and alerts our pancreas to produce the hormone insulin. Insulin then tells our cells that it's time to 'get energy' from the ingested sugar.
- Regular sugar intake can interfere with your endocrine function. Over time, this constant intake of added sugar and the 'roller coaster' track can build insulin resistance. Insulin resistance is when the body and liver begins to store sugar as fat.

o **Liver**

- Excessive added sugar intake over time can increase the risk for non-alcoholic fatty liver disease (NAFLD). Left untreated, liver failure or cancer may result.

An orange and a medical syringe are shown in the background of the title section.

sugar side effects

o Cardiovascular health

- o According to a study, getting >21% of calories from added sugar doubles your risk for dying from cardiovascular disease.
 - o High sugar diets are linked to heart disease, obesity, inflammation and elevated triglycerides, blood sugar, and blood pressure levels.
 - o Studies have confirmed that sugar can significantly increase the risk of dying from metabolic syndrome or cardiovascular disease.
 - o Research has shown that people getting 20% of their calories from added sugar have a 38% higher risk of dying from heart disease compared to those who get 8%.
 - o High added sugar intake is associated with increased inflammation and oxidative stress, which are important factors in the development of atherosclerosis.
 - o Sugar intake may increase cardiovascular risk by increasing fat synthesis by the liver (a process called de novo lipogenesis [DNL]). Excessive fructose metabolism can cause the liver to make new fat, an effect which could be greater when fructose is paired with glucose. DNL is linked to increased triglyceride and cholesterol levels and has been associated with increased inflammatory factors, such as C-reactive protein in the blood.
-
- o Note: In a 2015 research review, authors concluded that data support an association between added sugars and atherosclerosis, peripheral vascular disease, coronary artery disease, cardiomyopathy, heart failure, and cardiac arrhythmias.



sugar side effects

o Weight gain

- o Excessive fructose consumption may cause a resistance to leptin, which is an important hormone that regulates hunger and alerts the brain to stop eating.
- o Studies have confirmed that consuming fructose increases hunger and desire for food more than glucose, the primary type of sugar found in starchy foods.

o Gut health and immunity

- o A surmountable amount of evidence supports the notion that sugar, among other poor dietary factors, changes the gut microbiota in a way that increases intestinal permeability (i.e. leaky gut). Leaky gut can lead to immune function impairments as well as other symptoms including increased allergies, skin issues, poor digestion, etc.
- o Chronic, low-grade inflammation stemming from poor gut integrity and deficiencies can lead to the transfer of harmful substances from the gut to the bloodstream.
- o Additionally, excessive added sugar intake has been associated with a higher risk of depression. The area of gut health and its role as the 'second brain' has been a major focus of research recently. It is believed that neurotransmitter dysregulation and inflammation caused by poor gut health are likely to play a role on mental health.
 - A study following 8,000 people for 22 years found that men who consumed 67 grams or more of sugar per day were 23% more likely to develop depression than men who ate less than 40 grams per day.
 - A study of >69,000 women demonstrated that those with the highest intakes of added sugars had significantly greater risk for depression, compared to those with lowest intakes.



sugar side effects

o Skin

- o A diet high in refined carbohydrates has been associated with a higher risk of developing acne. Foods with a high glycemic index (e.g. processed food products, sweets, etc.) elevate blood sugar more rapidly than foods with a lower glycemic index. These foods can quickly spike blood sugar and insulin levels, causing increased androgen secretion, oil production and inflammation – all of which play a role in the development of acne.
- o A study of 2,300 teenagers found that those who frequently consumed added sugar had a 30% greater risk of developing acne.
- o Consuming a diet high in refined carbohydrates leads to the production of advanced glycation end products (AGEs) and may cause skin to age prematurely. AGEs damage collagen and elastin, which are proteins that help the skin stretch and keep its youthful appearance.

o Cellular aging

- o Consuming high amounts of added sugar has been shown to accelerate telomere shortening, which increases cellular aging.
- o A study of 5,309 adults found that regularly drinking sugar-sweetened beverages was associated with shorter telomere length and premature cellular aging.

sugar side effects

Kidney disease

- Having consistently high blood sugar levels can cause blood vessel damage in your kidneys which can lead to an increased risk of kidney disease.

Dental health

- Eating too much sugar can cause cavities. Bacteria in your mouth feed on sugar and release acid byproducts, which cause tooth demineralization.

Gout

- Added sugars raise uric acid levels in the blood, increasing the risk of developing or worsening gout.



What does it say?

nutrition label | sugar lingo

"Sugar-free"

- Each serving contains less than a ½ gram of sugar per serving.
- It can contain artificial sweeteners to boost sweetness.

"Low sugar"

- No established definition.

"Reduced sugar"

- A product contains 25% less sugar compared to the original item with its original serving size.

**SUGAR
FREE**





common misconceptions

Can't I just swap sugar for artificial sweetener?

- o Consumption of sweeteners like aspartame, saccharin, and sucralose are linked to weight gain, not weight loss, according to an analysis of 37 studies published in the Canadian Medical Association Journal.
- o Artificial sweetener consumption has been linked to a higher risk for high blood pressure, type 2 diabetes, metabolic syndrome, heart attacks, and stroke.
- o Mounting evidence suggests that artificial sweeteners can have a negative impact on blood sugar, make it harder to keep appetite in check, contribute to various metabolic disturbances, and disrupt gut microbiota. All of which can increase your risk for obesity and other health problems.

What about polyols like xylitol, erythritol, and sorbitol?

- o These are another category of sweeteners that also fall under the category of 'sugar substitutes.' They contain fewer calories than sugar and are generally less sweet or as sweet sugar.
- o Polyols are FODMAPs, a collection of compounds in food shown to exacerbate gastrointestinal symptoms in some people with IBS.
- o The best approach (if including these in your diet) is to consume them in moderation.

ingredient check

INGREDIENT LIST CHECK | common names of added sugar

Added sugar may appear on ingredient lists by different names, but the body metabolizes them all in essentially the same way.

- o Agave nectar
- o Agave syrup
- o Brown sugar
- o Cane syrup
- o Caramel
- o Carob syrup
- o Coconut sugar
- o Coconut sugar
- o Confectioner's powdered sugar
- o Corn sweetener
- o Corn syrup
- o Dehydrated cane juice
- o Dextrin and maltodextrin
- o Dextrose or crystal dextrose
- o Evaporated cane juice or fruit juice
- o Evaporated corn sweetener
- o Fruit juice/fruit juice concentrate
- o Glucose, lactose, maltose, fructose, sucrose and other ingredients ending in 'ose'
- o High-fructose corn syrup
- o Honey
- o Invert syrup
- o Malt sugar
- o Maple syrup
- o Molasses
- o Muscovado
- o Other fruit nectars (for example, pear nectar)



ingredient check

INGREDIENT LIST CHECK | continued

Continued

- o Panela (raspadora)
- o Raw sugar
- o Rice syrup
- o Rice syrup
- o Sugar
- o Sweet sorghum
- o Syrup
- o Treacle
- o White sugar

Other ingredients to consider:

- o Any ingredient with the word "sugar," such as white granulated sugar, brown sugar, beet sugar, raw sugar, or sugar cane juice
- o Any ingredient with the word "nectar," such as agave nectar, peach nectar, or fruit nectar;
- o Any ingredient with the word "syrup," such as corn syrup, high fructose corn syrup, carob syrup, maple syrup, or malt syrup;
- o Any ingredient containing a word ending in "-ose," including sucrose, dextrose, glucose, fructose, maltose, lactose, galactose, saccharose, and mannose

More 'natural', less processed options – ok in moderation:

- Coconut palm sugar
- Honey
- Pure maple syrup
- Blackstrap molasses

hidden sources

Which popular foods contain hidden sources of sugar?

Major food and beverage sources of added sugars:

- o Candy
- o Regular soft drinks/sodas
- o Energy drinks
- o Sports drinks
- o Desserts or snacks (e.g. cakes, cookies, pies, cobblers, etc.)
- o Refined carbohydrates (e.g. sweet rolls, pastries, doughnuts, etc.)
- o Sweetened teas and fruit drinks (e.g. iced tea, fruit punch, etc.)
- o Dairy desserts (including ice cream)

Common “healthy” foods containing high amounts of added sugar:

- o Cereals (including hot cereals and flavored oatmeal)
- o Packaged breads (including ‘whole wheat’, ‘multi-grain’, etc.)
- o Coffee drinks
- o Protein bars and meal replacement bars
- o Snack bars (i.e. granola bars and other seemingly ‘healthy’ bars)
- o Sweetened yogurts and other dairy products (e.g. flavored kefir, frozen yogurt, etc.)
- o Frozen waffles or pancakes
- o Condiments (e.g. sauces, dressings, marinades, ketchup, relish, etc.)
- o Dried fruit and other fruit snacks

How much is safe?

SAFE AMOUNT OF ADDED SUGAR TO CONSUME PER DAY

- According to the World Health Organization (WHO) and the American Heart Association, no more than 6 teaspoons (or about 100 calories) for most women or 9 teaspoons (or about 150 calories) for most men, per day is recommended.
- According to dietary guidelines, it is recommended that added sugar intake be less than 10% per day.
- The American Heart Association recommends no more than 6 teaspoons of added sugar for women per day and no more than 9 teaspoons of added sugar for men per day.

Important Note:

This is a guideline and does not take into account activity levels, personal metabolism, height, etc.



how do I avoid it?

How to cut back on added sugar intake:

Consider food swaps - instead of a food 'product' made with added sugar, eat the real food, in it's most whole, raw form

Examples:-

- Raw cashews vs. honey-roasted or chocolate covered cashews
- Homemade trail mix vs. candy or pre-packaged trail mix

Pair a naturally sweet food with a nourishing fat/protein source (i.e. Granny smith apple with almond butter) Together, these take a little longer to digest and are less likely to spike your blood sugar quite as fast as sugar (carbohydrates) would alone.

Keep a food diary; accountability works well with a lot of people (this can be 'pen and paper' or something you keep electronically in your phone or on a tablet/computer.)

Consider trying a 3-day 'added sugar fast' – make it a goal to only consume foods containing natural sugars; you may be surprised at how much you were previously consuming and how much your taste buds can change with only a few days of 'added sugar' rest.

Aim to have a source of protein, nourishing fats, and vegetables at each meal; this helps to reduce intakes of processed grains and flour products.

Swap your morning cereal for a bowl of rolled oats topped with nut butter and fresh berries, or an omelet made with fresh greens.

Shop the perimeter of the grocery store, focusing on fresh, whole ingredients.

avoiding hidden sugars

How to avoid hidden and added sugars (or crave them less)

Rethink your drink – Stick with unsweetened versions of beverages like coffee, tea, etc. Choose water, sparkling water, herbal tea, green tea, kombucha, unsweetened coconut water, plain/black coffee, etc.

Make your own – Oftentimes seemingly ‘healthy’ options including smoothies, juices, salad dressing, etc. are actually full of added sugars. Try making recipes from scratch at home, this way, you’ll have control of what ingredients are added to these foods.

Consume more nourishing fats – Instead of foods with added sugars, choose nourishing fats such as raw nuts/seeds, avocados, olive oil, full-fat dairy, etc. Ample nourishing fats in the diet help to reduce sugar cravings.

Use natural sweeteners (in moderation) – Natural sweeteners such as raw honey, dates, maple syrup, etc. can provide the sweetness profile your recipes calls for or may help you to transition from artificial or highly-processed sweeteners to more natural forms.



ALTERNATIVES & SIMPLE SWAPS:

Make note, any added sugar is still considered added sugar; whether it be honey, agave nectar, maple syrup, etc.

However, these options are 'natural' sweeteners vs. those sweeteners refined and processed (i.e. white granulated sugar, artificial sweeteners, etc.)

The key here is to be mindful of how much added sugar you are consuming, cut back if necessary, and gradually re-introduce at an appropriate amount over time.

Ideally, aim for any added sugar intake to be primarily derived from those of the most natural state (i.e. honey, maple syrup, etc.)

Instead of:

Fruit-flavored yogurt --- > **Try:** Plain, full-fat yogurt topped with fresh fruit

Fruit-flavored kefir --- > **Try:** Blend plain kefir with fresh fruit

Fruit snacks --- > **Try:** Fruit-vegetable leathers/strips

Traditional salad dressing --- > **Try:** Drizzle avocado oil, salt, and pepper or a 3:1 ratio of nourishing oil and balsamic vinegar

Sports drink (e.g. Gatorade, Powerade, etc.) --- > **Try:** Coconut water or make your own sports drink with coconut water, lemon juice, salt, and a bit of honey

Soda/soft drinks --- > **Try:** Sparkling water

ALTERNATIVES & SIMPLE SWAPS (cont'd)

Instead of:

Traditional desserts --- > **Try:** Fresh berries topped with whipped cream (simply made by whipping heavy cream until soft peaks form)

Traditional ketchup or condiments --- > **Try:** Making your own or searching for brands that have simple ingredients and no added sugar

Traditional jams, peanut butter, etc. --- > **Try:** Search for brands that have simple ingredients and do not include added sugars as part of the ingredients list



Let's Connect



www.facebook.com/groups/tschoolonline



[@tinasprinkleretreats](https://www.instagram.com/tinasprinkleretreats)



www.tinasprinkle.com



tina@tinasprinkle.com

A banner for 'METABOLIC RESET' featuring a variety of fresh fruits like raspberries, oranges, and grapes arranged in a circular pattern around the text. The text is in white capital letters on a dark grey background.

METABOLIC RESET

