Villain 4: Sugar



### **What It Is:**

Here’s the deal: the Sugar villain is one of the worst when it comes to having a TON of aliases and effects on the body. But what makes him so sneaky is the fact that we actually need him, too. So before we focus on just the bad, let’s make it more clear what exactly sugar is, and how our body uses it to survive.

Sugar is a type of carbohydrate, a macronutrient that your body uses for energy. It’s made up of molecules containing carbon, hydrogen, and oxygen. The simplest sugars, called monosaccharides, include glucose, fructose, and galactose. When two monosaccharides join together, they form disaccharides, such as sucrose (table sugar) and lactose (milk sugar). Larger carbohydrate molecules like starch are called polysaccharides and are made of many glucose molecules linked together.

**How Sugar is Used in the Body for Good**

We need sugar, like it or not. Our bodies are fuel engines and some of the power it needs is from energy and fuel that sugars provide. And in the case of sugar, if you don’t use it, you won’t necessarily lose it. Sugar does get stored in various forms in our body to be used as an energy source for later. Most easily it is stored in fat cells, which is why eating too much sugar can go straight to fat. Let’s break this all down a bit…

**Energy Source**

When you eat sugar, it is broken down in your digestive system into glucose, which enters your bloodstream.

Your body’s cells absorb glucose with the help of a hormone called insulin, which is made in the pancreas.

Once inside the cells, glucose is used in a process called cellular respiration, where it reacts with oxygen to produce ATP(adenosine triphosphate), the energy currency your body uses for everything from thinking to moving your muscles.

**Fuel for the Brain**

The brain relies on glucose as its main energy source because it doesn’t store fuel well. This is why having stable blood sugar levels is important for concentration and memory.

**Storage for Later**

If your body doesn’t need immediate energy, it stores glucose in the liver and muscles as glycogen. This stored glycogen can be used later when energy demand increases, like during exercise.

**Low Glycemic Index Foods**

Now what about that thing you hear about called “low glycemic index foods” ? Let’s make this little health benefit a lot less confusing, shall we?

Low glycemic index foods are foods that don’t make your blood sugar go up really fast after you eat them. Like we said, blood sugar is like the energy fuel in your body. Some foods give you a quick boost of energy, but it doesn’t last long, like eating a lot of candy. Low glycemic foods give you energy more slowly and steadily, so you feel full and energized for a longer time.

These foods are usually healthier for your body because they don’t make your energy crash later.

Examples include:

- Fruits like apples, oranges, and berries (but not super sweet ones like watermelon).

- Vegetables like carrots, broccoli, and spinach.

- Whole grains like brown rice, oatmeal, and whole wheat bread.

- Proteins and healthy fats like nuts, seeds, and yogurt.

So basically, low glycemic index foods are great to eat if you want to stay full longer, and keep your energy steady throughout the day!

The Glycemic Index Guide is an excellent resource for a comprehensive list of low glycemic index foods, and can be found at:

<https://glycemic-index.net/low-glycemic-index-foods/>

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### **Why Sugar Is Bad:**

**Sugar is extremely acidic.**

A pathogen, or “bad guy” like a bacteria, virus, or cancer cell all thrive in a sugar-rich, acidic environment. Sugar LOVES to feed your sickness starters! This is where your food label superpowers come in handy: the more alkaline you can be, the better for fighting off colds, flus, and killing cancer cells. Don’t give the Sugar Villain a chance to get past the front door, and choose foods that will alkalize your body and be very low in sugar in the first place.

Now let’s talk a little about **addiction**. Did you know that sugar is attracted to the same part of the brain as heroin, and is almost as addictive?

When you eat sugar, it triggers a “reward system” in your brain. This system is designed to make you feel good when you do things necessary for survival, like eating or drinking.

Here’s what happens step-by-step:

1. Sugar and Dopamine:

When you eat something sweet, your tongue sends signals to your brain. Your brain releases a chemical called dopamine in an area called the nucleus accumbens. Dopamine is sometimes called the “feel-good chemical” because it creates a sense of pleasure.

This dopamine release makes you feel happy and reinforces the behavior, encouraging you to eat more sugar.

2. Repetition and Cravings

If you eat sugar often, your brain starts to expect it. Over time, it becomes harder to feel the same level of pleasure from the same amount of sugar. This is called tolerance.

To feel that same “sugar high,” you may need to eat more sugar, just like how people addicted to drugs need more of the drug over time.

3. Brain Pathways

Sugar activates the mesolimbic dopamine system, which is the same brain pathway that drugs like heroin and cocaine stimulate. While sugar is not as strong as these drugs, it still taps into this reward system, which is why it can feel so satisfying and hard to resist.

*So, you eat sugar → Brain releases dopamine → You feel good.*

*Dopamine levels drop → You feel like you need more sugar to feel happy again.*

*You crave more sugar → The cycle repeats.*

And the worst part, unlike heroin, sugar is everywhere — in drinks, snacks, and meals. This makes it easy to overconsume, leading to health problems like obesity, diabetes, and heart disease.

**Too Much Sugar Overwhelms the System**

If you eat more sugar than your body needs, your cells and liver become overwhelmed. Excess glucose is converted into fat and stored in the body, leading to weight gain and potentially fatty liver disease.

**Spikes in Blood Sugar**

Eating a lot of sugar at once causes a rapid rise in blood sugar levels, triggering the pancreas to release large amounts of insulin. This can lead to a sugar crash, leaving you feeling tired and hungry again soon after.

Over time, constant spikes and crashes can make your cells less responsive to insulin, a condition called insulin resistance, which can lead to type 2 diabetes.

**Inflammation and Cell Damage**

Excess sugar in the bloodstream can stick to proteins in your body, forming harmful molecules called advanced glycation end products (AGEs). These molecules can damage tissues and contribute to diseases like heart disease and aging of the skin.

**Feeding Harmful Bacteria**

Sugar can also feed bad bacteria in your mouth, leading to tooth decay. Even worse, it destroys the good bacteria in your gut, causing all kinds of digestive problems, candida overgrowth, mouth sores, brain fog and disruption of the good gut-brain axis mechanism.

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### **How to Find Sugar in Food:**

**The ingredient list (1st🥇), AND the nutrient portion of the label (second 🥈) need to be examined.**

5 grams.

That’s all it takes. 5 grams.

Just as a sense of reference, 1 teaspoon is 4 grams of sugar, so just a little over 1 tsp is what the body needs to make all of its metabolic processes work normally.

Remember that little fact - it’s important when looking at food labels! Be sure to choose foods that are 5gm or less. Up to about 11gm is still functional, but the more processed and less natural the sugar is, the worse it gets for your body to handle.

Here are all of the different kinds of sugar you may see on a label: natural, and artificial. Let’s start with the most dangerous Villains to recognize and why: the 7 artificial sweeteners.

**Most Dangerous Artificial Sweeteners**

1. Aspartame

Common Uses: Diet sodas, sugar-free gum, low-calorie desserts.

Health Risks

Neurological issues: Linked to headaches, migraines, and mood disorders in sensitive individuals.

Cancer risk: Some studies suggest a possible link to certain cancers, though findings are controversial.

Metabolic effects: May negatively impact gut microbiome and glucose tolerance.

Phenylketonuria (PKU): Dangerous for people with this rare genetic disorder as they cannot metabolize phenylalanine, a component of aspartame.

2. Saccharin

Common Uses: Tabletop sweeteners, baked goods, and canned products.

Health Risks

Cancer concerns: Early studies linked saccharin to bladder cancer in animals, though human studies are inconclusive.

Allergic reactions: Some individuals may experience hives, rashes, or breathing difficulties.

Gut disruption: May affect beneficial gut bacteria, potentially leading to metabolic issues.

3. Sucralose (Splenda)

Common Uses: Beverages, baked goods, and sugar-free candies.

Health Risks

Gut microbiome disruption: Reduces beneficial bacteria in the gut, possibly impairing digestive and immune health.

Carcinogenic potential: When heated, sucralose may produce harmful compounds like chloropropanols, which are associated with cancer.

Metabolic effects: May interfere with insulin sensitivity and glucose regulation.

4. Acesulfame Potassium (Ace-K)

Common Uses: Sugar-free beverages, baked goods, and processed foods.

Health Risks

Cancer concerns: Animal studies suggest potential links to cancer, though human evidence is limited.

Metabolic stress: May affect insulin response and glucose metabolism over time.

Artificial taste: Can overstimulate the brain’s sweet receptors, leading to sugar cravings.

5. Cyclamate (Banned in the U.S. but used in other countries)

Common Uses: Sugar-free syrups, beverages, and candies.

Health Risks

Cancer concerns: Linked to bladder cancer in animal studies, which led to its ban in the U.S.

Endocrine disruption: Possible interference with hormonal balance.

6. Neotame

Common Uses: Low-calorie processed foods, beverages, and desserts.

Health Risks

Toxic byproducts: Contains aspartame derivatives but in much smaller quantities.

Unknown long-term effects: Due to limited independent studies, its safety profile is not well-established.

7. Advantame

Common Uses: Beverages, desserts, and baked goods (newer sweetener, rarely used).

Health Risks

Aspartame derivative: May pose risks similar to aspartame, though effects are generally weaker due to lower doses used.

Minimal research: Limited data on long-term effects.

And now, for the rest of the aliases you need to know when finding sugar in the ingredient list of the label…

1. **Refined Sugars**

Highly processed sugars offer sweetness and other functional benefits like shelf stability and texture enhancement.

**High-Fructose Corn Syrup (HFCS)**

### *DOUBLE DANGER!!* It is an excitotoxin, too!!

Function: Sweetener with a mix of glucose and fructose; enhances moisture retention.

Metabolism: Fructose component metabolized in the liver; glucose used systemically.

Applications: Found in sodas, candies, baked goods.

**Powdered Sugar**

Function: Used for icing, decoration, and quick-dissolving sweetness.

Metabolism: Same as sucrose (glucose + fructose).

Applications: Confectionery, frostings.

**Brown Sugar**

Function: Adds moisture and a distinct molasses flavor.

Metabolism: Same as sucrose (glucose + fructose).

Applications: Baking (cookies, cakes), sauces.

**Invert Sugar**

Function: Prevents crystallization; used in syrups and candies.

Metabolism: Easily absorbed as free glucose and fructose.

Applications: Confectionery, jams, and beverages.

2. **Natural Sugars**

These sugars provide energy and are metabolized quickly by the body. They also play a role in flavor, texture, and fermentation processes.

Monosaccharides (Simple Sugars)

**Glucose**

Function: Primary energy source for cells; absorbed directly into the bloodstream.

Metabolism: Processed via glycolysis to produce ATP. Excess stored as glycogen or fat.

Applications: Sweeteners in food, glucose syrup in candies, energy drinks.

**Fructose**

Function: Intensely sweet; enhances palatability.

Metabolism: Processed in the liver; converted to glucose, glycogen, or triglycerides.

Applications: Sweeteners (e.g., high-fructose corn syrup), natural sugar in fruits.

**Galactose**

Function: Less sweet; combines with glucose to form lactose in milk.

Metabolism: Converted to glucose in the liver.

Applications: Found in dairy products and some legumes.

Disaccharides

**Sucrose** (Table Sugar)

Function: Provides sweetness and stability in baked goods; caramelizes for flavor.

Metabolism: Broken down into glucose and fructose in the small intestine.

Applications: Common sweetener in baking, beverages, and processed foods.

**Lactose**

Function: Naturally occurring sugar in milk; feeds gut microbiota in some individuals.

Metabolism: Requires lactase enzyme for digestion into glucose and galactose.

Applications: Dairy products, lactose-derived syrups.

**Maltose**

Function: Less sweet than sucrose; provides energy and fermentation substrate.

Metabolism: Broken down into two glucose molecules.

Applications: Used in brewing, malted milkshakes, and cereals.

3. **Natural Sweeteners**

These are the best guys to look for! They actually can satiate your sugar cravings, but not lead to harmful neurologic, or metabolic problems in your body. They offer functional benefits beyond sweetness, such as flavor complexity or nutrients. Best part is they can easily be substituted for refined sugar in baking or cooking recipies, and in drinks like coffee, tea and smoothies.

**Honey**

Function: Natural humectant; adds flavor complexity and antimicrobial properties.

Metabolism: Contains a mix of glucose and fructose; quickly absorbed.

Applications: Sweetener, preservative, natural remedy. Excellent for boosting immunity and crushing allergies if you can find a raw, local honey made from bees pollinating close to where you live.

**Maple Syrup**

Function: Adds sweetness and a distinct maple flavor; rich in antioxidants.

Metabolism: Mainly sucrose; absorbed as glucose and fructose.

Applications: Pancakes, desserts, marinades.

**Coconut Sugar**

Function: Contains inulin, a prebiotic fiber; slower glycemic response.

Metabolism: Similar to sucrose.

Applications: Baked goods, beverages.

**Agave Nectar**

Function: High fructose content provides intense sweetness with a lower glycemic index.

Metabolism: Fructose metabolized by the liver.

Applications: Beverages, desserts.

**Stevia**

Function: Zero-calorie natural sweetener with no glycemic impact.

Metabolism: Broken down into steviol glycosides; excreted without entering glycolytic pathways.

Applications: Beverages, desserts, health products.

**Erythritol** (Sugar Alcohol)

Function: Low-calorie, non-cariogenic; provides bulk and sweetness.

Metabolism: Mostly absorbed unchanged; excreted in urine.

Applications: Sugar-free candies, baking.

4. **Novel Sweeteners**

Also a lesser evil sugar villain, these sweeteners provide functional benefits like low glycemic impact or additional health benefits.

**Allulose**

Function: Low-calorie sweetener; mimics sucrose in texture and taste.

Metabolism: Absorbed but not metabolized for energy; excreted unchanged.

Applications: Low-calorie baked goods, beverages.

**Monk Fruit (Luo Han Guo):**

Function: Zero-calorie sweetener; contains mogrosides with antioxidant properties.

Metabolism: Broken down into mogrosides and excreted.

Applications: Sugar-free drinks, health products.

**Trehalose**

Function: Provides mild sweetness and stability; protects against oxidation.

Metabolism: Broken into glucose during digestion.

Applications: Used in pharmaceuticals, frozen foods.

5. **Sugar Alcohols**

Offer reduced-calorie sweetness, bulk, and a lower glycemic response.

**Xylitol**

Function: Non-cariogenic; provides sweetness similar to sucrose.

Metabolism: Partially absorbed; does not spike blood sugar significantly.

Applications: Dental products, sugar-free gum, baking.

**Erythritol**

Function: Zero-calorie bulk sweetener with cooling effect.

Metabolism: Mostly excreted unchanged.

Applications: Sugar-free products, low-calorie foods.

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## **The Antidote - Balancing The Risks**

To balance the risks of eating sugar, incorporate foods that alkalinize the body, and mitigate sugar’s negative effects on metabolism, gut health, and inflammation. These foods support stable blood sugar levels, optimize digestion, alkalinize and provide the body with nutrients to counteract sugar-related risks.

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Specific Foods That Balance Sugar Consumption

1. High-Fiber Foods

Why: Fiber slows sugar absorption, preventing blood sugar spikes and feeding beneficial gut bacteria.

Examples:

Vegetables: Broccoli, kale, spinach, carrots, artichokes.

Fruits (low glycemic index): Berries, apples, pears, and citrus fruits.

Legumes: Lentils, chickpeas, and black beans.

Whole Grains: Oats, quinoa, barley, and brown rice.

2. Healthy Fats

Why: Fats delay gastric emptying, reducing sugar’s rapid absorption and blunting insulin spikes.

Examples:

Nuts and Seeds: Almonds, walnuts, chia seeds, flaxseeds.

Oils: Extra virgin olive oil, avocado oil, and coconut oil.

Fatty Fish: Salmon, mackerel, sardines (rich in omega-3 fatty acids).

3. Protein-Rich Foods

Why: Protein stabilizes blood sugar by slowing carbohydrate digestion and promoting satiety.

Examples:

Lean Proteins: Chicken, turkey, eggs, tofu, and tempeh.

Dairy/Alternatives: Greek yogurt (unsweetened), cottage cheese, almond milk.

Fish and Seafood: Cod, shrimp, and tuna.

4. Prebiotic and Probiotic Foods

Why: These improve gut health, reducing sugar’s negative effects on microbiome balance.

Examples:

Prebiotics: Garlic, onions, leeks, asparagus, bananas (green).

Probiotics: Kefir, sauerkraut, kimchi, miso, and yogurt (unsweetened).

5. Low-Glycemic Index (GI) Carbohydrates

Why: Low-GI foods release glucose slowly, preventing rapid blood sugar increases.

Examples:

Whole Grains: Quinoa, bulgur, farro.

Root Vegetables: Sweet potatoes, carrots, parsnips.

Legumes: Lentils, chickpeas, and black beans.

6. Antioxidant-Rich Foods

Why: Antioxidants combat inflammation caused by sugar-induced oxidative stress.

Examples:

Berries: Blueberries, raspberries, blackberries.

Dark Leafy Greens: Kale, spinach, Swiss chard.

Herbs and Spices: Turmeric (curcumin), cinnamon, ginger, and cloves.

Dark Chocolate: 70% cacao or higher (in moderation).

7. Foods Rich in Chromium and Magnesium

Why: These minerals enhance insulin sensitivity and regulate blood sugar.

Examples:

Chromium: Broccoli, green beans, eggs, and nuts.

Magnesium: Spinach, almonds, pumpkin seeds, and avocado.

8. Vinegar or Fermented Foods

Why: Acetic acid in vinegar slows gastric emptying and lowers post-meal blood sugar levels.

Examples:

Apple cider vinegar (diluted in water).

Pickles (low-sugar options).

9. Herbal Teas

Why: Certain herbal teas stabilize blood sugar and reduce sugar cravings.

Examples:

Green tea (EGCG-rich).

Cinnamon tea.

Fenugreek tea.

10. Water-Rich Foods

Why: High water content helps dilute sugar’s effects and improve digestion.

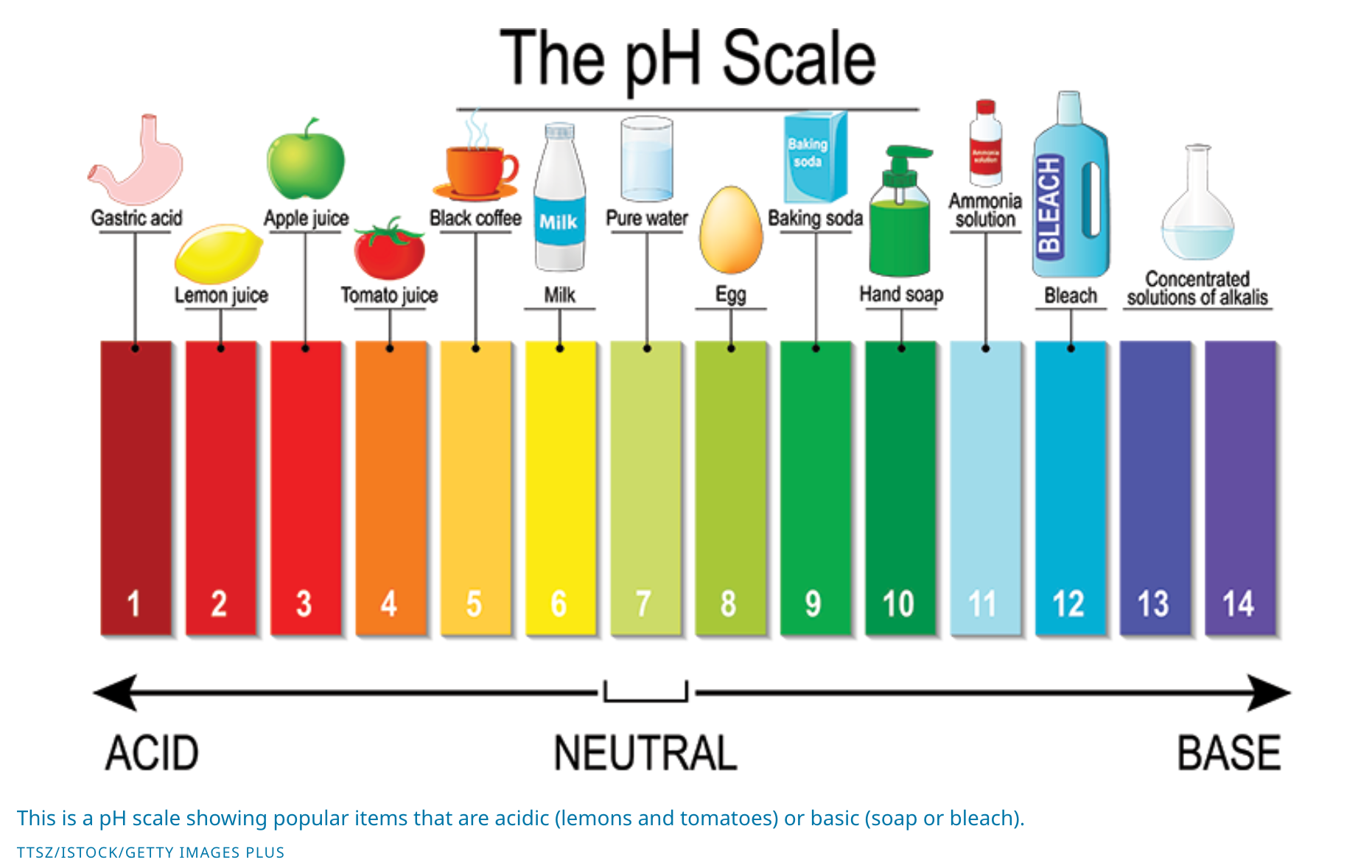
Examples:

Cucumbers, celery, watermelon, and zucchini.

11. Highly Alkaline Foods – listed from high to low pH

The pH chart ranges from 1 (highly Acidic) to 14 (highly alkaline /or basic).

Right in the middle is 7, which = neutral.



My favorite comprehensive reference list of alkaline vs. acidic foods is from Essense of Life, a nutritional support resource for cancer patients, and can be enjoyed here: [*https://rense.com/1.mpicons/acidalka.htm*](https://rense.com/1.mpicons/acidalka.htm)

*“*Note that a food’s acid or alkaline forming tendency in the body has nothing to do with the actual pH of the food itself. For example, lemons are very acidic, however the end products they produce after digestion and assimilation are very alkaline so, lemons are alkaline forming in the body. Likewise, meat will test alkaline before digestion, but it leaves very acidic residue in the body so, like nearly all animal products, meat is very acid forming.”

The alkalinity of the following foods depends on how they are grown, processed, and prepared. For best results, consume these foods raw, lightly steamed, or minimally cooked to preserve their alkalizing properties.

Highly Alkaline Foods (pH ~9.0–8.5)

Green Leafy Vegetables:

Kale

Spinach

Swiss chard

Collard greens

Mustard greens

Sea Vegetables:

Seaweed (e.g., kelp, wakame, nori)

Spirulina

Chlorella

Herbs (Fresh):

Parsley

Cilantro

Basil

Dill

Moderately Alkaline Foods (pH ~8.5–8.0)

Cruciferous Vegetables:

Broccoli

Brussels sprouts

Cabbage

Cauliflower

Root Vegetables:

Sweet potatoes

Beets

Radishes

Turnips

Alkaline Fruits:

Lemons (despite their acidic taste, they have an alkalizing effect)

Limes

Watermelon

Grapefruit

Avocado

Sprouts:

Alfalfa sprouts

Bean sprouts

Broccoli sprouts

Mildly Alkaline Foods (pH ~8.0–7.5)

Other Vegetables:

Asparagus

Zucchini

Green beans

Bell peppers (especially red and yellow)

Cucumbers

Celery

Legumes (soaked/sprouted):

Lentils

Chickpeas

Mung beans

Nuts & Seeds (raw, unprocessed):

Almonds

Chia seeds

Flaxseeds

Herbs & Spices:

Ginger

Turmeric

Cayenne pepper

Lower Alkaline Foods (pH ~7.5–7.0)

Fruits:

Berries (blueberries, blackberries, raspberries)

Apples

Pears

Mangoes

Bananas (ripe)

Whole Grains (sprouted or minimally processed):

Quinoa

Millet

Buckwheat

Other Alkaline Foods:

Coconut water

Herbal teas (e.g., chamomile, nettle, rooibos)

Raw honey (in moderation)