

Beyond Sugar-Free:

An Illustrated Guide to
Refined Carbohydrates
& Insulin Resistance

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Diagnosis:Diet

nutrition science meets common sense



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Publication designed by Suzi Smith

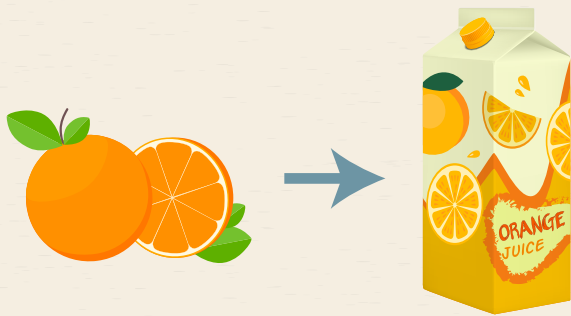
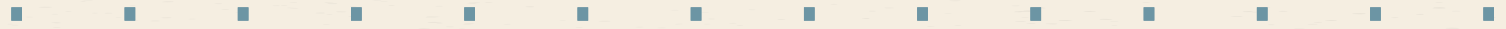
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Note: food lists are not intended to be comprehensive

What are refined carbohydrates?

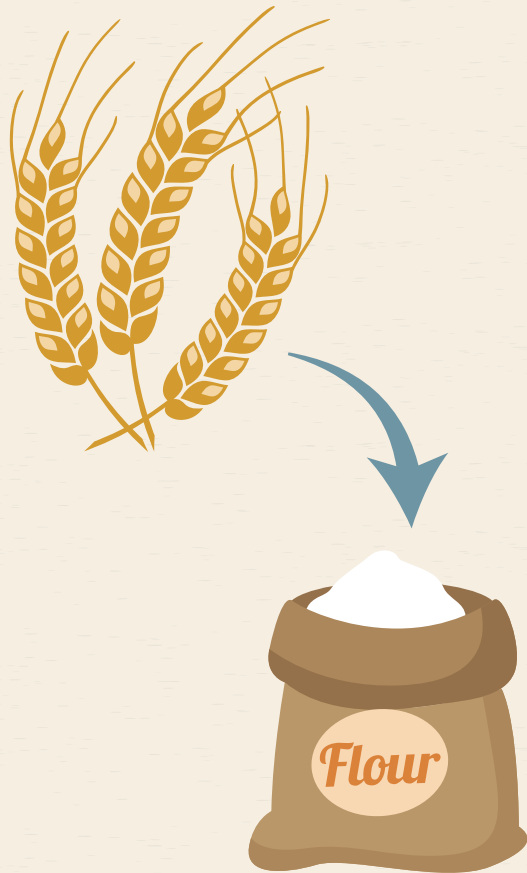


The term “refined” is so confusing that it’s actually easier to answer this question by first answering the opposite question: which carbohydrates are NOT refined? It is simple to identify an unrefined carbohydrate. If you are looking at a sweet or starchy whole food that you could come across exactly as is in nature, you are looking at an UNrefined carbohydrate source. Examples include a piece of fruit, a Lima bean, or a sweet potato. ALL sugars and starches, EXCEPT those that come in the form of a natural whole food are considered refined to some extent.



Refined carbohydrates are forms of sugars and starches that don’t exist as is in nature. They do *come from* natural whole foods, but they have been altered in some way by processing to “refine” them. Processing methods include industrial extraction, concentration, polishing, extrusion, puffing, purification, and enzymatic transformation. Examples include fruit juice concentrate, table sugar, and agave syrup. Refined sugars are easy to identify because they always taste sweet and typically come in the form of crystals, syrups or powders. With the exception of honey (which we’ll address shortly), all sweeteners, whether natural or artificial, are considered refined. Refined starches, on the other hand, are a lot more confusing.

What are refined grains?



Truly whole grains are intact kernels (seeds) complete with their outer bran coating, just as they are found in nature. Once the grain is broken into pieces by any kind of processing, it could be considered refined to some extent. The tinier the resulting particles, the more refined a grain is considered to be. The confusion about what constitutes a “refined” grain comes about because processing methods vary. Some processing methods (such as stone-grinding) produce large, coarse particles, whereas industrial processing methods produce ultra-fine powders that have had all of the fiber and most nutrients stripped away. Coarse, stone-ground grain meal and cracked kernel grains are minimally refined, whereas soft, powdered grains (flours of all kinds and starches such as corn starch) are highly refined.

Particle size matters because the smaller the particles, the easier they are to digest, and the faster your blood sugar will rise after you eat them.

To make matters more confusing, there are some forms of grain processing that don't involve grinding at all. Examples include polishing, high-heat treatment, and extrusion puffing. All of these processes damage or remove the bran coating of grains, making grains faster to cook and making the starches inside easier to digest.

Refined carbohydrate list (sweet)

Just because it's natural, doesn't mean it's healthy.

Even though honey exists in nature and isn't technically refined, it is a pure simple sugar that is difficult to obtain in significant quantities without special equipment or risk. Honey affects our health in exactly the same way that other sugars do, and actually contains more sugar per teaspoon than any other sugar source.



REFINED AND SIMPLE SUGARS

(often called "added sugars")

- Table sugar/white sugar (aka sucrose)
- Confectioner's (powdered) sugar
- Honey
- Agave syrup
- Corn syrup
- High-fructose corn syrup
- Brown sugar
- Molasses
- Maple syrup
- Fructose
- Brown rice syrup
- Maltose
- Glucose syrup
- Tapioca syrup

- Rice bran syrup
- Malt syrup
- Sorghum
- Treacle
- Panela
- Saccharose
- Carob syrup
- Dextrose, dextran, dextrin, maltodextrin
- Fruit juice concentrate

FRUIT JUICES

- All fruit juices except for lemon/lime. (Most fruit juices require special equipment to produce in significant quantities.)

Refined carbohydrate list (starchy)



ALL FLOURS, including

- Wheat flour
- Oat flour
- Chickpea flour
- Rice flour
- Corn flour
- Amaranth flour
- Tapioca flour
- Potato flour
- Semolina flour
- Spelt flour
- Kamut flour
- Millet flour
- Quinoa flour
- Teff flour

100% stoneground, whole meal flours are less refined and not as unhealthy as other types of flours because they are not as finely ground and take longer to digest.

EXAMPLES OF REFINED GRAINS

- Instant oatmeal
- White rice
- Polished rice
- Instant rice
- Cream of wheat
- Cream of rice
- Corn grits

EXAMPLES OF REFINED STARCHES

(essentially any powdered ingredient with the word "starch" in it)

- Corn starch
- Potato starch
- Modified food starch
- Tapioca starch



Foods HIGH in refined carbohydrates



BAKED GOODS & CEREALS

- Muffins and donuts
- Pancakes and waffles
- All doughs (phyllo, pie crust, etc)
- Breads* and bagels
- Pizza (because of the dough)
- Most crackers and rice cakes*
- Rice wrappers
- Most cereals except for unsweetened, 100% whole grain cereals in which you can see the whole grains in their entirety with the naked eye (unsweetened muesli, rolled oats, etc.)
- Pastas, noodles and couscous
- Tortillas*
- Panko crumbs, bread crumbs and croutons
- All breaded or battered foods

SNACK FOODS

- Corn chips
- Pretzels
- Caramel corn and kettle corn
- Most granola bars, power bars, energy bars, etc (unless labelled sugar-free).
- Sweetened yogurts and other sweetened dairy products
- Honey-roasted nuts

CONDIMENTS

- Ketchup
 - Honey mustard
 - Tartar sauce
 - Russian dressing
 - Most barbecue sauces
- Check labels on salsa, tomato sauces, salad dressings and other jarred/canned sauces for sugar/sweeteners

DRINKS

- Sweetened sodas
- Chocolate milk (and other sweetened milk products) and hot cocoa
- Condensed milk
- Most milk substitutes (almond milk, soy milk, oat milk, etc) have sugar added
- Sweet wines and liqueurs

DESSERTS

- All desserts except whole fruit
- Ice cream, sherbet and frozen yogurt
- Cookies
- Cakes, pies and pastries
- Candy
- Chocolate (dark, milk and white), except baker's chocolate which is unsweetened
- Jello®, puddings and custards
- Jellies, jams and preserves

* those made from 100% stone-ground whole grain are less refined

Foods LOW in refined carbohydrates



WHOLE FOODS

- Fresh or frozen meat, poultry, and seafood
- Eggs
- Fresh or frozen unsweetened fruits
- Fresh or frozen vegetables
- Whole grains (whole grain rice, oats, barley, quinoa, corn, etc)
- Nuts and seeds of all types
- Unsweetened coconut
- Whole legumes (beans, peas, lentils)
- Olives
- Milk

PREPARED FOODS

- Unsweetened nut butters
- Guacamole
- Unsweetened pickles

- Tofu
- Tempeh
- Textured vegetable protein
- Seitan
- Unsweetened, all-natural dairy products (plain yogurt, cheeses, butter, cream, sour cream, etc)

BEVERAGES

- Water
- Unsweetened coffee and tea
- Sparkling water (either plain or with natural flavors or essences added)
- Unsweetened milk substitutes (almond milk, soy milk, oat milk, etc)
- Most red wines, dry white wines, & all spirits (whiskey, gin, vodka, etc)

CONDIMENTS/DRESSINGS/SAUCES

- Unsweetened tomato sauce
- Unsweetened salad dressings (most fat-free dressings contain sugar). Low-sugar options include blue cheese, ranch, full-fat Italian, Greek, Caesar. Check labels for sugar content!
- Herbs and spices
- Olive oil
- Coconut Oil
- Unsweetened vinegars (balsamic and other fruity vinegars can be very sweet—read label for carb content)
- Unsweetened salsa
- Vegetable tapenades

Insulin resistance



How do you know if you have insulin resistance?

I have a popular post on my website dedicated to this question called [“How to Diagnose, Prevent and Treat Insulin Resistance”](#) that includes a free downloadable PDF of tests you can use to figure out where you are on the insulin resistance spectrum. It also helps you understand how much carbohydrate is personally safe for you to eat, because we are all different in our ability to tolerate carbohydrates.



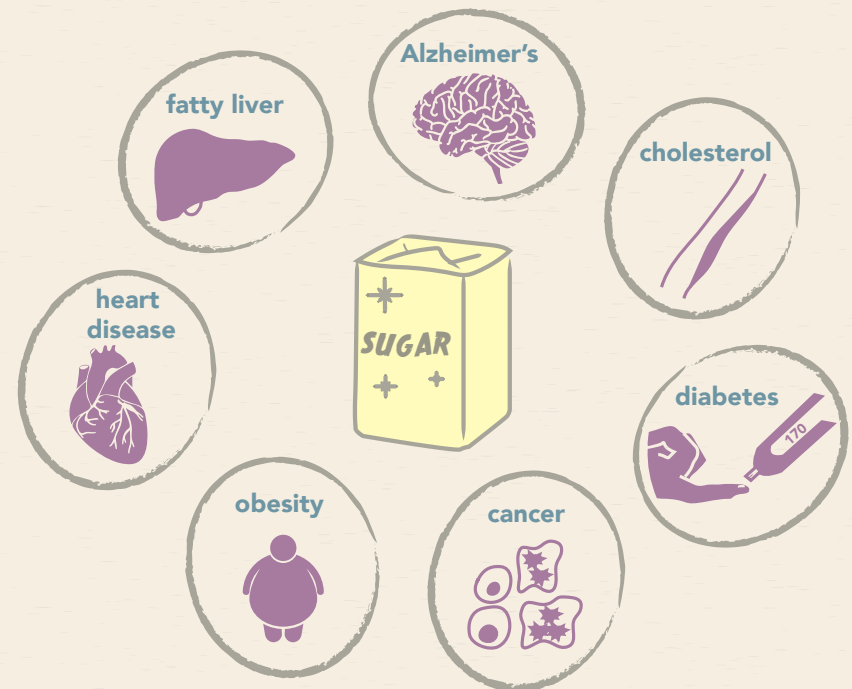
Insulin resistance means that your body has become less sensitive to the effects of insulin—a powerful hormone released after meals that tells your body what to do with the calories you eat. More than 50% of Americans now have insulin resistance, placing millions of people at high risk for serious chronic diseases. Insulin resistance is sometimes referred to as “pre-diabetes” because one of the most common consequences of unchecked insulin resistance is type two diabetes—a devastating metabolic disorder of high blood sugar and insulin levels that damages every cell in the body. Why do so many people now have insulin resistance, and how does it develop?

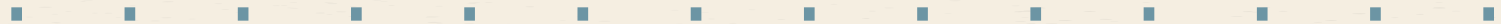
After eating a meal, the digestive system breaks down the sugars and starches in the foods you eat into simple individual sugar molecules called glucose and fructose. Glucose is the form of sugar found in our bloodstream, often called “blood sugar.” [We’ll get to fructose in a little while, but for now we’re going to focus on glucose.] Any meal containing sugars or starches, whether they are refined or from whole foods, will cause blood glucose to rise to some extent. When blood glucose rises, your pancreas will release insulin into the bloodstream to process that extra glucose. Insulin tells muscle and liver cells to soak up excess glucose from your blood stream. Insulin also tells the liver to stop releasing glucose into the bloodstream. These are two of the ways that insulin works to keep blood sugar in a normal range.

The most powerful trigger for insulin release is glucose (from sugars and starches), particularly *refined* sugars and starches. If you eat too many refined sugars and starches too often, as most people do, your blood glucose will spike frequently and your body will have to release excessive amounts of insulin over and over again to deal with those glucose spikes. Eventually your cells can become so accustomed to insulin spikes that they become less responsive to insulin. When cells become numbed to insulin's signals, your blood sugar could stay too high for too long after meals. In response to this numbing, the body releases even MORE insulin to try to get cells to respond better, leading to a vicious cycle of more insulin release causing more insulin resistance.

Left unchecked, one result of this vicious cycle can be type two diabetes, a disease marked by high blood sugar and high insulin levels. The easy way to break this cycle is to reduce your body's demand for insulin by changing the amount and type of carbohydrate you eat. I highly recommend this wonderful [TED talk by Dr. Sarah Hallberg](#) explaining how to reverse type 2 diabetes using simple dietary strategies.

But diabetes is not alone—most other common chronic diseases also have insulin resistance at their core. That's because insulin regulates the metabolism of every organ in the body. Obesity, heart disease, gout, fatty liver, and cancer can lie waiting around the corner for us if we eat foods that put too much stress on our insulin signaling system.

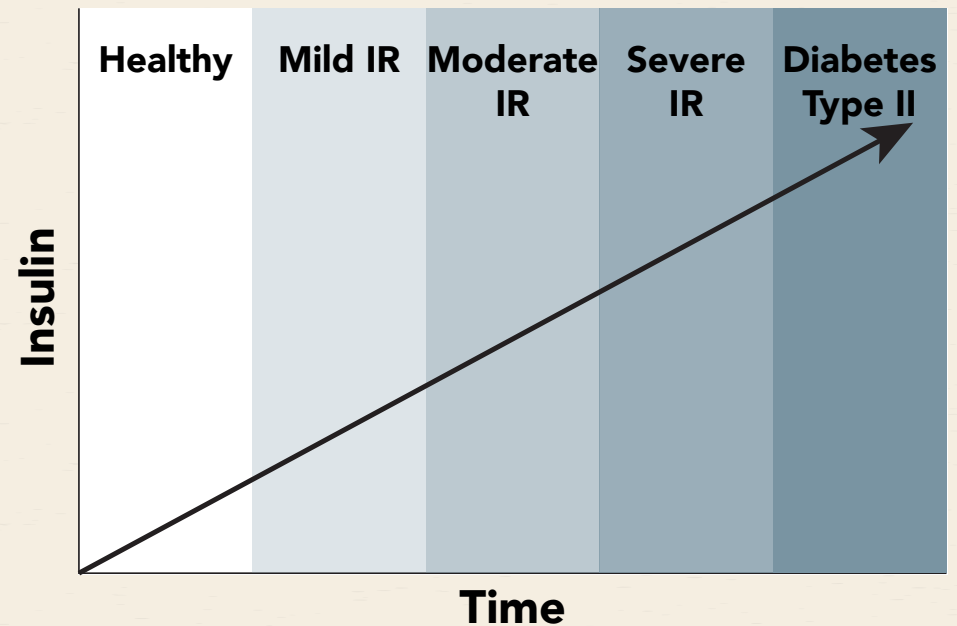




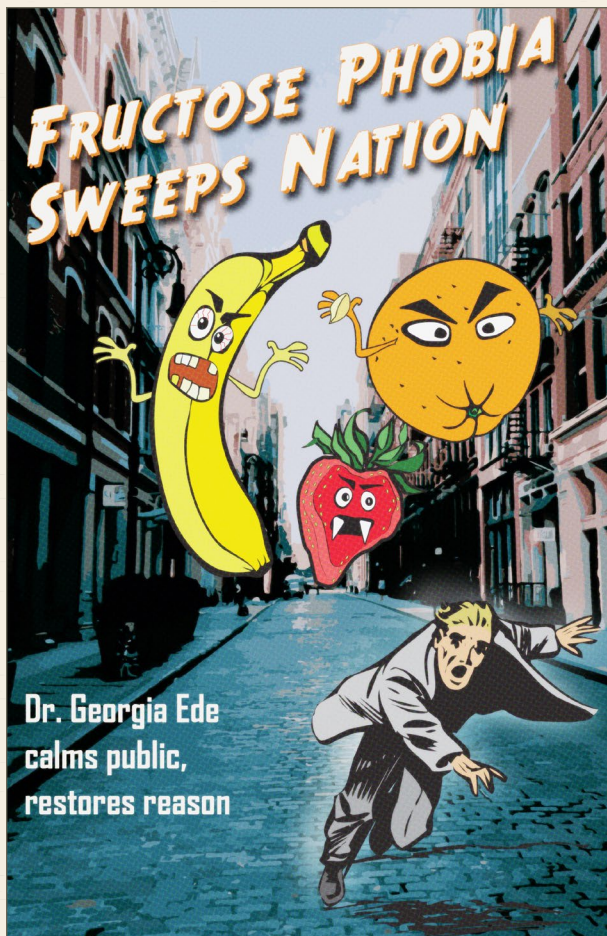
Insulin is not simply a blood sugar regulator—it is a master growth hormone that orchestrates the activity of numerous other hormones in the body—from sex hormones like estrogen and testosterone—to stress hormones like adrenaline and cortisol. High insulin levels signal the body to go into growth and storage mode. They turn fat burning OFF and turn fat storage, cell growth, and cell division ON. Anyone with insulin resistance trying to lose weight will find it much easier to do so if they eat in a way that lowers their insulin levels and unlocks fat storage. People with cancer may find it easier to slow tumor growth and respond to standard medical treatments if they eat in a way that lowers their insulin levels and turns down cell growth and division rates. People with anxiety and mood swings may find it easier to feel calm and even-tempered if they eat in a way that lowers their insulin levels and stabilizes stress hormone activity.

Insulin resistance takes a serious toll on brain health, playing a key role in mood disorders such as bipolar disorder, and psychotic disorders such as schizophrenia. But where the science is especially compelling is in the field of dementia. We now understand that insulin resistance is the key driving force behind

most cases of garden-variety Alzheimer’s disease. I encourage you to read and share a short article I wrote for Psychology Today summarizing the powerful connection between diet and dementia entitled “[Preventing Alzheimer’s Is Easier Than You Think.](#)”



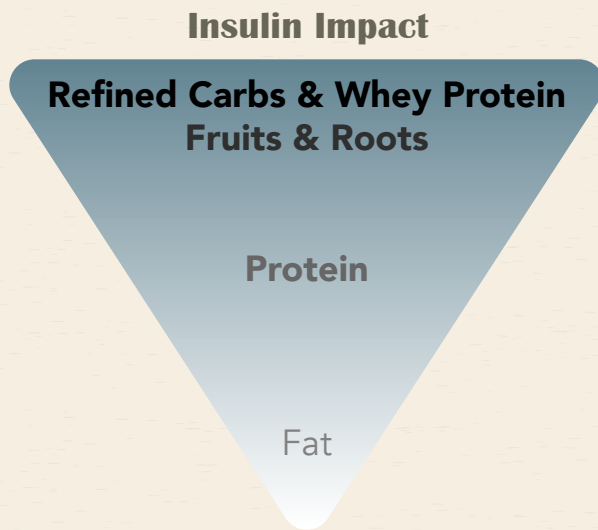
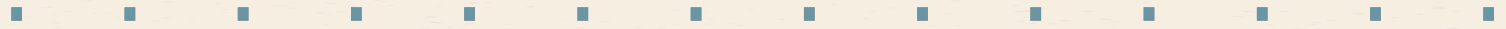
A word about fructose



All sweet and starchy foods get broken down during digestion into the same two simple sugar molecules: glucose and fructose. We already covered what happens to glucose—but what about fructose? We used to be told that fructose (aka “fruit sugar”) was the ideal sweetener for people with diabetes because it doesn’t cause blood sugar or insulin spikes. However, in recent years its reputation has tanked, as some experts have decided that fructose is the silently sinister sister of the sugar family, single-handedly responsible for obesity, diabetes, heart disease, fatty liver disease, gout, cancer, and worldwide destruction. The gist of the anti-fructose argument is that fructose is dangerous because it heads straight to the liver, and turns instantly into fat.

I describe in detail how the body processes glucose and fructose in my article, [Has Fructose Been Framed?](#) In a nutshell, after the first few steps of processing in the liver, fructose and glucose both get broken down into the exact same molecule and enter a single common pathway. From that point on, you can’t tell the difference between them. For this and other more complicated reasons (see [“Fructose Raises Appetite for Better Science”](#)), I argue that fructose is no worse than glucose for human metabolism. Placing the emphasis on fructose runs the risk of implying that glucose is safe to consume in large quantities, which is just not true. My post [“Why Sugar Is Bad for You: A Summary of the Research”](#) explains in more detail why you don’t need to worry about how much fructose you eat—focus instead on cutting way down on ALL simple sugars and you’ll be a lot better off!

10 tips to improve your metabolism and take control of your health

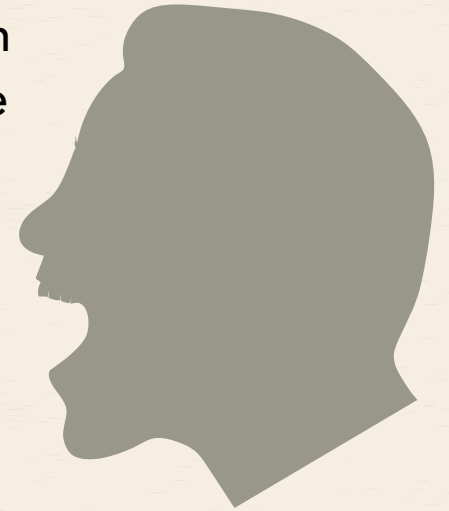
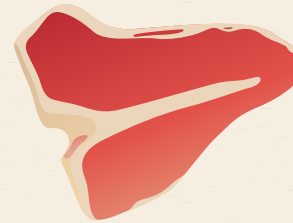
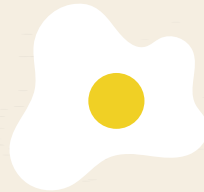


In summary, eating a diet that goes easy on your insulin system is the single most powerful way to protect your metabolism and minimize your risk for serious chronic diseases. What does a lower-insulin diet look like in the real world? Refined sugars and starches (along with whey protein—see #8 below) trigger the strongest insulin surges, so minimizing those is key. Whole food sources of carbohydrates like fruit and root vegetables typically require a little less insulin than refined sources. These are followed by protein-rich foods like meat, seafood and poultry, which cause a moderate rise in insulin levels. Surprisingly, the macronutrient that is gentlest on your insulin signaling system is fat, which has very little impact on insulin levels. Below you'll find an illustrated guide to healthier eating that incorporates these principles. Here's to your good health—bon appetit!

“It is your **diet**, not your **DNA**, that determines your **destiny**.”

1. EAT REAL WHOLE FOODS

Stick to meats, seafood, poultry, eggs, nuts, vegetables, and fruits. Eat protein and fat with every meal to feel fuller longer and reduce the need for snacking.



2. BECOME A SUGAR SLEUTH

Learn sugar's many aliases to avoid buying products with added sugars.

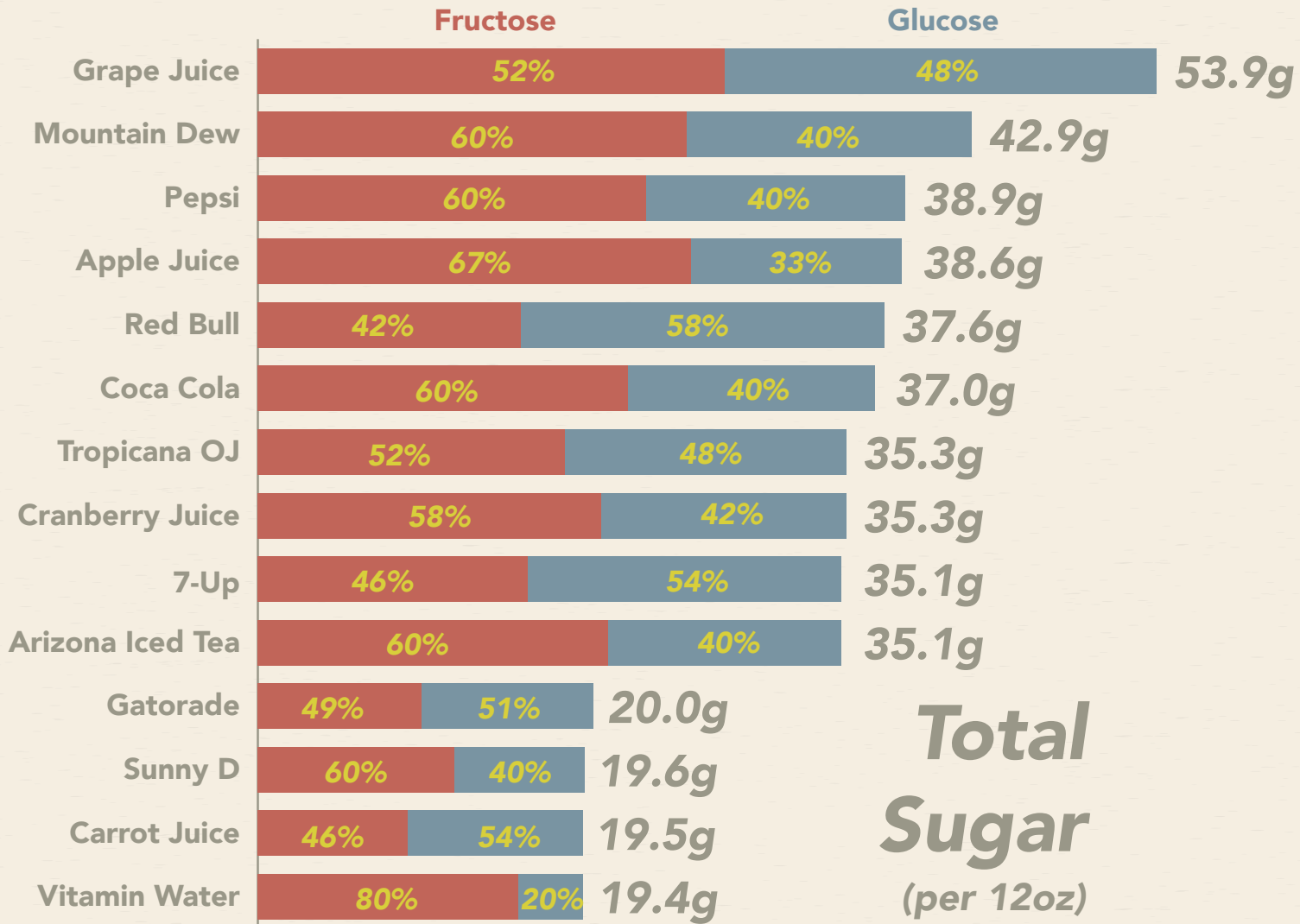
corn syrup, honey, agave, maple syrup, molasses, fruit juice concentrate, cane syrup, cane juice, brown rice syrup, rice bran syrup, tapioca syrup, maltodextrin, barley malt, malt syrup, maltose, dextran, sorghum, treacle, panela, beet sugar, saccharose, dextrose, carob syrup



3.

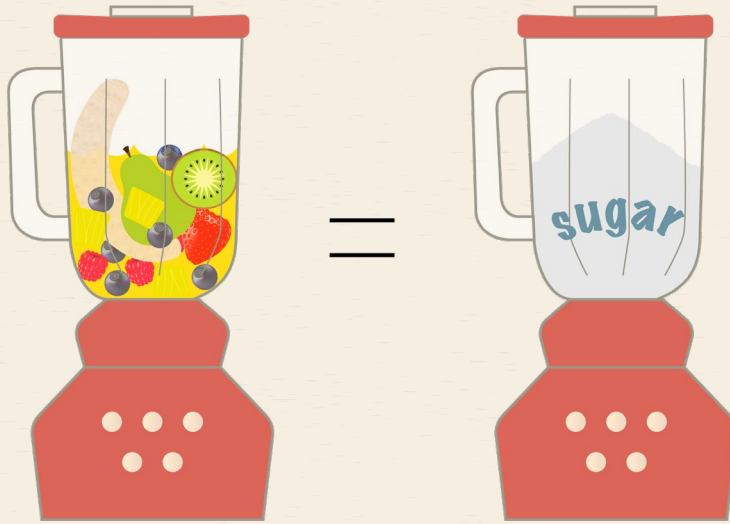
DON'T DRINK SUGAR

Fruit juice, sports drinks, sweetened energy drinks, and sweet sodas are essentially liquid sugar. Drink water, seltzer, or unsweetened iced tea/coffee.



4.

STEP AWAY FROM THE SMOOTHIES



Smoothies are an easy way to consume a large amount of fruit in a short amount of time. A small (16 oz) Jamba Juice® Classic Smoothie contains 50-70 grams of sugar!

5.

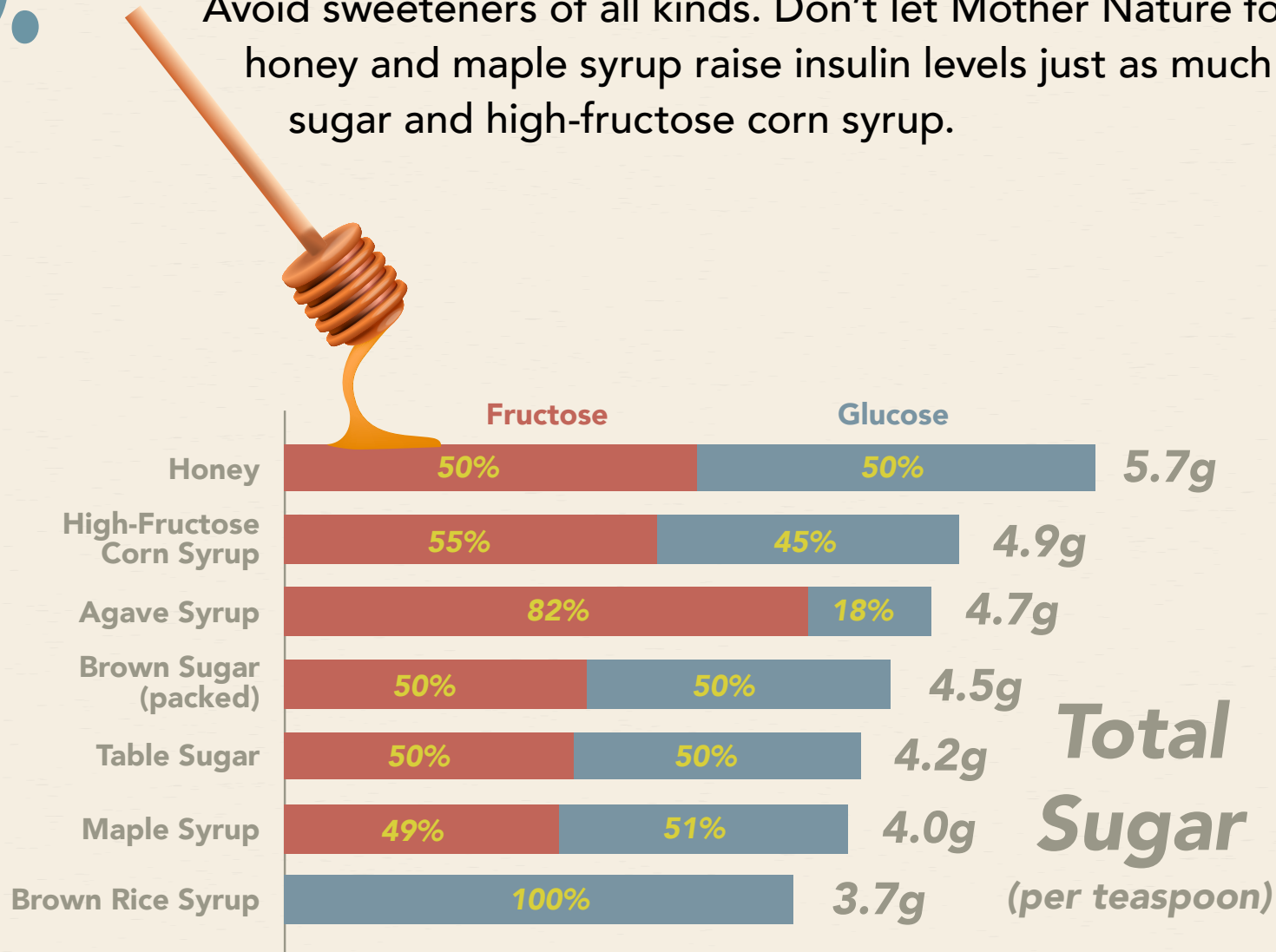
FLOUR = GLUCOSE

Baked goods don't have to contain sugar or taste sweet to cause an insulin spike. Even whole-grain flours break down into sugar fast enough to contribute to insulin resistance.



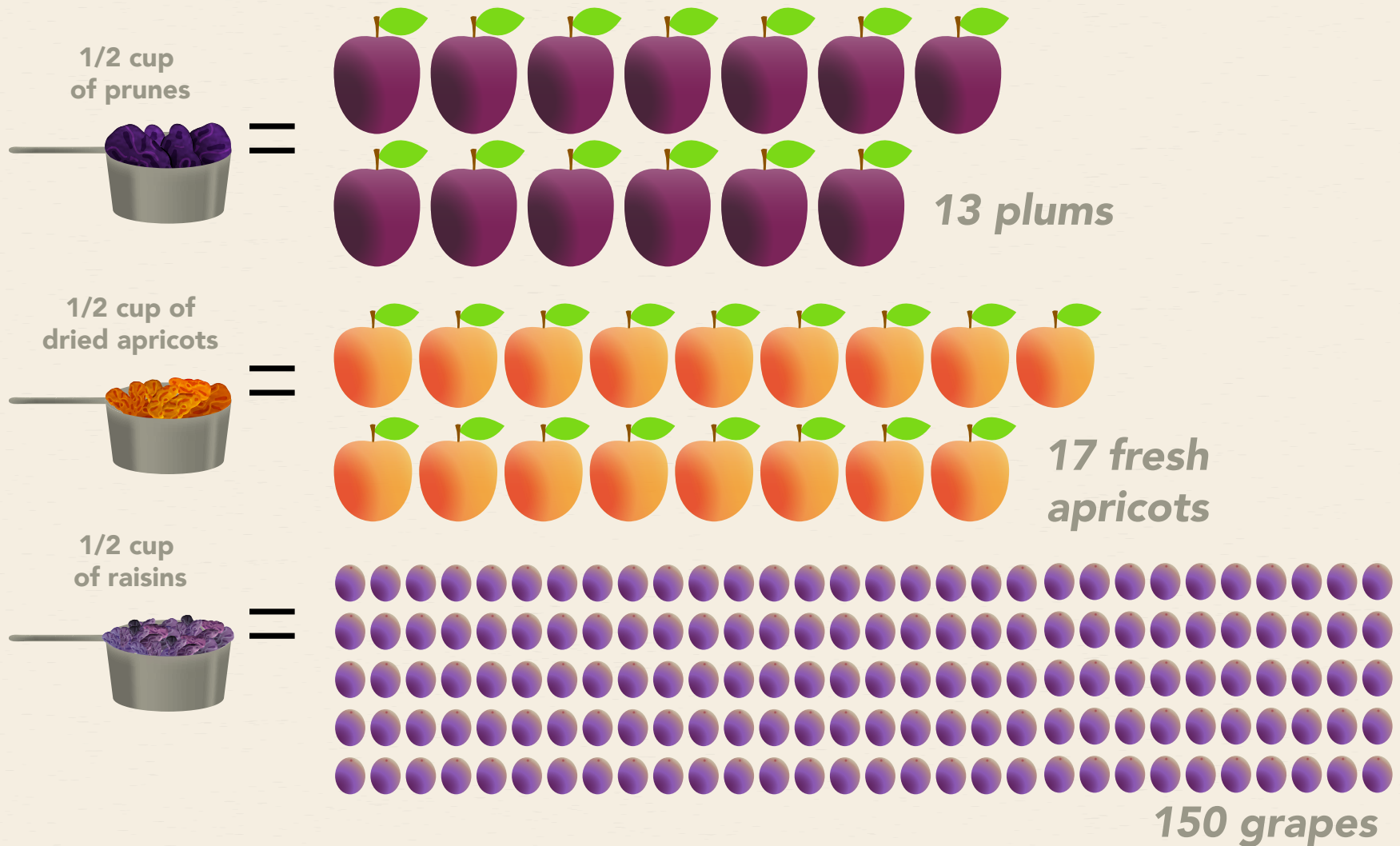
6. DON'T ADD SUGAR

Avoid sweeteners of all kinds. Don't let Mother Nature fool you—honey and maple syrup raise insulin levels just as much as table sugar and high-fructose corn syrup.



7. AVOID DRIED FRUIT

The drying process concentrates the sugars, and it's much easier to overeat fruit when it doesn't contain water. Water helps you feel full and satisfied sooner, so you're less likely to overdo it.



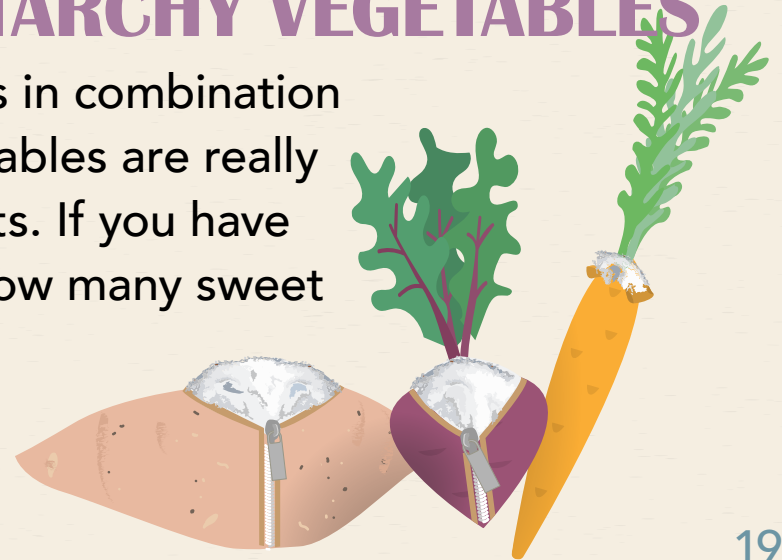
8. **LIMIT DAIRY**

Whey proteins in some dairy products and protein powders raise insulin levels just as much as refined carbohydrates do! Milk products also naturally contain hormones that trigger insulin-like responses in the human body.



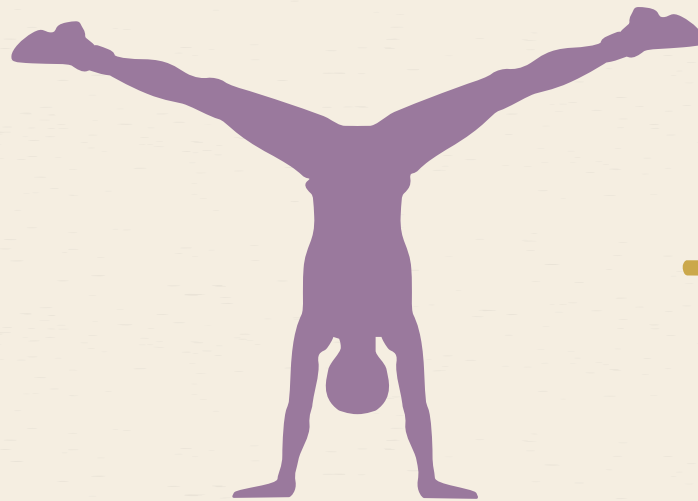
9. **BEWARE OF SWEET AND STARCHY VEGETABLES**

Plants store energy as glucose (sometimes in combination with fructose) in their roots, so root vegetables are really just lumps of sugar wearing vegetable suits. If you have insulin resistance, you may need to limit how many sweet and starchy vegetables you eat.



10. EXERCISE

Exercise improves blood sugar and insulin levels because muscles pull glucose out of the blood to use for energy. Strength building/resistance training is even more effective (and less time-consuming) than aerobic exercise when it comes to boosting your metabolism.



Infographic references can be found in "[How to Diagnose, Prevent and Treat Insulin Resistance](#)"

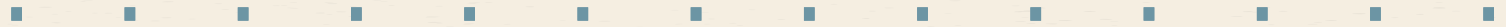
Challenge yourself!



Keep a food diary for a week to see how much sugar you usually consume, then use these tips to practice reducing your daily sugar intake. A useful free tracking tool is [MyFitnessPal](#). You can estimate sugar content of foods by subtracting fiber grams from total carbohydrate grams to get “net carbs.” Start by trying to cut your sugar intake by half. If you don’t have insulin resistance, work towards removing all sources of sugar except for fruits and vegetables. If you have insulin resistance, aim for 20 grams of carbohydrate per meal or less (until cravings improve). Have your blood tested for insulin resistance markers before you start, and three months after reaching your sugar goal to see the results of your efforts.

You have the **power to change**
the course of your future.

The last word



CREDITS

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If you have questions pertaining to your unique clinical circumstances, Dr. Ede may be able to help you via her virtual nutrition practice. For more information and to schedule an appointment: www.diagnosisdiet.com/consultations.

REFERENCES

References for the information in this publication can be found in the linked articles on the [Diagnosis:Diet website](#).