

THE GLYCEMIC INDEX

Everything You Need To Know In
Support Of Your Low Carb Lifestyle



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What Is The Glycemic Index?

The GI, or glycemic index, is a tracking system that measures a food's ability to raise blood glucose levels.

Foods receive a score on a 100-point scale; a food that scores high on the GI will raise blood glucose more than a low or medium ranged GI food will.

- **Low/Moderate GI** → 55 or less
- **High GI** → 70 or more

Dr. David Jenkins, a professor of nutrition, developed the glycemic index in 1981 after studying how different foods rich in carbohydrates affected blood sugar levels in diabetics.

At the time, the popular belief was that starchy foods had a dramatic effect, while sugary foods did not. He used his research to come up with the grading scale.

The Too Simplistic "Simple" Versus "Complex" Carbs Reference

Carbohydrates are classified as simple or complex, and this classification is largely based on the number of simple sugars in the molecule.

- Simple carbs are those made of one or two simple sugars, like sucrose in table sugar, galactose in milk or fructose in fruit
- While complex carbs, or starches such as bread, rice and corn, are those made of long chains of the simple sugar glucose, hence the name complex

Before the GI scale, advice on healthy dietary carb intake revolved around simple versus complex; with the latter being, the optimal one as it was believed that complex carbs had less of an impact on raising blood sugar levels.

It was discovered that the simple versus complex determination was much too simplistic since the blood glucose (glycemic) response to complex carbs is actually much more varied and complicated between different foods.

The GI scale was developed in order to more specifically rank carbs, and how each will affect blood glucose levels after intake as is relevant to the referent carb of pure glucose.

- Low GI carbohydrates slowly trickle glucose into your blood stream, while high GI foods flood your blood with glucose, causing erratic blood sugar spikes.
- A GI score of any food is based on how rapidly a food product converts into sugar inside the body and how quickly those sugars flood the blood stream calling upon insulin to be released to remove this glucose from the blood stream. For this reason, high GI foods are referred as insulin triggers.

The Apple Versus The Potato

A very telling example of the above is the example of the apple versus the potato.

A white potato without skin has a GI of 98, while one raw apple has a GI of 34

But...

The potato is considered a complex carb, while the apple is considered to be a simple carb

As you can see this discrepancy, makes the GI scale much more useful than simply referencing a food either as complex or simple when it comes to gaging its impact on blood glucose levels and the subsequent insulin response in the body.

- Any foods that are considered to cause significant insulin release will typically be high on the GI scale.
- Foods with a low GI will not cause sugar to rise rapidly in your blood as high GI foods do and the fiber content in these foods helps improve satiety to stay satisfied for longer time periods.

Blood sugar levels affect your energy, appetite, weight, and mood and when unhealthy can lead to insulin resistance, and the very dangerous metabolic syndrome, which is a set of conditions including, obesity, type 2 diabetes, heart disease, fatty liver, and others.

Foods that have lower scores tend to be higher in protein, fat, and fiber. According to WebMD when consuming a meal that contains a high GI food item, you can lower its impact by adding eating it with a fat or a protein.

This will also help prevent energy crashes, as you choose food items that will reduce blood sugar spikes and balance your energy throughout the day.

GI Scale Versus Glycemic Load

Glycemic load (GL) is a ranking system for carbohydrates (sugars and starches) that measures the amount of carbohydrates in a specific food. One unit of glycemic load estimates the effect of eating one gram of glucose.

Versus...

The **glycemic index (GI)**, actually determines how quickly those carbs will be digested and turned to glucose (sugar) in the blood stream.

The concept of glycemic load was developed in 1997 by Dr. Walter Willett and his associates at the Harvard School of Public Health.

Glycemic Load Formula

$$GL = GI \text{ divided } 100 \text{ multiplied by Net Carbs}$$

(Net carbs is total carbohydrate count of a food minus its dietary fiber)

A high GL food will raise blood sugar levels more so and faster than a low or medium GL food.

- **LOW GL:** Less than 10 → Little impact on blood sugars
- **MODERATE GL:** 10 to 20 → Moderate impact on blood sugar
- **HIGH GL:** Higher than 20 → High blood sugar spikes

The GI index does not consider the actual carb counts in any certain food, making glycemic load a better predictor of how a carb food affects blood sugar.

Various food items that are ranked high on the glycemic index have readily available carbs for quick absorption in the blood stream, but the same food with a high GI, can also have a low GL because a given serving of that food may not actually contain very many carbs.

This makes GL a far better indicator of how
much impact any carb will have on blood glucose levels

For example, carrots are a low GL food with a score of 6, and a high GI score of 71. While that GI score of 71 may at first seem that this is a food that will greatly impact blood sugar levels, when you see the very low GL score of 6 per serving, the story changes.

This means that unless you plan to eat 2 pounds of carrots in one sitting, they are not going to affect your blood sugars.

Benefits Of Low GI/GL For Health

The benefits of low glycemic eating are plentiful and include...

Stable Blood Sugar

Healthy blood sugar, a reduced risk for insulin resistance and type 2 diabetes are three of the main benefits of choosing low GL foods. Eating low GL foods will keep blood sugars stable, to avoid the constant release of insulin that functions to remove those sugars from the blood, which can lead to insulin resistance that leads to metabolic syndrome, which includes type 2 diabetes, obesity, increased belly fat and other dangerous medical conditions.

Stable blood sugars also stabilize mood, and improve emotional health. A poor diet can result in brain fog and as blood sugars drop and rise throughout the day, this leads to crashes and crankiness.

An additional benefit is that with balanced blood sugar, you enjoy steady energy to fuel your entire day.

Nutrition

Most anyone can benefit from eating a diet that is well balanced in protein, healthy fats, and lower GL and GI foods.

Foods with lower GL and GI scores will usually be rich in fiber and nutrients to provide energy, and promote health within the body and all its internal processes.

Weight Loss

When you decrease your intake of high GL foods, and especially refined starches and sugars your appetite is healthier, you eat less naturally, reduce out of control cravings, and lose weight.

Additionally, consuming low GL foods keeps you satiated longer because the sugar is released slowly, and these foods are digested slower than fast acting sugars.

Fast acting sugar carbs, those with a high GL cause erratic blood sugar spikes that plummet quickly, leading to cravings, erratic hunger, and the consumption of more calories than you might actually need.

Eating such a diet naturally results in weight loss and healthy weight management.

Your body will greatly benefit from the nutrients it really needs, with a rich intake of minerals, vitamins, and fibers and as a result, you crowd out the need for the empty calories that accompany refined foods high on the GL scale.

Reduced Risks For Cardiovascular Disease

Doctors and other researchers in the Harvard Nurses Health Study (the largest epidemiological study conducted in the US into the risk factors for major chronic diseases in women) found that baked potatoes and cold cereal have a very high glycemic load.

75,521 women aged 38 to 63 who had no previous diagnosis of diabetes, angina, myocardial infarction, stroke, or any other cardiovascular conditions were followed for ten years (Liu, S., Willett, W.C., Stampfer, M.J., et al).

During the 10 year follow up, the study documented 761 cases of coronary heart disease, 208 of which were fatal and 553 nonfatal, and dietary glycemic load was directly associated with risk of cardiovascular heart disease even when adjustments for smoking status, age, total caloric intake and other risk factors for heart disease were accounted for.

This study concluded that carbs classified as high by the GI scale, instead of the traditional classification of either “simple” or “complex” were better predictors of cardiovascular disease risks.

Reduced Risks For Metabolic Syndrome

Metabolic syndrome, which can increase your risk of having a heart attack or suffering a stroke, is a set of conditions believed to be caused by insulin resistance, as triggered through unhealthy intake of high glycemic load carbohydrates. Metabolic syndrome includes obesity, type 2 diabetes, heart disease, fatty liver and other medical conditions.

While the exact etiology is unclear, metabolic syndrome is actually triggered by a prolonged state of insulin resistance, elevated triglycerides, high blood pressure, and excess belly fat marked by a larger waist circumference.

Eating a low glycemic diet, helps reduce the risk of insulin resistance and lower risks for metabolic syndrome.

Reduced Risks For Cancer

Patrick J. Skerrett, of Harvard Health, discusses the risks of a diet high on the glycemic index. It has been linked to an increase in risk of pancreatic, colorectal, breast, and prostate cancers. In addition, eating high GI foods increases the risk of cardiovascular disease.

Reduced Risks For Gallbladder Disease

Results of two studies found that a diet high in both GI and GL significantly increased risks of developing gallstones in male subjects who took part of the Health Professionals Follow-up Study as well as female subjects that were part of the Nurses' Health Study. More studies are needed in this area, but the results are promising.

Using GI And GL For Low Carb Eating

The glycemic load rating can help you live a healthier lifestyle by choosing low carb foods that support a healthy weight.

Unless you are following a ketogenic diet, or another very strict low carb plan that typically limits carb intake to 20 grams per day and limits their sources to non-starchy vegetables, some dairy and nuts, using the GI and GL scales can help you choose better foods for your menus.

The ketogenic diet maybe a good choice for those with carb sensitivity, or those who need to lose weight, as significantly eliminating most all carbs triggers a metabolic process known as ketosis, which begins to burn stored body fat for energy instead of using glucose that comes from dietary carbs. This has proven successful for many in losing weight and keeping it off.

For those who simply wish to control their carb intake, choosing better carbs low on the GI and GL scales can really help.

GL Foods

Here are some of the various GL ratings for different foods, so you can get an idea of what the healthier choices are.

High GL Foods

- Corn Bread (100 grams)- 30.8 GL
- French Bread (1 slice) - 29.5 GL
- Corn Flakes (1 cup) - 21.1 GL
- Donut - 24.3 GL
- Bran or Blueberry muffin (1 medium) – 30 GL
- Grape Nuts (1 cup) - 31.5 GL
- Muselix (2/3 cup) - 23.8 GL
- Cranberry Juice Cocktail (1 cup) - 24.5 GL
- Cola (12 ounce) - 25.2 GL
- Corn, yellow (1 cup) - 61.5 GL
- Peaches, canned, heavy syrup (1 cup) - 28.4 GL
- Prunes (1 cup) - 34.2 GL
- Potato (1 med) - 36.4 GL
- Macaroni or white pasta (180 grams) - 33 GL
- White rice
- Parsnips (150 grams) - 33 GL
- Quinoa (150 grams) - 43 GL
- Corn chips, plain, salted (30 grams) - 24 GL
- Jelly beans (1 ounce) – 22 GL

Moderate GL Foods

- 100% Whole Grain bread (30 grams) - 10 GL
- Grape-Nuts® (30 grams) - 10 GL
- Vanilla wafers (25 grams) - 10 GL
- Pear, canned in pear juice (60 grams) - 10 GL
- Rice cakes (25 grams) - 11 GL
- Milk, skim (200 ml) - 11 GL
- Apple (120 grams) - 11 GL
- Grapefruit (120 ml) - 11 GL
- Hamburger bun (30 grams) - 12 GL
- Pita bread, white (50 grams) - 12 GL

- Gatorade, orange flavor (250 ml) - 12 GL
- Whole wheat kernels (150 grams) - 12 GL
- Microwave popcorn, plain (50 grams) - 12 GL
- Cranberry juice cocktail (250 ml) - 13GL
- Couscous (150 grams) - 13 GL
- Pearled barley (60 grams) - 14 GL
- Brown rice (150 grams) - 14 GL
- Graham crackers (25 grams - 14 GL
- Baked beans (150 grams) - 15 GL
- Banana (60 grams) - 18 GL
- Pretzels, oven-baked (60 grams) - 18 GL

Low GL Foods

- Tomato (medium) – 1.5
- Cashews (50 grams) - 1 GL
- Green peas (80 grams) - 2 GL
- Dates, dried (120 grams) - 3 GL
- Black beans (150 grams) - 3 GL
- Soy beans (50 grams) - 3 GL
- Papaya (1 cup) – 6.6 GL
- Milk, full-fat (250 mL) - 4 GL
- Soy Milk (1 cup) - 4 GL
- Peach, canned in light syrup (120 grams) - 4 GL
- Raisins (120 grams) - 4 GL
- Carrots (80 grams) - 4 GL
- Peas (1/2 cup) – 3.4 GL
- Orange, raw (1) - 5 GL
- Pear (120 grams) - 5 GL
- Kidney beans (150 grams) - 5 GL
- Whole wheat bread (30 grams) - 7 GL
- Black-eyed peas (150 grams) - 7 GL
- M & M's®, peanut (20 grams) - 7 GL
- Hummus (100 grams) - 7 GL
- Peach, fresh (120 grams) - 9 GL
- Chickpeas (150 grams) - 9 GL
- Navy beans (150 grams) - 9 GL
- Ice Cream (lower Fat) (1/2 cup) - 9.4 GL
- Ice Cream (full fat) (1/2 cup) - 6 GL
- Pudding (1/2 cup) - 8.4 GL

- Yogurt, plain (1 cup) - 6.1 GL

Zero GL Foods

- Broccoli
- Cabbage
- Celery
- Green Beans
- Cucumbers
- Mushrooms
- Spinach
- Leafy greens
- Other non-starchy vegetables
- All meat, fish, game, poultry and seafood
- Eggs

GI Foods

High GI Foods

A GI Over 70 Is Considered High On The Glycemic Index

- Cakes, doughnuts, and other sweets
- Pancakes and waffles
- Many breakfast cereals
- White Flour
- Instant Oats
- White Rice
- Potatoes
- White Bread

Low/Medium GI Foods

- Quinoa
- Popcorn
- Corn on the cob
- Sweet Potato
- Mango
- Pineapple
- Beets
- Rolled Oats
- Oat Bran
- Brown Rice
- Whole Milk Full Fat
- Soy Milk
- Kidney Beans
- Lentils
- Berries
- Barley
- Nuts

Zero GI Foods

- Meat, seafood, fish, game and poultry
- Eggs
- Most all non-starchy vegetables have very low GI scores, including green beans, broccoli, leafy greens, onions, cucumbers, mushrooms and others
- Avocados have about 1 gram of impact carbs, so they are very low GI



To Give An Example Of Snacks and Meals That Fall Under The Low And Medium Range On The GI Scale:

- A snack mix made up of cashews, almonds, pumpkin seeds, and sacha inchi seeds.
- Hummus with cherry tomatoes, cucumber slices and carrot sticks to dip.
- Barley salad mixed with shredded kale, diced apple, flax, pumpkin, hemp, and walnut.
- Rolled oats, served hot or cold, with mango or peaches and chia seeds sprinkled over the top.

16 Tips For A Low GI/GL Diet

1. Avoid corn. Eat whole grains in strict moderation, good choices include brown rice, wild rice, and steel cut oats.
2. Avoid white food, including rice, bread, pasta, sugar, and potatoes.
3. Eat 4 to 6 ounces of protein with every meal, healthy choices are plentiful and include red meat, fatty fish, seafood, eggs, chicken, turkey, and game. Protein helps improve insulin health, and builds and feeds lean muscle mass, which promotes fat burning within the body.
4. Eat a healthy fat with every meal, including olive oil or avocados. Avoid partially hydrogenated fats or trans fats that greatly contribute to heart disease, these are often found in many processed foods.
5. Eat 5 to 6 smaller meals throughout the day instead of 3 big ones. Eating a protein, healthy carb and a healthy fat every 3 hours is an easy way to keep the metabolism going and to avoid feeling famished, which almost always leads to overeating.
6. Beans are a fat free protein source, and in general have a lower GL than grains.
7. Choose healthy snacks, like unflavored seeds and nuts that have little carbs and are good sources of healthy fats.
8. Avoid junk and processed foods that come in a box, bag, or container, typically these foods are always high GL and GI and lead to weight gain.
9. Skip any foods with high fructose corn syrup, which is really bad news for insulin health and overall health.
10. Eat a lot of non-starchy vegetables, like tomatoes, onions, leafy greens, lettuce, mushrooms, cucumbers, and peppers. They have virtually no carbs and are loaded with essential vitamins, minerals, antioxidants, and fiber.
11. Limit high sugar fruits, like mangos, bananas, and papayas that carry a high GI. Instead, eat berries, which are low in sugar and high in antioxidants.
12. Limit or avoid juices and opt for whole fruits instead, which are much lower in sugar and have a much lower glycemic load. Fruit juice, even the pure varieties do cause erratic and intense blood sugar spikes.

13. Avoid all soda pop drinks, they are loaded with sugar, have zero nutritional value and are empty calories that can only turn to fat.
14. Avoid sweets, such as pies, cookies, cake, muffins, sweet breads, and ice cream as much as possible; enjoy them only in strict moderation.
15. Be mindful when eating, enjoy every bite, chew slowly, and sit at a table to eat instead of the television so you can really register all that you have eaten. Make sure to give yourself at least 15 minutes after eating a small meal for the brain to register satiety, you'll be surprised at how little food you really need to feel satisfied. Never eat to where you feel stuffed or your stomach is going to explode, this always means you ate too much and a lot of that food will be stored as fat.
16. Drink plenty of water throughout the day to avoid dehydration.

Summary

The GI diet may have originally been created for diabetes patients to manage their blood sugar levels and insulin intake, however, its use extends far beyond that today.

There are serious type 2 diabetes and obesity epidemics in this country, and many experts attribute these problems to a high intake of dietary carbs on a societal level.

- Basing your diet around the glycemic index and glycemic load offers a tight control, which can slow the development of conditions, and complications that are associated with diabetes and help you lose weight.
- Studies on low GI diets and cholesterol have been consistent - a low GI diet lowers cholesterol and low density lipoproteins, specifically when combined with an increase in fiber intake.
- The effect of a low GI diet has had positive effects on controlling appetite. The assumption is that because high GI and GL foods rapidly increase glucose levels, the subsequent insulin response returns the feeling of hunger much quicker than seen with low GI and low GL foods. Therefore, the long-term effect will be that you are better able to manage your weight by eating less throughout the day and generally feeling more satisfied.

Choosing foods that are low on the GL scale will help you make decisions for a well-balanced diet and to better determine how various foods affects your blood sugars. You don't need to be diabetic to be mindful of foods high on the GI and GL scales.

Combined with regular exercise, a low-carb, healthy glycemic diet can help you better manage your weight, improve your overall health, and prevent risks for serious chronic disease, such as type 2 diabetes and the serious consequences of metabolic syndrome.

Stay well and take care!