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Successful Weight Loss Using the Glycemic Index and Glycemic Load

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Everyone who has dieted has had the experience of losing weight, and then gaining it right back. Some experts believe that weight loss itself produces two effects that cause us to put the pounds right back on:

- First, the calorie restriction increases our hunger and sooner or later we begin to consume more calories.
- Second, the weight loss causes our metabolism to slow so fewer calories are burned.

Researchers reported in the *Journal of the American Medical Association (JAMA)* that patients who lost weight with a *low-glycemic* diet kept the weight off longer than patients who lost the same amount of weight with a standard low-fat diet.

Glycemic Index (GI)

The glycemic index is a measure of the ability of a food to raise blood sugar levels after it is eaten. The index compares the blood sugar response to a particular food with the body's reaction to pure glucose (sugar), which is given the value of 100. For example, if a food raises blood sugar only half as much as pure glucose, that food is given a glycemic index of 50. The portion size used to test the glycemic index of various foods is the amount that contains 50 grams of carbohydrate. Some research has used white bread instead of glucose as the standard of comparison for determining the glycemic index of foods.

Glycemic Load (GL)

Glycemic load is a related measurement calculated by multiplying the glycemic index of a food by the amount of carbohydrate contained in a typical serving of that food. Glycemic load may be more reliable than glycemic index as a predictor of how a food will affect the blood sugar level. That is because some foods with a high glycemic index (such as carrots) contain such a small amount of carbohydrate in a normal serving that they would not be expected to raise the blood sugar level very much. Carrot juice, on the other hand, which contains a relatively large amount of carbohydrate, would produce a substantial increase in the blood sugar level because the glycemic index of carrot juice is much higher than that of raw carrots.

Weight Loss and the Glycemic Index

The high-glycemic carbs include sugar, potatoes, pasta, white rice, and white bread. The *JAMA* investigators took 39 young, overweight patients and randomized them to either a low-glycemic diet or a low-fat diet. Patients in both groups dieted until they lost at least 10% of their body weight. Patients in the low-glycemic group reported less hunger than their low-fat counterparts, and further, the slowing down in their metabolism was less than that seen in the low-fat group. Consequently, they were able to keep the weight off more efficiently than patients in the low-fat group. Furthermore, the low-glycemic weight loss produced a greater reduction in triglyceride levels, insulin resistance (see articles at www.jameslhollymd.com/yourlifeyourhealth which explain insulin resistance), and blood pressure than in the low-fat group.

It is likely that the key to the beneficial effects seen with the low-glycemic diet were due to avoidance of the spikes in blood glucose - and thus in blood insulin levels - seen in diets that allow high-glycemic carbohydrates (such as low-fat diets). Spiking-then-falling insulin levels are known to produce great hunger. Further, insulin keeps people from metabolizing fat they've already stored, and when they're hungry they have trouble burning that stored energy - and consequently they consume more energy. The low-glycemic diet avoids this pattern of eating-hunger-eating-hunger. Losing weight is still a matter of reducing the calories you eat and increasing the calories you burn up. But it turns out that what kind of calories you do eat when losing weight makes a lot of difference.

In the April, 2006 *Archives of Internal Medicine*, a randomized control study examined four types of diets and their effect on both weight loss and cardiovascular risk factors. The glycemic load was highest in diet 1 and lowest in diet 4. Changes in weight, body composition, and blood chemistry profile were studied. While all groups lost a similar of weight, the proportion of subjects in each group who lost 5% or more of body weight varied significantly by diet:

- Diet 1 (high carb and high glycemic), 31% lost 5% or more
- Diet 2, (high carb and low glycemic), 56% lost 5% or more
- Diet 3 (high protein and high glycemic), 66% lost 5% or more
- Diet 4 (high protein and low glycemic), 33% lost 5% or more

Women on diets 2 and 3 lost approximately 80% more fat mass than those on diet 1. LDL (bad cholesterol) levels declined significantly in the diet 2 group but increased in the diet 3 group. Both high-protein and low-GI regimens increase body fat loss, but cardiovascular risk reduction is optimized by a high-carbohydrate, low-GI diet.

Glycemic Index Affected By

The glycemic index of a food is governed by several factors, such as:

- Physical form, such as a whole apple vs. applesauce. Mashing foods tends to give them a higher glycemic index/load.
- Ripeness. The riper the fruit, the higher its glycemic index.
- Fiber -- particularly viscous fiber, a type of soluble fiber found in oats, barley, and other foods. Generally, the higher the fiber, the lower the glycemic index/load.
- Acidity. The higher a food's acidity, the lower its glycemic index/load.
- Processing. The more processed or refined a food, generally, the higher its glycemic index/load will be. When a grain is in a more "whole" form, your body's digestive enzymes have a tougher time breaking it down, which lowers the glycemic response to it. (There are some notable exceptions: pasta, and parboiled and basmati rice tend to have lower glycemic indexes, especially if they're not overcooked.)
- Whether protein and fat were eaten with the food. The presence of high amounts of protein and fat will decrease the glycemic index/load.

How to Interpret the Glycemic Index (GI)

- 70 or higher = High glycemic index food
- 56-69 = Medium glycemic index food
- 0-55 = Low glycemic food

Mashed potatoes (GI = 92) increase your blood sugar almost as much as pure glucose does (GI = 100). As a result, mashed potatoes are classified as a "high glycemic" food. In contrast, lentils have an index value of only 28, so lentils are a "low glycemic" food. In general, low-glycemic foods are better at controlling your blood sugar than high-glycemic foods. Thus, lentils are obviously much better for controlling your blood sugar than mashed potatoes.

Refined or processed foods generally have a higher-glycemic index. For example, the glycemic index for rice cakes is 78 vs. 55 for brown rice. Corn flakes are high at 81 vs. whole sweet corn at 54. **In general, the less refined or processed the food is, the lower its glycemic index will be. So consuming foods in their natural form is very much to your advantage.**

You can make intelligent food substitutions that will lower the glycemic index of a snack or a meal. For example, some people consider a bran muffin or PowerBar as a healthy snack. However, an apple (GI = 38) is a much better choice than a bran muffin (GI = 60) or PowerBar (GI = 56). Or, if you're having a carbohydrate food as part of a main meal, sweet potatoes (GI = 61) are a better choice than mashed potatoes (GI = 92).

Glycemic Load (GL)

The glycemic load is an index number you get when you multiply the glycemic index and "available" carbohydrate in a serving of food, and then divide by 100. Why should you care about the glycemic load? Let's look at each component of the glycemic load:

glycemic index and available carbohydrate. Remember that the glycemic-index value for a food only tells you how quickly the available carbohydrate is converted into blood sugar. You can think of the glycemic index as indicating the glycemic "quality" of the food. The glycemic load indicates the "quantity" of the food.

Take carrots, for example. The glycemic index for carrots is 47, which indicates that it is high "quality" carbohydrate because it will help slow the increase in blood sugar from eating the carrot. Also, remember, the more you cook the carrot, the higher the glycemic index becomes. The available carbohydrate in 80 grams of carrots is 6 grams. This is because of the high fiber content of the carrot which cannot be absorbed. Thus the fibrous carbohydrate does not "count" toward the glycemic load.

So let's calculate the glycemic load of eating a medium carrot: Glycemic load of 1 medium carrot = $47 \text{ glycemic index} \times 6 \text{ gms of carbohydrate} / 100$. Therefore, the glycemic load of 1 medium carrot = 2.82 (which is then rounded off to 3). But what would happen if you had ten servings of carrots, instead of just one? Your glycemic index would remain the same at 47. However, the glycemic load would increase from 6 to 60.

The reasons the glycemic load increased is that you are eating more servings. Of course, that's no problem with carrots. It's unlikely you would want to eat ten carrots at one sitting! After eating five or six, you would probably lose your appetite altogether. By the way, that's a big advantage of low glycemic index foods: they fill you up before you can eat too many "available" carbohydrates.

On the other hand, it's a different story with french fries. Their Glycemic index is 75 and indicates that they are a low "quality" carbohydrate because the higher the GI, the worse the carbohydrate is for blood sugar control. The glycemic load of a serving of french fries is 22 which indicates high "quantity" of carbohydrates that could raise your blood sugar. So with french Fries, you have the worst of both worlds. The quality is poor, and the quantity is high. Worst of all, french fries taste good! It's tempting to have a few extra fries, instead of a serving of carrots.

Don't forget – the rise in your blood sugar depends on both the **quality** (glycemic index) and the **quantity** (glycemic load) of carbohydrate in your meal.

Other Tips for Lowering Your Glycemic Index

1. Don't overcook carbohydrates. Extensive cooking causes the starch fibers to break down, thus making them easier and faster to digest. This is especially true for starchy foods like grains.
2. Use whole grains. By "whole", we mean the hull or skin is still attached. This fibrous coat slows down the assimilation of the carbohydrates inside. An obvious example is brown vs. white rice. Brown rice is still encased in its hull.
3. Minimize products that contain finely milled carbohydrates, especially flours. Small particle sizes are more quickly digested and absorbed. When you look at any glycemic index table, you'll notice that bread made with white flour has a

value of 73 while bread made with whole wheat flour has glycemic index of 71, nearly the same. You would think that whole wheat bread would have a much lower glycemic value because it has a lot more fiber. However, the fine milling nullifies the anti-glycemic effect of this fiber.

4. The type of fiber in the carbohydrate is important. There are two types of fiber: soluble and insoluble. Insoluble fiber does not absorb water, whereas soluble fiber does. As soluble fiber absorbs water, it becomes viscous and slows down the digestion of starches, which reduces your glycemic response. Apples, lentils, beans, and rolled oats have soluble fiber. Psyllium seed powder is a popular soluble fiber supplement.

What Should Your glycemic load be for a meal?

The average person should keep their glycemic load for a meal to about 35. A coke has a glycemic load of 35. This is why a hamburger, fries and a coke are a “bad meal” for anyone. The glycemic load – counting the bread, fries, coke, etc. – can be as high as 60 for the meal. It is possible to change that while still enjoying a hamburger meal. Substitute a diet beverage or water for the coke. Change the bread to whole grain.

To control your weight you must eat less and exercise more, but you don’t have to stop enjoying your favorite foods. You just have to “trick” your body by eating foods which do not raise your blood sugar rapidly and which therefore do not cause you to get hungry faster.