



NUTRITION LIBRARY GLYCEMIC INDEX

POTATOES AND THE GLYCEMIC INDEX

The health-promoting benefits of vegetables are well-documented in scientific literature and potatoes have long held the prominent position of **America's favorite vegetable** for their **versatility, taste** and **nutritional value**. So why have so many diet books, popular magazines and self-proclaimed “nutritionists” told the American public to stop eating potatoes? They have been lured into believing that a controversial physiological measure known as the glycemic index (GI) is the silver bullet to managing weight and preventing disease. Originally developed as a **tool for the dietary management of diabetes**,¹ the GI has been promoted to the general public as a dietary tool for weight loss and disease prevention, despite a lack of scientific support for such uses.

GLYCEMIC INDEX DEFINED

Almost all carbohydrates, regardless of the form in which they are consumed (e.g., starch, lactose, sucrose) are digested to glucose which then enters the bloodstream, causing a temporary rise in blood glucose levels. This rise in blood glucose levels is referred to as the “glycemic response.” The glycemic index (GI) is a mathematical calculation that takes into account an individual’s glycemic response to a test food (e.g., potatoes) relative to the glycemic response to reference food (typically either white bread or glucose). More specifically, the GI is defined as, “incremental area under the glucose response curve of 50 grams of available carbohydrate from a test food relative to 50 grams of available carbohydrate from a reference food.”¹ The food is then ranked, high-, medium- or low- depending on the numerical value derived and where it fits on the GI scale. Sound complicated? It is!!

THE HYPE ABOUT CARBOHYDRATE TYPE

Proponents of diets based on GI try to “sell” their plans by oversimplifying glycemic index. They suggest that all “starchy foods” have a high GI.

The fact is the glycemic indices of carbohydrate-rich foods — even those high in starch — don’t fall neatly into low, medium or high GI categories. For instance, tables of GI show that the GI of starchy carbohydrate foods (e.g., potatoes, rice, pasta) vary widely.^{2,3} Moreover, it has been hypothesized that carbohydrates that have a high GI cause obesity and a number of

chronic diseases including diabetes, heart disease, and even colon cancer.⁴ In fact, despite the media hype, scientific evidence largely supports consuming a moderate-to-high carbohydrate diet to prevent obesity and decrease the risk of chronic disease.⁵

A GLYCEMIC GRAY AREA

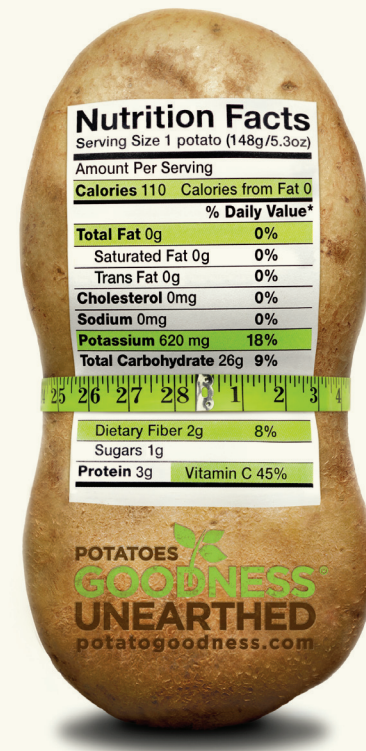
A number of factors have been shown to affect the GI of a food, rendering the usefulness and practicality of the GI in diet planning questionable at best.⁵

RIPENESS: As a fruit ripens the GI tends to decrease, thus the GI of a green banana would be higher than that for a ripe banana.⁶

PROCESSING: Grinding, rolling, pressing, mashing or even thoroughly chewing can increase the GI of a carbohydrate-rich food.⁵

PREPARATION METHODS: The GI of a starchy food can be significantly reduced by cooking and then cooling (creating what is known as resistant starch). This is the reason that cooled potatoes have a significantly lower GI compared to potatoes consumed immediately after cooking.^{5,7}

VARIETY OR ORIGIN: The GI of potatoes can vary greatly depending upon the variety as well as their origin (where they were grown). Russet potatoes have been historically classified as high on the GI; however, this classification may not be valid because GI values were estimated either from studies using potato varieties from outside the United States or incorrect methods for measuring GI.



The first study to examine the GI of US Russet Potatoes using valid methodology was published in April 2005 and showed that the GI of the US Russet Potato was considerably less than has been frequently reported in the literature. This makes it impractical to assign a blanket GI value to potatoes.^{2, 3, 5}

TIMING: The GI of foods is determined under experimental conditions after an overnight fast, and likely does not apply to foods consumed later during the day because glycemic response is strongly influenced by the composition of the previous meal, particularly when meals are consumed within an interval of a few hours.⁸

INDIVIDUAL VARIATION: Research not only shows that individuals can vary in their glycemic responses to the same food, but the glycemic index of a given food can vary significantly in the same person when measured at different times of the day or over several days.^{9, 10}

INCLUSION OF OTHER FOODS OR CONDIMENTS: The addition of protein and/or fat or increasing the acidity of a carbohydrate-rich food may also lower the GI. In the case of potatoes, adding common toppings such as cheese, butter, salsa, or vinegar (which increases the acidity) will lower the GI. Similarly, eating a baked potato with a chicken breast, lean meat, or fish will result in a lower overall GI.⁵

Finally, it should be emphasized that the GI is valid only for 50 grams of a single, carbohydrate-rich food. In reality, carbohydrate-rich foods are rarely eaten by themselves or in isolation of other foods, and research

has shown that the presence of other macronutrients (e.g., fat and protein) can significantly alter the GI of a given carbohydrate-rich food.

BOTTOM LINE

Because of the complexity of the GI as well as its inherent limitations, most nutrition scientists concur that the amount of carbohydrate as well as its nutrient density are more important than the glycemic index. Indeed, after a comprehensive review of the literature, the 2010 Dietary Guidelines Advisory Committee concluded that the GI was not a useful tool for managing body weight or preventing disease.¹¹

When it comes to weight control and disease prevention, nutrient dense carbohydrates including whole grains, fruits, vegetables (including potatoes), and low-fat or nonfat dairy products should form the basis of a healthful diet.¹¹

1 Jenkins DJA, et al. Glycemic index of foods: A physiological basis for carbohydrate exchange. *Am J Clin Nutr.* 1981;34:362-366

2 Foster-Powell K, et al. International table glycemic index and glycemic load: 2002. *Am J Clin Nutr.* 2002;76:5-56.

3 Atkinson FS et al. International tables of glycemic index and glycemic load values. 2008. *Diabetes Care.* 2008;31:2281-2281

4 Jenkins DJA, et al. Glycemic index: An overview of implications in health and disease. *Am J Clin Nutr.* 2002;76(suppl):2665-2735.

5 Pi-Sunyer, FX. Glycemic index and disease. *Am J Clin Nutr.* 2002;76(suppl):2905-2985.

6 Englyst HN, Cummings JH. Digestion of the carbohydrates of the banana in the human small intestine. *Am J Clin Nutr.* 1986;44:42-50.

7 Fernandes G, et al. Glycemic index of potatoes commonly consumed in North America. 2005;105:557-562.

8 Wolever TMS and Bolognesi C. Time of day influences relative glycemic effects of foods. *Nutr Res.* 1996;16:381-384.

9 Vega-Lopez S, et al. Inter-individual variability and intra-individual reproducibility of GI values for commercial white bread. *Diabetes Care.* 2007;30:1412-1417

10 Williams SM. Another approach to estimating the reliability of glycemic index. *Br J Nutr.* 2008;100:364-371.

11 Dietary Guidelines for Americans. 2010. <http://www.cnpp.usda.gov/dietaryguidelines.htm> accessed 9-10-2011

MEXICAN CHICKEN POTATO SOUP

INGREDIENTS

- 4 Anaheim chile peppers*
- 2 teaspoons olive oil
- 1/2 cup sliced green onions
- 1 teaspoon bottled garlic
- 3/4 teaspoon ground cumin
- 3/4 teaspoon cumin seed
- 4 cups reduced sodium chicken broth
- 1 cup fresh or frozen corn
- 2 cups cubed red potatoes
- 1 1/2 cups cooked chicken (leftover or from a rotisserie chicken)
- 1/4 teaspoon salt

DIRECTIONS

1. Preheat oven to 450 degrees.
2. Place peppers on a foil-lined baking sheet. Roast for 20 minutes or until blackened, turning occasionally. Wrap peppers up in foil to steam. Let stand 15 minutes. Remove skin and seeds from peppers and chop.
3. Heat oil in Dutch oven over medium heat. Add onions, garlic, ground cumin and cumin seed. Saute 5 minutes. Add chicken broth, reserved peppers, corn, potatoes and chicken. Bring to a boil. Cover, reduce heat and simmer 20 minutes. Serve with baked corn tortillas strips, cheese, avocado, and cilantro, if desired. Makes 4 (2 cup) servings.

*May substitute 1 (4-oz.) can diced green chiles.

OPTIONAL TOPPINGS: Baked corn tortilla strips, diced avocado, shredded Monterey Jack cheese, chopped cilantro



NUTRITIONAL ANALYSIS PER SERVING: 240 calories, 23 g protein, 26 g carbohydrate, 6 g total fat, 49 mg cholesterol, 781 mg sodium, 3 g fiber, 32 mg vitamin C, 737 mg potassium.

For more healthy potato recipes and nutrition, please visit potatogoodness.com

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