



Factsheet

Resistant Starch – Rediscover An Old Ingredient With Modern Health Benefits

Resistant starch has been consumed for thousands of years and has recently been rediscovered as an important ingredient for maintaining health & wellness. However, as foods have become more processed and convenient, the amount of resistant starch in our diets has decreased. Individuals in developed countries such as the U.S., where processed foods are prevalent, are at a disadvantage as most people consume only 3 to 5 grams of resistant starch per day. Individuals in less developed countries who eat fewer processed foods consume 15 to 20 grams per day¹, the amount health experts recommend eating to obtain full physiological benefits. Health care professionals can help meet these consumption targets by encouraging consumers to eat a healthy mix of whole foods and natural resistant starch-enhanced processed foods.

Resistant Starch Defined

Most starches are digested and absorbed into the body through the small intestine, but some resist digestion and pass through to the large intestine where, through fermentation, they act like dietary fiber. This type of starch is called "resistant starch." The formal definition of resistant starch is the total amount of starch, and the products of starch degradation that resists digestion in the small intestine of healthy people.²

Discovering Resistant Starch

Resistant starch is naturally found in common foods such as legumes (beans and peas), grains, and even bananas. When cooked and served cold as in salads, certain starchy foods (*i.e.* potatoes, pasta and rice) contain resistant starch. Natural resistant starch is also an ingredient with the brand name Hi-maize[®] resistant starch found in a growing group of commercial products such as bread, cereal and snacks. [For information on how to find foods with natural resistant starch, please visit www.resistantstarch.com for a copy of “**Add Natural Resistant Starch To A Healthy Eating Plan.**”]

Benefits

Research from more than 200 peer-reviewed studies, conducted over the last 15 years, demonstrates that consuming Hi-maize natural resistant starch as part of a healthy eating plan provides **five key benefits**:

- 1. Natural resistant starch helps individuals increase their dietary fiber intake.** Hi-maize tests and labels as insoluble dietary fiber (measured by approved AOAC methods), and removes the barriers that have previously hindered people from eating more fiber:
 - Hi-maize is a fine, white starch with a small particle size from a natural variety of non-GMO corn. Foods containing Hi-maize retain their taste or texture and do not require people to change their dietary preferences. Hi-maize has been formulated into bread, crackers, cookies and other baked goods as well as cereal, pasta and snacks.
 - High levels can be consumed (even those exceeding the recommended intake of dietary fiber) with modest or no digestive side effects.^{3,4,5}
 - It is available for home-use and can be added to foods like smoothies for an easy fiber boost.

- 2. Natural resistant starch helps with weight control.** With two-thirds of American adults overweight or obese⁶, weight loss and maintenance is a concern. Hi-maize can help in several ways:
- Hi-maize contains fewer calories ^{7,8} (2-3 calories) than flour (4 calories). When Hi-maize replaces flour on a one-to-one substitution, the calories in the product will be lower.
 - Like other types of dietary fibers, the consumption of products with Hi-maize can help individuals feel fuller⁹ and decrease their appetite.¹⁰
 - Ongoing investigation shows natural resistant starch may impact body composition by increasing fat oxidation and reducing fat storage after a meal. In a recent clinical study¹¹, it changed the sequence in which the body burns food – with fat being placed at the top of the list relative to carbohydrates and protein. Animal studies have also shown that it decreases fat synthesis,¹² reduces fat cell size with chronic consumption,¹³ and reduces abdominal obesity.¹⁴
- 3. Natural resistant starch helps with glycemic management.** Reducing the glycemic of foods helps to smooth out the energy fluctuations experienced by individuals but also can have broad health implications, even in non-diabetic individuals. A variety of studies shows how Hi-maize offers numerous glycemic-related benefits:
- Hi-maize reduces the glycemic and insulin response of foods when it replaces flour or other rapidly digestible carbohydrates.^{15,16} A study from the USDA recently confirmed that consumption of a moderate amount of resistant starch can improve (lower) the glucose and insulin responses of both normal and overweight women.¹⁷
 - Hi-maize consumption has been shown to increase insulin sensitivity in healthy people.^{18,19}
 - Hi-maize has a sustained energy release: part of its energy is released in the small intestine as glucose and part of its energy is released in the large intestine as fermentation short-chain fatty acids (SCFAs). While glucose is the exclusive energy source for the brain, SCFAs are an energy source for muscle and fat tissues.²⁰
- 4. Natural resistant starch promotes digestive health.**
- It selectively increases beneficial bacteria, while suppressing harmful bacteria – what’s called a ‘prebiotic’ fiber.²¹
 - Its fermentation increases SCFA production (butyrate is particularly important for colon health), which reduces intestinal pH and reduces the production of potentially harmful ammonia and phenols.
 - It promotes regularity with a mild laxative effect.
 - It reduces DNA damage that could potentially lead to colorectal cancer.^{22,23}
 - It assists in restoring normal intestinal function in individuals with diarrhea.^{24,25}
- 5. Corn-based resistant starch replaces wheat in gluten-free food.** Hi-maize is made from corn and can replace wheat in foods that are required to be gluten-free. This is especially important for those individuals suffering from Celiac disease.
- The fermentation of natural resistant starch produces more of the SCFA butyrate than other sources of fiber.²⁶ Butyrate has been shown to have anti-inflammatory properties and appears to be important in maintaining healthy colonic mucosal structure and function.²⁷

To help people increase their intake of resistant starch, encourage them eat foods with naturally occurring resistant starch and to purchase and consume products with natural Hi-maize resistant starch. **For more information, visit www.resistantstarch.com. For a Hi-maize sample, recipes and a research monograph, please call 1-800-797-4992.**

[®] Hi-maize resistant starch is a registered trademark of National Starch Food Innovation.



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