



Grains of truth about **RESISTANT STARCH**

Definition and History

Resistant starches have been around a long time; however it is only recently that we have begun to understand them. For many years scientists thought that all starches were fully digested. Today more sophisticated research techniques have discovered that some starches move undigested into the large intestine where they ferment, taking on the role of dietary fiber.

Carbohydrates can be divided into two groups: those that are digested in the small intestine and those that are not. Resistant starch is starch that is not digested, or “resists” digestion in the small intestine.

Sugars and most starches fall into the first group. They are rapidly absorbed and used for short-term energy. These are referred to as available or digestible carbohydrates.

The second group consists of resistant starch and dietary fiber. They pass through the small intestine undigested and, if not digested, can't provide energy. They are sometimes called non-glycemic carbohydrates.

Types

Researchers once thought there were just two types of fiber – soluble and insoluble. We are slowly learning about resistant starch here in the United States, although foods with high resistant starch content have been widely used in Australia for a number of years.

- **Soluble fiber** may help to lower cholesterol and blood sugar levels. It is found in many fresh and dried fruits, vegetables, oats, legumes, and seeds. Soluble fiber promotes intestinal health by being fermented by bacteria in the large intestine. It is also known as prebiotic fiber.
- **Insoluble fiber** provides bulking and helps keep us “regular.” Good sources of insoluble fiber are whole grain breads and cereals, fruit, vegetables, seeds, unprocessed bran and wheat germ.

- **Resistant starches** are those that escape digestion in the small intestine. These starches are “invisible,” meaning it doesn't alter the appearance, taste or texture of foods. It is found in a variety of foods we eat everyday like legumes, cooked and chilled pasta and rice, and potato salad. The term “resistant starch” by itself won't appear on any food label, but can be labeled as starch, cornstarch, modified corn starch or maltodextrin.

Health Benefits

There are many health benefits of resistant starch. As already mentioned, it provides fiber, prebiotic benefits to the gut, and overall colon health.

Public health figures in the U.S. have not yet set recommended consumption levels for resistant starch. In Australia however, where resistant starch has been widely consumed and extensively studied, their Division of Human Nutrition advises intakes of 20g per day of resistant starch for bowel related benefits. Currently most developed countries consume between 3-7g per day.

Because we need to get anywhere from 25-38g of fiber each day, resistant starch allows reaching or even exceeding the daily limit without any digestive side effects.



Food Sources

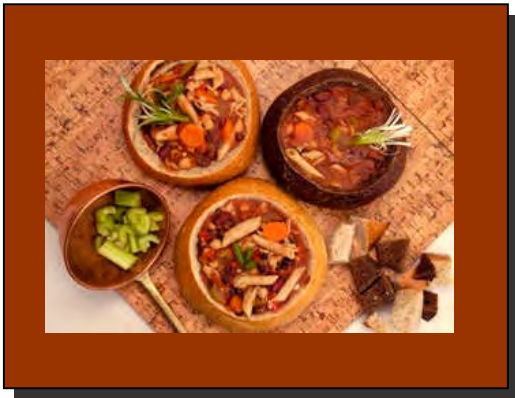
There are many sources of resistant starch. Beans are the best source and there are many types and preparation methods to create resistant starch.

Whole, unprocessed grains are another good source of resistant starch, followed by various grain flours. Consumers can also look for grain-based foods like macaroni and spaghetti which contain resistant starch.

Mixed Bean Soup with Pasta

Ingredients:

3 quarts vegetable stock
 1 28-ounce can crushed tomatoes in puree
 1 15-ounce can black beans, drained
 1 15-ounce can garbanzo beans, drained
 1 15-ounce can kidney beans, drained
 2 medium carrots, trimmed, scrubbed and cut into 1/2-inch dice
 2 medium stalks celery, washed and cut into 1/2-inch dice
 3/4 cup onion, peeled and chopped
 1 small green bell pepper, cored and cut into 1/2-inch dice
 1 small red bell pepper, cored and cut into 1/2-inch dice
 8 cloves garlic, chopped
 1 teaspoon ground oregano
 1 teaspoon thyme
 1 teaspoon rosemary
 1 teaspoon basil
 1 cup dry pasta, penne or rotini
 3 tablespoons balsamic vinegar
 pepper to taste



Description: Great served in warm homemade bread bowls. See our recipe for **Whole Wheat Bread Bowls**.

Directions: In large soup pot combine everything except pasta, vinegar, and black pepper; bring to a boil over high heat; reduce heat to low and simmer, partially covered until carrots are tender crisp, stirring occasionally.

Add pasta and cook until tender, about 10 minutes.

Stir in vinegar and season with pepper. Serve in warm bread bowls.

Servings: Provides 12 servings

Calories per Serving: 164 calories per serving

Nutrition: One serving provides approximately: 164 calories, 8 g protein, 32 g carbohydrates, 9 g fiber, 2 g fat (0 g saturated), 0 mg cholesterol, 41 mcg folate, 3 mg iron and 613 sodium.

Source: Wheat Foods Council

Examples of Naturally-Occurring Resistant Starch

Food	Serving Size	Amount of Resistant Starch (grams)
Navy beans	½ cup cooked	9.8
Banana, raw	1 medium, peeled	4.7
Cold potato	1, 2" diameter	3.2
Lentils	½ cup cooked	2.5
Cold pasta	1 cup	1.9
Pearl barley	½ cup cooked	1.6
Oatmeal	1 cup cooked	0.7
Wholegrain bread	2 slices	0.5

SOURCE: Starch Food Innovation database of resistant starch.



Wheat Foods
 C O U N C I L

10841 S. Crossroads Drive, Suite 105
 Parker, Colorado 80134
 303/840-8787
 303/840-6877 fax
 Mail: wfc@wheatfoods.org
 URL: www.wheatfoods.org