



# **Fiber**

## **Wellness Educational Unit**

*It's Your Life* Health Management Program  
&  
Prevention and Community Health  
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# Fiber

Many of us have seen the commercials on TV of certain companies that claim they can lower our cholesterol by eating their high fiber cereals. Do you ever wonder how that actually works? How is it that I eat this plant-derived material (yes, plants) and somehow my cholesterol points go down? Does it matter how it works? We think it matters. The more knowledge you can acquire about fiber or nutrition in general, the more informed decisions you can make regarding what you eat. Informed decisions lead to improved health and possibly the prevention of disease.

## Types of Fiber

To begin, fiber is a substance found only in plants and exists in two forms - soluble (dissolves) and insoluble (doesn't dissolve). Soluble fiber is absorbed within the body and insoluble fiber passes through the digestive tract intact and is not digested when eaten (more commonly called roughage). The both have huge benefits to our health.

## Benefits of Fiber

The benefits of fiber are numerous. Listed below are examples of some of the benefits of having a high fiber diet:

### Lower Blood Cholesterol

Soluble fiber has been scientifically proven to reduce blood cholesterol levels. Lowering cholesterol will aid in the reduction of heart disease risk. There are four explanations as to how soluble fiber works to lower cholesterol.

First of all, cholesterol is used to make bile acids in the body (bile acid is critical for digestion and absorption of fats). The liver removes the cholesterol from the blood to make more bile acid. Soluble fiber comes into play when it forms a gel that binds with bile acids in the intestines and is then excreted in the feces; thus, the more bile acids removed from the body, the more cholesterol removed from the blood. The process repeats itself in turn, lowering your cholesterol points.

Second, the helpful bacteria in the intestines ferment the fiber. This digestive process is said to give off short-chain fatty acids and that may help to inhibit the making of cholesterol in the body.

Third, soluble fiber may slow the emptying of the digestive system and reduce insulin concentrations after eating. This process also further inhibits the creation of cholesterol.

Finally, oat soluble fiber has been thought to reduce the amount of absorption of cholesterol in the intestines.

### Improve Blood Sugar Levels

Soluble fiber can slow down the absorption of sugar, which can help stabilize blood sugar levels.

## **GI Disorders**

### **Constipation/Loose Stools**

To help with constipation, fiber increases the weight of stools and softens it, making it easier to pass.

To help with loose, watery stools, fiber absorbs water and adds bulk to stool, solidifying the stool.

### **Irritable Bowel Syndrome**

In the same way fiber affects constipation, IBS symptoms are lessened by the bulkier and softer stools, which are easier to pass.

### **Hemorrhoids**

One of the main causes of hemorrhoids results from increased pressure from straining to move a stool. Fiber increases the bulk and softens the stool, which makes emptying the bowel easier. This reduces pressure on hemorrhoids caused by straining and can help prevent hemorrhoids from protruding.

### **Diverticular Disease**

Diverticulosis is bulging pockets in the colon caused by weak spots. Approximately 10% of Americans over age of 40 have diverticulosis, and it becomes more common as people age. These bulges can become infected and inflamed, causing diverticulitis, which can be very painful. It is believed that diverticular disease (diverticulosis and diverticulitis) is caused by a low fiber diet, as a result of increased pressure and straining due to constipation.

Fiber also increases transit time (passage) of waste in the large intestine further reducing the risk of digestive diseases.

### **Weight Loss**

Fiber also may help reduce overeating and unwanted weight gain. High fiber foods, such as fruits, vegetables, and whole grains generally require more chewing time – allowing your body to register fullness – so you're less likely to overeat. High fiber foods generally feel larger in your stomach and take longer to digest, making you feel fuller for a longer period of time. High fiber foods are usually less energy dense – so you're eating fewer calories for the same volume of food.

### **Colon Cancer**

Evidence that dietary fiber reduces colorectal cancer is mixed – some studies show that fiber reduces cancer risk, while others show nothing or a greater risk. Other studies have shown that a diet high in fat, especially animal fat such as red meat and processed meats, can increase risk of colorectal cancer. The American Cancer Society recommends eating a diet high in fruits, vegetables, and whole grain foods, and to limit high-fat foods. Increasing physical activity will help lower risk for colorectal cancer as well. If you are concerned about colorectal cancer, regular screening, including testing for and the removal of polyps can prevent colon cancer.



## What Do I Eat To Get My Fiber?

Some sources of soluble fiber are found in oats, peas, beans, certain fruits and psyllium. Psyllium (pronounced sea-lee-um) is found in certain cereals and bulk fiber laxatives. Some sources of insoluble fiber are All-Bran cereal, wheat germ, kidney beans and apples with the skin left on.

Some points to remember when incorporating high-fiber foods into your diet:

- Start adding high-fiber foods to your diet gradually.
- Too much fiber at once may produce discomfort such as bloating, cramping, and gas.
- Eat a variety of fiber-rich foods – fruits, vegetables, beans and legumes, and whole grains.
- Drink more fluid as you increase your fiber intake – liquids help your body digest fiber (Recommended intakes: 6-8/8oz glasses/day).
- Take a dose of Beano (found at your local drug store) when eating high fiber foods to help with excessive gas. This will help digest the sugars associated with high fiber foods that cause gas.

## How Much Fiber Should I Eat?

The Dietary Guidelines for Americans recommend that we get our fiber in the following three ways:

- 2-4 cups of various vegetables
- 1 ½ – 2 ½ cups of various fruits
- 5-10 – 1 oz equivalents of various grain products such as breads, cereals, pasta and rice – half of which should be from whole grains

The amount of fiber recommended for a daily diet has been debated for years. In September 2002, the National Academies' Institute of Medicine (IOM) published the first-ever recommendations for fiber intake. The recommended daily intake for total fiber for adults 50 years and younger is 38 grams for men and 25 grams for women. The recommended levels for men and women over 50 are 30 and 21 grams, respectively. Using the nutrient-density approach (fiber expressed as a percentage of calories or per 1,000 calories), IOM recommended that Americans of all ages consume 14 g of total fiber for each 1,000 kcal. Currently it is estimated that Americans get 10-15 grams of fiber daily. Do you know how much fiber you get each day? You might be surprised if you add up your total consumption for the day.



## Fiber Content of Foods in Common Portions

A high fiber diet can help lower cholesterol, control blood sugar (soluble fiber), and prevent constipation (insoluble). Aim for 25-35 grams (g) of total fiber each day –or 6-8 grams per meal, and 3-4 grams per snack, choosing foods from all the categories listed here. Increase your fiber intake gradually, over 2 or 3 weeks, so your system can adapt to the added bulk without discomfort. Drink plenty of fluids, at least 6-8 cups of caffeine-free liquid daily.

Food Item	Serving Size	Total Fiber/ Serving (g)	Soluble Fiber/ Serving (g)	Insoluble Fiber/ Serving (g)
<b>Vegetables, cooked (cooked)</b>				
Asparagus	½ cup	2.8	1.7	1.1
Beets, flesh only	½ cup	1.8	0.8	1.0
Broccoli	½ cup	2.4	1.2	1.2
Brussels sprouts	½ cup	3.8	2.0	1.8
Corn, whole kernel, canned	½ cup	1.6	0.2	1.4
Carrots, sliced	½ cup	2.0	1.1	0.9
Cauliflower	½ cup	1.0	0.4	0.6
Green beans, canned	½ cup	2.0	0.5	1.5
Kale	½ cup	2.5	0.7	1.8
Okra, frozen	½ cup	4.1	1.0	3.1
Peas, green, frozen	½ cup	4.3	1.3	3.0
Potato, sweet, flesh only	½ cup	4.0	1.8	2.2
Spinach	½ cup	1.6	0.5	1.1
Tomato sauce	½ cup	1.7	0.8	0.9
Turnip	½ cup	4.8	1.7	3.1
<b>Raw Vegetables</b>				
Cabbage, red	1 cup	1.5	0.6	0.9
Carrots, fresh	1, 7 ½ in. long	2.3	1.1	1.2
Celery, fresh	1 cup chopped	1.7	0.7	1.0
Cucumber, fresh	1 cup	0.5	0.2	0.3
Lettuce, iceberg	1 cup	0.5	0.1	0.4
Mushrooms, fresh	1 cup pieces	0.8	0.1	0.7
Onion, fresh	½ cup chopped	1.7	0.9	0.8
Pepper, green, fresh	1 cup chopped	1.7	0.7	1.0
Tomato, fresh	1 medium	1.0	0.1	0.9
<b>Fruits</b>				
Apple, red, fresh w/skin	1 small	2.8	1.0	1.8
Applesauce, canned	½ cup	2.0	0.7	1.3
Apricots, dried	7 halves	2.0	1.1	0.9
Apricots, fresh w/skin	4	3.5	1.8	1.7
Banana, fresh	½ small	1.1	0.3	0.8
Blueberries, fresh	¾ cup	1.4	0.3	1.1
Cherries, black, fresh	12 large	1.3	0.6	0.7
Figs, dried	1 ½	3.0	1.4	1.6
Grapefruit, fresh	½ medium	1.6	1.1	0.5
Grapes, fresh w/skin	15 small	0.5	0.2	0.3
Kiwifruit, fresh, flesh only	1 large	1.7	0.7	1.0
Mango, fresh, flesh only	½ small	2.9	1.7	1.2
Melon, cantaloupe	1 cup cubed	1.1	0.3	0.8
Orange, fresh, flesh only	1 small	2.9	1.8	1.1
Peach, fresh, w/skin	1 medium	2.0	1.0	1.0
Pear, fresh, w/skin	½ large	2.9	1.1	1.8
Plum, red, fresh	2 medium	2.4	1.1	1.3
Prunes, dried	3 medium	1.7	1.0	0.7
Raisins, dried	2 tbsp	0.4	0.2	0.2
Raspberries, fresh	1 cup	3.3	0.9	2.4
Strawberries, fresh	1 ¼ cup	2.8	1.1	1.7
Watermelon	1 ¼ cup cubed	0.6	0.4	0.2

Food Item	Serving Size	Total Fiber/ Serving (g)	Soluble Fiber/ Serving (g)	Insoluble Fiber/ Serving (g)
<b>Legumes (cooked)</b>				
Black beans	½ cup	6.1	2.4	3.7
Black-eyed peas	½ cup	4.7	0.5	4.2
Chick peas, dried	½ cup	4.3	1.3	3.0
Kidney beans, light red	½ cup	7.9	2.0	5.9
Lentils	½ cup	5.2	0.6	4.6
Lima beans	½ cup	4.3	1.1	3.2
Navy beans	½ cup	6.5	2.2	4.3
Pinto beans	½ cup	6.1	1.4	4.7
<b>Pasta, Rice, Grains</b>				
Barley, pearled, cooked	½ cup	3.0	0.8	2.2
Popcorn, popped	3 cups	2.0	0.1	1.9
Rice, white, cooked	½ cup	0.8	trace	0.8
Spaghetti, white cooked	½ cup	0.9	0.4	0.5
Spaghetti, whole wheat, cooked	½ cup	2.7	0.6	2.1
Wheat bran	½ cup	12.3	1.0	11.3
Wheat germ	3 tbsp	3.9	0.7	3.2
<b>Breads and Crackers</b>				
Pumpernickel	1 slice	2.7	1.2	1.5
Rye	1 slice	1.8	0.8	1.0
White	1 slice	0.6	0.3	0.3
Whole wheat	1 slice	1.5	0.3	1.2
<b>Cereals</b>				
All Bran	1/3 cup	8.6	1.4	7.2
Benefit	¾ cup	5.0	2.8	2.2
Cheerios	1 ¼ cup	2.5	1.2	1.3
Corn flakes	1 cup	0.5	0.1	0.4
Cream of wheat, regular, dry	2 ½ tbsp	1.1	0.4	0.7
Fiber One	½ cup	11.9	0.8	11.1
40% Bran Flakes	2/3 cup	4.3	0.4	3.9
Grapenuts	¼ cup	2.8	0.8	2.0
Oat bran, cooked	¾ cup	4.0	2.2	1.8
Oat flakes	1 cup	3.1	1.5	1.6
Oatmeal, dry	1/3 cup	2.7	1.4	1.3
Puffed Wheat	1 cup	1.0	0.5	0.5
Raisin Bran	¾ cup	5.3	0.9	4.4
Rice Krispies	1 cup	0.3	0.1	0.2
Shredded Wheat	1 cup	5.2	0.7	4.5
Special K	1 cup	0.9	0.2	0.7
Wheat flakes	¾ cup	2.3	0.4	1.9
<b>Nuts and Seeds</b>				
Almonds	6 whole	0.6	0.1	0.5
Flaxseeds	1 tbsp	3.3	1.1	2.2
Peanut butter, smooth	1 tbsp	1.0	0.3	0.7
Peanuts, roasted	10 large	0.6	0.2	0.4
Sesame seeds	1 tbsp	0.5	0.2	0.3
Sunflower seeds	1 tbsp	0.5	0.2	0.3
Walnuts	2 whole	0.3	0.1	0.2

Adapted from Anderson JW. *Plant Fiber in Foods*. 2<sup>nd</sup> ed. HCF Nutrition Research Foundation Inc, PO Box 22124, Lexington, KY 40522, 1990.



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# RECIPES

## Macchu Picchu Platter

*This main dish salad features quinoa, an ancient Inca grain. High-protein quinoa cooks in 15 minutes, so it's great for fast meals.*

### Ingredients

#### Quinoa salad:

- 1-cup (200g) quinoa, well rinsed
- 1 cup (150g) frozen corn kernels, thawed
- Juice of one lemon
- 1 Tbsp (15mL) olive oil
- 2 to 3 scallions, minced
- Salt and black pepper, to taste

#### Bean salad:

- 1 16-ounce (455g) can pinto beans, drained
- 1 cup (200g) diced tomato
- 1 Tbsp (15mL) apple cider
- 1/4 cup (10g) chopped parsley or cilantro
- Freshly ground black pepper, to taste

#### Garnishes:

- Pumpkin seeds
- Black olives
- 1 red bell pepper, cut into strips

### Directions

Boil 2 cups water (480mL) in a saucepan. Add the quinoa and simmer, covered, for 15 minutes. When done, fluff with a fork and transfer to a bowl. Combine quinoa with remaining ingredients for the quinoa salad.

While the quinoa cooks, toss the bean salad ingredients in another bowl.

To assemble, spread quinoa salad evenly on a platter. Leave a well in the center and mound bean salad into the well. Sprinkle with pumpkin seeds. Arrange olives and pepper strips around the edge.

### Nutrition Facts

Calories: 283    Fat: 6g    % fat calories: 19%    Cholesterol: 0mg    Fiber: 14g

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## Granola on the Go

*Your kids will love the crunchy, sweet taste of this granola for breakfast, as a quick snack or as a topping on yogurt. Parents, you'll love knowing this recipe provides plenty of vitamin E and fiber-rich ingredients. It's also lower in sugar than many store-bought versions.*

## **Ingredients**

4 1/2 cups (385g) rolled oats  
1/4-cup (30g) wheat bran  
1/2-cup (60g) wheat germ  
1/4-cup (30g) nuts or seeds (try a combo such as sunflower or sesame seeds and walnuts)  
1/2-cup (120mL) honey  
1/4-cup apple juice  
1/2 cup (75g) assorted, chopped dried fruit such as apricots, apples or figs  
2 Tbsp (30mL) canola oil  
2 tsp (4g) cinnamon

## **Directions**

Preheat oven to 350°F (175°C). Coat a 9x13-inch (23x33cm) pan with nonstick cooking spray.

In a large bowl, mix together oats, bran, germ, nuts and cinnamon.

Blend honey, canola oil and juice. Add mixture to oats and stir until well coated.

Spread granola onto a baking sheet and cook 25 minutes, stirring a few times so that granola browns evenly. Remove from oven and let the granola cool on the baking sheet for 10 minutes.

Add dried fruit when mixture cools. Store in an airtight container.

## **Nutrition Facts**

Calories: 488

Fat: 12g

% fat calories: 22%

Cholesterol: 0mg

Carbohydrate: 85g

Fiber: 10g

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## **Falafel**

*Beans are one of humanity's earliest cultivated crops, and, in turn, have been critical to the survival of ancient civilizations. Today, many cultures incorporate beans into their trademark dishes. One particular bean dish is falafel, a dish as popular in the Middle East as hamburgers are in the United States.*

## **Ingredients**

- 1 can (15 ounces or 425g) garbanzo beans, rinsed and drained
- 1 medium onion, coarsely chopped
- 1/4 cup (10g) packed parsley leaves
- 2 cloves garlic, minced
- 1/2 tsp (1g) ground cumin
- 3/4 tsp (1.5g) dried oregano leaves
- 2–3 tsp (10–15mL) lemon juice
- Salt and pepper, to taste
- 1 cup (115g) dry plain bread crumbs, divided
- 1/4 cup (40g) chopped raisins
- 1 egg yolk
- Olive oil cooking spray

### **Tomato-Cucumber Relish:**

- 1/2 cup (100g) chopped tomato
- 1/2 cup (75g) chopped cucumber
- 1/3-cup (80g) fat-free plain yogurt
- 1/2 tsp (1g) dried mint leaves (optional)
- Salt and pepper, to taste (sea salt if on a corn-free diet\*)

## **Directions**

Process garbanzo beans, onion, parsley, garlic, cumin and oregano in a food processor until smooth; season to taste with lemon juice, salt, and pepper. Stir in 1/2-cup (60g) breadcrumbs, raisins and egg yolk.

Form bean mixture into 16 patties, using about 1 1/2 Tbsp (25mL) for each. Coat patties with remaining 1/2-cup (60g) breadcrumbs.

Spray large skillet with cooking spray; heat over medium heat until hot. Cook falafel over medium heat until browned on the bottom, 2 to 3 minutes. Spray tops of falafel with cooking spray and turn; cook until browned on the bottom, 2 to 3 minutes. Arrange 4 falafel on each plate; serve with Tomato-Cucumber Relish.

### **To make Tomato-Cucumber Relish:**

Combine tomato, cucumber, yogurt and mint leaves in small bowl. Season to taste with salt and pepper.

\* *Allergy notes:* People following a corn-free diet should avoid iodized salt since it contains dextrose, which should be avoided by those allergic to corn.

### **Nutrition Facts for Falafel**

Calories: 311      Fat: 4g      % fat calories: 12%      Cholesterol: 54mg  
Carbohydrate: 58g      Protein: 12g      Fiber: 7g      Sodium: 575mg

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## **Pasta Fagioli**

*This classic Italian pasta and bean dish is irresistibly good and cheap! Kids especially love it. You can speed up cooking time by preparing beans in a pressure cooker.*

### **Ingredients**

- 1 cup (180g) dried kidney beans
- 6 cups (1.4L) water
- 1 tsp (5mL) olive oil
- 1 onion, finely chopped
- 4 cloves garlic, minced
- 1 carrot, thinly sliced
- 1 green pepper, chopped
- 2 cups (490g) canned stewed tomatoes
- 1 tsp (6g) salt (sea salt if on a corn-free diet\*)
- 8 ounces (230g) pasta elbows, shells or macaroni
- 3 Tbsp (8g) fresh basil, chopped, or 1 Tbsp (6g) dried basil

### **Directions**

Soak beans overnight. Drain off soaking water, rinse beans and drain again. Put soaked beans into a large, heavy-bottomed soup pot with 6 cups water. Bring to a boil, lower heat and simmer 1 1/2 to 2 hours until beans are tender. Drain excess liquid, leaving just enough to make a gravy-like sauce.

Sauté onions, garlic, carrots and green pepper. Add vegetables, tomatoes and salt to beans and simmer 20 minutes.

In a separate pot, bring 2 quarts (1.9L) of salted water to a boil and cook pasta until al dente. Drain and rinse well. Gently stir pasta and basil into the beans and serve

\* *Allergy notes:* People following a corn-free diet should avoid iodized salt since it contains dextrose, which should be avoided by those allergic to corn.

### **Nutrition Facts for Pasta Fagioli**

Calories: 246      Fat: 1g      % fat calories: 4%      Cholesterol: 0mg      Fiber: 12g

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# **Whole Grain Pizza Dough**

## **Ingredients**

- 1 package active dry yeast
- 1-1/2 cups (360mL) warm water
- 2 Tbsp (30mL) olive oil
- 2 cups (240g) unbleached white flour
- 1-1/2 cups (180g) whole-wheat flour
- 1 tsp (6g) salt

## **Directions**

Dissolve yeast in the warm water. Stir in olive oil and set aside.

Combine white flour and salt in a large mixing bowl, making a well in the center. Add the yeast mixture and stir until blended.

Gradually stir in the whole-wheat flour, adding only enough to make a soft, workable dough.

Turn dough out onto a floured surface and knead until smooth and elastic, about 5 minutes. (Continue to lightly flour your work surface if the dough becomes sticky while kneading.)

Place dough in an oiled bowl, cover with a towel and let rise in a warm place until it's doubled in bulk, about 35 to 40 minutes. At this point, the dough can be used to make 1 16-inch pizza, 6 Pizza Pockets or breadsticks.

## **Nutrition Facts**

Calories: 297

Fat: 5g

% fat calories: 16%

Cholesterol: 9mg

Carbohydrate: 54g

Fiber: 5g

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