



Darren L. Peterson, M.D.
Board Certified in General Surgery

High Fiber Diet



Purpose

Dietary fiber is the part of a plant that provides and maintains the plant's structure. Cellulose, hemicellulose, polysaccharides, pectins, gums, mucilages, and lignins are dietary fibers. These fibers are unrelated chemically, however, they all have one thing in common -- they can't be digested by the human body. For this reason, they can help correct disorders of the large intestine (colon), and keep it functioning normally. Therefore, it is important to increase the amount of fiber in the diet.

Function of The Colon

The main job of the colon is to complete the digestion process. This occurs by removing excess water from food wastes entering from the small intestine. When wastes pass through the intestines too quickly, not enough water is absorbed. Watery stools and diarrhea are the result. In contrast, if the passage of waste is too slow, too much water is absorbed. This results in hard stools and constipation, which often leads to straining. These simple problems occasionally lead to more serious disorders.

The Importance of Dietary Fiber

Fiber (also called roughage or bulk) promotes the wavelike contractions that keep food moving through the intestine. Also, high-fiber foods expand the inside walls of the colon. This eases the passage of waste. Fibrous substances pass through the intestine undigested. They also absorb many times their weight in water, resulting in softer, bulkier stools.

Studies show that rural Africans, who eat diets high in fiber, eliminate food waste in one-third the time it takes people from urban westernized cultures. Their stools are larger and softer. Because of the greater bulk and speed of foods through the digestive tract, it is believed that harmful substances are also swept out before they can cause problems. In fact, these rural people have fewer of the digestive tract diseases that plague Western man. It is thought that this may be related to the nature of their diet.

A high-fiber diet causes a large, soft, bulky stool that passes through the bowel easily and quickly. Because of this action, some digestive tract disorders may be avoided, halted, or even reversed simply by following a high-fiber diet. A softer, larger stool helps prevent constipation and straining. This can help avoid or relieve hemorrhoids. More bulk means less pressure in the colon, which is important in the treatment of irritable bowel syndrome and diverticulosis (defects in the weakened walls of the colon). In addition, fiber appears to be important in treating diabetes, elevated cholesterol, colon polyps, and cancer of the colon.

Nutrition Facts

As long as a balanced selection of foods from each of the basic food groups is chosen, the High Fiber Diet is nutritionally adequate. Some studies indicate that excessive intake of certain dietary fiber sources may bind and interfere with the absorption of the following minerals: calcium, copper, iron, magnesium, selenium, and zinc. However, there appears to be no problem for those adults who follow a balanced, regular diet. Occasionally, a physician may prescribe supplements.

The Use of Fiber in the Irritable Bowel

Irritable bowel syndrome (IBS) is one of the most common disorders of the lower digestive tract. There is no disease present with IBS, but it creates bothersome symptoms such as altered bowel habits -- constipation, diarrhea, or both alternately. There may also be bloating, abdominal pain, cramping, and spasm. An attack of IBS can be triggered by emotional tension and anxiety, poor dietary habits, and certain medications. Increased amounts of fiber in the diet can help relieve the symptoms of irritable bowel syndrome by producing soft, bulky stools. This helps to normalize the time it takes for the stool to pass through the colon. Liquids help to soften the stool. Irritable bowel syndrome, if left untreated, may lead to diverticulosis of the colon.

Fiber and Colon Polyps/Cancer

Colon cancer is a major health problem. This disease is most common in Western cultures. Most colon cancer starts out as a colon polyp, a benign mushroom-shaped growth. In time it grows, and in some people it becomes cancerous. Colon cancer is almost always curable, if polyps are removed when found or if surgery is performed at an early stage. It is now known that people can inherit the risk of developing colon cancer, but diet may be important, too. There is a very low rate of colon cancer in residents of countries where grains are unprocessed and retain their fiber. The theory is that in the Western world, cancer-containing agents (carcinogens) remain in contact with the colon wall for a longer time and in higher concentrations. So, a large bulky stool may act to dilute these carcinogens by moving them through the bowel more quickly. Less carcinogenic exposure to the colon may mean fewer colon polyps and less cancer.

Fiber and Diverticulosis

Prolonged, vigorous contraction of the colon, usually in the left lower side, may result in diverticulosis. This increases pressure causing small and eventually larger ballooning pockets to form. These pockets usually cause no problems. However, sometimes they can become infected (diverticulitis) or even break open (perforate) causing pockets of infection or inflammation of the sac lining the abdomen (peritonitis). A high-fiber diet may increase the bulk in the stool and thereby reduce the pressure within the colon. By so doing, the formation of pockets is reduced or possibly even stopped.

Some professionals recommend restricting the following foods in diverticulosis diets: nuts, poppy seeds, caraway seeds, rye seeds, popcorn, crunchy peanut butter, corn, cucumber, and squash; as well as fruits and vegetables with seeds such as strawberries, figs, and tomatoes. However, there has never been any medical proof that these foods are injurious. Many gastroenterologists allow and even encourage consuming these foods, depending on an individual's tolerance.

Fiber, Cholesterol and Gas

Insoluble fiber is found in wheat, rye, bran, and other grains.

It is also the fiber found in most vegetables. Insoluble fiber means it does not dissolve in water. It also cannot be used by intestinal-colon bacteria as a food source, so these beneficial bacteria generally do not grow and produce intestinal gas.

Soluble fiber, on the other hand, does dissolve in water forming a gelatinous substance in the bowel. Soluble fiber is found in oatmeal, oat bran, fruit, psyllium (Metamucil, Konsyl), barley, and legumes. Soluble fiber, among its other benefits, seems to bind up cholesterol allowing it to be eliminated with the stool. If enough is removed it can lower the blood cholesterol 10-15%.

The down side of soluble fiber is that it can be metabolized by gas forming bacteria in the colon. These bacteria are harmless but for those who have an intestinal gas or flatus problem it is probably best to avoid or carefully test soluble fibers to see if they are contributing to intestinal gas. Whenever possible, both soluble and insoluble fiber should be eaten on a daily basis.

A Dietary Fiber Supplement May Be Helpful

Some people don't tolerate fibrous foods well. If you can't consume enough fiber in your diet alone, certain stool softening and bulking agents are available. These products absorb water and produce the bulk necessary for the digestive tract to perform naturally. They help create a soft and well-formed stool. For this reason, they can be very useful in preventing and treating digestive tract disorders. Metamucil, Konsyl, and Per Diem Fiber are such products. These contain psyllium mucilloid and come from the seed of the psyllium plant. Citrucel (hemicellulose) and FiberCon (polycarboxisal) are other bulking agents that can also be used.

Special Considerations

To improve your diet, add foods that contain more dietary fiber. You can include some or all of the following:

1. Whole-grain foods (such as bran cereals) and breads (those made with whole wheat grains).
2. Fresh fruits (including the skin and pulp).
3. Dried or stewed fruits (such as prunes, raisins, or apricots).
4. Root vegetables (such as carrots, turnips, or potatoes).
5. Raw or fresh vegetables, such as cabbage. (Lettuce is actually low in fiber.)

Eating bran cereal in the morning is often the easiest way to obtain fiber. All-Bran, 100% Bran, Bran Buds, oat bran, oatmeal, and Raisin Bran are some of the high-fiber cereals presently available. Bran can cause rumbling intestinal gas and even some mild cramping, so it should be eaten in small amounts at first. The amount can be increased as the body gets used to it. The goal should be one to two large, soft, formed stools a day.

You should also try to follow these dietary rules:

1. Drink plenty of liquids, including fruit or vegetable juices and water. Drink at least six cups of water or fluid a day.
2. Eat slowly. Chew your food thoroughly. This allows the saliva and digestive

- juices of the stomach, liver, and pancreas to break down food more easily. It may also help prevent problems from developing in the lower digestive tract.
- Eat your meals at regular intervals.

Fiber Contents of Foods
Goal (25 to 35 grams per day)

Common servings of foods containing dietary fiber are shown below. Increase your intake by including fiber from all sources. (Foods from meat and dairy groups are not good sources.) Foods that are good sources of fiber are also typically low in fat.

Food	Serving Size	Fiber (gm)
Cereals:		
All-Bran	1/3 cup	8.5
Bran Buds	1/3 cup	7.9
Bran Chex	2/3 cup	4.6
Cheerios	1 1/4 cup	1.1
Corn Bran	2/3 cup	5.4
Corn Flakes	1 1/4 cup	0.3
Cracklin' Bran	1/3 cup	4.3
Crispy Wheats n' Raisins	3/4 cup	1.3
40% Bran	3/4 cup	4.0
Frosted Mini-Wheats	4 biscuits	2.1
Graham Crackos	3/4 cup	1.7
Grape Nuts	1/4 cup	1.4
Heartland Natural Cereal	1/4 cup	1.3
Honey Bran	7/8 cup	3.1
Most	2/3 cup	3.5
Nutri-Grain, barley	3/4 cup	1.7
Nutri-Grain, corn	3/4 cup	1.8
Nutri-Grain, rye	3/4 cup	1.8
Nutri-Grain, wheat	3/4 cup	1.8
100% Bran	1/2 cup	8.4
100% Natural Cereal	1/4 cup	1.0
Oatmeal, (cooked regular, quick, or instant)	3/4 cup	1.6
Raisin Bran-type	3/4 cup	4.0
Rice Krispies	1 cup	0.1
Shredded Wheat	2/3 cup	2.6
Special K	1 1/3 cup	0.2
Sugar Smacks	3/4 cup	0.4
Tasteos	1 1/4 cup	1.0
Total	1 cup	2.0
Wheat Chex	2/3 cup	2.1

Wheaties	1 cup	2.0
Wheat n' Raisin Chex	3/4 cup	2.5
Wheat germ	1/4 cup	3.4

Food	Serving Size	Fiber (gm)
Vegetables (cooked):		
Asparagus, cut	1/2 cup	1.0
Beans (string, green)	1/2 cup	1.6
Broccoli	1/2 cup	2.2
Brussels sprouts	1/2 cup	2.3
Cabbage (red, white)	1/2 cup	1.4
Carrots	1/2 cup	2.3
Cauliflower	1/2 cup	1.1
Corn, canned	1/2 cup	2.9
Kale leaves	1/2 cup	1.4
Parsnip	1/2 cup	2.7
Peas	1/2 cup	3.6
Potato (with skin)	1	2.5
Potato (without skin)	1	1.4
Spinach	1/2 cup	2.1
Squash, summer	1/2 cup	1.4
Sweet potatoes	1/2	1.7
Turnips	1/2	1.6
Zucchini	1/2 cup	1.8

Food	Serving Size	Fiber (gm)
Vegetables (raw):		
Bean sprouts	1/2 cup	1.5
Celery, diced	1/2 cup	1.1
Cucumber	1/2 cup	0.4
Lettuce, sliced	1 cup	0.9
Mushrooms, sliced	1/2 cup	0.9
Onions, sliced	1/2 cup	0.9
Pepper, green, sliced	1/2 cup	0.5
Spinach	1 cup	1.2
Tomato	1	1.5

Food	Serving Size	Fiber (gm)
Fruits:		
Apple (with skin)	1	3.5
Apple (without skin)	1	2.7
Apricot	3	1.8
Apricot, dried	5 halves	1.4
banana	1	2.4
Blueberries	1/2 cup	2.0
Cantaloupe	1/4 melon	1.0
Cherries, sweet	10	1.2

Grapefruit	1/2	1.6
Grapes	20	0.6
Orange	1	2.6
Peach (with skin)	1	1.9
Peach (without skin)	1	1.2
Pear (with skin)	1/2 large	3.1
Pear (without skin)	1/2 large	2.5
Pineapple	1/2 cup	1.1
Plums, damson	5	0.9
Prunes	3	3.0
Raisins	1/4 cup	3.1
Raspberries	1/2 cup	3.1
Strawberries	1 cup	3.0
Watermelon	1 cup	0.4

Food	Serving Size	Fiber (gm)
Legumes:		
Baked beans/tomato sauce	1/2 cup	8.9
Dried beans, cooked	1/2 cup	4.7
Kidney beans, cooked	1/2 cup	7.3
Lentils, cooked	1/2 cup	7.3
Lima beans, cooked	1/2 cup	4.5
Navy beans, cooked	1/2 cup	6.0

Food	Serving Size	Fiber (gm)
Breads:		
Bagels	1	0.6
Bran muffins	1	2.5
Cracked wheat bread	1 slice	1.0
Crisp rye bread	2 crackers	2.0
Crisp wheat bread	2 crackers	1.8
French bread	1 slice	0.7
Italian bread	1 slice	0.3
Mixed grain bread	1 slice	0.9
Oatmeal bread	1 slice	0.5
Pita bread	1 piece	0.4
Pumpernickel bread	1 slice	1.0
Raisin bread	1 slice	0.6
White bread	1 slice	0.4
Whole wheat bread	1 slice	1.4

Food	Serving Size	Fiber (gm)
Pasta and rice:		
Macaroni	1 cup	1.0
Rice, brown	1/2 cup	1.0
Rice, polished	1/2 cup	0.2
Spaghetti, regular	1 cup	1.1

Spaghetti, wheat	1 cup	3.9	
Food	Serving Size	Fiber (gm)	
Juices:			
Apple	1/2 cup	0.4	
Grapefruit	1/2 cup	0.5	
Grape	1/2 cup	0.6	
Orange	1/2 cup	0.5	
Papaya	1/2 cup	0.8	
Food	Serving Size	Fiber (gm)	
Nuts:			
Almonds	10 nuts	1.1	
Filberts	10 nuts	0.8	
Peanuts	10 nuts	1.4	
Lentils, cooked	1/2 cup	7.3	
Lima beans, cooked	1/2 cup	4.5	
Navy beans, cooked	1/2 cup	6.0	
Sample Menu			
Breakfast	Lunch	Dinner	
<ul style="list-style-type: none"> • grapefruit 1/2 • oatmeal 3/4 cup • raisins 2 Tbsp • whole wheat toast 2 slices • margarine 2 tsp • jelly/jam 2 Tbsp • skim milk 1 cup • coffee 3/4 cup 	<ul style="list-style-type: none"> • vegetable soup 1 cup • lean hamburger patty 3 oz • multi-grain bun 1 • tomato 2 slices • lettuce • baked beans 1/2 cup • medium apple 1 • oatmeal cookie 1 • skim milk 1 cup 	<ul style="list-style-type: none"> • garden salad: lettuce 1 cup cucumber 1/8 cup tomato 1/2 med bean sprouts 1/8 cup salad dressing 2 Tbsp • broiled chicken 3 oz • brown rice 1/2 cup • broccoli with cheese sauce 1/2 cup • pumpernickel bread 1 slice • margarine 1 tsp • strawberries 1/2 cup with plain low-fat yogurt 1/2 cup • skim milk 1 cup 	
Snack			
<ul style="list-style-type: none"> • bran muffin • margarine 1 tsp • orange juice 1/2 cup 			
This Sample Diet Provides the Following			
Calories	2491	Fat	89 gm
Protein	121gm	Sodium	3585 mg
Carbohydrates	318 gm	Fiber	38 gm