

Fiber, Digestion, and Health

What is fiber?

Dietary fiber is the edible component of plant foods that can't be digested by humans. The edible skins of fruits and vegetables are especially high in fiber. Cellulose, inulin, lignin, maltodextrin, pectin, polydextrose, and vegetable gums are varieties of dietary fiber. Fiber is not a nutrient but helps improve digestive function and may have other health benefits.

How does fiber work?

Fiber affects the rate of digestion of foods, the absorption of nutrients, and the movement of waste products (stool) through the colon. It also provides a substrate for beneficial intestinal bacteria.

Dietary fiber includes water-soluble and insoluble types, which have different functions in the body. Note that fiber is not necessarily fiber-like in texture. While the type of fiber varies depending on the food, most foods have a mixture of types.

- **Insoluble fiber** attracts water to the intestine, increasing the bulk and softness of waste products. Good sources of insoluble fiber are whole grain products, green beans, potato skins, carrots, cucumbers, squash, celery, tomatoes, nuts, and seeds.
- **Soluble fiber** softens stool. It also ferments in the intestine and produces sub-

stances that may have a variety of health effects. Soluble fiber can help lower blood cholesterol, slow the absorption of carbohydrate from foods, and help stabilize blood sugar levels. Good sources are oatmeal, oat bran, nuts, seeds, legumes, sweet potatoes, apples, pears, plums, prunes, and berries.

How much fiber do we need?

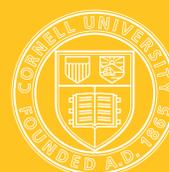
By eating whole grains, vegetables and fruits on a daily basis we can obtain all the fiber we need. Try including some at each meal. The daily value (DV) on food labels is 25 grams per day, but recommended amounts differ depending on caloric intake, as well as gender and age, as indicated in the table. It is difficult to determine exactly how much fiber we consume every day, but the information in food tables and on food labels can guide you. These often do not distinguish type of fiber, but most high-fiber foods contain a combination.

Recommended Daily Fiber Intake (Source: National Academy of Sciences)	
Women 19 - 50 years of age	25 grams
Men 19 - 50 years of age	38 grams
Women over 50 years of age	21 grams
Men over 50 years of age	30 grams

Fiber and constipation

Insufficient dietary fiber is a very common cause of constipation, defined as infrequent bowel movements or stool that is too firm, too small in volume, or difficult to pass. It is normal to have a bowel movement anywhere from three times a week to three times a day, depending on the individual. For many people, a daily bowel movement is normal. However, being dependent on a laxative for a daily

Fiber in Foods (Source: US Department of Agriculture)		
Foods	Serving Size	Fiber (grams)
Almonds (sliced)	¼ cup (1 oz)	3
Apple	1 medium	3
Artichokes	½ cup	5
Banana	1 medium	3
Beans or lentils (cooked/canned)	1 cup	6-20
Berries	1 cup	3-10
Bread, whole wheat	2 slices	4-6
Broccoli, cooked	¾ cup	5
Brussel sprouts	1 cup	4-6
Cabbage (cooked)	1 cup	3
Carrots (cooked)	½ cup	3
Cereal	½ cup	varies
Corn (sweet)	½ cup	2
Crackers	2	0-2
Dates	½ cup	7
Figs, dried	3	10.5
Green beans	½ cup	2
Greens (cooked)	½ cup	2-4
Pear	1	5
Peas, green	½ cup	4
Plums	1	1
Popcorn	1 cup	1-2
Potato, no skin	1 small	2
Potato with skin	1 small	7
Raisins	1 cup	5
Spinach, cooked	½ cup	2-4
Squash, winter (cooked)	½ cup	3
Sweet potatoes (cooked)	1 med	5
Tomatoes	1 small	1.5
Watermelon	1 cup	1
Walnuts	¼ cup	2



bowel movement is *not* normal. A gradual increase in fiber intake from foods, especially insoluble fiber such as wheat bran, usually helps with constipation. This should be accompanied by sufficient fluid intake.

Additional causes of constipation are listed below, many of which may be corrected by lifestyle changes.

- **Inadequate fluid intake** can harden stool. 8 to 12 cups (8 oz each) of water or other fluids are recommended daily, but more may be needed in hot weather and with exercise.
- **Insufficient food intake** may decrease bowel activity and bulk of stool.
- **Low amount of physical activity** (a sedentary lifestyle) may decrease bowel activity.
- **Ignoring the urge** can lead to stool retention and constipation. Many people neglect to go to the bathroom because they are too busy or do not like public restrooms, but it is important to take time to use the toilet, particularly after meals. Straining on the toilet, however, isn't advisable and may result in hemorrhoids.
- **Change in routine**, such as travel, may affect bowel function due to stress, change in diet, or inadequate timing of bathroom visits.
- **Emotional or physical stress** may affect bowel function directly or via change in routine.
- **Pregnancy** may cause constipation due to hormonal changes and/or pressure on the bowel.
- **IBS** sometimes causes constipation (see below).
- **Some medications** including anticonvulsants, narcotics, and calcium channel blockers, can cause constipation.

Chronic constipation (not corrected by lifestyle changes) requires a medical evaluation to determine any underlying causes. An unexplained change in bowel function, unplanned weight loss, pain, or rectal bleeding are also reasons to seek medical attention.

Fiber and IBS

IBS (Irritable Bowel Syndrome) is a very common disturbance in bowel function, probably due to disrupted intestinal rhythm. Symptoms, which range from mild to severe, may include abdominal pain, bloating, diarrhea, and/or constipation. IBS should be distinguished from lactose intolerance, food sensitivities, and other, more serious bowel problems that include rectal bleeding, unexplained weight loss, and persistent pain. IBS is not dangerous, but symptoms can be troublesome. Typical

triggers for IBS are stress, lack of sleep, spicy foods, alcohol, caffeine, and eating too fast. A consistent pattern of fiber intake, along with sufficient fluids and lifestyle improvement, will often improve IBS.

How much fiber is too much?

When increasing fiber intake, it's best to do so gradually. A diet too high in fiber may cause bloating and abdominal pain. Fiber in the absence of adequate water intake may produce constipation, rather than prevent it. Also, tough, fibrous or stringy fruits and vegetables that are not well chewed can potentially cause an obstruction in the digestive tract.

What about fiber supplements?

The best way to get fiber is from foods, but sometimes a supplement is recommended by a health professional, especially when dietary fiber intake is otherwise too low. Supplements differ in their ingredients, function, price, flavor, dosage, and side-effects. Side effects of some fiber supplements can include bloating, gas, pain, and inhibited absorption of some medications.

Some of the ingredients and brand name products are as follows: psyllium (a seed sold in powder form under the name Metamucil), cellulose (in Citrucel soft chews), methylcellulose (in Citrucel powder and caplets), inulin (in FiberSure and FiberChoice), and polydextrose (in All-Bran powder). Calcium polycarbophil is a synthetic polymer (in Fibercon). Acai palm berries are high in fiber and are currently marketed with various health claims that are mostly unverified.

Can I use laxatives?

Most people with constipation do not need laxatives, and it is best to avoid them unless recommended by a medical professional. A belief in the importance of daily bowel movements has led some people to self-medicate with over-the-counter laxatives, and some people use laxatives as a form of purging or for "weight loss." This is a problem because laxatives have potential side effects, including nutrient malabsorption and laxative dependence. Laxatives, whether "natural" or not, are not a good solution. If you are a frequent laxative user, please see a medical provider to learn some different strategies.

When is a low fiber diet needed?

A low fiber diet may be prescribed for specific digestive concerns, such as inflammation of the intestine (enteritis) or inflammatory bowel disease (IBD). This diet limits the amount of undigested material that passes through the large intestine, thus decreasing bowel movements

and helping to ease diarrhea and other symptoms, including abdominal pain. As the digestive system returns to normal, fiber can slowly be added back into the diet. A low residue diet is similar to a low fiber diet, but excludes more foods.

Additional health benefits of fiber

The most immediate benefit of dietary fiber is its improvement of digestive function. Ongoing research on fiber continues to explore these potential long-term benefits:

- Lower risk of heart disease.
- Decreased progression of colon polyps to colon cancer.
- Healthy weight management.
- Improvement in blood glucose levels.

A good daily intake of fiber goes well with other positive lifestyle habits in promoting lifelong health. These habits include a balanced food pattern, sufficient fluid intake, daily physical activity, and regular sleep. Fiber from food, rather than from additives or supplements, probably provides the greatest health benefit.

More information

Consult these sources for useful information on fiber, constipation, IBS, and other digestive problems:

- **The American Heart Association** gives more information about fiber, including recommendations for children, at www.americanheart.org (search "fiber").
- **The Mayo Clinic's** comprehensive website on health: Mayoclinic.com
- **NDDIC** (The National Digestive Diseases Information Clearinghouse) answers questions and provides publications about digestive disorders. Phone: 800-891-5389. Website: www.digestive.niddk.nih.gov
- **USDA National Nutrient Database** lists fiber and nutrient content in foods at the website: www.ars.usda.gov/SerVICES/docs.htm?docid=9673

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