

# HIGH FIBER DIET



## Definition

A high-fiber diet is a diet in which the individual consumes foods that meet or exceed the dietary reference intake (DRI) for dietary **fiber** set by the United States Institute of Medicine (IOM) of the National Academy of Sciences.

## Origins

No single person developed the high-fiber diet. Over the years, researchers have compared the rate of various chronic diseases in populations that had high-fiber diets with those that had lower dietary fiber intake. They found, for example, that native Africans who ate a high-fiber, plant-based diet are rarely bothered by **constipation**. However, in industrialized countries where a lot of animal products are consumed, constipation is common. Observations like this encouraged researchers to look at other roles that dietary fiber might play in health. From their findings came a consensus that a high-fiber diet is a healthy diet. This is reflected in the Dietary Guidelines for Americans 2005, which encourage people to eat more high-fiber foods such as whole grains.

## Description

The United States Institute of Medicine (IOM) of the National Academy of Sciences has set **dietary reference intakes** (DRIs) for fiber based on research data that applies to American and Canadian populations. DRIs provide nutrition guidance to both health professionals and consumers. The current daily DRIs for fiber are as follows:

- children ages 1-3 years: 19 grams
- children ages 4-8 years: 25 grams
- men ages 14-50: 38 grams
- men age 51 and older: 30 grams
- girls ages 9-18: 26 grams
- adult women ages 19-50: 25 grams
- women age 51 and older: 21 grams
- pregnant women: 28 grams
- breastfeeding women: 29 grams

**Cholesterol**—A waxy substance made by the liver and also acquired through diet. High levels in the blood may increase the risk of cardiovascular disease.

**Constipation**—either having fewer than three bowel movements a week or having difficulty passing stools that are often hard, small, and dry.

Soluble fiber	Insoluble fiber
Apples	Apples (with skin)
Bananas	Barley
Black beans	Bran and bran cereals
Black-eyed peas	Brown rice
Blackberries	Bulgur
Blueberries	Carrots
Broccoli	Cauliflower
Brussels sprouts	Celery
Chickpeas	Couscous, whole wheat
Citrus fruit (oranges, grapefruit)	Cucumbers
Kidney beans	Green beans
Lentils	Pears (with skin)
Navy beans	Tomatoes
Northern beans	Vegetables, raw
Nuts and seeds	Wheat bran
Oat bran	Whole grain cereals
Oatmeal and foods made with oats	Whole grains
Peaches	Whole wheat breads
Pears	Whole wheat pasta
Peas, dried	Zucchini
Pinto beans	
Plums	
Prunes	
Strawberries	

## **Function**

The average American consumes only 14 grams of fiber each day, despite extensive research that shows that higher levels of fiber provide increased health benefits. The purpose of a high-fiber diet is to encourage people to eat more fiber in order to receive the advantages of those health benefits. The high-fiber diet is not designed specifically to be a weight loss diet, although weight loss may occur as a side effect of the diet.

Dietary fiber is the collective name for a group of indigestible carbohydrate-based compounds found in plants. They are the materials that give the plant rigidity and structure. Two types of fiber are important to human health, insoluble fiber and soluble fiber.

Insoluble dietary fiber from the plants moves through the digestive system essentially unchanged. It is not digested, and it does not provide energy (calories). Instead, fiber adds bulk to the waste (stool or feces) in the large intestine (colon). Increased bulk causes the walls of the intestine to contract rhythmically (peristalsis), so that waste moves through the large intestine more rapidly. In the colon, most of the water in digested food is reabsorbed into the body, and then the solid waste is eliminated. By passing through the colon more rapidly, less water is reabsorbed from the waste. The stool remains soft and moist and is easy to expel without straining.

Good sources of insoluble fiber include:

- whole grains and foods made of whole grains, such as whole wheat bread and whole wheat pasta, couscous, or bulgur
- bran and bran breakfast cereals
- brown rice
- carrots, cucumbers, and other raw vegetables

Soluble fiber is found dissolved in water inside plant cells. Like insoluble fiber, it is not digested and does not provide energy, although it may be consumed by bacteria that live in the digestive tract. In water, soluble fiber forms a gel-like substance. This gel absorbs water and helps to keep the stool soft. Good sources of insoluble fiber include:

- oatmeal and foods made with oats
- foods such as chili or split pea soup that contain dried beans and peas
- lentils
- apples
- pears
- citrus fruits

Because fiber is so important in the diet, the amount of fiber in canned goods, frozen foods, and other processed foods sold commercially must be shown on the label. A food that is labeled “high in fiber” contains 5 or more grams of fiber per serving. As of mid-2007, manufacturers were required to show only the total amount fiber in each serving of food. However, at this time regulations were under consideration that that would require soluble dietary fiber to be listed separately from total fiber. This is because soluble fiber has health benefits that insoluble fiber does not. A good list of high-fiber foods can be found at <http://www.gicare.pated/edtgs01.htm>

## **Benefits**

Perhaps the most important health benefit of a high-fiber diet is its potential to protect against heart disease. Multiple large, well-designed studies have shown that soluble fiber can lower blood cholesterol levels. High levels of cholesterol can lead to the build up of plaque, a hard, waxy substance, on the walls of arteries. This can block blood flow and result in stroke or heart attack. The mechanism for lowering cholesterol appears to be connected to the fact that cholesterol binds with soluble fiber in the intestine and can then be eliminated from the body or bile acids. Soluble fiber in oats and oat products appears to be more effective in lowering cholesterol than soluble fiber from other grains. This finding has been accepted by the American Heart Association which recommends a high-fiber diet to maintain or improve heart health.

A high-fiber diet can prevent digestive system problems such as constipation, **hemorrhoids**, and diverticulitis by keeping stool soft and easy to expel. Hemorrhoids are swollen veins around the anus caused by straining to eliminate stool. Diverticulitis is a disease in which, sections of the intestine bulge out to form pockets called diverticuli that collect food and become infected. Increased bulk and moisture from dietary fiber helps materials move more easily through the intestine and not become trapped in these pockets.

## **QUESTIONS TO ASK THE DOCTOR**

- Is this diet good for my entire family?
- Should I be taking any nutritional supplements while I am on this diet?
- Does this diet pose any special risks for me that I should be aware of?
- Is it safe for me to become pregnant while on this diet?

Claims have been made that a diet high in fiber reduces the risk of colon **cancer**. The theory is that fiber speeds up the elimination of waste from the colon. This decreases the time that cells lining the intestinal wall are exposed to potential cancer-causing agents. However, in the mid-2000s, a study that followed 80,000 nurses for 16 years found no relationship between dietary fiber and colon cancer. More research remains to be done in this area.

## **Precautions**

Fiber should be increased in the diet gradually. If fiber intake increases suddenly, abdominal pain, gas, and diarrhea may result. Also, when eating a high-fiber diet, it is important to drink at least 8 glasses (64 oz or 2 L) of water or other fluids daily. People whose fluid intake must be restricted for medical reasons should avoid a high-fiber diet.

## **Risks**

Few risks are associated with a high-fiber diet in healthy individuals. However, in people with gastrointestinal disorders such as **irritable bowel syndrome** and **inflammatory bowel disease**, a high-fiber diet may irritate the bowel and worsen their symptoms. Likewise, people who have had a surgical weight-loss procedure may be unable to tolerate a high-fiber diet. Adding bran fiber to foods is not recommended due to the risk of poor intakes of some **vitamins** that bind with phytates or oxalates in many high-fiber foods.

## **Research and general acceptance**

Many large, well-designed, long-term studies have been done on the health effects of a diet high in fiber, as noted in the Benefits section. The almost universally accepted result is that health benefits result when individuals meet or exceed the DRI for fiber for their age group. This concept is so well accepted that it has become the official position of the National Institutes of Health and other U.S. government agencies charged with improving the health of the nation. Increased fiber intake is included in the government-promoted goals for Healthy People 2010.

## **Resources**

### **BOOKS**

Spiller, Gene A. and Monica Spiller. *What's with Fiber?* Laguna Beach, CA: Basic Health Publications, 2005.

Watson, Brenda and Leonard Smith. *The Fiber35 Diet: Nature's Weight Loss Secret* New York: Free Press, 2007.

### **ORGANIZATIONS**

American Academy of Family Physicians. P. O. Box 11210, Shawnee Mission, KS 66207. Telephone: (913)906-6000. Website: <<http://www.aafp.org>>.

American Cancer Society. 1599 Clifton Road NE, Atlanta GA 30329-4251. Telephone: 800 ACS-2345. Website: <<http://www.cancer.org>>.

American College of Gastroenterology. P.O. Box 342260 Bethesda, MD 20827-2260. Telephone: (301) 263-9000. Website: <<http://www.acg.gi.org>>.

American Gastroenterological Association. 4930 Del Ray Avenue, Bethesda, MD 20814, Telephone: (301) 654-2089. Website: <<http://www.gastro.org>>.

National Digestive Diseases Information Clearinghouse (NDDIC). 2 Information Way Bethesda, MD 20892-3570. Telephone: (800) 891-5389. Fax: (703) 738-4929. Website: <<http://digestive.niddk.nih.gov>>.

### **OTHER**

FamilyDoctor.org. "Fiber: How to Increase the Amount in Your Diet." American Academy of Family Physicians, December 2005. <<http://www.familydoctor.org>>.

"Diverticulitis and Diet." EveryDiet.com, undated, accessed April 20, 2007. <<http://www.everydiet.org/diverticulitis.htm>>.

Jackson Siegelbaum Gastroenterology. "High-fiber Diet." 2006 <<http://www.gicare.pated/edtgs01.htm>>.

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Mayo Clinic Staff. "Dietary Fiber: An Essential Part of a Healthy Diet." MayoClinic.com, December 16, 2005. <http://www.mayoclinic.com/health/fiber/NU00033>>

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