



Dietary Fiber

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What are Dietary Fibers

Most dietary fibers are carbohydrates, but they are not digestible. The human body lacks the enzymes needed to breakdown dietary fibers for absorption. As a result, dietary fibers move into the lower intestine intact. Dietary fibers include many substances such as cellulose, hemicellulose, gums, pectins, lignins, mucilages, and tannins.

In general, dietary fibers are divided into two basic types: insoluble fibers and soluble fibers. Both types of fiber are important for good health. Insoluble fibers are found in foods such as wheat bran, corn bran, whole grain breads and cereals, and vegetables. Insoluble fibers help with intestinal function. Insoluble fibers absorb water and swell up in the intestine, resulting in a larger softer stool that moves through the intestine easier and faster. Soluble fibers are found in some fruits; oats; barley; and beans, peas and lentils. Soluble fibers form a gel when water is added to them. This contributes to a feeling of fullness in the stomach. Soluble fibers slow down the rate food leaves the stomach and some nutrients are absorbed. Soluble fibers also help control blood glucose and blood cholesterol levels.

Health Benefits of Dietary Fibers

Dietary fibers are important for good health. Dietary fibers provide health benefits for many conditions including constipation, diverticular disease, colon cancer, heart disease, and diabetes. However, dietary fibers are only one factor involved in these conditions. In addition to providing dietary fibers, foods rich in complex carbohydrates tend to be low in fat and contribute many other compounds such as vitamins, minerals, and phytochemicals that also may provide health benefits.

Digestive System

Insoluble fibers provide many health benefits in the digestive tract. Insoluble fibers absorb water resulting in a larger, softer stool that is faster and easier to eliminate, which can help relieve constipation.

Diverticular Disease

Diverticular disease is where there are protrusions or out-pouches in the wall of the colon. These pouches are believed to develop from excessive pressure, which weakens the wall of the colon. In many cases, there are no obvious symptoms, but in some people the diverticula become inflamed and painful. Insoluble fibers may help prevent diverticular disease by absorbing water making a larger, softer stool that requires less pressure to move through the digestive system.

Colon Cancer

Both insoluble and soluble fibers may protect against

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colon cancer. Insoluble fibers absorb water making a larger, softer stool. A larger stool can help dilute potential cancer causing substances in the intestine. Since a larger, softer stool moves through the intestine faster, the colon is exposed to any cancer causing substance for less time. Bile acids are released into the intestine to help with fat digestion. Bile acids can be converted into potential cancer causing substances in the intestine. Soluble fibers can bind bile acids and increase their excretion.

Heart Disease

Soluble fibers may have a role in lowering blood cholesterol. As mentioned, soluble fibers can bind to bile acids and increase their excretion. With fewer bile acids in the intestine, less fat is absorbed. Also by increasing bile acid excretion, the liver must use its cholesterol to make new bile acids.

Diabetes

Soluble fibers may have a favorable effect on blood glucose. Soluble fibers decrease the rate at which food is released from the stomach and delays glucose absorption into the blood. This may help prevent wide swings in blood glucose throughout the day.

How much Dietary Fiber

The Dietary Reference Intake for fiber is 14 grams per 1,000 calories. Dietary fiber can bind some minerals and decrease their absorption. However, if mineral intake is adequate a recommended dietary fiber intake will not compromise mineral balance. Fiber intake is like all nutrients in that "more" is not always "better." The importance of consuming a diet that provides a variety of nutrients is the key.

Fiber on the Food Label

The Nutrition Facts Panel on food labels lists the number of grams of fiber per serving of food. The Nutrition Facts Panel also lists the percent Daily Value one serving provides for fiber based on a 2,000 calorie reference diet. The FDA set a Daily Value (DV) on food labels for fiber at 28 grams for a 2,000 calorie diet. The following terms are used on food labels to describe the fiber content of foods.

- High source of fiber is 20 percent or more of the fiber DV per serving.
- Good source of fiber is 10 to 19 percent of the fiber DV per serving.

Adequate Intakes For Dietary Fiber (grams/day)

Age	Male	Female
0 to 6 months	Not Determined	Not Determined
7 to 12 months	Not Determined	Not Determined
1 to 3 years	19	19
4 to 8 years	25	25
9 to 13 years	31	26
14 to 18 years	38	26
19 to 30 years	38	25
31 to 50 years	38	25
51 to 70 years	30	21
71 years and older	30	21
Pregnancy < 19 years	-	28
Pregnancy 19-50 years	-	28
Lactation < 19 years	-	29
Lactation 19 - 50 years	-	29

Food Sources of Dietary Fibers

Dietary fibers come from plant foods. The best sources of dietary fiber are whole grain breads and cereals; fruits and vegetables; beans, peas and lentils; nuts and seeds. Foods are the best source of dietary fiber. Foods provide both soluble and insoluble fiber. In addition, food sources of fiber can be spaced out over the whole day.

You can get enough dietary fiber without using fiber supplements by choosing foods high in fiber and following the USDA MyPlate Plan recommendations of 2.5 cups of vegetables, 2 cups of fruit, and 6 oz. of grains for a reference 2,000 calorie diet. Cooking, processing, and removing peels can lower the fiber content in foods. The following tips can help you make higher fiber selections through the USDA MyPlate food groups.

Healthy Choices to Increase Fiber through the USDA MyPlate Food Groups

Grain Group

- To increase the fiber content in breads look for whole-grain breads with “whole wheat flour,” “stone-ground whole wheat flour” or “100 percent whole wheat flour” as the first ingredient.
- To increase the fiber content in cereals look for “whole-grain wheat,” “whole-grain oats” or “whole-grain rice” as the first ingredient.
- Brown rice is higher in fiber than refined white rice.
- Experiment with different food such as couscous, barley, bulgur, quinoa and kasha in salads, soups and casseroles to increase fiber.

Fruit and Vegetable Groups

- Fruits are naturally high in fiber. Fresh fruits are higher in fiber than frozen or canned. Peels and seeds in fruits increase fiber.
- Vegetables are also naturally high in fiber. To keep the fiber content of vegetables high, try eating them raw or steam just until tender. Leaving the skins on vegetables can also increase fiber.
- Add dried fruits to cereal, muffins and quick breads to increase fiber.

Protein Foods Group

- Beans, peas and lentils are low in fat and an excellent source of fiber, vitamins and minerals. Add beans, peas and lentils to soups, stews, salads and rice dishes.
- Nuts are a good source of fiber but are also high in fat.

Guidelines for Increasing Dietary Fiber

It is important to increase dietary fiber intake slowly. Increasing dietary fiber intake too fast may cause unpleasant side effects such as bloating and excessive gas. Since fiber absorbs water it also is important to drink plenty of fluids when increasing dietary fiber. Recommended fluid intake is 13 cups a day for males and 9 cups a day for females. Also, try to spread out high-fiber foods throughout the day.

References

- Whitney, E.N. & Rolfes, S.R. (2015). *Understanding Nutrition*, 14th ed., Wadsworth, Cengage Learning, Belmont, CA.
- United States Department of Agriculture. *Dietary Guidelines for Americans 2015-2020*. Accessed at <https://health.gov/dietaryguidelines/2015/guidelines/>
- United States Department of Agriculture. ChooseMyPlate.gov. Accessed at www.choosemyplate.gov

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