

## Fiber in the Diet

Dietary fiber is an important part of the diet. The fiber is actually composed of foods, which cannot be digested by the body. There are many types of fiber. Some fibers, such as those in oat bran, are called soluble, and in water forms a gelatinous bulk, which is capable of absorbing cholesterol and sugars, thereby preventing absorption by the body. Other fibers, such as those found in wheat bran, nuts or vegetables are considered insoluble and add bulk to the stool. Both are important and provide benefits, however, it is the insoluble fiber, which is the most important in maintaining colonic health.

## The Function of the Large Intestine

The principal function of the large intestine or the colon, is to remove water from the intestinal contents or chyme, which is deposited into the colon from the small intestine. If the food passes through the large intestine too quickly, not enough water is absorbed, and diarrhea results. In contrast, if waste material remains too long in the intestine, too much water is absorbed. This results in hard stools and constipation, often leading to straining.

## The Importance of Dietary Fiber

Fiber, also known as roughage or bulk, helps to retain water in the stool and promotes wavelike contractions that assist in the movement of food through the intestine. Foods high in fiber expand the inside wall of the colon, easing the passage of waste, by providing the bulk needed to carry the waste into the rectum prior to expulsion.

In non-Western countries, food is digested and eliminated in one-third the time it takes people who live in Western cultures. The difference is that the non-Western diet is much richer in fiber. The higher fiber content speeds up the time required to digest food and expel wastes, and also helps to sweep out harmful substances before they can cause problems in the body. It is interesting to note that people with higher fiber diets suffer less from many of the digestive tract diseases that plague Western man.

A high-fiber diet, with the associated large, soft, bulky stool, that passes through the bowel more easily and quickly, helps to prevent, stop, or even reverse some digestive tract disorders. The softer, larger stool helps prevent constipation and straining, which can help prevent and/or relieve hemorrhoids. More bulk means less pressure in the colon, and this is important in treating irritable bowel syndrome and diverticulosis.

Most Americans eat only 10-15 grams of fiber a day. The recommended intake is 30-35 grams a day. High fiber foods, such as fruits and vegetables, are lower in calories, and help to limit or control weight gain. Fiber containing pills or powders generally should be avoided, as they contain relatively lit-

tle fiber and are expensive. Fiber-containing foods are superior as they contain essential vitamins and minerals and are much less expensive. The fiber supplements are useful when food allergies or intolerance prevent adequate fiber intake.

## Irritable Bowel Syndrome and Fiber

Irritable bowel syndrome, also known as spastic colon or IBS, is a functional and/or motility disturbance of the lower digestive tract. There is no disease present in irritable bowel syndrome. However, its symptoms can mimic other diseases. The symptoms of IBS are constipation and/or diarrhea, abdominal pain, cramping and spasm. Acute episodes can be triggered by emotional tension and anxiety, poor dietary habits, and certain medications. Increasing the dietary fiber may help to relieve symptoms of irritable bowel syndrome by producing soft, bulky stools and by helping to normalize the pressure and time the stool takes to pass through the colon. This results in less discomfort. If irritable bowel syndrome is not treated it may lead to the development of diverticulosis.

## Diverticulosis and Fiber

Diverticulosis occurs when pockets or balloon-like sacks bulge out from the bowel wall. The diverticuli develop gradually over time and are due to prolonged or excessive pressure within the bowel. The diverticuli usually cause no symptoms, but sometimes may become infected causing diverticulitis, or even break open, causing an abscess or peritonitis. By increasing the bulk in the stool, the high-fiber diet reduces pressure within the colon. In doing so, diverticular formation may be eliminated and diverticulitis may be prevented.

## Cholesterol, Sugar and Fiber

Fiber types are divided into two categories. Insoluble fiber is found in wheat bran and in the cell walls or cellulose of vegetables and fruits. Soluble fiber is commonly found in oatmeal, oat bran (the best source), guar gum, fruit pectin and gum arabic. When mixed with water, it produces a gelatinous appearing gel. While known to have some bowel-regulating effects, soluble fiber also may lower blood cholesterol by binding with the cholesterol in the intestine and carrying it away in the stool. Similar effects have been noted with sugars and blood sugar levels. That is why a high fiber diet should contain both types of fiber.

## Cancer and Fiber

Recent evidence seems to indicate that fiber alone, even up to 30 grams a day, does not independently reduce the risk of colon or other cancers. However, societies, which consume fiber in quantities of 50-60 grams a day, have no colon cancer and/or polyps. There are other factors associated with fiber intake that play a major role. Most high fiber foods are also very rich in vitamins and minerals. These chemicals are known as anti-oxi-

dants, and attack other chemicals known as free radicals. Free radicals occur in the body as natural by-product of metabolism, yet, they can damage surrounding cells and may be related to the increased risk of heart disease, macular degeneration (eye problems), and cancers. Hundreds of very potent anti-oxidants occur in many fruits, whole grains, nuts, and vegetables, which are also high in fiber, especially those that are rich in color such as dark green, yellow, red, or orange. Nature seems to have naturally put these two substances together, and five portions of fruits and/or vegetables are recommended each day.

## Miscellaneous Fiber Facts

Not all fiber is equal. Man-made or processed types of fiber such as psyllium (Fibercon, Konsyl, Metamucil) and methylcellulose (Citrucel) may be more convenient, however, these products are lacking the important antioxidants found in grains, nuts, fruits, and vegetables.

With regard to overall intestinal health, the old saying, "you are what you eat," applies closely. Fiber and the anti-oxidants contained in fiber may be associated with improvements or prevention of many conditions including: 1) diabetes, 2) bowel irregularity, constipation or diarrhea, 3) irritable bowel syndrome and 4) colon polyps and cancer.

## Fiber Containing Foods

High fiber foods can be found in most food groups. Different types of food should be selected to get the maximum benefit.

- 1. Legumes** - The bean family is superior as it contains both soluble and insoluble types of fiber, including kidney, pinto, navy, lima, and baked beans.
- 2. Whole Grains** - Wheat bran and oat bran are present in a variety of cereals and breads. The label should say that the bread contains whole wheat or whole grain. Plain white bread is entirely lacking in fiber, and the color may be deceiving, as some manufacturers artificially color bread brown to make it look more wholesome.
- 3. Whole Fresh Fruits** - Valuable pectin-type fiber is found in the pulp. Skins, membranes, and seeds are insoluble fiber. Figs, prunes and raspberries have the highest fiber content.
- 4. Cooked or Stewed Fruits** - Apricots, prunes and apples are good choices.
- 5. Cruciferous and Green Leafy Vegetables** - Lettuce, spinach, celery, cucumbers, cauliflower, and broccoli are good examples.

**6. Root Vegetables** - Potatoes, yams, sweet potatoes, turnips, and carrots are all excellent sources.

## General Guidelines

The following are some good general guidelines to help you begin your high fiber diet:

1. Drink plenty of liquids, including fruit or vegetable juices and water.
2. Eat slowly and chew food thoroughly to allow the upper digestive tract (esophagus, stomach and small intestine) to work well. This will help avoid problems from developing in the lower digestive tract.
3. Eat meals at regular intervals.
4. Initially, large amounts of fiber, especially wheat bran may cause rumbling, cramping and/or intestinal gas. Therefore, it is advised that you should begin with small amounts initially, slowly increasing the amount as tolerance is acquired. The goal should be 30-35 grams of fiber a day, which will usually produce 1 to 2 soft, formed stools daily.

## Dietary Fiber Supplements

For those people who have trouble tolerating many high fiber foods, such as wheat, fruits and vegetables, stool softening and bulking agents are available over the counter. These products are usually plant fiber which acts to absorb water and produce bulk, for the digestive tract to perform naturally. Psyllium fiber is found in many commercial products such as Metamucil, Per Diem and Konsyl. There are both sugar containing and sugar-free products. Most pharmacies carry a generic brand at significant cost savings. Citrucel (hemicellulose) and Equilactin (polycarboxisal) are other bulking agents that can be used. These fiber supplements, in conjunction with foods, offer an easy way to reach the fiber goal of 30-35 grams per day. However, use of these products should be strictly limited to those who are unable to eat normal high fiber foods.

## Fiber Content of Foods

Goal - 30 to 35 grams per day

Common servings of foods containing dietary fiber are shown below. It is best to select a variety of foods every day. Foods that are good sources of fiber are typically low in fat and calories.

serving size                      grams of dietary fiber

### BREADS

1 medium	bran muffin	3
1 slice	whole wheat bread	2
1 slice	white bread	1
1 slice	pumpernickel bread	1
1 slice	rye bread	1
1 slice	raisin bread	1
4 squares	saltines	0

### CEREALS AND PASTA

1 ounce	Kellogg's All-Bran Extra Fiber	14
1 ounce	General Mills Fiber One	12
1 ounce	Kellogg's All-Bran	9
1 cup	whole wheat pasta	5
1 ounce	Kellogg's Bran Flakes	4
1 ounce	Post Fruit and Fiber	4
1.4 ounces	Kellogg's Raisin Bran	4
1 ounce	Nabisco Shredded Wheat'n Bran	4
1 ounce	oatbran	4
1 ounce	General Mills Raisin Nut Bran	3
1 ounce	General Mills Cheerios	2
1 ounce	Post Grape-Nuts	2
1 ounce	oatmeal	2
1 cup	popcorn	2
1 ounce	General Mills Total	2
1 ounce	General Mills Wheaties	2
1 cup	pasta	<1
1 ounce	Kellogg's Corn Flakes	<1
1/2 cup	cooked brown rice	<1
1/2 cup	cooked white rice	<1
1/2 cup	egg noodles	0

### LEGUMES

1/2 cup	kidney beans	9
1/2 cup	baked beans	7
1/2 cup	navy beans	5

1/2 cup	pinto beans	5
1/2 cup	lentils	2

### VEGETABLES

1/2 cup	cooked frozen peas	4
1 medium	potato (with skin)	4
1/2 cup	cooked broccoli tops	3
1/2 cup	cooked young carrots	3
1/2 cup	cooked corn	3
1/2 medium	fresh avocado	2
1/2 cup	cooked green beans	2
1/2 cup	Brussels sprouts	2
1/2 cup	cooked eggplant	2
1/2 medium	cooked sweet potato	2
1/2 cup	raw cabbage	2
1/2 cup	raw bean sprouts	1
1/2 cup	raw lettuce	1
1/2 cup	sliced raw mushrooms	1
1 medium	dill pickle	1
1/2	mashed potatoes	1
10 medium	French fried potatoes	1
1/2	fresh tomato	1
1 stalk	raw celery	<1
6 slices	raw cucumber	<1
2 rings	green pepper	<1
1/2 cup	raw onions	<1

### FRUITS AND NUTS

3.5 ounces	dried figs	18
32.5 ounces	prunes	8
3.5 ounces	raspberries	7
1/4 cup	almonds	5
1 medium	apple (with skin)	3
1 medium	banana	3
1/2 cup	blackberries	3
5 dried	dates	3
1 medium	nectarine	3
1 medium	peach (with skin)	3
1/4 cup	roasted peanuts	3
1 cup	strawberries	3
1	pear (with skin)	2
1/4 cup	cantaloupe	2

10 medium	olives	2
1 medium	orange	2
2 tablespoons	smooth peanut butter	2
1 medium	tangerine	2
1/4 cup	walnut pieces	
1 medium	apricot	1
10 large	cherries	1
1/2 medium	grapefruit	1
1/2 cup	pineapple	1
2 tablespoons	raisins	1
2 medium	plums	<1
1/2	orange juice	0

### SPECIAL INSTRUCTIONS:

#### ENDOSCOPIC MICROSURGERY ASSOC., P.A. MARK D. NOAR, M.D. & ASSOCIATES

Therapeutic Endoscopy, Gastroenterology & Hepatology

7402 York Road, Suite 100                      (410) 494-1846  
Towson, MD 21204

9110 Philadelphia Road., Suite 108                      (410) 574-2566  
Baltimore, MD 21237

620 W. McPhail Road., Suite 104                      (410) 569-4444  
Bel Air, MD 21014

Hunt Valley Medical Center                      (410) 494-1846  
10 Warren Road, Suite 110, Cockeysville, MD 21030

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# The High Fiber Diet



## Endoscopic Microsurgery Associates