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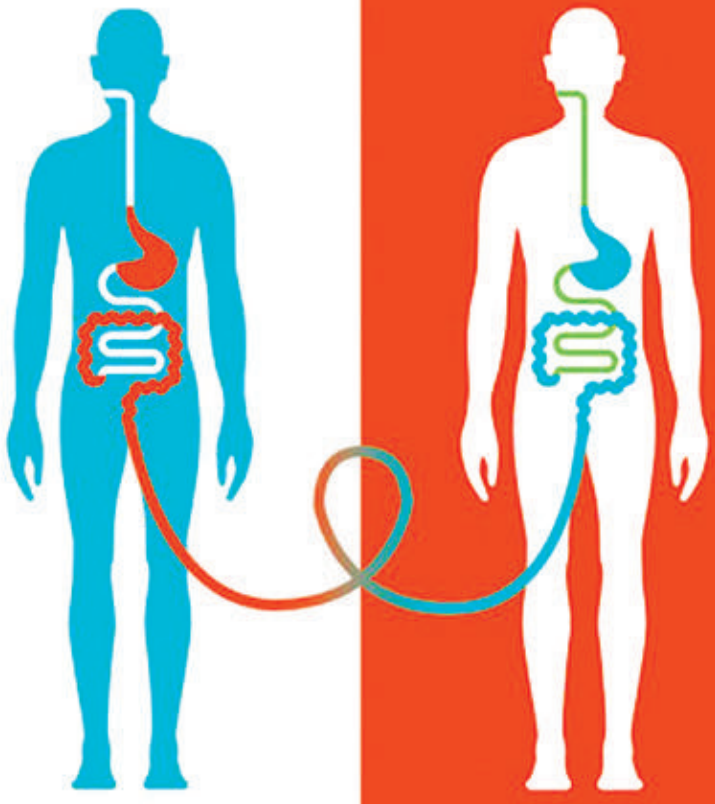

Fecal Microbiota Transplant - An Emerging Boon for Mankind

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Dietary Fiber: An Amplified Use

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Introduction

There are various fiber products available in the market today, containing either a natural fiber, such as inulin, psyllium or β-glucan. Some are synthetically created products such as polydextrose (synthetic polymer of glucose and sorbitol), wheat dextrin (heat/acid treated wheat starch), or methylcellulose. There is significant difference between what is called a dietary fiber (the non digestible carbohydrates and lignin that are intrinsic and intact in plants) and functional fiber (the isolated, non digestible carbohydrate). A fiber to be considered functional fiber, should be isolated from a non digestible carbohydrate found in a fiber supplement and must have clinical evidence of a therapeutic physiologic effect. When stating the term "fiber supplement" it implies that the product helps make up for the shortfall in fiber consumption from the foods such as fruits, vegetables, and whole grains, This article helps us to understand the importance of fiber supplements which actually have clinical evidence of a beneficial physiologic effect and are qualified as functional fibers.

Background and significance

The data that we have today about the health benefits of high dietary fiber due to consumption from fruits, vegetables, and whole grains comes mainly from population-based (epidemiologic) studies.

Dietary fiber which is supposed to be found mainly in fruits, vegetables, whole grains and legumes — is probably the best known for its ability to prevent and relieve constipation. Foods containing fiber can provide other health benefits as well, like helping to maintain a healthy weight and lowering the risk of diabetes and cardiovascular disease.

What is dietary fiber?

Food components, such as fats, proteins or carbohydrates are broken down and absorbed by the body. But fiber isn't digested by the body. Dietary fiber, known popularly as roughage diet or bulk diet, includes mainly the parts of plant foods that our body can't digest or absorb. Hence, it passes relatively intact through our stomach, small intestine and colon and out of the body.

Fiber is commonly classified basing on the solubility as soluble, which dissolves in water, or insoluble, which doesn't dissolve.

- Soluble fiber. This type of fiber gets dissolved in water and forms a gel-like material. It can help lower blood cholesterol and also glucose levels. Soluble fiber is found in oats, peas, beans, apples, citrus fruits, carrots, barley and psyllium.
- Insoluble fiber. This type of fiber helps the movement of food through the digestive system there by increases stool bulk. This kind is therefore beneficial to those who struggle with constipation or irregular stools. Whole-wheat flour, wheat bran, nuts, beans and vegetables, such as cauliflower, green beans and potatoes, are considered good sources of insoluble fiber.

Some plant-based foods, such as oatmeal and beans, contain both soluble and insoluble fiber. However, the amount of each type of fiber varies significantly in different plant foods.

How much fiber do you need?

The guidelines for adequate intake of daily dietary fiber are based on the significant association between a high-fiber diet and a reduced risk for cardiovascular disease. The Institute of Medicine recommends a fiber intake of about 25 g/day for women and 38 g/day for men (adults aged 21–50). Older adults tend to consume fewer calories, so the recommendation for women and men over 50 is 21 and 30 g/day, respectively. Only about 5% of the population achieves the recommended level of dietary fiber consumption. On an average, adults tend to consume only about 15 g of fiber per day, and those who are on a low carbohydrate diet consume less than 10 g per day.

The Institute of Medicine, which provides science-based advice on matters of medicine and health, gives the following daily fiber recommendations for adults:

Fiber: Daily recommendations for adults

	Age 50 or younger	Age 51 or older
Men	38 grams	30 grams
Women	25 grams	21 grams

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Foods containing high fiber include

- Whole-grain products
- Fruits
- Vegetables
- Beans, peas and other legumes
- Nuts and seeds

The grain-refining process of refined foods removes the outer coat (bran) from the grain, which lowers its fiber content. Enriched foods have some of the B vitamins and iron back after processing, but not the fiber. Refined or processed foods such as canned fruits and vegetables, pulp-free juices, white breads and pastas, and non-whole-grain cereals are therefore lower in fiber content,

Benefits of a high-fiber diet

A high-fiber diet has many benefits, which include:

- **Normalizes bowel movements of both large and small intestine**

  Dietary fiber is supposed to increase the weight and size of the stool and softens it. It makes the stool bulky which is easier to pass, decreasing the chance of constipation. In case of loose, watery stools, fiber also helps to solidify the stool because it absorbs water and hence adds bulk to stool.

- **Maintains bowel health**

  A high-fiber diets always slower the risk of developing hemorrhoids and small pouches in the colon (diverticular disease). Some fiber is fermented in the colon.

- **Lowering cholesterol levels**

  Soluble fiber found in beans, oats, flaxseed and oat bran helps lower total blood cholesterol levels by lowering low-density lipoprotein, or "bad," cholesterol levels. Studies also have shown that high-fiber foods have other heart-health benefits, such as reducing blood pressure as well as inflammation.

- **Helps control blood sugar levels**

  In people with diabetes, fiber — mainly soluble fiber — slows the absorption of sugar which in turn would help improve blood sugar levels. A diet that includes insoluble fiber may also reduce the risk of developing type 2 diabetes.

- **Aids in achieving healthy weight.**

  High-fiber foods tend to be more filling compared to low-fiber foods, hence person is likely to eat less and stay satisfied longer and high-fiber foods tend to take longer to eat and to be less "energy dense," which means they have fewer calories for the same volume of food.

Another benefit attributed to dietary fiber is prevention of colorectal cancer. However, the evidence that fiber reduces colorectal cancer is mixed

Evidence Based Studies

What we believe today about the health benefits of dietary fiber is derived from population-based epidemiologic studies, which can assess for statistical associations, but lack the control necessary to establish causation. In contrast, the isolated fibers in fiber supplements are readily assessed for a direct health effect in well-controlled clinical studies. In the small intestine, clinical evidence supports that viscous, gel-forming fiber (e.g., psyllium, β-glucan) effectively lowers elevated serum cholesterol, and improves glycemic control in patients with metabolic syndrome and type 2 diabetes. Low viscosity/non viscous soluble fibers (e.g., inulin, wheat dextrin) and insoluble fiber (e.g., wheat bran) are not providing these viscosity-dependent health benefits. In the large intestine, fiber must resist fermentation to remain intact in stool and significantly increase stool water content, in order to provide a laxative effect. Large/coarse particles of insoluble wheat bran can provide a mechanically cause an irritating effect, stimulating the mucosa to secrete water and mucous.

Non fermented gel-forming psyllium retains its high water-holding capacity to provide a dichotomous stool normalizing effect. It softens hard stool in constipation, firms' loose/liquid stool in diarrhea, and normalizes stool form in patients with IBS.

Dietary Fiber Requirements

	Age	Adequate Intake
Children	1-3 years	19g
	4-8 years	25g
Boys	9-13 years	31g
	14-18 years	38g
Girls	9-13 years	26g
	14-18 years	26g
Adult Men	19-50 years	38g
	>51 years	30g
Women	19-50 years	25g
	>51 years	21g
	Pregnancy	28g
	Breast feeding	29g
Co-Morbi-dities	Diabetes	25-50g
	Cardiac Problems	25-35g

Different sources of fiber foods

Fruits	Serving size	Total fiber (grams)*
Raspberries	1 cup	8.0
Pear, with skin	1 medium	5.5
Apple, with skin	1 medium	4.4
Banana	1 medium	3.1
Orange	1 medium	3.1
Strawberries (halves)	1 cup	3.0
Figs, dried	2 medium	1.6
Raisins	1 ounce (60 raisins)	1.0

Legumes, nuts and seeds	Serving size	Total fiber (grams)*
Split peas, boiled	1 cup	16.3
Lentils, boiled	1 cup	15.6
Black beans, boiled	1 cup	15.0
Beans	1 cup	10.4
Almonds	23 nuts	3.5
Pistachio nuts	49 nuts	2.9

Grains, cereals	size	Total fiber (grams)
Barley, pearled, cooked	1 cup	6.0
Oat bran muffin	1 medium	5.2
Oatmeal, instant, cooked	1 cup	4.0
Popcorn, air-popped	3 cups	3.6
Brown rice, cooked	1 cup	3.5
Bread, whole-wheat	1 slice	1.9

Vegetables	Serving size	Total fiber (grams)*
Broccoli, boiled	1 cup	5.1
Turnip greens, boiled	1 cup	5.0
Potato, with skin, baked	1 small	2.9
Tomato paste, canned	1/4 cup	2.7
Carrot, raw	1 medium	1.7

Conclusion

It is important for the people to understand the importance of the use of dietary fiber that drive specific related health benefits. Awareness should be increased so that the amplified use of these high dietary fiber products would decrease the health related risks and also help in increasing the quality of life of the people,

The Osborn wave is a deflection with a dome or hump configuration occurring at the R-ST junction (J point) on the surface ECG. It was first described by Dr. John Osborn in the year 1953 as an “injury current” resulting in ventricular fibrillation during experimental hypothermia. However more recent evidence suggest that hypothermia increases the epicardial potassium current relative to the current in the endocardium during ventricular repolarization and this transmural voltage gradient is reflected on the surface electrocardiogram as Osborn wave. The other causes of prominent Osborn waves include early repolarization variant, hypercalcemia, and the Brugada syndrome. They are also named as camel-hump waves or hypothermic waves. They become more prominent with fall of body temperature and gradually resolve with rewarming.

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