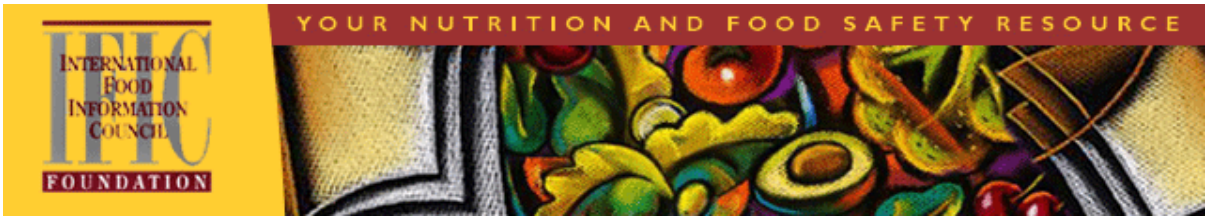

Fiber Fact Sheet

Bottom Line

The potential health benefits of consuming adequate amounts of dietary fiber are diverse, just as the definitions of fiber and the foods that provide it are varied. A wealth of scientific evidence supports the *Dietary Guidelines for Americans* recommendation to choose fiber-rich fruits, vegetables, and whole grains often. We have learned much about certain fibers, including wheat bran for promoting regularity as well as beta glucan from oats and barley and soluble fiber from psyllium for lowering cholesterol levels. Still, there remains more to be learned about other types of fiber and the amounts of these fibers required to produce the greatest health benefits, not only for reducing heart disease, but for other potential benefits including maintaining and improving digestive health, maintaining a healthy body weight, and reducing risk of diabetes and some types of cancer.

Introduction

Interest in fiber as a health-promoting food component began in the 1960s. However, prior to the early 1970s, fiber received little attention from health experts. It was often referred to as “crude fiber” and the understanding of its role in health was indeed “crude.” Fiber began to make health news when studies observed that certain populations with a high fiber intake had lower rates of certain conditions and diseases, including constipation, diverticular disease, some types of cancer, and heart disease.[1] These findings sparked an interest in the relationship of fiber to human health that continues today. Additionally, a proposed new definition for fiber may also have an impact on fiber labeling and analysis, food composition databases, development of new ingredients, and nutrition guidelines and communications with consumers.

Over the last decade, significant developments have been made in our understanding of fiber and its role in the promotion of health and disease risk reduction. A wealth of scientific evidence demonstrates that adequate dietary fiber intake has a number of health benefits, including maintenance of healthy laxation and the reduced risk of cardiovascular disease. The 2005 *Dietary Guidelines for Americans* recommendation to “choose fiber-rich fruits, vegetables, and whole grains often” is based on this evidence.[2] Other potential health benefits being investigated include fiber’s role in maintaining a healthy weight, reducing risk of some types of cancer, and glucose modulation.

Yet, intake of fiber is consistently below recommended amounts.[3] The introduction of fiber-rich foods, including whole grain breads and cereals as well as fruits and vegetables, early in a child's life, may promote acceptance and continued consumption of these foods later in life. Research has shown that healthful foods may need to be introduced up to eight or 10 times before the food is accepted.[4] Additionally, the development of new fiber ingredients and improvements in food formulations have, and will continue to, improve the taste of fiber-containing processed foods. For example, certain fibers such as inulin, polydextrose, and oligofructose can be used to enhance the inherent fiber content of certain foods or be added to foods that typically do not contain fiber in order to help consumers increase their fiber consumption.

Fiber Recommendations and Intake

In 2002, the Institute of Medicine (IOM) established an Adequate Intake (AI) level for fiber as part of the Dietary Reference Intake (DRIs) for macronutrients. The AIs for total fiber are based on amounts that have been observed to protect against heart disease.[5] The IOM recommends that people of all ages consume 14 grams of fiber for each 1,000 calories. Based on the available research, the IOM panel felt there was insufficient evidence to set a Tolerable Upper Intake Level (UL) or Recommended Daily Allowance (RDA) for fiber. Please see Table 1 for recommendations by age and sex.

Table 1: Fiber Recommendations by Age and Sex

Population	Daily Fiber Recommendation
Children ages 1-3 years old	19 grams
Children ages 4-8 years old	25 grams
Young boys ages 9-13 years old	31 grams
Young girls ages 9-13 years old	26 grams
Teenage boys ages 14-18 years old	38 grams
Teenage girls ages 14-18 years old	26 grams
Young and adult men ages 14-50 years old	38 grams
Young and adult women ages 19-50 years old	25 grams
Men ages 50 years and older	30 grams
Women ages 50 years and older	21 grams

Chart adapted from: Institute of Medicine *Dietary Reference Intakes: Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids.* Washington, DC, National Academies Press, 2002

Most Americans consume about half the amount of fiber recommended by the IOM. According to the 2003-2004 National Health and Nutrition Examination Survey (NHANES 03-04), average intakes of dietary fiber from food range from 15.0 to 18.3 grams/day for adult men 19-50 years and 12.3 to 13.8 grams/day for adult women 19-50 years.[3] However, some more novel fibers such as inulin and oligofructose, are not yet included in the USDA food composition database used to estimate fiber intake in national nutrition surveys; therefore, these average intakes may be slightly underestimated.

Fiber is consumed primarily as a component of processed, whole, and fiber-enriched foods. The major food sources, accounting for 85 percent of the fiber in the U.S. food supply, are grain products, vegetables, legumes, nuts, soy, and fruits.[6] Of this total, grain products account for more than a third of the fiber in the food supply. White flour is considered a major contributor, yet it has only about 40 percent of its original fiber content.[7] Legumes are rich sources of fiber, providing about 6-9 grams of fiber per ½-cup serving. Whole grain foods supply about 1-5 grams per serving, with fiber amounts reaching 9 grams or more per serving for bran cereals. However, the total amount of fiber for a whole grain food can vary widely depending on the reference amount or labeled serving size. Fruits and vegetables supply varying amounts of fiber, about 1-4 grams per serving, depending on whether the skin is consumed.[8] See "Examples of Dietary Fiber" chart below.

Health Effects of Fiber

Gastrointestinal Health

Fiber plays an important role in normal laxation, which is related primarily to fiber's effect on stool weight.[9] An increase in stool weight is caused by the presence of fiber, the water that the fiber holds, and by partial fermentation of the fiber, which increases the amount of bacteria in the stool.[10] A larger and softer mass produced by consuming fiber-containing foods causes the large intestine to contract and move the contents towards excretion more rapidly. This reduction in transit time through the intestinal tract promotes bowel regularity and plays a role in preventing constipation and diseases of the large intestine.[11] Different types of fiber have varying effects on stool weight. Cereal fibers, such as bran, are most effective in increasing stool weight and decreasing transit time, since these fibers are partially fermented in the large intestine.[12]

Diets low in fiber should not be assumed to be the cause of constipation, but may be considered a contributing factor. Increasing fiber intake may aid in relieving mild to moderate constipation, yet a higher fiber diet may not improve or may worsen bowel patterns in some individuals with chronic constipation or irritable bowel syndrome (IBS).[13,14] Still, fiber may improve stool consistency in some individuals with IBS with constipation, but it has not been found to improve the abdominal pain, distension, or bloating associated with IBS.[11,15] Some types of "prebiotics" (readily fermentable fibers, such as lactulose, that promote beneficial bacteria) have been found effective in improving stool frequency and consistency in individuals with mild-to-moderate constipation.[16] More research is needed to determine the effects of prebiotic fibers on chronic constipation and IBS.

Animal studies of the effects of prebiotic fiber on chronic inflammatory bowel diseases (IBD), including Crohn's disease and ulcerative colitis, show promising results. Prebiotics stimulate the growth and metabolism of protective bacteria, helping to restore a normal balance of intestinal bacteria, which appears to be associated with reduced disease activity in individuals with IBD.[17] More research

will help identify the specific types of prebiotics that may be effective in the dietary management of different types of IBD.

A diet adequate in fiber is believed to reduce the risk of diverticular disease, which is prevalent in older adults.[9,18] With the bulking action of some types of fiber, less forceful contractions are needed to propel the contents of the colon, thus reducing the likelihood of developing diverticula, or pockets that form in the mucosal layer of the colon. Inflammation of the diverticula results in acute divericulitis. A high-fiber diet is accepted as traditional treatment for diverticular disease to prevent the formation of additional diverticula, lower the pressure in the colon, and reduce the possibility of an existing diverticula becoming inflamed.[9] More recent research is revealing that bacterial overgrowth or imbalance may be involved in the development of diverticular disease.[19] Thus, the possibility of increased relevance of the use of prebiotics (and probiotics, the direct addition of beneficial bacteria to food) in the dietary management of this disease requires exploration.

Cancer

While the science continues to emerge regarding the specific role of dietary fiber and cancer, many studies have shown that diets high in fiber-containing foods are associated with reduced risk of some types of cancer. After reviewing the available evidence, the US Food and Drug Administration (FDA) found sufficient scientific support to issue a health claim stating that diets low in fat and high in fiber-containing grain products, fruits, and vegetables may reduce risk of some cancers.[20] Most research studies examining the link between fiber and cancer have focused on colorectal cancer with fewer studies on breast cancer. The relationship of fiber intake to colon cancer is the subject of ongoing investigation. Extensive evidence supports the theory that fiber protects against colorectal cancer.[21,22] The proposed mechanism is that fiber's effect on increasing bulk and decreasing transit time helps to "sweep" cancer-causing substances out of the large intestines. However, inconsistent findings from large observational studies have spurred controversy and debate about whether fiber truly plays a role in reducing the risk of colorectal cancer. Several intervention studies and a recent pooled analysis of 13 studies found no significant relationship between fiber intake and risk of colorectal cancer.[23-25]

Possible explanations for the conflicting results have been suggested. Reasons why fiber failed to demonstrate a benefit may include insufficient study length, timing of the intervention related to development or recurrence of cancer, the confounding role of other dietary factors, and the potential that study participants did not consume sufficient amounts or the right types of fiber to positively affect results.[5,9] Inconsistency in the results of fiber and colorectal cancer studies indicates that further research is warranted. Longer-term trials and higher levels of fiber intake are strategies recommended for further investigation.[26] Until then, experts agree that the potential benefits of fiber related to reducing the risk of colorectal cancer are enough reason to continue promoting increased consumption. In a large prospective study examining the effects of fiber on

gastric cancer, cereal fiber was associated with reduced gastric cancer risk, which confirms the findings from numerous case-controlled studies.[27]

A growing number of studies have examined the relationship of fiber intake on development of breast cancer. Fiber may protect against certain types of breast cancer by decreasing blood levels of estrogen. The strongest associations have been observed between greater intakes of bread and cereal fiber and reduced breast cancer incidence.[28] However, other studies have found no correlation between breast cancer and cancer incidence.[29,30] Further investigation, especially related to the extent to which fiber may decrease estrogen levels in the body, is necessary to determine if fiber plays a role in reducing risk of breast cancer.

Heart disease

The evidence for fiber's role in reducing risk of coronary heart disease (CHD) is strong enough that the recommended AI for fiber is based on the intake level observed to protect against CHD. The studies conducted to date have found reduced CHD rates in individuals consuming certain sources of dietary fiber (cereal foods) and certain viscous fibers (gums such as oatmeal and barley and pectins such as apples, berries, and citrus fruits). This benefit is believed to be primarily a result of fiber's effects on interfering with cholesterol and bile acid absorption, thus lowering blood levels of total cholesterol and low-density lipoprotein (LDL) cholesterol. Another proposed mechanism is the delayed absorption of fat and carbohydrate, which leads to increased insulin sensitivity and decreased levels of circulating triglycerides.[5] A recent American Dietetic Association position paper on dietary fiber and health also suggests other mechanisms, including fiber's affect on blood pressure and C-reactive protein, which are also biomarkers for cardiovascular disease risk.[31]

Several studies have examined the effects of various fiber types (cereal, fruit, and vegetable) on the risk of coronary heart disease. Three large prospective studies, which were instrumental in setting current intake recommendations, found a strong relationship between cereal fibers and a weak or no relationship between vegetable and fruit fibers.[32-34] More recently, a pooled analysis of research confirmed that CHD risk was 10 to 30 percent lower for both men and women for each 10 gram per day increment of total, cereal or fruit fiber.[35] Further investigation has revealed that the viscous fibers, including oat bran (beta-glucan), psyllium, pectins, and guar gum, are most effective in reducing blood cholesterol levels.[36,37] Two of these fibers, beta-glucan (from oats or barley) and psyllium have been sufficiently researched for the FDA to issue an approved health claim for soluble fiber and risk of CHD.[38,39] Furthermore, soluble fiber sources from oats, barley, and pectin-rich fruits and vegetables provide lipid lowering benefits beyond those achieved by reducing intake of saturated fat and total fat alone.[40] The American Heart Association's 2006 Diet and Lifestyle Recommendations emphasize high-fiber foods, especially whole-grain products, legumes, fruits and vegetables, as part of an overall dietary pattern to reduce the risk of heart disease in the general population.[41] An added benefit observed with

increasing fiber intake from whole grains, fruits and vegetables is preventing the rise in blood levels of triglycerides, a consequence often associated with a low-fat, high carbohydrate diet.[42]

Diabetes

According to a number of observational studies, consumption of foods containing fiber has been associated with a reduced risk of type 2 diabetes.[5] Dietary fiber is thought to play an important role in the reducing the risk of diabetes and nutritionally managing the disease by helping to normalize the glucose response and decrease insulin concentration and requirements. Higher intake (between 13-16 grams per day or greater) of dietary fiber, especially cereal fiber, has been consistently associated with lower risk of type 2 diabetes and improved insulin sensitivity.[43-46] While the exact mechanism for these effects related to non-viscous fibers are unclear, viscous fiber from oats, legumes, gums, and pectins has been found to significantly reduce the glycemic response by delaying gastric emptying and glucose absorption.[47,48] Yet, studies support a stronger link between non-viscous fiber, mainly from whole grain foods, and reduced risk of developing insulin resistance and type 2 diabetes. One explanation for this difference is that the quantity of viscous fiber consumed in the average diet is insufficient to observe a significant effect on glycemic control.[49] In addition to fiber, other components of whole grains, including magnesium, vitamin E, phytic acids, and phenolic compounds, also may contribute to the decreased risk of type 2 diabetes.[50,51]

Current guidelines for the prevention and dietary management of diabetes from the American Diabetes Association include the recommendation to consume a variety of fiber-containing foods such as legumes, fiber-rich cereals, fruits, vegetables, and whole grain products.[52] The recommended level of dietary fiber is 14 g/1,000 kcal and one-half of grain intake as whole grains, consistent with fiber and whole grain intake goals set for the general population. Evidence is lacking to recommend a higher fiber intake for people with diabetes than for the population as a whole.

Weight management

Meals rich in fiber are processed more slowly by the body, provide more volume compared to lower fiber meals, and tend to produce a feeling of fullness with fewer calories. In addition, high fiber foods require more chewing and may take longer to eat, thus potentially limiting the total energy intake. These qualities are believed to be involved in the control of energy balance and body weight.[53] However, the strongest evidence to support fiber's role in weight management comes from studies that found an association between a fiber-rich diet and lower body mass index (BMI).[5] Although evidence suggests that increased fiber intake results in increased satiety and decreased hunger, the question of whether these changes facilitate decreased energy intake leading to weight loss remain unanswered. Additional research is needed to determine the amounts and types of fiber required to produce the greatest effects on managing body weight.

Table 2 below, “Examples of Dietary Fiber” provides specific examples of fiber, where they are found in the diet, and their potential health benefit.

Table 2: Examples of Dietary Fiber (Functional and Total)		
Class/Component	**Source***	**Potential Benefit**
Insoluble fiber	Wheat bran, corn bran, fruit skins, whole wheat, nuts	May contribute to maintenance of a healthy digestive tract; may reduce the risk of some types of cancer
Beta glucan**	Oat bran, oatmeal, oat flour, barley, rye	May reduce the risk of coronary heart disease (CHD); may lower blood cholesterol levels
Soluble fiber**	Psyllium seed husk, peas, beans, apples, citrus fruit	May reduce the risk of CHD and some types of cancer; may lower blood cholesterol levels
Whole grains**	Cereal grains, whole wheat bread, oatmeal, brown rice	May reduce the risk of CHD and some types of cancer; may contribute to maintenance of healthy blood glucose levels; may promote healthy weight maintenance
Lignins	Flax, rye, some vegetables	May contribute to maintenance of heart health and healthy immune function
Prebiotic fibers (Inulin, Fructooligosaccharides (FOS), Polydextrose, Galactooligosaccharides	Whole grains, onions, some fruits, garlic, honey, leeks, fortified foods and beverages, inulin from chickory root	May improve gastrointestinal health; some may improve calcium absorption

Chart adapted from *International Food Information Council Foundation Functional Foods Backgrounder* available at: http://www.ific.org/nutrition/functional/index.cfm

*****Examples are not an all-inclusive list

******FDA approved health claim established for this component

Fiber Innovations and Prebiotics

A greater understanding of fiber's role in health has brought innovations in the development of fiber-enhanced foods and ingredients. Ingredients are being developed to boost fiber content in various foods, some of which would not be expected to contain fiber.[54] Traditionally, corn, wheat, and oats have supplied the fiber for use as a food ingredient in other foods. However, there are many other sources of fiber from fruits, vegetables, legumes and seeds that can also be extracted and added to other foods. Examples include a concentrated fiber source derived from barley, digestion-resistant maltodextrin-based ingredients, and formulations that include polydextrose and other ingredients that supply fiber and serve as lower-calorie substitutions for sugar and corn syrup.[54,55] These concentrated fiber sources are being formulated to introduce or increase fiber in a variety of foods, including grain products, baked goods, snacks, cereals, vegetarian patties, side dishes, pasta, and beverages.

Fiber ingredients such as pectins, gums, inulin, polydextrose, and oligofructose may offer multifunctional benefits, including prebiotic functions. Prebiotics are nondigestible food components that feed and stimulate the growth of friendly bacteria in the digestive tract (when added directly to foods or supplements, these beneficial bacteria are known as probiotics), which help to ensure the body has the microorganisms it needs for a healthy digestive system. This combination of prebiotics, along with probiotics, may also help support healthy immune function.

Most types of prebiotics behave as fiber in the body, passing through the small intestine intact and undergoing fermentation in the colon.[56] Two common prebiotics are inulin and oligofructose, or fructooligosaccharides (FOS). These are found naturally in many plant foods and may be extracted from foods for use as food ingredients. Inulin and oligofructose may be added to foods for purposes other than their prebiotic functions, including simply increasing the food's fiber content.[56] A wide variety of foods with added inulin or oligofructose are available today, including fermented milks, milk drinks, cottage cheese, desserts, bakery products, spreadable products, chocolate, meal replacers, bars, cereals, and ice cream.

Defining Fiber

The definition of "fiber" in the diet has evolved with the recognition of fiber as a nutrient with demonstrable health effects. Many definitions have been proposed and most have been developed with nutrition labeling in mind, emphasizing fiber as a measurable food component.[57-59] Today, multiple definitions of fiber are in use around the world. The definitions vary based on the origin of fiber components, the analytical methods used to identify and quantify fiber, and whether beneficial health effects in the body are part of the definition.[60] For example, in 2000 the American Association of Cereal Chemists developed the following definition.[58]

Dietary fiber:

- Is the edible parts of plants, or analogous carbohydrates, that are resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine;

- Includes polysaccharides, oligosaccharides, lignin and associated plant substances; and

- Promotes beneficial physiological effects, such as laxation and/or blood cholesterol attenuation and/or blood glucose attenuation.

Currently, in the U.S., fiber is defined for regulatory purposes primarily by the analytical methods used to isolate and measure fiber.

With the long-term goal to make nutrition labeling uniform throughout the world, scientists recognize that a single definition of fiber is needed.[57] As part of the process for developing the DRI levels for macronutrients, the IOM formed the Panel on the Definition of Dietary Fiber. After studying existing definitions and criteria for defining fiber, the IOM panel proposed moving from a definition based solely on the method used to measure fiber content in food to one that also recognizes the potential health effects of fiber. The result was a two part definition for total fiber that includes "dietary fiber" and "functional fiber."[5] Table 3 below, "Proposed Definitions for Fiber" provides the proposed definitions and examples for each of these fibers.

Table 3: Proposed Definitions for Fiber		
	Definition	Examples
Dietary fiber	Carbohydrates and lignin that are intrinsic and intact in plants and that are not digested and absorbed in the small intestine	Cereal brans (e.g., oat bran, wheat bran, barley), naturally occurring resistant starch, naturally occurring oligosaccharides (e.g., raffinose, stachyose and verbacose in legumes), and some fructans
Functional fiber	Isolated or purified carbohydrates that are not digested and absorbed in the small intestines and that have beneficial physiological effects in humans	Isolated nondigestible animal carbohydrates, pectins or gums, resistant starch formed during processing, and synthetic fibers (e.g., resistant maltodextrin, fructo-oligosaccharides, polydextrose)
Total fiber	Sum of dietary fiber and functional fiber	

Institute of Medicine: *Dietary Reference Intakes: Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids.* "Dietary, Functional, and Total Fiber." Pp 339-421. Washington, DC, National Academies Press, 2002

This proposed dual definition encompasses both the viscous forms of fiber that may help lower serum cholesterol levels and modulate blood glucose levels (e.g., oat bran, legumes) and the bulking agents that improve laxation (e.g., wheat bran). It also includes isolated or extracted fibers, such as synthetically manufactured or naturally occurring polysaccharides (e.g., gums), isolated carbohydrates from animal sources (e.g., chitin, chitosan, and galactooligosacharides), and commercially produced carbohydrates (e.g.,resistant starch, polydextrose).[61] In addition, the proposed definition allows for flexibility to incorporate new fiber sources as they may be developed in the future.

Traditionally, the terms "soluble" and "insoluble" fiber have been used to classify the specific type of fiber on food labels, in scientific research, and in nutrition education efforts with consumers. These terms provided a useful categorization of fibers with different properties, as understood at the time of their inception. As part of the proposed definition for fiber, the IOM recommends that "soluble" and "insoluble" fiber terms be phased out. This is based on scientific findings that suggest the health benefits of fiber are not related to the solubility of a fiber. Instead, viscosity and fermentability are proposed as more meaningful characteristics of fiber.[57] For example, viscous fibers such as psyllium seed husk, which are thick and sticky, stay in the stomach longer and provide a feeling of fullness. This is important for weight control and maintenance of normal blood

glucose levels. Viscous fibers also interfere with the absorption and metabolism of dietary fat and cholesterol, which may result in reduced blood cholesterol levels. Fibers that are partially or completely fermented in the large intestine are known to improve fecal bulk and laxation and relieve constipation.

Fiber Labeling and Consumer Communications

The IOM proposed definition for fiber has not yet been adopted by the US FDA for the purposes of food labeling and health claims.[57] As part of an upcoming revision of reference values and mandatory nutrients for food labeling, the FDA is considering analytical, regulatory, and consumer issues associated with adopting this new definition to support fiber labeling.[62]

Adopting a new and more expansive definition for fiber will affect nutrient content claims and health claims for fiber on food packages. Nutrient content claims, such as “high fiber,” “good source of fiber,” and “more (or added) fiber” currently are allowed on food packages (see box Current Fiber Labeling). These descriptors and the percent Daily Value (DV) for dietary fiber on the Nutrition Facts panel are based on a Daily Reference Value (DRV) of 25 grams of fiber per day, which is the recommended daily amount of fiber, established for labeling purposes, for a 2,000 calorie diet.

The listing of insoluble and soluble fiber content on today’s food labels is considered voluntary for food manufacturers. If these terms are phased out, fiber-related health claims also will be affected. Two of the three health claims approved for fiber’s role in health are linked to the soluble fiber content of food and require that the soluble fiber amount per serving be provided on the food label. See “Current Fiber Labeling Box Below.”

A change in the way fiber is communicated to consumers on labels and in other education efforts may help improve consumer awareness and intake of fiber. Yet, it may also require clear explanations and patient guidance from nutrition communicators to avoid further confusing consumers who think current food labels are already too complicated.[63]

Results from the 2007 IFIC survey, *Consumer Attitudes toward Functional Foods/Foods for Health*, indicate that the majority of consumers are aware of fiber’s relationship with maintaining a healthy digestive system and reducing risk of heart disease and cancer.[64] Because consumers more easily identify fiber with whole foods, encouraging a diet that includes an abundance of whole grains, fruits, and vegetables may not only help to meet fiber goals, but also can help to meet other dietary guidelines for overall health. Strategies to educate and motivate Americans to achieve recommended intakes of fiber as part of an overall healthful diet along with advances in food technology to introduce or increase fiber in foods have great potential for preserving the health of Americans and reducing risk for disease.

Current Fiber Labeling

High fiber: 5 grams or more per reference amount customarily consumed (RACC)

Good source of fiber: 2.5 to 4.9 grams per RACC

More or added fiber: at least 2.5 grams more per RACC (as compared to an appropriate reference food)

FDA-Approved Health Claims related to Fiber:

- Fiber-containing grain products, fruits, and vegetables and cancer (21 CFR 101.76)
- Fruits, vegetables and grain products that contain fiber, particularly soluble fiber, and risk of coronary heart disease (21 CFR 101.77)
- Soluble fiber from certain foods and risk of coronary heart disease (21 CFR 101.81)

A model health claim for fiber may read:

"Low-fat diets rich in fiber-containing grain products, fruits, and vegetables may reduce the risk of some types of cancer, a disease associated with many factors."

Or

"Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain some types of dietary fiber, particularly soluble fiber, may reduce the risk of heart disease, a disease associated with many factors."

Or

"Soluble fiber from foods such as oat bran, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease."

Bottom Line

The potential health benefits of consuming adequate amounts of dietary fiber are diverse, just as the definitions of fiber and the foods that provide it are varied. A wealth of scientific evidence supports the *Dietary Guidelines for Americans* recommendation to choose fiber-rich fruits, vegetables, and whole grains often. We have learned much about certain fibers, including wheat bran for promoting regularity as well as beta glucan from oats and barley and soluble fiber from psyllium for lowering cholesterol levels. Still, there remains more to be learned about other types of fiber and the amounts of these fibers required to produce the greatest health benefits not only for reducing heart disease but also for other potential health benefits including maintaining and improving digestive health, maintaining a healthy body weight, and reducing risk of diabetes and some types of cancer.

Related Reading

Whole Grains Fact Sheet

Shopping for Health? Check Out these Food Components

Functional Foods Backgrounder

All about Carbohydrates and Health

Focus on Fiber

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