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Dietary Fiber and Cardiovascular Disease

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You've heard about dietary fiber for decades, haven't you? Dietary fibers are the structural and storage polysaccharides and lignin in plants, which are not digested in the human stomach and small intestine. Functional fibers have similar effects as dietary fiber, but are extracted or isolated from natural sources or are synthetic. Pectin, for example, is extracted from citrus peel and is used as a gelling agent — it is the basis for jams and jellies (1,2).

Populations that consume more dietary fiber have a lower risk for chronic disease. Fiber also has beneficial effects on risk factors for several chronic diseases (1). In September 2002, the Institute of Medicine's Food and Nutrition Board released new Dietary Reference Intakes (DRI) that contained the first recommended intake levels for dietary fiber (2). The Adequate Intake (AI) level is 14 gm of fiber per 1,000 kcal. Thus, adult men aged 50 years old and under should consume 38 gm of fiber each day; women should consume 25 gm/day. Due to reduced food intake, older men should consume 30 gm of fiber and older women should consume 21 gm/day. These AI levels are based on research demonstrating that dietary fiber protects against coronary heart disease (CHD).

The Third Report of the Expert Panel on the Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) was released in May 2001. For the first time ever, the National Cholesterol Education Program (NCEP) guidelines recognized fiber for its beneficial effect in lowering LDL cholesterol and recommend including viscous fiber (10 to 25 gm/day) in the Lifestyle Changes (TLC) diet (3).

Dietary fiber helps to protect against cardiovascular disease by improving blood lipid profiles, lowering blood pressure, and reducing indicators of inflammation (1).

Fiber and cardiovascular disease

Since the publication of the 2002 DRI for fiber, other epidemiological studies have shown that dietary fiber protects against cardiovascular disease. Bazzano and colleagues examined the relationship between total and viscous dietary fiber intake and risk of coronary heart disease (CHD) and cardiovascular disease (CVD) in adults who participated in the National Health and Examination Survey I Epidemiologic Follow-up Study. A higher intake of fiber, particularly viscous fiber, reduced the risk of CHD (4).

Pereira and colleagues conducted a pooled analysis on the effect of total fiber and types of fiber on the risk of developing heart disease. Consumption of dietary fiber from cereals and fruits was inversely associated with risk of coronary heart disease. For every 10 gm per day increase in total fiber, there was a reduction of 14 percent in coronary events and 27 percent in coronary deaths. For every 10 gm/day increment of fruit fiber, there was 16 percent decrease in coronary events and 30 percent in deaths. There was no association between vegetable fiber and coronary heart disease events or deaths (5).

The *Nurses' Health Study* cohort showed an inverse relationship between dietary fiber, especially whole grain foods, and fatal and non-fatal coronary heart disease (6,7). Epidemiological studies suggest individuals who regularly consume whole grains have a 20 to 40 percent lower chance of cardiovascular disease compared to individuals who rarely eat them (8). Fatal and nonfatal myocardial infarctions have been inversely related with total fiber intake, especially cereal fiber (9).

Mozaffarian and colleagues found that cereal fiber consumption was inversely associated with the occurrence of CVD — the risk of developing CVD was 21 percent lower in the highest quintile of intake compared to the lowest quintile (10). Jensen and associates also found that whole grains were protective against CVD and that the bran component of whole grains appeared to be a key factor in this relationship (11). Erkkilä and colleagues found that higher intakes of cereal fiber and whole-grain products were associated with less progression of coronary atherosclerosis in postmenopausal women with established heart disease (12).

Fiber and LDL cholesterol

Several dietary fiber sources lower LDL cholesterol levels. These include foods such as apples, barley, beans and other legumes, fruits and vegetables, oatmeal, oat bran and rice hulls, and purified sources such as beet fiber, guar gum, karaya gum, knojac mannan, locust bean gum, pectin, psyllium seed husk, soy polysaccharide and xanthan gum (1).

The beta-glucan in oats, barley and psyllium husk have been adequately researched for the Food and Drug Administration (FDA) to authorize a health claim that foods meeting specific compositional requirements and containing 0.75 gm to 1.7 gm of soluble fiber per serving can reduce the risk of coronary heart disease (1). These viscous dietary fibers are specifically included in the NCEP dietary guidelines (3).

The Food and Drug Administration (FDA) reviewed 42 clinical trials that investigated the effects of oatmeal and oat bran on total cholesterol and LDL levels. Based on this extensive body of research, in 1997 the FDA approved the first food-specific health claim (13). You've probably seen it on food labels or in magazine ads: "Soluble fiber from foods such as oat bran, rolled oats or oatmeal, and whole oat flour, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease."

To carry this claim, oat products must contain at least 0.75 gm of oat fiber (beta-glucan) per serving and be low in total fat, saturated fat, and cholesterol (13). The 0.75 gm amount represents one-fourth of the 3 gm

amount required to achieve an average 6 mg/dL reduction in total cholesterol (14). In practical terms, an intake of 3 gm of beta-glucan represents 1.5 cups of cooked oatmeal or 1 cup of cooked oat bran (15).

The magnitude of the cholesterol reduction is related to the person's initial cholesterol level – individuals with higher cholesterol levels respond more to beta-glucan than individuals with lower cholesterol levels (5). This makes oat fiber a valuable tool for reducing cholesterol in those who would benefit the most. Oat fiber is easily added to the diet and well-tolerated by most people, producing very little gastrointestinal distention, bloating or gas (15).

Psyllium is a rich source of viscous fiber derived from the husks of blond psyllium seed. Anderson and colleagues initially investigated the effect of psyllium supplementation in men with hypercholesterolemia following a high fat American diet (20 percent of energy from protein, 40 percent from carbohydrate, and 40 percent from fat). The subjects consumed 3.4 gm of psyllium or cellulose placebo at mealtimes (three doses per day) for eight weeks. The psyllium treatment reduced serum total cholesterol levels by 14.8 percent, LDL cholesterol by 20.2 percent, and the ratio of LDL cholesterol to HDL cholesterol by 14.8 percent, relative to baseline values. The reductions in total cholesterol and LDL cholesterol became progressively larger with time, and this trend appeared to be continuing at the eighth week (16).

Consumption of 10.2 gm of psyllium husk per day (3.4 gm taken three times per day or 5.1 gm taken twice a day) lowered total cholesterol by 4 percent and LDL cholesterol by 7 percent in subjects consuming a low-fat diet (17). Psyllium also lowered serum ratios of apo B to apo A-1 by 6 percent (17). This is a favorable change as apo B promotes atherogenesis and Apo A-1 (the protective factor in HDL cholesterol) reduces atherogenesis.

Consumption of 10.2 gm of psyllium husk per day provides about 7 gm of viscous fiber. Psyllium products must contain at least 1.7 gm of viscous fiber per serving and be low in total fat, saturated fat, and cholesterol to qualify for the health claim. The 1.7 gm amount represents one-fourth of the 7 gm amount required to achieve a significant reduction in total cholesterol (18).

Psyllium is well-tolerated and has an excellent safety record as an over-the-counter bulk fiber laxative (16). Psyllium-enriched foods such as ready-to-eat cereals lower total cholesterol and LDL cholesterol as effectively as psyllium fiber supplements (19).

Glore, *et al*. conducted a literature review of 77 studies to evaluate the impact of viscous fiber on serum lipids (20). Sixty-nine of 77 studies (88 percent) reported significant reductions in total cholesterol, 41 of 49 (84 percent) reported significant reductions in LDL, 43 of 57 (75 percent) reported no change in HDL, and 50 of 58 (86 percent) reported no change in triglycerides. Although the sources and amounts of viscous fiber varied, the authors noted that a significant cholesterol- and LDL-lowering effect can be expected with daily consumption of the following: 6 to 40 gm of pectin, 8 to 36 gm of gums (*e.g*. guar gum), 100 to 150 gm (0.5 to 0.75 cup) of dried beans, 25 to 100 gm (0.3 to 1.2 cups) of dry oat bran, 57 to 140 gm of dry oatmeal (0.7 to 1.7 cups), or 10 to 30 gm (3 to 9 tablespoons) of psyllium husk.

Mechanism of action

Viscosity is a characteristic shared by all cholesterol-lowering fibers. There are several theories to explain how viscous fiber lowers serum cholesterol (1,17,20). The primary explanation involves bile acid circulation. In the liver, LDL cholesterol is converted into bile acids, which are used to emulsify fats in the intestine for digestion and absorption. When bile acids are reabsorbed and come back to the liver (via the portal blood flow from the intestines), they block further production of bile acids. This process, called the enterohepatic circulation of bile, is very effective in conserving bile.

Viscous fiber interferes with this process — it binds with bile acids and decreases their absorption from the intestine. As a result, LDL cholesterol is removed from the blood and converted to bile acids by the liver to replenish the bile acids excreted in the stool. This is the predominant way that viscous fiber is believed to lower serum cholesterol (1,17,20).

The changes in the composition of the bile acid pool associated with the consumption of some viscous fibers may also diminish cholesterol synthesis. Slowing down cholesterol synthesis (the mechanism by which the "statin drugs" work) may have a favorable effect on blood cholesterol levels because endogenous synthesis accounts for about 75 percent of the total body cholesterol pool (1). Viscous fibers are part of the "portfolio diet" which is discussed below.

Fiber in the 'Portfolio Diet'

Numerous foods and substances in foods have an effect on serum cholesterol levels. Jenkins and colleagues evaluated the combined effect of viscous fibers, plant sterols, soy protein, and almonds on blood lipids in 25 subjects with high cholesterol (21).

The "portfolio diet" contained 4.9 percent of calories from saturated fat, 48 mg of cholesterol per day, 8.3 gm of viscous fibers from oatmeal and psyllium per 1000 kcal, 1.2 gm of plant sterols from margarine per 1000 kcal, 16.2 gm of soy protein per 1000 kcal, and 16.6 gm of almonds per 1000 kcal.

LDL cholesterol was reduced by 35 percent on the portfolio diet and by 12.1 percent on the low saturated fat and cholesterol diet. There were no differences in blood pressure, HDL cholesterol, serum triglycerides, lipoprotein(a), or homocysteine concentrations between the two diets (21).

Up to 12 percent of the LDL cholesterol reduction seen on the portfolio diet could be attributed to the reduction in saturated fat and cholesterol. This 12 percent reduction, added to an assumed 4 to 7 percent reduction in LDL cholesterol attributable to each of the four dietary components, may have accounted for the 35 percent reduction in LDL cholesterol (21).

Jenkins and associates conducted another study (22) to determine whether the portfolio diet could lower LDL cholesterol as much as statin drugs. The hyperlipidemic subjects received either: a low-saturated fat control diet; the control diet plus 20 mg of lovastatin per day; or a low-saturated fat portfolio diet high in plant sterols (1 gm/1000 kcal), soy protein (21.4 gm/100 kcal), viscous fibers (9.8/1000 kcal), and almonds (14 gm/1000 kcal). LDL cholesterol decreased by 8 percent in the control group, 30.9 percent in the statin group, and 28.6 percent in the portfolio group. C-reactive protein was reduced by 10 percent in the control group, 33.3 percent in the statin group, and 28.2 percent in the portfolio group. The reductions in LDL cholesterol and C-reactive protein in the statin and portfolio groups were significantly different from the control group but not from each other (22).

Jenkins and colleagues found that a portfolio diet reduced C-reactive protein to a similar extent as the starting dose of a first-generation statin (23). The researchers also found that although lovastatin decreased LDL cholesterol more than the portfolio diet (33.3 versus 29.6 percent), both were effective in lowering LDL cholesterol below the LDL level set for primary prevention (23).

These intriguing studies suggest that combining a number of foods and food components (such as viscous fibers) in a single dietary portfolio may lower LDL cholesterol similarly to statins and increase the potential effectiveness of dietary therapy to reduce the risk of heart disease.

Other potential mechanisms

Fibers also favorably influence blood pressure and C-reactive protein, which are additional risk factors for cardiovascular disease. Dietary fiber intake was inversely associated with C-reactive protein in the National Health and Examination Survey (24). King and colleagues found that 30 gm of fiber/day (from a high-fiber diet or fiver supplement) reduced levels of C-reactive protein (25). A meta-analysis found that fiber intake was associated with lower blood pressure (26). Whelton and associates found that an increased intake of dietary fiber reduced blood pressure in patients with hypertension (27).

Fiber and health

A fiber-rich diet is likely to be less calorie-dense and lower in fat and added sugar. High fiber diets providd bulk, are more satiating, and have been linked to lower body weights. Minimally processed plant foods also provide micronutrients and phytochemicals that have positive health effects (1,28).

The influence of diet on health occurs not only from the subtle effects of numerous individual food components, but from whole foods and the associated interactions that occur among these components (1,29,30,31). This concept is called “food synergy.” Research suggests that whole foods offer more protection against chronic diseases than dietary fiber, antioxidants, or other biologically active ingredients in foods (1,2,9,30,31). Adding purified fiber to the diet is not as beneficial as changing the diet to include more whole foods that are high in fiber (1). The concept of synergy among whole food components and the healthfulness of a varied diet are important aspects of any dietary counseling (1,2,30,31).

Americans presently consume only about 15 gm of dietary fiber daily (1). The American Dietetic Association recommends an increased consumption of fruits, vegetables, legumes, and whole- and high-fiber grain products as recommended by MyPyramid to bring American adults closer to the recommended intake levels for dietary fiber (1).

Healthy adults who consume an amount of fiber within the recommended range are unlikely to have problems absorbing nutrients. Excessive fiber intake may cause abdominal distension, flatulence, and diarrhea. Dietary fiber should be increased gradually to allow the gastrointestinal tract time to adapt and accompanied by an adequate fluid intake (1).

The chart on the following page lists dietary sources of soluble fiber.

Soluble Fiber - Food sources

Food Source	Soluble Fiber (gm)	Total fiber (gm)
CEREAL GRAINS (1/2 cup cooked)		
Barley	1	4
Oatmeal	1	2
Oatbran	1	3
Seeds		
Psyllium seeds, ground (1 Tbsp)	5	6
FRUIT (1 medium fruit)		
Apple	1	4
Bananas	1	3
Blackberries (1/2 cup)	1	4
Citrus Fruit (orange, grapefruit)	2	2-3
Nectarines	1	2
Peaches	1	2
Pears	2	4
Plums	1	1.5
Prunes (1/4 cup)	1.5	3
LEGUMES (1/2 cup cooked)		
Beans		
Black Beans	2	5.5
Kidney Beans	3	6
Lima Beans	3.5	6.5
Navy Beans	2	6
Northern Beans	1.5	5.5
Pinto Beans	2	7
Lentils (yellow, green, orange)	1	8
Peas		
Chick Peas	1	6
Black eyed Peas	1	5.5
VEGETABLES (1/2 cup cooked)		
Broccoli	1	1.5
Brussels Sprouts	3	4.5
Carrots	1	2.5

References

1) Position of the American Dietetic Association: Health Implications of Dietary Fiber. J Am Diet Assoc. 108: 1716-1731, 2008.

2) Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrates, Fiber, Fat, Protein and Amino Acids (Macronutrients). Sept. 5, 2002. www.nap.edu/books/0309085373/html

3) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. *JAMA*. 285:2486-2497, 2001.

4) Bazzano LA, HE J, Ogden LG, *et al*. Dietary fiber intake and reduced risk of coronary heart disease in US men and women: the National Health and Nutrition Examination Survey I Epidemiologic Follow-up Study. *Arch Intern Med*. 163: 1897-904, 2003.

5) Peeira MA, O'Reily E, Augustsson K, *et al*. Dietary fiber and risk of coronary heart disease: a pooled analysis of cohort studies. *Arch Intern Med*. 164: 370-376, 2004.

6) Liu S, Stampfer MJ, Hu FB, Giovannucci E, *et al*. Whole-grain consumption and risk of coronary heart disease: results from the Nurses' Health Study. *Am J Clin Nutr.* 70: 412-419, 1999.

7) Wolk J, Mason JE, Stampfer MJ, *et al*. Long-term intake of dietary fiber and decreased risk of coronary heart disease among women. *JAMA*. 281: 1998-2004, 1999.

8) Jacobs DR, Gallagher DD. Whole grain intake and cardiovascular disease: a review. *Curr Atheroscler Rep*. 6: 415-423, 2004.

9) Rimm EB, Ascherio A, Giovannucci E, *et al*. Vegetable, fruit and cereal fiber intake and risk of coronary heart disease among men. *JAMA*. 275: 447-451, 1996.

10) Mozaffarian D, Kumanyika SK, Lemaitre RN, *et al*. Cereal, fruit, and vegetable fiber intake and the risk of cardiovascular disease in elderly individuals. *JAMA*. 289: 1659-1666, 2003.

11) Jensen MK, Koh-Banerjee P, Hu FB, *et al*. Intakes of whole grains, bran, and germ and the risk of coronary heart disease in men. *Amer J Clin Nutr.* 80: 1492-1499, 2004.

12) Erkkilä AT, Herrington DM, *et al*. Cereal fiber and whole-grain intake are associated with reduced progression of coronary-artery atherosclerosis in postmenopausal women with coronary artery disease. *Am Heart J*. 150: 94-101, 2005.

13) Food and Drug Administration. Food Labeling: Health Claims; Soluble Fiber from Whole Oats and Risk of Coronary Heart Disease. *Federal Register*. 62:15343- 15344, 1997.

14) Ripsin CM, Keeman JM, Jacobs DR. Oat products and lipid lowering: a meta analysis. *JAMA*. 267:3317-3325, 1992.

15) Hasler C. Oat beta-glucan, coronary heart disease risk, and health claims. *SCAN's Pulse*. Vol. 15, No. 4, Fall 1996.

16) Anderson JW, Zettwoch N, Feldman T et al. Cholesterol-lowering effects of psyllium hydrophilic mucilloid for hypercholesterolemic men. *Arch Intern Med*. 148:292-296, 1988.

17) Anderson JW, Allgood LD, Lawrence A, *et al*. Cholesterol-lowering effects of psyllium intake adjunctive to diet therapy in men and women with hypercholesterolemia: meta-analysis of 8 controlled trials. *Am J Clin Nutr*. 71:472-479, 2000.

18) Food and Drug Administration. Food Labeling: Health Claims; Soluble Fiber from Certain Foods and Coronary Heart Disease. *Federal Register.* 63:8103-8121, 1998.

19) Olson BH, Anderson SM, Becker MP, *et al*. Psyllium-enriched cereals lower blood total cholesterol and LDL cholesterol, but not HDL cholesterol, in hypercholesterolemic adults: results of a meta-analysis. *J Nutr*. 127:1973-1980, 1997.
20) Glore SR, Van Treeck D, Knehans AW, Guild M. Soluble fiber and serum lipids: a literature review. *J Am Diet Assoc*. 94:425-436, 1994.
21) Jenkins DJ, Kendall CW, Marchie A, *et al*. The effect of combining plant sterols, soy protein, viscous fibers, and almonds in treating hypercholesterolemia. *Metabolism*. 52: 1478-1483, 2003.
22) Jenkins DJ, Kendall CW, Marchie A, *et al*. Effects of a dietary portfolio of cholesterol-lowering foods vs lovastatin on serum lipids and C-reactive protein. *JAMA*. 190: 502-510, 2003.
23) Jenkins DJ, Kendall CW, *et al*. Direct comparison of a dietary portfolio of cholesterol-lowering foods with a statin in hypercholesterolemic participants. *Am J Clin Nutr*. 81: 380-387, 2005.
24) Ajani UA, Ford ES, Mokdad AH. Dietary fiber and C-reactive protein: findings from national health and nutrition examination survey data. *J Nutr*. 134: 1181-1185, 2004.
25) King DE, Egan BM, Woolson RF, *et al*. Effect of a high-fiber diet vs a fiber-supplemented diet on C-reactive protein level. *Arch Intern Med*. 167: 502-506, 2007.
26) Streppel MT, Arends LR, Van't Veer P, *et al*. Dietary fiber and blood pressure: a meta-analysis of randomized placebo-controlled trials. *Arch Intern Med*. 165: 150-156, 2005.
27) Whelton SP, Hyre AD, Pedersen B, *et al*. Effect of dietary fiber intake on blood pressure: a meta-analysis of randomized, controlled clinical trials. *J Hypertens*. 23: 475-481, 2005.
28) Lichtenstein AH, Appel LJ, Brands M, *et al*. Diet and lifestyle recommendations revision 2006. A scientific statement from the American Heart Association Nutrition Committee. *Circulation*. 114: 82-96, 2006.
29) Jacobs D, Tapsell L. Food, not nutrients, is the fundamental unit in nutrition. *Nutr Rev*. 65: 439-450, 2007.
30) Messina M, Lampe JW, Birt DF, *et al*. Reductionism and the narrowing nutrition perspective: time for reevaluation and emphasis on food synergy. *J Am Diet Assoc*. 101: 1416-1419, 2001.
31) Position of the American Dietetic Association: Total diet approach to communicating food and nutrition information. *J Am Diet Assoc*. 107: 1224-1234, 2007.

Examination for FIB09

1. The Adequate Intake levels for fiber are based on research demonstrating that consuming a low-fiber diet increases the risk of:
    A. Colon cancer
    B. Obesity
    C. Coronary heart disease
    D. Diabetes
    E. All of the above

2. Which of the following dietary fiber sources lower LDL cholesterol levels?
    A. Wheat bran
    B. Oatmeal
    C. Methylcellulose
    D. Barley
    E. B and D

3. Which two dietary fibers are specifically included in the NCEP dietary guidelines?
    A. Beta-glucan and pectin
    B. Beta-glucan and psyllium
    C. Psyllium and guar gum
    D. Psyllium and beans
    E. None of the above

4. What is the predominant way that viscous fiber is believed to lower serum cholesterol?
    A. It binds with bile acids and decreases their absorption
    B. It is fermented and produces short chain fatty acids
    C. It reduces intestinal cholesterol absorption
    D. It replaces foods that are high in saturated fat and cholesterol
    E. None of the above

5. The literature review by Glore, *et al*. on the effect of viscous fiber on serum lipids found:
    A. Significant increases in HDL
    B. Significant reductions in total and LDL cholesterol
    C. Significant decreases in triglycerides
    D. A and C
    E. B, and C

6. A fiber rich diet is likely to:
    A. Be less energy dense
    B. Be lower in fat and added sugar
    C. Counteract the cholesterol raising effects of a diet high in saturated fat and cholesterol
    D. A and B
    E. A, B, and C

7. Oat products must contain at least _____ gm of oat fiber per serving and be low in total fat, saturated fat, and cholesterol to carry the FDA health claim.
    A. 0.50
    B. 0.75
    C. 1.0
    D. 1.5
    E. 3.0

8. Psyllium products must contain at least _____ gm of viscous fiber per serving and be low in total fat, saturated fat, and cholesterol to qualify for the FDA health claim.
    A. 1.7
    B. 3.4
    C. 5.1
    D. 7.0
    E. 10.2

9. Dietary fiber should be:
    A. Increased gradually
    B. Consumed in a purified form to lower LDL cholesterol the most
    C. Accompanied by adequate fluid intake
    D. A, B, and C
    E. A and C

10. The Adequate Intake levels for dietary fiber are ____ gm/day for adult men aged 50 years and under and ____ gm/day for adult women aged 50 years and under.
    A. 28 and 15
    B. 28 and 20
    C. 38 and 25
    D. 38 and 30
    E. None of the above

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