

Dietary Fiber and Prevention of Coronary Heart Disease

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Dietary fiber is probably not a major factor in the prevention of heart disease. A more important role is played by dietary fatty acids and cholesterol through their effects on plasma lipoproteins and perhaps on blood coagulation, and by dietary sodium via its effect on blood pressure. However, fiber does have some interesting effects on risk factors for coronary heart disease (CHD).

DIETARY FIBER AND RISK FACTORS FOR CORONARY HEART DISEASE

First, an increased intake of fiber-rich foods usually leads to a lower fat and cholesterol intake; even with controlled diets we had problems in reconciling a high-fiber intake with a high-fat intake (1). Thus, fiber crowds out fat, and this is an important side benefit of high-fiber diets.

Second, dietary fiber components in beans, fruits, and vegetables by themselves cause a moderate but undeniable lowering of low-density lipoprotein cholesterol (2,3). Inclusion of these products in a low-fat diet may also mitigate (3) the fall in high-density lipoprotein cholesterol which is commonly observed when fat intake is decreased (4). For wheat bran, contradictory findings have been published, but most investigators concluded that wheat bran has no specific beneficial effect on plasma lipoprotein concentrations.

Third, there are some indications that dietary fiber lowers blood pressure in hypertensives, although the evidence is not always consistent.

Finally, there is evidence that certain fiber-rich foods, especially legumes and oats, can improve glucose tolerance in diabetics. It is to be expected that this will delay the onset of vascular pathology in such patients, although again solid proof for this is lacking.

FIBER ANALYSIS, FOOD FORTIFICATION, AND HEALTH CLAIMS

Although analysis methods for dietary fiber have advanced greatly since the days when "crude fiber" was the only available assay (5), these methods still do not adequately predict the various physiological effects that different types of fiber can have.

A striking example of this is the effect of coarse versus fine wheat bran on colonic function. Consumption of coarse wheat bran has marked effects on intestinal transit time, stool weight, and stool moisture content. If the bran is first ground to a powder then these effects are much reduced, while the amount and chemical composition of the dietary fiber consumed remain the same (6,7). Obviously, there is more to the effect of fiber than merely the amount of indigestible material as determined in the laboratory.

It is easy to increase the dietary fiber content of a food by adding cellulose or other inert substances to it, but, at present, there is no evidence for a beneficial effect of purified cellulose on risk factors for ischemic heart disease. Thus, favorable effects of dietary fiber have been documented only for certain fiber-rich foodstuffs, and cannot be extrapolated to other foods even though these may show a high dietary fiber content on chemical analysis.

PRACTICAL CONCLUSIONS

1. An increased consumption of beans, pulses, vegetables, fruits, and whole-grain cereal products will help to lower the risk for coronary heart disease.
2. Claims for specific benefits of wheat bran preparations in the normalization of plasma lipoprotein concentrations have as yet not been sufficiently documented.
3. In general, it should not be assumed automatically that fiber-fortified foods share the favorable effects of the fiber-rich foods mentioned above.

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