

Dietary Fiber Can Reduce the Risk of Type 2 Diabetes

There is plenty of evidence showing the importance of dietary fiber to human health. Consumption of foods rich in dietary fiber has long been associated with increases in stool bulk resulting in improved laxation. More recent evidence has shown a link with reductions in cholesterol from fiber consumption. One lesser known benefit of dietary fiber is the health benefits surrounding diabetes.

Diabetes

The prevalence of type 2 diabetes has increased rapidly during the past decades in the United States. Although lifestyle characteristics such as obesity, physical activity and smoking are established risk factors for this disease, less is known about dietary factors. The quality of carbohydrates (refined versus whole-grain) has received particular interest because it can influence the digestion rate and thus the blood glucose and insulin response. A higher intake of dietary fiber has been consistently associated with a lower risk of diabetes.



Fiber and Diabetes

Dietary modification is useful in both type 1 and type 2 diabetes. Glucose levels after a meal are largely determined by carbohydrate (sugar) intake. Decreased intake of simple carbohydrates and increased fiber consumption lowers postprandial glucose (blood taken one to two hours after eating to see the amount of sugar in the blood).

Fiber supplements have been shown to enhance weight loss and alter blood glucose and insulin regulation favorably. Soluble fibers (dissolves in water) have been routinely reported to lower postprandial blood glucose and insulin levels. It exerts this effect by turning into a gel which binds to food, sugars, cholesterol and fats in the stomach and carries them through the digestive tract.

It is believed that there is an inverse relationship between fiber intake and the occurrence of type 2 diabetes (as fiber intake increases, occurrence of type 2 diabetes decreases). Most studies attribute this relationship to total fiber intake. Whole grain cereal fibers offer the most research to support their overall effect on diabetes risk.

Cereal fiber consists of two types of fiber – soluble and insoluble. These types of fiber have different effects on glucose metabolism (the rate at which your body processes sugar). The beneficial effect of soluble fibers such as psyllium and methylcellulose is oft associated with reduced glucose and insulin responses because it slows the effect of carbohydrate absorption and digestion. The insoluble fiber component allows quicker intestinal transit allowing less time for carbohydrates to be absorbed in the gastrointestinal tract, thus relieving insulin demand.



Diabetes and Death

Diabetes leads to heart disease and strokes. Both of which are the leading cause of disability and death in the United States. While atherosclerotic heart disease (the process of progressive thickening and hardening of the walls of arteries from fats and cholesterol deposits on their inner lining) is the most prevalent cause of death, it is perhaps the most modifiable one.¹

¹ Kenneth O, Kochanek MA, Smith BL, eds. Deaths: Preliminary Data for 2002. *National Vital Statistics Reports*. 2004; vol 52, No 13.

One way of reducing the risk of coronary heart disease (CHD) or “heart attack” is to increase the intake of soluble dietary fiber. In 2002, one large study found that a high total dietary fiber intake when compared to low fiber intake was associated with almost a 30% lower risk of CHD.²

Soluble fibers such as pectin, psyllium and guar gum and dietary fibers from beans, breakfast cereals, fruits and vegetables can reduce levels of total and LDL cholesterol. While whole-grain fibers have the strongest effect on reducing CHD (29% reduction rates) several studies have shown that psyllium (the type of soluble fiber found in Metamucil) is more effective than other soluble fibers, given in equal amounts, in decreasing serum cholesterol and LDL cholesterol concentrations.³

Note that the U.S. Food and Drug Administration (FDA) has approved a health claim for only two fibers, oat bran and psyllium, indicating that their intake as part of a diet low in saturated fat and cholesterol might reduce risk for CHD.

How much fiber do you need?

Most Americans don't consumer enough fiber, in fact recent surveys show that Americans consume between 11 and 15 grams of fiber a day. The National Fiber Council recommends 32 grams of fiber per day for a healthy body. Diabetes associations and national advisory boards recommend intake of a minimum of three servings of vegetables and two servings of fruit per day.

Summary of the role of fiber in lowering your risk for type 2 diabetes:

- ▶ Weight loss is encouraged for many individuals with a family history of type 2 diabetes
- ▶ The popular low-carbohydrate diets for weight loss lack adequate daily intake of soluble fibers
- ▶ Natural soluble fiber supplementation should be used such as oat bran
- ▶ If you are unable to increase fiber consumptions via diet, use of an FDA-approved soluble fiber supplement (psyllium) may be necessary to help achieve this daily intake

Conclusion

Diets high in whole-grain carbohydrates and limited in refined carbohydrates may reduce the risk of type 2 diabetes. White bread is the refined carbohydrate most strongly related to diabetes incidence. Thus, simply changing from white bread to rye or whole wheat bread will increase your dietary fiber intake for the day and will possibly help you delay the onset of diabetes.



Nutrition Facts

Serving Size 1 slice (38g)	
Servings Per Container 18	
Amount Per Serving	
Calories 90	Calories from Fat 10
<hr/>	
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Polyunsaturated Fat 0g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%
Sodium 190mg	8%
Total Carbohydrate 18g	6%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 4g	

² Rimm EB, Ascherio A, Giovannucci E, Spiegelman O, Stampfer MJ, Willett WC. Vegetable, fruit, and cereal fiber intake and risk of coronary heart disease among men. *JAMA*. 1996;275:447-451.

³ Anderson JW. Whole grains protect against atherosclerotic cardiovascular disease. *Proc Nutr Soc*. 2003;62:135-142.