

## Dietary Fiber and Diabetes Mellitus

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Diabetes mellitus is increasing day by day in the United States. In 2014, approximately 9.3% of the U.S. population was living with diabetes. This number had increased from 8.3% in 2011 unfortunately, 8.1 million (27.8%) of these cases remain undiagnosed. Type 2 diabetes mellitus (T2DM) accounts for approximately 90% to 95% of those with diabetes. Diabetes is currently the most common cause of kidney failure, non-traumatic lower-limb amputations, and new cases of blindness in the US. In 2010, diabetes was listed as the seventh leading cause of death in the US. Patients with diabetes are at a 2 to 4 times more risk of stroke and death as compared to those without diabetes. Dietary fibers are defined as polysaccharide components of vegetables which cannot be digested in the small intestine except for a certain limited degradation of pectin. Some of them can be digested in the colon. Structural polysaccharides are represented by cellulose, hemicelluloses and lignin. They are mostly found in whole grain, bran and whole meal bread. Restorative polysaccharides are represented by pectin, gums, mucilage and certain hemicelluloses. They are mostly found in legumes, lentils, beans and peas, fruits (especially apples and citrus fruits), oats, barleycorn, root crop and green vegetables. Health benefits of dietary fibre have been well documented in the literature over the past two decades. Diets, deficient in dietary fibre, lead to a number of diseases such as constipation, hiatus hernia, appendicitis, diabetes, obesity, coronary heart diseases, gallstones, etc. Type 2 diabetes mellitus is associated with numerous complications, including kidney failure, blindness, increased susceptibility to infection, coronary heart disease. It is predicted that by 2030, 10% of the world's population will have type 2 diabetes mellitus. Interventions that improve diet quality have been demonstrated to be effective in controlling hyperglycemia and its associated risk factors, which in turn reduces the risk of diabetes-associated complications. Recent epidemiological findings have suggested that there is an association between high

dietary fibre intake and a reduced risk of developing diabetes and coronary heart disease. In particular, soluble dietary fibre has been shown to reduce insulin resistance in female non-diabetic patients. A survey conducted in the US reported an average dietary fibre intake of 17g/day in non-diabetic individuals, with an average of 16g/day demonstrated in diabetic patients. Soluble dietary fiber has been associated with lower postprandial glucose levels and increased insulin sensitivity in diabetic and healthy subjects; these effects were generally attributed to the viscous and/or gelling properties of soluble fiber. The American Diabetes Association recommends specific diet as part of medical nutrition therapy for secondary and tertiary prevention of complication in patients with type 2 diabetes mellitus. This diet includes the consumption of fiber-rich foods. ADA recommends 30 to 50g of dietary fiber per day for patients with type 2 diabetes mellitus. Dietary fiber intake from a variety of sources has been associated with marked decreased risk of coronary events in epidemiologic studies in patients with and without diabetes [1-3].

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