

Flaxseed and Diabetes.

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Abstract

Flaxseed contains 32% to 45% of its mass as oil of which 51% to 55% is α -linolenic acid. Flax lignan complex and secoisolariciresinol diglucoside (SDG) have been isolated from flaxseed. Flaxseed and its components have antioxidant, hypolipidemic and hypoglycemic effects. These are mostly due to the SDG content. Oxidative stress has been implicated in both type 1 and type 2 diabetes. Flaxseed, flaxseed oil and flax lignan complex have not been investigated as to whether they reduce the incidence of diabetes and/or delay the development of diabetes. However, their effects on serum glucose have been studied. Flaxseed and flax lignan complex improve glycemic control. Animal models of type 1 diabetes involving streptozotocin administration or utilizing Bio-Breed diabetic (BBdp) prone rats are associated with oxidative stress. SDG treatment reduced the incidence of diabetes using serum glucose levels by 75% in the streptozotocin model of diabetes and by 72% in the BBdp rat model of diabetes. These reductions in development of diabetes were associated with decreases in oxidative stress measured by serum and pancreatic malondialdehyde (MDA). SDG delays the development of diabetes in Zucker diabetic fatty (ZDF) rat model of type 2 diabetes and this effect was associated with a reduction in serum MDA and glycated haemoglobin A1C. The data suggest that SDG may have a great potential for reducing the incidence of type 1 diabetes and delaying the development of type 2 diabetes in humans.