

Diabetes and Dietary Supplementation

Diabetes is a serious threat to the health of Americans. According to the latest report from the Centers for Disease Control and Prevention, approximately 24 million people in the United States have diabetes. There are three types of diabetes: type 1 (insulin dependent); type 2 (non-insulin dependent); and gestational diabetes, which can occur during pregnancy. This disease is characterized by high levels of blood glucose due to defects in insulin production, insulin action, or both. Diet is a major treatment modality for managing diabetes and its associated symptoms. Several dietary supplements have been demonstrated to help maintain blood glucose levels within the normal range, as well as to help in alleviation of associated symptoms.

Insulin resistance refers to the condition of the muscle cells, fat cells and liver cells not properly responding to insulin. Insulin is a hormone secreted by the pancreas that signals these cells to remove glucose from the blood. At the onset of the resistance, the pancreas can adjust and secrete more insulin to keep blood glucose levels normal. However, as the resistance becomes greater, enough insulin cannot be produced to compensate, and type 2 diabetes develops. Certain nutrients have shown promise in helping enhance the cells' sensitivity to insulin. Banaba leaf, gymnema, bitter melon, nopal, chromium, vanadium and cinnamon all help in maintaining normal blood glucose levels.

Starchy carbohydrates are the most important source of calories in our diets. Starches are long chains of glucose and are provided in staple foods such as breads, pastas and cereals. In order for starches to provide energy to the body, they must be digested into small enough particles to be absorbed. The majority of this process occurs in the small intestine by the action of an enzyme called alpha-amylase. Certain ingredients can greatly interfere with this process, including a white kidney bean extract that inhibits the activity of alpha-amylase. Psyllium contains a high amount of water-soluble fiber that swells in the digestive tract and slows the emptying of foods from the stomach, reduces surface area on foods that enzymes need to act on, and can create somewhat of a barrier between the gut wall and glucose molecules to reduce absorption. These dietary supplements need to be taken with meals to be effective. They are most effective with meals containing starches; psyllium is useful with any carbohydrate-containing meals. The end result of either dietary supplement is a slowed or reduced release of sugars into the blood, as well as a reduced surge of insulin.

Alpha Lipoic Acid is probably best-known as the "universal antioxidant." It is soluble in both water and fat, which allows it to exert its protective actions on virtually every

tissue in the body. Alpha lipoic acid (ALA) has been used outside the U.S. as an approved drug therapy for diabetic neuropathies since 1959. Studies have shown that ALA can significantly reduce symptoms associated with diabetic neuropathies such as severe pain, weakness, burning and touch pressure. Some evidence also suggests that ALA may mimic insulin and signal cells to take in glucose from the blood.

Diabetes can develop as a result of genetic, environmental and/or auto-immune factors. We have the most control over the environmental factors. Recent epidemiological studies have made a connection between regions that receive less ultraviolet radiation (our primary source of vitamin D) and the increased incidence of type 2 diabetes in populations living there. It has also been observed that daily supplementation of vitamin D in infants during the first year of life is associated with a reduced incidence of type 1 diabetes later in life. Supplementing with Vitamin D3 daily may be warranted for those concerned with developing diabetes.