



DIABETES AND THE VEGAN DIET

Sandra Hood, BSc (Hons), SRD

Since 45% of men and 33% of women in the UK are classified as overweight (Department of Health 1997) it is not surprising that diseases such as diabetes (also known as diabetes mellitus) have increased enormously. In the UK diabetes affects 1.4 million people and there may be as many as 1 million more who remain undiagnosed. Worldwide there are over 150 million cases and the total is expected to double by 2010. Diabetes has major implications for disability and mortality and represents a phenomenal burden on the National Health Service, consuming an estimated 8% of resources.

Diabetes occurs when the mechanism for converting glucose to energy no longer functions properly. This causes an abnormally high level of glucose in the blood, giving rise to a variety of symptoms. High glucose levels over several years can damage various parts of the body.

Insulin, a hormone produced by the pancreas, is needed to convert glucose into energy. If the pancreas does not produce enough insulin, or if the body cannot utilise the insulin, diabetes occurs. There are two different types of diabetes, type 1 and type 2. In type 1, usually diagnosed before the age of 40, there is complete or near-complete absence of insulin due to destruction of the insulin-producing cells, insulin treatment is essential for survival and treatment is by insulin injections and diet.

The cause of type 1 diabetes is unknown, though there are many theories. In 1987 (Diabetes Epidemiology Research International) a report stated that 60 to 95% of cases of type 1 diabetes could be prevented, with diet playing a significant part. Dahlquist & Mustonen (2000) report on the rapidly increasing incidence of childhood diabetes in Sweden and suggest that the correlation with gross domestic product may suggest risk factors associated with wealth such as high growth rate in children, a known risk factor for childhood diabetes. In Europe the incidence of type 1 diabetes in children has risen by 2 to 5% annually, with an increase of 50% in about ten years (Silink 2002). Diabetes is noticeably rare in parts of the world with a traditional non-Westernised diet and lifestyle. It has also been suggested that cows' milk consumption may be linked with type 1 diabetes, but studies are inconclusive (Silink 2002).

In type 2 diabetes, the body still produces insulin but either there is not enough of it or it is not working properly. Treatment is either by diet alone or by tablets and diet and sometimes with insulin. In the past, children and adolescents were assumed to develop

only type 1 diabetes with type 2 affecting only people over the age of 40. However, an epidemic of type 2 diabetes is now sweeping the world and affecting ever younger children. Only this year, the first cases of adult-type diabetes were found in four overweight teenage children in the UK. It has been suggested that 80 to 95% of cases could be prevented and in Finland last year it was shown that with lifestyle interventions, increased activity, low fat diet and weight loss, risk was reduced by 58% (Tuomilehto et al 2001). Type 2 diabetes is associated with the consumption of energy dense foods, inactivity and obesity. Obesity is a major factor, with 80% of sufferers being overweight. The risk is doubled for the overweight and tripled for the obese. [The most frequently used measurement is body mass index (BMI) which is weight in kilograms divided by the square of height in metres. A BMI of 18.5 to 24.9 is regarded as healthy, while 25 to 29.9 is regarded as overweight and 30 or above as obese.]

The World Heart Federation states that "as many as 22 million children throughout the world are overweight" and the World Health Organisation reports that "one billion people are now overweight or obese", which it links with the Westernisation of diets with fruits, vegetables and whole grains being replaced by junk food high in saturated fat and added sugar (*The Observer* 29/9/02 p9).

Type 1 diabetes cannot be cured, but in many cases type 2 diabetes can be prevented and vegans may be at reduced risk of developing the disease. One small study (Nicholson et al. 1999) showed that changing to a low fat vegan diet reduced weight and improved serum glucose concentrations in patients with type 2 diabetes. Other studies have shown that reducing saturated fat, increasing fibre, reducing weight and increasing physical activity can reduce the incidence of type 2 diabetes significantly (Tuomilehto et al. 2001).

Meat consumption has been positively associated with diabetes (Snowdon & Phillips 1985) but other dietary components may also be involved. For instance, meat eaters tend to consume less fruit and vegetables, fibre and complex carbohydrates such as beans, legumes, wholegrain bread and fruit than vegans and vegetarians. It has also been shown that saturated fat may increase insulin secretion and possibly lead to insulin resistance (Collier & O'Dea 1983).

There is much controversy about the relationship between the amount and types of dietary fat and carbohydrate and the risk of diabetes. Current recommendations promote low fat, high carbohydrate diets for the prevention of diabetes, heart disease and other chronic diseases. However, it is now increasingly appreciated that the types of fat and carbohydrate are important. There is strong evidence that vegans are at reduced risk (Davis & Melina) due to

- Less obesity.
- High intake of fibre.
- Low intake of saturated fat.
- High intake of magnesium.

OBESITY

The vegan diet is natural for promoting healthy weights. It is low in fat, particularly saturated fat, high in fibre, and tends to have a larger proportion of complex carbohydrates such as whole grains than a non-vegan diet. Vegan children tend to be lighter than their peers (Sanders et al 1978; Sanders & Manning 1992), and overweight children are at increased risk of obesity in adulthood, increasing the risk of diabetes. In England between 1984 and 1994 the proportion of overweight boys increased from 5.4% to 9% and the proportion of overweight girls from 9.3% to 13.5% (Pharmacy Magazine 2001). Continuously taking in excess energy (kcal) increases the body's need for insulin while at the same time producing surplus fat stores which make the body more resistant to insulin and reduce its effectiveness.



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SATURATED FAT

A high intake of saturated fat is a risk factor for type 2 diabetes (Mann 2002) and animal products are the greatest sources of saturated fat in the Western diet. Plant fats are from 6 to 25% saturated, with the exception of tropical oils which are 50 to 85% saturated but usually form only a small part of the diet. Saturated fats should not provide more than 10% of total calories.

Substituting non-hydrogenated polyunsaturated fat (found in natural vegetable oils, nuts and seeds) for saturated and trans-fatty acids (such as those in vegetable shortening and hard margarines) could appreciably reduce the risk of type 2 diabetes (Hu et al 2001). Trans-fatty acids occur naturally in dairy products and in meat as a result of the hydrogenation process in the animal's lumen, but nowadays many processed vegan foods also contain hydrogenated fats and these are as harmful as saturated animal fats.

FIBRE

Vegans generally have a high fibre diet with less reliance on refined carbohydrates. Vegan diets tend to be rich in whole grain products and pulses, fruits, vegetables and oats which contain soluble fibre. Three servings of whole grains per day are recommended to reduce risk of type 2 diabetes, coronary heart disease and certain cancers. Only 1 in 40 Britons eats this amount and almost one third of the population eat none at all! (IVFS 2002). Studies have shown that vegans may consume twice as much fibre as omnivores (Thorogood & Mann 1990; Sanders & Manning 1992; Draper et al 1993). Whole grain products and soluble fibre decrease the rate of absorption, producing slower glycaemic and insulinaemic responses – i.e. slower release into the bloodstream – compared with highly processed grains. Studies suggest an association between increased intake of whole grains and reduced risk of type 2 diabetes (Fung et al. 2002; McKeown et al. 2002). Researchers at Harvard University have been testing the hypothesis that whole grain consumption improves insulin sensitivity in overweight and obese adults. They have found a 10% decrease in developing diabetes when the amount of whole grains in the diet is increased. Whole grains also contain beneficial antioxidants, vitamins, phytochemicals and magnesium.

MAGNESIUM

Diabetes has been associated with low levels of magnesium (Ma et al. 1995), which may also help to prevent complications of diabetes such as deterioration of the retina. Vegan diets are rich in this mineral and sources include whole grains and nuts.

Diabetes, particularly type 2, has been shown to be a preventable disease if diet and exercise are taken seriously. Genetics undoubtedly also play a part and certain people are at greater risk. In recent years the diet of vegans and vegetarians has also changed considerably with many high fat, high salt, high sugar convenience foods now available and an increasing number of vegans and vegetarians eating poor diets, taking less activity and putting on weight. There is no doubt that a vegan diet can be protective and could lead the way in preventing and perhaps treating diabetes, but only if it is based on unrefined whole foods and not on processed and refined convenience foods.

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