

## THE VEGETARIAN SOCIETY

# HEALTH AND VEGETARIANS

A vegetarian diet is known to confer a wide range of health benefits. Research has shown vegetarians to suffer less heart disease, hypertension, obesity, diabetes, various cancers, diverticular disease, bowel disorders, gall stones, kidney stones, and osteoporosis (Dwyer, 1988). Vegetarian diets have also been used in the treatment of various illnesses, including rheumatoid arthritis and nephrotic syndrome.

Dickerson & Davies (1986) studied matched pairs of vegetarians and non-vegetarians with regard to their general health. It was found that the vegetarians made 22% of the visits to hospital out-patients of non-vegetarians, and spent a similarly reduced proportion of time in hospital.

### **A HEALTHY VEGETARIAN DIET**

A typical vegetarian diet closely matches expert dietary recommendations for healthy eating, being low in saturated fat and high in fibre, complex carbohydrates, and fresh fruit and vegetables.

The 1983 NACNE Report (National Advisory Committee on Nutrition Education) in the UK recommended a reduction in fat intake, particularly saturated fat, and an increased dietary proportion of polyunsaturated fats to saturated fats. An increased intake of complex carbohydrates and fibre and a decreased intake of sugar and salt were also recommended.

The World Health Organisation (1990) has similarly recommended a reduced intake of fat and increased consumption of complex carbohydrates. Increased consumption of fruit, vegetables, cereals and pulses is also recommended.

The nutritional guidelines from the World Health Organisation, the NACNE Report and other expert bodies form the basis of advice given on healthy eating by health professionals today.

Vegetarian diets tend to be lower in total fat. Taber & Cook (1980) found lacto-ovo vegetarians to consume an average of 35% of energy as fat, compared to omnivores consuming over 40% of energy as fat. A study of the diets of a group of French vegetarians found they had a daily intake of 25% less fat than non-vegetarians (Millet, 1989).

Vegetarians also tend to eat proportionally more polyunsaturated fat to saturated fat compared with non-vegetarians. Animal products are the major sources of dietary saturated fat.

The best dietary sources of complex carbohydrates and fibre (also called non-starch polysaccharides or NSPs) include wholegrain cereals, vegetables and pulses and so vegetarian diets tend to be high in these nutrients. Animal products contain no fibre or complex carbohydrate.

Recent research has demonstrated the importance of protective antioxidant nutrients in the diet found in fresh fruit and vegetables. These antioxidant nutrients include the beta-carotene form of vitamin A, vitamin C and E. Many researchers now believe that these nutrients play a major role in reducing the risk of chronic diseases such as heart disease and cancer. A high consumption of fresh fruit and vegetables is a benefit of vegetarian diets.

All these factors contribute to the proven health of vegetarians although it is difficult to account for the exact contribution of each nutrient. All vegetarian diets are not necessarily healthy, for example if too high a proportion of high fat dairy products are consumed.

### **HEART DISEASE**

Cardiovascular disease is the major cause of mortality in Britain, being responsible for around 50% of all deaths. The majority of these deaths are from coronary heart disease.

A Department of Health report in 1994 concluded "A diet high in fat (particularly saturated fat) and high in salt is associated with an increased risk of coronary heart disease".

Vegetarians suffer markedly lower mortality from coronary heart disease compared to non-vegetarians (Key et al (1999)). This reduced risk may be related to the lower blood cholesterol levels of vegetarians.

Findings from the Oxford Vegetarian Study, a 12 year study of 6000 vegetarians and 5000 meat-eater found that the incidence of coronary heart disease mortality was 28% lower in vegetarians compared with matched omnivores, after all non dietary factors had been taken into consideration (Thorogood, 1994).

Burr & Butland (1988) found vegetarians to suffer significantly lower mortality from heart disease than health conscious non-vegetarians. Mortality from ischaemic heart disease was 57% lower in vegetarians than the general population, and 18% lower than in non-vegetarians following a healthy lifestyle. Deaths due to cerebrovascular disease was 43% lower in the vegetarians compared with the general population.

A study of nearly 28 000 Seventh Day Adventists in California noted a clear trend of increasing incidence of heart disease with rising frequency of meat consumption (Snowdon, 1988).

The Coronary Artery Risk Development in Young Adults (CARDIA) Study examined diet in relation to health in over 5000 young adults aged 18 to 30. Vegetarians were found to have greatly improved cardiovascular fitness and a lower risk of heart disease (Slattery, 1991). A low level of meat consumption was linked to improved general health.

An eleven-year study of 1900 German vegetarians has found mortality from cardiovascular disease to be 61% lower in male vegetarians and 44% lower in female vegetarians than the general population. For ischaemic heart disease, mortality was reduced still further, to only one-third of that expected (Claude-Chang, 1992).

The protective effect of a vegetarian diet is believed to be related to the lower blood

cholesterol levels seen in vegetarians. Repeated studies have demonstrated the low blood cholesterol levels of vegetarians (Resnicow, 1991). Thorogood (1990) found vegetarians to have cholesterol levels 10% lower than health conscious meat-eaters. High blood cholesterol is a primary risk factor in heart disease. Significantly, vegetarians have lower levels of low-density-lipoprotein (LDL) cholesterol. This is the cholesterol fraction particularly associated with heart disease.

Research has suggested that a 10% reduction in blood cholesterol may be associated with a 30% reduction in the incidence of coronary heart disease (Martin, 1986).

A recent collaborative analysis of 8,300 deaths among 76,000 men and women in five prospective studies concluded that vegetarians have a 24% reduction in mortality from ischaemic heart disease, this increased to 45% in the under 65s. When compared with regular meat eaters the vegetarians showed 34% less mortality (Key, 1998).

The California Lifestyle Heart Trial has indicated that a low fat vegetarian diet together with other lifestyle changes such as exercise and stress management can in fact reverse the progress of heart disease, by reducing cholesterol plaques in coronary arteries (Ornish, 1990).

## **HYPERTENSION**

Hypertension, or high blood pressure, can contribute to heart disease, strokes and kidney failure. A number of studies have shown vegetarians to have lower blood pressures than non-vegetarians (Sacks, 1974, Armstrong, 1977).

A vegetarian diet has also been shown to reduce blood pressure in hypertensive patients (Margetts, 1986).

A seven year study on blood pressure in middle aged men concluded that diets higher in fruit and vegetables, and lower in meat may reduce the risk of developing high blood pressure (Miura et al, 2004).

The reason for the low blood pressure associated with vegetarian diets is unclear. The relative leanness of vegetarians is one suggestion, as is the effect of reduced sodium or increased potassium or calcium in the diets

of vegetarians.

## **OBESITY**

Vegetarians are leaner than non-vegetarians and their weights are generally closer to desirable levels. The British Medical Association (1986) has stated that vegetarians have lower rates of obesity. Appleby et al (1998) as part of the Oxford Vegetarian Study concluded that non meat eaters are thinner than meat eaters. This may be partly due to a higher intake of dietary fibre, a lower intake of animal fat, and only in men a lower intake of alcohol.

## **DIABETES**

Snowdon (1985) found type II diabetes to be only half as common as a cause of death amongst the largely vegetarian Seventh Day Adventist population as in the general population.

An average vegetarian diet closely matches the British Diabetic Association's recommendations for diabetic patients. Vegetarian diets tend to be high in complex carbohydrates and dietary fibre, which has a beneficial effect on carbohydrate metabolism, lowering blood sugar levels. The leanness of vegetarians also contributes to reduced incidence of diabetes. Diabetes is often associated with raised blood cholesterol levels and a vegetarian diet confers protection against this.

## **CANCER**

Cancer is the second leading cause of death in Britain, accounting for 25% of all deaths. It has been estimated that diet may be linked to 30-70% of cancers (Doll, 1990). Certain cancers, such as colon, breast and prostate are clearly diet related (Cummings & Bingham, 1998).

The 1998 report by the Committee on Medical Aspects of Food and Nutrition Policy. Working Group on Diet and Cancer stated that "It is estimated that, on average, a third of cancers could be prevented by changes in diet"

It went on to say "A diet which is high in fibre (fruit & vegetables) and whole grain cereal and low in fat has the potential to prevent a number of cancers, including colorectal and breast cancer".

Sir Kenneth Calman, Chief Medical Officer, has stated (1997) that "there is a relationship between eating red meat and cancer".

The Oxford Vegetarian Study found cancer mortality to be 39% lower among vegetarians compared with meat-eaters (Thorogood, 1994).

A study of 23 000 largely vegetarian Seventh Day Adventists found cancer mortality rates to be 50-70% of those of the general population for several cancer sites unrelated to smoking or alcohol (Phillips, 1975).

Professor Nick Day of the University of Cambridge and the European Prospective Study into Cancer has stated that vegetarians may suffer 40% fewer cancers than the general population.

The World Cancer Research Fund's dietary advice to minimise cancer risk involve reducing the intake of dietary fat and increasing the consumption of fruits, vegetables and wholegrains.

## **COLON & STOMACH CANCER**

Vegetarians have lower rates of colon cancer than non-vegetarians (Phillips, 1980). Incidence of colon cancer has been strongly linked to the consumption of meat (Armstrong, 1975, Singh & Fraser, 1998). Willett (1990) carried out a study of over 88 000 women aged 34 to 59 years. Women eating red meat daily ran over twice the risk of developing colon cancer than women eating red meat less than once a month.

Reduced incidence of colon cancer in vegetarians may be attributed to dietary differences which include increased fibre intake, increased consumption of fruit and vegetables, and decreased intake of total fat and saturated fat. The mechanism by which a vegetarian diet is protective against colon cancer is unclear and a great deal of research is being carried out in this area.

It has been suggested that secondary bile acids are carcinogens which may play an important role in colon cancer. These are derived by bacterial metabolism from primary bile acids made in the liver and secreted into the intestine. Vegetarians have lower levels of secondary bile acids than non-vegetarians

(Turjiman, 1984). The differences in bacterial populations between the intestines of vegetarians and non-vegetarians may also be important. Bacterial flora in vegetarians has been shown to possess reduced ability to transform bile acids into potential carcinogens (Johansson, 1990).

The role of dietary fibre in prevention of colon cancer may also be important. This was first noted in 1971 when it was suggested the high incidence of colon cancer in Western countries was linked to low fibre diets. Other dietary components associated with high fibre foods, such as folate, have also been implicated as having protective effects.

More recently Chen (2002) found that the risk of distal stomach adenocarcinoma was positively associated with red meat intake.

### **BREAST CANCER**

Evidence also suggests a vegetarian diet is protective against breast cancer (Phillips, 1975). This may be due to the increased fibre and reduced fat intake of vegetarian diets. Vegetarian diets can alter the levels of circulating sex hormones which may have a beneficial effect. Fibre is thought to be protective by modifying circulating oestrogen levels.

Studies of adolescent girls have shown age of menarche to be delayed in vegetarians (Sabate, 1992). Later age of menarche is believed to lower the risk of breast cancer in adult life.

### **OTHER CANCERS**

Studies have shown vegetarians to suffer less from various other cancers. Mills (1989) studied the incidence of prostate cancer amongst 14 000 Seventh Day Adventists and found a relationship between increased risk and increasing animal product consumption.

Mills (1988) also found pancreatic cancer to be associated with consumption of animal products. Increasing consumption of fruit, vegetables and pulses was shown to have a protective effect. Rao (1989) found a vegetarian diet to be protective against oesophageal cancer.

Studies have also shown vegetarians to have lower incidence of lung cancer. This can be largely attributed to vegetarians tending to be

non-smokers. High consumption of fruit has also shown to be protective against lung cancer (Fraser, 1991).

### **DIVERTICULAR DISEASE**

Diverticular disease affects the colon and symptoms include lower abdominal pain and disturbed bowel habit. It occurs frequently in western countries where intake of dietary fibre is low. Gear (1979) found diverticular disease to be less frequent in vegetarians, 12% of vegetarians studied having diverticular disease compared with 33% of non-vegetarians. This is thought to be due to the increased fibre of vegetarian diets.

### **GALL STONES**

Gall stones are composed of cholesterol, bile pigments and calcium salts. They form in the gall bladder and can cause severe pain. A study of over 750 women found the incidence of gall stones to be less frequent in vegetarians. 25% of non-vegetarians compared with 12% of vegetarians had gall stones. After controlling for age and body weight, non-vegetarians were found to have a relative risk of gall stones almost twice that of the vegetarians (Pixley, 1985).

Vegetarians are leaner, and consume more dietary fibre and less dietary cholesterol, all of which is believed to protect against gall stone formation.

### **KIDNEY STONES**

Kidney stones form in the kidney and can cause considerable pain when passing down the urinary tract. Prevalence of kidney stones is lower in vegetarians (Peacock, 1969).

A high intake of animal protein increases the urinary loss of calcium and oxalate, known risk factors in kidney stone formation. Meat is also high in purines which leads to increased uric acid in the urine. Urinary uric acid is also a risk factor for kidney stones.

### **OSTEOPOROSIS**

Osteoporosis is the loss of calcium from bone tissue, leading to bones that are brittle and liable to fracture. It is most commonly seen in postmenopausal women.

Some studies have suggested that

vegetarians may be at lower risk of osteoporosis than non-vegetarians. Sellmeyer's study (2001) found that elderly women with a high dietary ratio of animal to vegetable protein intake had more rapid femoral neck bone loss and a greater risk of hip fracture than those with a low ratio.

Marsh (1988) found bone loss to be considerably less in postmenopausal women who were vegetarian than those who were non-vegetarian. The non-vegetarian diet contained higher amounts of sulphur, which derived from animal protein. Dietary sulphur increases the acidity of urine, which results in increased urinary calcium loss. Increased urinary calcium loss is related to increased calcium loss from bone tissue.

Hip fractures associated with osteoporosis has been shown to be higher in countries consuming a diet high in animal protein (Abelow, 1992).

### **APPENDICITIS**

The Oxford Vegetarian Study found that people who do not eat meat have a 50% lower risk of requiring an emergency appendectomy than those who do (Appleby, 1995).

### **OTHER DISEASES**

A vegetarian diet has been claimed to reduce the risk of gout, hiatus hernia, constipation, haemorrhoids, and varicose veins. These diseases are linked to diets low in fibre and high in saturated fat.

### **FOOD POISONING & PESTICIDE RESIDUES**

Over 50 000 cases of food poisoning are reported every year and the actual incidence of food poisoning is estimated to be ten times this figure. Meat, eggs and dairy products are the primary sources of food poisoning. Professor Richard Lacey of the University of Leeds has stated that "More than 95% of food poisoning is derived from meat and poultry products".

Pesticide residues in foods include PCBs and dioxins. These are found in highest concentrations in meat, fish and dairy products. Studies have shown these toxic chemicals can be passed on from pregnant

women to infants during both pregnancy and lactation and may damage the developing nervous systems. Hall (1992) has stated a vegetarian diet minimises the risk of contamination.

### **RHEUMATOID ARTHRITIS**

Studies have shown that vegetarian diets can be successfully used to treat the symptoms of rheumatoid arthritis and other rheumatic diseases. Kjeldsen-Kragh (1991) found that rheumatoid arthritis patients following a vegetarian diet suffered considerably fewer swollen and tender joints and less stiffness or pain.

### **NEPHROTIC SYNDROME**

Nephrotic syndrome is a kidney condition involving high levels of protein in the urine which may lead to progressive kidney damage as well as promoting atherosclerosis and heart disease. Studies have shown a low protein vegan diet can be used to reduce the symptoms of nephrotic syndrome (D'Amico, 1992).

### **THE CHINA HEALTH PROJECT**

The China Project on Nutrition, Health & Environment is a massive study involving researchers from China, Cornell University in Boston, and the University of Oxford, into the relationships between diet, lifestyles and disease-related mortality in 6500 Chinese subjects from 65 mostly rural or semi-rural counties.

The rural Chinese diet is largely vegetarian or vegan, and involves less total protein, less animal protein, less total fat and animal fat, and more carbohydrate and fibre than the average Western diet. Blood cholesterol levels are significantly lower. Heart disease, cancer, obesity, diabetes, and osteoporosis are all uncommon. Areas in which they are becoming more frequent are areas where the population has moved towards a more Western diet with increasing consumption of animal products.

The China Health Project has clearly demonstrated the health benefits of a diet based on plant foods. One of the Project's co-ordinators, Dr Colin Campbell of Cornell University, has stated that "We're basically a vegetarian species and should be eating a wide variety of plant foods and minimising our

intake of animal foods."

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