

# IS THERE A CASE FOR GOING VEGO?

**DAA VEG IG SEMINAR SUMMARY**  
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# The Case for Going Vego - Sustainability

By Dr Rosemary Stanton, APD, OAM  
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With climate change a fact, dietitians need to factor in the environmental effects of all our recommendations about what we consume. These effects include use of water, land clearing, soil fertility, transport, packaging, storage, refrigeration and overconsumption.

An examination of the use of water for food production shows that production of meat uses much more water than production of plant foods. Water usage is especially high when animals are fed grains, legumes or specially grown pasture.

An examination of soil fertility is especially relevant for Australia since our soils are extremely low in phosphorus and the price of superphosphate fertiliser has increased 8-fold over the last year or two and is set to rise even higher as world stocks fall. Production of most animal foods requires much more phosphorus than production of plant foods.

In looking at production of greenhouse gases, 16% of Australia's emissions arise from food production, with 70% of this coming from animal production. Production of beef is particularly problematic because of land clearing for enhanced pasture, methane production by the animals and the huge inefficiency of using grains and legumes as animal fodder (40% of the world's grains and legumes are currently fed to animals). An average steer also produces 29kg of wet waste/day and this becomes a problem in lot-fed beef production.

Energy resources are also used in transport, storage and necessary refrigeration of animal foods. Processing, packaging, use of out-of-season foods, using food crops for ethanol, excessive choice and overconsumption are also issues and apply to both plant and animal products.

For both health and sustainability, the World Health Organisation recommends we bias our diets towards plant foods and away from a high consumption of animal products and highly processed items.

# Vegetarian Diets & Weight Management

By Sue Radd, APD  
Nutritionist, Author and Speaker

As obesity rates surge, it is important for dietitians to identify eating patterns that can minimise weight gain and may be effective in treating overweight and obese clients. Plant-based diets may be an underutilised modality in this regard.

On the whole, epidemiological studies show that vegetarians, especially vegans, are leaner than omnivores by 1-5 BMI points, depending on the study in question.

A review by Berkow & Barnard of 40 observational studies (1977-2005) found that vegetarians weighed significantly less than non-vegetarians as measured by BMI or body weight. More recent data from EPIC-Oxford, which includes more than 21 000 vegetarians/vegans, indicates that meat eaters have the highest mean BMI and vegans the lowest (across all age groups for both men and women), with fish eaters and lacto-ovo vegetarians faring somewhere in between. Interestingly, smoking, physical activity and education accounted for < 5 % of the difference in BMI. Further, a follow up study examining weight gain over five years in this cohort found that those who changed their diet in one or several steps in the direction of meat eater → fish eater → vegetarian → vegan showed the smallest annual weight gain ( $p < 0.001$ ).

The latest findings from Adventist Health Study-2 ( $n = 97\ 000$ ), of which less than half the subjects are vegetarians, conclusively show that even among this health conscious group, vegetarians, especially vegans, have lower BMI's than omnivores - with a difference of up to 5 BMI points being evident.

While limited clinical trials exist, Turner-McGrievy et al (2007) showed that free living postmenopausal women lost significantly more weight over a two year period with a low fat vegan diet vs. NCEP Step II diet, despite a lack of energy restriction and both diets were deemed to be highly acceptable.

The dietary factors most strongly associated with an increased BMI are high protein (% of energy) and low fibre intake. Plant-based diets may also be protective against weight gain by virtue of their lower energy density. There is emerging evidence that flavonoids may have a role in protecting against fat gain.

# Vegetarian Diets and Diabetes

By Kate Marsh, AdvAPD, CDE  
Dietitian, Diabetes Educator

Vegetarian diets are typically lower in saturated fat and higher in dietary fibre. They are also likely to include more wholegrains, legumes, nuts and soy protein, and together with the absence of red meat, this type of eating plan may provide many benefits for people with diabetes and those at risk.

## Reduce diabetes risk

The Adventist Health Study found a significantly lower risk of diabetes in vegetarians compared to non-vegetarians, the association with red meat remaining even after adjustment for body weight, other dietary factors and physical activity. Higher intakes of dietary haem iron, red meat, processed meat and animal protein are associated with a higher risk of type 2 diabetes and gestational diabetes (GDM). High fat diets, particularly those high in saturated fat, are associated with an increased risk of type 2 diabetes while higher intakes of fibre, cereal fibre and wholegrains have been associated with a reduced risk of type 2 diabetes. A higher intake of nuts, legumes and soy foods have also been associated with a reduced risk of type 2 diabetes. Vegetarian diets are likely to have a lower glycemic index (GI) and research shows that a low GI diet can reduce the risk of type 2 diabetes.

## Improve metabolic control, reduced medication use

There are only a few intervention studies assessing the effects of a vegetarian diet in people with diabetes, and weight loss has generally been greater on the vegetarian diets, making it difficult to determine the independent effect of the diets. However, greater weight loss may be one of the advantages of a vegetarian diet as even small amounts of weight loss can help in both the prevention and management of type 2 diabetes. A recent study comparing a low fat vegan diet with a diet based on the American Diabetes Association guidelines found that the vegan diet reduced HbA1c levels significantly more than the ADA diet, led to a greater weight loss and a greater reduction in LDL cholesterol urinary albumin. On the vegan diet 43% of subjects were able to reduce their medication compared to only 26% in the ADA group.

## Prevent complications

A number of studies have now shown that replacing animal protein intake with vegetable and soy protein may improve renal function in people with diabetes and impaired renal function. Vegetarian diets are associated with a reduced risk of cardiovascular disease, which is the leading cause of death in people with diabetes. There is some evidence to suggest a vegetarian diet may help with painful diabetic neuropathy but further research is needed.

## Caution - monitor vitamin B12.

One potential concern with a vegetarian diet is vitamin B12 deficiency. Anyone following a vegetarian diet should have their vitamin B12 levels monitored regularly, and this is particularly important for those taking metformin, which interferes with vitamin B12 absorption.

# The Vegetarian Dietary Pattern and Health

By Dr Gary E Fraser

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Vegetarian dietary patterns and health were reviewed with particular reference to the Adventist Health Studies in USA. The current Adventist Health Study-2 (AHS-2) recruited 96,000 participants throughout USA and Canada; 26% are black, 66% are female; average age is 60 years and there is a wide variety in dietary habits. Participants were classified by dietary status - vegan (no dairy, meat or fish) - 4,500 (4.6%), lacto-ovo vegetarian (eat meat and fish <1/month) - 31,300 (32.3%), pesco-vegetarian (eat meat and poultry <1/month but fish more frequently) - 9,800 (10.1%), semi-vegetarian (eat meat and fish <1/week) - 5,200 (5.4%), and non-vegetarian - 46,000 (47.5%).

Preliminary analysis of dietary status and several prevalent health conditions as reported at baseline showed that higher adherence of a vegetarian diet correlated with lower rates of obesity, hypertension, high cholesterol and type-2 diabetes.

Relative BMI was progressively lower as the diet moved from non-vegetarian towards vegan. For a typical average height and aged participant weight difference between non-vegetarian and vegan was about 15 kg.

There was a gradation of blood pressure correlating with vegetarian status. The odds ratios (compared to non-vegetarians) of treated hypertension for white subjects were: vegan (OR = 0.243), lacto (OR = 0.485), pesco (OR = 0.649), semi (OR = 0.774), non-vegetarian (OR = 1.00). In analysis of type-2 diabetes adjusting for age, sex, race, education, income, TV time and BMI and using non-vegetarians as the reference relative risks were: vegan RR= 0.60, lacto-ovo RR = 0.55, pesco RR=0.72, semi RR = 0.85.

Vegetarians are greatly protected from heart disease - probably due to the absence of meat. This effect is age-dependent especially in females. Nut consumption and whole grains reduces heart disease risk; nuts lower LDL cholesterol; fish consumption in small amounts may lower risk of fatal CHD; saturated fats and trans-fatty acids increase the risk of CHD while polyunsaturated fats (mainly n-6) decrease the risk.

Previous studies show that Adventists in California have longer life expectancy: vegetarianism, nut consumption, physical activity, absence of past smoking and medium body weight each appear to contribute an extra 2-3 years of life.

In AHS-2 total carotenoid consumption was significantly higher in pesco, lacto-ovo and vegans. Lacto-ovo vegetarians are relatively low-dairy consumers and may be different to UK vegetarians. The probable health effects of dairy foods are: a weak effect to increase the risk of CHD; may decrease risk of colorectal cancer; increased risk of aggressive prostate cancer; decrease in risk of fractures but probably only in those who are markedly calcium deficient.

Preliminary analysis of vegetarian pattern and mortality in AHS-2 of 1200 deaths with Adventist non-vegetarian as the reference group; and adjusting for age, sex and race, show that pesco and lacto-ovo vegetarians have significantly lower death rates. In summary as we search for the optimum vegetarian diet Fraser suggests a low dairy, high quality vegetarian diet that avoids calorie dense processed foods and to keep an open mind about occasional fish.

# Meeting the NRV's on a vegetarian diet.

By Carol Zeuschner APD, Michelle Reid APD & Angela Saunders APD Dietitians

Since the release of the Nutrient Reference Values (NRVs) for Australia and New Zealand in 2006, there has been some concern expressed about the ability to meet these new recommendations on a vegetarian diet, particularly with the increased requirements for iron and zinc at 180% and 150% RDI respectively.

Our aim was to conduct dietary modelling to determine whether the NRV's can be met on a vegetarian diet, and also compare the nutritional qualities to a meat-containing diet.

Using a light physical activity level (PAL) and mid-range anthropometrics, corresponding meal plans were developed for an adult female. A female was chosen due to the higher iron requirements. Both diets had similar amounts of energy (kJ), and both met the Acceptable Macronutrient Distribution (AMDR). However, the vegetarian meal plan had almost double the amount of iron than the meat containing diet (32mg vs 18mg). Similar amounts of zinc and vitamin B12 were achieved in each diet, although both these nutrients were marginally higher in the meat-containing diet.

Further differentiations between the vegetarian and traditional meat diet included: sodium above the Upper Limit (UL) and fibre intake lower than recommended levels in the meat-containing diet. Fat profile was more favourable in the vegetarian diet, and more consistent with recommendations for chronic disease prevention. Both saturated fat and cholesterol was lower in the vegetarian diet, while poly and monounsaturated fats were proportionally higher.

**LEARNINGS FOR PRACTICE:** This dietary modelling exercise has shown that a vegetarian diet can be nutritionally adequate. However, it is important for practitioners to be aware of the following significant nutrients.

**IRON:** Vegetarian diets can contain as much or more iron than mixed diets. Iron in plant foods is sensitive to the presence of inhibitors and enhancers of iron absorption. Vitamin C rich foods in the same meal, as well as techniques such as soaking, sprouting and leavening, will reduce the effects of inhibitors such as phytate. The RDI for vegetarians is 80% higher, due to factors that affect absorption.

Iron deficiency anaemia is no greater in vegetarians than in non-vegetarians. Absorption of iron is regulated by how much we need, and there is evidence of adaptation to lower intakes over time. Typically vegetarians have lower iron stores, but serum ferritin levels are usually within the normal range. Lower iron stores may reduce the risk of chronic diseases such as cardiovascular disease, metabolic syndrome, diabetes and colorectal cancer.

Valuable sources of iron in a vegetarian diet: Iron-fortified breakfast cereals, wheat germ, wholegrain products, soy milk, nuts and seeds (cashews, almonds, macadamia, pistachio, pine nuts), legumes (lentils, baked beans, chickpea), dried fruit (figs, apricots), broccoli, tahboui (parsley), vegetarian meat analogues.

**ZINC:** The RDI for zinc is 50% higher, again due to higher levels of phytic acid in vegetarian diets. Zinc requirements can be met if phytate levels are low. As with iron, food preparation techniques (leavening, soaking, sprouting) can reduce phytate levels and improve absorption. Zinc absorption is also dependent on levels of intake and need, and adaptation to lower intakes can result in reduced losses and increased absorption. Zinc deficiency is not common in Western vegetarians.

Valuable sources of zinc in a vegetarian diet: Brown rice, sunflower seeds, cashews, chickpeas, tofu, wheat germ, legumes, wholegrain products.

**VITAMIN B 12:** Active vitamin B12 is not found in any plant foods, including mushrooms, spirulina, tempeh and miso. The inactive vitamin B12 found in these foods can prevent absorption of active B12. Vegetarians (especially pregnant/breastfeeding vegan women) need to carefully plan to include foods that are good sources of vitamin B12, such as dairy, eggs and fortified soy products. Older adults (vegetarian and non-vegetarian) may be at risk of deficiency due to poor diet, drug side effects or gastric atrophy.

The best measure of Vitamin B12 status is a diet history plus homocysteine levels and serum B12. A high homocysteine level is the most practical measure of Vitamin B12 deficiency. High levels of folate (typical in vegetarian diets) can mask B12 deficiency.

Valuable sources of vitamin B12 in a vegetarian diet: Dairy products, eggs, fortified vegetarian meal products, yeast spread, fortified soy milk, fortified vegetarian meat analogues.

**OMEGA 3:** Plant based diets are rich in omega 6 fatty acids but tend to contain less omega 3, unless eggs, fish and microalgae is included. The requirement for omega 3 fatty acids may be higher in vegetarians (particularly vegans) due to apparent inefficient conversion of ALA to EPA and DHA. To maximise the conversion, it is important to avoid saturated fats, trans fatty acids and excess omega 6s. A vegetarian diet cannot meet the current RDI of long-chain omega 3 unless microalgae-fortified foods or supplements are consumed.

DHA supplements derived from microalgae, as well as DHA enriched products, are an effective means of increasing DHA intake, particularly for pregnant/breastfeeding vegetarian women.

Valuable sources of short chain omega 3 (ALA): flaxseed (linseed), canola, walnuts, pecans, green leafy vegetables and soy.

### **Is there a case for going vego?**

Plant based diets are lower in saturated fats, cholesterol, animal protein and haem iron. They are also higher in fibre, beneficial fats and carbohydrates (low GI), folate, arginine, plant sterols, antioxidants and phytonutrients. The bioactive phytonutrients in plant foods also have additive and synergistic effects providing unique health benefits. Hence vegetarians tend to have lower rates of heart disease, cancer, type 2 diabetes and hypertension. There are also environmental and social equity benefits.

The ADA position statement (2003) on vegetarian diets throughout the lifecycle not only supports an appropriately planned vegetarian or vegan diet as being nutritionally adequate, but also highlights the health benefits in the prevention of certain diseases.

There are many reasons for going vego, and recent dietary modelling has shown with careful planning it is possible to meet the current NRVs on a vegetarian diet.



*For a full list of references, a Vegetarian Ready Reckoner, and full web presentations from the November 2008 VEG IG symposium “Is There a Case for Going Vego?” go to the **DAA website, VEG IG resources and DINER.***