



EDITORIAL

Cardiovascular Benefits of Plant-Based Diets

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Editorial referring to the article: [Better Adequacy of Food Intake According to Dietary Recommendations of National Cholesterol Education Program in Vegetarian Compared to Omnivorous Men](#)

Increasing evidence suggests that plant-based dietary patterns, characterized by higher intake of plant foods and lower intake of animal foods, confer benefits to cardiovascular health.¹⁻⁴ Vegetarian diets are a subset of plant-based diets that exclude some or all animal products (vegan diets).⁵

A meta-analysis of 86 cross-sectional and 10 cohort prospective studies evaluated the association between vegetarian, vegan diets, risk factors for chronic diseases, risk of all-cause mortality, incidence, and mortality from cardio-cerebrovascular diseases. The overall analysis of cross-sectional studies revealed significantly reduced levels of body mass index, total cholesterol, LDL-cholesterol, and glucose levels in vegetarians and vegans compared with omnivores. In relation to cohort studies, the analysis showed a significantly reduced risk of incidence and/or mortality from ischemic heart disease by 25%.⁶

Yokoyama et al.,⁷ conducted a meta-analysis of 30 observational studies and 19 clinical trials to assess the association of plant-based diets and plasma lipids. The authors concluded that plant-based diets are associated with decreased total cholesterol, LDL-cholesterol, and HDL-cholesterol, but not with decreased triglycerides. Eichelmann et al.,⁸ observed that plant-based diets are associated with an improvement in obesity-related inflammatory profiles, with reductions in the concentrations of C-reactive protein, interleukin-6, and soluble intercellular adhesion molecule-1.⁸

Keywords

Plant-based diet, vegetarian diet, cardiovascular health.

Recently, the European Society of Cardiology highlighted that a shift from a more animal-based to a plant-based dietary pattern may reduce the risk of atherosclerotic cardiovascular disease.³ In line with this, the American Heart Association (AHA) published a dietary guidance recommending the consumption of healthy sources of protein, mostly from plants, as soybeans, other beans, lentils, chickpeas, and peas to reduce cardiovascular risk.⁹ In addition, there is a growing concern about the impact of the food system on the environment and climate change. A plant-based dietary pattern is more sustainable as it contributes to the reduction of greenhouse gas emissions.¹⁰ The AHA also reinforced that the replacement of animal-source foods by plant-based whole foods has additional benefits to planetary health. Conversely, a sustainable dietary pattern is not necessarily associated with a lower cardiovascular risk, since a plant-based diet, high in refined carbohydrate and added sugar, may increase the risk of type 2 diabetes and cardiovascular disease (CVD).⁹

Baden et al.,¹¹ investigated the associations between 12-year changes (from 1986 to 1998) in plant-based diet quality assessed by three indices – an overall plant-based diet index (PDI), a healthful plant-based diet index (hPDI), and an unhealthful plant-based diet index (uPDI) (score range: 18 to 90) – and subsequent total and cause-specific mortality (from 1998 to 2014). The study concluded that improving plant-based diet quality over a 12-year period was associated with a lower risk of total and cardiovascular mortality, whereas increased consumption of an unhealthful plant-based diet was associated with a higher risk of total and CVD mortality.¹¹ In another cohort, it was observed that

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improving adherence to overall and healthful plant-based diets was associated with a lower risk of type 2 diabetes, whereas decreased adherence to such diets was associated with a higher risk.¹²

In addition to the known benefits of increased fiber intake, the positive effects of healthy vegetarian and plant-based diets also might be attributed by the modulation of gut microbiota composition. Increasing evidence has shown that different dietary patterns affect the gut microbiota, and differences in this ecosystem between vegetarian and omnivores have been documented. Plant-based diets seem to contribute to greater diversity in gut microbiota, which is associated with lower risk of developing metabolic disorders and CVD.¹³ This positive impact may be due to the higher amount of fermentable fibers, polyphenols and polyunsaturated fatty acids in the diet, that act as prebiotics and selectively stimulate the increase of beneficial species.¹⁴

In this issue of the Journal, Antoniazzi et al.,¹⁵ in a cross-sectional study, compare dietary adequacy, according to the recommendations of the National Cholesterol Education Program (NCEP), between apparently healthy vegetarians and omnivorous men. Several cardiovascular risk markers were significantly lower in vegetarians compared to omnivores, including, body mass index, waist circumference, blood pressure, total cholesterol, LDL cholesterol, triglycerides, apolipoprotein B, fasting

glucose, glycated hemoglobin, pulse wave velocity, and carotid intima-media thickness. Vegetarians consumed significantly more dietary fibers, polyunsaturated fats and plant stanols, and significantly less protein, total fat, monounsaturated fat, saturated fat and dietary cholesterol. The NCEP recommendations for saturated fat (<7% of total calories), dietary cholesterol (<200mg/day) and fiber (20-30g/day) were met, respectively by 77%, 95% and 39% of vegetarians vs. 48%, 43% and 25% of omnivores ($p < 0.01$). All vegetarians and omnivores consumed monounsaturated and polyunsaturated fatty acids within NCEP recommendations. Logistic regression analysis showed that, compared with omnivorous diets, vegetarian dietary patterns were associated ($p < 0.05$) with an adequate intake of saturated fat and dietary cholesterol, even after adjustment for energy intake and age. The authors concluded that vegetarians were more likely to consume saturated fat, cholesterol, and fibers according to NCEP recommendations, which may contribute to lower levels of cardiovascular risk markers.

In summary, the findings of the study conducted by Antoniazzi et al.,¹⁵ are in line with recent evidence suggesting beneficial effects of plant-based diets, and highlight that achieving nutritional recommendations for CVD prevention may be easier for vegetarians compared to omnivores.

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