

Nuts as Part of Sustainable Diets for Planetary Health

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Globally, populations have diverged from traditional diets and increasingly adopted unhealthy diets high in ultra-processed food, calories, fat, sugar and salt and low in dietary fibre.¹⁻³ This nutrition transition has adversely impacted both human and planetary health.

The prevalence of non-communicable diseases has increased worldwide as a result of this nutrition change,^{1,2} while increasing the double burden of malnutrition in low- and middle-income countries.⁴ The phenomenon has concomitantly depleted the environment and contributed to climate change.^{1,5} Thus, human health and nutrition are inextricably linked to planetary health.

The Need for Sustainable Diets

The interplay among diet, health and the environment has made it imperative to make diets sustainable, as diet is an important environmental stressor contributing to over a quarter of the global greenhouse gas emissions.⁶ A

sustainable diet has “low environmental impact, contributes to food and nutrition security and to healthy life for present and future generations.”⁷ Plant-based dietary patterns are more sustainable than animal-based patterns because of their lower environmental impact^{6,8} (Figure 1). Thus, there is a global shift towards adopting plant-based diets.⁹ The prevalence of veganism and vegetarianism doubled between 2015 and 2017 and approximately 30–40% of consumers are interested in reducing meat consumption.⁹

As consumers increasingly adopt plant-based diets, multi-dimensional impacts of such shifts have been investigated. From the nutritional standpoint, dietary pattern shifts that reduce or exclude a particular food group from the diet diminish or even completely deplete the intake of certain nutrients essential for optimal health and performance. For example, animal foods are rich sources of protein, iron, zinc, iodine and B12. Reducing or completely excluding animal food poses challenges meeting requirements for these nutrients. To prevent deficiencies and to sustain normal physiology and function, transformed diets should substitute the deficient essential nutrient(s) from another food source. Ideally, these substitutions should not alter the caloric or nutritional values from those recommended in dietary guidelines. Therefore, transformations

to make diets healthy and sustainable can be extremely challenging. Rising to this challenge, the EAT–Lancet Commission envisioned a universal dietary transformation that requires substantial dietary shifts, including a drastic reduction of over 50% in the global consumption of unhealthy foods such as red meat and sugar and a 100% increase in consumption of healthy foods such as nuts, fruits, vegetables, and legumes.⁵

The Role of Nuts in Sustainable, Healthy Diets

The theoretical support for increasing nut consumption as part of sustainable diets comes from three main angles. Firstly, the addition of nuts buffers the reduced levels of protein and minerals such as iron and zinc consequent to reduced animal food consumption. In this context, it is interesting to note that 1.5 ounces (42 g) of tree nuts or peanuts provides >10% of the United States recommended dietary allowance (RDA) for protein, iron, zinc, copper, thiamine and vitamin E for men aged 31–50 years. The same amount of tree nuts also provides >10% of the RDA for vitamin B6 and selenium, while a similar amount of peanuts provides >10% of the RDA for niacin, pantothenic acid and total folate for adult men.¹⁰

Secondly, excluding animal foods apart from reducing protein quantity also lowers its biological quality.



Biological quality refers to the extent to which the amino acid profile of the protein in food can satisfy the body's requirements for growth and maintenance. Animal foods contain all nine essential amino acids needed for these processes. In contrast, most plant proteins are of low biological value because they lack certain essential amino acids and/or have lower digestibility.¹¹ Therefore, while consuming a predominantly plant-based diet, it is prudent to combine proteins sources such as cereals, legumes, peanuts and tree nuts to optimise essential amino acids levels in the diet.^{11,12} Walnuts also contribute to intake of omega-3 fatty acids, a rarely found nutrient in plant-based foods with several health benefits. Therefore, incorporating nuts in meals or as snacks is highly likely to improve the nutritional quality of plant-based diets.

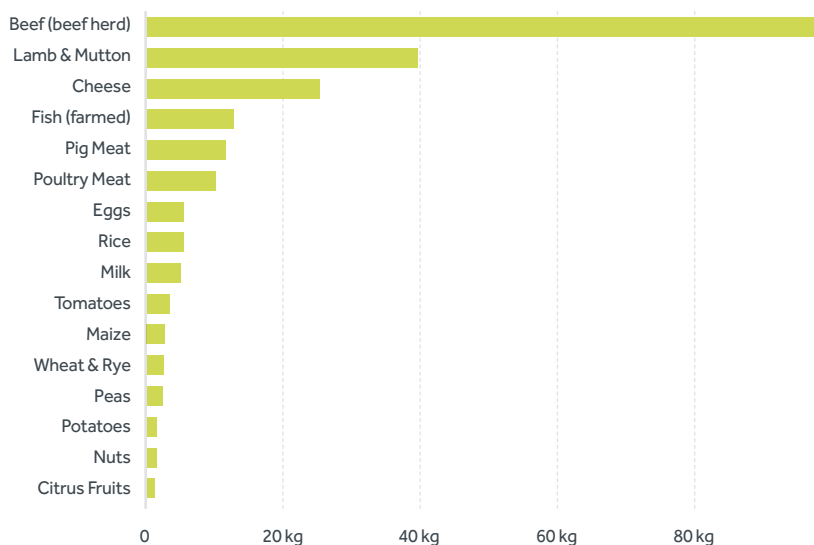
Thirdly, most tree nuts and peanuts contain several bioactive compounds that promote health and reduce chronic disease risk through their antioxidant, antiviral, antiproliferative, hypocholesterolaemic and anti-inflammatory actions.¹⁰ Thus, from health and nutrition perspectives, nuts can be a very essential part of plant-based sustainable diets.

Ensuring Environmental Sustainability of Nut Consumption

The environmental impact of increasing nut consumption has received much interest lately. An assessment of nuts using environmental, nutritional and social indicators identified variations in performance across nuts. While walnut performed well across all dimensions, several other types of nuts required some trade-offs.¹³ Interestingly, a mathematical dietary optimisation approach for defining healthier and more sustainable diets in their multiple modelling efforts found that 87% of the simulated scenarios required increased consumption of nuts and seeds.¹⁴ Since reducing protein from animal sources requires a concomitant increase in plant-based protein including nuts, several sustainable options for nut production have been suggested.^{5,15,16} Among others, the potential solutions include considering the type of nuts to cultivate, improving water resource management efficiency. With the successful adoption of these strategies, nuts can play an important role in achieving healthy and sustainable diets for populations across the world. ■

Figure 1:
Greenhouse gas emissions per kilogram of food product.

Emissions are measured in carbon dioxide equivalents. This means non-CO₂ gases are weighted by the amount of warming they cause over a 100-year timescale.



Note: Greenhouse gases are weighted by their global warming potential value (GWP100). GWP100 measures the relative warming impact of one molecule of a greenhouse gas, relative to carbon dioxide, over 100 years. Source: Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science* (New York, N.Y.), 360(6392), 987–992. <https://doi.org/10.1126/science.aag0216>. Data sourced and visualized from: <https://ourworldindata.org/environmental-impacts-of-food>

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