Sustainable diets are context specific but are they realistic?

See Articles page e451

Sustainable diets have long been proposed as a means to improve public health and food security, and to reduce the impact of the food system on the environment.[1] Various sustainable diets have been suggested, which generally encourage reduced consumption of animal-source foods and replacement with foods from plant-based sources.[2] But it is not so simple. A diet might be sustainable, healthy, economically fair, and culturally acceptable in one region and not in another.[3] For example, although reducing consumption of animal-source foods in high-income countries might bring sustainability benefits, this might not be an equitable or ethical approach in low-income country settings where undernutrition remains prevalent. To date, research on sustainable diets has not made cross-country comparisons and has been largely focused on high-income settings and with greenhouse gas emissions as the single measure of environmental impact.[4,5]

In *The Lancet Planetary Health*, Marco Springmann and colleagues[6] report a global analysis of the health and environmental impacts of a variety of sustainable diets. The authors modelled nutrient levels, chronic disease mortality due to nine diet-related risk factors, and a range of environmental impacts for 158 countries. Three approaches to designing sustainable diets were considered, motivated by environmental, food security, and public health objectives.

The results show that the different approaches to sustainable diets might not have the same implications in different regions. Following environmental objectives by substituting animal-source foods with plant-based foods brought benefits for health along with reductions in emissions of greenhouse gases, but these benefits were greatest in high-income countries and, on a global level, the benefits were somewhat negated by increases in water use. Approaches that sought to redress dietary energy imbalances reduced premature mortality globally but had minimal environmental benefits. Adopting nutritionally balanced, low animal-source food diets in line with dietary guidelines provided the greatest benefits for health and the environment in general, with greater reductions in mortality than from changes in energy balance alone in addition to larger reductions in emissions, although these were somewhat reduced by some increased resource use (eg, water, cropland, nitrogen, and phosphorus), especially in low-income countries. This approach might also be more equitable, since it allows for some increased dietary diversity and consumption of animal-source foods in low-income countries.

The analysis by Springmann and colleagues[6] provides context-specific guidance on the composition of sustainable diets. Although necessarily involving some important simplifications (eg, it did not account for impacts on biodiversity), it adds to the literature in the field of sustainable diet research by using a consistent global modelling framework and accounting for a range of health outcomes and environmental impacts related to diets. The study suggests that dietary patterns broadly in line with available evidence on healthy eating are most beneficial to both the environment and health. This conclusion reinforces the results of single-country studies showing that following dietary guidelines (eg, eating a diet with balanced energy intake rich in fruits and vegetables) will help improve health as well as reduce the negative environmental impacts of diets.[7]

Not all sustainable diets are equal. Rather, their impacts on health and environmental sustainability will depend crucially on the local context, with large differences across regions demonstrated through this study and others.[6,8] The analysis by Springmann and colleagues[6] supports the evidence that health outcomes and environmental impacts of diets can be improved by ensuring that dietary guidelines are followed and suggests a failure of communication and of food policy, not insufficient evidence. The task now is to translate that knowledge into practice by finding effective ways of bringing about the required changes. The proportion of people who meet dietary guidelines tends to be very low.[9,10] Reasons for this might vary according to the context: access to sufficient healthy food is a problem in low-income and middle-income countries (and among low-income groups worldwide), but in high-income countries, some targets are not met (eg, fruit and vegetable consumption) while other recommended limits are exceeded. The complex interplay of factors such as price, desirability, convenience, and culture makes designing interventions that will actually change diets a substantial challenge.

Thus, research into sustainable diets will increasingly need to be co-designed and guided by input from those

responsible for creating policy. The engagement aspect of research (with the public and stakeholders) will be more important than ever, and increased attention will need to be devoted to empirical applications of models and assessments of interventions. Desirable endpoints for diets across the globe have been well established, but the journey to achieving these is just beginning.

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1 Macdiarmid JI, Kyle J, Horgan GW, et al. Sustainable diets for the future: can we contribute to reducing greenhouse gas emissions by eating a healthy diet? *Am J Clin Nutr* 2012; **96:** 632–39.
2 Pimentel D, Pimentel M. Sustainability of meat-based and plant-based diets and the environment. *Am J Clin Nutr* 2003; **78:** 660S–63S.
3 Perignon M, Masset G, Ferrari G, et al. How low can dietary greenhouse gas emissions be reduced without impairing nutritional adequacy, affordability and acceptability of the diet? A modelling study to guide sustainable food choices. *Public Health Nutr* 2016; **19:** 2662–74.
4 Aleksandrowicz L, Green R, Joy EJM, et al. The impacts of dietary change on greenhouse gas emissions, land use, water use, and health: a systematic review. *PLoS One* 2016; **11:** e0165797.
5 Jones AD, Hoey L, Blesh J, et al. A systematic review of the measurement of sustainable diets. *Adv Nutr* 2016; **7:** 641–64.
6 Springmann M, Wiebe K, Mason-D'Croz D, Rayner M, Scarborough P. Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: a global modelling analysis with country-level detail. *Lancet Planet Health* 2018; **2:** 451–61.
7 Milner J, Green R, Dangour AD, et al. Health effects of adopting low greenhouse gas emission diets in the UK. *BMJ Open* 2015; **5:** e007364.
8 Vieux F, Perignon M, Gazan R, Darmon N. Dietary changes needed to improve diet sustainability: are they similar across Europe? *Eur J Clin Nutr* 2018; **72:** 951–60.
9 Krebs-Smith S, Guenther PM, Subar AF, et al. Americans do not meet Federal dietary recommendations. *J Nutr* 2010; **140:** 1832–38.
10 Jones NRV, Tong TYN, Monsivais P. Meeting UK dietary recommendations is associated with higher estimated consumer food costs: an analysis using the National Diet and Nutrition Survey and consumer expenditure data, 2008–2012. *Public Health Nutr* 2018; **21:** 948–56.