Toronto Vegetarian Association

360 College Street, Unit #301
Toronto, ON
M5T 1S6
P: 416-544-9800
E: tva@veg.ca
https://veg.ca/

RESEARCH SUMMARY

October 9, 2020

Poore, J. and Nemecek, T., 2018, "Reducing food's environmental impacts through producers and consumers", *Science,* vol. 360, no. 6392, pp. 987-992

https://science.sciencemag.org/content/360/6392/987

Abstract

Food's environmental impacts are created by millions of diverse producers. To identify solutions that are effective under this heterogeneity, we consolidated data covering five environmental indicators; 38,700 farms; and 1600 processors, packaging types, and retailers. Impact can vary 50-fold among producers of the same product, creating substantial mitigation opportunities. However, mitigation is complicated by trade-offs, multiple ways for producers to achieve low impacts, and interactions throughout the supply chain. Producers have limits on how far they can reduce impacts. Most strikingly, impacts of the lowest-impact animal products typically exceed those of vegetable substitutes, providing new evidence for the importance of dietary change. Cumulatively, our findings support an approach where producers monitor their own impacts, flexibly meet environmental targets by choosing from multiple practices, and communicate their impacts to consumers.

Notes

1. The Toronto Vegetarian Association (TVA) had no involvement with this study, financially or otherwise, and has no conflicts-of-interest. The TVA is not responsible for the accuracy of this study.
2. This summary is intended for educational purposes only. Interpretations are made to the best of our ability. Always refer solely to the original study when citing the claims of the study.

TVA Summary

Toronto Vegetarian Association

360 College Street, Unit #301
Toronto, ON
M5T 1S6
P: 416-544-9800
E: tva@veg.ca
https://veg.ca/

RESEARCH SUMMARY

This 2018 study is a meta-analysis performed by J. Poore of the University of Oxford and T. Nemecek of the LCA Research Group, published in the prestigious journal *Science*. The study analysed the environmental impacts of food production according to five indicators: land use; fresh water withdrawals weighted by local water scarcity; and greenhouse gase (GHG), acidifying, and eutrophying[1] emissions. The authors sought to provide recommendations for producers and consumers to reduce the environmental impact of food production. It is important to the TVA because it quantifies the climatic impacts of "typical" diets compared to a vegan diet.

The meta-analysis covered 570 studies with a median reference year of 2010. The data set covers approximately 38,700 commercial farms in 119 countries, and 40 products that compose approximately 90 percent of global protein and calorie consumption. The sample was upscaled using data from the Food and Agriculture Organization. The assessment period began with the initial effect of producer product choice, and ended at retail. This period includes packaging and transportation.

The study found that "moving from current diets [that include animal products] to a diet that excludes animal products has transformative potential, reducing food's land use by 3.1 (2.8 to 3.3) billion ha (a 76% reduction), including a 19% reduction in arable land; food's GHG emissions by 6.6 (5.5 to 7.4) billion metric tons of CO_2eq (a 49% reduction); acidification by 50% (45 to 54%); eutrophication by 49% (37 to 56%); and scarcity-weighted freshwater withdrawals by 19% (-5 to 32%) for a 2010 reference year." The study then went on to state that, "for the United States, where per capita meat consumption is three times the global average, dietary change has the potential for a far greater effect on food's different emissions, reducing them by 61 to 73%."

The study also, "consider[ed] a second scenario where consumption of each animal product is halved by replacing production with above-median GHG emissions [such as beef] with vegetable equivalents. This acheives 71% of the previous scenario's GHG reduction...and 67, 64, and 55% of land use, acidification, and eutrophication reductions."

In an interview about the study, the study's author, Joseph Poore, said that, "a vegan diet is probably the single biggest way to reduce your impact on planet Earth, not just greenhouse gases, but global acidification, eutrophication, land use and water use."[2]

Ryan Cannon
Volunteer, TVA

*The author has a B.Sc. in Mathematics & Engineering from Queen's University in Kingston, Ontario and is an avid reader of scientific literature. He has been a vegetarian since 1996 and a vegan since 2015. He is dedicated to spreading scientific knowledge to promote and support the veg*n lifestyle.*

[1] Eutrophication, *def*: the process by which a body of water becomes enriched in dissolved nutrients (such as phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen. (Merriam-Webster)

[2] Carrington, D., 2018, May 31, "Avoiding meat and dairy is 'single biggest way' to reduce your impact on Earth", *The Guardian*, https://www.theguardian.com/international