
Conference or Workshop Item:
Galazoula, M, Greenwood, DC orcid.org/0000-0001-7035-3096, Martin, A orcid.org/0000-0002-2559-6483 et al. (1 more author) (2022) Affordability of healthy and environmentally friendly diets in the UK. In: Nutrition Society Summer Conference, 12-15 Jul 2022, Sheffield.

https://doi.org/10.1017/S0029665122001987

Affordability of healthy and environmentally friendly diets in the UK

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Although diets that meet dietary health recommendations can be more environmentally friendly, few studies have examined whether such diets are affordable(1). However, studies on optimising diets usually focus on the average population diet, without taking into consideration differences between individual diets. In this study, we assess the change in food costs that people face when changing to healthier, more environmentally friendly diets whilst also minimising changes in the quantity of the foods consumed. An average daily diet was estimated for adult participants in the National Diet and Nutrition Survey (NDNS) based on data in four food diaries collected from 2014–2017 (N = 2,165)(2). Environmental impact measures were assigned for greenhouse gas emissions (GHGE), land use and freshwater withdrawal(3). Food prices were assigned to each food subgroup to calculate the daily diet cost(4). Linear programming, a mathematical optimisation technique, was used for optimising diets. It is comprised of an objective function, either to minimise or maximise, along with constraints of the optimisation problem. The aim of linear programming is the minimisation of changes in the portions of the foods consumed by each participant to increase their acceptability. The recommendations of the Eatwell Guide, as well as environmental restrictions, are the constraints, which were relaxed by up to ±50% to ensure that the changes to the quantities would be minimal. The environmental impact for each indicator was restricted to be below the median of each impact respectively. Overall, people's daily diets were associated with 5.8kgCO2eq, 5.7m2year land use, 601litres of freshwater and cost £5.10. Only 23 (1%) of diets could be optimised to achieve Eatwell Guide recommendations with minimal changes. When constraints were relaxed so diets only had to be within ±50% of recommendations, 1,512 (70%) of diets could be optimised. Before optimisation, the optimised diets were associated with 6.5 kg CO2eq, 6.3m2year land use, 654litres of freshwater and cost £5.40. After optimisation, these diets were associated with reductions in GHGE (4.9 kg), land use (4.6 m2year), freshwater withdrawals (492 liters) and costs (£4.40). The diets that were not optimised had below average environmental and monetary cost with a weighted mean 5.2kgCO2eq GHGE, 5.0m2year land use, 546 litres of freshwater and £4.40 cost. Our study suggests that shifting towards healthier and more sustainable diets can be affordable with minimal changes only when the dietary recommendations are considerably relaxed. Diets that could not be optimised with minimal changes to the relaxed recommendations had similar environmental footprint and cost with the optimised ones. If price is not a deterrent to people switching to healthier, more environmentally diets, then policy makers may need to consider other factors that may prevent their uptake when designing policies to promote better dietary health.

References

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