Quantifying the greenhouse gas emissions of New Zealand households' food purchases: An analysis by sociodemographic variables

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New Zealand has committed to a 50% reduction in greenhouse gas emissions (GHGEs) from 2005 levels by 2030. Dietary changes within New Zealand could simultaneously improve population health and contribute towards the nation's emissions reduction target, as agricultural emissions are estimated to account for half of New Zealand's GHGEs[1]. This research aimed to quantify the GHGEs associated with household purchases of major food groups in New Zealand and identify the sociodemographic characteristics that are associated with per capita household dietary emissions. Household dietary emissions were estimated using the NielsenIQ Homescan[(R)] consumer panel — a large sample of households within New Zealand who report purchasing data of take-home food and beverages. The sample is nationally representative in terms of broad geographical regions and selected key demographic characteristics. Carbon emission estimates were assigned to 1,908,485 total food and beverage purchases from 1,775 households over one year (2019) using a process-based life cycle assessment (LCA) dataset initially constructed in the United Kingdom (UK) and adapted for New Zealand[2]. This LCA dataset contains estimates of greenhouse gas emissions generated over the life cycle of the production of food products from the following stages: farming and processing, transit packaging, consumer packaging, transport, warehouse and distribution, refrigeration, and overheads. Greenhouse gas emissions are expressed in kg of carbon dioxide equivalents per kg of food product over a 100-year time horizon. Total emissions from purchases of major food groups were then estimated. Multiple linear regression was used to examine the relationships between household variables and per capita dietary emissions. Overall purchases of red and processed meat (35%) and dairy products (19%) were responsible for the greatest proportion of emissions. The age group of the primary household shopper as well as household size were predictors of per capita dietary emissions — households with primary shoppers > 65 years had, on average, 33% (95% CI: 20% to 49%) higher per capita dietary emissions, compared to households with primary shoppers 34 years; and every additional household member was associated with, on average, 11% (95% CI: 9% to 13%) lower per capita dietary emissions. We have shown in this large representative sample of New Zealand households that purchases of just two food groups — red and processed meat, and dairy — were responsible for approximately half of dietary greenhouse gas emissions. Larger households had lower per capita dietary greenhouse gas emissions, and older shoppers had relatively higher greenhouse gas emissions. Whilst similar associations have been reported elsewhere more research is needed to confirm these latter findings. With enhanced understanding of the observed association between age of a household's primary shopper and per capita dietary emissions, interventions may be devised that encourage shoppers to purchase lower-emitting foods, particularly less meat and dairy.

Keywords: diet; greenhouse gas emissions; climate impact

Ethics Declaration

Yes

References

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