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The neglected potential of red and processed meat replacement: simulation modelling and systematic review

A. Reynolds[1], C. Ni Mhurchu[2] and C. Cleghorn[1]

[1]*University of Otago, Dunedin, Otago, New Zealand and*
[2]*University of Auckland, Auckland, Tāmaki Makaurau, New Zealand*

What we eat is fundamental to human and planetary health,[1,2] with the current global dietary transition towards increased red meat intakes and ultra-processed foods[3] likely detrimental.[4-8] We modelled five red and processed meat replacement scenarios to consider health, equity, greenhouse gas emissions, and grocery cost outcomes using an established multistate lifetable model.[9] Current red and processed meat intakes were replaced with minimally or ultra-processed plant-based foods, cellular meat, or in line with EATLancet and Heart Foundation recommendations. We then conducted a systematic review to identify successful population-level meat intake reduction strategies to provide practical, evidence-based pathways to achieve any benefits that may be observed in modelling. We found that all red and processed meat replacement scenarios were nutritionally adequate and improved Quality Adjusted Life Years (159–297 per 1000 people over their life course) when compared with current red and processed meat intakes, with a health system savings of $2,530–$5,096 per person. Age standardised per capita health gain for Māori was 1.6 to 2.3 times that of non-Māori. Greenhouse gas emissions reduced per modelled scenario (19–35%) while grocery cost varied (↓7%–↑2%) when compared with current red and processed meat intakes. The greatest benefits for all outcomes were achieved by meat replacement with minimally processed plant-based foods, such as legumes. These minimally processed plant-based foods appeared consistently superior to ultra-processed plant-based foods, which may also cost individuals more to purchase. The systematic review identified only two implemented population-level strategies to reduce meat intakes, one of taxation and one of dietary guidelines. More work in this area is needed, with economic tools, restriction of advertising, labelling standards, food reformulation, healthy food environments, awareness raising, nutrition counselling, as well as population education programmes used in isolation or combination possible. Implementing equitable interventions that support the necessary change towards healthier dietary patterns and practices is necessary. Until then, these and past analyses can only indicate the neglected potential of red and processed meat replacement.

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