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## Sustainability and cost of typical and heart-healthy dietary patterns in Australia

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Climate change is a pressing global issue, with food systems contributing significantly to greenhouse gas (GHG) emissions, biodiversity loss, and freshwater depletion<sup>(1)</sup>. A major challenge is to feed a projected 10 billion people by 2050 whilst minimising environmental impact<sup>(2)</sup>. Numerous factors influence food choices, including convenience, affordability, taste, nutrition, accessibility, cooking skills, and cultural norms. The growing demand for convenience has transformed the food landscape, with availability of ready-to-eat meals and prepackaged products rapidly increasing, potentially impacting health if not integrated into balanced diets. The aim was to quantify and compare the environmental and financial impact of two diets: a heart-healthy Australian diet (HAD) aligned with national dietary guidelines and a typical Australian diet (TAD) reflecting current population intakes. Both plans were designed for convenience, using ready-to-eat meals and minimal preparation options for a randomised, cross-over, feeding trial. The environmental footprint of each dietary pattern was calculated using the Global Warming Potential (GWP\*) metric<sup>(3)</sup>, considering individual foods, multi-ingredient foods, and mixed dishes. Prices were obtained from a large Australian supermarket. The study focused on two-week meal plans designed to meet the nutritional needs of a reference 71-year-old male (9000 kJ). Results showed that the HAD produced 23.8% less CO<sub>2</sub> equivalents (CO<sub>2</sub>-e) per day than the TAD (2.16 kg vs 2.83 kg CO<sub>2</sub>-e). Meat and discretionary foods were the main contributors to the TAD's environmental footprint, while dairy and vegetables were the most significant contributors to the HAD's footprint. The potential impact of widespread adoption of the HAD is substantial. For example, if half of the adult population switched to the HAD, it could lead to a reduction of approximately 2.6 billion kg of CO<sub>2</sub> emissions annually, equivalent to the emissions of 1.2 million passenger cars per year<sup>(4)</sup>, which would require over 256 million trees to offset the amount of CO<sub>2</sub>e produced<sup>(5)</sup>. However, the HAD was 51% more expensive than the TAD, presenting a significant barrier to adoption. Strategies to reduce costs of convenient healthy food are needed. Future studies should expand the GWP\* database and consider additional environmental dimensions to comprehensively assess the impact of dietary patterns. Current findings have implications for menu planning within feeding trials and for individuals seeking to reduce their carbon footprint while adhering to heart-healthy eating guidelines.

### References

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