

## Short-term impact of a healthy and typical Australian dietary pattern on cardiometabolic outcomes: insights from a randomised, cross-over feeding study

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Immune Health Research Program, Hunter Medical Research Institute, New Lambton Heights, NSW, 2305 Australia. Cardiovascular disease (CVD) remains a major cause of global mortality. Poor diet quality, characterised by excessive consumption of energy-dense, nutrient-poor foods and insufficient intake of fruits, vegetables, and whole grains, is associated with an increased risk of CVD<sup>(1)</sup>. This study compares the impact of two short-term dietary interventions, a Healthy Australian Diet adhering to national guidelines and a Typical Australian Diet representing current national consumption patterns, on several cardiometabolic outcomes. These outcomes include body weight, waist circumference (WC), body fat percentage (BFP), blood pressure (BP), fasting blood lipids and glucose concentrations. Data from an eight-week randomised, cross-over feeding study involving 34 adults (53% female, age 38.4 ± 18.1 years) were analysed, with participants randomly assigned to consume each diet for two weeks, separated by a two-week washout period. During each feeding phase, all food items were provided to ensure compliance. The Healthy Australian Diet adhered to the Australian Dietary Guidelines<sup>(2)</sup>, including a balanced intake of the five food groups and meeting Acceptable Macronutrient Distribution Range targets<sup>(3)</sup>, with saturated fat limited to ≤10% of energy. The Typical Australian Diet was formulated based on apparent consumption patterns in Australia<sup>(4)</sup>, setting total fat intake at 40% of energy and total saturated fat at 15% of energy. Comprehensive data collection occurred at four key visits: week 0 (end of run-in; baseline 1), week 2 (post-feeding phase 1), week 4 (end of washout, baseline 2), and week 8 (post-feeding phase 2). Trained personnel measured WC using a tensile tape, while body weight and BFP measurements were obtained using bioimpedance analysis (Inbody 270; Biospace Co, Seoul, Korea). Blood pressure was recorded using the Uscom BP+ supra-systolic oscillometric central blood pressure device. Blood glucose and lipid (triglycerides, total-, low-density lipoprotein- [LDL] and high-density lipoprotein- [HDL] cholesterol) concentrations were measured after a 12-hour fast by an accredited pathology service. Differential changes in cardiometabolic variables between intervention groups were evaluated using linear mixed-effect models, adjusting for diet sequence, feeding phase, and subject ID as a random variable to account for potential autocorrelation. Post-hoc pairwise comparisons were conducted to assess the impact effects of each diet. There were no significant differences between the Healthy Australian Diet and the Typical Australian Diet with respect to weight, BFP, WC, blood triglycerides, systolic and diastolic BP. However, the Healthy Australian Diet led to a significantly greater decrease in total-, LDL-, HDL- and non-HDL cholesterol, and fasting blood glucose relative to the Typical Australian Diet ( $p < 0.001$ ). The results underscore the importance of promoting dietary intakes that align with Australian Dietary Guidelines for optimising the risk of CVD and impaired glucose tolerance. Conversely, the Typical Australian Dietary pattern demonstrated detrimental cardiometabolic effects over a short period of just two weeks.

**Keywords:** cardiovascular disease; cardiometabolic outcomes; healthy Australian diet; randomised controlled trial.

### Ethics Declaration

Yes

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### References

1. Aune D, Giovannucci E, Boffetta P *et al.* (2017) *Int J Epidemiol* **46**(3), 1029–1056.
2. NHMRC (2013) <https://www.nhmrc.gov.au/adg> (last accessed 8 August 2023)
3. Lee E, Choi J, Ahn A *et al.* (2015) *Clin Exp Hypertens* **37**(6), 463–7.
4. ABS (2022) <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/apparent-consumption-selected-foodstuffs-australia/latest-release> (last accessed 8 August 2023)