

Abstract

Cite this article: Soh BXP, Smith N, von Hurst P, Vignes M, and McNabb W (2025). Assessment of protein intake and protein quality among New Zealand vegans. *Proceedings of the Nutrition Society* **84**(OCE2): E179. doi: [10.1017/S0029665125100359](https://doi.org/10.1017/S0029665125100359)

Assessment of protein intake and protein quality among New Zealand vegans

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Dietary protein provides amino acids, nine of which are indispensable (IAAs) as they are not synthesised within the body. Adoption of a vegan diet has shown an increased trend in several Western countries.⁽¹⁾ Past assessments of total protein intake of vegan populations were found to be low but not necessarily below daily requirements.⁽²⁾ However, plant-sourced proteins generally have lower quantities of digestible IAAs as compared to animal-sourced proteins.⁽³⁾ Simply accounting for protein intake without considering amino acid profile and digestibility could overestimate protein adequacy among vegans. This study aims to quantify protein intake and protein quality (digestible IAAs) among a cohort of NZ vegans as compared to individual requirements. Dietary intake data was obtained through a four-day recall from 193 individuals participating in a cross-sectional study of adult vegans (above 18 years) residing in New Zealand who have followed a vegan diet for at least two years. Ethical approval was granted (HDEC 2022 EXP 12312). Anthropometric data was collected at Massey University, Auckland. Protein and IAA composition of all foods were derived by comparing dietary data to food composition data from New Zealand FoodFiles and the US Department of Agriculture. Mean values for protein and IAA were adjusted for true ileal digestibility and body weight (kg).^(4,5) Mean protein intakes for males and females were 0.99 and 0.81 g/kg of body weight/day, respectively. Overall, 78.8% of males and 74.5% of females met the Estimated Average Requirement (EAR) for daily protein. Plant-sourced proteins in the vegan diet provided 52.9 mg of leucine/g of protein and 35.7 mg of lysine/g of protein, which were below the reference scoring patterns (leucine: 59mg/g, lysine: 45mg/g).⁽⁵⁾ When adjusted to individual body weight, average IAA intakes were above daily requirements, but lysine just met requirements at 31.2 mg/kg of body weight/day (reference: 30 mg/kg/d). The importance of adjusting for digestibility is noted as the percentage of vegans meeting adequacy for protein and IAAs decreased as compared to using only IAA compositions without this adjustment. In contrast to grains and pasta, legumes and pulses were the foods that contributed most to overall protein and lysine intake while providing lower energy intake. Lysine followed by leucine were the two most limiting IAAs in the diet of this NZ vegan cohort. Increased proportion of legumes and pulses, and decreased proportion of grains and pasta within the diet can potentially increase leucine and lysine intake but must be considered in the context of the whole diet.

Keywords: vegan diets, protein intake, protein quality, lysine

Ethics Declaration: Yes

Financial Support: Lottery Health Project Grant (LHR-2022-185)

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