Proceedings of the Nutrition Society (2025), 84 (OCE1), E23

The 48th Annual Scientific Meeting of the Nutrition Society of Australia, 3-6 December 2024

## Temporal patterns of total, animal and plant protein intake: a latent class analysis

H.R.B. Arini<sup>1</sup>, R.M. Leech<sup>1</sup>, S.-Y. Tan<sup>1</sup> and S.A. McNaughton<sup>2,3</sup>

<sup>1</sup>Institute for Physical Activity and Nutrition, School of Exercise and Nutrition Sciences, Deakin University, Geelong, Victoria, Australia

<sup>2</sup>School of Exercise and Nutrition Sciences, Deakin University, Geelong, Victoria, Australia

<sup>3</sup>*Health and Well-Being Centre for Research Innovation, School of Human Movement and Nutrition Sciences, University of Queensland, St Lucia, Queensland, Australia* 

Previous studies have shown the health benefits of daily total protein intake<sup>(1)</sup>, yet temporal protein patterns in the population have rarely been investigated. The currently available studies have examined the associations between total protein intake at eating occasions (EOs) with cardiometabolic<sup>(2)</sup> and muscular health<sup>(3)</sup> but have not accounted for different protein sources. This study aimed to describe temporal patterns of total, plant, and animal protein intake at EOs in Australian adults, and to examine these patterns according to their sociodemographic and eating pattern characteristics (e.g., meal and snack frequencies, amount of protein intake). Using the 2011-12 Australian National Nutrition and Physical Activity Survey data, this study included adults aged ≥ 19 years who completed one 24-hour dietary recall (n = 6741). Total, animal and plant protein intake at self-reported EOs was estimated using the AUSNUT 2011–13 nutrient database and Australian Dietary Guidelines (ADG) food classification system<sup>(4)</sup>. Plant protein included grains, nuts, and other plantbased, protein-containing foods, while animal protein consisted of meats, dairy, and other animal-source foods. Separate latent variable mixture models were used to identify temporal patterns of total, animal, and plant protein based on hourly intakes of total, animal, and plant protein, respectively. Pearson's Chi-square test (for categorical variables) and one-way analysis of variance (for continuous variables) were used to examine the differences in participant characteristics between latent classes of temporal protein patterns. Three latent classes for men's and women's intake of total, animal, and plant proteins were identified. Class 1 was characterised by high probabilities of consuming protein at the usual Australian mealtime (e.g., dinner at 18:00-19:00h), and participants in this class were significantly older than the other two classes (all, p < 0.001). Class 2 had a high probability of eating protein an hour later than the mealtime of Class 1 and the highest protein intake from meals (all, p < 0.001), except for men's total protein and women's plant protein. Participants in Class 2 of total (all, p < 0.001), animal (all, p < 0.001), and plant protein (women only, p = 0.02) were characterised by high income and employment status. Participants in Class 3 had the lowest meal frequency (all, p < 0.001) and the lowest total, animal, and plant protein intakes from meals (all, p < 0.001), but the highest intakes from snacks (p < 0.001), except for women's animal protein intake. Most adults in Class 3 of total (men only, p < 0.001) and animal protein (all, p < 0.001) also had high education level, lived in urban areas, and were not married. Three temporal protein patterns with distinct characteristics were identified in this study. Future studies need to investigate whether these temporal protein intake patterns are associated with health outcomes.

## References

- 1. Pedersen AN, Kondrup J, Børsheim E (2013) J Food Nutr Res 57, 1-30
- 2. Berryman CE, Lieberman HR, Fulgoni IIIVL et al. (2021) Clin Nutr 40, 4301-4308
- 3. Gaytán-González A, Ocampo-Alfaro MdJ, Torres-Naranjo F et al. (2020) Nutrients 12, 3156-3156
- 4. Food Standards Australia and New Zealand (2023) AUSNUT 2011–13 data files https://www.foodstandards.gov.au/science-data/monitoringnutrients/ausnut/a

https://doi.org/10.1017/S0029665125000333 Published online by Cambridge University Press