Proceedings of the Nutrition Society (2020), **79 (OCE3)**, E792 doi:10.1017/S0029665120007788

Nutrition Society Live 2020, 14–15th July 2020

Does timing of a protein supplement affect energy and macronutrient intakes and measures of appetite in a middle-older aged adult population?

E.R Tuttiett[1], B.M Corfe[1], E. Stevenson[2], T. Hill[2] and E.A Williams[1]
[1]*Department of Oncology and Metabolism, The Medical School, The University of Sheffield, Sheffield, S10 2RX and* [2]*Human Nutrition Research Centre, Population Health Sciences Institute, Faculty of Medical Sciences, Newcastle University, Newcastle, NE2 4HH*

With ageing there is a reduction in muscle mass and strength, termed sarcopenia[1]; this can have negative impacts including loss of independence and reduced quality of life. Ageing is also associated with reduced appetite, termed anorexia of ageing, and this can result in reduced energy intakes and malnutrition[2]. The current UK Reference Nutrient Intake for protein is 0.75 g/kg body mass, however, higher intakes of 1.2–1.5 g/kg body mass[LW1] [3] have been suggested for older adults. Increased dietary protein intake may reduce the risk of sarcopenia, however protein is the most satiating macronutrient[4] so could exacerbate the risk of malnutrition. The aim of this research was to investigate the effect of protein supplementation, and timing of delivery, on dietary intake and appetite. It was hypothesised that protein supplementation would reduce self-reported hunger and appetite, and reduce subsequent energy intake.

Twenty-four middle-older aged (50–75 years) participants were recruited to a randomised cross-over trial. In phase 1 (pre-supplementation) participants completed a 3day food diary and were asked to report hunger and appetite using visual analogue scale questionnaires. In the second and third phases, participants consumed a whey protein gel (containing 20 g protein and 376kJ of energy) for 4 days either in the morning (30–60 minutes after breakfast) or the evening (30–60 minutes before bed) and completed the same tasks as phase 1. There was a 1-week wash-out period before crossing over to the alternative time point. Ethical approval for this study was granted by the University of Sheffield's ethics committee (ethical approval number: 024856). Wilcoxon statistical analysis was undertaken using SPSS version 25.

All dietary analysis was conducted without the inclusion of the additional protein supplement. Habitual energy intake at baseline was 8083kJ/day, and 7849.8kJ/day and 7898.2kJ/day following morning and evening protein supplementation respectively. There was no significant difference in energy intake, irrespective of when protein supplementation occurred (habitual vs morning; $P = 0.376$, habitual vs evening; $P = 0.338$). Furthermore, food diary analysis revealed that the macronutrients (carbohydrate, protein and fat) did not differ following protein supplementation. Adjustments of protein intakes in relation to participants' body mass revealed dietary protein consumptions of 1.21 (±0.38), 1.22(±0.38), 1.25(±0.42) g/kg body mass at baseline, morning and evening supplementation respectively. Once again these differences were non-significant (habitual vs morning; $P = 0.753$, habitual vs evening; $P = 0.700$.) Similarly, no differences were observed in self-reported measures of hunger and appetite.

The consumption of a 20g/day protein supplement for a period of 4-days did not alter habitual energy intake or hunger or appetite measures in a middle-older adult population in an acute setting. Despite potentially informing protein delivery strategies, a limitation of this research is the short term duration of intervention. Future work should assess the impact of longer duration protein supplementation on habitual intakes.

1. Santilli V, Bernetti A, Mangone M, Paoloni M. (2014) *Clin Cases Miner Bone Metab* **11**, 177–80.
2. Landi F *et al*. (2016) *Nutrients* **8**, 69.
3. Wolfe RR, Miller SL, Miller KB (2008). *Clin Nutr*. **27**, 675–84.
4. Astrup A. (2005) *Am JClin Nutr* **82**, 1–2.