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## The effect of protein supplementation and its timing on energy intake and appetite in a middle-older aged adult population

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### Abstract

**Introduction:** With ageing there is a reduction in muscle mass and strength, termed sarcopenia. A further consequence of ageing is a reduction in appetite and this can result in a reduced energy intake and malnutrition. Increased dietary protein intake may reduce the risk of sarcopenia, however, protein is particularly satiating. Increasing protein intake in the older adult population, without a reduction of overall energy intake and appetite is desirable. The primary aim of this study was to investigate the effect of protein supplementation on dietary intake and appetite. A further aim was to explore whether the time of consumption (morning vs evening) modified the impact of protein on energy intake and appetite.

**Materials and methods:** 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 3d 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 at either the evening (before bed) or in the morning (after breakfast) and completed the same tasks as phase 1. There was a 1-week wash-out period before crossing over to the alternative time point. Repeated measures ANOVA was used to analyse the data.

**Results:** There was no significant difference in average daily energy and macronutrient intake provided by the habitual diet in the pre-supplementation phase compared to the whey protein supplementation phases, irrespective of timing ( $p > 0.05$ ). Similarly, no significant differences were observed in reported feelings of hunger and appetite ( $p > 0.05$ ).

**Discussion:** Contrary to expectations, the addition of a 20g/day whey protein supplement did not alter subsequent energy and macronutrient intake when consumed over a 4-day period in this middle-older adult population. This may be due to the low-calorie composition of the supplement, or the timing of the intake. This research helps to inform protein delivery strategies, however different product formulations need to be explored, and studies of longer duration are required to understand the impact of prolonged supplementation on eating behaviour.

### Conflict of Interest

There is no conflict of interest