The Impact of Essential Amino Acid Supplements Enriched With L-leucine on Appetite and Energy Intake in Elderly Women

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Introduction

- Inadequate protein intake (PI), the main source of essential amino acids (EAAs), and reduced appetite are contributing factors to age-related sarcopenia.
- Protein supplementation frequently confers beneficial adaptations in performance and body composition.
- The satiating effects of dietary protein may negatively affect energy intake (EI), thus there is a need to explore alternative strategies to facilitate PI without compromising appetite and subsequent EI.

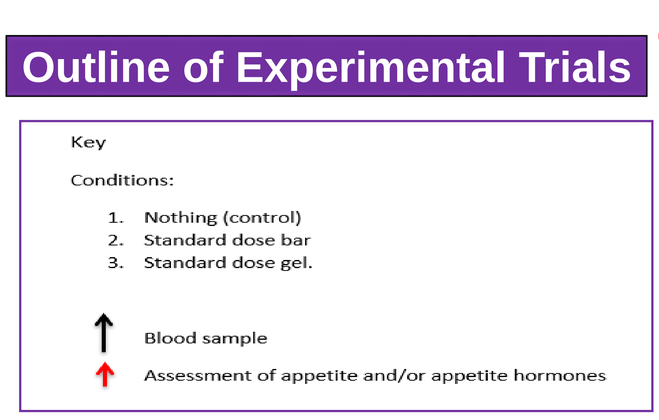
Results

- In **Experiment 1**, energy intake (EI) at ad libitum breakfast (ALB) was not different between conditions (282±135, 299±122, 288±131 kcal for Control (C), Bar (B) and Gel (G) respectively). However, **total EI (Fig. 1a)** *was significantly higher in B and G compared to C* after accounting for the energy content of the supplements (P<0.0005).
  - Analysis revealed *significantly higher* **appetite ratings (Fig. 2a)** Area under the Curve (AUC) (P<0.007), a *tendency for higher* **acylated ghrelin** AUC (P=0.087), and *significantly lower* **pancreatic polypeptide** AUC (P=0.02) in C compared with B and G **(Fig. 2b)**.
- In **Experiment 2**, EI at ALB was significantly higher (P=0.028) in C (306±122 kcal) compared to B (245±135 kcal) and G (254±118 kcal). However, **total EI (Fig. 1b)** was *significantly higher* in B and G after accounting for the energy content of the supplements (P<0.007).
- **In both experiments**, there were no differences between supplements for ratings of taste, aftertaste or overall palatability. Similarly no differences were observed in visual appeal, smell, taste, aftertaste and palatability of the breakfast.

Conclusion

- Supplementation with either the bar or gel **increased total energy intake** whether consumed 1h before or during breakfast.
- This may represent an effective nutritional means for ***addressing protein and total energy deficiencies*** in elderly women.

Outline of Experimental Trials



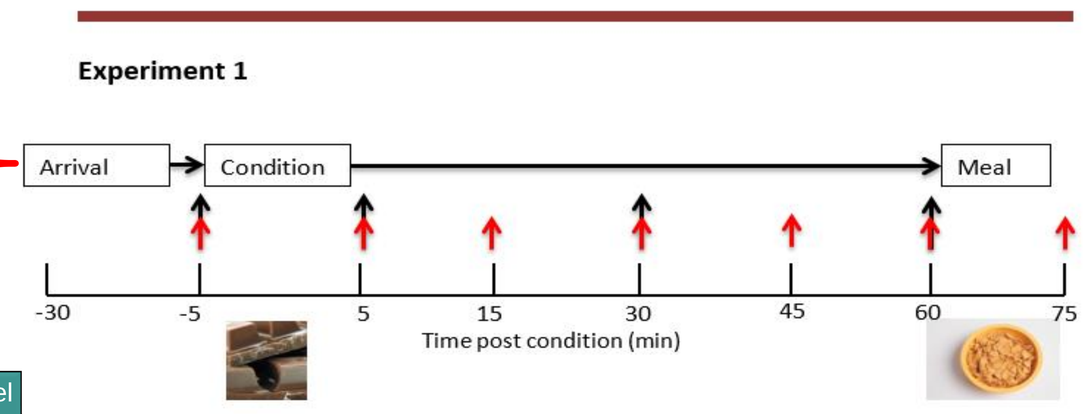


Fig. 2a: CA ratings in the control (▼), bar (●) and gel (○) trials (experiment one). Values are mean (SEM).

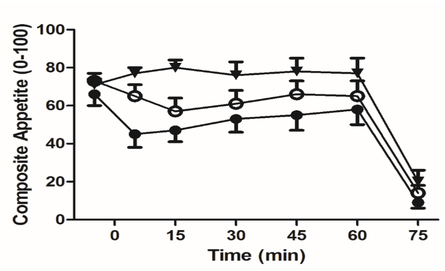


Fig. 2b: Plasma peptide YY (a), acylated ghrelin (b) and pancreatic polypeptide (c) concentrations in the control (▼), bar (●) and gel (○) trials (experiment one). Values are mean (SEM).

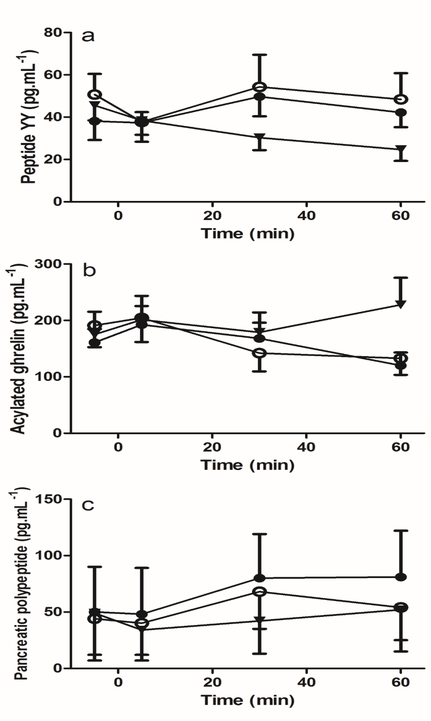


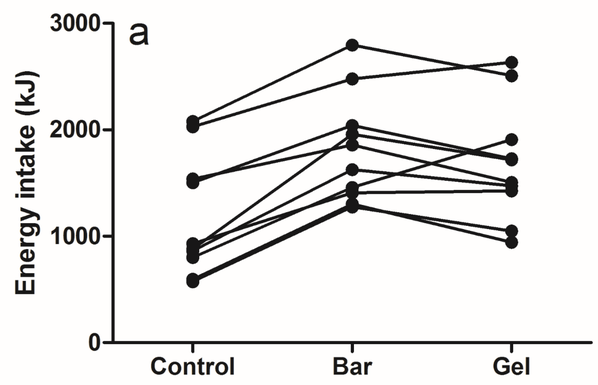
Fig 2: Composite Appetite (CA) and Hormone Concentration

Methods

- Elderly women completed two experiments where they consumed either a Bar (B, 135 kcal) or a Gel (G, 114 kcal), rich in EAAs (7.5 g, 40% L-Leucine), or nothing [control (C)].
- In **Experiment 1,** subjects (n=10, 68±5 years, mean ± SD) consumed B, G or C with appetite sensations and appetite-related hormonal responses monitored for 1h, followed by consumption of an ad libitum breakfast (ALB).
- In **Experiment 2**, subjects (n=11, 69±5 years) ingested B, G or C alongside an ALB.

Total Energy Intake (EI)

Fig. 1a: Experiment 1



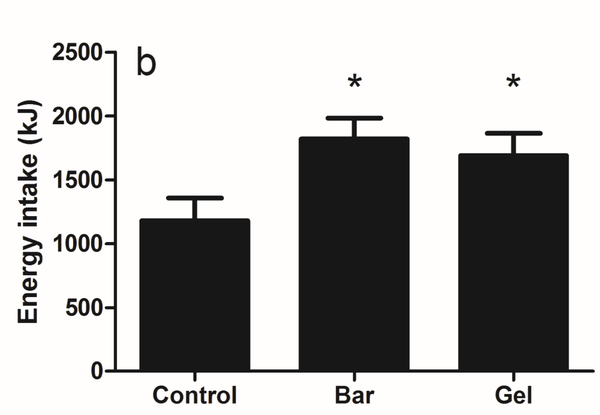
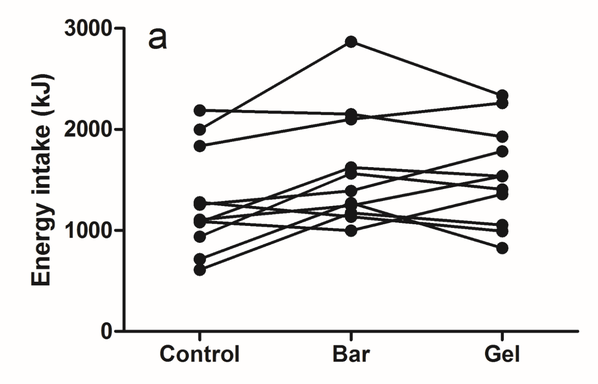
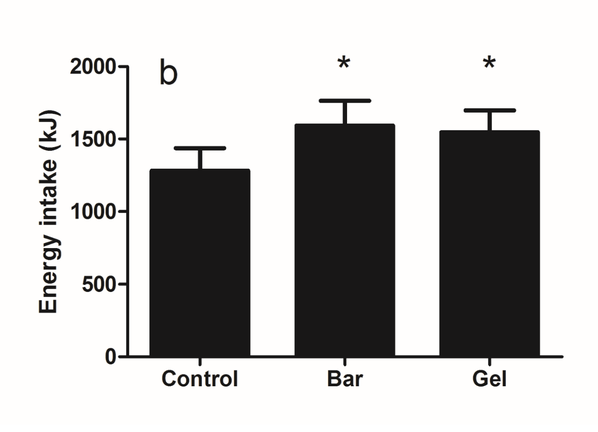


Fig. 1b: Experiment 2





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