

The impact of liquid preloads varying in macronutrient content on postprandial kinetics of amino acids relative to appetite

K. Korompokis, E. Östman and A. Dougkas
Food for Health Science Center, Lund University, Lund, Sweden

Protein has been suggested as the most satiating macronutrient and its ingestion leads to a cascade of pre- and post-absorptive signals which regulate appetite through various pathways^(1,2). However, the exact underlying mechanisms, especially in presence of variable macronutrient composition, are not fully elucidated. The aim of the present study was to investigate the absorption kinetics of proteins after co-ingestion with the other macronutrients and examine their impact on appetite and satiety-related gut hormones.

A randomized, within-subjects, 2-level full factorial design was implemented, where 36 healthy men and women consumed seven preloads with similar energy density (3.1 kJ/g) and volume (670 mL) but with varying macronutrient content. The energy from protein (%) and the CHO:fat ratio were combined in three levels of 9 (LP), 24 (MP), 40 (HP) and 0.4 (LC:HF), 2 (MC:MF), 3.6 (HC:LF) respectively. The amino acid concentrations were measured in a sufficient subgroup of seven male subjects⁽³⁾ and analyzed with linear mixed models ANCOVA (PROC MIXED procedure) in respect to appetite sensations and gut hormones.

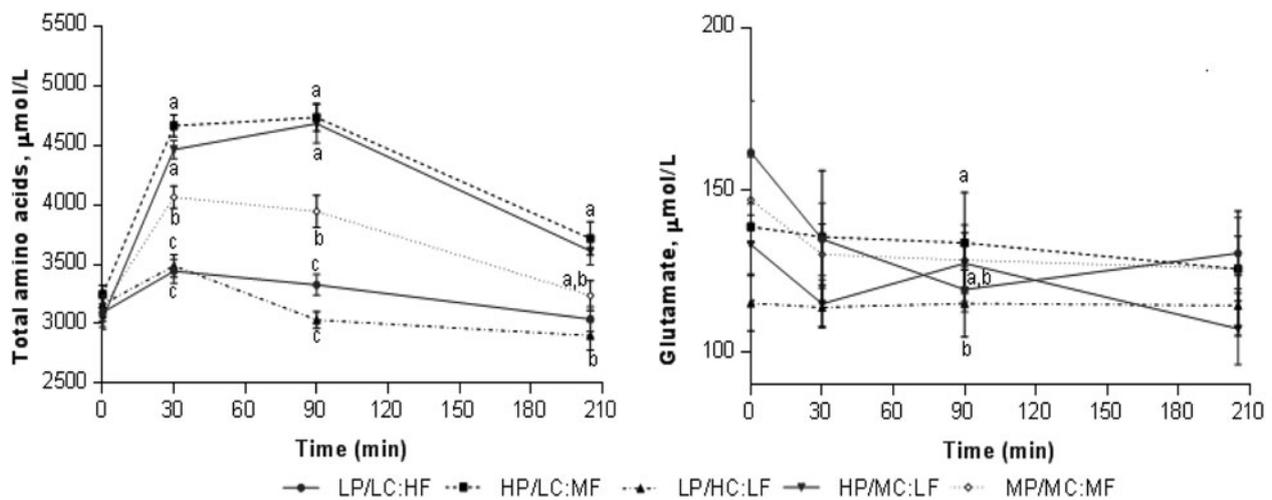


Fig. 1. Absorption kinetics of total amino acids and glutamate

Protein had a statistically significant role in postprandial amino acid profiles ($P < 0.05$), while no differences ($P > 0.05$) were detected between the two high protein preloads despite the different CHO:fat ratios, indicating that neither carbohydrate nor fat influenced the profiles. The amino acids were not related to appetite sensations or gut hormones ($P < 0.05$), except for glutamate, which was positively associated with the desire to eat and prospective consumption ($P < 0.05$) and negatively related to ghrelin ($P = 0.025$). Valine, lysine, leucine, isoleucine and α -aminobutyric acid were inversely associated with *ad libitum* energy intake ($P < 0.05$).

In conclusion, protein was the most influential factor for the postprandial kinetics of amino acids and the circulating amino acids were not consistently related to appetite regulation, except glutamate.

1. Fromentin G, Darcel N, Chaumontet C *et al.* (2012) *Nutr Res Rev* 25(1), 29–39
2. Tome D (2012) *Br J Nutr* 92 Suppl 1:S27–30
3. Bos C, Metges CC, Gaudichon C *et al.* (2003) *J Nutr* 133(5), 1308–1315