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Title:

Investigating the Postprandial Amino Acid Responses Following Administration of Whey Protein Hydrolysate versus Intact Protein as a Preload in Healthy Adults

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Preparation of Your Abstract

1. The title should be as brief as possible but long enough to indicate clearly the nature of the study. Capitalise the first letter of the first word ONLY (place names excluded). No full stop at the end.
2. Abstracts should state briefly and clearly the purpose, methods, results and conclusions of the work.
Introduction: Clearly state the purpose of the abstract
Methods: Describe your selection of observations or experimental subjects clearly
Results: Present your results in a logical sequence
Discussion: Emphasize new and important aspects of the study and conclusions that are drawn from them

Introduction: Proposed rapid absorption and enhanced bioavailability of protein hydrolysates, compared to intact forms, has drawn interest for potential to optimise postprandial amino acid (AA) metabolism. Such kinetic differences may influence protein metabolism, satiety, and glycaemic regulation. However, bitterness can limit hydrolysate palatability; lower degrees of hydrolysis (DH) may mitigate this. This study examines acute effects of a bovine lightly-hydrolysed (12.6% DH) whey protein hydrolysate (WPH) versus intact concentrate (WPC) and water control (WC) on plasma AA concentrations.

Methods: In a randomised, double-blind, 3-arm crossover design, following a standardised evening meal and overnight fast, 20 healthy participants (9 men, 11 women; BMI: 19-25 kg/m^2) consumed WC (0g protein), WPH (25g), or WPC (25g), as a preload beverage (t_{0min}), followed by a mixed-meal test (1580 kJ) at t_{30min}. Venous blood samples were collected over a 210min experimental period. The beverage flavour profiles were closely matched and administered with >2d washout period. Plasma AAs were assessed by ultra-high-pressure-liquid-chromatography (UHPLC) and incremental area-under-the-curve ($iAUC_{0\text{-}210mins}$) was analysed using linear mixed-model regression in SPSS (V29.0).

Results: Compared to WC, WPH and WPC elicited greater cumulative postprandial $iAUC_{0\text{-}210mins}$ for the sub-groups of essential-AAs, conditional-AAs, and branched-chain-AAs [treatment effect: $p<0.001$ for each], with no differences between the protein beverages. Differential effects of the whey proteins on individual AAs were observed, with $iAUC_{0\text{-}210mins}$ glutamine and histidine significantly increased after WPC (post-hoc pairwise comparison vs. WC: $p<0.05$), and glycine decreased following WPH (post-hoc pairwise comparison vs. WC: $p=0.01$).

Discussion: Although whey proteins elicited greater postprandial cumulative AA responses than WC, distinct effects emerged for glutamine, histidine, and glycine, indicating that protein hydrolysis modulates individual AA profiles. Notably, the pronounced decline in glycine following WPH should be considered in the application of protein hydrolysates. Whether higher DH proteins yield comparable outcomes or show threshold-dependent effects remains uncertain.