

**The appetite-suppressant and GLP-1-stimulating effects of whey proteins in obese subjects are associated with increased circulating levels of specific amino acids.**

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Abstract: The satiating effect of whey proteins depends upon their unique amino acid composition because there is no difference when comparing whey proteins or a mix of amino acids mimicking the amino acid composition of whey proteins. The specific amino acids underlying the satiating effect of whey proteins have not been investigated to date.

Aims and methods: The aim of the present study was to evaluate the appetite-suppressant effect of an isocaloric drink containing whey proteins or maltodextrins on appetite (satiety/hunger measured by a visual analogue scale or VAS), anorexigenic gastrointestinal peptides (circulating levels of glucagon-like peptide 1 (GLP-1) and peptide tyrosine tyrosine (PYY)) and amino acids (circulating levels of single, total [TAA] and branched-chain amino acids [BCAA]) in a cohort of obese female subjects (n = 8; age: 18.4 ± 3.1 years; body mass index, BMI: 39.2 ± 4.6 kg/m<sup>2</sup>).

Results: Each drink significantly increased satiety and decreased hunger, the effects being more evident with whey proteins than maltodextrins. Similarly, circulating levels of GLP-1, PYY and amino acids (TAA, BCAA and alanine, arginine, asparagine, citrulline, glutamine, hydroxyproline, isoleucine, histidine, leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tyrosine, and valine) were significantly higher with whey proteins than maltodextrins. In subjects administered whey proteins (but not maltodextrins), isoleucine, leucine, lysine, methionine, phenylalanine, proline, tyrosine, and valine were significantly correlated with hunger (negatively), satiety, and GLP-1 (positively).

Conclusions: Eight specific amino acids (isoleucine, leucine, lysine, methionine, phenylalanine, proline, tyrosine, and valine) were implicated in the appetite-suppressant and GLP-1-stimulating effects of whey proteins, which may be mediated by their binding with nutrient-sensing receptors expressed by L cells within the gastrointestinal wall. The long-term satiating effect of whey proteins and the effectiveness of a supplementation with these amino acids (i.e., as a nutraceutical intervention) administered during body weight reduction programs need to be further investigated.

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