In Vitro Evaluation of Bioavailability of Whey Proteins and of their Hydrolysates by Dialyzability

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Research on the bioavailability of trace elements, amino acids and small peptides is carried out by both in vivo and in vitro methods. The objective of this research was to evaluate in vitro dialyzability of milk whey proteins hydrolysates. Whey hydrolysates were produced with commercial proteolytic enzymes. Content of whey proteins after gastrointestinal digestion was 5.44±0.18g/L; after gastric digestion, it was 5.45±0.16g/L and after intestinal digestion, 4.41±0.11g/L in the external medium and 2.14±0.06g/L in the internal. Quantitative results for peptides and amino acids were: whey: 0.087±0.002U; after gastric digestion: 0.368±0.004U; after intestinal digestion (external medium): 0.253±0.003U, and after intestinal digestion (internal medium) 0.488±0.004U, showing clearly that there was an increase in levels throughout digestion, indicating that hydrolysis and absorption were happening. The amount absorbed within the dialysis membrane was higher the amount outside the membrane, indicating diffusion of the hydrolysate. SDS-PAGE showed possible proteins and digestion products, indicating the degree of proteolysis attained in gastrointestinal digestion. HPLC results showed the sequence of digestion through the hydrolysis of proteins, formation of small peptides and amino acid absorption into the dialysis membrane of many small peptides and free amino acids. From these results we conclude that the dialyzability was effective in showing the bioavailability of peptides and amino acids obtained from hydrolyzed bovine milk whey.

Keywords: Bioavailability, dialyzability, whey protein hydrolysates

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