

IDENTIFICATION OF BIOACTIVE PEPTIDES IN A THERAPEUTIC INFANT FORMULA FOR THE NUTRITIONAL TREATMENT OF COW'S MILK ALLERGY

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INTRODUCTION

Human milk is the gold standard of infant nutrition during the first months of life. It contains minor components such as bioactive peptides with activities such as antioxidant, antihypertensive, antibacterial and/or immunomodulator properties. These compounds seem to perform their functions when they are hydrolysed during the infant digestion and they have specific functions according with their amino acids sequence

The aim of this study was to identify bioactive peptides after an *in vitro* digestion in a new extensively hydrolysed formula, which may have a relevant role in the nutritional treatment of cow's milk allergy in infants.

METHODS

The hydrolysis procedure consisted on the simulation of gastric and intestinal digestion of the samples by *in vitro* enzymatic treatment. Soluble fraction was filtered and the water-soluble extract was subjected to ultrafiltration through a hydrophilic 3000 Da membrane. The hydrolysates were injected into an HPLC system connected on-line to an Esquire-LC quadrupole ion trap instrument for RP-HPLC-MS/MS analysis, according to the method of Hernández-Ledesma et al 2004¹. The m/z spectral data were processed using Data Analysis 3.0 (Bruker Daltonik) and transformed to spectra representing mass values. MS(n) spectra were processed in BioTools 2.1 (Bruker Daltonik) to perform peptide sequencing.

RESULTS

75 fragments, with a molecular weight lower than 1000 Da, were identified, 77% of them derived from whey (Figure 1). 14 fragments were identified which could have angiotensin converting enzyme (ACE) inhibitory activity (SLSQSK, EMPFPK, VVPPFLQ, VRGPFPI, LHLPLP, LHLPLPL, IIAEK, LDIQK, ALPMH, ALPMHI, VLDTDYK, GLDIQK, LDAQSAPL, VAGTWY). Other peptides with other possible functional effects were detected (Table 1)

CONCLUSION

- Some of the bioactive peptides found in this therapeutic formula could be isolated, produced and clinically tested with the aim to produce supplements for special medical purposes such as prevention or treatment of allergy

Disclosure of Interest: E. Matencio, F. Romero & P. Abellán: Conflict with: R&D Hero Spain. C. Gómez, I. Recio, A. Gil & G. Ros: None Declared.

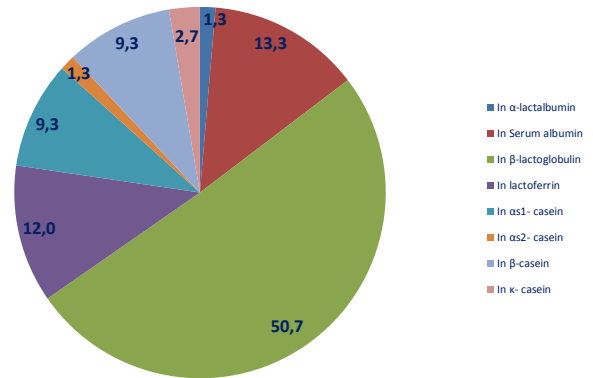


Figure 1. Bioactive peptides in the protein fractions of the extensively hydrolysed formula (%)

Table 1. Bioactive peptides identified in extensively hydrolysed formula and possible attributed effects.

PEPTIDES	SOURCE / POSSIBLE EFFECTS
ALPMH ALPMHI	Source: β -lactoglobulin • ACE-inhibitory activity ² • Antihypertensive properties ^{3,4} • Hypocholesterolemic effects ⁵
SLAM SLAMA	Source: β -lactoglobulin • Antioxidant ⁶
LHLPLP LHLPLPL	Source: β -casein • Antihypertensive properties ⁷
VLNENL	Source: α 1-casein • Immunomodulatory ⁸ • Antibacterial activity ⁸
ISQPE	Source: Lactoferrin • Antibacterial effects ⁹
IPAVF	Source: β -lactoglobulin • Antibacterial effects ¹⁰

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