



**HAL**  
open science

## Gastrointestinal digestion improving the antihypertensive activity of whey peptides

Luisa Ozorio, Nariana Regina Pereira, José Eduardo Silva-Santos, Caroline Mellinger-Silva, Lourdes Maria Correa Cabral

► **To cite this version:**

Luisa Ozorio, Nariana Regina Pereira, José Eduardo Silva-Santos, Caroline Mellinger-Silva, Lourdes Maria Correa Cabral. Gastrointestinal digestion improving the antihypertensive activity of whey peptides. 32. EFFoST International Conference, Nov 2018, Nantes, France. , 2018. hal-01948613

**HAL Id: hal-01948613**

**<https://hal.science/hal-01948613v1>**

Submitted on 7 Dec 2018

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



# GASTROINTESTINAL DIGESTION IMPROVING THE ANTIHYPERTENSIVE ACTIVITY OF WHEY PEPTIDES

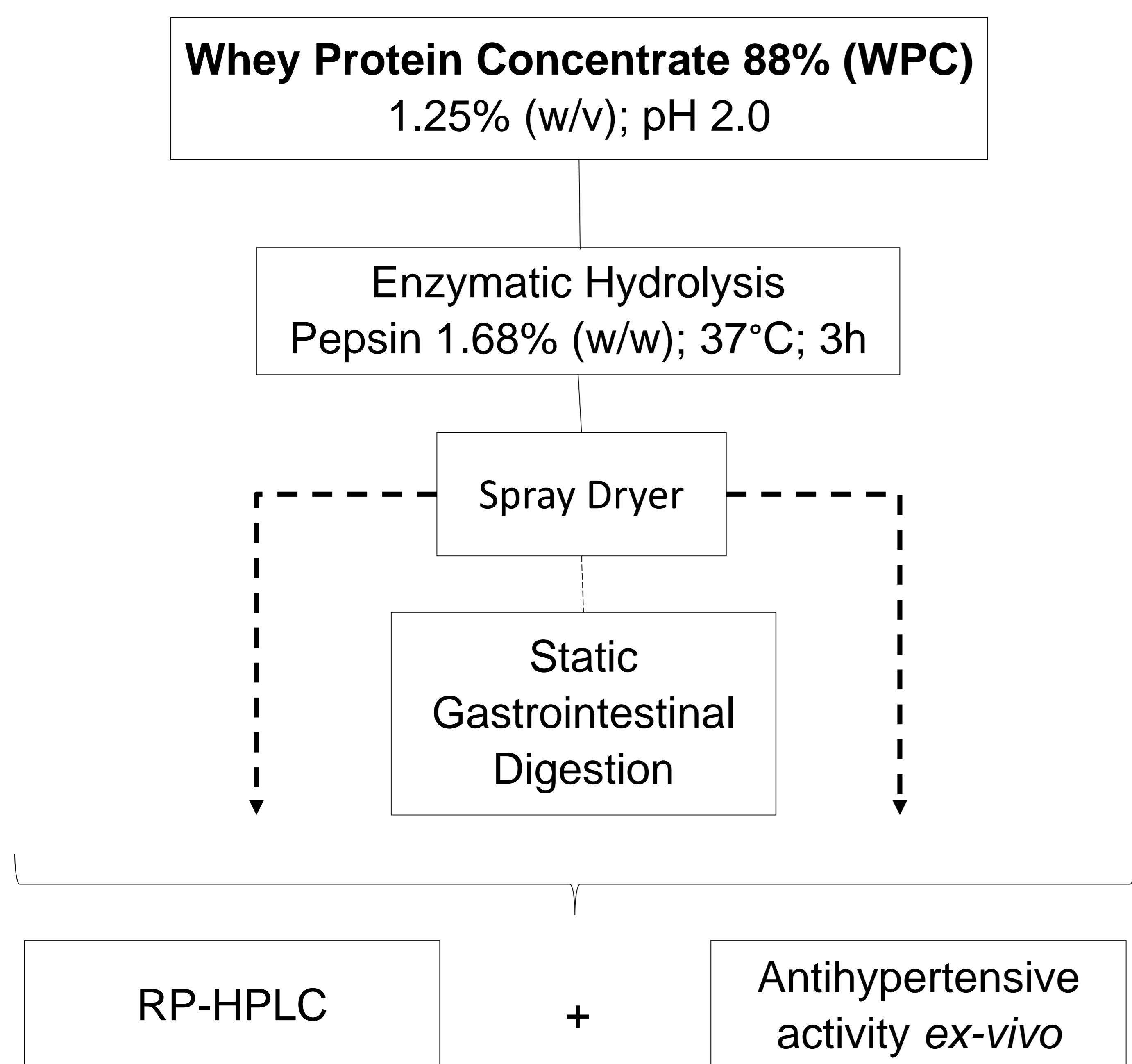
Luísa Ozorio<sup>1,2</sup>; Nariana Regina Pereira<sup>3</sup>; José Eduardo Silva-Santos<sup>3</sup>; Caroline Mellinger-Silva<sup>4</sup>; Lourdes Maria Correa Cabral<sup>4</sup>

<sup>1</sup>Federal University of Rio de Janeiro, Chemistry Institute, Rio de Janeiro, Brazil; <sup>2</sup>INRA, Agrocampus Ouest, STLO, 35000, Rennes, France; <sup>3</sup>Federal University of Santa Catarina, Laboratory of Cardiovascular Biology, Santa Catarina, Brazil; <sup>4</sup>Embrapa Food Technology, Rio de Janeiro, Brazil

## INTRODUCTION

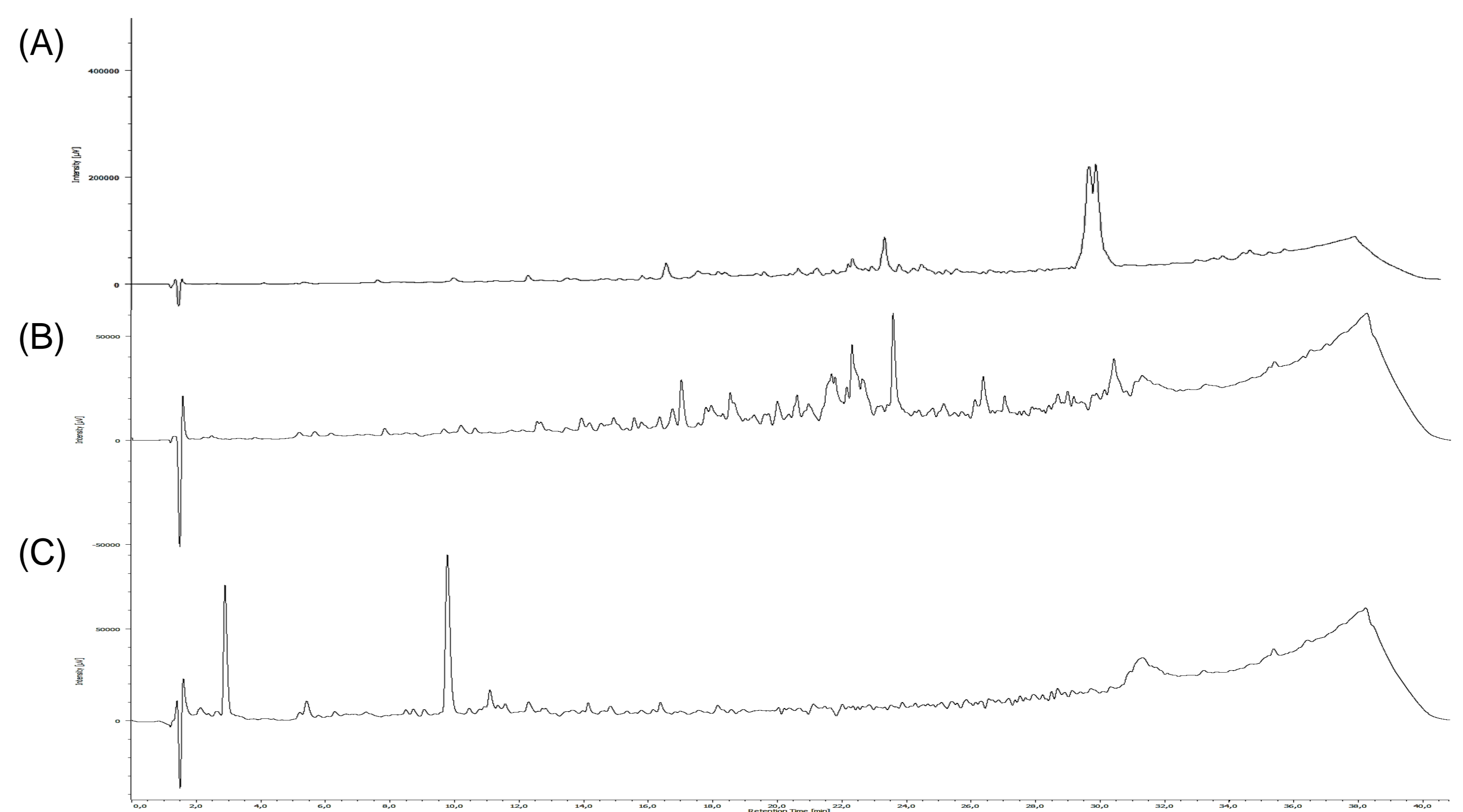
- Whey proteins are extensively hydrolyzed by gastrointestinal enzymes and brush border membrane peptidases, releasing free amino acids and peptides.
- Some whey peptides are able to cross the intestinal lumen and exert their biological activity, which lowering blood pressure may be included.
- Despite all knowledge concerning whey peptides, there are only few products commercially available with this proposal, emphasizing the need of more studies regarding this theme.
- Aiming to make a better use of this agroindustrial byproduct, together with the need to meet the demands of this market, the present study proposed to evaluate the *ex-vivo* vasorelaxant activity of a whey hydrolysate during gastrointestinal digestion.

## MATERIALS AND METHODS

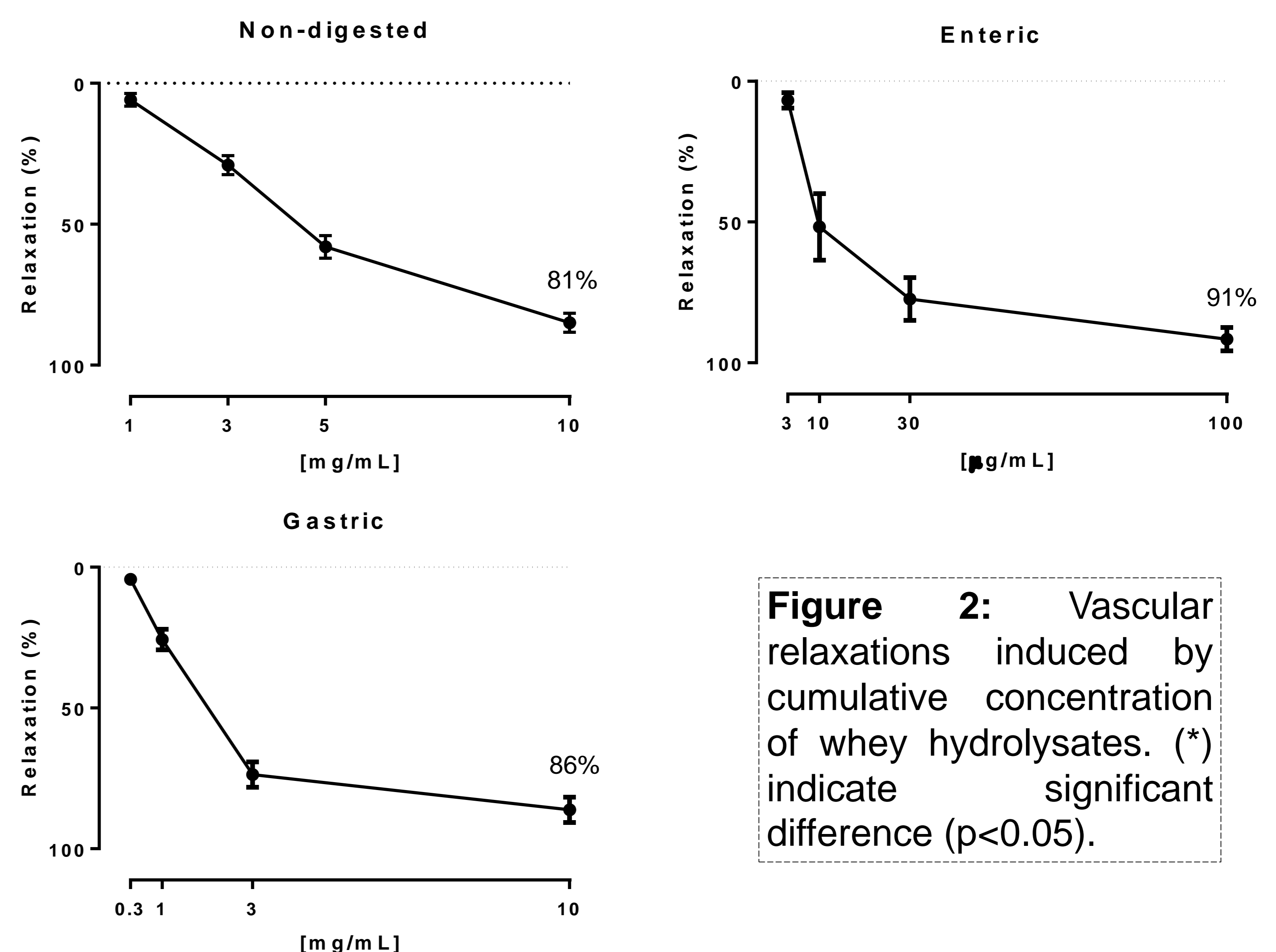


**Acknowledgements:** Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de nível Superior (CAPES), Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) and Institut National de la Recherche Agronomique (INRA) for the financial support and winery Vinícola Rio Sol for supplying the Alicante Bouschet grape pomace

## RESULTS



**Figure 1:** Peptide profiles of whey hydrolysates. (A) Spray-dried hydrolysate non digested; (B) Whey hydrolysate after gastric and (C) intestinal static digestions.



**Figure 2:** Vascular relaxations induced by cumulative concentration of whey hydrolysates. (\*) indicate significant difference ( $p < 0.05$ ).

## CONCLUSIONS

The gastrointestinal digestion of the whey hydrolysate lead to the formation of more than 70 peptides and a complete  $\alpha$ -lactalbumin and  $\beta$ -lactoglobulin hydrolysis. The antihypertensive activity of the hydrolysate is proportional to its degree of hydrolysis, since the enteric digested sample achieved  $91.59\% \pm 9.90$  of vasorelaxation, when applied  $100 \mu\text{g.mL}^{-1}$  of sample, an increase of approximately 100 times-fold, when compared to the non-digested and gastric digested samples. The results showed that the whey hydrolysate with reduced cost of production presented a high vasorelaxant activity after gastrointestinal digestion, which may be of great interest for food and nutraceutical industries.