The Use of Pure and Commercial Pepsins in the Obtainment of Antihypertensive Whey Peptides

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The consumption of whey hydrolysates has become more popular with the discovery of its functional properties, such as antihypertensive potential. However, its high cost of acquisition remains a barrier for some consumers and small industries. The aim of the present study was to generate antihypertensive whey peptides, through enzymatic hydrolysis, catalyzed by pure (PPA) and commercial (PPC) pepsins, comparing both obtainment processes. PPA presented an enzymatic activity of 11-fold higher, and a cost of acquisition of 1400-fold higher when compared to PPC. The hydrolysis processes were performed for 3h-reaction and the enzyme concentrations applied were of 0.4% and 1.6% for PPA and PPC, respectively. HPLC analysis showed that β-lactoglobulin was partially hydrolyzed in both treatments, while α-lactalbumin was completely hydrolyzed during the first minute in PPA, and between 1 and 2h in PPC treatment. SDS-PAGE gels showed lactoferrin, serum albumin and caseins being hydrolyzed before 1-min-reaction in both experiments. Biological analysis showed a vascular relaxation of 77.1% and 66.9% in rats' denuded aortic rings, when applied 10 mg mL^{-1} of PPA and PPC hydrolysates, respectively, showing that peptides also act through independent endothelium pathways, besides the well-known angiotensin-converting-enzyme inhibition. The results showed that an increment of 4 times in the commercial pepsin concentration was enough to generate a whey hydrolysate with high antihypertensive potential and lower cost of acquisition. Supported by FAPERJ and CAPES.

Biography

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Dr. Caroline Mellinger Silva is a Biochemist Researcher at the Brazilian Agricultural Research Corporation-Embrapa, Rio de Janeiro-Brazil. She has experience in Biochemistry/Chemistry of Macromolecules and develops research on chemical characterization of polysaccharides and proteins with potential biological and technological aspects. She also evaluates the structural and functional behaviour of macromolecules after simulation of human digestion. Currently, develops research on the recovery of agro-industrial byproducts for the development of new products.