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Title: Preparation of Low-phenylalanine Whey Hydrolysates, Using Papain and Pancreatin Immobilized on Activated Carbon and Alumina

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Abstract: This study involves the preparation of whey hydrolysates with low phenylalanine (Phe) content aiming the treatment of phenylketonuria. For hydrolysing the proteins, two enzymes were used, papain and pancreatin, in an immobilized form, on Activated Carbon (AC) and alumina (AL) and three enzyme: substrate ratios (E:S) were tested for each enzyme. Activated carbon was used to remove Phe from hydrolysates. The second order spectrophotometry was used to evaluate the efficiency of Phe removal as well as the losses of tyrosine (Tyr) and tryptophan (Trp). The results showed that the activated carbon was efficient to remove Phe from whey hydrolysates and the values changed from 84-97%. Tyr and Trp losses varied from 45-70 and from 63-78%, respectively, depending on the enzyme and the immobilization support used. The use of pancreatin was more advantageous (smaller final Phe content) than papain when AC was used as the immobilization support and the inverse was observed when using AL. The E:S affected the Phe removal only when the support was AC and the desirable effect associating the decrease of Phe content with E:S reduction was just observed for papain when passing from 2-1%. Also, the use of these two enzymes in an immobilized form was able to produce high oligopeptide (40%) and low aminoacid (2%) contents which is advantageous form the nutritional point of view.

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