

3rd International Conference and Exhibition on **Food Processing & Technology** July 21-23, 2014 Hampton Inn Tropicana, Las Vegas, USA

Influence of protein substrate treatment on kinetics of enzymatic hydrolysis of whey proteins

Renata S C Souza¹, Renata V Tonon², Lourdes M C Cabral² and Louise E Kurozawa³

¹Federal Rural University of Rio de Janeiro, Brazil

²Embrapa Food Technology, Brazil

³State University of Londrina, Brazil

Whey is one of the main residues from the dairy industry, particularly from the cheese production. It contains water, lactose, salts and soluble proteins. Enzymatic hydrolysis has been used in order to improve some of the activities attributed to the whey proteins, since it results in peptides with different amino acid sequences and molecular sizes. The aim of this study was to evaluate the influence of substrate pretreatment on the kinetics of enzymatic hydrolysis of whey proteins using the enzymes Alcalase and Flavourzyme. The evaluated substrates were: fresh acid whey, reconstituted powdered whey protein concentrate and whey protein concentrated by ultrafiltration. The effect of an endopeptidase and an exopeptidase on the kinetics of enzymatic hydrolysis was evaluated. Results were fitted by an empirical model, which is function of degree of hydrolysis (DH) and processing time. The highest DH (%) was obtained using the endopeptidase Alcalase to hydrolyse the fresh whey, reaching 63%, which was due to a possible unfolding of the protein molecule, caused by prior freezing to which this substrate was subjected. The ultrafiltered and reconstituted samples presented DH values of 57 and 27%, respectively. For Flavourzyme, all the substrates presented lower values of DH than those hydrolysed by Alcalase (10 - 20%). The kinetic equation proved to be adequate for modeling enzymatic reaction for milk whey proteins, showing a good fit to the experimental data ($R^2 > 0.986$).

Biography

Renata V Tonon is a Researcher at Embrapa Food Technology (Ministry of Agriculture, Livestock and Food Supply, Brazil) and concluded her PhD in Food Engineering at the University of Campinas, Brazil. Her main research interests are focused on microencapsulation, spray drying and membrane technology, as tools for concentration and preservation of bioactive compounds, as well as for wastes and coproducts recovery.

renata.tonon@embrapa.br