IMPACT OF IN VITRO FERMENTATION, ENZYMATIC HYDROLYSIS, AND DIGESTION ON THE DEGRADATION OF B-CASOMORPHIN-7 IN MILK USING *LACTICASEIBACILLUS CASEI* AND *LIMOSILACTOBACILLUS FERMENTUM*

Eduarda Degani Araújo[1], Leandra Oliveira Xavier Albiero[2], Rafaela Ansiliero[2], Maria de Lourdes Borba Magalhães[2], Gustavo Felippe da Silva[2], Aniela Pinto Kempka[1,2]

[1] Santa Catarina State University. Department of Food Engineering and Chemical Engineering, Pinhalzinho, SC, Brazil. eduarda.araujo@edu.udesc.br; aniela.kempka@udesc.br

[2] Santa Catarina State University. Department of Animal Production and Food Science, Multicentric Graduate Program in Biochemistry and Molecular Biology. Lages, SC, Brazil. leandra.xavier0118@edu.udesc.br, rafaela.a@edu.udesc.br, maria.magalhaes@udesc.br, gustavo.silva@udesc.br.

The objective of this study was to reduce the formation of β-casomorphin-7 (BCM-7), an opioid peptide derived from β-casein A1, associated with inflammation and gastrointestinal disorders. To achieve this, strategies involving thermal treatments and bacterial fermentation with *Lacticaseibacillus case*i and *Limosilactobacillus fermentum*, combined with enzymatic hydrolysis, were evaluated. The thermal treatment at β-casomorphin-7 100°C for 30 minutes increased the concentration of soluble proteins to 7.58 ± 0.07 mg/mL, while autoclaving at 105°C for 15 minutes had a lesser impact, resulting in 3.24 ± 0.05 mg/mL, this method was chosen as the standard to minimize protein degradation and prepare the milk for subsequent processes. Bacterial fermentation preserved the proteins during digestion, while the control showed a significant drop in soluble protein concentrations, from 5.32 ± 0.05 mg/mL to 0.19 ± 0.01 mg/mL. SDS-PAGE evidenced the degradation of milk proteins, including β-casein. The ELISA showed that *L. fermentum* was more efficient in reducing BCM-7, decreasing its concentration from 0.22 ± 0.01 to 0.08 ± 0.01. The combination of *L. casei* and *L. fermentum* did not result in any additional significant reduction. Thus, fermentation combined with enzymatic hydrolysis proved effective in reducing the formation of BCM-7.

Keywords: BCM-7. Fermentation. Enzymatic Hydrolysis.