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Degradation of β-casomorphins and identification of degradation products during yoghurt processing using liquid chromatography coupled with high resolution mass spectrometry

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ABSTRACT

Liquid chromatography-high resolution mass spectrometry (LC-HRMS) was used to investigate the degradation of β-casomorphin 5 (β-CM5) and β-casomorphin 7 (β-CM7) by *Streptococcus thermophilus* and/or *Lactobacillus delbrueckii* ssp. *bulgaricus*, and to identify the degradation products forming during yoghurt processing. Bovine UHT milk was fermented with: (i) a single strain of *L. delbrueckii* ssp. *bulgaricus*, (ii) a single strain of *S. thermophilus* and (iii) the mixture of *S. thermophilus* and *L. delbrueckii* ssp. *bulgaricus* to pH 4.5 and then stored at 4 °C for 1 and 7 days. Results showed that *L. delbrueckii* ssp. *bulgaricus* and/or *S. thermophilus* completely degraded β-CM5 and β-CM7 upon fermentation to pH 4.5 and degradation products were significantly influenced by bacteria strains and storage time. Four peptides, β-CNf60-61 (YP), β-CNf62-63 (FP), β-CNf64-66 (GPI) and β-CNf62-66 (FPGPI) were tentatively identified through high resolution MS/MS experiments; however, it was not possible to confirm if either milk protein or β-casomorphins