

Identification of the Peptide PyroQ- β Casein_{194–209} as a Highly Specific and Sensitive Marker to Differentiate between Ultrahigh-Temperature Processed (UHT) Milk and Mildly Heated Milk

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Supporting Information

ABSTRACT: In this study, a new approach was introduced to identify marker peptides that reflect the thermal treatment of commercial milk samples and differentiate ultrahigh-temperature processed (UHT) milk from mildly heated milk. Peptide profiles of training set samples, pasteurized ($n = 20$), extended shelf life ($n = 29$), and UHT ($n = 29$) milk, were recorded by MALDI-TOF-MS after StageTip microextraction. As marker candidates, 13 peptides were selected, and their cutoff levels were defined. The quality of the cutoff levels was then tested with a blind test set. Thus, the peptide m/z 1701.0, which was identified as pyroQ- β casein_{194–209}, could ideally differentiate UHT milk from mildly heated milk with an accuracy of 100%. Due to its high reliability and sensitivity, this peptide may be applied in routine analysis to monitor thermal processing of milk. An additional heating experiment showed that the marker peptide candidates are formed during milk processing by endogenous enzymes and selective thermal cleavage.

KEYWORDS: peptide profiling, marker peptide, milk, heating, PCA, MALDI-TOF-MS

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