

New Lactase Enzymes

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Lactose-free UHT milk has a shorter shelf life (6 months) than conventional UHT milk (9 months), which challenges shelf-life and product distribution for the food industry as well as sensory qualities in relation to consumers. The short shelf-life is linked to a higher reactivity of the lactase generated galactose and glucose as substrate for the Maillard reaction compared to lactose. Moreover, the lactase enzyme preparations have shown to contain unwanted proteolytic side-activity[1], [2]. This proteolytic activity generates free amino terminals and free amino acids, which are the second substrate for driving the unwanted Maillard reactions. Furthermore, the unwanted proteolytic activity can lead to bitter peptide formation and in combination with the Maillard reaction also cause protein aggregation[3]. These unwanted chemical changes results in early product deterioration of the lactose-free UHT milk. In this study, three new lactase enzymes, which differ in purity and activity, will be characterized. Full milk will be used for the study and milk samples added the enzymes either pre- or post-hydrolysis, will be stored for up to one year. Mass spectrometry and protein analytical methods will be used to investigate unwanted proteolytic side activity, aggregate formation and Maillard parameters in order to improve shelf-life and quality of lactose-free UHT milk.

References:

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