



**E410**

### **Effect of Post Lactase Treatment on the Heat-induced Lactosylated Milk protein**

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Milk and milk products undergo a series of changes during processing and storage. However, ultra-high temperature (UHT) treatment increases the shelf-life of milk, the negative impacts of UHT processing are also published. During milk processing by UHT treatment, a biochemical reaction between lactose and the  $\epsilon$ -amino group of lysine and in some extent with other amino acids are taken place to form a stable protein-bound lactulosyl-lysine. Unfortunately, protein with lactosylated-lysine hinders the proteolysis of protein by proteases in intestinal tract. Therefore, a systematic and judicious investigation is needed to understand the protein structure in the context of food quality and safety. In present investigation, a HPLC-ESI-TOF mass spectrometric method was set up using deconvolution of acquired intact protein mass spectra for detecting lactosylation of milk protein. A mass shift of +324 (characteristic for lactose attachment) with respect to the unmodified casein was considered for assessing the change of molecular mass of casein due to lactosylation. In this proof-of-concept study, commercially available regular and lactose-free UHT and extended shelf life (ESL) milk were selected. In the tested lactose-free UHT milk, along with lactosylated casein (+324), hexosylated casein (+162) were observed. It is postulated that the observed hexosylated species was a result of an intrasaccharide ( $\gamma$ 1) cleavage between glucose and galactose in the attached lactose moiety. This was supposed to be the result of post-UHT treatment with lactase enzyme. This finding provides evidence for the ability of the post-UHT added industrial galactosidase enzymes to accept protein attached lactose as substrate and thus the ability to modify the extent of heat-induced lactosylation of UHT milks. Lactosylated casein was not detected in ESL milk. The financial support of the OTKA K135 294, Bolyai scholarship of the MTA and the ÚNKP-20-5-1 grant are kindly acknowledged.