

## **Assessment of physico-chemical and heat induced changes during preparation and storage of UHT milk**

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Short title: **Changes during processing and storage of UHT milk**

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**Summary**

Ultra-high-temperature (UHT) and aseptically packaged milk are increasing demand throughout the world. In this study, physico-chemical and heat induced changes during the preparation and storage of UHT milk were assessed. Raw pasteurized and UHT processed milk sample were analyzed freshly, however UHT milk sample was stored at 5 and 30<sup>0</sup>C for 4 months and analyzed regularly at an interval of one month. Parameter such as pH, viscosity, Non-casein-nitrogen (NCN), Non-protein-nitrogen (NPN), particle size, zeta potential of casein micelles, soluble calcium (Ca), soluble magnesium (Mg), proteolysis, HMF, lactulose and color were analyzed. During processing there was slightly increase in viscosity, NPN, particle size, soluble calcium, HMF, lactulose, and colour value using heat treatment of milk while decrease in in pH and NCN content. During storage of UHT milk there was significant ( $p<0.001$ ) increase in viscosity, non-protein nitrogen, non-casein nitrogen, *a* value, *b* value, hydroxyl methyl furfural, lactulose, soluble calcium and soluble magnesium and a significant ( $p<0.001$ ) decrease in pH and *L* value. There was also observed little change in the particle size and zeta potential of casein micelles during storage. Changes were more pronounced in milk sample stored at 30<sup>0</sup>C than that stored at 5<sup>0</sup>C. During storage there occurred salt imbalance, increase in nitrogenous components and formation of Maillard browning products which adversely affected its quality. It was concluded that Maillard reaction and proteolysis led to the acidification which had destabilizing effect on the milk.