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Effect of formulation and heat treatment on 5-hydroxymethylfurfural formation and quality parameters in dulce de leche

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ABSTRACT

This work assessed the effect of formulation and heat treatment on the formation of HMF, non-enzymatic browning and rheology of dulce de leche (DL). Laboratory scale trials were developed with different DL formulas: whole powdered milk, skimmed milk, and lactose-free skimmed milk, and added sucrose, subjected to different processing temperatures (110°C, 120°C, and 130°C). Additionally, an alternative formulation was designed in which half the sucrose was replaced by 50% tagatose. DL samples were compared with three commercial products in terms of water activity, soluble solids content, pH, colour, apparent viscosity, and HMF concentration. HMF formation in DL was mitigated (35%) in a lactose-free formulation by lowering the process temperature. Moreover, HMF formation was reduced up to 80% replacing sucrose by tagatose without affecting the quality parameters (pH, soluble solids, colour, and apparent viscosity). Decrease in processing temperature and the use of tagatose are viable alternatives for HMF mitigation in DL.

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