DEVELOPMENT OF NEW RSCM PROCESSES

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ABSTRACT

All concentrated milks thicken with storage time and the degree of thickening is highly dependent on the storage temperature. The aim of the current research project was to investigate this phenomenon in reconstituted concentrated milk (RCM) and recombined sweetened condensed milk (RSCM) and to investigate a method for overcoming the quality defect. RCM was initially investigated as this system had been extensively documented by previous works at Massey University, New Zealand. The RCM system was chosen to provide an opportunity of learning all about time dependent rheology. It was observed that reshearing of age thickened RCM samples destroyed the ability to age thicken again in subsequent storage. RSCM was then investigated to assess the effect of shear and temperature on age thickening during storage. Two shear levels of 900 and 31,000s^{-1} were applied during the recombination stage in the process of producing RSCM. Samples of RSCM produced using both shear rates were then stored at temperatures of 30, 40 and 50°C for a period of 12 weeks. Triplicate samples from each storage temperature were analysed weekly for apparent viscosity, particle size distribution and colour. The RSCM samples stored at 50°C gelled by the 7th week while RSCM samples stored at 30 and 40°C did not gel even by the 12th week. The results of particle size distribution were consistent with the age thickening results. The particle sizes of samples stored at 30 and 40°C almost did not change with storage time but the particle sizes of samples stored at 50°C increased with storage time until they gelled. The colour of RSCM became darker with increased storage temperature and time. This was particularly noticeable at 50°C.

The study showed that the commonly observed quality defect in RSCM could be overcome for samples stored below 40°C for at least 12 weeks by the application of shear rates in excess of 900s^{-1} during the manufacture of the product.

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