

Effect of Microbiological and Chemical Factors on Flavour of Spray Dried Full Cream Milk Powder

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Full cream milk powder is susceptible to flavour changes which limit its shelf life and consumer acceptability. Natural flavour of full cream milk powder can be degraded during production process and storage as a result of lipid oxidation and lipolysis induced by extracellular microbial enzymes. The aim of this study was to determine chemical and microbiological factors which influence the flavour of milk powder processed in two spray drying plants (Plant 1 and Plant 2). Twelve samples were collected from spray drying milk powder plants at three different time periods for four weeks (0, 7, 14, 21 day) in replicates. Lipid oxidation value (TBARS), free fatty acid content, peroxide value, yeast and mold count and vegetative microbial count of milk powder samples were evaluated using standard protocols. Thermophillic spore counts were evaluated by heating milk powder samples at 106°C for 30 min subsequent plating on plate count agar and incubating at 55°C for 48 h. Results of the study showed that TBARS value of samples from Plant 2 were higher than those of Plant 1 ($p < 0.05$). In addition, free fatty acids content of milk powder samples from Plant 1 were lower than those from the Plant 2 and vegetative cell counts were significantly higher in full cream milk powder samples of Plant 1 compared to those of Plant 2 ($p < 0.05$). Finally, it can be concluded that chemical factors including lipid oxidation and lipolysis induced by heat resistant microorganisms can affect the final flavour of spray dried full cream milk powder.

Keywords: Lipid oxidation, Free fatty acid, Lipolysis, Vegetative microbial count