

Development of Milk Based Carbonated Beverages

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By

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ABSTRACT

Carbon Dioxide has been used extensively in the preparation of many beverages. Presence of this gas creates bubbles in the liquid. However, there is limited research conducted on stability of casein with carbonation. Hence, this study was carried out to develop a milk based carbonated beverage with higher protein stability and nutritional value. Several preliminary trials were conducted using different flavours and fruit pulps and samples with higher protein stability were selected. Then, carbonated beverages were prepared using selected flavors, colors, water, skimmed milk powder, stock syrup, sucrose, acidulant (citric acid or phosphoric acid) and stabilizer (Sodium Carboxymethyl Cellulose). Then, carbonated and pasteurized (81.5°C for 10 minutes) and cooled to 10°C. The levels of SMP and citric acid were changed and the best recipe was selected by assessing the protein stability (by observing the sedimentation and layer separation) and sensory attributes (by sensory evaluation). The selected product was used to measure fat, ash, protein, titratable acidity, carbonation level, aerobic plate count, *Escherichia coli* and yeast and mould count. Non-parametric data were analyzed by Friedman non-parametric test and parametric data were analyzed by one way ANOVA (CRD) using MINITAB 14 software. In preliminary trials, strawberry flavored carbonated milk with 1.2% SMP and 0.2% citric acid (261), strawberry flavored carbonated milk with 1.8% SMP and 0.3% citric acid (123), yoghurt flavored carbonated fresh milk 18.4% and 0.3% citric acid (241) and both strawberry and yoghurt flavored carbonated milk with 1.9% SMP and 0.4% citric acid (255) were selected. pH of all treatments except treatment 241 were reduce ($p < 0.05$) with storage. Treatment 241 showed lowest pH variation. Hence, there was no sedimentation and layer separation observed in treatment 241. Treatment 241 showed higher ($p < 0.05$) overall acceptability than other treatments. This may be due to the “sparkling” mouth feel resulted from lower carbonation level. According to the results of microbiological analysis, there was no growth of *E. coli* and yeast and mould in treatment 241 until 3rd week of storage. According to the results of proximate analysis, there was 3.2% fat, 2.1% protein and 0.7% ash content in treatment 241 which is higher than the other three treatments.

Key words: carbonated milk, protein stability, acidulant, stabilizer