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Development of a low-calorie ice cream.

Regular consumption of ice cream containing high quantity of fat and sucrose contributes to adverse health effects such as obesity, cardiovascular diseases, hypertension, diabetes etc. The present study was conducted to develop a low calorie ice cream with high consumer acceptability. Different low calorie ice cream formulations were tested using citrus pectin as the fat replacer and sorbitol and acesulfame K as sugar substitutes. Three ice cream formulations namely A, B and C having following fat- pectin combinations were prepared: 4% fat + 0.5% pectin (A), 3% fat + 0.6% pectin (B), 2% fat + 0.7% pectin (C). A conventional high fat and high sugar ice cream containing 10.2 % fat and 15.4% sugar was prepared and used as the control. All formulations including the control were analyzed for over-run, flow rate, melting rate, acidity and total solids using standard methods after 48 hours of frozen storage. The developed ice creams were subjected to sensory evaluation using 10 trained panelists to analyze organoleptic properties. Sensory evaluation data were statistically analyzed using Friedman non-parametric test.

The results showed that all formulations of low calorie ice creams satisfied the requirement of total solids and acidity. Formulation A was not significantly different to that of control, in physical and chemical properties. However, formulation B and C had significantly lower ($P<0.05$) flow rate (0.6, 0.7< 1.5) and melting rate (0.7, 0.6<1) than control. In terms of sensory evaluation of, formulations A and B had significantly higher mean scores ($P<0.05$) for appearance, creaminess, taste, aroma, color and overall acceptability than formulation C and were not significantly different from the control.

The results suggested that of the three low calorie ice cream formulations tested, formulations A and B were having significantly superior ($P<0.05$) sensory qualities than formulation C. The sensory qualities of A and B were not significantly different from that of the control. The results indicated that a high quality low calorie ice cream sweetened with sorbitol and acesulfame K can be developed using the combination of 3% fat and 0.6% citrus pectin. The resulting low calorie ice cream contains 71 kcal/ 100 g, which is 50% less than that of the standard (control) ice cream.