

The Effect of Overrun and Storage Temperature on Melting Resistance of Ice Cream

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Meltdown behaviour of ice cream is most important factor when considering the product quality. The aim of the study is to find the effect of overrun and storage temperature on melting resistance of ice cream. Nine samples of vanilla ice cream were prepared with the combination of three overrun percentages (90%, 100%, 110%) and three storage temperatures (-28 °C, -20 °C, -15 °C). The meltdown test was carried out to check the meltdown behaviour of nine treatments. Complete Randomized Design with two factor factorial was used to check the interaction of both storage temperature and the overrun. The treatments were organoleptically evaluated for taste, appearance, body/texture, mouth feel, overall acceptability and melting resistance using 25 inhouse panelists with 5 point hedonic scale. Statistical analysis of sensory data was done with Friedman non-parametric test. Physicochemical (fat, pH, total solid, specific gravity) and microbiological analyses (coliform, total plate count) were done for ice cream mixture. Overrun and the storage temperature have a significant impact ($P < 0.05$) on the meltdown of ice cream. There was a significant interaction ($P < 0.05$) between the overrun and the storage temperature on meltdown behaviour of ice cream. The lowering storage temperature and increasing the overrun both positively affected to melting resistance of ice cream. The 110% overrun percentage with -28 °C storage temperature gave the best combine effect contributed towards melting resistance. Except taste other sensory attributes were significantly different ($P < 0.05$) in nine treatments. Highest scores for melting resistance and appearance were obtained in 110% overrun with -28 °C storage temperature whereas highest scores for mouthfeel, body/texture and overall acceptability were obtained in 100% overrun with -20 °C storage temperature. Too high overrun and lowest storage temperature adversely affect on sensory attributes. Physicochemical and microbiological results revealed that ice cream mixture was in accordance with the Sri Lanka standards specification for ice cream.

Key Words; Ice cream, Overrun, Storage temperature, Melting resistance