

**THE EFFECT OF OVERRUN AND  
STORAGE TEMPERATURE ON MELTING  
RESISTANCE OF ICE CREAM**

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By

**BASNAYAKA MUDIYANSELAGE UDARI BASNAYAKA**

**Animal Science Degree Programme  
Faculty of Animal Science & Export Agriculture  
Uva Wellassa University**

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## ABSTRACT

Meltdown behaviour of ice cream is most important when considering the product quality. One of the most important goals of an ice cream manufacturer is to produce a product with a minimum melting until consumption. The aim of the study is to find the effect of overrun and storage temperatures 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 at the end of 50 minutes. Complete Randomized Design with two factor factorial with nine factorial combinations were used to check the interaction of both storage temperature and the overrun. The treatments were organoleptically evaluated for taste, appearance, body/texture, mouth feel, melting resistance and overall acceptability using 25 in house 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 carried out for the ice cream mix.

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 treatment gave the best combine effect contributed toward melting resistance. Except taste other sensory attributes were significantly different ( $P < 0.05$ ) in nine treatments. The highest scores for melting resistance and appearance were obtained in 110% overrun with -28 °C storage temperature. The highest scores for mouth feel, body/texture and overall acceptability were obtained in 100% overrun with -20 °C storage temperature. Too high overrun and the lowest storage temperature adversely affect on body and texture, mouth feel and overall acceptability of ice cream. Physicochemical and microbiological results showed that ice cream mixture was in accordance with the Sri Lanka Standards specification for ice cream.