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HEAT SHOCK & MELTDOWN ISSUES IN ICE CREAM

Compositions in Ice Cream

Ice cream is an aerated suspension food that comprises of fat, protein, sweeteners, stabilizers, emulsifiers and water and is characterized by being a sweet emulsion that is whipped, creamy and consumed in the frozen state. The grade of an ice cream depends on the amount of milk fat content. Ice creams containing more than 12% of milk fat are generally recognized as premium ice cream (Choi and Shin, 2014).

Common Challenges Facing

Overrun refers to the amount of air pushed into the ice cream. Premium ice cream tends to be more overrun with a denser, heavier and creamier structure with richer mouth feel as compared to regular

ice cream. Storage temperature is a major factor in preserving the quality attributes of premium ice cream during the prolonged storage. The industry standard for ice cream storage is -28.9°C. The International Dairy Foods Association has stated that any ice cream product stored at higher than -28.9°C will incurr heat-shock damage (Park et al., 2015).

Fat globule size and composition influence the meltdown rate and it has been observed that ice cream samples with high fat level have high melting rate (Ilansuriyan & Shanmugam, 2018). Heat shock (temperature fluctuation) significantly increases the size of ice crystal formation in low fat ice cream. Emulsifiers and stabilizers play a dominant role in ice cream formulation. They improve the texture of ice cream by enhancing the viscosity and limiting the movement of free water molecules in ice cream (Syed et al., 2018).

Integrated Blends of Emulsifiers and Stabilizers Can Help

Stabilizers help to maintain a uniform nature and stabilizes the protein and fat. On top of that, it helps to prevent the formation of ice crystals especially in fluctuations of temperature during storage from factory to consumers. It gives creaminess and texture as well as reduce or slowing the meltdown rate (Ilansuriyan & Shanmugam, 2018). Study showed that ice cream consistency and heat shock stability were increased with emulsifiers. Incorporation of emulsifiers help to smoothen the texture and thorough distribution of air cells. Mono and di-glycerides are most common emulsifiers used in ice cream production (Syed et al., 2018).

Emulsifiers and stabilizers make up minor parts of ice cream. However, integrate just a little dose of emulsifiers and stabilizers would make a significant impact on the quality of the final product.

References

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