

## Abstract

With the rise in demand for newer and healthier ice cream varieties, the food industry is urged to develop reduced fat and reduced sugar ice creams. However, poor texture and bitter after taste often becomes the main problem. The objective of this study is to formulate and determine the best concentrations of inulin and erythritol as fat and sugar replacers, respectively, by comparing their physicochemical and sensorial properties. The ingredients are important because it determine the ice cream structure, which is responsible for the final quality of the ice cream. The results showed that incorporating 6% inulin into the formulation would produce a light fat ice cream ( $\pm 6$ g of fat). Additionally, the usage of erythritol was able to reduce the sugar content to half of normal ice cream ( $\pm 7$ g). Inulin caused an increase in ice cream viscosity and reduction in overrun. Furthermore, the batch freezer in the current study was found to produce low overrun ice cream with the maximum value ( $\pm 32\%$ ). Thus, commercial ice cream was shown to have the highest overrun value and slowest melting rate. The usage of erythritol did not reduce the brix value and total solids. The microstructure that is formed by inulin, which is a soluble fiber, was able to prevent ice cream from melting. Therefore, ice creams with 6% inulin had slower melting rates. Among all samples, the ice cream with 6% inulin and 7% erythritol was the most acceptable based on the sensorial attributes and did not significantly differ with the control.