

USE OF NATURAL SWEETENERS (MAPLE SYRUP) IN PRODUCTION OF LOW-FAT ICE CREAM

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Abstract

Ice cream is a popular frozen milk products worldwide. In the same time, maple syrup is one of the few products in the Middle East, Asia and Iraq, that has been used as a natural local substance instead of sucrose. This food product as health and nutritional benefits compared to sucrose. That's why this research aims to assess the extent to which maple syrup ratios differ in the physical, chemical, microbiological and sensory aspects of low-fat ice cream.

The chemical, physical and sensory characteristics of produced ice cream in our food science laboratory were evaluated. Samples were divided into 5 sections: Control sample (A) with 100% sucrose, Sample (B) with 75% sucrose and 25% maple syrup, Sample (C) with 50% sucrose and 50% maple syrup, Sample (D) with 25% sucrose and 75% maple syrup and Sample (E) with 100% maple syrup. Following parameters were examined: carbohydrates has been calculated via the (by the spectrometer), total solids (by the drying oven at 110 0C), fat (via the Gerber test), ash (furnace burning), and pH (by pH meter). Also were determined: basic specific weight of the product (by density vial), viscosity mixture ice cream (by viscosity meter), melt resistance (via loss, %), the length of the product's staying solid and overrun (using formulae: overrun = $x100 [(W1 - W2) / W2]$, where W1 = weight of 250 mL of the mix and W2 = weight of 250 mL of ice cream). The sensory assessment it was done by panel test (25 participants who completed assessment of ice cream for: flavor, body and texture, color, and appearance).

Results showed decrease in total solids by increasing replacement of sucrose with maple syrup from 35.14 for (Sample A) to 31.29 for fully replaced sample (sample E). Similarly, carbohydrates also decreased to 20.73 in sample (E). Maple syrup contains organic acids, consequently, pH decreased to 4.92 in sample E. In contrast, ash percentage increased by increasing the substitution rate, from 0.91% in sample A, reaching 1.49% for the ice cream sample with a 100% substitution rate (Sample E). For the viscosity and specific weight, both decreased in most of the treatments compared to the control sample due to the decrease in the total solids rate. Melting resistance of the ice cream samples gradually decreased with the increase in the replacement percentage. Sensory assessment of ice cream samples obtained with different values between treatments, where sucrose replacement with maple syrup improves flavor, textures, color and appearance, especially for ice cream samples with an alternative rate of 50% and 100%.

The resulting ice cream by replacing maple syrup with sucrose led to a decrease in total solids, carbohydrates, pH, specific weight, viscosity, and melting resistance, while ash and excess ratio were improved, the values of the sensory properties of ice cream were improved, which is a result of used maple syrup recipes. Overall we can conclude that maple syrup is a promising replacement of sucrose in low-fat ice cream.

Key words: Ice cream, Skim milk, Maple syrup, Overrun, Sucrose.