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Development of herbal ice cream using ginger and black tea flavor and determination of its quality parameters

K. M. G. Kariyawasam¹, D. A. M. Arsecularatne² and V. S. Jayamanne¹

¹*Department of Food Science and Technology, University of Ruhuna, Kamburupitiya, Sri Lanka.*

²*Ceylon Cold Stores PLC, Colombo 2, Sri Lanka.*

Ice cream is a popular frozen sweetened dessert often made with various artificial flavors. Nowadays, people prefer natural flavors rather than artificial flavors in food products especially considering the various health benefits associated with natural ingredients. Ginger, which has a high pungency level, can be used as a natural flavor ingredient in food product formulations. In addition, ginger is a medicinal herb which has several reported health benefits such as prevention of cough and cold. Moreover, the sensory properties of ice cream can be improved using ginger and black tea flavor. However, high pungency levels may have negative effects on the flavor profile of ginger ice cream. Therefore, this study was carried out to evaluate the suitability of ginger juice and black tea as flavoring agents in production of ice cream by evaluating the effect of them on the physicochemical, microbiological, sensory properties and the shelf-life of the final product. Ginger juice was used at levels of 4, 6, 8, 10 % (v/v of ice cream mix) and black tea flavor (LA 09303) was used at levels of 0.2, 0.3, 0.4, 0.5 % (v/v of ice cream mix) to prepare the ice cream. The basic ice cream mix was formulated to have 9% fat, 8.5% MSNF and 14.6% sugar. The ice cream containing 6% ginger juice and 0.3% was identified as the most suitable sample for making the ginger ice cream considering its significantly high ($P < 0.05$) sensory properties. It showed the best sensory properties compared to other experimental samples after six weeks of storage. Addition of ginger juice resulted in decreasing of fat, protein and total solids in all the experimental samples. There were no significant ($P > 0.05$) changes in MSNF, titratable acidity and pH in all the experimental samples. Addition of ginger juice appeared to significantly increase ($P < 0.05$) the viscosity and melting resistance of the various ice cream formulations. Aerobic organisms (Aerobic Plate Count) and *E. coli* were not detected in all the ice cream products during storage, thus, showing hygienic production procedures. It can be concluded that herbal ice cream products can successfully be manufactured by adding 6% ginger juice and 0.3% black tea flavor.

Keywords: Ice cream, Ginger, Black tea, Ginger juice, Flavoring, Sensory properties