

EFFECT OF FLAXSEED OIL TOWARDS PHYSICOCHEMICAL
AND SENSORY CHARACTERISTICS OF REDUCED FAT
ICE CREAMS AND ITS STABILITY IN
ICE CREAMS UPON STORAGE

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2009

ABSTRACT

Ice cream usually contains high milk fat content which may contribute to increased dietary fat intake and undesirable weight-gaining effect. The objectives of this study were to determine the best formulation, physicochemical and sensory effects of flaxseed oil formulated reduced fat ice creams while understanding the incorporated flaxseed oil fatty acids stability upon 21 and 42 days of storage. Three formulations and a control (C) of reduced fat ice cream with total fat 7.5% (w/w); F1, F2 and F3 samples were developed by adding different amounts of flaxseed oil (2.5%, 5.0% and 7.5% w/w) respectively to replace milk fat. All formulated ice cream samples were subjected to physicochemical analyses on meltdown test, titratable acidity, pH value, total solids, protein and fat contents. Sensory evaluations were conducted through Quantitative Descriptive Analysis (QDA) and consumer hedonic test. The flaxseed oil fatty acids profile and stability in formulated ice cream samples were analysed using gas chromatography (GC). The total solids content of F3 sample was significantly higher ($P < 0.05$) than C whereas meltdown characteristic, pH value, titratable acidity, protein and fat contents were not significantly different ($P > 0.05$) between C and all flaxseed oil formulated samples. QDA results showed significant differences ($P < 0.05$) among formulations in colour, sweetness, smoothness and creaminess attributes while not significantly different ($P > 0.05$) in firmness and mouth coating attributes. F1 sample was judged as the best and highly preferred by panellists with high acceptance level for appearance, aroma, flavour, texture and overall acceptability ($72.78\% \pm 11.32$; $68.56\% \pm 15.48$; $78.56\% \pm 12.16$; $80.34\% \pm 12.32$; $78.45\% \pm 10.45$). GC analysis revealed that omega-3 (ALA) and omega-6 (LA) fatty acids concentration had no significant reduction ($P > 0.05$) upon 21 days but significantly lower ($P < 0.05$) upon 42 days of ice cream storage.

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