Characterization of nanoemulsion of Nigella sativa oil and its application in ice cream

ABSTRACT

The aim of this study was to develop ice-cream product fortified with a Nigella sativa oil (NSO) nanoemulsion at four ratios (0% control, 3%, 5% and 10%). The NSO nanoemulsion stabilized by combinations of gum arabic, sodium caseinate, and Tween-20 at three ratios (5%, 10%, and 15%) of emulsifiers. The results showed that 10% nanoemulsion has the highest stability and zeta potential (−31.92), and lowest change of PDI (0.182). The 5% nanoemulsion showed the lowest particle size (175.83 μm). The result demonstrated that NSO nanoemulsion improved the ice-cream physical properties and consumer acceptability. Among the different samples, sensory evaluation revealed that ice-cream sample of 5% nanoemulsion received more acceptability from the panelist. This results demonstrated ice cream can be fortified with NSO nanoemulsion. This means it could be used as a functional ice cream with manifold NSO health benefits.

Keyword: Emulsifier; Ice cream; Nanoemulsion; Nigella sativa oil; Physicochemical stability