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Development of a reduced fat ice cream by utilizing buttermilk and oats (*Avena sativa*)

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Currently, people are inclined towards smart dieting and nutritional nourishment. This trend is also seen in the consumption of ice cream too. With that drive to healthier ice cream, free-fat, low-fat, and fat-reduced products which are made with 25% less fat than the reference ice cream, are also becoming mainstream in the ice cream market. Therefore, this study was carried out to develop a reduced-fat ice cream by utilizing buttermilk and oats with high sensory attributes. Buttermilk is a byproduct of butter production that has good technological features, excellent nutrition, and health-promoting properties such as reducing levels of bad LDL, improving cardiovascular health, etc. Oat is an incredibly nutritious cereal with a bunch of health benefits, including hypocholesterolemic and anti-cancerous properties. The incorporation of oats improves the overall quality of production. Ice cream mixes were prepared by adding 50.3%, 57.09% and 53.08% buttermilk instead of milk. Treatments included 0%, 4%, 6%, and 8% oat flour while reducing the amount of milk cream by 21%, 12%, 8.8%, and 5%, respectively. After that, prepared products were subjected to physicochemical analysis (melting rate, pH, titratable acidity, fat, protein, fibre, and moisture), microbial analysis, and texture analysis by a texture analyzer. Moreover, sensory quality was evaluated on a seven-point hedonic scale by 35 untrained panellists. The over-run values of the ice creams that were tested ranged from 60-70%. The protein content, fibre content, overrun value, and melting resistance of ice cream samples were increased as the percentage of oat flour increased, but fat contents were decreased. There were negative results for *E. coli* and *Salmonella*, which fulfil the SLS specification for ice cream. The sensory evaluation with the Friedman test revealed all sensory parameters were significantly different except colour ($P < 0.05$). Ice cream with 4% of oat flour was selected as the most acceptable treatment for sensory attributes. Buttermilk can replace milk with an economical benefit due to a byproduct of butter. There was 36% total solid in 4% oats incorporated ice cream. It is recommended that 4% of oats flour with buttermilk ice cream have higher sensory attributes with 2.5% protein, 0.42% fibre, and 5.5% fat content while satisfying the level of the fat content of a reduced fat ice cream, which would be an innovative product to the market.

Key words: Buttermilk, Ice cream, Oats, Reduced fat.

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