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Antioxidant, Physiochemical, Microbiological, and Sensory Properties of Yoghurt Incorporated with Beetroot (*Beta vulgaris* L) Powder

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In the present study, freeze dried beetroot (*Beta vulgaris* L.) extract was incorporated into set yoghurt as a natural colorant. The ferric reducing antioxidant power and the presence of microorganisms (i.e. coliform, yeast & mould) in beetroot powder were examined. Beetroot powder showed high antioxidant capacity ($46.00 \pm 0.43 \mu\text{M Fe}^{2+}$ equivalents/g) and was safe from microorganisms. Yoghurt samples were prepared using different beetroot concentrations and three concentrations (0.07%, 0.1%, and 0.15%) were selected by comparing the colors with commercially available artificial strawberry colored set yoghurt. The physiochemical, microbiological, and sensory attributes of yoghurt with selected beetroot concentrations were measured at 1, 5, 9 and 13 days of storage at 4°C. There was no significant reduction in titratable acidity, syneresis and pH of beetroot powder incorporated yoghurt throughout the storage period. Total coliform count and yeast & mold count were negative in all samples during 13 days of storage. During the sensory evaluation, panelists gave a significantly ($P < 0.05$) higher rank to the 0.1% beetroot incorporated yoghurt. Accordingly, 0.1% beetroot incorporated yoghurt was selected as the most preferred and subjected to antioxidant analysis, proximate analysis and a second sensory evaluation in comparison with artificial strawberry colored set yoghurt. Results showed significantly ($P < 0.05$) higher antioxidant capacity in 0.1% beetroot incorporated yoghurt compared to strawberry colored yoghurt. The dry matter content of 0.1% beetroot incorporated yoghurt was significantly ($P < 0.05$) higher than that of strawberry colored yoghurt. The crude protein and fat contents in 0.1% beetroot incorporated yoghurt were not significantly different from strawberry colored yoghurt. Furthermore, 0.1 % beetroot incorporated yoghurt obtained significantly ($P < 0.05$) higher consumer preference in the second sensory evaluation. Therefore, 0.1% beetroot powder can be incorporated into set yoghurt as a natural colorant with enhanced antioxidant activity and consumer preference.

Keywords: Set-yoghurt, Beetroot powder, Natural colorant, Antioxidant

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