

Utilization of Lycopene from Tomato (*Lycopersicon esculentum L.*) Peel as Natural Antioxidant and Colorant in Stirred Yoghurt

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Tomato peel is a good source of lycopene which can be used as a natural antioxidant agent and colorant in foods. This study investigated use of Tomato Peel Powder (TPP) as an antioxidant agent and a colorant in stirred yoghurt. Tomatoes were washed, immersed in boiling water (1-2 min) and hand peeled. Tomato peel was lyophilized, pulverized and analyzed for Radical Scavenging Activity (RSA) using DPPH (2, 2-diphenyl-1-picrylhydrazyl) method and Total Phenolic Content (TPC) using Folin-ciocalteu reagent assay. Total Carotenoid Yield (TCY), expressed as lycopene in TPP was measured. FTIR (Fourier Transform Infra-Red) and UV-Vis spectrum analysis were done for TPP comparing with extracted lycopene and commercial lycopene. Two batches of stirred yoghurts were prepared by adding lyophilized TPP at level of 0%, 2%, 4%, 6% and 8% (w/w) Before Incubation (BI) and After Incubation (AI). The physiochemical properties, microbial and sensory analysis were conducted to determine the quality of stirred yoghurts. RSA and color of all ten stirred yoghurt samples were investigated at 7 days interval at refrigerated storage for 21 days using DPPH method and colorimeter, respectively. RSA (%) and TPC of TPP were $50.05 \pm 0.66\%$ and 0.38 ± 0.01 mg GAE extract, respectively. TCY of the TPP was 71.42 ± 0.1 mg kg⁻¹. FTIR and UV-Vis spectrum data confirmed the presence of lycopene in TPP. Significantly higher ($P < 0.05$) overall acceptability was shown by the stirred yoghurt contained (2%) TPP. The highest RSA was shown by the sample contained 8% TPP, AI ($23.07 \pm 0.04\%$) while, the lowest RSA was shown by the control BI ($1.58 \pm 0.03\%$). TPP (8%) added sample showed the highest color value for redness (18.83 ± 0.37). Results revealed that TPP can be successfully incorporated into stirred yoghurt as a natural antioxidant agent and a colorant.

Keywords: Tomato peel, Radical scavenging activity, Total phenolic content, Stirred yoghurt