Effect of Tea and Coffee Polyphenols on Syneresis and Quality of Set Yoghurt during Refrigerated Storage

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Syneresis is the most pronounced textural defect in yoghurt. Polyphenols can bind with milk proteins to form a network in dairy matrices, minimizing the syneresis. The study evaluated the concentration effect of polyphenols derived from green tea (GT), black tea (BT), and coffee (CF) on syneresis, physicochemical, and quality attributes of yoghurt during refrigerated storage (4°C). Green tea yoghurt (GTY), black tea yoghurt (BTY), and coffee yoghurt (CFY) with four different polyphenol concentrations (10, 20, 30, and 60 mg (GAE)/100 ml) were prepared by adding different volumes of the infusions. All yoghurts, including the plain yoghurt [Control (CY)], were prepared without stabilizers. Chemical characteristics (pH, titratable acidity) and physical characteristics (degree of spontaneous syneresis, water holding capacity, and colour) were evaluated for the storage period of 21 days. The yoghurt samples with the highest sensory acceptance were examined to determine the Total Phenolic Content, Antioxidant Capacity, and microbial analysis (Total Plate Count and Yeast and mould count). All treated yoghurt samples showed a significantly (p<0.05) lower level of spontaneous syneresis than the control samples. With increasing concentration, the ability to reduce syneresis was increased except in CFY. Treated yoghurts showed a significantly higher viscosity indicating the possible polyphenol-milk protein matrix formation. GTY and CY had no significant difference (p>0.05) in colour, while BTY and CFY showed a significant (p<0.05) colour difference when increasing the polyphenol concentration. GTY-10, BTY-10, and CFY-20 achieved the highest overall acceptability from the sensory analysis where GTY-10 represents green tea yoghurt with 10 mg (GAE)/100 ml added polyphenol, etc. In conclusion, adding natural polyphenols can reduce syneresis in set yoghurt while stabilizing colour and maintaining its chemical properties within the acceptable range. The degree of syneresis reduction is determined by polyphenol type and concentration.

Keywords: Yoghurt, Syneresis, Polyphenols, Black tea, Coffee, Green tea