Development of value-added butter through the addition of green tea (Camellia sinensis L.) extract

ABSTRACT

The present work highlights the potential production of value-added butter with enhanced nutritional and microbiological properties through the addition of 2 - 10% (w/w) green tea (Camellia sinensis L.) extract. The results revealed no significant difference in the moisture content (13 - 14% w/w) of all the butter samples. However, an increase in the amount of green tea extract resulted in a significant increase ($p < 0.05$) of the ash content (0.00 - 1.00%) and redness (a* value, 4.92 - 6.93), while both the lightness (L* value, 150.65 - 145.74) and yellowness (b* value, 54.45 - 50.30) of the butters significantly decreased ($p < 0.05$). Furthermore, the green tea butters (GTBs) exhibited significantly ($p < 0.05$) higher antioxidant properties in terms of total phenolic content (0.07 - 0.10 vs. 0.01 GAE% w/w db) and DPPH activity (7.27 - 13.94% vs. not detected) as compared to the control butter. After six weeks of storage, in relation to the control butter, the GTBs recorded significantly lower ($p < 0.05$) peroxide value (2.13 vs. 0.88 mEq/kg), total plate count (1.11 × 104 vs. 2.42 × 103 CFU/g), and yeast and mould count (2.02 × 103 vs. 6.05 × 102 CFU/g), but produced a significantly higher ($p < 0.05$) amount of acid value (0.56 vs. 1.36 mg KOH/g fat). The incorporation of up to 6% (w/w) green tea extract did not compromise the sensory acceptance of the GTBs. The overall result indicated that green tea extract can be used as a natural food additive, antioxidant, and preservative in butter.

Keyword: Cream; Dairy; Fat; Lipid; Shelf-life