

Thermal stability of phenolic compounds in coconut cake and its stabilizing effect on stripped sunflower oil

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Coconut cake possesses phenolic compounds which are antioxidatively active in chemical and food model systems. However, the thermal stability of these phenolic compounds has not yet been investigated. In this study, the thermal stability of phenolic compounds in coconut cake (PCCC) was compared with that of synthetic antioxidants, butylated hydroxy toluene (BHT), butylated hydroxy anisole (BHA) and tert butyl hydroxy quinone (TBHQ) using two food model systems. PCCC were extracted using ethanol:water (70:30 v/v) and the phenolic concentration was determined using the Folin-Dennis method. Thermal stability was tested by heating PCCC and other synthetic antioxidants at 180 °C up to two hours. In 30 min intervals, the activity of heated antioxidants were tested by evaluating their ability to inhibit thiobarbituric acid reactive substances (TBARS) formation in egg yolk emulsion (EYEM). The percentage inhibition of TBARS formation was calculated against a control EYEM sample prepared without added antioxidants. Protective effect of antioxidants on stripped sunflower oil (SSO) was also evaluated. For this purpose, PCCC and synthetic antioxidants were heat treated at 180 °C for two hours and these antioxidants were incorporated into SSO. The induction time (IT) of SSO was determined at 100 °C in the Rancimat apparatus. The percentage inhibition of TBARS formation in EYEM by BHT, BHA, TBHQ and PCCC decreased with heating time and the percentage inhibition of all antioxidants decreased below 40 % after two hours of heating at 180 °C. However, at 30 min of heating, inhibition percentage of TBARS formation by PCCC (72±4 %) and TBHQ (68±2 %) is considerably higher compared to BHT (54±2 %) and BHA (42±2%). The IT of SSO varied in the order, control (1.85±0.14 h) < BHT (2.06±0.08 h) < BHA (2.14±0.06 h) < PCCC (2.18±0.03 h) < TBHQ (2.44±0.10 h). The results of these experiments suggest that PCCC can be used to stabilize foods under high temperature cooking conditions.

Key words: Coconut cake, Egg yolk emulsion, Phenolic compounds, Rancimat, Thermal stability

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