

Determination of Antioxidative Ability of Clove, Nutmeg and Cinnamon Essential Oils on the Oxidative Stability of Coconut Oil

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Abstract

Coconut Oil in many forms such as Virgin Coconut Oil (V.C.O), White Coconut Oil (W.C.O) and Refined, Bleached, and Deodorized (RBD) Coconut oil. Lipid oxidation is a primary factor influencing the rancidity of coconut oil. Considering the hazardous effect of synthetic antioxidant where natural antioxidant is successive alternative. Three coconut oil types were treated with cinnamon, clove, and nutmeg essential oil separately with concentration of 0.5g/L stored at (30 °C±1) to be tested across 8 weeks with 2-weeks interval. Peroxide value (PV) (AOAC 965.33), Iodine value (IV) (AOAC 993.20) and Free Fatty Acid (FFA) value (AOAC 940.28) of control and treated samples were analyzed. Control sample of RBD resulted in PV, IV and FFA value as 2.62±1.15, 9.54±0.22 and 0.07±0.01 respectively. Control sample of WCO and VCO did not recorded peroxide value. IV and FFA value of VCO were as 5.71±0.24 and 0.45±0.11. While WCO received 7.64±0.32 and 0.64±0.18 for IV and FFA value. Nutmeg oil treated VCO and WCO has recorded lowest IV as 5.37±0.34, 7.24±0.24 and shown lowest FFA for clove treated oil as 0.30±0.19 and 0.429±0.13. Treated RBD sample resulted with significant lowest peroxide value with cinnamon 2.07±1.06. RBD with Clove resulted lowest IV 9.09±0.27. RBD with Nutmeg resulted lowest FFA value 0.04±0.01. All treated samples of RBD, VCO and WCO depicted significantly ($p < 0.05$) lower concentration of PV, IV and FFA value compared to the control samples. Research has indicated that the essential oil of clove, nutmeg, and cinnamon could be used favorably to delay the oxidation process of coconut oil.

Keywords: Coconut, FFA, Oxidation, RBD, VCO, WCO