

# COMPOSITIONAL CHARACTERISTICS, ANTIOXIDANT EFFICACY AND OXIDATIVE STABILITY OF DIETARY OILS

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This study was conducted to evaluate the compositional characteristics, antioxidant efficacy and oxidative stability of commonly available oils namely, regular coconut oil (CO), virgin coconut oil (VCO), white coconut oil (WCO), refined bleached deodorized coconut oil (RBDCO), coconut paring oil (CPO), soya bean oil (SO), sunflower oil (SFO), palm oil (PO), mee oil (MO) and sesame oil (SEO). The fatty acid profile was determined using gas liquid chromatography. Isolated phenolic fraction of oil was used to determine total phenolic content (TPC) and antioxidant efficacy. The total phenolic content (TPC) was determined using Folin-Ciocalteu's colorimetric method. The antioxidant potential of the oil extracts was assessed using DPPH and ABTS radical scavenging assays and  $\beta$ -carotene/linoleate model system. The stability of oils was assessed against light induced oxidation and autoxidation over 28 days of storage period. The acetone extracts of mangosteen (*Garcinia mangostana* L.) peel, cinnamon (*Cinnamomum zeylanicum* Blume) bark and chili (*Capsicum annum*) was used as natural antioxidant to stabilize SEO. The effect of pomegranate (*Punica granatum* L.) peel extracts on the stability of WCO during deep frying ( $180 \pm 5$  °C/ 10 min) was determined. The rate of oxidation was monitored by the measurement of peroxide, conjugated dienes (CD), conjugated trienes (CT) and thiobabaturic reactive substances (TBARS) values with time. The results indicated that MO contained the highest percentage of monounsaturated fatty acids while, CO contained the highest percentage of saturated fatty acids (88 – 93%). The phenolic fraction of SEO exhibited the strongest antioxidant activity than other oil tested. Antioxidant activity possessed by oil samples can be arranged in ascending order; CO, SO, CPO, RBDCO, SFO, MO, WCO, PO, VCO and SEO. Results denoted that the concentration strongly influences the antioxidant power of each sample and there is no prooxidant effect of these extracts even at higher concentration level tested. WCO can be categorized as oil which has strongest oxidative stability against autoxidation. The oxidative stability of the oil tested can be arranged in descending order as WCO, VCO, MO, SEO, SO, CO, CPO, RBDCO, PO and SFO. The results suggest that the oil cannot be stored for a long period under fluorescence light. Based on the results VCO can be categorized as the oil that has strong antioxidant activity, oxidative stability and nutritive value. However, the oil that is ideal for elevated temperatures is WCO since it has the highest oxidative stabilities. Extracts of mangosteen, cinnamon bark and chili can be used as natural additives that retard the oil autoxidation process effectively. However, their antiphotoxidative properties are lower. Results revealed that pomegranate peel extracts from all three varieties are potent antioxidants that can effectively stabilize WCO during deep frying.

