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COMPARISON OF FATTY ACID COMPOSITION AND  
ANTIOXIDANT PROPERTIES OF VIRGIN COCONUT OIL  
AND TRADITIONAL COCONUT OIL.

By

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## Abstract

The major quality parameters (peroxide value, acid value, iodine value and saponification value) of coconut oil were determined using reported methods. Both traditional coconut oils (TCO1, TCO2 and TCO3) and virgin coconut oils (VCO1, VCO2 and VCO3) gave different results for quality parameters (Acid value and peroxide value) which were prepared using different endosperm components. The peroxide value of TCO 3 was found to have the lowest value compared to other oils and the lowest acid value was observed in VCO 2. Individual fatty acid analyses of traditional coconut oil, virgin coconut oil and commercial coconut (CCO) were done using gas chromatography.

The phenolic composition and antioxidant potential were determined and compared in TCO, VCO and CCO. The objective of this study was to investigate how processing method, temperature and components of the endosperm of coconut affected the yields of phenolic substances and the antioxidant capacity of coconut oil. Total phenolic content of TCO and VCO was determined by the Folin-Denis procedure and expressed as acid equivalents. The total phenol content in TCO varied from 66 - 305 mg/kg and in VCO the above value varied from 62 - 66 mg/kg . In addition, antioxidant activities were tested by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay, deoxyribose assay and ferric-reducing antioxidant power. Polyphenol fraction from TCO was found to have the highest inhibitory effect on radical scavenging activity and reducing power compared to that from the other two oils.

Individual phenolic compounds present in the nonsaponifiable fraction of coconut oils were identified and quantified by Reverse Phase HPLC with UV detection. The phenolic compounds were identified comparing the retention time of authentic standards. Then the phenolic compounds were quantified by using calibration curves

Effect of polyphenol fraction isolated from TCO, VCO and CCO were tested for the ability to maintain physiological antioxidant levels. Coconut oil mixed meals were fed to Wistar rats for 84 days and after the experimental period, Trolox Equivalent Antioxidant Capacity (TEAC) of serum of rats were compared. TEAC value was determined by the ABTS [2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)] assay using the Trolox as a standard compound. The results of the experiment showed that the diet containing TCO, had the highest level of TEAC value and the value significantly increased and stabilized with the time. Phenolic compounds and antioxidant activity of coconut cake (poonac) was also investigated. TCO shows excellent antioxidant properties due to the rich phenolic fraction of TCO. The nutritional quality of other coconut oil cans also improved by incorporation of phenolic substances in to coconut oil from coconut cake. The study indicated better antioxidant activities of coconut cake extracts compared to BHT. Enriched coconut oil was prepared using coconut cake and copra oil and this oil effectively enhanced the total antioxidant capacity of the blood serum of Wistar rats. The total phenol contents in coconut oils significantly correlated with TEAC values.