

## Effect of the wet extraction methods on the phenolic profile of coconut oil

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There are multiple methods for producing virgin coconut oil, which can broadly be divided into wet and dry processes. In the wet methods, coconut oil is directly extracted from the coconut milk, an aqueous emulsion is prepared using freshly grated coconut kernel. The method used to extract oil can affect the quality parameters and the phenolic profile of each coconut oil. Therefore, the phenolic profile, and the antioxidant capacity of coconut oil produced using four wet extraction methods, namely, boiling method (BM), fermentation method (FM), chilling and thawing method (CTM) and centrifugation method (CM) were quantified using previously reported methods. The shelf life of each oil sample at 28 °C was analyzed based on the induction time of each oil sample using a Rancimat apparatus. Phenolic profiles and unsaponifiable matter were analyzed qualitatively and quantitatively using HPLC. Shelf life at 28 °C ( $2.9 \pm 0.0$  years),  $\alpha$ -tocopherol ( $78.9 \pm 0.4$  mg/Kg), total phenolic content ( $660 \pm 1$  gallic acid equivalent mg/oil Kg) and antioxidant activity ( $19.4 \pm 1.0\%$ ) are significantly ( $P < 0.05$ ) higher in the oil prepared by BM compared to the other wet extraction methods. The phenolic profile of CM and CTM included *p*-hydroxybenzoic acid, epigallocatechin gallate (EGCG), and epicatechin. The phenolic profile of coconut oil prepared by FM included gallic acid, *p*-hydroxybenzoic acid, EGCG, epicatechin, and epigallocatechin (EGC). In addition to the *p*-hydroxybenzoic acid and gallic acid, galocatechin gallate (GCG), and catechin were found in significantly ( $P < 0.05$ ) higher amounts in coconut oil extracted using BM as a result of epimerization of EGCG and epicatechin to GCG and catechin under the heating conditions used in the BM. Hydrolysis of EGCG was found to be responsible for the observed low levels of EGCG ( $0.01 \pm 0.00$  mg/oil Kg) and the presence of gallic acid and EGC in the coconut oil prepared by FM compared to the other two cold extraction methods (CTM, CM). Therefore, the extraction method has a significant impact on the phenolic profile of coconut oil.

**Keywords:** Coconut oil, Wet extraction, Phenolic profile, Epimerization, Hydrolysis

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