

# COMPARISON OF PHYSIOCHEMICAL PROPERTIES OF VIRGIN COCONUT OIL AND WHITE COCONUT OIL FROM COCONUTS GROWN IN NORTH WESTERN PROVINCE, SRI LANKA

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**Abstract:** Physiochemical properties of oils depend on the quality of the raw material and the extraction method. White coconut oil (WCO) and virgin coconut oil (VCO) which are extracted by different extraction methods are widely used in Sri Lankan cuisine and in folk medicine. The study aimed to determine the physiochemical properties of WCO and VCO and to evaluate the effects of extraction methods on the quality of coconut oils. Mature coconuts of the 'Tall' cultivar from plantations in North-West were used in oil extraction. Unrefined VCO and WCO were extracted from fresh coconut kernel and copra, respectively using small-scale oil expellers. Fatty acid profiles, colour, refractive index (RI), relative density (RD), free fatty acid content (FFA), moisture, and peroxide values (PV) were determined according to the Sri Lankan Standards 313: Methods for analysis of vegetable fats and oils. Statistical analysis was performed using 2- sample t-test. The extraction method had a significant influence on the physiochemical properties of WCO and VCO. The fatty acid composition of WCO and VCO were similar ( $P > 0.05$ ). White coconut oil had a higher colour index than VCO ( $9.67 \pm 2.82$  vs.  $0.77 \pm 0.23$ ,  $P < 0.01$ ), probably due to extraction of copra with the testa intact. Free fatty acid content, PV and moisture content were higher in WCO when compared to VCO ( $0.39 \pm 0.12$  vs.  $0.08 \pm 0.02$ ,  $0.19 \pm 0.01$  vs.  $0.00 \pm 0.00$ ,  $0.13 \pm 0.02$  vs.  $0.06 \pm 0.01$ ), respectively ( $P < 0.05$ ). Results indicated a lower oxidative stability, increased acidity and initiation of oxidation in WCO. The low moisture content of VCO indicated a longer shelf life and the potential to naturally preserve. No significant differences were observed between RI and RD. All values of both oils except the colour index of WCO complied with SLS standards. In conclusion, based on physiochemical properties, VCO is superior in quality to WCO. Coconut being a main agricultural produce of Sri Lanka, promotion of more beneficial and productive practices in processing of coconut for human nutrition is emphasized.

**Keywords:** Coconut oil; Extraction methods; Physiochemical; Unrefined