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**Rate of peroxide formation in used and fresh refined coconut oil**

Senevirathne KDNT, Seneviratne NAKPJ\*, Jayathilaka N

*Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka.*

**Background:** Acid value and peroxide value are quality parameters of edible oils, which indicate the freshness of oils. Free fatty acids and peroxides can be removed from coconut oil and other edible oils by various refining methods. When the free fatty acids and peroxides are removed from coconut oil by refining, both fresh and used coconut oils or oils with expired shelf life cannot be distinguished by acid value or peroxide value tests. In this context, used refined coconut oil is sold as fresh oil. As used oils may have undergone harmful chemical reactions such as oxidation, polymerization, and lipid decomposition, it is important to develop methods to distinguish between used and fresh refined oils. The method available currently for distinguishing these oils involve sophisticated techniques such derivatization followed by <sup>31</sup>P NMR spectroscopy.

**Objectives:** The present study attempts to develop a simple experiment to distinguish between used coconut oil and fresh coconut oil.

**Method:** Ten used coconut oil and ten fresh coconut oil samples were stripped (removed fatty acids, peroxides and polar substances) by passing through activated alumina columns (4.0 cm × 1.8 cm) and hexane was used as the eluent. Hexane was removed from eluted oils and peroxide values of the samples were monitored at room temperature for 12 days according to the American Oil Chemists' Society (AOCS) official method Cd 8-53. Experiments were carried out in triplicates.

**Results:** The initial peroxide values of fresh and used coconut oil was 0.8±0.1 mmol kg<sup>-1</sup> and 4.4±2.9 mmol kg<sup>-1</sup> respectively. The mean rate of peroxide formation in used coconut oil (0.9±0.4 mmol kg<sup>-1</sup> day<sup>-1</sup>) was significantly ( $p \leq 0.05$ ) higher than the rate of peroxide formation in fresh coconut oil (0.2±0.1 mmol kg<sup>-1</sup> day<sup>-1</sup>).

**Conclusion:** Rate of peroxide formation can be used to distinguish between used and fresh refined coconut oil.