Phenolic content and shelf life of commercial virgin coconut oil and copra oil

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There are two main types of coconut oil, virgin coconut oil (VCO) and copra oil (CO), based on their production process. VCO is extracted from fresh, mature coconut kernel by wet or dry methods of extraction, whereas CO is extracted by the dry method of pressing copra. Temperature exceeds 80 °C during the extraction of CO while lower temperatures around 50°C are maintained during the extraction of VCO. Shelf life is an important parameter of cooking oils and oils become rancid quickly when the shelf life is short. Minor polar compounds such as phenolic substances are known to improve the shelf life. The objective of this study was to determine total phenolic contents (TPC) and shelf life of commercially available VCO and CO, in order to see whether TPC and shelf life are correlated. Two samples from each were used for the analysis. Phenolic compounds of the oils were extracted using methanol:water (80:20 v/v) and TPC was determined using Folin-Denis colorimetric assay and expressed as gallic acid equivalents. Oxidative stability was determined using the Rancimat apparatus at 120, 130, 140 and 150 °C temperatures and extrapolated using Q_{10} temperature coefficient to obtain the shelf life at 30 °C. The TPC was significantly ($p<0.05$) higher in CO (13.28±3.13 mg/kg oil) than in VCO (0.52±0.22 mg/kg oil). The induction times (hours) of VCO at 120,130,140 and 150 °C were 51.89±0.08, 26.39±3.44, 13.29±1.84 and 6.26±0.54 respectively, while that of CO were 16.22-41.71, 7.40-18.59, 3.89-14.18 and 1.89-8.43 respectively. The results indicate that induction times of commercial CO samples varied remarkably for different samples, showing the variable quality of CO in the market. The shelf life of VCO deduced was 4.75±1.07 years, while that of CO varied in the range 0.87–1.26 years. The results indicate that CO with higher TPC has a shorter shelf life compared to VCO with lower TPC, suggesting that non-phenolic antioxidants which may be destroyed or inactivated at higher temperatures may be preserved in VCO to improve its shelf life.

Key words: copra oil, phenolic content, Rancimat, shelf life, virgin coconut oil

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