Investigation of Different Extraction Techniques on the Quality of Generated Virgin Coconut Oil (VCO)

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The health and nutritional benefits of consuming coconut oil have been recognized in many parts of the world for centuries. The aim of this study was to compare the quality parameters of coconut oil under different extraction techniques. Two different techniques (hot process and natural fermentation) were employed to produce virgin coconut oil (VCOs) from coconut milk and coconut cream separately. The natural fermentation process was carried out with different fermentation durations of 8, 10, 12, 14 and 16 hour and which were considered. Studies were conducted to determine the effect of techniques on major parameters such as higher yield of VCO and such quality parameters- free fatty acid content, acid value, iodine number, saponification value and sensory parameters (colour and smell). It was confirmed that the coconut milk yielded highest oil (44 mL) when it was extracted under the treatment of 16 hours fermentation. In case of cream, the same fermentation duration generated only 35 mL of VCO. Generated quantities (44 mL and 35 mL) from these two treatments had highest significant nature than VCO which produced through hot process from coconut whole milk (14 mL) and cream (19 mL) separately. Chemical properties: free fatty acids, acid value were analysed to determine the degree of rancid nature. From both substances, fermented VCO had significantly lower free fatty acid and acid value than commercial and hot processed product. In fermentation of both cream and milk, the iodine values of VCO vary from 11.39±1.032 to 14.21±0.063 mg iodine/100g and 7.33±0.314 to 12.25±0.449 mg iodine/100g, respectively which were significantly higher than that of hot processed and commercial product (5.82±0.049). Low iodine values obtained revealed that the particular oil contains few unsaturated bond and non-drying properties. The results made known that the highest saponification value (mg NaOH/g), was found to be 296.10 ± 1.719, which was obtained from 16 hours fermentation of coconut milk. The generated oils from each treatment have the potential in industrial applications especially in cosmetics and soap making as also evidenced by previous studies. Except the chemical properties, the organoleptic properties (colour and smell) were excellent in quality in hot processed oil than fermented product, which were done with ten panel members. Colour of the fermented product increased with time and smell became rancid for both substances. The 10 - 12 hours fermented oil extraction is the best product by considering all analyzed properties and which is environmental friendly.

Keywords: Acid value, VOC, Free fatty acid, Organoleptic properties, Saponification