

Performance evaluation of a screw type oil expeller for extraction of sesame oil

Bandara, D.M.S.P, Dissanayake, T.M.R, Rathnayake, H.M.A.P, Swarnasiri, D.P.C, "Performance Evaluation of a Screw Type Oil Expeller for Extraction of Sesame Oil" Proceedings of the International Symposium on Agriculture and Environment 2013, University of Ruhuna Sri Lanka, pp 103-106

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This study aims at evaluating the most common type of extractor available in the market with a view to improving its performance with maximum extraction efficiency achieved by sesame. Sesame, (*Sesamum indicum*) is one of the oldest and important oil seed crop in the world. The sesame seed apart from providing edible oil is also rich in protein. A study was carried out to evaluate the performance of a medium scale screw type oil expeller for extracting sesame oil. In fact, the mechanized medium scale method has not been previously applied in the oil expelling industry for sesame seed in Sri Lanka.

For this experiment, the popular screw type machine with 25 mm shaft pitch, 75x315 mm internal barrel and 4 kW three phase motor were used. The development was made in order to increase the oil expelling efficiency in terms of extract bar clearance, speed of the main spiral shaft and outer body closer to the exhaust out let. The optimum oil yield was 44% obtained under 0.2mm and 0.3mm barrel shaft clearance and the main spiral shaft speed of 75 rpm.

The quality of refined oil at maximum oil yield was analyzed out in terms of saponification value, free fatty acid and specific gravity. The results obtained for saponification value, free fatty acid and specific gravity were 182.33, 3.3.12 % and 0.917 gcm⁻³.respectively. Color of the sesame oil was closer to the yellow which revealed by the lightness value (L*) of 26 and positive value b of 8.27. The capacity and energy consumption per kilograms of refined sesame oil were 39kg/hr and 0.103kWh/kg. This study reveals that sesame oil could be obtained using the screw type oil expeller and it can be recommended for medium scale entrepreneurs relative to the traditional Sekku method.