

## **The physicochemical characteristics of residual oil and fibers from oil palm empty fruit bunches**

### **ABSTRACT**

Abundant oil palm empty fruit bunches (OPEFB) generated from the palm oil mill industry create huge problems for the environment and the palm oil mill itself. Despite the importance of determining the amount of oil left in the OPEFB, little research of that nature has been reported. This study describes the oil content and physicochemical characteristics of OPEFB fibers, detection of oil attachment on the fiber's surface using sudan red dye, contact angle values, and also the quality of the residual oil. The OPEFB fibers, which are normally used as mulch for the palm oil mill, have been found to be a rich source of lignocellulosic materials, especially cellulose, which constitutes 33.70 to 35.10% for a press-shredded fiber. Residual oil (3 to 7% on dry basis) extracted from the OPEFB exhibits good quality parameters such as deterioration of bleachability index (DOBI), free fatty acid (FFA), and peroxide value (PV). The DOBI values were still in the acceptable range, which is from 1.94 to 2.43, while the PV results are within the range of about 1.84 to 2.80 meq/kg. The major fatty acids of the residual fiber oil were palmitic and oleic acids, at 39.77% to 39.89% and 39.55% to 42.60%, respectively. There were no significant changes in the macronutrients and quality of the OPEFB residual oil. Therefore, the residual oil from the OPEFB should be recovered and reused as a raw material for industrial applications, boosting the oil extraction rate (OER) in the palm oil industry.

**Keyword:** Crude palm oil; Oil palm empty fruit bunches; Physicochemical characterization; Crude palm oil quality; Oil extraction rate