

## **Centrifugal separation-assisted and extraction of crude palm oil from separated mesocarp fiber: Central composite design optimization**

### **ABSTRACT**

In the current research, a centrifugal separator was developed for oil palm fruitlets to separate the mesocarp fibers from the nuts prior to oil extraction, which usually involves grinding the whole palm fruitlets to get the oil. This new technique can increase the yield of crude palm oil derived from the mesocarp without the presence of kernel oil from the nuts. This work focused on the effect of rotational speed and separation time on the mesocarp/nut recovery, oil yield, and broken nut percentage. It was found that the increase of rotational speed and milling time increased the mesocarp recovery without damaging the kernels. The oil extracted from the mesocarp was analyzed, and the results show that the oil properties such as free fatty acid, deterioration of bleachability index, and carotene were better than the properties of the palm oil extracted using the conventional method. From the optimization study, the maximum mesocarp recovery (60.84%) and palm oil extracted (46.02%) were obtained at 943 rpm of rotational speed and 20 s of milling time. The centrifugal technique allowed the separation of mesocarp from the nuts for a better palm oil extraction.