

**Stabilisation of palm olein by ethanolic garlic (*allium sativum* L.)
extract and tertiary butylhydroquinone (tbhq) in circular frying
system**

ABSTRACT

Most of antioxidants (AOX) in palm olein (POo) were removed during the refining process. POo is the major oil used for frying purposes. The quality of POo is decreased due to high temperatures with a prolonged time during the frying operation, therefore, external AOX need to be added for stabilising POo. Tertiary butylhydroquinone (TBHQ) is a synthetic AOX which is commonly used to stabilise frying oils. Nevertheless, a natural potent AOX (i.e., garlic extract) is preferred to either replace or partially substitute the synthetic AOX. AOX of garlic (kating cultivar) was extracted using an ethanol due to its highest AOX activity compared to other commercial garlic cultivars. In this study, the influence of ethanolic garlic extract (EGE) and a combination of AOX (TBHQ and EGE) on the stability of POo in a circular deep fryer (170 °C) were compared to TBHQ at various frying times (0, 10, 20, 30, 40, and 50 h). The lowest p-anisidine and TOTOX values were observed in POo with addition of the highest EGE. However, the combination of TBHQ and EGE resulted the lowest acid number, yellowness colour with the highest lightness of POo. In addition, the length of frying times significantly ($p < 0.5$) affected AOX stability of POo during frying in terms of increased acid number, p-anisidine number, TOTOX value, and yellowness colour; but, decreased in lightness and redness colour. Hence, EGE could be partially replaced TBHQ and, in general, improved AOX stability of POo in the circular deep fryer.