

## **Monitoring the change patterns of physicochemical properties of oil blend as function of storage time.**

### **ABSTRACT**

The aim of this study was to investigate the effect of storage time, type and concentration level of frying oil on the physicochemical properties of oil blend during 8 consecutive week storage. The physicochemical properties of frying media, namely melting point, iodine value (IV), peroxide value (PV), anisidine value (AV), TOTOX value (TV) and free fatty acids (FFA), were considered as response variables. The results obtained from PV, AV and TV measurements indicated that the oil blend containing higher content of linolenic acid (C18:2) and lower percentage of oleic acid (C18:1) showed less stability to the oxidation. This was explained by the higher chemical stability of oleic acid towards oxidation both at ambient and elevated temperatures compared to polyunsaturated fatty acids. The prepared oil blends (POO:OO, 75:25 and 50:50) indicated higher PV ( $> 1.64$  meq O<sub>2</sub>/kg) compared to control sample PV (0.8 meq O<sub>2</sub>/kg) in Week 0 of storage, while the increase in PV of control sample was found to be sharper compared to the prepared oil blends. In fact, the oil blend containing higher content of linolenic acid (C18:2) and lower percentage of oleic acid (C18:1) showed less stability to the oxidation. Thus, the sharper increase in PV of control sample was largely contributed to the high amount of linolenic acid. During 8 weeks storage, the melting point of control and oil blends (POO:OO, 75:25 and 50:50) increased, from 21.40 to 22.45, from 18.27 to 21.72 and from 14.51 to 19.41°C, respectively. Thus, the highest and least changes in melting points were shown by oil Blend 2 (POO:OO, 50:50) and control sample. In most cases, the main effect of storage time and the interaction effect of storage time and type of frying oil showed the most significant ( $p < 0.05$ ) effect and the least significant ( $p < 0.05$ ) effect on physicochemical properties of frying media, respectively. This study suggests that the chemical stability of frying oil during storage depends not only on the saturated fatty acid content but also on the concentration level of monounsaturated and polyunsaturated fatty acids.

**Keyword:** Frying oil; Oil blend; Melting point; Iodine value; Peroxide value; Anisidine value; TOTOX value; Free fatty acid; Linolenic acid, Olive oil; Oxidation.