

Physico-chemical stability of flaxseed oil with natural antioxidant mixtures during heating

ABSTRACT

An optimization study has been carried-out to evaluate synergistic effects of natural antioxidants on physico-chemical characteristics of flaxseed oil during heating. Results showed that the use of oleoresin rosemary extract, sage extract and citric acid improved the stability of the oil during 20 times of frying. This study also revealed that the addition of these antioxidants effectively retarded flaxseed oil deterioration after as early as 5 times of frying of potato chips. Analyses from Response Surface Methodology (RSM) indicated that for all physico-chemical characteristics of flaxseed oil evaluated, all mathematical models or equations could be developed with high confidence, where all R² values greater than 0.87. From this study, the highest R² (0.98) was shown by yellow colour, followed by absorbance at 268 nm (0.97), saturated /unsaturated fatty acid ratio (0.95), absorbance at 232 nm (0.93), and AnV (0.92). R² values for four other parameters were 0.88 (PV and IV) and 0.87 (FFA and red colour). This meant that the R² values obtained from this study were all satisfactory and considered accurate enough, not only for prediction purposes, but also for optimization purposes.

Keyword: Citric acid; Optimization; Flaxseed oil; Response surface methodology; Rosemary; Sage