



Section E2

601/E2

Stabilization of stripped soybean oil using natural antioxidants

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Soybean contains ~19% oil, of which the triglycerides are the major component. Soybean oil is characterized by relatively large amounts of the polyunsaturated fatty acids (PUFA), i.e., ~55% linoleic acid and ~8% α -linolenic acid, of total fatty acids. Linoleic acid in soybean oil is an essential fatty acid (EFA) belonging to the ω -6 family of PUFAs, which exerts important nutritional and physiological functions. As with many other edible oils, stability of soybean oil is a problem due to oxidation. Primary oxidation products such as hydroperoxides, formed due to the oxidation of oleate, lenoleate and lenenate add oxidative flavor to soybean oil. These primary oxidation products decompose to secondary oxidation products adding flavor variations. The present research project was conducted to test the efficiency of the natural antioxidants extracted from coconut cake, using soybean oil as the food model system. In this study, soybean oil was stripped with silicic acid and activated charcoal using n-hexane as the solvent. Phenolic antioxidants in ethanolic extract of coconut cake were quantified by Folin-Denis colorimetric method. The total phenolic content of coconut cake was 442 mg/kg. The extracted phenolic antioxidants were added to stripped soybean oil as 10 mg/L, 20 mg/L, 30 mg/L, 50 mg/L, 60 mg/L, 100 mg/L concentrations in order to stabilize the oil and oxidation stability was measured as Peroxide Value (PV) and Thiobarbituric Acid Reactive Species (TBARS) values. The results given in Table 1 show the addition of the different concentrations used. Phenolic concentrations above 100.0 mg/L in oil were not achieved due to the solubility problems of phenolic substances in soybean oil.

Table.1 Time taken for the formation of a significant amount of primary and secondary oxidation products

| Phenolic concentration (mg/L) | Peroxides (Days) | TBARS (Days) |
|-------------------------------|------------------|--------------|
| 0.0 | 1 | 6 |
| 20.0 | 2 | 8 |
| 50.0 | 6 | 8 |
| 100.0 | 10 | 10 |

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