

**Effect of Some Technological Treatments on Physical,  
Chemical and Biological Properties of Some Edible  
Oils.**

**By**

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## Abstract

The objective of this study was to examine changes in physiochemical properties, oxidation indices, phenolic compounds and fatty acid composition during refining of cottonseed oil and soybean oil compared to unrefined oils such as olive, flaxseed and sesame oils. 2,2-diphenyl-1-picrylhydrazyl (DPPH) and Rancimat method were used for determination of antioxidant capacities. The results obtained showed that specific gravity have decreased after refining, while refining process does not have a significant effect on the refractive index. Correspondingly, there was reduction in the chemical properties such as acid value, peroxide value, thiobarbituric acid, saponification value and unsaponifiable matter. While unrefined oils have highest values of acid, peroxide and thiobarbituric acid values compared to refined soybean and cottonseed oils. The refining had a positive effect on the oxidative stability of the oil. Refined cottonseed oil showed relatively higher antioxidant activity by both DPPH and Rancimat methods than refined soybean oil, while oxidative stability of flaxseed and sesame oils lowest than crude soybean and cottonseed oils but higher than refined soybean and cottonseed oils. This study also revealed that the refining process caused approximately 48.8% and 50% decrease of total phenolic contents in soybean and cottonseed oils, respectively. In the other hand the total phenolic compounds in olive oil was higher than crude, refined soybean and cottonseed oils. There was an increase in the total monounsaturated fatty acids coupled with a significant decrease in the saturated fatty acids in the oil samples after refining process. The loss of bioactive compounds from crude oils is inevitable during the conventional refining processes. Therefore innovations in these oils processing are necessary to produce commercial oil with high antioxidant content.

Rats injected with  $\text{CCl}_4$  and fed on BD containing different oils (crude and refined oils) recorded a significant increase in BWG% (-3.20, -4.37, -5.9 and -9.89 %) in groups treated with saesme and crude and refined soybean oils) compared to the positive control (-

17.03). The effect feeding rats on diets containing different oils on liver functions, kidney functions and liver enzymes were studied. Liver functions decreased in all groups except the control positive group while after 30days of feeding there was significant different between the control positive and the other groups. Histobathological study showed that rats fed on BD containing refined soybean and cottonseed oil for 15and 30 days normal histopathological structure findings of hepatic parenchyma compared to control positive liver which showed congested central vein (arrow head) and dilated blood sinusoids (arrow).

**Key words:** cottonseed oil, soybean oil, extra virgin olive, flaxseed and sesame oils, refining process, oxidative stability, chronic hepatitis, Histobathological

