

**CHEMICAL STUDIES ON BY-PRODUCTS OF SOME VEGETABLE  
OILS  
BY**

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**ABSTRACT**

Chemical studies were conducted on by-product compounds of refining stages of corn, soybean and sunflower oils (degumming, bleaching and deodorizer distillate). Crude lecithin was separated from the degumming by-product compounds and its effect as an antioxidant on frying process was investigated.

There were significant differences ( $P < 0.01$ ) in the unsaponifiable matter percent among the different studied vegetable oils besides of the by-products of the three refining stages. Phospholipids (PL) were the major components in the studied gums. The individual phospholipids subclasses were found to be phosphatidylserine (PS), phosphatidylinositol (PI), phosphatidylcholine (PC) and phosphatidylethanolamine (PE). The predominant PL-bound fatty acids were palmitic, oleic and linoleic acids.

Frying the sunflower oil caused significant increases ( $P < 0.01$ ) in acid value, peroxide value and benzidine number. On the other hand, it caused significant decrease ( $P < 0.01$ ) in the percentage of total unsaturated fatty acids. Conversely, a significant increase ( $P < 0.01$ ) occurred in the percentage of total saturated fatty acids. The addition of lecithin powder which was separated from corn, soybean and sunflower gums caused a pronounced increase in the induction period of sunflower oil.

**INTRODUCTION**

The technological processes of fat and oil manufactures result in accumulation of large quantities of by-products. Proper utilization of these by-products might reduce waste disposal problems and provide a new potential source for improving oil properties. Crude oils are subjected to a number of commercial refining processes, both physical and chemical (namely degumming,, neutralization, bleaching and deodorization), to remove substances that may cause undesirable flavor, color and odor (Nawar, 1985). For example, degumming remove phospholipids and mucilaginous; alkaline refining removes free fatty acids, phospholipids, metals and chlorophyll. The process of bleaching reduces