Methods of Determining Adulteration Made in Olive Oil

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Olive oil is the only oil obtained from olive tree, Olea europaea L. fruits. Oils which have been extracted using a solvent or modified with natural triglyceride structure by esterification and mixtures with other oils are outside this definition. Natural olive oil: Olive oil is obtained by applying mechanical or physical processes such as washing, decantation, centrifugation and filtration processes in a thermal environment that will not cause any change in the natural qualities of the olive tree fruit. Natural olive oil are the oils that carry the physical, chemical and sensory properties of the products in their category. The oils obtained by using solvents or assistants with chemical or biochemical effects or by reesterification are outside this definition.

Our country has an important place in the production of vegetable oil. We are also an important Mediterranean country in olive oil production, which is especially beneficial for health. The fact that the production of olive oil in our country is limited, the increase in demand by consumers and the high cost of production are the main reasons which increase the economic value of olive oil and which are attracted to the market by being admitted with other vegetable oils.

Adulteration made in olive oil may cause negative effects on health as well as deceiving consumers by economic damages. For this reason, adulteration in olive oil has become an important problem that has to be emphasized especially in recent years.

In recent years, olive oil, which has a high economic value, has come into frequent relation with lower valued vegetable oils. Some oils such as olive oil, milk oil and cocoa oil are expensive and therefore it is aimed to make more profit by mixing them with low cost vegetable oils (soybean, sunflower, canola).The authenticity of products labeled as olive oil is very important both in terms of trade and health.

Determination of oil mixtures made in olive oil is imported to determinate major and minor components.Each oil has its own components. Determination of their presence and their quantities is important to determinate adulterated oils. Chromotographic methods have been developed to detect the major and minor components of fats and oils. Spektroscopic methods are the methods used for short-term analysis of oils. The combined use of analytical and chemometric techniques is necessary to identify the adulteration in olive oil and to conduct quantitative analysis. Researchers who have determined that the NIR and FTIR methods are effective have also emphasized that spectroscopic methods are easier to use because they are generally cheaper, faster, more reliable, and do not require chemicals compared to chromatographic methods (GC and HPLC). Fourier Transform Infrared Spectroscopy (FTIR - ATR), Fourier Transform Near Infrared Spectroscopy (FT - NIR), Stimulated Dispersion Fluorescence Spectroscopy (EX - EM Fluorescence) and finally Synchronous Fluorescence [SYN Fluorescence]), which are advanced molecular spectroscopic methods, 13 C NMR and P-NMR, and Raman spectroscopy techniques are also included in this group. Determination of only sterol contents is not enough when olive oil is adulterated with fruit oils such as hazelnuts oils. Because the fatty acids and sterol contents of fruit oils are very similar to olive oil. It has been stated that adulteration can be detected by taking advantage of the proportion of free and bound sterols in the determination of 10% and higher rates of hazelnut oil. Detection of vegetable oil mixtures is usually made using fatty acid distributions and

glyceride fractions of the sterol compositions they have.In this study, the adulterations made in olive oils and the methods developed and used for their determination will be disc

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