

Application of a New Analytical Method for Free Fatty Acids Alkyl Esters in Virgin Olive Oils

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The esterification of free fatty acids (FFA) with low molecular alcohol, such as methanol and ethanol, can easily take place in an acid medium and strongly depends on the reagent contents and on temperature. In olive fruits the content of free fatty acid alkyl esters (FFAEs) is highly related to olive health conditions and is obviously enhanced if olives undergo hydrolytic and fermentative processes. A “soft deodorization” at temperature below 100 °C easily corrects the negative sensorial features of low quality virgin olive oils obtained from fermented olives. Thus, in order to detect the presence of “soft deodorized” oils in virgin olive oils, the European Union (EU) has recently adopted the method for FFAEs determination [1] previously proposed by the International Olive Council (COI) [2]. In this study, a new GC-MS method was compared with the Official EU method. Several virgin and extra virgin olive oil samples were analyzed by both methods and the obtained results were compared by Passing Bablok regression. A correlation > 95 % for total FFAEs was calculated, though the two methods were not identical since the slope of the regression line was significantly different from 1. This was not surprising since the numerical results obtained by EI MS detection (SIM mode) with the sole methyl heptadecanoate as internal standard are obviously different from those obtained by FID detection. The new method is thus proposed for future Ring Test trials since Official Method has a low reproducibility [2].

[1] EU Regulation 61/2011 of 24/1/2011, Off. J. European Union, 27/1/2011, I23

[2] International Olive Oil Council. Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters. COI/T.20/Doc. No 28/Rev. 1 -2010