

Chemometric Classification of Olive Oil and Other Edible Oils by Compositional Profiles

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An analytical procedure for the identification and quantification of olive oils adulteration with other vegetable oils is proposed. The only data required for this calculation are the results obtained from the gas chromatography of fatty acids and triacylglycerols. The data of nearly 3000 vegetable oils (including 2000 olive oils) and animal fats were analysed and statistically evaluated.

The principal component analysis (PCA) have been used to obtain the maximum of information for the interpretation of the results. The practical aspect is that the number of principal components is much less than the number of experimental variables such as the individual fatty acids and triacylglycerols. PCA makes it possible to describe relations among the different vegetable and animal fats using only three fatty acids (C16:0, C18:1 and C18:2) and 8 triacylglycerols. Finally the composition of blends could be quantified .

Fatty acids (C16:0, C18:1(11c), C18:2) and some triacylglycerols have been used in chemometric analysis to characterize the geographical origin of olive oils. A chemometric classification of more than 2000 olive oils from all European countries, Tunisia, Turkey, USA and Australia have been undertaken. The results obtained are promising for the authentication of olive oils. Even blends from different countries could be detected.

The mathematical procedure is very simple and gives a ranking of possible solutions for the given fatty acid and triacylglycerol composition