MULTINUCLEAR MAGNETIC RESONANCE IN FOOD COMPOSITION AND QUANTITATIVE ANALYSIS.

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NMR spectroscopy is emerging as an alternative analytical tool in several applied fields, including Food Science.[1,2] With NMR, it is possible to identify many compounds in a complex mixture simultaneously and non-destructively. Very often, the mixture can be analyzed with minimal or no treatment, which is a very desirable feature in terms of speed of the analysis, recovery of the analyte, and operator time. Quantification of single constituents in mixtures is also possible through integration of the area of the NMR signal. One of the most serious drawbacks of this technique is its scarce sensitivity, although great strides have been accomplished in the recent years.

“Manchego”, a popular Spanish cheese, is produced from pasteurized or raw dairy milk according to a regulation approved by the European Union. The cheese has a protected denomination of origin (PDO) mark, which strictly defines the geographical area of its production.

NMR spectroscopy allows to establish a quantification methodology of each of the components found in different cheeses, using an internal standard and/or a derivatizing agent.

Moreover, in this oral communication an NMR study of other food as, wine and olive oil will be presented.

This research marks the first characterization of some food with DO “La Mancha” using NMR spectroscopic analysis. The global analysis of metabolites in wine could provide useful information on different quality markers of red wine from Castilla-La Mancha region. This study further demonstrates the possibility of NMR-based metabolomic research to characterize wine quality and applied fermentation methods and product origin.

The study demonstrates the efficiency of the 31P-NMR technique to detect and quantify DG and other minor components of olive oil and provides a new way to detect oxidized olive oils. Also, in order to apply the study to the quotidian chemistry, important differences between thermal and microwave oxidation were found.

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