

## Rapid Screening of Virgin Olive Oils Quality Grades by HS-GC-IMS

F. Panni<sup>1</sup>, E. Casadei<sup>1</sup>, E. Valli<sup>1</sup>, S. Barbieri<sup>1</sup>, C. Cevoli<sup>1</sup>, A. Bendini<sup>1</sup>, C. Rossini<sup>2</sup>,  
F. Battaglia<sup>2</sup>, D.L. García-González<sup>3</sup>, T. Gallina Toschi<sup>1</sup>

<sup>1</sup>University of Bologna, Cesena, Italy

<sup>2</sup>Labservice Analytica S.R.L., Bologna, Italy

<sup>3</sup>Instituto de la Grasa (CSIC), Seville, Spain

The development of screening methods, based on the analysis of volatile compounds, represents one of the most current challenges to support the Panel test for the classification of virgin olive oils (VOOs). This approach is foreseen in the framework of the EU H2020 OLEUM project, as part of the „Quantitative Panel Test“. In this work, a FlavourSpec HS-GC-IMS (Headspace Gas Chromatography Ion Mobility Spectrometry) analyzing 167 samples of VOO, was adopted as targeted approach. The 3D data matrices composed with 15 volatile compounds, previously selected as markers of positive and/or negative sensory attributes in VOOs, were used to develop chemometric models by PLS Toolbox for MATLAB. Specifically, two different types of statistical techniques have been used: PLS-DA to discriminate the samples according to the quality grades and PLS to estimate the sensory attributes (the most perceived defect and the fruity attribute). Furthermore, the analytical performance of the method was evaluated, calculating the intra and inter-day repeatability, in terms of RSD% of the area of two specific volatile markers in a single sample for each quality grade. Another investigated parameter was the linearity of the 15 examined volatile compounds, expressed in terms of range and  $R^2$ . Finally, through the calibration curves, the 15 volatile compounds were quantified in the VOO samples and their concentrations discussed with respect to their occurrence in the different quality grades.

This work is developed in the context of the project OLEUM „Advanced solutions for assuring authenticity and quality of olive oil at global scale“, funded by the European Commission within the Horizon 2020 Programme (2014–2020, GA no. 635690). The information expressed in this abstract reflects the authors' views; the EC is not liable for the information contained therein.