

## Virgin Olive Oil Aroma Analysed by Metal Oxide Sensors

García-González, D L<sup>1</sup>, Tena, N<sup>1</sup>, Morales, MT<sup>2</sup>, Aparicio, R<sup>1</sup>

Unidad Asociada CSIC-US

<sup>1</sup>Instituto de la Grasa (CSIC), Seville, Spain

<sup>2</sup>Faculty of Pharmacy, University of Seville (US), Seville, Spain

The sensing systems based on metal oxide sensors (MOS) reached the food industry more than a decade ago and it was presented as a non-destructive technique for food aroma analysis that could compete with panel test. Thus, MOS based sensor systems have been used to classify olive oils from several qualities or geographical origins. Nevertheless, an accurate interpretation of sensor signals from a chemical and sensory point of view is still demanded by analysts. The high complexity of virgin olive oil aroma and the little knowledge on the relations between volatile compounds and sensory attributes are the reason why most of the current applications of electronic noses are reported without a proper chemical explanation.

133 virgin olive oil samples from different sensory qualities (lampante and non-lampante) were classified by an artificial neural network (ANN) model based on metal oxide sensor responses to know if sensors were sensitive to volatiles responsible for the olive oil quality. A selected set of virgin olive oil samples were simultaneously analysed by electronic nose, SPME-GC and panel test. The volatile compounds that better distinguish the lampante and non-lampante virgin olive oils were explained by the agreement between the sensor responses, the concentration of the volatile compounds and the intensity of the sensory attributes. The sensor responses selected for the classification model were highly correlated ( $R \geq 0.80$ ) with the concentration of 14 compounds (eg. acetic acid, decanal) that were more abundant in low quality oils (lampante category). This result points out that ANN model detects sensory defects rather than olive oil positive sensory attributes.