



# An interlaboratory study on the transfer of GC-IMS calibration models between laboratories for the classification of olive oil samples: Observations and lessons learned

María José Cardador<sup>1</sup>, Marina Chanivet<sup>1</sup>, Sandra Ávila<sup>1</sup>, David Saavedra<sup>2</sup>, Luis Aparicio<sup>2</sup>, Lourdes Arce<sup>1</sup>.

<sup>1</sup> Department of Analytical Chemistry, University of Córdoba, Córdoba, Spain

<sup>2</sup> SOVENA Grp SA, Seville 41310 Spain

## INTRODUCTION

Olive oil can be classified according its quality in EVOO, VOO or lampante.

The classification of olive oil samples in the 3 categories is performed using chemometrics.

A calibration model should be done analyzing by GC-IMS at least 200 olive oil samples, labelled by official sensorial analysis which is tedious and expensive.

Only samples tested by two official tasting panels whose results matched were used in this study to avoid the transfer of the error of sensorial analysis to the analytical methodologies.

There is a growing interest in routine laboratories to find a robust calibration equation which can be transferred between instruments and laboratories with comparable results.

## OBJECTIVE

- Evaluation of the possibility of transferring a calibration equation built with one device to other laboratories to predict the olive oil category.
- Comparison of the data obtained with two similar instruments.

Only preliminary results are showed.

## ANALYSIS HS-GC-IMS

The analyses were performed in two different laboratories using similar instruments based on headspace (HS)-GC-IMS.

Olive oil samples and standards (6 ketones) were analysed with the same analytical method to minimize sources of variation.

### Instrument 1 HS-GC(Agilent)/IMS(G.A.S.)



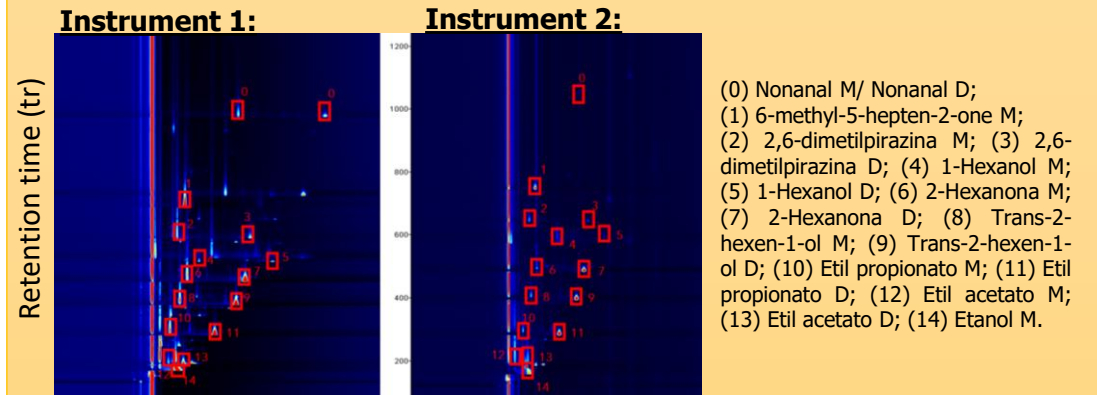
### Instrument 2 HS-GC(Perkin)/IMS(G.A.S.)



- <sup>3</sup>H radioactive ionization source
- Carrier gas: He (Agilent) / N<sub>2</sub> (Perkin-Elmer)
- Drift gas: N<sub>2</sub>
- Sample incubation: 60°C / 15 min
- GC ramp temperature: 40°C/ 3 min – 15°C/min – 120°C / 21.5 min
- Drift tube temperature: 55 °C

## PRELIMINARY RESULTS

- Similar number of markers can be observed in the topographic plots of the olive oil samples analyzed by both instruments.
- This figure shows the topographic plot of the analysis of a mixture of 14 standards. Some differences can be observed in the retention time of the compounds.



	<b>Instrument 1:</b>	tr: 605 s td: 9,77 ms I: 2,45
<b>Example: 2-butanona</b>	<b>Instrument 2:</b>	tr : 509 s td : 9,94 ms I: 3,68

## PRELIMINARY CONCLUSIONS

Slight differences are observed between the instruments:

- Slightly higher tr on instrument 1
- Slightly higher intensity in instrument 2
- Similar td on both instruments