



## ROUTINE QUALITY CONTROL OF EDIBLE OILS



### A portable NIR analyser to detect raw material adulteration and measure quality parameters

- **Identification** of different **oil varieties** and **origins**
- **Detection** and **quantification** of counterfeit raw materials
- **Measurement** of key **quality parameters**, such as acidity
- **Monitoring** of oil quality during deep **frying process**
- Accurate **measurements** even **through packaging**
- **Portable** device to be used in the warehouse or outdoor
- Very easy to use with intuitive user interface and **touch screen**



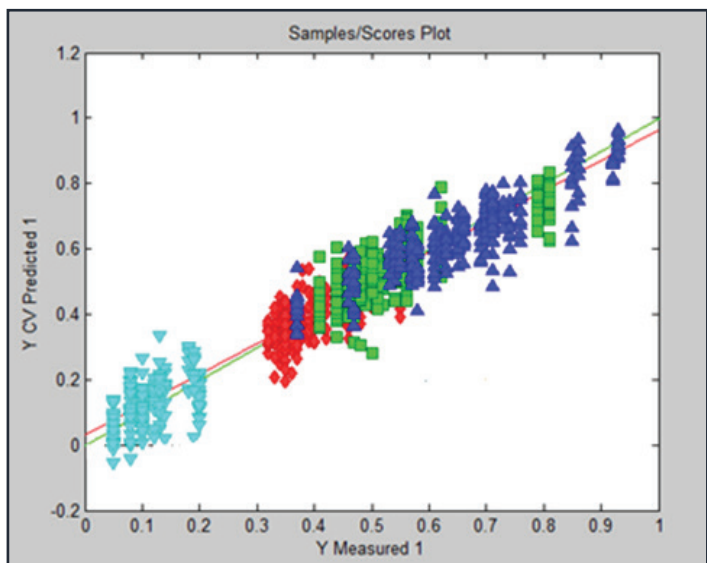
### VISUM PALM: Quality control of edible oils

Nowadays, physicochemical and organoleptic quality parameters of edible oils are performed according to the official methods established in the European legislation. This procedures are manual, time consuming and not eligible for its in-line implementation. On the contrary, NIR reflectance

spectra is very sensitive to the characteristics of edible oils and, complementarily, this novel method offers the advantages of rapid, non-destructive analysis and easier routine operation as well as the possibility to be implemented online for both automated process control and quality control.

**CASE STUDY**

110 vegetable oil samples were obtained from different industrial frying processes and their near infrared spectra were acquired with Visum Palm. The acidity values of the samples were analysed according to traditional methods and expressed as percentage of oleic acid as reference values.



**Fig. Calibration of the acidity value content of different vegetable oil samples**

A chemometric model was developed to correlate the spectra of the samples with the acidity index.

The model was able to successfully predict the acidity index of a new set of oil samples with an accuracy of  $\pm 0.05$  of percentage of oleic acid, whereas the accuracy of the analytical method at laboratory was of  $\pm 0.08$ .



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 The versatility of a tool like the spectroscopy-based analyser VISUM Palm in Europastry is a huge revolution in our meaning to maintain the quality of the processes under control. In our case, not only brings us reliable information but time and cost-saving data about total acidity and the content of the polar components in the frying oil of the production line.  
 At the same time, VISUM Palm gave us useful data to determine the qualities of fried products, like moisture and fat percentages. This functionality helps to save arduous lab tasks and lets our employees stay focus on other high value-added duties. The return of the investment is clear and well based.  
 Our idea is to extend its use to the foreign bodies control due its difficult characterisation and identification within the dough and raw materials. The VISUM Palm is an open system, in terms of the quantity and type of parameters, and it is also capable of characterising this type of materials.  
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**Marina Diana**  
 EUROPASTRY,S.A.


**CONCLUSIONS**

**The VISUM PALM analyser is capable to determine the acidity index of vegetable oil samples with an accuracy of  $\pm 0.05$  % of oleic acid, in less than 5 seconds.**