# Olive-oil screening

Comprehensive quality check with NIR spectroscopy

Maxfry®
advanced food ingredient.

# Olive oil – a trend food

Olive oil is an expensive food product with a steadily growing market. Adulterations and fraudulent labelling are common practice. Therefore the assessment of the quality and authenticity of olive oils plays a vital part for producers, regulatory authorities, oil suppliers and consumers. The adulterations most frequently detected in extra virgin olive oil are blends with olive oils of inferior quality, refined (deodorized) olive oils or even other types of oil with a high oleic acid content.

## Blunt analytical tools

The EC regulation 2568/91 proposed a number of methods for qualitative and quantitative analysis, in order to classify olive oils and identify falsifications. The restriction of standard methods to the identification of individual markers as indicators of falsification tempts forgers to simply remove these markers (stigmastadiene, alkyl ester, ECN42, trans-fatty acids, various sterols or fatty acids) and to create clever blends which comply with the limit values. Another major deficiency in quality control is the fact that these standard methods have so far never been updated to the present state of the art. The official standard methods are unable to ensure sufficient authentication and characterisation of olive oils. Adulterations and false statements of origin thus cannot be recognized effectively or even detected at all.

## Maxfry® uses innovative instrument technology

Rapid technological progress in the fields of statistical tools and instrument technology has produced tools which offer quick, reliable access to the information necessary for effective and comprehensive quality control. Spectroscopic processes such as NIR spectroscopy (near-infrared spectroscopy) enable the identification of numerous analytical parameters using just a single measurement.

Since 2011, Maxfry® GmbH has been investigating the feasibility and limits of analytical methods to ascertain the authenticity and quality of olive oil. Some 5,000 samples were tested using standard analysis procedures over a wide range of parameters, including sensory panel tests, fatty-acid and triacylglycerol distribution, K-values, peroxide value, monomeric oxidized TAGs, anisidine value, free fatty-acid content, 1.2- to 1.3-diacylglycerol ratio and pyropheophytine A, in order to establish a total of some 100,000 analytical results. The results were used as reference parameters to develop more than 30 new NIR methods. These include checking the fruity, bitter and spicy sensory profile, sensory defects, oxidation stability, biological age, adulteration through blending with other types of vegetable oils, recognition of soft-deodorized olive oils and identification of the geographic origin within Europe with a high probability of 95 to 100%. The NIR-spectroscopic method of analysis developed by Maxfry® is the only method worldwide which is capable of detecting adulterated olive oils with a correctness of more than 95%, and of classifying the quality of olive oil including its sensory profile and its defects. Just one measurement procedure (in triplicate) which takes less than two minutes is necessary to obtain all required analytical information.

## Olive-oil screening with NIR

Maxfry® NIR olive-oil screening is a fast, efficient and reliable method of quality assurance for olive-oil distributors and producers. As a customer of our service, you will receive detailed information about the characteristics, authenticity, quality and geographic origin of the sample submitted at minimal expense in terms of time and money. Normally, within 48 hours of our receipt of an original, sealed sales package (or other suitable sample container with a minimum content of 50 ml), you will receive a detailed written evaluation in the form of a standardised protocol first via email, then as an original printout.

**The analysis protocol includes the following information:**

**Organisational details**
**(date of receipt, sample declaration of ingredients, key figures, type of packaging, etc.)**

**Aroma profile (fruitiness, bitterness, spiciness, harmoniousness)**

**Information about sensory defects, if any**

**Information about adulterations, if any**

**Information about quality based on analytical key figures and relevant limit values**

**Details of fatty-acid distribution for the nutrition table**

**Triglycerol distribution to determine purity, identity and region of origin.**

**Probable geographic origin derived from two different statistical methods (KNN method; logistic regression)**

**Information about the age and residual shelf life of the olive oil based on analytical key figures (best before date)**

## Quality under control


## Your advantage

- Fast, low-cost quality control
- Comprehensive assessment of numerous analytical parameters
- Analytical results with a statistical probability of more than 90%
- Globally unique proof of adulterations, misuse and irregularities in the supply chain (examination of batch identity)

**Sounds interesting?**
Please get in touch with us and take advantage of Maxfry® advanced olive oil screening.
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**We look forward to receiving your enquiry!**

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