QUALITY CONTROL OF OILSEEDS AND PRESSED OIL

INTRODUCTION

For the manufacturers of edible oils it is very important to control the crushing process at all the stages to achieve the best cost efficiency. In order to provide maximum yield and meet the product specifications it is necessary to monitor process as closely and rapidly as possible.
Rapid determination of the key parameters with the use of InfraLUM® NIR analyzers provides the opportunity to control the process at every stage from quality control of oilseeds at intake point to the QC of the final product (liquid or solid).

MEASUREMENT METHOD

The method is based on measuring the transmission spectrum of a sample in the near-IR spectral region and subsequent determination of the analyzed parameters/constituents using a calibration model.
Transmission measurement with an FTNIR spectrometer provides highest accuracy and reproducibility of the measurements.

ANALYZED PRODUCTS AND CONSTITUENTS DETERMINED

Products	Parameters / Constituents					
	Protein	Moisture	Fat	Phosphorus	Acid Value	Fiber
Sunflower seeds	+	+	+			
Rapeseeds	+	+	+			
Soybeans	+	+	+			+
Linseeds		+	+			
Soybean meal	+	+	+			+
Sunflower meal	+	+	+			+
Sunflower oil				+	+	

These constituents can be determined within the whole possible range of content in the above products.
The validity of the calibration models listed in the table has been confirmed by dozens of successful installations and happy customers.
Determination of other parameters of interest for specific samples (like erucic acid and glucosinolate content for rapeseed) is also available.

ADVANTAGES OF THE METHOD

- Rapid analysis without sample preparation (simultaneous determination of all parameters in 1.5 min)
- Multifunctional – one instrument does all the applications
- No sample preparation needed
- FTNIR spectrometry – the highest accuracy of measurements
- Low cost per analysis (no reagents and consumables are needed)
- Simple measurement procedure
- No special qualification of attending personnel is required

EQUIPMENT

- InfraLUM® FT-12 NIR Analyzer with basic calibration models
- Cells with suitable pathlenghths
- Personal computer with SpectraLUM/Pro® software operating under Windows® 7/8/10

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PREOPERATIONAL PROCEDURES

The following procedures should be performed before proceeding to the measurements:

Sampling and sample preparation

The samples should be used that are routinely analyzed in a laboratory for the quality control of a production process. The contents of the sample constituents should cover the whole measuring range.

Calibration of the analyzer

Basic calibration models for the specified parameters are supplied by LUMEX Instruments.
If necessary for other parameters the calibration process involves the following steps:

- reference analysis made by standard chemical methods
- measurement of transmission spectra of the reference samples
- creation of a calibration model that establishes relation between the content of a constituent with the spectral data

As a rule, calibration is made by LUMEX specialists or authorized representative.
The measurement range of a calibration model depends directly on the range of the constituent content, and the measurement accuracy depends on the precision of analysis by standard chemical methods.

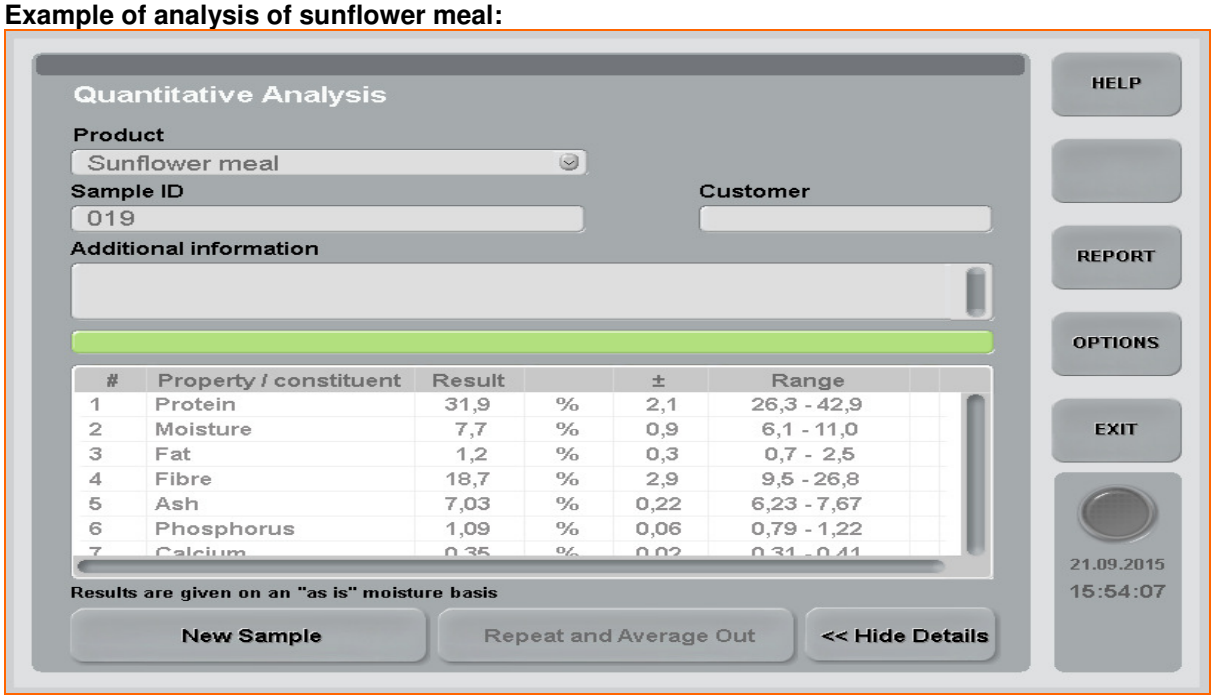
MEASUREMENT PROCEDURE

The sample is put in the cell of the InfraLUM® FT-12 analyzer and the measurement is made automatically.

DATA PROCESSING

The measurement result (content of the constituents in the analyzed sample of a product) is calculated automatically by the SpectraLUM/Pro® software and is displayed on the PC screen.

Example of analysis of sunflower meal:



The contents of this paper are subject to change without notice.
The information in this leaflet is supplemental. To get more specific information on this method, please contact the developer of this method Lumex Instruments Group.

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