



Feed and Feed Ingredients

Introduction

Feed manufacturers have to comply with product assurance and safety schemes set by producers and retailers. The manufacturers have to analyse products for many components, such as; fibre, protein, oil, moisture and starch. Analysis of raw materials, process materials and final products are crucial to ensure profitable manufacturing.



Performing these measurements by chemical analysis would be time consuming and costly. Therefore FT-NIR analysers have replaced most of the traditional methods. These analysers can be placed directly in the production area and can be operated by plant personnel. The analysis time is less than one minute.

FT-NIR analysis presents plant operators and laboratories with an invaluable tool for process control and quality assurance to increase profitability.

INGOT® Near-Infrared calibrations packages allow a substantial QC saving to be made by reducing the cost of nutritional testing without compromising analytical accuracy and precision.

FT-NIR Analysis

The AgriQuant is an FT-NIR analyser equipped with a large rotating bottle accessory. This accessory is developed for analysis of forage and feed samples. Feed samples are not always homogeneous, resulting in a need to see more of the sample. As the sample bottle rotates during analysis a large amount of the sample is analysed.



Figure 1: Quant FT-NIR analyser and sample spinner.

Sample Preparation

Samples can be directly measured in the sample bottle. Improved analytical performance may be obtained on samples that are milled prior to analysis - please enquire for details.

Calibration Model Information

The INGOT® feed and feed ingredient global model uses samples from the following areas:



UK, Ireland, EU, USA, Australia, South East Asia, Pakistan, India, China, Argentina, Japan, Malaysia, Norway, Iceland, Peru and Brazil.

Property	Min %	Max %	Number	R ²
Moisture	2.1	21.6	36,000+	0.952
Oil	0.1	61.6	27,000+	0.998
Protein	1.7	61.7	39,000+	0.994
Fibre	0.1	36.5	15,000+	0.974
Ash	0.7	59.4	22,000+	0.962
Starch	0.1	77.5	6,000+	0.988

Table 1: INGOT® Feed and Feed Ingredients Global Database, Wavelength Range 1100nm-2500nm, data on an as received basis

Property	Range %	SEC	SECV	R ²
Moisture	6.3 - 16.8	0.34	0.35	0.944
Oil	2.3 - 13.8	0.34	0.36	0.969
Protein	13.2 - 35.5	0.64	0.65	0.947
Fibre	1.2 - 8.2	0.46	0.48	0.835
Ash	3.3 - 14.3	0.5	0.52	0.769

Table 2: Typical INGOT® Broiler Finished Feed Performance Data

Property	Range %	SEC	SECV	R ²
Moisture	8.9 - 17.1	0.32	0.34	0.903
Oil	1.3 - 2.5	0.14	0.16	0.721
Protein	6.8 - 13.8	0.27	0.29	0.942
Ash	1.6 - 2.5	0.13	0.15	0.86

Table 3: Typical INGOT® Wheat Performance Data

Summary

In a highly competitive market manufacturers need to strike a balance on analysis costs and process optimisation. INGOT® Near-Infrared calibrations packages allow a significant cost saving by reducing the expense of traditional chemical tests or contract analysis without compromising analytical accuracy and precision.

Further Information

For further details regarding INGOT® please contact Central Laboratories direct: www.central-labs.co.uk



CAL INGOT® Calibration Models

INGOT® provides multi-component analysis, the range and extent depending upon the type of feed or ingredient to be analysed. No on-site wet chemistry laboratory is required, eliminating the need for the purchase, use and disposal of expensive, and often hazardous, chemicals. Compatible with Specman® Gold QC software, which applies quality control rules to the INGOT® data, it follows trends and produces management reports for operational and technical staff.

INGOT® calibration packages are also available for: **Flour and Milling, Wet Forage, Dried Forage, Animal Proteins, Pet Food, Aqua Feed and Rapeseed Plant Breeders.**

For further information on INGOT® calibration packages contact Central Laboratories:
Tel: +44 (0) 1327 810910 | email: sales@central-labs.co.uk | www.central-labs.co.uk

Quant Technology

Upgrading your FT-NIR analysis with the new Quant analyser means you will be at the forefront of analytical performance and technology. The Quant is the most reliable FT-NIR system in the market with the lowest cost of ownership. Easy to use and with minimal maintenance, it will provide constant analysis results for many years. Many configurations are possible, including remote probes and automation.

Spectral Performance

The internal VCSEL solid state laser is fully self calibrating and ensures exceptional wavelength accuracy with precise results. It is highly durable and has a greater than 20 years average life-time. The innovative double pivot interferometer is designed to ensure increased robustness and allows more reproducible spectroscopy.

Signal to Noise (60s, 16 cm ⁻¹ , at peak response) > 900 000:1
Spectral Range 3,700 to 14,885 cm ⁻¹ (672 to 2702 nm)
Frequency Repeatability @ 7300 cm ⁻¹ < 0.006 cm ⁻¹
Frequency Accuracy @ 7300 cm ⁻¹ < 0.01 cm ⁻¹
Absorbance Reproducibility (toluene) < 0.002 AU

Ethernet Communication, 10 / 100 Mbps
Size w 435 x d 280 x h 372 mm, 24 kg
Operating Temperature 10 -35 °C
Operating Relative Humidity 5 - 80% (non-condensing)
Regulatory Certification and Compliance TUV, CE and RoHS

Maintenance

Preventative maintenance is recommended every 5 years to replace the source module that has a 10 year average life-time. Apart from this, the system is maintenance and adjustment free. No components to replace or adjust. No consumables. No He-Ne laser. No hygroscopic optics. No purge required. The interferometer has a life-time warranty and the analyser has a 2 year warranty.

Built to Last

Featuring rugged and durable modules, a permanently aligned optical system and a design that combines minimal mechanical components, the Quant will operate for years to come with no interference. The result: a reliable spectrometer that always produces results of great consistency.

Small Footprint

The vertical design of the Quant makes it one of the most space-efficient spectrometers in the market. Its vertical design also facilitates access to internal components.



InfraQuant 2.0

Spectroscopic Analysis Software

Designed in collaboration with NIR users, Q-Interline have developed InfraQuant 2.0, the next generation of NIR operator software. Built-in instrument validation provides a high level of security and is automatically performed on every reference collection. Based on the latest Microsoft technology it is fully compatible with the latest Windows platforms and ready for future upgrades. This technology also provides a safe and accessible platform for integration into a LIMS.

