

A close-up photograph of green grass with dew drops, serving as a background for the title.

Forage and Silage

AgriQuant B8
For Wet & Dry Forage & Silage

The AgriQuant B8

For Wet & Dry Heterogenic Products



Get More Value Out of Your Forage

Forage - like grass and maize silage - is widely used for feeding cows, and it is mandatory to know all the major components and the feeding value of these products. NIR analysers have replaced most of the traditional methods analysing the forage dried and ground. The NIR analysis time per sample is less than one minute, but the drying and grinding of the sample takes several days. So there is a need for analysing the wet forage to save time and money.

Q-Interline has developed a system for analysing wet forage where it is possible to get a representative measurement of the sample giving representative results.

AgriQuant B8 with the Spiral Sampler

The AgriQuant B8 is based on the latest generation FT-NIR technology and has the following main features:

- Cutting edge spectral performance and best signal to noise ratio on the market enabling analysis of low concentrations components as well as high reproducibility
- Flexible FT-NIR platform with a range of accessories for other product types
- Intuitive InfraQuant software
- Maintenance free. The lamp has an expected lifetime of ten years
- 3 years full warranty

Get Your Sampling Right

The sample is analysed by diffuse reflection measurement in a patented AgriTube. By rotating the tube and bringing it forward at the same time during the analysis, a very large area of the sample is scanned ensuring representative sampling and reducing effects from product heterogeneity.

For dry materials the analysis is conducted in partly filled short tubes introducing a tumbling & mixing during analysis securing that all parts of the sample has the same probability to become part of the spectrum in line with the fundamental sampling theory.

For wet materials the fresh sample are stuffed into 250 mm long AgriTubes. The area analysed can be as large as 375 cm² and this is 20 times larger than the area scanned using a normal petri dish based system.

The AgriTubes have a large opening for easy filling. After analysis the sample can easily be removed since there lids in both ends of the tube.

The AgriTubes have a customizable length to adapt to available sample mass. The workflow can be optimized in the lab with multiple cost cuvettes.

See a video presentation of the patented AgriQuant B8 at q-interline.com or watch our YouTube channel and experience how easy it is to perform the analysis on the AgriQuant B8.

The Spiral Concept

375 cm² Truly Representative Sample Surface Scanning

Calibration

The AgriQuant B8 is pre-calibrated against certified methods for a variety of components and further local models can be added by the user or by Q-Interline or our representatives.

Comprehensive samples of wet maize silage and samples of wet grass silage have been gathered from various parts of Europe and used for the calibrations. The material was scanned properly wet & dry and corresponding chemical information was derived by certified labs.

The NIR region contains both combination and overtone information. The most sensitive bands are those derived from the O-H, N-H and C-H stretch region well covered by the AgriQuant which is sensitive in the entire NIR region from 4.000-10.000 cm⁻¹ (equivalent of 1.000-2.500 nm).

All models supplied by Q-Interline are based on Partial Least Squares (PLS) combining the spectral data and the chemical information into robust predictive models.

Validation was performed over an extended period of time covering seasonal variation. All validation was performed with independent samples not part of the calibrations.

Conclusion

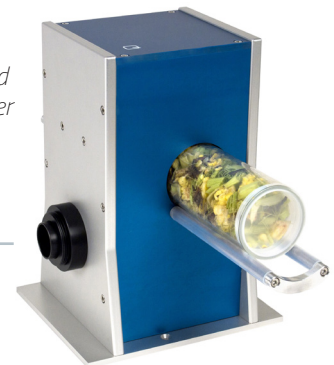
The AgriQuant B8 is a strong FT-NIR analyser for wet and dry forage. It supplies results in less than 2 minutes for multiple components. The AgriQuant B8 offers to eliminate drying and grinding of the sample and save both time and money.

The AgriQuant B8 is excellent for analysing heterogenic samples since the sample area analysed can be as big as 375 cm².

The AgriQuant B8 comes with the intuitive InfraQuant software which guides the operator through the steps of the analysis and the results are displayed with easy to understood color codes, reflecting the validity of the results.

The system can be used with barcode option for easy entering of sample ID and it can also be equipped with a label printer to get the result on a label. Analytical results are automatically exported in .xml file format for easy integration with the Lims or Sap systems.

*The Patented
Spiral Sampler
with the
AgriTube*



*AgriTube
with
Wet Silage*



*AgriTube
with
Dry Silage*

The Spiral Concept

Q-Interline has invented and patented the Spiral Sampler specifically for the AgriQuant B8 platform.

The Spiral Sampler uses patented technology and takes representative scanning to a whole new level, which makes it ideal for analysis of heterogenic products like fresh forage, maize silage, compost, soil and much more.

The Spiral Sampler is unique because it, unlike any other sampling accessory, makes it possible to scan up to an amazing 375 cm² of the sample in less than two minutes. A normal spinning petri dish only scans 18 cm². The Spiral Sampler scans thus approximately 20 times more than traditional petri dish solutions.

The Spiral Sampler is fast and easy to handle. It produces highly reliable analytical data because the sample measures are representative. The reproducibility is therefore unsurpassed as are the results achieved and the cost per analysis is very low. With the Spiral Sampler it has become much easier to analyze heterogenic products than ever before.

Application Performance Specifications

A single number cannot specify performance of an application; rather it is the accumulated performance of parameters such as representativity, repeatability, robustness and agreement with wet-chemistry. The application specification below for

maize and grass silage includes fresh and ensilaged material from various species and geography. The application is not limited. It is also a strong tool for analyzing pasture, hay silage, lucerne, cereal silage and similar products.

Specifications of Range and Agreement (SEP) when compared to certified reference methods

	Maize Silage Dry		Grass Silage Dry		Maize Silage Wet		Grass Silage Wet	
	Range	SEP	Range	SEP	Range	SEP	Range	SEP
Dry Matter %					28-36	1	16-89	2.1
Crude Protein %	6-10	0.5	6-27	0.7	5-9.5	0.5	6-20	0.9
Crude Fibre %	14-34	0.7	17-40	0.7	17-22	0.5	22-30	0.8
NDF %	30-64	1.4	30-70	1.3	31-40	1.7	43-69	1.8
ADF %	18-31	0.8	20-40	1.1	23-31	0.8	28-38	1.4
In Vitro/Digest	62-80	1.5	50-85	2.0	66-76	1.5	58-68	1.5
pH	3.5-4.5	0.1	4-5.5	0.1	3.6-4.0	0.1	3.7-4.3	0.1

Table 1: Typical performance of the application of the AgriQuant B8 when compared to wet-chemistry. Final performance will depend on performance of reference methods, drying method, weighing errors etc. used for calibration and validation. All numbers reported on dry-basis.

* Feasibilities has shown that larger ranges are possible with elevated SEP values.

Other Feasible Parameters

Ammonium-N	D-Cell	Cellulose	Oil	Metabolisable Energy
Lact.Acid g/kg	Ace.Acid g/kg	Sugar g/kg	Starch%	Ash%

Reproducibility Performance

The large area or mixing mode in dry & wet modes respectively secures that the entire sample is part of the NIR measurement, securing a representative scanning of the sample. This results in very high performance for the AgriQuant B8 in terms of reproducibility. Whether an Agritube is rescanned "as is" or the sample is repacked the AgriQuant B8 guarantees to deliver consistent results with variations between sub-subsequent measurements within the agreement tolerances.

In practice, this means that analyzing the sample once is sufficient, saving time and trouble, yet maintaining high trust in the results.

Robustness Performance Specifications

The Spiral applications are very robust over time, i.e. the calibrations has been developed under varying temperature conditions, using multiple AgriTubes, multiple instruments, multiple reference labs with solid reference method performance, multiple species of the crops etc. Yet any calibration will always perform at it's best with local adoption to account for specific local sources of influence.