

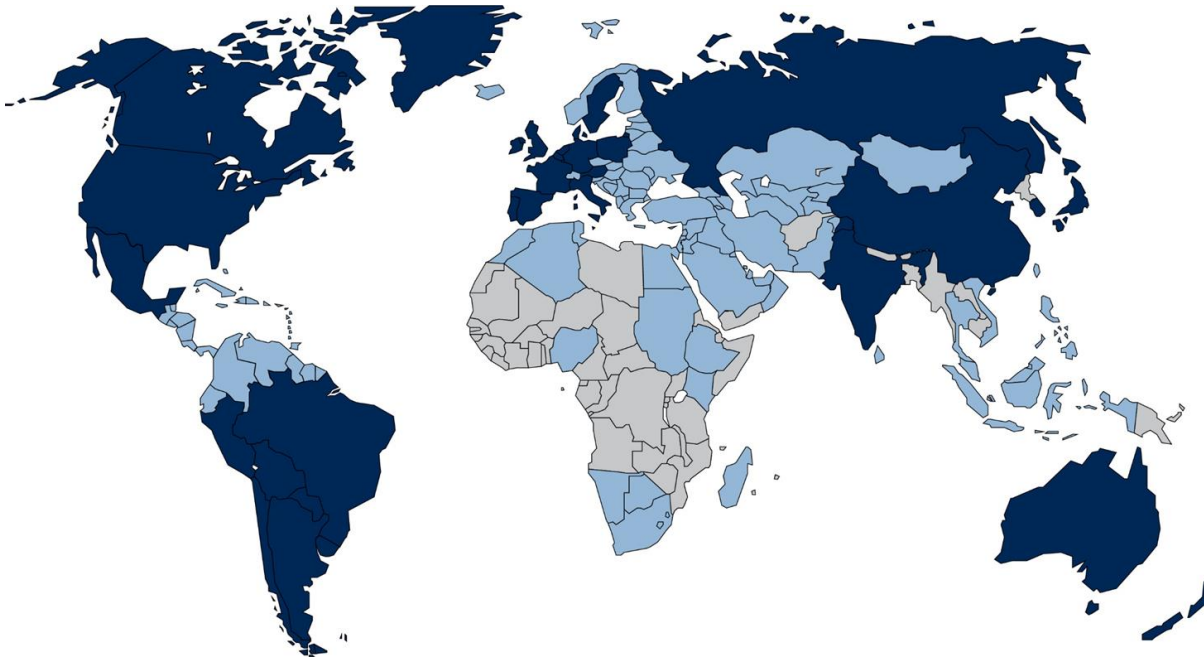
NIR TECHNOLOGY IN WHEAT QUALITY ANALYSIS.

Diana Gomez Williams 15 March 2018



WHO IS FOSS ?

FOSS is a Danish Company with worldwide presence that works on adding value to our customers in improving quality and optimizing production .



Subsidiaries

Distributors

FOSS VISION IN FOOD ANALYSIS

We want to contribute to the **rational use of our planet's natural resources** And thus to the nutrition and health of the people of the world.

We want to provide the world's best Dedicated Analytical **Solutions**

We want to be a world-class company based on competent and engaged employees striving for **top customer satisfaction**

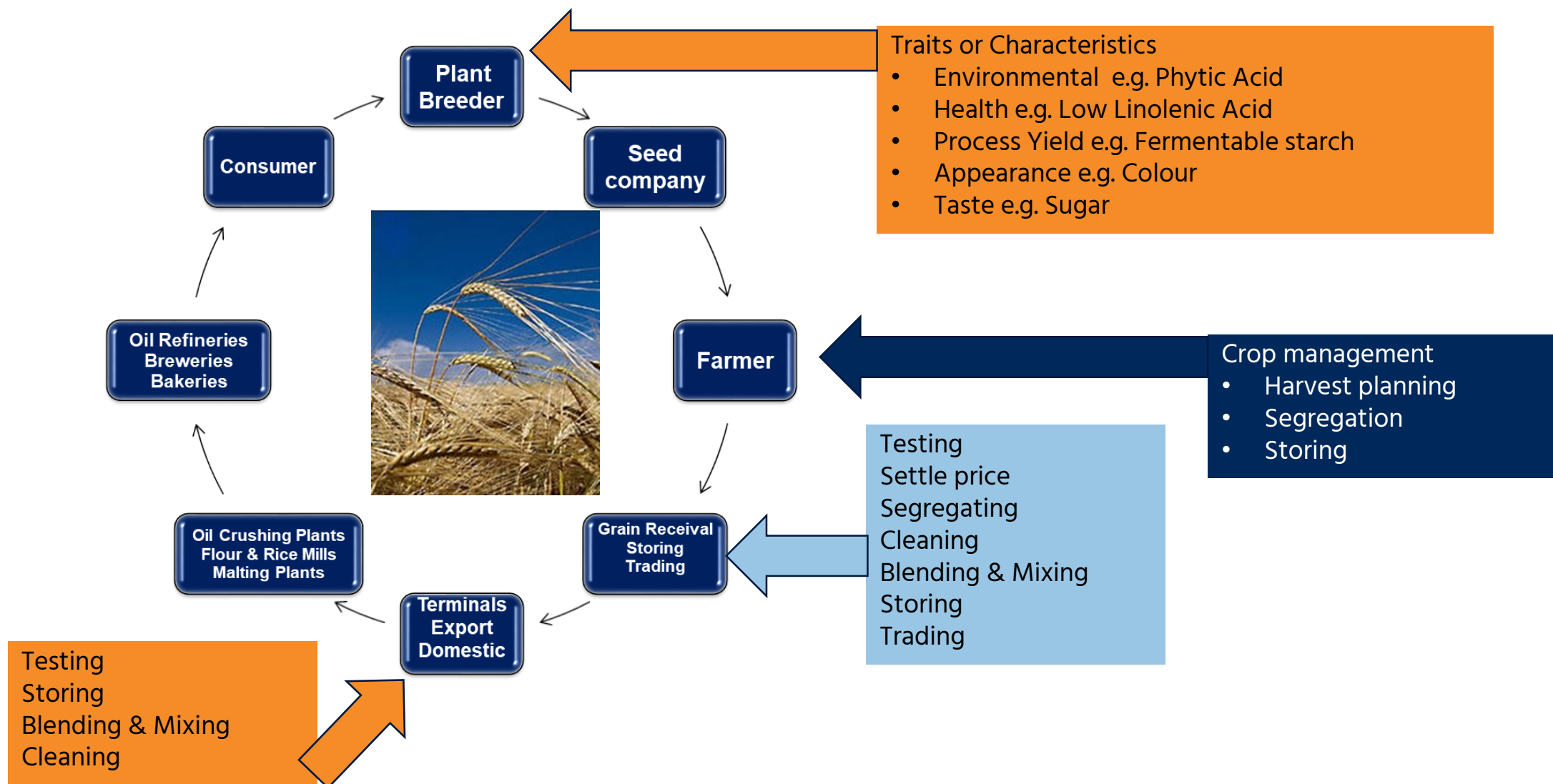
Dedicated analytical solution is more than just equipment. It is about having all you need to get analysis results with minimal impact on your resources



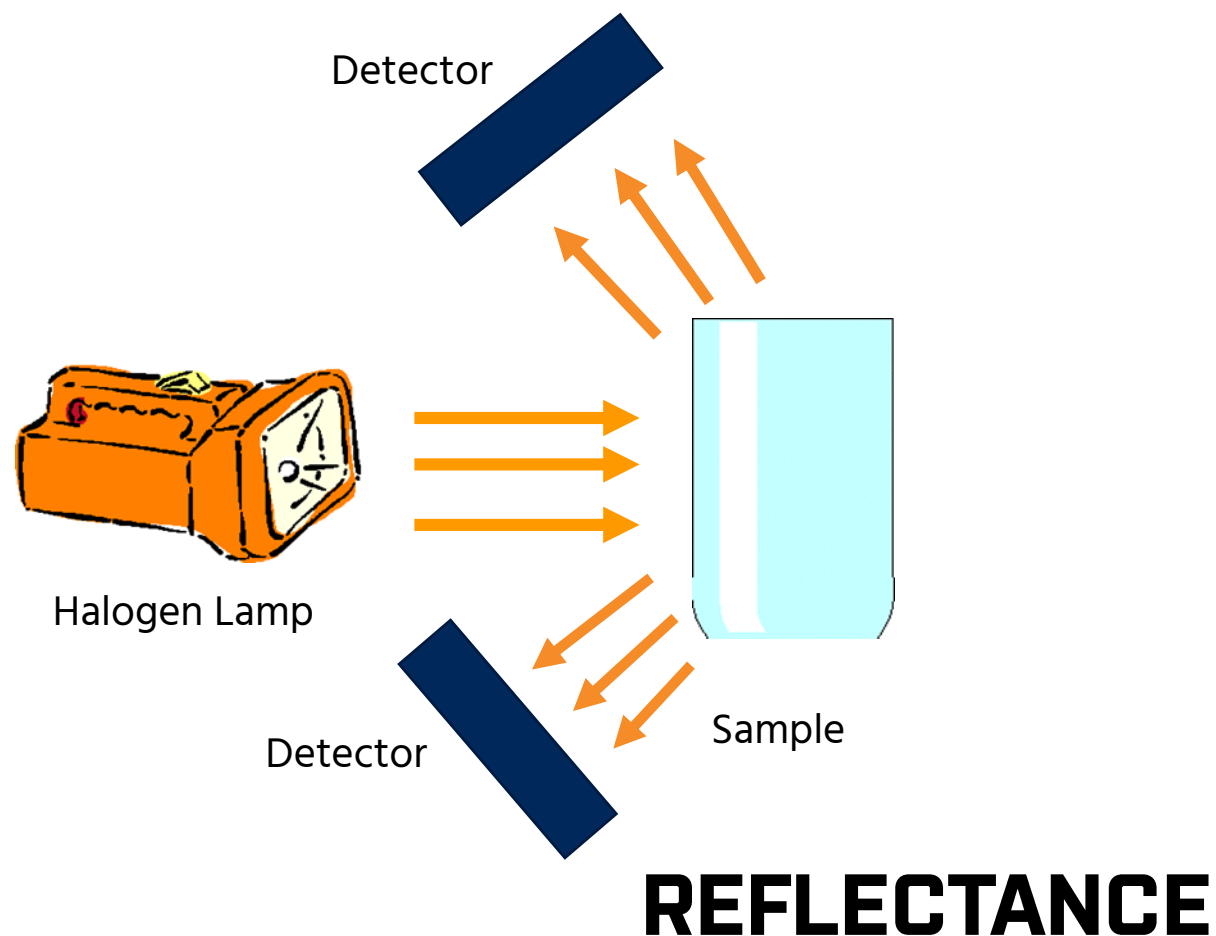
The annual FOSS Grain Network meeting is taking place in Hamburg Germany.

“Grain Networks have been around for many years, but there is more to come”, said FOSS CEO Kim Vejlbj Hansen <in his opening speech.

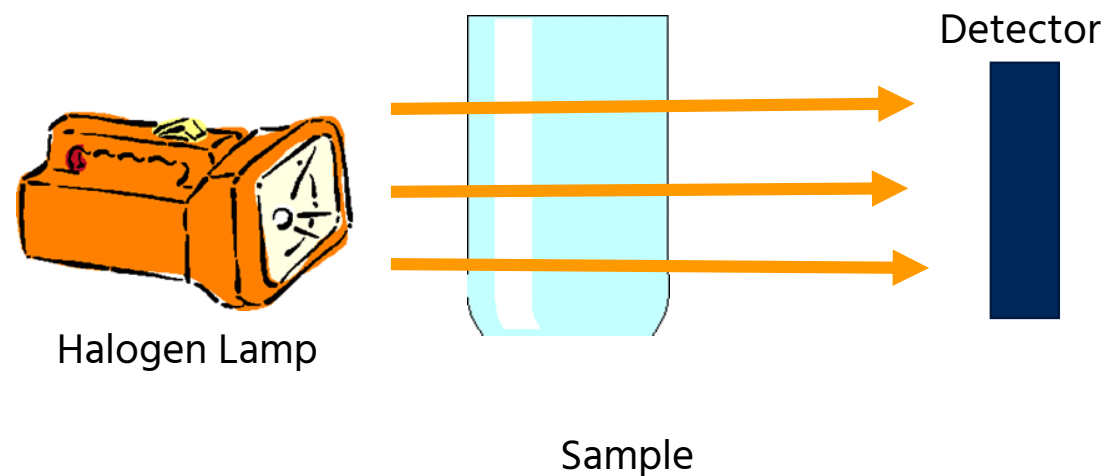
WHY NIR TECHNOLOGY IN WHEAT QUALITY ANALYSIS ?



What is NIR-Spectroscopy ?

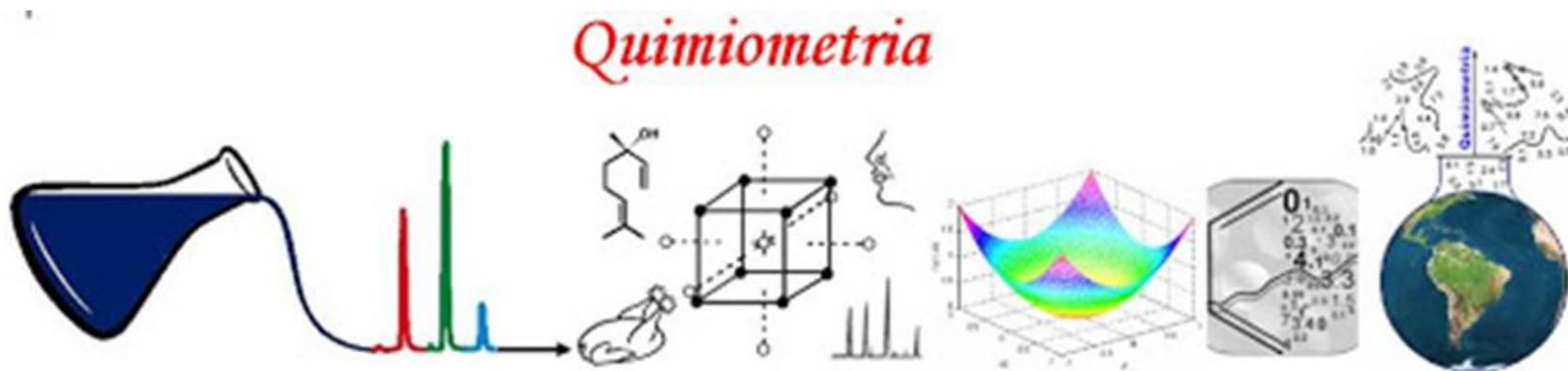


TRANSMITTANCE



NIR TECHNOLOGY & CHEMIOMETRICS

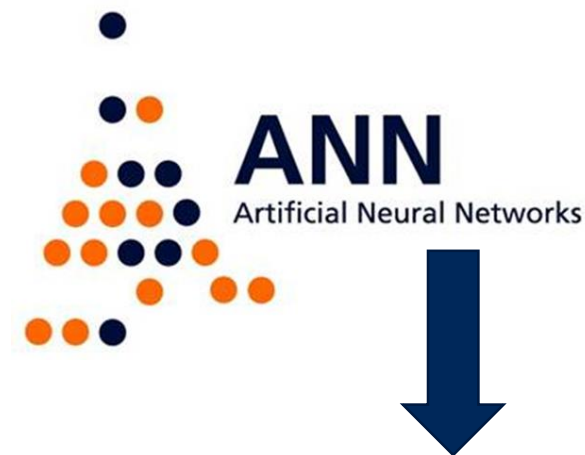
Chemometrics:
Application of statistical or
mathematical methods to chemical
data



SPECTRA + CHEMOMETRICS = NIR CALIBRATIONS

- Accomodate large data bases
- Handles non Linear Relationships
- Superior Stability
- High Accuracy
- Excelent transferability

GLOBAL CALIBRATIONS



	MLR	PLS	ANN
Sample to sample variation that can be calibrated for	Small 30 – 100 samples are used in a calibration Many different calibrations needed	Large 50 – 400 samples are used in a calibration	Very large Minimum 1000 samples are used in a calibration Large geographical variation in one calibration
Transferability	Poor	Good	Excellent
Applicability	Limited	Large	Very large Global

QUALITY PARAMETERS USING NIR & ANN CALBRATIONS

FOSS has Ready to use ANN calibrations :

- Wheat : Ash, Protein, Moisture, Wet gluten, Zeleny, Starch
- Wheat Flour: Moisture, Protein, Ash, Water absorption, Wet Gluten



Compared with traditional methods for the determination of these parameters, NIR with ANN calibrations, is rapid, simple, and repeatable

FOSS can also support customers in the development of their own calibrations

DEVELOPMENT OF CALIBRATIONS WITH NIR & ANN

Studies are being performed around the world to develop and validate the performance of NIR analysis with ANN Prediction Models, the potencial using ANN is enormous.

- **P (Tenacity)**
- **P/G**
- dough development time
- dough stability time
- degree of dough softening
- extensibility (L)
- Strength
- and baking test (loaf volume and loaf weight)

"We succeeded to predict 6 of the 14 quality parameters with high accuracy by using ANN. The results indicate that this technique could be considered as a valuable tool for wheat flour quality prediction, demonstrating a high level of accuracy for moisture content, protein content, P, P/G, Zeleny sedimentation, and water absorption. Especially, Zeleny sedimentation value is predicted with high accuracy than the other studies in the literature."

WHITE PAPER: Prediction of wheat quality parameters using near-infrared spectroscopy and artificial neural networks

Ayşe C. Mutlu • İsmail Hakkı Boyacı • Hüseyin E. Geniş • Rahime Öztürk • Nese Basaran-Akgül • Turgay Sanal • Asuman Kaplan Evlice

WHICH NIR INSTRUMENTS USE ANN CALIBRATIONS?

APROBACION NTPE
USDGRAIN INSPECTION APPROVAL

· ISO 12099:2010 Food & Cereals



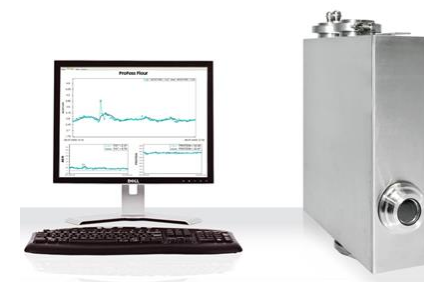
INFRATEC™



NIRS DS2500™



INFRATEC SOFIA™



PROFOS™



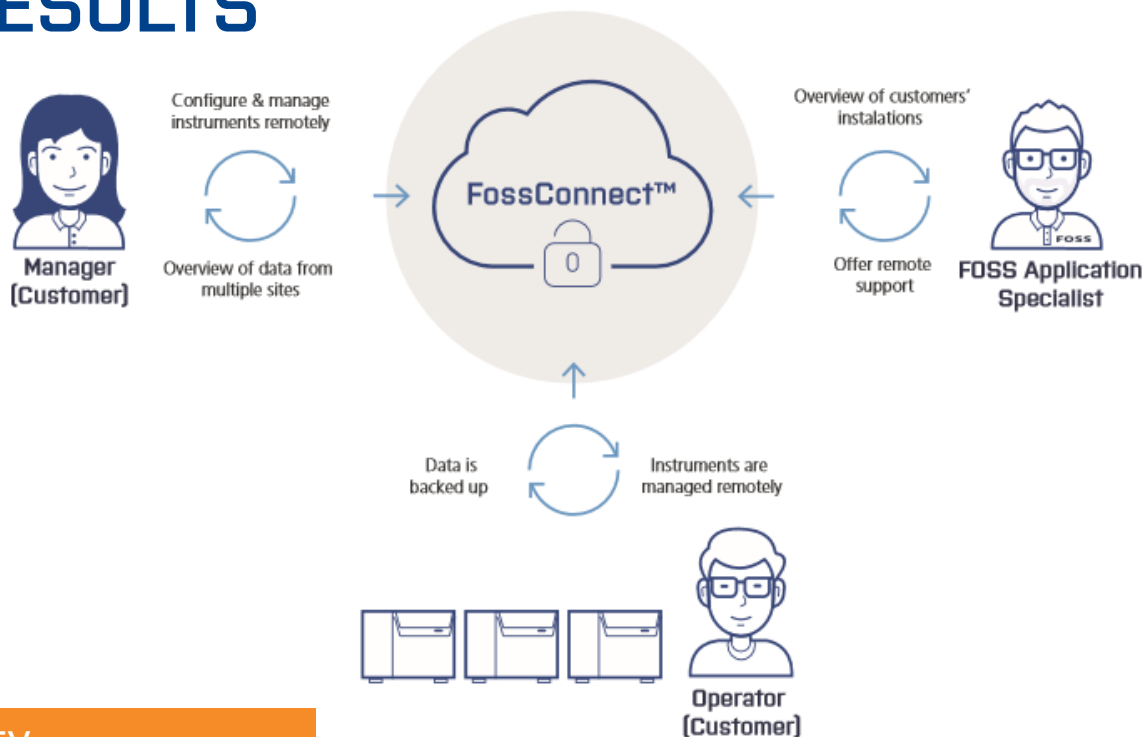
DA1650™

APROBACION GIPSA

DS/EN ISO 9001:2008

DATA HANDLING OF ANALYSIS RESULTS

FOSS Works in analytics beyond measure:
Data easy management is essential now a days, so FOSS adds value to the results you get from your equipments :
FOSS Connect™.



GRAIN NETWORKS : FOSS Connect™
linking analytical instruments to a control hub to gather valuable data from multiple analyzers in one place & to remotely configure instruments and calibrations

Traceability

Support

Manage from a desktop

FossAssure™

range of digital services designed to make your daily operations as simple as possible

- FossAssure™ Instrument
- FossAssure™ Calibration

SOME OF FOSS GRAIN NETWORKS





Thankyou for your attention