

APPLICATIONS OF NEAR INFRARED SPECTROSCOPY IN AGRICULTURE

The aim of the course is to briefly summarize the reasons of the interest in the use of near-infrared spectroscopy for addressing emerging food quality and safety issues.

The course will describe the use of NIR to assess the quality and safety of agro-food products and to control food processing at the laboratory, field and industry levels. In particular, it describes the theory and application of NIR spectroscopy in the food, feed and non-food sectors. The properties of the electromagnetic radiation characteristic of molecular vibrational spectroscopy will be briefly explained, highlighting the measurement mode and spectra acquisition procedure. Instrumentation for laboratory and in situ analysis

will be outlined and sample presentation techniques are discussed. One section of the course will be devoted to data treatment and interpretation; as well as the proper use of the statistics. Overview of the chemometrics tools for multivariate calibration for both quantitative and qualitative analysis purposes will be provided.

The course will also summarize recent applications of NIR to tackle food, feed and non-food problems. Focus will be made on the main outputs and most promising trends that should lead to the development of a new methodology. The information provided will relate to the routine application of NIR for quality control at the laboratory level and for process control of various food products.

The following topics will be addressed:

- What is NIR? Just the result of the interaction of the light and the matter?
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- Right sampling and right sample presentation make the differences!
- Data-treatment, statistics and validation: make it simple!
- Demonstration: from the spectra to the validated and exploitable results.
- Routine quantitative analysis: examples and perspectives.
- Routine qualitative analysis: examples and perspectives.
- A challenge: the analysis of manure by NIR.
- Best NIR practices, 30 years of experience.



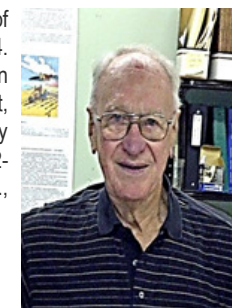
Requirements: No specific pre-requisites are required. However, basic knowledge in near-infrared and chemometrics is assumed.

TRAINER PROFILE



Dr. Pierre Dardenne is Agronomy Engineer from Gembloux Agricultural University. In 1980, he has been employed by the Walloon Agricultural Research Centre (CRA-W) to lead researches in Near Infrared Spectroscopy (NIRS), domain that he did not leave since. Since 2000, he leads at CRA-W the department, extended and renamed on 1 st January 2010 "Valorisation of agricultural products". He is leading groups of scientists working on biomass, feed and food chemical composition, contaminants (heavy metals, antibiotics), milk microbiology and GMO detection, authenticity, anti-fraud and food safety are keywords in many research programs of his department. The department has 85 employees with 30 scientists. He was awarded by the Tomas Hirschfeld award in 2002 for his contribution to NIRS and he is immediate Past Chairman of ICNIRS.

Dr Phil Williams was graduate B.Sc. Hons 1st Class 1954; Ph.D. 1956 Univ. of Wales Aberystwyth. Cereal Chemist, Wagga Wagga, NSW, 1958-1964. Specialities: wheat kernel texture, protein-testing methods. Post Doctoral Grain Research Laboratory (GRL), Winnipeg, Canada, 1964-65. Analytical Chemist, GRL 1965-2002, specialities, protein-testing methods, near-infrared spectroscopy (NIRS) 1972-present. Pioneered application of NIRS in industry, February, 1972-75. Retired GRL March 2002. R & D Director PDK Projects, Nanaimo B.C., Canada, 2002-present, specialities. application of NIRS to soils and manures.



Dr. Vincent Baeten is head of the Food and Feed Quality Unit of the Valorisation of Agricultural Products Department of CRA-W (Belgium). The Food and Feed Quality Unit is involved in the development of methods based on electronic and vibrational spectroscopy (Fluorescence, NIR, NIR imaging, MIR, Raman), optical microscopy and chemometrics. In the last 15 years, he has participated to several European projects dealing with quality and safety of food and feed including aspects of quality, safety, traceability and authentication (STRATFEED, TYPIC, MEDEO, CO-EXTRA, TRACE, SAFEED-PAP, FEEDforHEALTH, CONFIDENCE, QSAFFE, FOODINTEGRITY). Dr Vincent Baeten has been awarded of the 2011-Q-Interline Sampling Awards.

Schedule: 8 am – 12 am
13:30 pm – 17:30 pm
 (October 18, 2015)

