TOPIC: NIR, MIR and Raman Spectroscopy in Food / Feed Analysis

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BIOGRAPHY

Dr. Vincent BAETEN is part of the statutory staff and is project leader at the Quality Department of Agricultural products of CRA-W since 1999. He got his Engineer degree (1993) and PhD (1998) in Agricultural Sciences from the Catholic University of Louvain. Since 2006, he leads at CRA-W the group of spectroscopy and chemometry that develop alternative physical methods for the quality, the authentication and the traceability of agro-food products and for feed safety. He has more than 15 years of experience on European projects. In 1996-98, he was awarded with a Marie Curie Fellowship at the Instituto de la Grasa of Seville (Spain) where he was involved in demonstrating the potential of alternative techniques for the detection and quantification of food product adulteration. Since 1999, he has been participating to the improvement of reference methods and the development of alternative methods for the detection of constituents of animal origin in feed. Since July 2006 he is the director of the Community Reference Laboratory for animal proteins in feedingstuffs (CRL-AP, www.crl.cra.wallonie.be). He has also a wide expertise in the management and administration of European projects. He has more than 30 publications linked to the MBM detection problematic. He was a member of the Scientific Committee of the Belgian Federal Agency for the Safety of the Food Chain (2004-2008). He participates and is member of the scientific committee of the TRACE IP (www.trace.eu.org) project, CON*FF*IDENCE (www.conffidence.eu) and COST Feed for Health (www.feedforhealth.org) European initiatives. These projects concern the traceability and the safety of food and feed products. He is also the coordinator of the European SAFEED-PAP project aiming the development of analytical methods for the species detection of processed animal proteins (http://safeedpap.feedsafety.org).

ABSTRACT

Which role for vibrational spectroscopy techniques (NIR, MIR and Raman) in food quality and safety?

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In the recent years, the applications of vibrational spectroscopy techniques to food quality and safety issues have drastically increased. This trend is essentially due to the development of new generation of spectrometers which are more robust, easy to use, flexible, able to work in network and suitable for on-line and on-field applications. In addition, the last developments of microscopic and imaging techniques based on the vibrational spectroscopy are full of promises for the field of food quality and safety. Today near-infrared (NIR), mid-infrared (MIR) and Raman spectrometers are more and more considered as classical instruments and used in food and feed analysis laboratories. The success of these techniques is their versatility allowing to develop and to validate methods for a large number of quality and safety issues. Moreover, they have several features (e.g. use of internal standards) that facilitate the running of these techniques in a quality system (e.g. ISO 17025).

The Walloon Agricultural Research Centre (CRA-W) is working since more than 20 years in the development of spectroscopic based solutions for the food and feed industries. Nowadays, it has a worldwide expertise in the field of management of spectral data-base and large spectrometers network. Network of instruments allow to share the same data-bases between instruments and to assure that the analytical results provided by different labs from a same company are consistent. More recently, it has been demonstrated that large data-bases can be used to tackle food and feed safety issues (e.g. melamine). On the other hand, microscopic and imaging spectroscopic techniques have been used with success in the development and validation of methods for the detection of meat and bone meal in feedingstuffs. This approach is tested and will be validated in the work of the SA*FE*ED-PAP project (safeedpap.feedsafety.org). The interest of imaging techniques is also studied in the CON*FF*IDENCE project (www.conffidence.eu) in order to detect plant contaminants in cereals. The fingerprinting nature of the vibrational spectra is used in the TRACE project (www.trace.eu.org) for traceability and authenticity issues (adulteration and geographical origin).

Keywords: spectroscopy food feed safety traceability

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