

## FASIS Highlights, November, 28, 29 & 30 2001

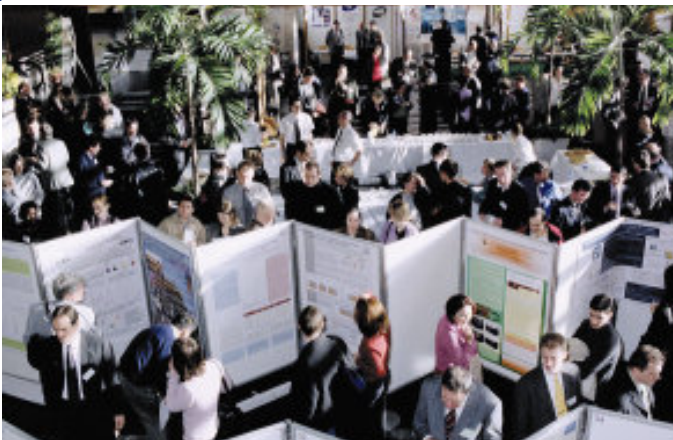


Photo : D. Roblin

Scientific exchanges in the coffee break.

*This year with BSE in the forefront of most of the food industry's concerns, a number of topics focused on beef traceability and the methods developed to enforce BSE control measures. Further sessions dealt with the authenticity of ingredients and raw materials providing details of the latest analytical techniques from laser fluorescence spectroscopy, stable isotope analyses and on-line hyphenated techniques like enantio-MDGC-IRMS. The final session, new this year, was devoted to food safety aspects.*

*Read on for edited highlights of the conference. Unfortunately it's not possible to find space for everyone in this special edition so apologies to those that have been left out. You can, however, read a full summary of all the talks on <http://www.euofins.com>*

**T**he 6th Symposium on Food Authenticity, FASIS, was held at the Cité des Congrès in Nantes (France), on the 28, 29 and 30 November, 2001. It brought together an international audience of over 300 participants, from 27 different countries including the US, Canada, Mexico, 11 EU Member States, and representatives from Hungary, Czech Republic, Georgia and Romania. 34 conferences and integrated poster sessions, gave everyone the opportunity to get up to date with some of the latest developments in food analysis. The variety and breadth of topics packed into three days were a clear demonstration of the considerable efforts that are being gone to by the scientific community to ensure the quality, authenticity and safety of the food on sale to the consumer.

The conference was opened by Dr. Gilles Martin, CEO of EUROFINS SCIENTIFIC, who looked back over the previous ten years of food authenticity, from the first symposium organised by the company in October 1991. As he pointed out, the decade has seen a major shift in focus in authenticity concerns and this has been mirrored by the change in topics dealt with at each event by the conference speakers. One thing was certain – there has never been a shortage of authenticity issues and food adulteration topics to fill the programme !



Photo : D. Roblin

Dr Gilles Martin opens the 6th FASIS.

### In this issue

**PRESENTATION ■ BSE – ENSURING TRACEABILITY ■ FASIS EXHIBITION SPACE  
 ■ AUTHENTICITY OF FOOD FLAVOURS AND INGREDIENTS ■ POSTERS ■ FOOD  
 SAFETY – ANALYSING, MEASURING AND MONITORING THE RISKS**

## BSE - Ensuring traceability

**BSE** was first identified in UK cattle in 1985 and in the ensuing years, specific legislation was introduced to control trade in beef. In 1996, when the link between BSE and vCJD was established, the Over Thirty Months scheme or OTMS rule was brought in, stipulating that no cattle over the age of 30 months was allowed to enter the human food chain. The traceability required to enforce this rule was inadequate at the time and the potential for fraud was high – the animal's value could be more than halved just the day after reaching the age of 30 months ! Working for Somerset Trading Standards in the UK, Dr Stuart Musgrove took part in several investigations into cases of alleged fraud. In his talk, he painted a black picture of deception and illegal practices, with examples of forged ear-tags and falsified cattle passports. And although Dr Musgrove ended on an optimistic note, today's traceability systems have improved radically, he still recommended the use of independent auditing to make sure the system works correctly.

One such auditing approach is the EUROFINS-TAG® system presented by Dr H  l  ne Pfitzinger of EUROFINS SCIENTIFIC that matches DNA fingerprints from meat samples taken at various stages of the production chain with reference samples held in a data bank. The genetic marker used to identify each animal can be microsatellites, but the approach presented by Dr Gregor Durstewitz of the Technical University of Munich, based on single nucleotide polymorphisms



*FASIS Speakers on Day 1. From the left, Dr W. Rieth, SGF, Germany, Dr C. Simoneau, Institute of Health and Consumer Protection, JRC Ispra, Italy, Mr. G. Le Bozec, General Food Directorate, France, and Dr S. Musgrove, Somerset Trading Standards, UK.*

(SNPs) is also suitable. The animal's genotype at a selected number of SNP loci is represented as a string of digital characters (0 or 1), resulting in its Digital DNA signature. An SNP database is available on the internet ([www.SNP.zoo.de](http://www.SNP.zoo.de)).

Further BSE control measures introduced in 1997 led to the development of new analytical techniques to enforce them. Dr Ernst L  cker of the University of Leipzig presented a method for the detection of banned Specified Risk Material (SRM), composed mainly of tissues of the central nervous system. The method, an immunological detection of a marker-protein, the neuron speci-

fic enolase (NSE) in the western blot, has now been internationally validated and a commercial test kit is available.

Meat and Bone Meal, MBM, has been prohibited in all animal feedstuffs since June 2000. An improvement on the official microscopy method for MBM detection was presented by Dr Vincent Baeten of the Belgian Agricultural Research Centre in Gembloux. A Near Infra Red Microscope (NIRM) is used to detect various particles in the feedstuffs which are then identified from their NIR spectral features. The system is quick and easy to use and can also discriminate between different animal origins.

### FASIS Exhibition Space

During the symposium, an exhibition space located near the coffee break and conference hall gave 8 companies the opportunity to present their products or services to senior executives and decision makers in the food business.

Very complementary to the conferences and posters, the exhibitors demonstrated concrete examples of implementing analytical tools and setting up knowledge exchange networks, all necessary tools for a wider diffusion and application of the scientific work presented at the symposium in today's food quality control.

- WATERS** (analytical instrument manufacturing)
- BRUKER** (analytical instrument manufacturing)
- MICROMASS** (analytical instrument manufacturing)
- RHONE DIAGNOSTICS** (instruments and supplies for food analyses)
- AES** (instruments and supplies for food analyses)
- THERMO FINNIGAN** (analytical instrument manufacturing)
- C-CUBE** (Scientific and technical services)
- WINELLO** (information and documentation services)

But what if the consumer decides not to eat beef at all ? A review of methods for the detection of ruminant meats in raw materials and finished products was given by Dr Michaela H  hne of the Nestl   Research Centre, Switzerland. The work compared DNA-based methods and ELISA tests, with beef-specific PCR coming out on top for sensitivity and specificity compared to the immunoassays. Although neither worked well in strongly heated products.

And finally an interesting response to the BSE crisis from Dr Antonio Delgado, CSIC, Granada. The use of stable isotopes to study human and animal diets has been well established. <sup>15</sup>N/<sup>14</sup>N isotope ratios for example, have been shown to increase from herbivores to omnivores to carnivores. According to Dr Delgado, this can be used to tell whether cattle has been fed animal protein-containing feedstuffs.

# Authenticity of food flavours and ingredients

Flavour and aroma are important aspects of consumer acceptance criteria and here, too, authenticity issues can arise. Professor Armin Mosandl, J. W. Goethe University, Frankfurt, reviewed some of the most sophisticated methods for flavour and essential oil authentication, including a range of online coupled techniques from capillary-GC isotope ratio mass spectrometry (cGC-IRMS), enantioselective capillary GC (enantio-cGC) to the advanced enantio-MDGC-IRMS. The latter provides the most comprehensive authenticity evaluation and has been applied to the authentication of products such as bergamot oil.

One of the main interests of the flavour industry is to be able to differentiate between natural and synthetic or semi-synthetic sources. In the case of vanilla, for example, its considerable commercial importance to the food industry coupled with a shortage of supply of the natural substance has led to the development of a number of alternative sources. Vanillin can be obtained from natural vanilla beans, synthesised from guaiacol and lignin and recently, it has also been produced by biotechnology, using ferulic acid, from bran or sugar-beet pulp, or eugenol, from clove oil, as the starting products. Two speakers gave complementary insights into this important topic. Dr Nicholas Walton from the Institute of Food Research in Norwich concentrated on the different biosynthetic pathways associated with the production of vanillin.

Dr Karine Wietzerbin of Eurofins Scientific presented the latest results obtained using quantitative deuterium NMR (SNIF-NMR®) and <sup>13</sup>C IRMS in order to differentiate these new origins.

Professor Peter Horn from the University of Munich also recommends isotopic signatures to provide information on product origin. In his talk he described the added benefit of including heavy isotope content - strontium, lead, neodymium - to build up a picture not only of naturally-occurring elements, but also of those which are anthropogenic in origin. Dr Eric Jamin of Eurofins Scientific showed the use of a multi-component, multi-element and multi-site approach, in which an isotopic profile is built up for different food matrices in order to address authenticity issues.

## Interpreting analytical data

With increasingly powerful analytical techniques available, care needs to be taken in how we interpret the data produced, as Dr Peter Farnell, LGC in Teddington, UK warned. With the introduction of the QUID Directive (97/4/EC), all characterising ingredients must be quantitatively declared on the label. But as Dr Farnell pointed out using the example of meat content, the amount of an ingredient often has to be measured indirectly, in this case from nitrogen and fat measurements. Natural variations, differences due to processing and national habits across the European Union,



Dr Claude Guillou, Joint Research Centre of the European Commission Ispra, Italy, chairman of the authenticity session

can lead to some surprising discrepancies in the final output. LGC is currently coordinating a European-funded Thematic Network to help ensure that the problems of interpreting test measurements are clearly defined and to take into account different perspectives in the interpretation that may arise in different EU countries.

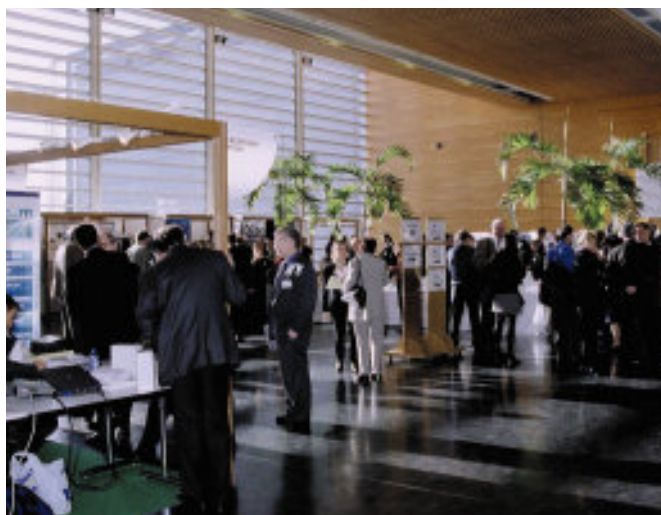
## Posters

### High quality posters provided a wealth of information

41 posters were on show during the coffee and lunch breaks covering a wide range of topics on food authenticity and food safety.

These included biomolecular techniques to identify fish and animal species and even the genetic origins of cocoa beans and chocolate, isotopic techniques to determine the geographical provenance of asparagus, an example of NIRS to authenticate traditional Iberian pig sausage, and the potential of fluorescence spectroscopy as a rapid screening method of bacteria such as *E. coli* in food products.

A full list of posters and their authors is available on [www.fasis.com](http://www.fasis.com)



FASIS Exhibition Space.

# Food safety - analysing, measuring and monitoring the risks

Photo : J. Merckling - Alimenta



Dr Sam Page of the World Health Organisation.

For the first time since these conferences have been organised, a session on food safety was included in the programme. It began with a global outlook on risk analysis, given by Dr Sam Page of the World Health Organisation in Geneva. The WHO and the FAO of the United Nations have organised food safety risk assessment activities since the 1950s, dealing with food additives, contaminants, and more recently with microbiological hazards and foods produced by biotechnology. For Sam Page, the only way to gain public confidence is through good science and improved communication.

Transparency is important but not always possible as Corinne Courvalin explained. A research scientist for ESSEC, Paris, she has been officially-mandated to cover a number of food safety crises. Using a case study involving *Listeria monocytogenes* she described the complex decision tree of actions and reactions required following a public scare. She was unable for confidentiality reasons from providing a written version of her talk for the conference file !

Communication was also the focus of the talk given by Dr Sebastian Kastrup of Wiertz, Eggert, Jörissen GmbH in Hamburg. He presented the newly-set up European Mycotoxins Awareness Network (EMAN), an EC-funded group aiming to provide communication links between industry, scientific research groups and government bodies on a number of aspects related to mycotoxins. More information is available on [www.mycotoxins.org](http://www.mycotoxins.org).

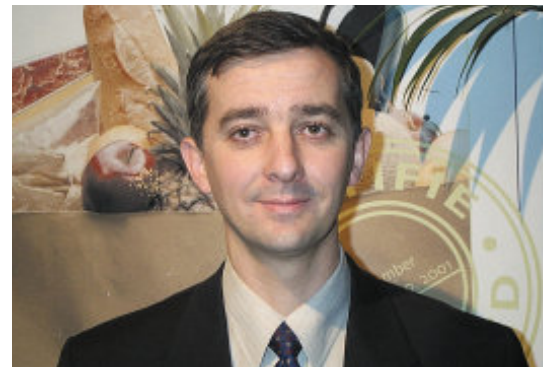
One session cannot hope to provide an exhaustive coverage of food safety aspects and the programme could only deal with some of the major problems facing the food industry. Reports on the latest analytical techniques to detect organic contaminants - remember the dioxin scandal in Belgium in 1999 - and pathogenic micro organisms such as *Legionella pneumophila* and marine and fresh water algal toxins were given.

In order to ensure the safety and quality of the food they sell, the major European retailers carry out regular inspections of their suppliers to check the quality management systems in place. A centralised approach followed in the UK, with the BRC (British Retail Consortium) standard for accredited inspections was presented by David Richardson of Checkmate International. Elisabeth Mouton, a consultant for SC2A in Paris, described the procedures in place in France, where the retailers prefer individual audits of their own suppliers. With the proposed shake up of the European Community's food

safety and hygiene rules, placing full responsibility for food safety on the food producers, such inspections will become ever more frequent. Would the move to a pan-European accredited inspection system ease the burden on small food business, who currently have to comply with a number of different audit rules, imposed on them by different retailers, often from different countries?

The case for small food businesses in the developing countries was put by Dr Linda Nicolaidis of the Natural Resources Institute, UK. With increasing international trade, these countries are heavily reliant on the EU and North American markets for their livelihood. According to Dr Nicolaidis, the importing countries should set realistic food safety objectives that can be met by the developing nations.

The session finished with a question and answer session chaired by Dr Louis Vareille, of Panzani, France. A lot of questions probably went unasked by the tired and hungry participants at the end of this particularly packed session. A move toward a round-table style discussion to give more people the opportunity to air their views is foreseen at the next FASIS event.



Dr Louis Vareille of Panzani.

Photo : J. Merckling - Alimenta



For all information concerning FASIS your contact is:  
**FASIS Organising Committee**

Eurofins Scientific  
B.P. 42301  
44323 Nantes Cedex 3  
France

Phone: (+ 33) 2 51 83 21 00  
Fax : (+ 33) 2 51 83 21 11  
[fasis@eurofins.com](mailto:fasis@eurofins.com)  
[www.eurofins-fasis.com](http://www.eurofins-fasis.com)

The complete folder of the presentations can be ordered from the Organisation Committee (price € 220).

**DATES TO REMEMBER**  
**7<sup>th</sup> International Symposium on Food Authenticity and Safety**  
**October 15- 16-17, 2003 Nantes, France**

#### FASIS Scientific Committee :

**Chairperson: Dr. Michèle Lees,**  
**Eurofins Scientific - France**  
Mr. J. A. Bouchand, DGCCRF, France  
Dr. M. Woolfe, Food Safety Agency, United Kingdom  
Dr. C. Hischenhuber, Centre de Recherche Nestlé, Switzerland

Pr. G. J. Martin, CEAIS, France  
Dr. B. Pöpping, Eurofins Scientific, Germany  
Dr. L. Reimann, Woodson Tenent, USA  
Dr. C. Guillou, European Joint Research Center Ispra, Italy  
Dr. F. Bellatif, Eurofins Scientific, France

FCS Nantes B 408 690 576