

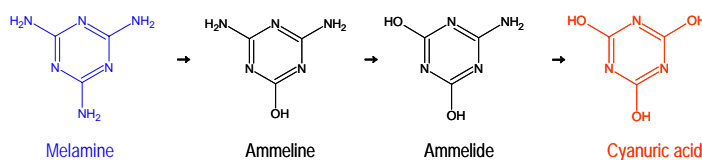
Edito

The end of the year 2008 has been particularly rich for LABERCA, first as National Reference Laboratory for food control through several sensitive dossiers (melamine in food product imported from South-East of Asia or persistent contaminants in river fishes), then as research unit (more than 20 articles published and/or in press, first valorisations in the field of metabolomics), and finally in terms of European funding (projects DEER and UNIQUECHECK, FP7) or knowledge dissemination (one SARAF extra session for DG research). Enjoy your reading.

Pf. Bruno Le Bizec

The melamine crisis

Following the human health problems reported from South-East of Asia in September 2008, in relation with the presence of melamine in food products such as milk and derivatives, the LABERCA was mandated by the French Ministry of Agriculture as referent structure in charge of organising the control of this chemical pollutant and its related metabolites (ammelime, ammelide, cyanuric acid).



The laboratory has developed and validated an appropriate analytical method for these compounds by gas chromatography coupled to tandem mass spectrometry (GC-MS/MS), disseminated on our website (<http://www.laberca.org>), and to several application laboratories in France for performing screening analyses, the confirmatory analyses being performed by the LABERCA.

In Brief

■ SARAF Certification

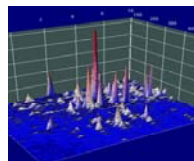
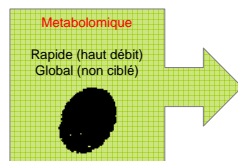
The continuous education structure School for Advanced Residue Analysis in Food (SARAF) is now certified according to the ISO 9001 : 2000 standard.

■ Visit of a Minister

In the frame of a visit to the national veterinary school of Nantes on 23th October 2008, the French Minister of Agriculture and Fishery Michel Barnier visited the LABERCA, a good opportunity to bring up the melamine crisis...

METABOLOMICS : a novel screening tool for illegal growth promoters in cattle

The development of metabolomic approaches based on liquid chromatography coupled to high resolution mass spectrometry is one research area of the laboratory which is supported by significant human and financial resources, and conducted through various research projects at regional, national, and European levels. Initiated since early 2007, and after a central phase consisting in establishing appropriate and necessary analytical procedures, these different studies today generate their first concrete results demonstrating the usefulness of this innovative approach for revealing some biomarkers signing an exposure to one or several xenobiotics.



The first valorisations of these works, related to the identification of illegal exposure to steroid hormones, corticosteroids, beta-agonists or growth hormones, are under publication.

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UNIQUE-CHECK : a multiple approaches project dedicated to the control of growth hormone illegal use and staff mobility

Marie Curie actions are a particularly popular and appreciated component among European research and development framework programs. Their initial orientation (simple financial support for mobility) progressively shifted towards a more complete tool for promoting researcher careers. In the frame of the FP7, Marie Curie actions have been grouped under the specific "people" program, the objective of which is to make Europe more attractive for the best scientists. Among the 5 defined thematics, the LABERCA with some of its European partners applied to the IAPP call to submit a collaborative project related to the growth hormone. One aim of this project will be to propose efficient and complementary tools and strategies for controlling this compound in cattle in general and in lactating cows in particular. This project was retained for funding, and is planned for 4 years from mid-2009. The second major objective will be to stimulate people mobility across several European laboratories in the field, and to promote the sharing of scientific knowledge generated within the project.



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Perfluorinated contaminants : a PhD thesis for the study of these emerging chemical pollutants

Perfluorinated compounds (PFC), e.g. PFOS or PFOA, represent a class of emerging persistent organic pollutants (POPs). These synthetic molecules, characterised by anti-adhesive properties, are present in many manufactured products as well as in the environment and represent a potential risk for human health. The global purpose of this new PhD thesis initiated in September 2008 will be to develop appropriate analytical tools for measuring these compounds at trace level in complex biological matrices. A first objective will be to generate some data regarding their occurrence in selected food products, and a second objective will be to collect some information leading to a better understanding the contamination and transfer mechanisms in the scope of identifying some solutions for controlling and/or managing this risk.

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Natural hormones : a PhD thesis to develop new screening strategies in bovines

The endogenous presence of the main natural hormones (estradiol, testosterone, progestérone) in biological fluids and tissues make the compliant / non compliant decision difficult for the analysed samples. Indeed, the extremely wide variability observed in terms of concentration levels does not allow to determine some reference thresholds for these parameters. The global purpose of this new PhD thesis initiated in September 2008 will be to investigate and evaluate 3 complementary approaches expected to lead to one or more screening criteria permitting to reveal an abuse of natural hormones in bovine: a statistical analysis of quantitative data related to the main hormone and phase I metabolites monitored in the considered samples, and 2 metabolomic approaches (targeted and untargeted).

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ECDs Workshop : a new SARAF session dedicated to endocrine disruptors

A workshop dedicated to the "Analysis of estrogenic endocrine disruptors in food: state-of-the-art and future trends from specific spectrometric approaches to emerging global transcriptomic approaches" was organised by the LABERCA from 9th to 11th December 2008, through the continuous education structure School for Advanced Residue Analysis in Food. The main objective of this workshop was to disseminate and demonstrate to the scientific community the various developments and findings gathered on this subject within the BIOCOP integrated project (<http://www.biocop.org>) conducted in the frame of the 6th FP and coordinated by Pf. Chris Elliott (Queen's University, Belfast). This event, also in connexion with the CASCADE network of excellence (<http://www.cascadenet.org>), gathered 16 participants from France, Belgium, The Netherlands, Northern Ireland, Italy, Hungary and Sweden. Internationally renowned speakers from the most recognised and reference experts in the field such as Pr. Niels Skakkebaek (Rigshospitalet, Copenhagen, Denmark), Dr. Bernard Jegou (INSERM, Rennes, France) or Dr. Alessandra Roncaglioni (Mario Negri Institute, Milano, Italy) have first introduced the complex clinical, biological, and mechanistic aspects of this thematic, respectively. Major scientists involved in the BIOCOP project were then invited to present their own methodological developments including targeted mass spectrometric measurements for steroid hormones (Bruno Le Bizec, Frédérique Courant) or phytoestrogens (Jean-Philippe Antignac), global transcriptomic profiling applied to mycotoxins or phytoestrogens (Pf. Hanspeter Naegeli, Dr. Hans Gmuender, Dr. Katerina Lancova), and finally some preliminary results in the field of metabolomics applied to the investigation of metabolic disorders induced in animal (Dr. Gaud Pinel) or human (Dr. Frédérique Courant) consecutively to a chemical exposure. Discussions were also organised so as to encourage exchange and networking within the group.

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Last Publications

- Veyrand B., Venisseau A., Marchand P., Antignac JP. And Le Bizec B. Determination of toxaphene specific congeners in fish liver oil and feedingstuff using gas chromatography coupled to high resolution mass spectrometry. *Journal of Chromatography B* 2008;865:121-126.
- Courant F., Antignac J-P, Laille J, Monteau F, André F and Le Bizec B. Exposure assessment of prepubertal children to steroid endocrine disruptors. 2. Determination of steroid hormones in milk, egg and meat samples. *Journal of Agricultural and Food Chemistry* 2008;56(9):3176-3184.
- Bichon E, Richard CA and Le Bizec B. Development and validation of a method for fipronil residue determination in ovine plasma using 96 well-plate solid-phase extraction and gas chromatography-tandem mass spectrometry. *Journal of Chromatography A* 2008;1201:91-99.
- Antignac J-P, Cariou R, Zalko D, Berrebi A, Cravédi J-P, Maume D, Marchand P, Monteau F, Riu A, André F and Le Bizec B. Exposure assessment of French women and their newborn to brominated flame retardants. Determination of tri- to deca-bromodiphenylethers in maternal adipose tissue, serum, breast milk and cord serum. *Environmental Pollution* 2009;157(1):164-173.
- Le Breton MH, Rochereau-Roulet S, Pinel G, Bailly-Chouriberry L, Rychen G, Jurjanz S, Goldmann T and Le Bizec B. Direct determination of recombinant bovine somatotropin in plasma from a treated goat. *Rapid Communication in Mass Spectrometry* 2008;22:3130-3136.
- Destrez B, Pinel G, Monteau F, Lafont R and Le Bizec B. Detection and identification of 20-hydroxyecdysone metabolites in calf urine by LC- HRMSn measurements and establishment of their kinetics of elimination after 20E administration. *Analytica Chimica Acta* 2008, Sous Presse.
- Duffy E, Rambaud L, Le Bizec B and O'Keefe M. Determination of hormonal growth promoters in bovine hair: comparison of LC-MS/MS and GC-MS/MS methods. *Analytica Chimica Acta* 2008, Sous presse.
- Bailly-Chouriberry L, Pinel G, Garcia P, Popot M.-A, Bonnaire Y, Le Bizec B. Identification of recombinant equine growth hormone in equine plasma by LC-MS/MS measurements as a confirmatory method for doping control. *Analytical Chemistry* 2008;80:8340-8347.