Agenda & Abstracts

Food safety research conference Luxembourg 2024
10 October – D'Coque Auditorium

Dear Participants,

Welcome to ALVA's research conference on food safety "Contaminants in the food chain". As food systems become increasingly complex and interconnected, it is highly important to address the diverse sources of contamination in food, feed, and food contact materials. The diversity of the topics presented at the conference today reflects the complexity of our food chains.

This conference is supported by the European Food Safety Authority (EFSA), and I am particularly pleased today to hear about EFSA's latest opinions and current activities. EFSA's expertise and commitment to protecting not only public health but also animal health contributes to safer food across Europe. We are grateful for EFSA's continuous efforts to strengthen science-based policymaking in the EU.

By bringing together experts from Luxembourg and neighboring countries, this conference aims to foster collaborations that will drive innovative solutions and improve food safety. We hope the discussions and findings presented at our conference will serve as a catalyst for ongoing cooperations and progress in ensuring the safety of our food chain.

Warm regards,

Wildschutz

Dr. Félix Wildschutz,
Director Luxembourg Veterinary
and Food Administration (ALVA)

Conference Chairs: Dr. Caroline Merten (ALVA), Dr. Arno Gutleb (LIST)
Conference organiser: Dr. Miriam Fougeras

Agenda

13h30 Registration & Coffee

14h00 Opening & Welcome: Conference Chairs & Martine Hansen, Minister of Agriculture, Food and Viticulture

14h15 **Risk assessment of feed and food contaminants: latest EFSA opinions and current activities**
Chantra Eskes, European Food Safety Authority (EFSA), EU

14h50 **Development of a multiresidue method for the quantitative determination of antibiotic residues in feed**
David Schuh, Administration of Technical Agricultural Services (ASTA), LU

15h15 **A multi-OMICs workflow employing advanced in vitro systems enabled with microfluidics for food and feed safety assessment**
Stefania-Delia Isaic, Luxembourg Institute of Science and Technology (LIST)

15h40 **Presence and risk assessment of quinolizidine alkaloids in lupin based food products**
Dr. Bram Miserez, Center of excellence for food chain quality, safety & risk assessment (CIBORIS), BE

16h05 Coffee break & poster session

16h50 **Total diet studies in France**
Dr. Véronique Sirot, French agency for food, environmental and occupational health & safety (ANSES), FR

17h25 **Per- and polyfluoroalkylated substances: a market review**
Dr. Luc Schuler, Food Chain Safety Division, Luxembourg Veterinary and Food Administration (ALVA)

17h50 **Unveiling the fate and impact of PFOA on the gastrointestinal tract and liver using advanced mass spectrometry: insights from the FLUO-GUT project**
Dr. Charlotte Stoffels, Luxembourg Institute of Science and Technology (LIST)

18h15 **Non-intentionally added substances in mechanically recycled PET – Analytical aspects and new purification methods**
Dr. Cedric Guignard, Luxembourg Institute of Science and Technology (LIST)

18h40 Wrap up & Closing: Conference Chairs

19h00 Reception & Poster session

Risk assessment of feed and food contaminants: latest EFSA opinions and current activities.

Dr. Chantra Eskes, Feed and Contaminants (FEEDCO) Unit, European Food Safety Authority (EFSA)

Feed and food chemical contaminants are substances that are unintentionally present in food or feed as a result of e.g. environmental contamination, process contamination, as natural toxins or as unauthorised veterinary medicines. Chemical contaminants may be harmful to humans and animals.

EFSA provides scientific advice and carries out risk assessments on a wide range of chemical contaminants that can be present in food and feed. This work is carried out by EFSA's Panel on Contaminants in the Food Chain. The Authority also collects occurrence data on contaminants in food and feed and supports the coordination of data collection and monitoring by Member States.

EFSA's scientific advice helps policy makers take informed decisions on managing risks of food and feed contaminants. This includes e.g., establishing maximum levels, monitoring and/or recommending strategies to reduce exposure to contaminants present in food and feed.

The presentation will discuss the latest scientific opinions on food contaminants, and provide an overview of the ongoing activities regarding food and feed contaminants.

Bio sketch

Chantra Eskes is team leader within the feed and contaminants (FEEDCO) Unit, responsible for the activities related to the risk assessment of food and feed contaminants and the CONTAM Panel at the European Food Safety Agency (EFSA), Italy. She graduated on food sciences and engineering in France and obtained a PhD on the adverse effects of food and feed contaminants to neural cells in Switzerland.

Before joining EFSA, Chantra worked at the international level for the development, validation and regulatory acceptance of new approach methods for the safety assessment of chemicals. She has been member of different OECD expert groups for over 15 years, was the president of the European Society of Toxicology In Vitro (ESTIV) from 2012 to 2016 and the chairwoman of the EURL-ECVAM Scientific Advisory Committee (ESAC) from 2017 to 2021.

Chantra is (co-)author of over 60 scientific manuscripts and book chapters as well as editor of different journals, books and monographs. Her activities contributed also to the acceptance of a number of OECD guidelines and guidance documents on new approach methodologies.

Development of a multiresidue method for the quantitative determination of antibiotic residues in feed

David Schuh, Nadine Daleiden, Danielle Ruckert and Claude Schummer*

Administration des Services Techniques de l'Agriculture – Division des laboratoires, service d'analyse des engrais, des aliments pour animaux et d'alcools. 72, avenue Lucien Salentiny, L-9080 Ettelbruck

** Presenting author*

Antibiotics are frequently used in agriculture to cure animals in case of disease, and a multitude of different antibiotics and anticoccidials are available today. The proper use of these products has been regulated in the EU regulation 1831/2003 on additives for use in animal nutrition. This regulation also forbids some products that were used in the past but have been banned because of toxic and/or carcinogenic properties for humans or animals.

Improper use of antibiotics in factories or on the farm may lead to cross-contaminations and residues of antibiotics may be found in feed not supposed to contain any antibiotics. These residues may end up in products like milk, eggs or meat. This can lead to problems in food production, in particular for fermented products like cheese or sausages. Furthermore, a constant background level of small amounts of antibiotics may cause resistances to antibiotics in bacteria.

The aim of this study was the development of a multiresidue method based on solid-liquid extraction and UHPLC-MS/MS detection. The method has been validated on 19 antibiotics from 10 different classes and has been applied to 15 cereal based feed samples. No antibiotics above the LOQ have been detected, only traces of Doxycyclin and Amprolium (below 100 µg/kg) have been measured in two samples. This confirms the suitability of the method for the detection of antibiotics in feed. Further studies will aim to increase the amount of monitored compounds and to include food matrices relevant to human health.

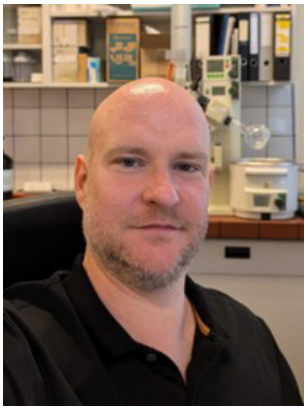
Bio sketch

David Schuh is originally from Esch-sur-Alzette, Luxembourg.

2006 he graduated with a bachelor's degree in Medical Laboratory Technology from Helmo/Hemes, Institut Saint Laurent-Gramme in Liège, Belgium. He completed his final thesis at the LNS, focusing on spa Genotyping of MRSA.

In 2008, he joined the ASTA team in Ettelbrück and worked for the agricultural seed control department. In 2013, he switched to the Chemistry department and has since been working in analytical organic chemistry.

Initially, he worked improving the method for measuring fat-soluble vitamins in animal feeds and successfully achieved accreditation. He and his team then developed a method for measuring aflatoxins using HPLC with fluorescence and UV photochemical derivatization. The next challenge is to develop a method for easily measuring antibiotics in animal feeds.



A multi-OMICs workflow employing advanced in vitro systems enabled with microfluidics for food and feed safety assessment

Stefania-Delia Isaic, Environmental Health Group, Luxembourg Institute of Science and Technology (LU)

Traditionally, food safety heavily relies on epidemiological data, which is often not available for new products, or on animal studies, which poses ethical issues regarding animal welfare and can only partly predict the human effects. Today's scientific efforts are focused on developing New Approach Methodologies (NAMs), proposing microphysiological systems (MPS) as complex in vitro models that can closely mimic the in vivo situation. If coupled with multi-OMICs approaches that provide a complete overview of biological processes triggered by chemical exposure, MPS can help reconstruct the molecular mechanism of action (MOA) and inform on key biomarkers.

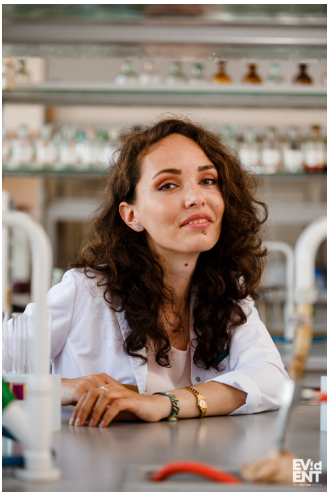
The main goal of the TULI project (OC/EFSA/IDATA/2023/02) is to establish and demonstrate an NAMs-derived -OMICs analytical bioinformatic standardised workflow for safety assessment of food and feed related chemicals, which will allow to derive reliable human reference points and health-based guidance values (HBGVs). The workflow will rely on multi-OMICs approach, comprising transcriptomics, metabolomics and epigenomics analysis. Using a well-established dual-organ MPS (PhysioMimix®, CN-Bio), we will recreate two axes (intestine-liver and lung-liver) by connecting advanced in vitro systems. In the first phase of the project, exposure to 6 data-rich substances will generate a training dataset that will support the refinement of the bioinformatics pipeline initially built based on a literature review and data gap analysis. We will capture two dimensions of exposure, by identifying acute and long-term biomarkers. In the second phase, exposure to 25 data-poor chemicals and downstream analysis of targeted OMICs will further validate the predictive power of the pipeline.

Bio sketch

MSc. Stefania-Delia Isaic is a doctoral researcher at the University of Luxembourg, where she conducts her research in collaboration with the Luxembourg Institute of Science and Technology (LIST). Stefania holds a Bachelor's and Master's degree in Pharmaceutical Sciences, as well as a second Master's degree in Drug and Environmental Toxicology.

Stefania's current research focuses on the development of New Approach Methodologies (NAMs) for regulatory safety assessments. Her doctoral work is centred around the development, qualification, and implementation of a microfluidic-enabled complex 3D in vitro model. This innovative approach aims to provide health-based guidance values for food contaminants, offering a more accurate and ethical alternative to traditional safety testing methods.

Before pursuing her doctoral studies, Stefania gained valuable experience as a Research Engineer within the Environmental Health group at LIST, specializing in Cell and Molecular Biology.



Presence and risk assessment of quinolizidine alkaloids in lupin based food products

*Sofie Schrijvers[1], Mia Eeckhout[1], Liesbeth Jacxsens[1], Bram Miserez[2]**

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[2] Ciboris npo, Zwijnaarde, Belgium

** Presenting author*

Lupins are gaining importance as a food source, both for human animal consumption, because of their high protein content. However, they are an allergen and contain quinolizidine alkaloids, toxic secondary metabolites. We have studied the presence of quinolizidine alkaloids on the Belgian food market, both in lupin based products and in animal products from animals fed with lupins, as well as the fate of the alkaloids during food processing.

An analytical method for various food matrices was developed for seven quinolizidine alkaloids and applied to over 300 food samples, selected based on market research. A food frequency questionnaire was used to determine the consumption and as a basis for a risk assessment. Total quinolizidine alkaloid consumption was estimated to be 3.9 ± 27.3 µg/kg body weight per day, with those consuming dry lupins, lupin flower or canned lupins to be at the highest risk of consumption of quinolizidine alkaloids.

Twenty samples calve feed was analyzed as well, together with the resulting veal and liver from 10 animals fed with this feed. A total quinolizidine alkaloid content of 42 ± 28 mg/kg feed was measured. In the resulting animal products, mainly lupanine was detected at about 3 orders of magnitude less.

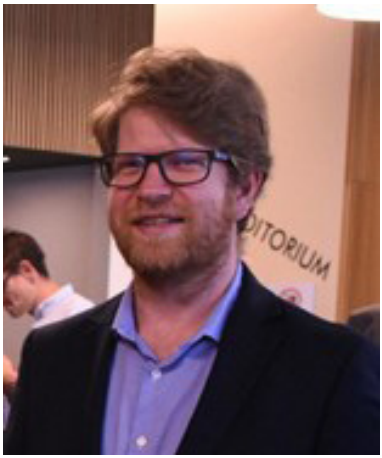
Several food processes were imitated on a laboratory scale and the amount of quinolizidine alkaloids were tracked through the different processing steps. Most a stabile at high temperatures and only soaking the beans removes the alkaloids from the food products.

Bio sketch

Bram Miserez studied at Ghent University where he obtained a Masters in Biochemistry and PhD in Chemistry, specializing in analytical chemistry and post-colun reactors. He worked at the University Hospital of Brussels (VUB) as in toxicology and did his postdoctoral research at St George's University of London, working on the identification and analysis of new psychoactive substances.

Bram Miserez is currently working at Ciboris, a part of the Primoris group. He is responsible for various analytical research projects, focusing on food fraud and food safety. Recent recent projects include the development of methods to detect food fraud in apricot juice (addition of peach juice), in asparagus (geographical origin) and in meat (addition of niacin in minced meats). In food safety, he has worked on the analysis of migrants from food packaging in food, the presence of mineral oils and process contaminants in babyfood, as well as quinolizidine alkaloids in various food and feed products.

Bram Miserez is the author of 16 papers, one book chapter and has presented at national and international conferences.



Total diet studies in France

Dr. Véronique Sirot

Risk Assessment Department, French agency for food, environmental and occupational health & safety (ANSES)

In France, food contamination is monitored in a regulatory framework through monitoring and surveillance programs managed by the competent ministries. In the 2000s, this knowledge was supplemented and strengthened by national Total Diet Studies (TDSs). TDSs are recognized worldwide as one of the most cost-effective surveys to assess food contamination, dietary chronic exposure of the population to a large set of chemical substances, and associated health risks.

To date, three TDSs have been conducted in France: TDS1 (2001-2005) and TDS2 (2006-2011) on the general population and a study targeting non-breastfed infants and children under three years of age (infant TDS, 2010-2016). Another study (TDS3) was initiated in 2019 to update the exposure data and the risk assessment of French adults and children over three years of age for more than 300 substances.

The results of the three first French TDSs showed that, for more than 90% of the substances, long-term dietary exposure was deemed as tolerable for the population considered. For the remaining substances, identified as concerns or for which the risk could not be ruled out, measures to reduce the exposure of the population were proposed. Management and/or research recommendations were also formulated in order to refine the conclusions relating to the risk associated with exposure to certain compounds in future studies.

Besides providing a huge database for researchers, the French TDS results represent a major tool for the French public authorities, as well as industry and other stakeholders, as an aide to decision-making in risk management (control and regulation) at the national, European and international levels.

Bio sketch

Véronique Sirot is a doctor of epidemiology and public health, and has been a senior project manager in the Risk Assessment Department of the French Agency for Food, Environmental and Occupational Health Safety (Anses) since 2005. She mainly works in the field of dietary exposure to chemical substances and risk assessment, providing inputs into the scientific expert committees of Anses, as well as participating actively in several national and EU research projects.

In charge of studies on exposure to food chemicals, Véronique Sirot is responsible for the coordination of the French Total Diet Studies (TDS): 2nd French TDS (2005-2011), infant TDS (2010-2016) and on-going 3rd French TDS. She participated in the EFSA working group on Total Diet Studies (2010-2011), chaired the scientific advisory board on the first German TDS, and is author or co-author of more than 70 international peer-reviewed papers in the field of dietary exposure and risk-benefit assessments.

Per- and polyfluoroalkylated substances: a market review

Dr. Luc Schuler, Luxembourg Veterinary and Food Administration (LU)

Per- and polyfluoroalkyl substances (PFAS) and PFAS-like fluorinated pesticides have attracted attention because of their persistence, bioaccumulation potential and possible adverse effects on living organisms. Due to the extreme persistence of these substances, nicknamed “eternal chemicals”, impacts on the environment and human health are likely to increase. Thees pollutants are linked to adverse health effects including increased risk of certain cancers, diabetes and for having potential endocrine disruption properties amongst others. Diet is an important source of PFAS and PFAS-like fluorinated pesticides exposure.

The main objectives of this study were to carry out market surveys and investigate the occurrence of PFASs in commonly consumed food items in order to evaluate the exposure to these substances and consequently contributing to regulate these contaminants in specific categories. Moreover, monitoring these substances enables long-term risk-based management of PFAS exposure in humans, livestock, and game.

Bio sketch

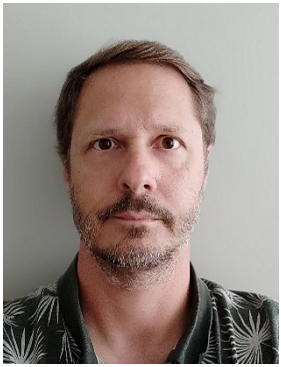
Luc Schuler, Ph.D. in cellular, molecular, and human biology (Catholic University of Louvain).

During his studies, his focus was directed towards identifying the genes involved in the degradation of polycyclic aromatic hydrocarbons by bacteria for bioremediation purposes.

Before joining Luxembourg Veterinary and Food Administration (ALVA), he worked for almost 10 years as a forensic DNA specialist for the judicial police. During that time, he was involved in method development for detecting, visualizing, and securing crime scene traces and forensic DNA profiling.

Luc Schuler currently works at the Division for the security of the food chain (ALVA) under the Ministry of Agriculture, Food and Viticulture in Luxembourg. He is responsible for the control of GMO food, food ingredients or foods consisting of GMOs as well as environmental, agricultural, and industrial contaminants in food.

Passionate about archery, he was coaching at the 2020 Tokyo Olympic Games.



Unveiling the fate and impact of PFOA on the gastrointestinal tract and liver using advanced mass spectrometry: insights from the FLUO-GUT project

Charlotte B. A. Stoffels[1], Tina B. Angerer[1], Gilles Frache[1], Hervé Robert[2], Sébastien Cambier[1], Maria A. Subirana[3], Dirk Schaumlöffel[3], Tom Wirtz[1], Arno C. Gutleb[1], Muriel Mercier-Bonin[2], Jean-Nicolas Audinot[1]*

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[2] Toxalim, Université de Toulouse, INRAE, INP-ENVT, INP-EI-Purpan, Université de Toulouse 3 Paul Sabatier, Toulouse, France
[3] CNRS, Université de Pau et des Pays de l'Adour, E2S UPPA, Institut des Sciences Analytiques et de Physico-Chimie pour l'Environnement et les Matériaux (IPREM), UMR 5254, Pau, France.
** Presenting author*

Perfluoroalkylated substances (PFAS), like perfluorooctanoic acid (PFOA), have been widely used in industry and consumer products, making them prevalent in the environment. These chemicals are persistent, accumulating in human bodies, and pose significant health risks. Although the digestive system is the first impacted upon oral exposure, their effects on the gastrointestinal tract and gut-liver axis remain largely unknown. The FLUO-GUT project aimed to investigate PFOA uptake and effects on human intestines and liver using in vivo (mice) and in vitro (human cell line) models, combined with advanced mass spectrometry (MS) techniques.

Mice and human cell models exposed to PFOA were analyzed using complementary MS methods. LC-MS/MS detected and quantified PFOA and other biomolecules, while various MS imaging (MSI) techniques studied PFOA localization from tissue to sub-cellular levels. Molecular information at the tissue level was obtained using TOF-SIMS and MALDI-MSI, while elemental information at the (sub-)cellular level was gathered with high-resolution SIMS techniques, including FIB-SIMS and NanoSIMS.

The mass spectrometry workflow showed that PFOA accumulates in both the intestines and liver, with higher levels in the liver in mice. PFOA localized in specific tissue areas, particularly in goblet cells in the intestines and hepatocyte cytosol in the liver. In the human Caco-2 cell model, PFOA was also mainly found in the cytosol. This study provided crucial data on intracellular PFOA concentrations, filling a gap in PFAS research. These findings highlight the value of MS analysis in understanding PFOA's impact on the gastrointestinal tract and liver, opening new avenues for toxicology research.

Bio sketch

Charlotte B. A. Stoffels, Ph.D.; Junior R&T Associate, Environmental Health (EH) Group, Luxembourg Institute of Science and Technology (LIST)

Charlotte Stoffels holds a master's degree in Chemical and Materials Engineering (2018) and a master's degree in Biomedical Engineering (2019), both from the University of Liège. Her academic training included internships with the Nano-Enabled Medicine and Cosmetics (NEMC) group and the Environmental Health (EH) group at LIST, where she gained valuable interdisciplinary experience.

In 2023, she earned her Ph.D. in Physics from the University of Luxembourg, completing her thesis within the Advanced Instrumentation for Nano-Analytics (AINA) group at LIST. Her doctoral research focused on pioneering a new methodology using high-resolution chemical imaging techniques to localize per- and polyfluoroalkyl substances (PFAS) within cells and tissues, significantly advancing nano-analytics and environmental toxicology.

Currently, Dr. Stoffels is a Junior R&T Associate in the EH group at LIST. Her work focuses on advancing the group's toxicology models and research initiatives, with a particular emphasis on integrating her expertise in cell imaging to deepen the understanding of toxicological impacts at the cellular level.

List of abbreviations
MS: Mass spectrometry; MSI: Mass spectrometry imaging; LC-MS/MS: Liquid chromatography with tandem MS; SIMS: Secondary ion mass spectrometry; TOF-SIMS: Time-of-flight SIMS; MALDI-MSI: Matrix-assisted laser deposition ionization MSI; FIB-SIMS: Focus ion beam platform combined with SIMS; Nano-SIMS: Nanoscale SIMS

Non-intentionally added substances in mechanically recycled PET – Analytical aspects and new purification methods.

Vincent Berthé, Cédric Guignard, Julie Soulier, Daniel Schmidt*

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** Presenting author*

Polyethylene terephthalate (PET) is extensively used for beverage bottles, due to its advantageous properties, such as low gas permeability, good mechanical strength, transparency, reflectivity, ease of processing, and affordability. As the third largest packaging polymer, PET recycling, especially of PET bottles, has significantly advanced thanks to cleaning technologies. Advantageously, mechanical recycling of PET is environmentally favourable compared to producing new resin.

EU regulations outline the procedures for recycling companies to gain approval for producing food-grade mechanically recycled PET (rPET), focusing on the safety of migrating substances. Beverage companies using PET with recycled content must also comply with European food contact material (FCM) legislation. Additionally, non-intentionally added substances (NIAS) must meet safety requirements following the European regulation.

Benzene can be found as a contaminant of rPET. It originates from heat-induced decomposition of rPET impurities such as polyvinylchloride (PVC), a secondary material coming from the sorting step of the mechanical recycling. Contamination of rPET by benzene could represent a public health concern, as it may migrate into the contents of the rPET package during conditioning and storage.

This work describes the analytical protocols developed to measure the benzene contamination sources of rPET materials and explores the effect of a new process that attempts to address such issues in the context of rPET use in packaging applications. Our results demonstrate the possibility to reduce benzene levels while maintaining an acceptable level of rPET performance. These improvements are promising in the context of material quality, food safety and environmental impact for the use of rPET in packaging applications.

Bio sketch

Dr. Guignard holds a Master degree in Applied Chemistry and a PhD in Organic Geochemistry from the University of Poitiers, France. He started to work at LIST in 2002 as a post-doctoral researcher, then was appointed in 2004 as the head of the Analytical Chemistry facility of the LIST/ERIN Platform. Dr. Guignard has been involved, as PI, WP leader, collaborator or sub-contractor, in many projects related to the quantification of organic and inorganic compounds in environmental, biological and food samples.

Since 2020, he is Pole Leader at the Biotechnologies and Environmental Analytical Platform of LIST. He is specialised in chromatographic techniques coupled to mass spectrometry (LC-MS/MS, LC-QToF, GC-MS, GC-MS/MS).

He supervises the development of analytical methods and manages the realization of the analytical services of the Platform. He is author or co-author of more than 75 publications and has an h-index of 31 (Scopus, 2810 citations).

Poster Abstracts

Food and feed innovations: perspectives offered by plant cell culture technology

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** Presenting author*

Dedifferentiated plant cells, which are cells that have re-entered the division cycle and over-proliferate under the stimulus of exogenously supplied phytohormones, represent a promising avenue in food and feed applications.

Unlike traditional plant cultivation methods, dedifferentiated plant cells can be mass-cultured in controlled, closed and sterile environments, the bioreactors, thereby reducing land and water use, minimizing the need for chemical inputs, lowering carbon emissions, and preventing soil degradation. Such a technology is compliant with Good Manufacturing Practices (GMP), scalable, season-independent, as well as free from contaminants and pathogens, hence conforming to the One Health principle. There is growing awareness of the economic potential of plant cell suspension cultures and a trend towards cellular agriculture, the production of typical agricultural products from cells rather than through traditional farming of plants and animals, is becoming clear. Plants are rich sources of bioactive phytochemicals, e.g., antioxidants useful for applications such as in nutraceuticals and cosmetics.

The Luxembourg Institute of Science and Technology (LIST) is currently investigating the cultivation of plant cell suspensions in laboratory- up to pilot-scale bioreactors to produce added-value bioactives. Two examples will be presented: Cannabis sativa and Centaurea cyanus cell suspension cultures. The results obtained by LIST will be shown and discussed in the light of their potential future use for food- and feed-related applications.

Evaluating toxicity of data-poor PFAS: insights from advanced in vitro co-culture models in the SCENARIOS project

Emma Arnesdotter, Charlotte Stoffels, Arno C. Gutleb, Tommaso Serchi*

Department of Environmental Health and Innovation, Luxembourg Institute of Science and Technology, Luxembourg.
** Presenting author*

Per- and polyfluoroalkyl substances (PFAS) are a broad chemical class of complex and persistent compounds used in several industrial and consumer applications, including firefighting foam, food packaging, non-stick repellents, and waterproof products. When PFAS chemicals leach into water sources from industrial and waste sites they can contaminate drinking water supplies. Additionally, plants, fish, and animals absorb PFAS from the environment. This results in human exposure through the intestinal system by consuming contaminated drinking water and food products. Intestinal absorption of most PFAS is considerable in mammals, including humans (EFSA 2020). Yet, sufficient toxicity information for risk assessment is available for only a few PFAS compounds.

The SCENARIOS project incorporates an extensive list of experimental tasks to collect experimental toxicity information on PFAS and human health. These tasks include in vitro experiments in advanced 3D models of barrier tissues related to the three major routes of exposure, i.e. ingestion, inhalation, and dermal contact.

In the SCENARIOS project, an intestinal in vitro co-culture system will be employed to evaluate the exposure to selected subgroups of data-poor PFAS. Transcriptomic dose-dependent dynamics coupled with functional assays and measurements of PFAS barrier crossing/uptake are used to inform on the putative mode of action and possible long-term effects of PFAS as contaminants in the food chain. The toxicity data generated with these advanced models will ultimately be integrated with PFAS cheminformatics to support the development of a chemocentric, multilayer read-across framework for grouping PFAS in risk assessment processes.

References:
EFSA 2020 – EFSA CONTAM Panel (EFSA Panel on Contaminants in the Food Chain), 2020. Scientific Opinion on the risk to human health related to the presence of perfluoroalkyl substances in food. EFSA Journal 2020;18(9):6223, 391 pp. https://doi.org/10.2903/j.efsa.2020.6223

Identifying Risks in the Food Chain: How NORMAN-SLE Enhances Contaminant Research

Hiba Mohammed Taha

Luxembourg Centre for Systems Biomedicine, University of Luxembourg, Esch-sur-Alzette, Luxembourg

Since its inception in 2015, NORMAN Suspect List Exchange (NORMAN-SLE) has become a vital knowledge base, facilitating the identification and monitoring of contaminants across air, soil, and water. The NORMAN-SLE offers an open and FAIR platform for the exchange of suspect screening lists enriched with accompanying expert knowledge and references. With over 118 suspect lists from more than 70 contributors, the database encompasses over 120,000 unique substances, including pharmaceuticals, pesticides, per- and polyfluoroalkyl substances (PFAS), as well as chemicals associated with food contact materials (FCMs).

NORMAN-SLE plays a crucial role in data collection, providing lists that aid in identifying chemicals likely to migrate into food, posing potential risks to human health. The integration of NORMAN-SLE data into major chemical databases like PubChem and the US EPA's CompTox Chemicals Dashboard enhances accessibility and utility, offering researchers and regulators additional functionality for chemical analysis and risk assessment.

In the context of food safety, NORMAN-SLE supports risk management by offering relevant suspect lists such as the S26 MYCOTOXINS, S54 European Food Safety Authority Priority Substances, S77 Food Contact Chemicals Database (FCCDB), S112 Migrating & Extractable Food Contact Chemicals (FCCmigex) by Food Packaging Forum and the PFAS subsets : S117 PFASFCCDB S118 and PFASFCCMIGEX. These lists enable targeted screening for contaminants, facilitating early detection and regulatory action to mitigate risks associated with chemical migration into the food chain. Through its collaborative and integrative approach, NORMAN-SLE significantly contributes to the global efforts in safeguarding food safety and public health.

This event is organised by the Luxembourg Veterinary and Food Administration (ALVA) with the support of the European Food Safety Authority (EFSA).

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