International Life

Sciences Institute





Contaminated food can cause more than 200 diseases - ranging from diarrhoea to cancers. One might assume that most of these diseases occur elsewhere in the world, but we know that foodborne diseases are also a major cause of illness in the EU. Food safety is the science of protecting our food supply from contamination. ILSI Europe is working on a number of key topics in this area, such as food allergy, microbiological food safety, (natural) contaminants, packaging, low dose effect and the identification of new tools to assess the safety of foods.

LOW DOSE EFFECT

The Threshold of Toxicological Concern (TTC) concept states that, at sufficiently low enough exposure, the associated risk related to the consumption of substances used in food contact articles may be deemed negligible. This concept is particularly useful for regulators and industry to assess potential health risk from substances when specific toxicological data are lacking.

Carcinogen Dose-Response Database for TTC

This CEFIC LRI-B18 project has advanced the state-of-the-art in cancer potency TTC in a number of ways: the database has extended existing datasets through data harvesting and collaborations with key stakeholders e.g. US FDA; the database is expandable and freely available via the CEFIC Toolbox and from a web-based centralised TTC database site (COSMOS TTC database); current approaches (e.g. Kirkland, WHO Mode of Action) to categorise genotoxic and non-genotoxic carcinogens have been updated and expanded to include further information on genetic toxicity; knowledge of current Points

of Departure (e.g. TD50, BMDL) has also been extended by further data harvesting and analysis, the output of which is captured in the database. Status: Completed

Uncertainty in TTC

This activity will create scientific knowledge and improve the understanding of stakeholders on the type of and on the degree of uncertainty associated with TTC-based assessments, as compared to traditional assessments. It will allow to better define in which cases a TTC-based approach is fully appropriate and in which cases other approaches might be preferable. Status: Manuscript in preparation

CONTAMINANTS

Consumers are exposed daily to naturally occurring contaminants and processrelated compounds, both of which can be toxic. ILSI Europe designs and implements programmes that help understand how these compounds are formed, improves our methods of detection and quantification and assesses their safety implications effectively. Scientific knowledge on exposure and mitigation of contaminants in food is advanced so that safer food products can be created.

Reaction & Potential Mitigation of Mycotoxins During Food Processing

Mycotoxins are toxic secondary metabolites produced by fungi that significantly affect the quality safety and yield of important crops used worldwide. A recent review identified options to optimise or introduce additional food processing in order to reduce mycotoxin contamination. In order to further increase the impact of this work this follow up activity will provide practical guidance for industry in order to mitigate mycotoxins. Status: Report series in

(Bio-)Markers of **Exposure to Process-Related Contaminants**

The advent of methodology to monitor biomarkers of exposure to process-related compounds is expected to provide a significant step forward in risk assessment an help mitigation prioritization The activity assessed and proposed biomarkers of dietary exposure to contaminants. Status: Completed

Mineral Oil Risk

Assessment

There is uncertainty about the exposure to mineral oils, how/what to measure and characterise, and ultimately what this exposure means in terms of consumer safety. This activity brought together tripartite stakeholders across sectors to examine the current approaches used to establish the safety of mineral oils. Status: Manuscript in preparation

PACKAGING

Can you imagine that European citizens waste on average 157 kg of packaging per person per year, of which more than 2/3 is food packaging? Packages play a key role in ensuring the safety of food; sophisticated smart packages can also inform the consumer about freshness or heat the product without an external source of heat. However, a careful evaluation of food contact materials and their interactions with food is needed to ensure both consumers' safety and minimial environmental impact.

7th Symposium on Food Packaging

The ILSI Europe International Symposia on Food Packaging are held every four years and are internationally recognised as a scientific forum to discuss the science that ensures the safety and quality of food packaging. The 7th symposium will be held in November 2020, supporting safety and innovation in the area of food packaging. Status: Symposium in prepara

In Vitro Bioassays

for FCMs Safety Packaging materials contain substances, such as chemicals, that come into contact with food and can further migrate into a food (Food Contact Materials - FCMs). There is an urgent need to better

ensure a safe migration of chemicals from FCMs to ensure food safety. *In vitro* bioassays may play a role to assess the safety of FCMs.

This ILSI Europe activity will develop a guidance document that clarifies the roles, availability and reliability of bioassays for packaging safety assessment.

Status: Manuscript in prepar

Series of Reports on Packaging Materials The Packaging Materials

Task Force has started off in 2000 a series of reports on Packaging Materials. Each report is dedicated to a major type of packaging material and aims at describing all essential aspects of their use to a non-specialised audience. 9 reposts have been published to date. The two first ones on plastics materials (Polyethylene

Terephthalate and polystyrene) have been updated and published in December 2017. A 10th report on Adhesives has been recently published. Status: Completed

Best practices for untargeted migrants screening NIAS are present in all

FCMs and there is no accepted methodology on how to perform the sample preparation, analysis, or how to identify and more importantly quantify the migrants. The current situation may lead to uncertainty about the safety of FCMs. This activity aims to provide best practices for identifying and quantifying unknown migrants from FCMs.

Status: New Activity

ALTERNATIVES TO ANIMAL TESTING

A lot of debate has surrounded the use of animal studies in nutrition and food safety, especially regarding identifying when they are mandatory and when they can be replaced by alternative methods. The development of new alternative methods offer new opportunities for food safety, nutrition and efficacy studies.

Holistic Approaches to **Develop Non-Animal**

This first activity aims to identify, through a holistic method, existing approaches that can be applied to the current regulatory frameworks in food safety, nutrition and efficacy studies. This project will identify existing tools and methods which are not reliant on generating data in animals to address those requirements. Status: Manuscript in preparation

MICROBIOLOGICAL FOOD SAFETY

Foodborne diseases are a common, costly – yet preventable – public health problem. Despite all the measures implemented to reduce food safety risk, food-borne illnesses continue to pose serious health threats worldwide. Every year food-borne diseases cause almost one in every ten people to fall ill, and children account for nearly one third of deaths from food-borne diseases.

Control Options for Viruses in Food Processing

Viruses are frequent, and probably, the most under-recognised cause of foodborne illnesses. Unfortunately, viruses are quite resistant to many treatments used in food processing. In addition, they could also contaminate food via their presence in the production/ processing environment. ILSI Europe is currently reviewing and summarising the control options for viruses in different food processing. Status: Completed

Process Validation Protocols

Currently, there are no generic protocols which could guide manufacturers and ensure that all relevant aspects are considered, when undertaking a validation. There is a great interest in the food industry to perform validation in a manner which would be accepted by all parties involved (e.g. authorities, customers). ILSI Europe aims to build a reference document with general guidelines supported by examples to be offered to the industry to understand how to validate the process to reduce the microbiological hazard associated with the products and processes to acceptable levels.

EU Project EFFORT

ILSI Europe participated in the EC-funded project EFFORT on Antimicrobial Resistance (AMR) throughout the food chain. EFFORT studies the complex epidemiology and ecology of AMR using newly developed molecular and bio-informatics technologies. Status: Completed



Status: Manuscript in preparation

FOOD ALLERGY

preparation

Up to 20 million European citizens – almost 5% – suffer from food allergies, and this trend is continuing to rise in both developed and developing countries, especially among children. Minimising the risk from allergenic foods is a shared responsibility of all stakeholders involved (e.g. food manufacturers, retailers, caterers and regulators). ILSI Europe aims to foster international collaborations to address the current challenges relating to food allergies.

Verifying VITAL® 2.0 Reference Doses: Suitability of Analytical Methods

Reliable analytical methods are a pivotal requirement for the introduction and adoption of reference doses in the EU. This activity will investigate the suitability of current analytical methods to reliably measure proposed allergens at concentrations resulting from the use of VITAL® 2.0 reference doses. ILSI Europe significantly contributed to the VITAL®

scientific expert panel and the development of reference doses for allergens. Status: Manuscript in preparation

Tolerable Risk in Food Allergy This activity will define what constitutes

tolerable risk in terms of food allergic reactions attributable to unintended allergen presence (UAP) and decisions on the use of precautionary allergen labelling. This consideration will focus on the incidence of reactions and their characteristics (symptom severity), but will also include factors such as quality of life considerations and benchmarks from other areas with similar manifestations of risk. Status: Manuscript in preparation

NEW APPROACHES FOR FOOD SAFETY

Next Generation Sequencing

Next Generation Sequencing (NGS) tools are fast evolving and are already applied in microbiological risk assessment. ILSI Europe will investigate how NGS can contribute to the improvement of risk assessment and management and aims to provide guidance to industry on the use and interpretation of these NGS tools. This will help exploit the full potential of NGS tools to ultimately improve food safety.

Status: Completed

Authenticity of Food

Various organisations work towards developing schemes for ensuring the authenticity food. Our goal is to establish the best practices in place word wide and suggest proactive ways to bridge the existing gaps in order to deter opportunistic food fraud and ensure product protection and consumer Status: Manuscript in preparation ToxCast Data on

Food Chemicals

ToxCast is a high-throughput screening programme by the US Environmental Protection Agency to assess toxicity of a wide range of chemicals.

food chemicals from the programme can be utilised in food and food ingredients safety risk assessment. Status: Three manuscripts in preparation

whether data derived for

ILSI Europe explores

Application of **Adverse Outcome Pathways**

Adverse Outcome Pathways (AOPs) are chemically agnostic and may be applicable in food safety risk assessments. This activity aims (i) to understand the coverage of existing AOPs for food ingredients / foods and (ii) to identify the necessary additional information required to enable AOPs

to be implemented for quantitative risk assessment and regulatory use with the aim of supporting the shift from animal testing to nonanimal approaches in food safety risk assessment. Status: Two manuscripts in

Micronutrient-Food **Matrix Interactions**

preparation

When micronutrients interact with other constituents in the food matrix, this affects how readily we take in nutrients. A systematic review will be performed to create a framework of methods to assess micronutrient bioaccessibility. Status: Manuscript in preparation

ERASMUS+ PROGRAMME SUIT4FOOD

SUIT4FOOD is a transnational, collaborative and multidisciplinary ERASMUS+ Programme that brings together European experts in food science, engineering and innovation communication, providing a multi-disciplinary view of food safety and stability technologies. The overall aim is to train early stage researchers and engineers in the area of sustainable technologies for controlling food safety and stability. Status: Ongoing

