

EUROPEAN SYMPOSIUM ON FOOD SAFETY

29-31 MARCH 2017
BRUSSELS, BELGIUM



PROGRAMME

HELD AT THE SQUARE — BRUSSELS MEETING CENTRE



ORGANIZED BY:



www.foodprotection.org

to the identification of community fingerprints to trace foodborne pathogens at the species or even strain level and their transmission through the food chain.

It is envisioned that risk assessment will gradually integrate information that concerns the behavior of microorganisms, assembled from “omics” data, and shift from the taxonomic definition of the biological hazards. Improvement in the resolution of metagenomics data would allow us to observe and study the foodborne pathogens in their environment even when they are not prevailing components of the microbial community.

The Use of Omics in Exposure Assessment

HEIDY DEN BESTEN, Wageningen University, Wageningen, Netherlands

Exposure assessment plays a central role in microbiological risk assessment. It provides an estimation of both the likelihood and the level of a microbial hazard in a specified consumer portion of food, taking microbial behaviour into account. To date, mostly phenotypic data have been used in exposure assessment.

This presentation will illustrate how mechanistic cellular information obtained through omics techniques could make a difference in: (i) understanding the dynamics of pathogens in a complex food eco-system; and, (ii) predicting pathogen behaviour variability. Advancements in the research activities of these two domains will be presented and discussed, through examples, with a special focus on industrial applications.



The Use of Omics in Hazard Characterisation

TREVOR PHISTER, PepsiCo, Leicester, United Kingdom

Omics technologies, such as Whole-genome Sequencing (WGS), have impacted food safety through its incorporation into epidemiological investigations. While there are still many questions surrounding the use of WGS in source identification, the technology has already been adopted by a number of public health agencies. Academia, industry, and regulatory bodies, however, have only just begun to explore the integration of omics data into microbial risk assessment (MRA).

MRA consists of four stages: Hazard Identification; Exposure assessment; Hazard Characterization; and Risk Characterization. In Hazard Identification, organisms that can potentially confer an adverse health effect are identified and defined. In Exposure Assessment, the dose at the moment of exposure is determined. In Hazard Characterization, the probability and severity of a disease outcome is determined as a function of the dose. Finally, in Risk Characterization the overall probability and severity of the illness is determined, including variability and uncertainty.

In this presentation, we will discuss the issues and challenges in using omics data in hazard characterization. The data may aid in decreasing the variability and uncertainty present in this stage. Current research suggests omics may be integrated in a number of ways from defining the differences in virulence between bacterial strains to the identification of biomarkers that may suggest increased virulence of a pathogen or susceptibility of a host. The use of omics in MRA is just beginning and, as it has with epidemiology, it is sure to have a big impact on how we characterize hazards in our food supply.

S7

Dietary Exposure to Food Chemicals: Data Needs, Methods, and Case Studies

In chemical food safety, dietary exposure to food chemicals is a key step in assuring that substances present in food are safe for consumers. This is the case regardless of whether the substance is a contaminant or is intentionally added; therefore, everything from flavourings, additives, food packaging migrants, contaminants, pesticides, and even some nutrients require risk assessment in order to assure their safe presence in food. Determining dietary exposure to food chemicals requires data on how foods are consumed and the chemical occurrence in those foods.

A number of approaches to dietary exposure exist, from simple deterministic screening methods to more refined techniques requiring detailed data on food consumption habits and chemical occurrence. Knowing which technique to use depends on the chemical in question and the specific needs in the exposure scenario. Typically, a tiered approach to assessing exposure is followed.

This symposium will present an overview of current approaches that can be used to assess dietary exposure to food chemicals, as well as some case specific studies demonstrating how these techniques have been applied in practice. Exposure models addressed will include screening methods that are used for routine risk assessment, refined high-tier probabilistic models, and methods that can be used for cumulative risk assessment or chemical mixtures. Case studies will include fluoride, as a contaminant in tea, and Vitamin A, which is present in personal care products and cosmetics, but potentially toxic at high levels of exposure.

Approaches to Dietary Exposure for Chemicals in Food: Data Needs and Modelling Techniques

CIAN O'MAHONY, Creme Global, Grand Canal Quay, Ireland

Exposure assessment is a key element of chemical food safety. A plethora of chemicals exist in food as additives, flavourings, food contact materials, pesticides, contaminants, and micronutrients, amongst others. In order to ensure the safety of a chemical present in food, an estimate of the likely exposure to the chemical in consumer populations is needed. This, in turn, can be compared with an appropriate Health-Based Guidance Value (HBGV) or reference dose to assess risk.

A number of techniques exist for estimating consumer dietary exposure to food chemicals; all, generally, centered around estimates of food intake and the level of chemical occurring in food. Techniques range from screening methods based on simple worst-case estimates of exposure to more refined probabilistic models aimed at providing realistic estimates of exposure for consumer populations. For certain chemical groups, like pesticides, methodologies have, also, been developed for cumulative or mixture exposure assessment. This presentation will provide a broad overview of different approaches to food chemical exposure assessment, as well as their data needs, uses, and future directions in the area.