



# ABERDEEN SCOTLAND

3-5 May 2023



## PROGRAMME

P&J LIVE



International Association for  
Food Protection®

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microorganisms will be highlighted. The industry plays an important role in the successful application of novel antimicrobials, and the symposium will also discuss the industrial perspective on the selection and evaluation of promising antimicrobial candidate compounds for food protection.

## S7 Microbiological Contaminants in Plant Protein Ingredients – Assessing Potential Risks

**Marjon Wells-Bennik**, NIZO Food Research, Ede, The Netherlands

**Mariem Ellouze**, Nestlé, Lausanne, Switzerland

**Yvan Le Marc**, ADRIA Food Technology Institute - UMT ACTIA 19.03 ALTERIX, Quimper, France

A wide variety of innovative foods made from alternative protein sources are now available on the market to replace animal proteins (meat, dairy and egg protein), and this trend is expected to continue. Alternative proteins may be derived from plants, including legumes, cereals, nuts, stone fruits, or seeds, or can be produced using yeast, fungi, or insects. Clearly, the composition of food products made with these ingredients is significantly different from the traditional animal products. Often, there is little information available on the loads and types of microbes that are present in such ingredients – however, this is needed to assess microbiological risks associated with ingredients used to produce new types of foods.

This symposium will focus on microbiological risks associated with plant protein-based foods. While many plant protein sources are not new (e.g., soy, oat, pea), their use and application in new food products may bring new challenges. A survey carried out on plant-based ingredients from different sources and in different forms (e.g., isolates, concentrates, kernels, flours) showed that bacterial spore formers are often predominant. Commonly encountered species include *Bacillus subtilis* and *Bacillus licheniformis*, and the pathogen *Bacillus cereus* is isolated regularly as well. Insight into the behaviour of these organisms is needed for the design of effective processing conditions and stable product formulations of plant-based foods, and to support trouble shooting activities in case microbial contaminants are encountered in finished products.

Microbial challenges and approaches taken to ensure the safety and quality of innovative plant-based products throughout the chain will be discussed. First, an overview of microbes in plant protein-based ingredients will be given. Subsequently, findings on inactivation and growth of *B. licheniformis* in plant-based food products and risk assessments of *B. cereus* will be presented taking diversity in phenotypic characteristics into consideration.

## S8 *Bacillus cereus* and Related Organisms, Differentiating Friend from Foe

**Laura Carroll**, Umeå University, Umeå, Sweden

**Mariem Ellouze**, Nestlé, Lausanne, Switzerland

**Maria Teresa Da Silva Felicio**, European Food Safety Authority (EFSA), Parma, Italy

The *Bacillus cereus* group, also known as *B. cereus sensu lato*, is a complex of closely related species, which are widespread throughout the environment and frequently isolated from a wide variety of foodstuffs. Numerous illnesses have been attributed to *B. cereus* group members, including food-borne gastrointestinal diseases (emesis and diarrhea), severe non-gastrointestinal infections, and anthrax/anthrax-like illnesses. Simultaneously, some *B. cereus* group members play important roles in industrial and agricultural settings, including as biocontrol agents and food spoilage organisms.

In order to minimize both human illness cases and economic losses, it is critically important that food producers differentiate high-risk *B. cereus* group strains from their lower-risk counterparts. However, evaluating risks posed by the presence of some *B. cereus* group members in foods remains extremely

challenging, particularly when *B. cereus* group members are present in novel or under-studied food matrices. The proposed symposium will discuss the current status of the *B. cereus* group and the public health risks its members pose in food. Specifically, the symposium will cover, (i) state-of-the-art genomic approaches, which are being used for *B. cereus* group surveillance, source tracking, outbreak detection, and risk assessment efforts, but require care in their interpretation; (ii) modeling approaches for predicting growth and inactivation of *B. cereus* group members in under-studied food matrices, with an emphasis on increasingly popular plant-based dairy alternative products; (iii) public health risks related to the presence of *B. cereus* group members in food assessed by the Panel on Biological Hazards (BIOHAZ) of the European Food Safety Authority (EFSA). Overall, the symposium proposed here will provide academic, industry, and EFSA perspectives and offer the most up-to-date portrayal of the *B. cereus* group, including current challenges and data gaps relevant for microbiological risk assessment.

## S9 Food Safety of Infant Foods, Care for Our Most Precious

**Kah Yen Claire Yeak**, Wageningen University, Wageningen, Gelderland, The Netherlands

**Sara Bover-Cid**, IRTA (Institute of Agrifood Research and Technology), Food Safety and Functionality Program, Monells, Girona, Spain

**Kalliopi Rantsiou**, Department of Agricultural, Forest and Food Sciences, University of Turin, Grugliasco (TO), Italy

Infants are more vulnerable to foodborne diseases. To ensure food safety, in general but even more so for infant foods, it is relevant to identify and rank hazards, to control the risk by properly validated interventions and to test for the hazards in the food and food processing environment for verification. In this symposium, all three aspects will be addressed by presenting the work carried out in the framework of the SAFFI project (Safe Food for Infants in the EU and China). An approach using a variety of databases on hazards, foods, outbreaks, and epidemiological data is used to develop a decision support system for hazard identification and risk assessment. The impact of emerging processing and preservation technologies on the behaviour of prioritized pathogens in baby food is assessed. A decision support system prototype will be presented for setting the conditions of non-thermal processes to control hazards in fruit purees as case-study. For verification of control, studies on traditional and molecular techniques relating ingredients, environmental and end products are analysed and correlated. The work performed supplies crucial information for use in setting efficient monitoring and sampling strategies at operational (infant food companies) and governmental (food safety agencies) level, designing or evaluating HACCP programs, performing quantitative risk assessments, and for example auditing activities and are thus relevant for food industry, governments and academia.

## S10 Testing and Improving HACCP Team Proficiency to Strengthen Food Safety Culture

**Carol Wallace**, University of Central Lancashire, Preston, Lancashire, United Kingdom

**Lone Jespersen**, Cultivate Food Safety, Hauterive, Switzerland

**Shingai Nyarugwe**, University of Central Lancashire, Preston, United Kingdom

For years, food companies have invested in collecting food safety data to demonstrate how compliant HACCP programs are and more recently to measure where their food safety cultures are at on a culture maturity continuum. These measures are often based on data collected through surveys and number of non-conformances. Decisions are then made