



CONFERENCE/WORKSHOP ORGANISER'S REPORT

“International Symposium on Food Safety (ISFS): New Tools to Detect and Prevent Foodborne Outbreaks from Farm to Fork”

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Brief Description of what the conference/workshop was about

Food safety is a global concern for all countries; while regulations are getting stronger, scientific knowledge in the field is getting more attention for all stakeholders in the food chain. The first International Symposium on Food Safety was held in Santiago, Chile from December 5th to 7th, 2016. The symposium had the main objective of bringing up-to-date scientific knowledge in new tools to detect and prevent foodborne pathogens in the food chain. We covered from irrigation water, animal production to food safety in processing plants.

To make possible the objective of this symposium, we allocated three topics in three different days:

Day 1: New tools to detect pathogens in the food chain from irrigation water to postharvest

Day 2: New tools to prevent outbreaks in all food commodities in food chain

Day 3: Prompt collaborative network between universities, regulatory agencies and industries

At this event, experts from academia, industry, and government agencies from Australia, Spain, Italy, Japan, United States, Canada, New Zealand, and Chile presented their standpoints. Importantly, this symposium covered the most important food commodities for the region.

Participation – details of total number of participants, countries they came from, backgrounds (academia, industry, etc.)

- A total of 279 participants from the industry (43.7%), Academia (29.7%), governmental institutions (15%) and international organizations (5.4%). There were also 17 individuals with no affiliations.
- Most of the audience were domestics (92.1%), however, there were representatives from 12 countries including Argentina, Australia, Brazil, Canada, Chile, Ecuador, Italy, Japan, Kuwait, Peru, Spain, and United States.

Major highlights from the presentations

New tools to detect:

- Scientific evidence of application or development of new detection methods for foodborne pathogens are being published very often
- Detection methods are affected by the matrix type
- Rapid detection methods based on DNA-amplification are able to analyze a large amount of samples in a few hours
- Producers rely in detection methods to make their food safety decisions, validations of the testing methods are necessary
- In the case of water used for food production, *E. coli* is not an ideal predictor of fecal pathogens in water
- Techniques for subtyping foodborne pathogens are moving forward whole genome sequencing
- The appearance of Next-Generation Sequencing provides a big chance for developing countries
- Establishment of a global data base of foodborne pathogen genomes is happening with USA FDA GenomeTrakr and BIGSdb, and Global Microbial Identifier
- Seek and destroy and Pathogen Environmental Monitoring Programs are stronger if DNA-based methods for subtyping are used
- New detection methods, including whole genome sequencing are showing the presence of old pathogens as *Listeria* and *Salmonella* in unexpected foods



- PCR-based methods for molecular serotyping of *Listeria*, along with whole genome sequencing are helping to identify emergence of pathogenic strains and its impacts in public health
- Whole genome sequencing is giving resolution to government agencies to track outbreaks at the global scale
- Microbiome and metagenomics are promising tools to be used in food safety; even though evidence is its early stage; we will see more and more scientific evidence of its applications

New tools to prevent:

- Risk analysis is a tool to estimate the risk to human health from foodborne hazards and to determine appropriate risk management strategies to control those risks
- Risk assessment studies may be needed to inform the level of hazard control that should be achieved at different stages of the food chain
- Quantitative Risk Assessment (QRA) approach allows an assessment of efficacy of on-farm interventions to reduce human illness
- Each farm environment should be evaluated independently for hazards as it represents a unique combination of numerous characteristics
- Predictive models can be integrated into supply chains to evaluate and manage performance
- Primary production is probably the main concern in terms of introduction of microbial hazards
- Postharvest practices provide many opportunities for amplification of microbial hazards
- Decision trees are simple tools that can be used for food safety risk assessment
- Uncertainty needs to be addressed and communicated to decision makers and stakeholders as one of the outcomes of the risk ranking process
- Sustained demand, globalization of food supply, improved transport conditions and logistics, and technological innovation have substantially modified the way in which fishery and aquaculture products are produced and distributed globally
- The control of the initial load of pathogenic *Vibrio parahaemolyticus* and the time and temperature of storage are key factors to minimize the risks of Public Health associated with consumption of bivalve molluscs
- Geographic Information System (GIS) are powerful tools that can be used to better understand spatial and weather factors that can increase the risk of foodborne pathogens in natural environments
- Hotspot maps can show areas where a pathogen was repeatedly isolated or where odds of isolation is high
- GIS enables users to manipulate existing datasets to create or generate new data.
- Economics is more than just impacts or costs
- Food safety compliance depends on industry organization. Conversely, industrial organization can be shaped by food safety standards (possibilities for exclusion)
- Traceability is an effective tool in matters of Safety and Food Safety
- Establishment-based Risk Assessment Model (ERA) is an evidence-based, standard, consistent and transparent approach to deliver timely results supporting risk-based decision making
- Developing evidence to show data-rich story to customers about the product, its provenance, sustainability, safety and quality can make how we see food safety

Prompt collaborative network

- The US experience in the establishment of the FDA FSMA Food Safety Technical Assistance Network, which provide important information to help industry to understand and implement regulations as FSMA
- It is important to develop collaborative networks as The Produce Safety Alliance (PSA), which is a collaboration between Cornell University, FDA, and USDA
- Public private alliance consisting of key industry, academic and government stakeholders



- Governments need to assist and support safe food by developing a national core curriculum, training and outreach programs
- Chilean universities and innovation research centres can develop projects of applied research to improve industry processes, especially post-harvest. The goal is to use modern tools of monitoring and pathogen's control.
- An example of a food safety committee was shown by the Fruit Export Association of Chile (ASOEX) to identify mechanisms to facilitate the implementation of preventive tools against food safety hazards in the fruit industry and to collaborate with the industry in such matters. Monthly meetings with about 20 professionals from different companies.
- ASOEX showed an example of the alliance between the public and private sectors to favor exports, enhance food health and food safety.
- The USDA showed examples of collaborative programs between the industry, academia and government: National Poultry Improvement Plan.
- Conclusions from the USDA were that will take long time and work to fully understand the needs of interested parties. Better knowledge of the industry needs would allow to better regulators.
- Academia is an essential collaborator to include the commercial and regulatory needs.
- The National Agency for Food Safety (Achipia) establishes regional advisory committees in food quality and food safety (CARS). The aims of the CARS are to link the risk analysis process (PAR) with issues related to food safety in the country. The committee can also propose risk evaluations through collaborative mechanisms.
- From Achipia, there is also a scientist network to provide expertise to the risk analysis process including expert elicitation panels.
- One of the Achipia's main goal is to articulate and coordinate the national system of food safety and food quality with the promotion of the production system, and also innovation and development strategies.

Major outcomes/conclusions in terms of policy relevance

New tools to detect:

- To date a number of advances have been conducted to improve technologies to rapidly detect pathogens in food production. While early detection is very important for food safety decisions, there are several concerns related with validation of these methods.
- New important cutting-edge technologies, as whole genome sequencing, are getting used in most of the world; policy makers need to understand these technologies and its applications to be able to get a consensus on common terms and regulations.
- Issues of chain co-ordination and chain governance thus matter (markets vs. hierarchies)
- Mitigation of food safety risks requires a systems approach, including development and use of appropriate tools by appropriately trained people who have a holistic understanding of the food system
- Innovative public-private partnerships (industry, government, academia) across the globe are needed to improve food safety, field that poses unique regulatory and implementation challenges

Relevance to CRP theme(s)

Pathogens transmitted through food represent a burden for human health. Every year, an estimated of 1:10 people around the world get a foodborne illness and a considerable number of people die from eating unsafe food; this representing an important public health concern. Sustainability of the food supply requires that food is produce to ensure safeness. Food systems are very complex and ensuring food safety, especially for the most vulnerable populations as infants, requires scientific evidence for all process used to control and prevent pathogens in the food chain. Policy makers and regulatory agencies in countries participating in the CRP should ensure that scientific knowledge is updated in terms of new science in the field of food safety.

Website for further details – please also indicate if the presentations are/will be available on the website

Key presentations are available un pdf format at: <http://veterinaria.unab.cl/first-international-symposium-on-food-safety/>