

Critical and Emerging issues in Food Safety and Quality

Critical issues are those that are the most pressing ones, and as such need to be addressed and considered as priorities. They can be known issues that are actually present/already occurring or even recurring. They can also be completely new or emerging. With the word “issues” is meant either hazards/challenges or opportunities or even trends that might have an impact on food safety and quality.

Emerging issues are those that are new, unexpected, or can cause change in the status quo. Many factors inside and outside the food production system(s) could directly and/or indirectly lead to emerging issues in food safety and quality.

Examples of “drivers of change” that could lead to emerging issues

- **Globalization of trade:** Food safety must be considered within a global context that is dynamic and evolving as part of the globalization process: increased international trade, more integrated markets, more rapid adoption of new technologies, increased market concentration, and information transfer, can all have important implications (both positive and negative) in food safety.
- **New distribution channels**
Increase in online retailers will eventually get to the food retail market; are there any food safety risks that might arise from such a change of the retail market, where the local store might be replaced with automated warehouses and logistics in distributing it to the end consumer?
- **Economic factors:** budgetary pressures on national governments to improve efficiencies and reduce spending on national food safety systems; the ability/ willingness of food enterprises to implement adequate food safety measures; trends in food adulteration and food fraud; fluctuation of food prices. All these, and many other economic factors can impact on food safety at different levels.
- **Climate change:** Climate change, perhaps the most compelling environmental issue of our time, can affect patterns of occurrence of food safety hazards. Indeed international commitment to address environmental issues has a significant impact on agricultural development strategies and on food safety
- **New technologies:** The increasing role of new and emerging technologies in food production, post-harvest treatment, processing, packaging and sanitary treatment is also significant in the context of food safety and more globalised food trade.
- **Scientific progress:** Technical and scientific innovation has multiple impacts on food safety and its management. More sensitive detection methods are providing new tools for investigating and indeed discovering new food safety hazards. Recent advances in food safety related sciences give us a better understanding of food-borne disease, and the role played by some food contaminants in the etiology of some pathologies and disorders.
- **Urbanization:** With the global population growing there is a sustained trend of migration from rural to urban areas. Cities (and surrounding areas) are increasingly becoming places where food is produced (i.e. urban and peri-urban agriculture). This plays an important role in how people procure food, what people eat, the nature of food traded and the interactions among food systems, people and the environment.
- **Regulatory landscape**
The regulatory landscape is changing with an increased importance on bilateral or multilateral treaties, emergence of private standards etc that can affect the food supply chain.
- **Public attention to food safety:** Increasing public awareness of food safety hazards, concern over hazards to health attributable to food hazards and reduced confidence in the ability of current food supply systems to manage food safety risks are additional factors to be considered in the food safety evolving context. At the same time food insecurity – an extreme manifestation of a large and growing wealth disparity within countries and among countries – remains a pressing global concern with important implications for decision-making on food safety at all levels.

Please note that the above are just some examples of drivers and the list is not complete. In responding to question #1 please consider these and any other broad drivers that you think could lead to emerging issues in food safety and quality.

1 - Identification of critical and emerging issues

Please identify what you believe to be the 3-5 most **critical issues** related to Food Safety and Quality, from **present to the next 2 - 5 years**.

- 1) Antimicrobial Resistance
- 2) Food fraud and authenticity
- 3) Campylobacter
- 4) Water
- 5) Chemical Contaminants

Please identify what you believe to be the 3-5 most important **emerging issues** related to Food Safety and Quality **in the next 2 to 5 years**.

- 1) New technologies
- 2) Urbanisation
- 3) Food fraud
- 4) Climate change
- 5)

2 - For each issue you have identified above please provide a short explanation¹ (1 or 2 paragraphs)

Critical Issues

Antimicrobial resistance

Antibiotic resistant bacteria threaten the successful treatment of human diseases. It is important that we understand the relative importance of the food chain as a whole in contributing to the public health problem. Better monitoring systems are needed to capture data relating to the use of antimicrobials in the various food chains (e.g. types & quantities of compounds used in various livestock production chains etc). Also monitoring and ongoing review of antimicrobial resistance data in bacteria from animals, foods and the environment.

Given the need for recycling waste materials in view of sustainability targets we also need to understand the extent to which systems for the disposal/recycling of animal manures and by-products and municipal organic materials contribute to the dissemination of AMR amongst bacteria.

Food fraud and authenticity

World trade is extensive now and there are large profits to be made in trading substandard or non-authentic food that may or may not be safe. Food fraud has the ability to cause significant national and sectoral damage as well as erode consumer confidence in food chain. There is concern regarding the ability of current controls to detect intentional fraud. Methodologies for detection need to be developed as well as methodologies for proactive vulnerability assessment. Early warning systems based on data analytics applied to big data would be advantageous.

For instance the 2013 Horsemeat Scandal identified significant fraudulent practices within the food chain. In 2015 the European Commission initiated an EU coordinated honey control plan to assess

¹ In providing a **short explanation** of 1 -2 paragraphs please briefly explain: 1) why you selected that issue (i.e. on what basis - information/data, knowledge or assumption - you made that choice) and 2) the expected and/or actual impacts of the issue (whether the impact would be sector-specific, affect only some sub-populations or countries/regions, whether it would be related to public health or trade etc)

the prevalence of honey adulterated with sugars and honeys mislabelled with regard to their botanical source or geographical origin. Interim results for the control identified 19% of the samples showed non-compliance in at least one of the checks to which they were submitted. To ensure quality standards are met and the consumer is not misled, there is likely merit in establishing controls across a range of foods to investigate the risk of fraudulent practices.

Campylobacter

Campylobacter is most common cause of bacterial foodborne disease in EU. Poultry recognised as most significant source, therefore has the potential to cause sectoral damage to poultry industry in the EU as well as costs associated with burden of human disease. Effective interventions needed within poultry production chain to reduce prevalence of these pathogens and limit human exposure.

Water

Climate change and global conflict will lead to pressures on water. We are already seeing regional conflict caused by water scarcity and also, in other regions, increased flooding. With these pressures will come a need to use different grades of water for different purposes in the food chain. Worldwide there is a need to define what is meant by clean water that is fit for food growing and food processing. Practical microbiological and chemical standards are required. Preferably different grades of water should be defined that are appropriate for different forms of use without increasing risk.

Horticultural producers (producers of food of non-animal origin) are significant users of water, both for irrigation and washing of crops. Groundwater, surface water or recycled water is used to irrigate crops. Contaminated water used for irrigation or for processing has been suspected as the likely source of contamination in a number of outbreaks related to horticultural crops.

Chemical Contaminants

Residues / chemical contamination are a critical issue, with recent experiences of dioxins, lead, Se, nicotine and various other residues in recent years, usually via ingestion and feed. Establishing best-in-class approaches to the identification and assessment of risks associated with biological and chemical contamination of foods and the development of innovative food safety controls, and tools that mitigate these risks is an acknowledged objective.

Emerging Issues

New Technologies

We need to understand the opportunities and threats that emerge from the use on new technologies in the food supply chain. Of particular focus are nanotechnology and synthetic biology. However, the brief could also be expanded to processing techniques like 3D printing. Whilst new technologies have their advantages they can also present risks in that potentially they can introduce a new hazard or risk into a process. Furthermore, they may create opportunities for food fraud e.g. developing a substance to mimic a food ingredient/mask food adulteration.

The food supplement sector is well positioned to take advantage of new technologies designed to produce food ingredients with higher nutrient contents or increased physiological effects. Systems need to be put in place by the industry in consultation with regulators to facilitate legitimate product development within acceptable safety parameters.

Urbanisation

This trend leads to higher incomes in certain segments of the population where the money used for food is a smaller percentage of expenditure. With this comes a tendency towards discretionary spend on food supplements including herbal supplements. The safety of many botanical constituents

of food supplements is undefined and data for risk assessment is sparse. There is a need for a concerted effort worldwide to define the safety of herbal supplements, both traditional and non-traditional.

Food fraud

As above under critical issues.

Climate change

Climate changes effect on the food supply and the viability of agriculture in certain regions of reduced/increased rainfall and temperature is a real emerging issue. We need to understand how this might impact on the biological safety and chemical safety of our food supply. For instance, mycotoxin formation, pathogen contamination, marine biotoxin spread.