STRENGTHENING FOOD SAFETY GOVERNANCE IN NEPAL THROUGH COLLABORATIVE CAPACITY DEVELOPMENT AND PRIVATE SECTOR ENGAGEMENT

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ABSTRACT

This article discusses the policy and regulatory challenges faced by Nepal in strengthening food safety governance and the potential solutions to address them. Capacity building through training programs and technical assistance, regional collaboration, and private sector engagement are the key strategies identified for improving food safety standards in the country. The article highlights the need for a comprehensive legal framework and the establishment of a centralized food safety authority in Nepal. The challenges faced by the private sector in complying with food safety standards are also discussed, particularly the difficulties faced by small and medium-sized enterprises. The potential benefits of regional collaboration in the food sector, including the harmonization of food standards, the development of regional frameworks for food safety based on the Codex, and the creation of a regional food safety rapid alert system, are also examined. The article concludes that addressing policy and regulatory challenges through capacity building, regional collaboration, and private sector engagement can lead to improved food safety governance in Nepal and help the country to overcome its food safety challenges.

1. INTRODUCTION

Food safety measures in developing countries are insufficient, scattered and lack efficacy in safeguarding consumer health or enabling countries to compete for export markets. The cost of enhancing food safety measures is usually high, and many developing countries encounter difficulties in enforcing food safety legislation. Despite the introduction of codex and ISO standards, several years ago, these countries continue to experience food safety problems, including food fraud, in their domestic market. Although progress has been made in developing or adopting international standards, the full implementation of these standards, and a significant reduction in food safety-related incidents, have yet to be realized (WHO, 2015).

The effective implementation of food safety regulations and standards is crucial in developing countries to ensure consumer health, trade and economic growth, and food security. Low- and middle-income countries (LMICs) are more vulnerable to foodborne illnesses, leading to significant medical expenses and loss of productivity. Unsafe food can also impede international trade, hindering economic development. Adopting international standards can help LMICs meet trade requirements and create a culture of transparency and accountability, building consumer trust in the food system while preventing foodborne illnesses and safeguarding public health. According to the World Health Organization (WHO), unsafe food is responsible for an estimated 600 million cases of foodborne illnesses and 420,000 deaths annually, most of which occur in low- and middle-income countries (WHO, 2020).

Nepal has made progress in improving its food safety standards through the establishment of a National Codex Committee and adoption of the HACCP system. However, implementation and enforcement remain a challenge, especially in rural areas where access to resources and training is limited. The level of compliance with food safety regulations in Nepal is generally low, indicating a need for capacity building among regulators and food handlers to ensure the safety and quality of food products (WHO, 2014).

Food safety is a growing concern in Nepal, as it has a significant impact on public health and international trade.

Nepal's membership in the World Trade Organization (WTO) requires the country to adopt its food safety regulations aligning with international standards, such as the Sanitary and Phytosanitary (SPS) agreement. As a result, Nepal has been working to update its existing food safety regulations to meet these standards. However, there are still regulations that need to be harmonized with Codex principles, and the implementation of Hazard Analysis and Critical Control Point (HACCP) principles in the food industry is not yet mandatory (Bajagai, 2012).

To ensure food safety standards in Nepal, it is crucial to focus on enhancing awareness, building capacity, and improving the infrastructure needed for effective implementation and enforcement of food safety regulations. This includes providing training and resources to regulators and food handlers, improving food testing facilities, promoting public education and awareness on food safety, and encouraging the adoption of international standards such as the Hazard Analysis and Critical Control Points (HACCP) system. By prioritizing these efforts, Nepal can create a safe and reliable food supply system that will not only protect public health but also promote economic growth and trade opportunities.

2. REGULATORY CHALLENGES IN ENSURING FOOD SAFETY STANDARDS IN NEPAL

Around 61 years ago, Nepal introduced the concepts of food safety, technology, and nutrition through its first periodic plan from 1956 to 1961, which highlighted the importance of exporting ghee to Tibet. This period marked the emergence of a problem in the export process, as there was a lack of proper processing skills for ghee, which resulted in a loss of around 10 million NRs (~ 100 thousand USD at that time) (Dahal *et al.*, 2017). The food safety system of Nepal is primarily guided by the Codex principles but still the country is not able to adopt all international standards and guidelines due to lack of adequate resources.

While the regulation of food safety in Nepal started in 1966 with the enforcement of the Food Act by the government, it wasn't until the country became a member of the World Trade Organization (WTO) in 2004 that food safety-related issues became a matter of increased concern and a priority for the government (Bajagai, 2012). The primary government institutions tasked with ensuring food safety and quality management in Nepal are the Department of Food Technology and Quality Control (DFTQC) and its subordinate offices, which fall under the purview of the Ministry of Agriculture and Livestock Development.

Other government institutions are also supplementing the regulation of the food safety and quality in the food and feed chain. The Department of Agriculture (DoA) and the Department of Livestock Services (DLS) share some of these responsibilities alongside the Department of Food Technology and Quality Control (DFTQC), which operates under the Ministry of Agriculture and Livestock Development. Additionally, the Nepal Bureau of Standards and Metrology (NBSM) governs some voluntary standards related to food safety. To further strengthen the regulation of food safety in Nepal, the government approved and implemented the Food Safety Policy 2019 on June 23, 2019. Moreover, a new food safety and quality regulation is in the pipeline, which is expected to enhance the existing food safety framework in the country.

Food safety incidents have gained widespread attention and pose significant challenges for national food safety regulation. Recent occurrences of food safety incidents worldwide have brought into question the capacity of food safety regulatory agencies. As a result, there is a growing demand for these authorities to take a more prescriptive and proactive approach to tackle food safety issues and ensure appropriate level of consumer protection (Cope *et al.*, 2010; Hoffman and Harder, 2010; Chen *et al.*, 2015). Food safety is a critical issue in Nepal, as the country faces several regulatory challenges in the design, implementation and enforcement of safety standards across the value chain which is shown in Table 1. Insufficient investment in this sector and lack of stakeholder engagement and cooperation are major obstacles. Partnerships/collaborations among federal, state, and local governments with industry, universities, private organizations, and consumers are also lacking. The prevailing laws/regulations are too old and do not address some issues clearly, such as nutrition labeling, newer additives, and export-import issues, and focus mainly on end-product testing rather than a preventive approach. There is also a lack of clear coordination mechanisms among different government institutions, including DFTQC, DoA, DLS, NBSM, and the Ministry of Health and Population. Additionally, there are gaps and overlaps in the roles and responsibilities of government institutions. Furthermore, the country has been unable to respond and adapt to new technology and changing consumer needs, leading to challenges in the regulation of food safety. In order to overcome the challenges facing the food safety sector in Nepal, it is essential for stakeholders to work collaboratively and invest in the implementation of modern technologies, regulations, and coordinated efforts.

Table 1. Regulatory challenges in enforcing food safety standards in Nepal

S.N	Regulatory Challenge	Description
1.	Insufficient investment	Lack of resources and funding for food safety programs and infrastructure, making it difficult to enforce regulations and conduct inspections.
2.	Lack of stakeholder engagement	Limited partnerships and collaborations among federal, state, and local governments with industry, universities, private organizations, and consumers.
3.	Outdated laws and regulations	Prevailing laws/regulations are too old and do not address some issues clearly, such as nutrition labeling, additives, and export-import issues.
4.	Reactive rather than preventive approach	Focus mainly on end-product testing rather than a preventive approach.
5.	Lack of coordination	Lack of coordination among different government institutions, including DFTQC, DoA, DLS, NBSM, and the Ministry of Health and Population.
6.	Gaps and overlaps in roles and responsibilities	Gaps and overlaps in the roles and responsibilities of government institutions.
7.	Inability to adapt to new technology and changing consumer needs	The country has been unable to respond and adapt to new technology and changing consumer needs, leading to challenges in the regulation of food safety.

3. CAPACITY CONSTRAINTS AND POTENTIAL SOLUTIONS IN ENFORCING FOOD SAFETY STANDARDS

The capacity constraints in the enforcement of food safety standards in poor countries, such as inadequate investment, lack of stakeholder engagement, insufficient partnerships and collaborations, unclear implementation plans can lead to increased risks of foodborne illnesses, economic losses, and damage to reputation and public trust in the food industry (Hoffmann *et al.*, 2019). The food safety governance in Nepal faces several challenges such as a limited structure of the governing body, insufficient risk-based inspection, and inadequate laboratories and manpower to carry out surveillance and monitoring. Additionally, the country suffers from a shortage of skilled personnel to operate advanced equipment, and a limited number of food safety standards that are not harmonized with Codex. Furthermore, there is a lack of a mechanism and resources to detect, address and prevent foodborne illnesses, and the research budget is also inadequate. These challenges have resulted in an ineffective implementation of food safety standards and regulations, leading to a high incidence of foodborne illnesses and other related problems in the country.

To address the capacity constraints in ensuring food safety standards in Nepal, several possible solutions can be considered which is summarized in the Table 2 given below. Firstly, a database for food safety control system can be established for better organization and management of food safety information. Secondly, a structured and well-planned food safety surveillance system can be implemented, with adequate monitoring and surveillance. The development of risk assessment methodologies can help in identifying and prioritizing potential food safety risks. Technical collaboration and networking of regional laboratories can improve the capacity of food safety testing and analysis. Thirdly, it is essential to ensure good practices in food production, processing, manufacturing, retail sale, transportation, preparation, and handling. This can be achieved through appropriate technical assistance and education for stakeholders. Additionally, a food chain approach and integrated food safety management system can be implemented to ensure comprehensive food safety management. Finally, developing a National FBD (Food borne disease) surveillance system can help in the early detection and response to food safety incidents.

Table 2. Capacity constraints and possible solutions in ensuring food safety standards in Nepal

S.N	Capacity Constraint	Possible Solutions
1	Lack of organization and management of food safety information	Establish a an integrated database for food safety system
2	Inadequate monitoring and surveillance	Implement a structured and well-planned food safety surveillance system
3	Insufficient capacity for food safety testing and analysis	Develop risk assessment methodologies, and collaborate and network regional laboratories
4	Poor practices in food production, processing, manufacturing, retail sale, transportation, preparation, and handling	Ensure good practices through appropriate technical assistance and education for stakeholders, enforcement of GMP and HACCP guidelines in food manufacturing premises
5	Inadequate food safety management system	Implement a food chain approach and integrated food safety management system
6	Lack of early detection and response to food safety incidents	Develop a National FBD surveillance system

4. LEARNING FROM OTHER COUNTRIES: BEST PRACTICES AND EXPERIENCES IN ENSURING FOOD SAFETY STANDARDS

Nepal can learn from the experiences of neighboring countries like India and China, which have faced similar challenges in ensuring food safety. For instance, India has established a strong food safety regulatory framework with the creation of the Food Safety and Standards Authority of India (FSSAI), which has a well-defined organizational structure, comprehensive legal framework, and efficient enforcement mechanisms.

Similarly, China has made significant progress in food safety regulation by implementing a risk-based approach and strengthening laboratory capacity (Chen *et al.*, 2021). Nepal can adopt similar strategies, including the establishment of a centralized food safety authority, risk-based inspection, and strengthening laboratory infrastructure. Collaborating and sharing best practices with neighboring countries could also help Nepal to develop a more effective food safety regulatory framework.

In order to improve the food safety standards in Nepal, the country can learn from the best practices and experiences of other countries. One key learning is the implementation of Good Agricultural Practices (GAP), Good Hygienic Practices (GHP), and Good Veterinary Practices (GVP) at the production level, as well as Good Manufacturing Practices (GMP), GHP, ISO, and HACCP at the processing level. Other best practices include ensuring Good Storage Practices (GSP) during storage, product recall, and traceability during distribution, strengthening and accrediting laboratories, and establishing Food Safety Indicators. Additionally, the government can offer subsidies for system certification and authorize private laboratories to facilitate timely and effective food testing and inspections. The establishment of a Food Epidemiology Unit can also help identify and prevent foodborne illnesses. Nepal can also adopt a risk-based inspection system and promote technical collaboration and networking among stakeholders, as well as a holistic approach to food safety management through the food chain approach.

Furthermore, Nepal can also learn from other countries' experiences with consumer education and awareness campaigns. For instance, Japan's Consumer Affairs Agency has launched a comprehensive food safety education program to promote safe food consumption among consumers, including schoolchildren, parents, and the elderly (Kimura, 2011). Another example is South Korea's "Smart Consumer" campaign, which aims to educate consumers about food safety issues and empower them to make informed choices (Sŏng-yong *et al.*, 2022). These programs have been effective in increasing public awareness and reducing food safety incidents.

Moreover, Nepal can also learn from innovative technologies and practices that are being developed and implemented in other countries. For example, the use of block chain technology in food traceability and supply chain management has shown promise in ensuring transparency and accountability in the food industry (Tian *et al.*, 2016). Additionally, the application of artificial intelligence and machine learning in food safety inspections can enhance the efficiency and accuracy of the inspection process.

5. COMPLIANCE WITH FOOD SAFETY STANDARDS IN NEPAL: CHALLENGES FACED BY THE PRIVATE SECTOR

In poor countries, the compliance with food safety standards is a major concern for the private sector, who often face difficulties in ensuring compliance due to limited resources, inadequate infrastructure, and a lack of proper training and knowledge (Henson & Jaffee, 2007). The private sector in Nepal faces several challenges in complying with food safety standards, hindering their ability to provide safe and high-quality products to consumers. While tools such as Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP) are widely used in export items like tea and coffee, they are less commonly utilized in domestic market products. Moreover, the government's communication on food safety largely occurs through associations of particular commodities, which creates a disjointed and inconsistent approach to food safety regulation. Additionally, private labs are not authorized by the government, which can make it difficult for businesses to conduct necessary testing and analysis of their products. The challenges faced by the private sector along with its possible solutions is summarized in Table 3.

Another challenge is that compliance with food safety standards is easier for large-scale food industries, while small and medium-scale industries often struggle to comply with these regulations. This results in violations of the law, particularly among street vendors, hotels, and restaurants. Small and medium-scale industries are often unable to afford system certification, which can be costly and time-consuming. Thus, there is a need for training and strengthening of these industries to improve their compliance with food safety standards and ensure the safety of the food supply chain.

Table 3. Challenges faced by the private sector in compliance with food safety standards in Nepal

Challenges	Possible Solutions
Limited resources and inadequate infrastructure	Provide financial support, grants, and subsidies to assist small and medium-sized enterprises (SMEs) in upgrading their infrastructure and acquiring necessary equipment for food safety compliance. Improve access to loans or credit facilities for businesses to invest in food safety measures.
Lack of proper training and knowledge	Conduct comprehensive training programs and workshops for food industry personnel to enhance their understanding of food safety regulations, best practices, and techniques. Collaborate with educational institutions and industry associations to provide specialized courses and certifications in food safety management.
Disjointed and inconsistent approach to regulation	Strengthen coordination and collaboration among government agencies, industry associations, and relevant stakeholders to develop unified and consistent food safety regulations.
Limited availability of authorized testing facilities	Establish authorized private laboratories with the necessary accreditation to conduct food safety testing. Strengthen and expand the capacity of government laboratories to meet the demand for testing services. Encourage partnerships between public and private sectors to improve testing facilities and promote quality assurance.
Compliance challenges for small and medium-scale industries	Provide financial incentives or subsidies specifically targeted at small and medium-sized enterprises to assist them in meeting food safety compliance requirements. Offer technical assistance and mentorship programs to guide smaller businesses in implementing food safety practices and acquiring necessary certifications.
Lack of awareness and understanding among SMEs	Launch awareness campaigns and educational initiatives to promote the importance of food safety among SMEs. Provide resources, such as guidelines, toolkits, and online platforms, to facilitate access to information and best practices. Collaborate with industry associations and trade organizations to disseminate information effectively.
Inadequate monitoring and surveillance	Strengthen regulatory agencies' capacity for regular monitoring and surveillance of food products. Increase inspections, random sampling, and product testing to ensure compliance with food safety standards. Implement stricter penalties and enforcement measures for non-compliance. Encourage public reporting mechanisms to identify and address violations.
Limited technical assistance and education	Establish partnerships between government agencies, NGOs, and international organizations to provide technical assistance, capacity building programs, and mentorship to the private food sector. Facilitate knowledge exchange platforms and industry forums to foster learning and sharing of best practices.

In addition to the challenges mentioned above, the private sector in Nepal also faces difficulties in accessing technical assistance and education regarding compliance with food safety standards. There is a lack of awareness and understanding among small and medium-sized enterprises (SMEs) regarding the importance of food safety, which often leads to non-compliance. Furthermore, the absence of authorized private laboratories and the limited capacity of government laboratories pose a significant challenge for the routine service delivery to the private sector in Nepal. This lack of laboratory infrastructure and testing facilities makes it difficult for small and medium-sized enterprises to ensure the safety and quality of their products. Inadequate monitoring and surveillance of food products in the market *also* contribute to non-compliance with food safety standards, as it allows for the sale of unsafe and adulterated food products.

6. REGIONAL COLLABORATION FOR FOOD SAFETY: AREAS, IMPLICATIONS AND BENEFITS

According to the Global Food Security Index (GFSI), which assesses the fundamental factors of affordability, availability, quality, and safety in 113 countries worldwide, the overall food safety situation in Southeast Asia is comparatively poor when compared to other developed nations (Shrestha & Khanal, 2019). The GFSI is a comprehensive, dynamic, and multidimensional model based on 34 distinct indicators that assess these food security drivers in both developed and developing countries. As seen from Table 4, India has the highest overall and category-ranked score in the South Asian Association for Regional Cooperation (SAARC) countries, while Pakistan has the lowest. All scores are rated on a scale of 0 to 100, with 100 being the most desirable (GFSI, 2022).

Regional collaboration in the food sector can have significant implications and benefits, particularly for poor countries. Sharing of knowledge and experiences can lead to the development of a common understanding of food safety standards, which can improve the overall quality and safety of food products in the region. This can result in a reduction in the number of foodborne illnesses and related deaths, improving public health outcomes. Regional collaboration can also facilitate the exchange of goods and services, leading to economic growth and development in the region. Moreover, regional collaboration can help to address common challenges and issues faced by poor countries, such as lack of infrastructure and limited resources for monitoring and surveillance of the food sector. Collaboration can also promote the harmonization of food safety regulations and standards, which can reduce trade barriers and improve market access for poor countries (Martinez *et al*., 2007). Additionally, regional collaboration can lead to technical assistance and capacity building for poor countries, enabling them to improve their food safety systems and comply with international standards. This can enhance the competitiveness of poor countries in the global market and increase their access to international trade opportunities.

Regional collaboration in the food sector can greatly benefit poor countries by ensuring that food safety standards are harmonized across borders, reducing trade barriers and promoting a more efficient food supply chain. One area of collaboration could be the harmonization of food standards to ensure that the same regulations are applied in all countries within a region. This could be achieved by developing a regional framework for food safety based on the Codex Alimentarius, which provides guidelines and standards for food safety and quality.

Table 4. Global Food Security Index of SAARC countries (GFSI, 2022)

Country	GFSI Rank/Score	Category Rank/ Score		
		Affordability	Availability	Quality and Safety
Afghanistan	NA	NA	NA	NA
Bangladesh	80/54	87/52.1	46/61.5	71/58.4
Bhutan	NA	NA	NA	NA
India	68/58.9	80/59.3	42/62.3	67/62.1
Nepal	74/56.9	85/52.7	13/70.9	72/57.8
Maldives	NA	NA	NA	NA
Pakistan	84/52.2	75/59.9	61/58.3	97/49.4
Sri Lanka	79/55.2	74/61	64/57.2	81/55

Another area of collaboration could be the development and implementation of a regional food safety strategy, which would aim to improve food safety practices and reduce the incidence of foodborne illnesses. Mutual Recognition Agreements (MRAs) could also be established to facilitate trade and recognition of food safety standards between countries.

The development and recognition of regional standards for system certification could also help to clear doubts and smoothen trade, especially for small and medium-sized enterprises. A Regional Food Safety Rapid Alert System could be established to improve communication and reduce trade losses in the event of a food safety issue. Finally, the establishment of a Regional Food Borne Disease Epidemiology Centre could help to identify and respond to foodborne disease outbreaks in a timely and effective manner. Moreover, through surveillance, investigation, risk assessment, capacity building, and collaboration, the center can contribute to improved food safety standards, enhanced public health outcomes, and ultimately protect the well-being of the population in the region. Overall, regional collaboration in the food sector has the potential to enhance food safety standards, promote trade, and improve public health in poor countries.

7. CONCLUSION

In conclusion, addressing policy and regulatory challenges, capacity building, regional collaboration, and private sector engagement are crucial for strengthening food safety governance in Nepal. The implementation of tools such as GMP, GHP, HACCP, and the establishment of a centralized food safety authority, risk-based inspection, and strengthening laboratory infrastructure are necessary for ensuring food safety standards. Similarly, collaborating and sharing best practices with neighboring countries can help Nepal to develop a more effective food safety regulatory framework. Additionally, private sector engagement plays a crucial role in ensuring compliance with food safety standards; however, small and medium-scale industries encounter numerous challenges that require immediate attention. Likewise, developing a regional framework for food safety based on codex, harmonization of food standards, and the formation of a Regional Food Safety Rapid Alert System can enhance regional collaboration and improve communication among countries. Furthermore, the establishment of a Regional Food Borne Disease Epidemiology Centre and the recognition of regional standards for system certification can contribute to improving food safety in the region.

REFERENCES

Bajagai, Y. S. (2012, August). Food safety regulation in Nepal and issues in the regulation of meat safety. In *National Conference on Food Science and Technology (Food Conference-2012)* (pp. 10-11).

Chen, K., Wang, X. X., & Song, H. Y. (2015). Food safety regulatory systems in Europe and China: A study of how co-regulation can improve regulatory effectiveness. *Journal of Integrative Agriculture*, *14*(11), 2203-2217.

Chen, X., Lyu, H., Zhang, J., Bai, L., & Wang, J. (2021). National food safety standards related to microbiological contaminants in China: Recent progress and challenges. *Foodborne Pathogens and Disease*, *18*(8), 528-537.

Cope, S., Frewer, L. J., Renn, O., & Dreyer, M. (2010). Potential methods and approaches to assess social impacts associated with food safety issues. *Food Control*, *21*(12), 1629-1637.

Dahal, N.R., Shrestha, P., & Karn, S.K. (2017). An overview on food safety, technology and nutrition (FSTN) sector of Nepal from federal perspective. *Food Research Bulletin,* 1-22.

Fulponi, L. (2006). Private voluntary standards in the food system: The perspective of major food retailers in OECD countries. *Food policy*, *31*(1), 1-13.

GFSI. (2022). Global Food Security Index. Website: https://foodsecurity index.eiu.com/

Henson, S., & Jaffee, S. (2007). The costs and benefits of compliance with food safety standards for exports by developing countries: the case of fish and fishery products. In *Global supply chains, standards and the poor: how the globalization*

of food systems and standards affects rural development and poverty (pp. 26-41). Wallingford UK: CABI.

Hoffmann, S., & Harder, W. (2010). Food safety and risk governance in globalized markets. Health Matrix, 20, 5.

Hoffmann, V., Moser, C., & Saak, A. (2019). Food safety in low and middle-income countries: The evidence through an economic lens. *World Development*, *123*, 104611.

Kimura, A. H. (2011). Nationalism, patriarchy, and moralism: the government-led food reform in contemporary Japan. *Food and Foodways*, *19*(3), 201-227.

Martinez, M. G., Fearne, A., Caswell, J. A., & Henson, S. (2007). Co-regulation as a possible model for food safety governance: Opportunities for public–private partnerships. *Food Policy*, *32*(3), 299-314.

Sŏng-yong, P., Yong-su, C., & Min-su, S. (2022). The Quandaries of Advertising Censorship. *Flower of Capitalism: South Korean Advertising at a Crossroads*, 101.

Shrestha, R. B., & Khanal, B. K. S. (2019). Improving Food Safety in Agriculture and Food Systems: A Strategic Policy Pathway for 2030 in South Asia. *Food Safety in South Asia: Challenge, Opportunity and Policy Perspectives*, 8-33.

Tian, F. (2016, June). An agri-food supply chain traceability system for China based on RFID & block chain technology. In 2016 13th international conference on service systems and service management (ICSSSM) (pp. 1-6). IEEE.

World Health Organization. (2014). *Capacity-building of national Codex Committees in the Member States of South-East Asia, Report of a regional workshop, New Delhi, India, 23-25 October 2013* (No. SEA-NUT-189). WHO Regional Office for South-East Asia.

World Health Organization. (2015). *WHO estimates of the global burden of foodborne diseases: foodborne disease burden epidemiology reference group 2007-2015*. World Health Organization.

World Health Organization. (2020). *Meeting report: the second global meeting of the FAO/WHO International Food Safety Authorities Network (INFOSAN), 9-11 December 2019*, Abu Dhabi, United Arab Emirates.