



Food and Agriculture  
Organization of the  
United Nations



# Regional Food Safety Conference for Asia and the Pacific

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Conference report  
17, 19, 24 and 26 November 2020



# **Regional Food Safety Conference for Asia and the Pacific**

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# Abstract

Unsafe food is a burden that costs to the region of Asia and the Pacific 225 000 deaths every year. In 2020, the spread of COVID-19 has emphasized the critical need for pre-requisite food safety programmes such as those offering good hygiene practices for food handling, which are at the core of the response to COVID-19. From 17 to 26 November 2020, Food and Agriculture Organization of the United Nations (FAO) has organized the Regional Food Safety Conference for Asia and the Pacific. The conference was hosted in collaboration with the Government of Thailand, to discuss the current food safety situations and opportunities with a particular focus on the needs and opportunities for the region. The conference consisted four sessions, one discussed on each day. These held specific focus on different aspect of food safety: national food control systems, science and technology, multi-sectoral collaboration and the international trades, communication and education. The dialogues covered traditional topics such as food safety standards, new and emerging subjects such as innovative technologies, and the spread of misinformation on food safety. Integrated food safety systems and strong regional collaborations among stakeholders were highlighted as highly important elements of a One Health approach, and it was shown how food safety is a shared responsibility and everyone in the food chain has a role to play.

## Keywords

Food safety, conference, Asia and the Pacific, webinar, national food control system, Codex Alimentarius, evidence-based, risk analysis, competent authority, food industry, civil society, standards, trade, farmers, communication, media, One Health, Food and Agriculture Organization of the United nations (FAO)



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# Abbreviations and acronyms

ASEAN	Association of Southeast Asian Nations
COVID-19	Name of the disease caused by the novel coronavirus SARS-CoV-2, standing for: coronavirus disease of 2019
FAO	Food and Agriculture Organization of the United Nations
HACCP	hazard analysis and critical control points
INFOSAN	International Food Safety Authorities Network
NGOs	non-governmental organization
SDG	Sustainable Development Goal
SPS	sanitary and phytosanitary measures
WHO	World Health Organization



# 1

## • Introduction

Across Asia and the Pacific, news on food safety issues and incidents frequently hit the headlines. Reports of food contamination and foodborne illnesses regularly cause alarm among the public and impact local businesses. This, in turn, has wider negative economic consequences as trade and tourism are adversely affected and the image of a country is associated with unsafe food. The concern among consumers reflects a lack of confidence in the way food safety is enforced and practiced. It also echoes necessity for greater investments in the infrastructure and technical capacity to assure that all food available in the marketplace is safe for human consumption, by default. It is now well-recognized that food security, food safety and nutrition go hand-in-hand and achieving Zero Hunger within the framework of Sustainable Development Goal (SDG) 2 is not simply about providing adequate food for everyone but ensuring safe and nutritious diets for all.

Some key foodborne pathogens alone make 600 million people ill and cause 420 000 premature deaths annually and that this translates into productivity losses of 95 billion USD a year in low- and middle-income countries. The difference that such huge sums as savings would make to the overall health and prosperity of the Asia-Pacific region, especially when most of the countries are off-track with respect to achieving the SDGs, is self-evident. The importance of having modern food control systems in the Asia-Pacific region, which has countries with the highest populations, the densest urban agglomerations and the highest economic growth rates in the world cannot, therefore, be under-estimated.

In order to discuss the opportunities and challenges in the area of food safety in the region, the Food and Agriculture Organization of the United Nations (FAO) organized the FAO Regional Food Safety Conference for Asia and the Pacific entitled “Food safety in the era of COVID-19: ensuring consumers’ trust”.

### 1.1 Objectives of the conference

The objectives of the conference were to:

- further elevate the importance of the subject in the context of SDG2;
- discuss the current state of food control systems in the region;
- hold in-depth discussions on existing food safety issues;
- analyse the impact of drivers of change such as technology and climate;
- explore mechanisms for all sectors of food and agriculture and all partners – governments, private sector, Non-Governmental Organizations (NGOs), academia, media and consumers – to strongly collaborate and create a food safety culture.

## 1.2 Overview of the of the conference

The conference was hosted online on Zoom and livestreamed on YouTube on 17, 19, 24 and 26 November 2020. A total of 1 529 people registered; and among them, 977 people participated. The conference was the result of the joint efforts between FAO and the Government of Thailand. The links to the recorded session are available in Annex 5 of this report.

Four sessions of the conference had four specific focused areas, namely: 1) government roles in food safety, 2) science-based evidence generation for risk-based prioritization, 3) trade, standards, industry and small-scale farmers, 4) managing misinformation on food safety, food safety communication, and education for the next generation of food safety practitioners.

The conference attracted diverse types of participants from the government sector (40 percent), academia and students (15 percent), private sector (12 percent), international organizations (two percent) and NGOs and others (31 percent). Seventy-six percent of the participants were from 33 countries in Asia and the Pacific region while the remaining 24 percent connected from 57 countries outside of the region. More details on the demographics of the participants are reported in Annex 3 of this report.

## 1.3 Key themes

### Roles of governments in food safety

The diversity of countries in the region in terms of their organization of national food control systems is causing profound differences in the way food safety is managed and controlled. Legal and regulatory frameworks for food control including imports which are in consonance, if not harmonized, with those of other countries are an important priority for countries. Risk-based inspection of imported foods has acquired enhanced significance due to the massive growth in global food trade. And the heavy dependence of Pacific countries on imported food links it strongly to food security and nutrition. Conducting national food safety assessments and making improvements over time using indicators is theoretically a good approach, but the ranking of countries based on such assessments can be a sensitive issue. Ensuring multi-sectoral co-ordination mechanisms across the food chain and good corporate governance with up-to-date regulations and their enforcement through risk-based inspection remains a strong need.

### Science-based evidence generation for risk-based prioritization

Surveillance, monitoring and analytical services generate much needed data and evidence on food safety hazards for risk analysis. This information is then expected to feed back into improving regulations, formulating food safety standards and implementing risk management measures including response to emergencies. Technical capacities in this area need to be constantly strengthened and upgraded. Countries face challenges due to the lack of a strong educational and scientific research systems and network that can deliver science-based evidence. This is further compounded by the uncertainty caused by climate change. Temperature and rainfall changes can force changes in crop rotations and thereby alter the pattern of pest and disease infestations and outbreaks which in turn is modifying schedules of agronomic inputs including fertilizers, manures, pesticides and veterinary drugs for livestock and fisheries. Downstream actions along the supply and value chains are affected with new temporal and spatial entry points being created for food safety hazards.

## **Trade and food standards for small-scale family farmers and fishers**

This is a complex area and countries consistently require technical advice and assistance to improve their understanding of mandatory and voluntary standards and their implementation. Partnerships with and delegation to the private sector are required to enhance the adoption of the latter whilst strengthening enforcement of the former are important to ensure that risk management and food safety is a shared responsibility. Voluntary standards make best practices more accessible and contribute to the ease of doing business in food products. But they need to be simplified through the development of easy to understand codes of practice that can be implemented by producers especially smallholders and supply chain actors many of whom are relatively less educated.

## **Responsible use of technology: can Asia-Pacific leads the way?**

Technology is changing the way food is being produced, processed and sold to consumers. It is vague on how e-commerce platforms and food delivery services, driven by the increasing prevalence of smartphones, are overseeing food safety of all of their suppliers. Factors such as the quality of ingredients, temperature, equipment and machinery, the exposure and training of the actors involved to good practices, type of transportation and food contact materials can influence safety. In rapidly urbanizing Asia, this sector is set to grow at a tremendous pace and food safety in online retail is an area that needs to start getting addressed very quickly. In addition, the sustainability of agri-food chains and the safety of leftover or surplus food is a growing concern.

## **Awareness and risk communication in the social media era**

Behaviour change communication and the creation of a food safety culture are issues that need to be high on the agenda of national food safety authorities. This involve mass training and awareness raising for food business operators, supply chain actors and consumers on the incorporation of food safety measures from farm to table. This needs to be coupled with demystifying food safety for the media. The internet is now the primary source of information in most parts of Asia where mobile data is cheaper than any other region in the world. The growth of information technology is also partly reflected in reporting on food safety issues where news spread fast on social and electronic media. The speed of news transmission through social media sometimes comes at the cost of its accuracy which leads to scares and unwanted actions such as destruction of food. Most of the times, information reaches the people are based on hearsay rather than on science. This is aggravated by limited expertise in the countries on risk communication that can ensure that correct information is made available at the right time to avoid unnecessary fear among consumers.

## **Technical education for next generations**

As the nature of agriculture production and downstream processing undergo profound changes, there is a pressing requirement to develop and upgrade university curricula and professional courses on food safety to address the demand of employers. The academic systems in the region need to prepare a new class of food safety professionals who are familiar with the principle of risk, can implement internationally accepted good practices and standards, carry out audits, perform reliable laboratory tests for detection of hazards and perform prevention and management actions. Scientific and academic institutions will also need to invest more in research on many aspects of food safety, ranging from hazard assessment to consumer behaviour.



# 2 • The FAO Regional Food Safety Conference for Asia and the Pacific: food safety in the era of COVID-19

## 2.1 The importance of food safety

Mr Jong-Jin Kim, Assistant Director General and FAO Regional Representative for Asia and the Pacific, opened the floor by speaking about the importance of food safety: in 2020, the COVID-19 pandemic has increased the awareness on food safety and encouraged the widespread adoption of good hygiene practices. This allows building stronger foundations for food safety and placing it at the centre of the efforts to achieve zero hunger. If systematically implemented, food safety measures can ensure that one-in-ten people in the world would not fall sick due to foodborne causes. That could probably save up to 95 billion dollars annually in low and middle-income countries. The largest global producers of some key commodities – rice, pulses, oilseeds, millets, sugar, milk, fruits and vegetables, fish, eggs – are all in Asia and the Pacific. These big volumes in the supply chain need to be managed safely as these commodities are exported globally. Food chains now span continents and countries, all with varying levels of food control and, hence, the importance of adopting commonly agreed standards like those of Codex Alimentarius. Among the main stakeholders of food safety, there are the government, the research community, the private sector and the consumers: this implies that this cannot be regulated by one entity alone. It therefore needs to be based on a judicious mix of regulation, delegation and participation.



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Mr Kiattibhoom Vonggrachit, the Permanent Secretary of the Ministry of Public Health of Thailand, delivered the welcome remark to the conference and further highlighted that food safety requires the region's attention. Food is one of the most important fundamentals of life. Thus, the availability, quality and safety of food are the utmost important. Each year, about 600 million people become sick and about 420 thousand people die from foodborne pathogens worldwide, specifically, in the Asia-Pacific region, about 275 million people fell ill because of food related causes each year. Unsafe food does not only cause negative impact to health, but it also affects the economy, trade and tourism. Particularly, during the COVID-19 pandemic, food hygiene is even more important for both safeguarding the people's health and revitalizing the economy. The issues of food security, food safety and nutrition are interlinked and must be addressed along the entire food chain, from production to consumption.

After the opening ceremony, the food safety toolkit was officially launched. Mr Sridhar Dharmapuri, the moderator, explained that this been jointly developed by FAO, Government of Thailand and a number of many experts around the world. They set of 10 different topics available for all the countries in the region. The food safety toolkit will be made available online at <http://www.fao.org/asiapacific/perspectives/one-health/food-safety/>.



For short video  
<https://www.youtube.com/watch?v=qY7-foxpc0c&feature=youtu.be>

For long video  
<https://www.youtube.com/watch?v=hY9azJqSLHw&feature=youtu.be>



## 2.2 Food safety in the era of COVID-19

Mr Alan Reilly, an Adjunct Professor at the Institute of Food and Health of the University College Dublin, in Ireland, discussed the challenges for national food control systems in the era of COVID-19.



The government's role is to establish national food safety programs to protect consumer health and interests, and to facilitate food trade. Aside from the aforementioned, they are also encouraged to invest on food safety in order to adapt to climate change, evolving food systems, consumer preferences and etc. Without these, government cannot underpin the food their industries produce for local and export purposes.

National food control systems include:

- national food safety policies, framework legislation, food regulation and food standards based on Codex Alimentarius and other global standards;
- coordination of operational management from farm-to-fork, which include synergistic cooperation between different agencies throughout the supply chain;
- risk-based inspections for import and export systems;
- collection of gathering data to verify the risk assessment and for decision making, and;
- training and education for all stakeholders.

The ongoing COVID-19 pandemic presents an exceptional and unprecedented challenge for competent authorities with responsibilities for national food safety control systems to continue conducting routine functions and activities in accordance with national regulations and international recommendations. A key component of the national food systems during this era is contingency planning. In this time of the pandemic, food supply chains have been disrupted: closures of some food processing plants, and exports were restricted in order to reduce the spread of disease.

To preserve the integrity of the national food safety control system and to support international trade and the food supply chain, each competent authority will need to prioritize critically important services during the ongoing COVID-19 pandemic. These may include introducing temporary suspensions of low-risk control activities that do not immediately affect the supply of safe food.

Another important aspect for food safety is maintaining communication and battling misinformation, especially in the internet. One of this is the way the virus being transmitted. Food is not known to transmit COVID-19. The primary transmission route is through person-to-person contact and through direct contact with respiratory droplets or aerosols generated when an infected person coughs or sneezes in poorly ventilated indoor spaces.

Competent authorities should constantly communicate to all the key stakeholders to provide the correct information. To do this, a dedicated website with regularly updated information and which is accessible to everyone can be a solution. Through timely and updated information, consumers can do a whole lot to protect themselves. Information on such websites can link to international Organizations' websites such as those of FAO and the World Health Organization (WHO) where you can get factual scientific information in a very digestible format. This is really the key to maintaining consumer confidence and ensuring that the food supplies work smoothly.

Competent authorities should lead the way in promoting food safety as a shared responsibility. Involvement at the planning and implementation level of food safety programs of all stakeholders, especially at the very beginning is key. Food control agencies should also focus on providing grounded information for consumers and keep such information updated. Particularly, focus on simple things that have to do with hygiene and sanitation.

## **2.3 National food control systems across Asia and the Pacific**

### **2.3.1 Collaborating for risk-based control systems in Bangladesh**

Mr Shah Mahfuzur Rahman, Head of the Food Safety Unit in the Institute of Public Health of Dhaka, in Bangladesh, has discussed about the food safety and quality control systems in Bangladesh. He introduced the agencies in the government of Bangladesh who are responsible for food safety and quality control activities, particularly the Bangladesh Food Safety Authority. The agency was created in February 2015 as a result of the Food Safety Act of 2013, and operates under the Ministry of Food in close collaboration with all stakeholders both from the public and the private sectors. Service agreements with different agencies were also signed to effectively coordinate and support activities to ensure safe and quality foods. The transition to risk-based systems requires all stakeholders of food safety, and the Bangladesh Food Safety Authority collaborates with stakeholders regularly to ensure that activities are carried out harmonically. The Bangladesh Food Safety Authority and the stakeholder ministries and their agencies are well committed to do this endeavors.



Bangladesh has several points of entry (land, air, sea) where import inspections are being made: after the foods are sampled and tested, they can enter the country. The import policy renews every three years, and the procedures are supported by the Department of Fisheries, the Department of Livestock Services, the Directorate General of Health Services, the Department of Agriculture Extension, and the Atomic Energy Commission. At the municipal level, food inspection activities are undertaken by local governments. In addition to this, the country has developed or adopted more than 600 food standards, guidelines and methods, and involves 50 food testing laboratories in both public and private sectors.

As for restaurants, guidelines and audit checklists were developed to guide managers and food handlers in maintaining good practices. The level of compliance to those guidelines is graded as well as the frequency of inspections, and grade are made available to consumers.

Online shopping has also been very popular in Bangladesh, especially during the pandemic. The Directorate General of Health Services has clearly advised for the full implementation of hygienic measures throughout the delivery process, and it has encouraged online payments to ensure social distancing.

In the aim of developing human resources in the field of food safety, the Institute of Public Health of the Ministry of Health and Family Welfare has been conducting a four years' Bachelor of Science in Health Technology (Food Safety) under the University of Dhaka. A Master of Public Health (Food Safety) is also under process in the Institute of Public Health of the Ministry of Health and Family Welfare. The Bangladesh Agriculture University has also been conducting a 4 years Bachelor of Science in Food Safety Management course.

### 2.3.2 A bi-national food safety system for Australia and New Zealand

Ms Lisa Szabo, Chief Executive Officer at the New South Wales Food Authority, in Australia, presented on the bi-national system between Australia (which is a federation represented by the Commonwealth, six States, two Territories) and New Zealand.

Food standards in Australia and New Zealand are developed by an independent statutory authority called Food Standards Australia New Zealand. The joint system creates the laws, policies, standards and processes to make sure food from both nations is safe to eat.

Three enduring key priorities for the food regulatory system in Australia and New Zealand were set since 2017:

1. to maintain a strong food regulation system – the framework for Australia and New Zealand's joint food regulatory system is now over 20 years old and a reform process is underway.
2. to support broader public health objectives – chronic and preventable disease associated with rates of obesity and overweight is of concern to both nations. Improving food choice though better package information is a current feature.

3. to reduce foodborne illness – in Australia the rates of salmonellosis are higher than in comparable countries and both nations have a similar issue with campylobacteriosis. Interventions targeting particular setting have seen the salmonellosis rates decline and the rate of campylobacteriosis steady.

Collaboration and participation of the food industry into a shared responsibility is key to delivering each priority area.



In Australia and New Zealand, both central and local governments are responsible for food inspections: in New South Wales, for example, there are around 15 000 licensed food production and processing premises and 40 000 restaurants and cafes. Between central and local government there are around 70 000 inspections a year. Furthermore, in the restaurant and café sector food businesses need to comply with levels of training that allow to further train other staff. The training certification is valid for five years and they are structured in modules. A 5-star scores-on-doors exists for food businesses, which is not mandatory and now covers 65 percent of food businesses in the state.

### 2.3.3 Advancing food safety in Myanmar

Ms Sabei Htet Htet Htoo, the Deputy Director of the Food and Drug Administration of the Ministry of Health and Sports in Myanmar, discussed about the food control system in Myanmar. Food safety controls in Myanmar are a multiagency approach task that aims at undertaking a farm-to-fork approach.

**GOVERNING LAWS AND LEGISLATIONS FOR FOOD CHAIN IN MYANMAR**

**FOOD SAFETY RELATED LAWS**

- The National Food Law (1997)
- The Amendment National Food Law (2013)
- The Public Health Law (1972)

**OTHER RELATED LAWS**

- Plant pest quarantine Law
- The Pesticide Law (2016)
- Fertilizer Law
- Sea water fisheries Law
- Fresh water Fisheries Law
- Animal Health and Livestock Development Law
- Consumer Protection Law (2019)

**Standard of reference**

Codex standards (and others)

<https://www.mlis.gov.mm>

Sabel

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One of the notable achievements in Myanmar was the post-market surveillance in non-permitted dyes and non-permitted additives which adulterates several foodstuffs in the country. These can cause chronic illnesses if consumed in significant amounts. The use of food dyes is increasing, therefore, the free dye market was developed. To address this, an advocacy was done on the higher levels. In parallel, engagement with stakeholders to raise their awareness over the use of food dyes were also done. Together with communication, market testing was also conducted. Constructive enforcements from the government instead of punishing approaches contributed to the success of the program.

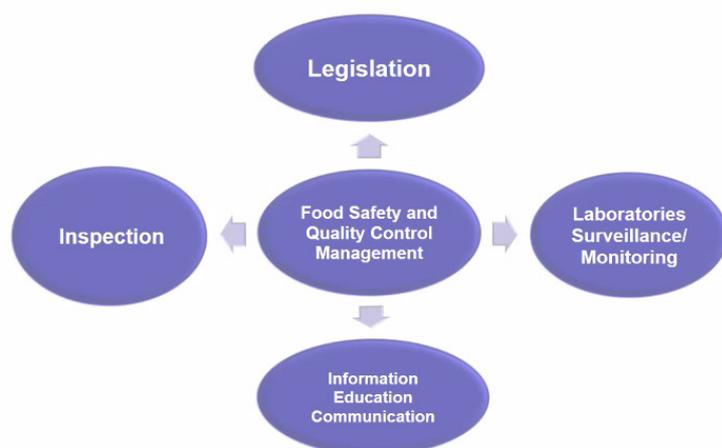
The country faces challenges in handling food standards adopted by the Association of South East Asian Nations (ASEAN), but these are alleviated by the efforts of Myanmar's standards to harmonize with Codex Alimentarius. As participation to regional and global networks becomes a source of support for the country, emerging trends still remain difficult to adopt. In these cases, collaboration with food safety stakeholders and particularly food industry is key. The country is working to provide reliable recommendations regarding food e-commerce for consumers, and food businesses collaborate with the government on the area so that surveillance online is possible.

The food safety authority in Myanmar also provides education to street food vendors through trainings: after completion, vendors can display a sticker that indicates compliance with government's training. In parallel, consumers are also educated through pamphlets to understand the key mandatory requirements for food street vendors.

### 2.3.4 The food safety control system in Nepal

Mr Mohan Krishna Maharjan, a senior food research officer at the Department of Food Technology and Quality Control of Nepal, gave an overview of the food safety and quality control system in Nepal. The Department of Food Technology and Quality Control focuses majorly on food and feed quality control programmes, laboratory analyses for food and feed, food technology/safety training and awareness and being the national codex and the International Food Safety Authorities Network (INFOSAN) Secretariat.

## National Food Control System



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In Nepal, a certification scheme for fruits and vegetables exists that consists of a sticker-grading programme in restaurants. Local governments are delegated to monitor this programme, and food business operators are responsible to comply with training activities and inspections. For what concerns food e-commerce, this has just recently started: deliveries need to register to the government and they are required to follow protocols related to good hygienic practices.

The update of the Nepalese legislative frameworks on the topic of food safety focuses on the interaction among stakeholders. The new resolution is still under the approval process. In the future, the country also envisions to strengthen and extend the accreditation scopes of their laboratories and to fully adopt the food safety management systems in the food supply chain.

## 2.4 Science and technology to innovate, set priorities and strengthen preparedness

Mr Robert Baker, Director of Corporate Food Safety Science and Capabilities at Mars Incorporated, presented the application of science and technology in food safety. The Mars global food safety centre was opened and designed to drive a global focus on addressing food safety challenges through partnerships and collaborations on a pre-competitive basis. It serves as a platform to build partnerships with governments, academia, non-government organizations and industry stakeholders. Mars incorporated keeps a focus on food safety by using genomics to understand food hazards and how to prevent them: it focuses on mycotoxins risk management, microbial risk management and food integrity (intended as to how to prevent food frauds). It is a domino effect: through science, a food safety issue can be addressed impacting the supply chain, the industry and at last, the society.

**“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”**

(World Food Summit, 1996)



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MARS

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Safe food is a critical part of food security, and no one entity can address the world's greatest food safety challenges. Industry and regulators have the expertise, tools and capabilities to raise the bar on food safety and security and optimize the effectiveness of food safety efforts globally. By working collaboratively in an integrated, multi-dimensional way, industry can play a critical role for the prevention and mitigation of food safety impacts.

Traceability is an area that the company has been putting specific focus into and an area that needs to be upgraded within the company and in the food industry as a whole: the key is cooperation and collaboration. To ensure traceability, a real time collection of data throughout the supply chain should be done. In the real-time collection of data, it is important to look at what is currently happening but also at the historical perspective. At Mars, tools are being developed for aflatoxin formation in corn. This will be used as barometer to assess what happens globally: a corn crop anywhere in the world has a specific risk of aflatoxin production. The data thus obtained are compared to the previous years' data. From these observations, trends can be understood and early interventions can be done. Also, genomic data is extremely insightful to look into the presence of microbes.

At Mars, huge volumes of raw produce are handled, and measures must be taken to minimise the risks. To do this, risk assessments are conducted that include literature reviews, formulation of specifications and inspections that are executed by audits. The company's large suppliers are usually involved in the process to ensure that they can meet the needs of Mars, and they have to comply with specs and data provided from Mars. Building relationships with suppliers cannot be underestimated, because they are key in risk management. To deliver this message, Mars interact with different groups and participates to networks such as the Global Food Safety Initiative.

Mars also has a history of collaborations with International Organizations like FAO and the World Food Programme, such as capacity building activities which are revealed to be enlightening. Areas covered were those of mutual interest and mutual benefits: a number of joint trainings were done in the area of mycotoxins, in terms of sampling, testing, and working with suppliers, which resulted in an excellent exchange of information and learnings. A work on mycotoxins modelling was done with Cambridge University and FAO as a hand-in-hand initiative.

## 2.5 Making the best out of science: prioritizing data for informed and science-based decision

Ms Delia Grace, professor of Food Safety Systems at the Natural Resources Institute of the University of Greenwich discussed the risk-based prioritisation of food hazards. She focused on the informal sector: an assembly of food systems which includes wet markets, street foods, and in general, all that has to do with food systems but that does not fall under regulations. In some areas, this is the main supplier of fresh produce and animal products, but in most cases, safety levels of these foods are considered unacceptable in terms of amount of hazards.



A key finding of her work was that the food safety concerns does not always correspond to the real factors that lead to sicknesses and deaths. Experts are often wrong in setting priorities on what food safety issues should be addressed: as they tend to prioritize chemical hazards. In reality, few pathogens create most of the problem, and when resources are scarce, that is where the focus should be put. Foodborne diseases have tremendous costs in terms of human lives and productivity. Food safety is a highly cultural and social issue and it is strictly linked with accessibility of food in the informal sector, which often has low standards throughout the chain.

The formal sector may not necessarily be the solution: it is only by prioritizing the hazards that food safety can be truly ensured. Supermarkets in low and middle income countries are still emerging so they do not always have the systems in place to ensure food is very safe. Furthermore, supermarkets in developing countries are still an option for the minority of people, and food often remains in a supermarket maybe for two or three days, giving time to bacteria to grow. In small value chains such as wet markets, risks are not necessarily high: more empowered good practices and basic sanitation would pave the way forward.

Wet markets are a source of livelihood in many places of the world, including Asia. Practice, rather than facilities should be modernized in to improve these contexts. By adopting and adapting codes of practices most of the issues linked to food safety would be highly mitigated, and the basic hygienic pre-requisites could be the simpler solution.

Food safety is the quintessential One Health issue, and wet markets are an example of the linkages between environment, health, animal health, food systems: a possible way forward for them could be their modernization also in terms of the “soft skills”. Behaviours play a major role, and education to a food safety culture could drive better systems. By forcing down the value of food safety in a capillary way, consumers would ask safe foods to vendors, who would then ask the same to the suppliers and so forth.

There is often a very unsystematic way of monitoring for foodborne diseases, and this is often very basic and usually looking at what is already known, instead of the unknown. In the past years, the world has observed many shifts in food systems and many new emerging foodborne diseases, but it did not well-adapt to pick up new elements in terms of monitoring systems. One Health can play a positive impact on surveillance and monitoring too. Epidemiology can be used for monitoring up to a certain extent, and to target the points where things are most likely to go wrong: drivers of emergence are often related to spill over opportunities and parts of the ecosystems that are more likely to emergence.

Prioritization of risks also help in the monitoring and surveillance programmes: for example, looking at the health impacts of aflatoxins, less than one percent of foodborne diseases are caused by them. Then, aflatoxins cause a lot of concerns as a hazard but they are not a substantial risk, and consumers education on such difference may be beneficial. Setting monitoring programmes in low and middle income countries is not straightforward: going close to the source and involving on the consumers in education campaigns. Resources are limited and prioritization is required: this is why regulation need to be complemented by delegation of tasks and participation of all stakeholders of food safety.

Ms Masami Takeuchi, Food Safety Officer at FAO, discussed about the use of data for food safety risk analysis. She explained the importance of data in the area of food safety to make informed decisions, to back up theories, to understand and further improve situations, to promote transparency and communication. Limited data is often the problem that many developing countries declare to have, but actually, some level of data exist everywhere: these can be ad hoc data, international assessments, and data from universities. Tools to conduct risk assessments and analysis are also made available by FAO and WHO, and they can support the prioritization of risks on a science-based fashion.



Incomplete data however, can lead to incorrect conclusions: there is no perfect set of data to make a conclusion, and it is really difficult to have the entire coverage. There is always some level of uncertainty with data and science, and there will always be a lack of data somewhere. And also, data can get polluted along the way of collection and a question of reliability of data arise. However, sensible conclusions do not necessarily need all complete sets of data.

In the area of food safety, FAO is working on a project on food safety indicators, a methodology that can be tailored on different context and which can be instrumental for the work on food safety: 40 regional food safety indicator areas were identified through literature, validated by experts and further implemented in four pilot projects in the region of Asia and the Pacific. The purpose of the project is to improve food safety situations by generating data and information that belongs to each specific country: these would be specifically fitting each national context, and they could be instrumental for food safety competent authorities to carry out their food safety works in a systematic way. Pilot projects resulted in improvements thanks to the possibility to measure food safety aspects.

Global food safety can benefit from data, information, science, technology and innovation: food safety requires collaborations, and engagement in public-private partnerships is an asset for food safety improvement. FAO will keep assisting its member countries and to support capacity development for data generation and collection and it encourages the undertaking of innovative approaches that utilize big data and bioinformatics. Finally, prioritization is a strategic and resource-saving option that allows to focus on risks based on data that pave the way to evidence-based actions.

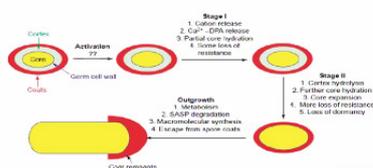
Data sharing is a key requirement to fully exploit the power of data: it is not necessary that all countries provide detailed information, but a methodology in collecting the overall data is important. International Organizations have platforms for the majority of data, which allows data sharing in an orderly manner that can become useful for other countries to be consulted. Joining regional or international collaborative bodies can be beneficial, especially to those countries who may face challenges in data collection and sharing.

## 2.6 Tackling foodborne diseases through science: collecting and sharing data

Ms Pathima Udompitkul, an Assistant Professor at the Department of Food Science and Technology of Kasetsart University, in Thailand, presented about *Clostridium* species spore germination and inactivation. She introduced the overview of *Clostridium* species. In terms of risk for food poisoning, the *Clostridium botulinum* produces a highly toxic neurotoxin that is lethal. However, in the canned food industry, the problem is very minimal. It might pose a higher risk on home canned food specially on the low acid ones. In terms of cases, *Clostridium perfringens* poses a higher threat as it has a very short generation time. Once it contaminates the food that has been stored in improper temperature, it can easily reach the infection dose.

## Spore Germination

**Germination** is the irreversible and rapid changes in the cytology and chemical makeup of the spore leading to loss of intrinsic resistance properties.



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Pathima Udornpittikul

The spore germination is one of the most important steps in the life cycle of spore-forming bacteria: by clearly understanding this mechanism, it can be possible to inactivate it. Researchers have been studying the use of particular compounds to block spore germination in *Clostridium*, which however, cannot be effective once the microorganism has already reached its infection dose. Furthermore, scaling up the process at the industrial stage could be very challenging, and there are still many steps left to identify possible solutions.

Another challenge that needs to be overcome involves the existence of superdormant spores, a subpopulation of spores that fails to germinate: the success of spore control strategies largely depends on the spores' germination and further inactivation. Superdormant spores are therefore an issue that needs to be tackled, and the future directions that research is undertaking consist on the elucidation of superdormancy mechanisms, the optimization of germination conditions to ensure that all spores can germinate, the development of universal compounds that trigger germination.

Mr Timothy Barkham, a Senior Consultant Medical Microbiologist at Tan Tock Seng Hospital's Department of Laboratory Medicine in Singapore, introduced his studies on *Streptococcus agalactiae* in humans and tilapia. *Streptococcus agalactiae* is a pathogen known in literature to cause bovine mastitis in cows (those infected can no longer produce milk) and infect fishes. There are also known cases of infection in humans that generally involve neonates or older adults with co-morbidities and that are described to cause severe sepsis.

In 2015, unusual infection of *Streptococcus agalactiae* were reported in Singapore in healthy young people, which was a clearly different target infection group compared to those reported before: microbiological and genomic investigation was thus made, resulting in the identification of a particular sub-group of *Streptococcus agalactiae*, which was later called ST283, to cause such unusual outbreak. Epidemiologic investigations followed which led to the correlation of this particular strain with the consumption of Yusheng in Singapore. *Streptococcus agalactiae* ST283 cases were found to be related to the practice of eating raw fish from river waters.

Genome sequencing allowed identification of the strain as ST283 and reports of this strain in the global literature were extremely limited. Digging into past global data, only a few cases were found, in France, Hong Kong, and Australia, but there had been very little sampling from South East Asia, so the absence of reports was considered unreliable. More investigations were made, and it was found that *Streptococcus agalactiae* ST283 was very common in South East Asia, in human and tilapia sepsis. In 2016, outbreaks of the same clone were then reported amongst tilapia farms in the North East of Brazil.

This transmission from South East Asia to Brazil shows there can be global movement of *Streptococcus agalactiae* ST283, and it is therefore extremely important to guarantee access to laboratory facilities and to promote the use of genome sequencing technologies to monitor it. The ongoing reservoir may spread at the global level. In Laos and Thailand, *Streptococcus agalactiae* appears to be primarily a foodborne infection associated with aquaculture, and across all Southeast Asia, it is a food safety concern. Tilapia farms are also at risk, at the global level.

Obtaining the entire coverage of data seems to be very unrealistic, but a possible solution for this can be on data sharing and scientific collaborations. Data collection can be similar to making jigsaws: even without all the pieces, it is possible to understand what the final image will look like. However, while not necessarily all data are needed to draw a sensible conclusion, it is true that without knowing how pieces connect to others, they can easily be misplaced. That is where a widespread habit for data collection and sharing at the different local levels could be extremely beneficial to understand the importance of microorganisms such as *Streptococcus agalactiae* ST283 as a source of foodborne diseases.



## 2.7 International food safety standards are at the core of food safety commitment

Mr Sanjay Dave, former Advisor to the Food Safety and Standards Authority of India, presented about the national contexts of food safety. He explained the impact of non-compliances to food safety and the action point for better food security, trade and tourism such as set up an effective food regulatory body, training of involve stakeholder and educate consumers etc.

The requirement for food safety exists, and it will exist forever: it is therefore key to ensure commitment and awareness to food safety in each national context. In the absence of an effective national food control systems, exports decline, imports surge and domestic markets suffer, leading to a variety of issues including food insecurity and a final negative trade balance.

Decrease in food exports may be linked to non-compliance to standards and lack of implementation of good practices in the value chain. Alongside, increase in the food imports may be linked to better spending powers, changing lifestyles, the need for a better nutrition. This reduces the negotiating capabilities of countries.

A single, effective regulatory body for food safety which adopts food safety standards that are aligned with those of Codex Alimentarius standards is required. The industry sector needs to be involved regarding the possible actions required to improve food safety in the countries and enhance food trade. Then, upgradation of laboratory infrastructures and regular training of food business operators is also important. Capacity building will be required at every level, and the International Organizations have a fundamental role to support this aspect. Finally, consumers need to be educated to demand safe foods, which will lead manufacturers to produce safe foods.



By adopting science-based Codex Alimentarius standards, countries can avoid carrying out double work. Codex encourages countries to align with the international standards that were created through consensus of 188 countries and the European Union, and that widely facilitates international trade. While these are voluntary, countries will be required to provide justifications for the adoption of stricter standards that should be based on scientific data. The role that FAO has been supportive and to facilitate the process of adoption and implementation of Codex standards.

Food safety is a participatory process, and it requires everyone to play a part: in India, this was mainly done through public-private partnerships. For the industry, the implementation of best practices coupled with traceability that are critical to food safety and which could help enhance market access will continue to play an important role. Authenticity of data is key for traceability: each stage needs to be documented and to be credible and correct. Furthermore, strengthening food testing mechanisms and bringing in surveillance programmes are also key for risk assessment and data generation, collection and sharing.

Food regulatory agencies can lay down policies and legislations that, subsequently, need to be implemented by both the industry and the regulators. The linkage is that the final product needs to be delivered safely to the consumers. To achieve this, In India, the food safety regulatory agency has identified and set the priorities and defined the capacity building activities to be delivered. These programmes were then implemented within the industry sector through organizations selected according to a set of criteria. A Train-the-Trainers programme was developed and further training was developed: this was a key public-private partnership activity, where the private sector implemented the training programs. These kind of partnerships should focus in building private-public capacities at all levels of the value chain. Every part of the food supply chain is taken into consideration from the point of view of the industry.

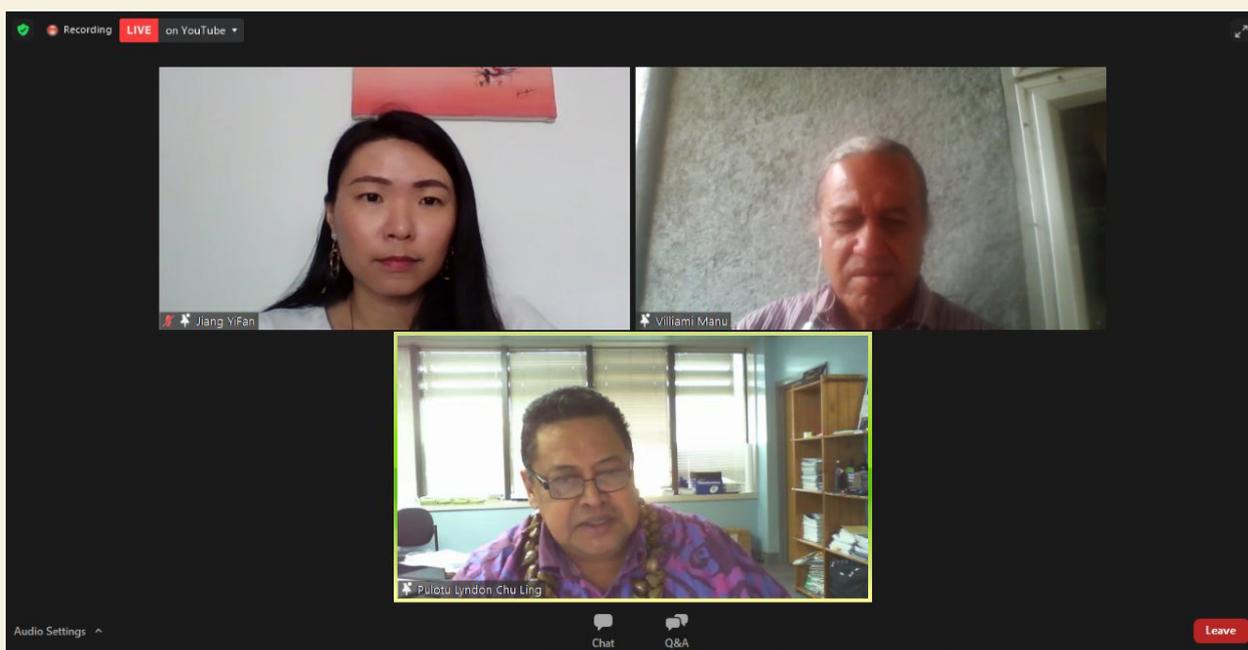
Investing in food safety education at different levels is instrumental to build capacities in the countries: while the biggest potential of the Asia-Pacific region consists in the incredible diversity of products in the region, the main challenge remains the generation of consumers' confidence. This can be achieved by demonstrating the compliance with all regulatory requirements at all chain levels, and by implementing good practices in a way that is sustainable and replicable.

NGOs can also play a supervision role for consumers in food safety. Participation of NGOs in the legislation setting process has revealed to be extremely beneficial. They can be included in the government boards, so that they have a voice in the standard-setting process, and they can advocate for their economic feasibility. They can also play a role in capacity building of food business operators of all kinds this can be done through a panel of experts that can design and provide training programs. Experts can be evaluated and selected by NGOs.

COVID-19 is a good opportunity to provide food safety education and raise awareness on food safety for all stakeholders. The pandemic has put countries behind in trade, but it has also given the spotlight to the assurance of good practices. This has given an education on safety to the people, including food safety throughout the food chain. Now this has to be maintained. In India, few universities and institutions are giving education in food safety, there are undergraduate programs that are now available in some regions of the country. The courses and certificates were designed and presented to universities.

## 2.8 Ensuring food safety in the Pacific Islands

A panel discussion entitled "Food safety in the Pacific" was facilitated by Ms YiFan Jiang, head of Science and Regulatory Affairs at Food Industry Asia. The two panellists were Mr Viliami Manu, Codex Contact Point in Tonga and Deputy Director of the Research and Extension Division, at the Ministry of Agriculture, Food, Forests and Fisheries of Tonga, and Mr Pulotu Lyndon Chu Ling, the chief executive officer for the Ministry of Commerce, Industry and Labour of Samoa.



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Codex standards play a fundamental role in the Pacific Islands, as they help addressing the situation of being heavily dependent on food imports. Samoa has been working on to establish the national standards on various aspects and utilizing with Codex standard as a very important platform. In Samoa, a Food Safety Act provides mandate to food safety competent agencies. Relevant other agencies were then established, and the topic of food safety is highly important in the country. The country has developed and enforced national food safety standards that align with Codex Alimentarius standards (in particular for eggs, sugar, cereals, fish products and cocoa) and it is committed to pursue this direction. The adoption of such standards largely help in overcoming challenges due to limited resources. What remains to be done in Samoa is to effectively implement all the standards through adequate capacities to ensure food safety.

Tonga is also committed in developing and implementing food safety standards that are based on Codex Alimentarius to overcome the challenges created by the dependency on food imports. Standards are particularly useful in food labelling to support food imports and exports. As most of imported foods usually come from developed countries, food safety of those was almost already assured. More recently, with the improvements of national food control systems, officers have realized that safety cannot be taken for granted, and thanks to collaboration in international networks and with trade partners such as Australia and New Zealand this is now being managed.

A WHO study from 2015 showed that the presence of parasites in food is the primary food safety issue in the Pacific islands, and countries in the Pacific have been conducting a thorough work to tackle this issue. In Samoa, multiple channels to increase awareness including traditional media and social media consumer organization and the village councils in order to reach out to the community and the consumers, special thanks to mobile phones. The scientific research organization of Samoa assists the country and the government in testing different products, in a coordinated manner with the ministry, which facilitates the testing process. Consumers are encouraged to communicate to the ministries about unsafe foods and the ministry then facilitates testing of those foods. All stakeholders are involved in the process of ensuring food safety, and this results from the many efforts in promoting food safety awareness. Collaboration among ministries occurs in Tonga to advise local consumers on local foods and their relative safety. Campaigns aimed at raising awareness are also carried out, which also involve schools.

The priorities for the future in Samoa and Tonga aim at strengthening the existing food control systems. In Samoa, work will be conducted to strengthen the functioning of the national Codex structure and increasing the capacity building of all stakeholders, to support the presentation at Codex technical forums, to build capacities of all stakeholders of food safety, to implement national food standards, to develop scientific and technical capacities for risk analysis; and to engage every stakeholder in food safety assurance. Similarly, in Tonga there are efforts towards strengthening collaboration among food safety stakeholders and increasing their levels of engagement in such work. The goal is to raise awareness over the fact that food labels are being produced according to Codex standards.

A current food safety challenge in Tonga involve street foods. As some meat products are not fully cooked and they are not safe, which creates food safety related incidents. People are starting to realize the importance of food safety because of these incidents. This adds up with the need to comply with standards for food imports and exports. In Samoa, a very important driver is the need to build technical capacities, as supply availability is still very low. Ongoing programs aimed at building capacities are very much needed. Another key driver is the fact that Samoa relies very much on the collaboration of food safety stakeholders. The private sector is the driver or the implementation of food safety standards, as they are the interface providing food products to the consumers. Forty manufacturers now comply with hazard analysis and critical control points (HACCP), but an annual check is required, and funds are required to do that. Consumers are the final users and it is key that they understand food labels, thus food labels are in a language that can be understood by Samoans (English or Samoan). Overall, the effectiveness of food control systems will be pursued with the development and implementation of Codex standards.

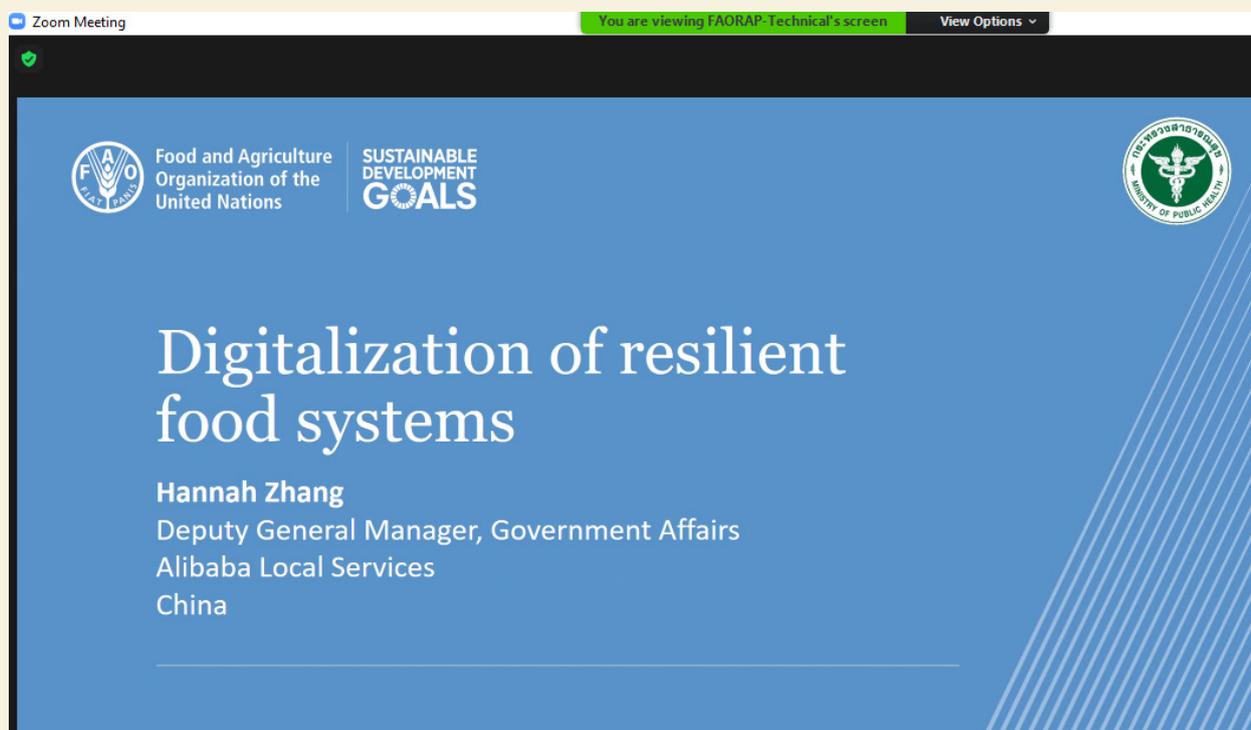
Coordination between the Pacific countries and other bodies (including regional and global networks) has upgraded very much food safety systems in the Pacific on topics such as food recalls and food safety in the Pacific Islands thanks to trainings. Active participation to Codex has emphasized the importance of food safety standards in the region. The technical assistance received from FAO and WHO supported countries in the Pacific to improve all capacities in food safety and food security. There is a consultative approach with other partners and organization to understand how to go through the different processes to achieve intended outcomes.

The focus for the Pacific Islands is therefore on collaborations and on finding common grounds to enhance food safety and regional trade among them. It is important that all stakeholders are involved and they work towards a common goal.

## **2.9 Increased activity of private sector in food safety and the SDGs**

Ms YiFan Jiang also introduced Food Industry Asia, an association of food industries in Asia and the Pacific which is based in Singapore and which has a coverage at the regional level. Food Industry Asia works closely with industry partners and organizations in the fields of development and implementation of standards, and by providing industries comments and expertise in this area. Food Industry Asia is an industry observer at the Codex Alimentarius Commission, where they provide the industry comments in the area of food safety standards. Collaboration through multilateral partnership for building capacities in laboratory capacities and standards setting is also done in a strong connection with International Organizations such as FAO, Asia Development Bank, and the World Bank.

Food Industry Asia has also worked hard to link food safety and nutrition: around the world and specifically in Asia, there are enormous challenges linked to the double burden of malnutrition and obesity. As a food industry organization, Food Industry Asia collaborates with stakeholders such as the nutrition community and society, universities and governments to create programmes to reach out to the consumers regarding nutrition education and intervention programmes. In 2019, a private-public partnership programme in Indonesia on community engagement was carried out with the support of the government to introduce nutrition education and healthy breakfast to primary schools.



Ms Hannah Zhang the Deputy General Manager of Government Affairs at Alibaba Local Services, delivered a presentation entitled “the digitalization for resilient food systems”. Alibaba provides products and services based on needs of merchant’s requirement. Ms Zhang explained how her company expedite recovery of food supply chain by digital means during COVID-19. She also gave the detail of their project to promote the sustainable development of the food supply chain and their collaboration with International Organization.

In China, the COVID-19 pandemic triggered the application of digitalization at an even further level compared to what happened before. This implied the implementation of contactless deliveries: through optical character recognition technologies, the digital receipts also show the whole delivery track and information such as the temperature at which the delivered food was kept. To maintain social distancing, the delivery was also done by using automated guided cars. Live broadcasting of kitchens allowed consumers to observe how foods were prepared at the restaurants before actually deciding to order them. Finally, through an intelligent catering management solution provider, traceability mechanisms were expanded to the link from suppliers to restaurants.

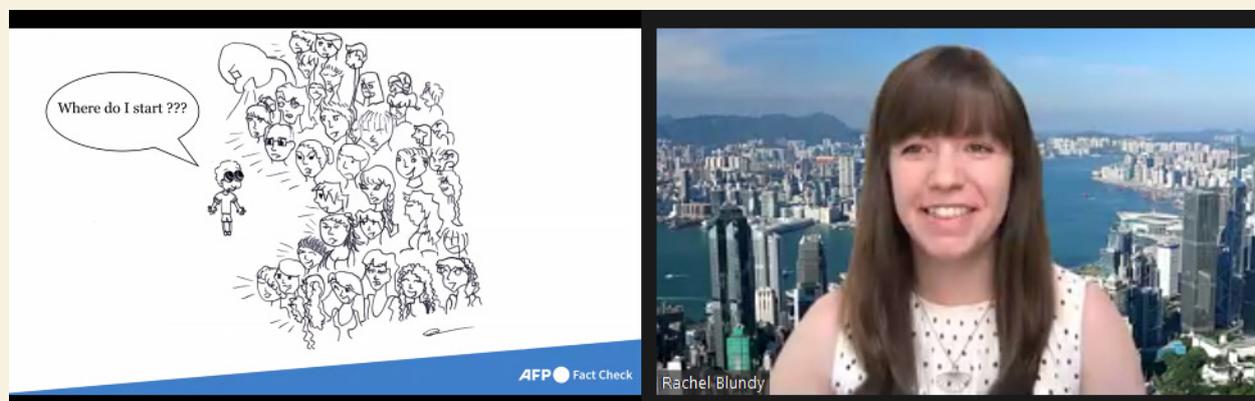
Each part of the supply chain is the most important part for food safety. The company considers the food supply chain as a whole and the processes required for the assurance requirements are worked together with the government and various associations. Communication to consumers is also done to promote good practices. Industry is at the interface of food safety and strong collaboration is required with government to ensure that messages pass through. Traceability systems are implemented in the delivery phase and that kind of data can be easily retrieve. Even regarding traceability, collaboration with the government occurs regularly to ensure that all standards are met.

NGOs can be good supervisors and they have a great role to play with the consumer's guide. From the government point of view, the engagement of NGOs in the regulating process is key. Standards must be feasible for all, and NGOs have a role in this. Other role is that of capacity building.

## 2.10 Addressing misinformation and communicating effectively in case of uncertainty

Ms Rachel Blundy, a Senior Editor at Agence France Presse (AFP) Fact-Check in Hong Kong, introduced the fact-checking work at her agency. AFP Fact-Check are the fact-checking news organization which aims to debunk misinformation that is circulating online. The posts that are usually debunked are chosen based on the impacts they may cause, the news value that they have, the potential damage they may create and the possibility to fully debunk them. Some key fact-checking methods that are used by AFP to debunk misinformation are:

1. obtaining quotes from trusted health authorities and/or doctors;
2. referring to credible scientific journals;
3. verifying user-generated contents.



Every day, there is at least one fact cover for each of the 13 countries covered by AFP, and usually this is selected among an average of three facts. A few hours are required to debunk a claim: this time include two editors' revisions and publishing of the fact-check. Translation in local languages can take another hour or two. Certainly everything is done within the working day.

To counter misinformation, AFP collaborates with ministries and experts which are usually very responsive. More than one opinion is included in the fact-check to make it more reliable and solid. Reporters in AFP have good contact with local health authorities and they are in close communication with them. These communications also occur via WhatsApp and debunking with a statement is possible within 30 minutes. If it's someone they have never contacted before, it could take longer to give the background information.

Encouraging people through education and media campaigns to understand what is real or not online is the first step to tackle the spreading of misinformation. There is a culture of social media that has to be learned at all levels of society, and young generations are more familiar with the use of social media and online information, which makes them more capable of recognizing what is misinformation on food safety and what is not. This is telling us that education has to start at the young age. How to detect and debunk misinformation is something that could be very helpful to teach. It is a very emerging area that deserves to be addressed notwithstanding the geographical area. Books publishing on misinformation can play a big impact to restore trust in authorities. This is a work that has to be done together with international organizations.

Everyone can do something to tackle misinformation: when people are unsure whether an information they read is true, there are a few things that can be done. Copy and paste the message directly on Google to search if it is a hoax and was debunked in the past. The general theme of the post can also be searched for any reliable source backing up that information. Before forwarding it is important to be sure that the information is correct. Citizens can also report misinformation to fact-checking agencies, for example, anyone can email AFP anytime, and WhatsApp line is also available to flag misinformation. But generally speaking, it is the reporters looking for the misinformation. This is done based on merit, and not depending on particular groups asking to fact-check. AFP assess claims independently.

Dr William K. Hallman, Professor and Chair of the Department of Human Ecology at Rutgers, the State University of New Jersey, in the United States of America, presented the importance of communication and why we should communicate uncertainty.



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Communicating uncertainty is essential to the efforts to be transparent about how decisions are being made, it is important to perception of honesty, which is key to build and maintain trust in the institutions. Uncertainty might be created by the complexity of the information available, which opens the floor to different interpretations and changes over time. Therefore, the communicating uncertainty should start as soon as possible. Rapid communication is important despite the uncertainty: doing things differently may facilitate the spread of incorrect information and give the idea that information is being hidden.

The natural inclination of authorities is to be completely sure of something before communicating, because of a belief that this will ensure trust and credibility. However, uncertainty that is expressed in the right way actually builds trust between governments and with the public, because it is a signal to who listens that the subject being communicated is important enough to be shared. The guiding question that could be taken as the standard is: “would you share it with your family”? If it is important enough to be shared with them, why shouldn't it be shared with other people?

The key to communicating uncertainty is to include all relevant information, namely: 1) what is known about the outbreak and this is how we know it; 2) what is not known about the outbreak and the reason why that is also important and how it impacts the decision taken; 3) what is being done to address what is not known; 4) what is recommended for the public to be done immediately. Furthermore, it is crucial to mention that there is a possibility for those recommendations to change as more information is known and that if better information becomes available, updates will adequately be provided to show that the public can rely on the authorities to be more transparent.

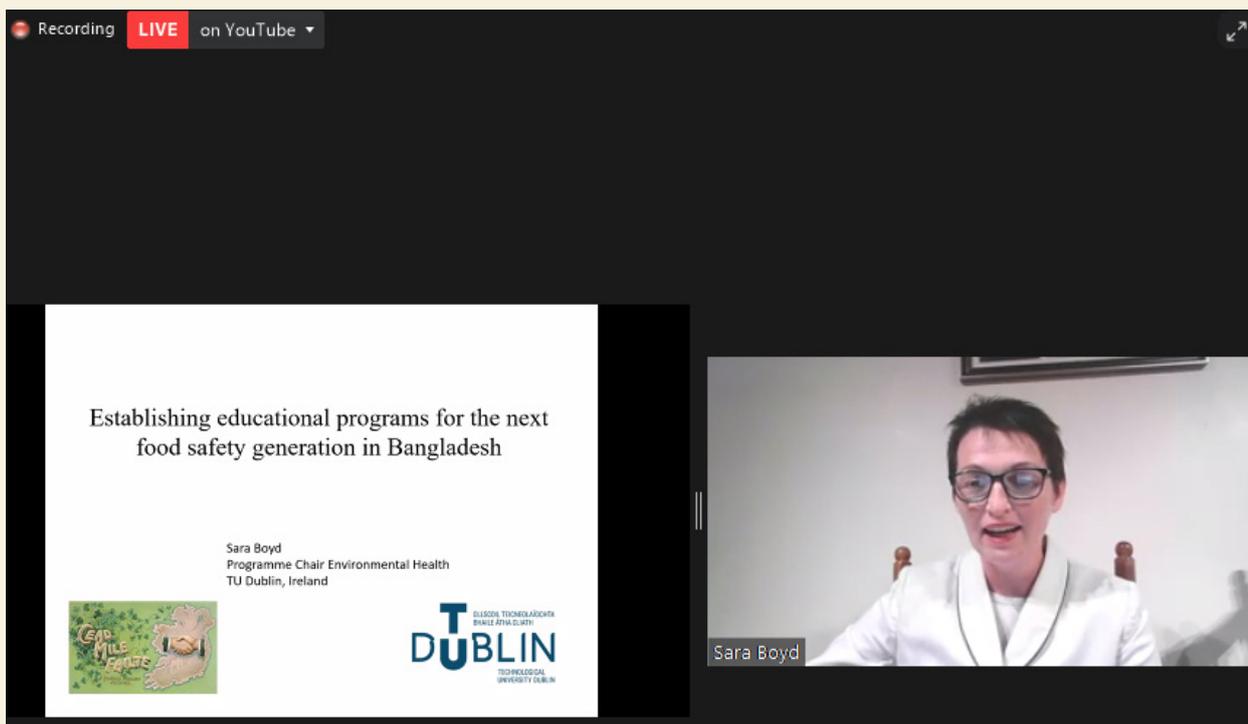
With the very connected world that we have, everything is a global issue. If an outbreak occurs in country A, people in country Z will be asking their governments about it. Monitoring what happens in other countries can help food and public health authorities be the first with the information in their own country. This would eventually be an asset in preventing the spread of misinformation.

Some foods and some pathogens are surrounded by higher levels of uncertainties. There is variability in the kinds of uncertainties. Risk levels change based on the known information over time: by making it clear from the beginning that the information may change however, changes in information and associated advice won't come as a surprise at a later stage. However, the release of new information needs to include the reason why that information has changed. Explanation of why the probabilities have changed is a key part of the communication. Explaining the probabilities often occurs qualitatively (likely/unlikely), and this may imply different levels of risk/probabilities to different people. In the end, however, people are more interested in the decisions that are made and the recommendations that authorities give than in numerical probabilities.

The current generation of food safety professionals as well as future professionals need to be trained to both reach specific audiences and to address misinformation on social media. Addressing misinformation is a shared responsibility. Both the people producing food safety information and the public need to know how to identify misinformation prevent its further spread on social media, and to effectively address the issues and worries raised by virally disseminated misinformation.

## 2.11 Education for the future generation of food safety practitioners

Ms Sara Boyd, programme Chair and Lecturer at the Technical University of Dublin, in Ireland, presented about the establishment of educational programs for the next food safety generation in Bangladesh. She presented the background of the project, the process and the steps involved in develop the new BSc in food safety management at the Bangladesh Agricultural University.



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The collaborative project between the Technical University of Dublin and the Bangladesh Agriculture University aimed at developing a Bachelor’s degree in food safety management and its relevant educational curriculum and to ensure that the Bangladesh Agriculture University counted with all necessary capacities. First, the officers of the Technical University of Dublin met the Bangladesh Food Safety Authority to discuss the requirements of the educational program, the desirable skills of future food safety officers, and the possible support needed. A feasibility study was done performed to establish the University to start the educational program, to identify the existence of relevant experience and to verify capacities and the possible necessity of support. The educational programme revealed to be extremely inter-disciplinary, and professional practice placement was therefore also included in the programme.

A briefing on the feasibility study was provided to the Bangladesh Agriculture University and a training was given to them at the Technical University of Dublin regarding the educational activities at the Technical University of Dublin, and the food safety activities at the Irish food safety authority. A conference was then held at the Bangladesh Agriculture University to propose the educational degree. Once agreed, the programme was designed in details, with every module having a basis on risk management. The degree was launched in March 2019 with approximately thirty students. Starting from the establishment of an educational program, more others could be developed and an educational network could be built.

Misinformation is something that can be included in educational curricula and the large availability of mobile phones and technology can be an advantage: something that is easily accessible can be produced to deliver correct information. These are things are included in the food safety curricula. The existing cases can be studied as case studies and use for educational processes for both students and professionals. It is important to include that the real facts and scientific figures are shared with the students. How to differentiate between facts and fiction is a key skill to be taught.

Ms Linda Nicolaides, Programme Leader of the MSc Food Innovation and Food Safety and Quality Management e learning. Principal Scientist and Quality Assurance Manager at the Faculty of Engineering and Science of the the Natural Resources Institute of the University of Greenwich, talked about the technical education and trainings for the next generation to understand the national food control systems, policy development, enforcement and laboratory capacities comply with national, regional and international food safety standards. Technical and scientific education is required to enable the next generation to understand tools used in ensuring the production of safe food.



Technical education and training is the underlying requirement for all fields of food safety and the next generation will have to develop the sound understanding for necessary knowledge and skills to ensure food safety in their countries. Strengthening countries' national food control systems requires the understanding to prevent hazards in foods, and young generations often come into this step in the national food safety work.

Among topics that need to be included in food safety educational curricula there are 1) the understanding of hazards and the way they manifest in foods; 2) the probability of hazards occurring; 3) predicting the risk that the hazard shall present; 4) management of the hazard to minimize the risk. Furthermore, all appropriate safety management and quality assurance systems need to be included (good practices, HACCP). Topics of cost effectiveness, minimization of wastes, and the use of sustainable packaging towards a circular economy as well as the digital technologies have to be included.

In educational curricula, the food control chain is addressed also from the perspective of risk analysis in the agriculture and the environment. This allows looking into disciplines that at the first sight might look like they are separated from food safety. This is done in collaboration with other students from the environmental disciplines: minimizing the environmental and food safety related risks. In this way, topics such as ecology and environment that may initially look as separate issues are put together with food safety. Food safety is the first thing that is addressed, then, this is connected to other disciplines. Food Safety covers many disciplines and multidisciplinary approaches are recommended.

An issue was raised that some agricultural universities in Asia and the Pacific may be behind in updating food safety studies if compared with other universities in developed countries. Universities can still progress on the fast dynamic food safety development by calling experienced teams that could provide the experience teaching it to the young generations that want to pursue the teaching profession. If organizations are experiencing funding issues, experienced teams can provide the experience teaching it to the young generations that want to pursue the teaching profession. Universities in the Asia and Pacific region can make links with universities in the north to develop capabilities in developing appropriate academic programmes for the region. Linking programme content with government and food industry needs are also important.



# 3 • Conclusions and recommendations

Mr Pisan Pongsapitch, the Secretary-General of the National Bureau of Agricultural Commodity and Food Standards, at the Ministry of Agriculture and Cooperatives in Thailand, concluded the conference by highlighting once again how food safety is a necessary requirement for food security. Safe food is critical not only to better health and food security, but also for livelihoods, economic development, trade and the international reputation of every country. Foodborne diseases impede socioeconomic development by straining health care systems, and harming national economies, tourism and trade. The access to sufficient safe and nutritious food is key, yet data on the impacts of unsafe foods are alarming.



The COVID-19 pandemic highlighted the need for the adoption of food safety standards coupled with an effective communication of clear and correct food safety contents. There was an increasing number of misinformation circulating about the topic of COVID-19 and food safety, and such misinformation has had an impact in the trust of consumers and in food trades. The pandemic has also highlighted that the big volumes of the food supply chain need to be managed safely and to do this, collaboration among sectors and countries is key. The adoption of food safety standards could help local traders to access new markets and increase their trades, as well as creating business opportunities and creating employment. For this reason, the Ministry of Agriculture of Thailand regularly participates to Codex Alimentarius activities aimed at harmonizing food safety across the globe.

During the four days of the FAO Regional Food Safety Conference for Asia and the Pacific, food safety was addressed in its fundamental parts: the common ground for national food control systems in the region was the need to respond to the changes of food consumption habits and the joint efforts with partner agencies in the countries to have a wide involvement of the food safety stakeholders. In 2020, national food control systems were further challenged by the spread of a global pandemic that led to the implementation of social distancing measures: the impacts mostly involved trade disruptions and the spread of concerns on food safety. Contingency planning involving prioritization of critical areas, the strict implementation of good practices and the availability of sound yet digestible information was considered to be key.

Collaborative work was identified as a critical aspect to food safety during the whole conference: for science and technology, this is key to achieve reliable results, and to collect and share data. Food safety is the quintessential One Health issue, because it involves animal and human health, the environment and the food systems: it is quite unrealistic that one can collect a full set of data alone. Collaboration with the different sectors and colleagues at the international level can help obtaining the picture of the jigsaw that data are composing: this would eventually help prioritizing risks, especially in the situation where resources are limited.

Food regulatory agencies can lay down policies and legislations that subsequently need to be implemented by both the industry and the regulators: for this reason, the industry sector needs to be involved in the possible actions aimed at food safety improvements. This could also support the alignment to Codex food safety standards, which are science-based, internationally agreed standards that aim at protecting consumers' health and at facilitating food trades. For example, in the Pacific Islands, Codex standards are key to address the situation of being dependent on food imports, which is why countries such as Tonga and Samoa are increasing over and over their participation to Codex meetings and trainings. By including food industries' point of view in Codex, multilateral partnerships for building capacities can be possible and delegation to the food industry on some key parts of the food safety work can be done. Industries can also be an asset in the application of innovative science and technology to improve food safety.

A collaborative food safety can only be achieved if consumers are well-informed: misinformation on food safety is a global problem and the region of Asia and the Pacific is faced with the challenge of providing correct information in a timely manner. When this is not done, it paves the way to the spread of misinformation, which can have negative impacts that could even affect human health. Encouraging people through education and media campaigns to understand what is real or not online is the first step to tackle the spreading of misinformation. Then, authorities must consider that even if the amounts of information are incomplete, their timely communication remains essential: this has to be coupled with the information regarding the reasons for such incompleteness.

Food safety education at different levels is key to build capacities in the countries: on one hand, this will help tackle the spread of misinformation; on the other, it will provide countries with future food safety practitioners that are equipped with a good set of capacities that is also tailored on their contexts. The traditional food safety topics that often fill food safety programmes curricula can be coupled with the directions that global food safety systems are trying to follow with regards of sustainability, technologies and the circular economy.

Food safety requires continuous improvements and learnings, and these have to be incorporated in the food safety work: with the continuous developments in this area, collaborations are a key to ensure that this becomes possible. The goal of having integrated food safety systems where the stakeholders of food safety work together to ensure safe food for all will require adequate guidance and regulations, timely and effective delegation of the food safety tasks and a wide participation of the consumers in what is advocated as the shared responsibility of food safety.



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# Annex 1

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## Conference agenda

### Day 1: Let's talk about government's role in food safety.

**Date:** Tuesday, 17 November 2020

**Time:** 9.30 hours ICT (Bangkok time)

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09.30-10.00	<ul style="list-style-type: none"><li>• Pre-conference networking opportunity</li><li>• Zoom instructions</li></ul>
10.00-10.30	Welcome  Opening remarks Jong-Jin Kim, Assistant Director-General and FAO Regional Representative for Asia and the Pacific Kiattibhoom Vongrachit, Permanent secretary, Ministry of Public Health, Thailand
10.30-11.00	National Food Control Systems – challenges in the era of COVID-19 Alan Reilly
11.00-11.30	Food safety and quality control system in Bangladesh Shah Mahfuzur Rahman
11.30-11.40	Coffee break
11.40-11.50	Australia's food control system: success in reducing salmonellosis Lisa Szabo
11.50-12.00	Food Control System in Myanmar Sabei Htet Htet Htoo
12.00-12.10	Food safety and Quality Control system in Nepal Mohan Krishna Maharjan
12.10-13.00	Discussion

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## Day 2: Let's talk about evidence-based food safety.

**Date:** Thursday, 19 November 2020

**Time:** 9.30 hours ICT (Bangkok time)

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09.30-10.00	<ul style="list-style-type: none"><li>• Pre-conference networking opportunity</li><li>• Zoom instructions</li></ul>
10.00-10.15	Summary of Day 1 and introduction to Day 2
10.15-10.45	Science and technology at Mars Robert C. Baker
10.45-11.15	Risk-based prioritisation of food hazards Delia Grace
11.15-11.25	Coffee break
11.25-11.35	Power of data – food safety risk analysis Masami Takeuchi
11.35-11.45	<i>Clostridium</i> spore germination and inactivation: an update Pathima Udombijitkul
11.45-11.55	<i>Streptococcus agalactiae</i> ST283 in humans and tilapia' Timothy Barkham
11.55-13.00	Discussion

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## Day 3: Let's learn from the experts in standard, trade, industry, and small-scale farmers.

**Date:** Tuesday, 24 November 2020

**Time:** 9.30 hours ICT (Bangkok time)

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09.30-10.00	<ul style="list-style-type: none"><li>• Pre-conference networking opportunity</li><li>• Zoom instructions</li></ul>
10.00-10.15	Summary of Day 2 and introduction to Day 3
10.15-10.45	The National Context of Food Safety Sanjay Dave
10.45-11.15	Digitalization for resilient food systems Hannah Zhang
11.15-11.25	Initial discussion with Sanjay Dave and Hannah Zhang
11.25-11.35	Coffee break
11.35-12.15	Food safety in the Pacific Moderator: Jian Yifan Panellists: Villiami Manu and Pulotu Lyndon Chu Ling
12.15-13.00	Discussion

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## Day 4: Let's get serious about managing food safety communication.

**Date:** Tuesday, 24 November 2020

**Time:** 9.30 hours ICT (Bangkok time)

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09.30-10.00	<ul style="list-style-type: none"><li>• Pre-conference networking opportunity</li><li>• Zoom instructions</li></ul>
10.00-10.15	Summary of Day 3 and introduction to Day 4
10.15-10.30	Special final-day remarks Mr Pisan Pongsapitch, Secretary-General of the National Bureau of Agricultural Commodity and Food Standards, Ministry of Agriculture and Cooperatives, Thailand
10.30-11.00	Fighting misinformation: the power of fact-checking Rachel Blundy
11.00-11.30	Communicating the uncertainty in food safety William K. Hallman
11.30-11.40	Coffee break
11.40-11.50	Establishing educational programs for the next food safety generation in Bangladesh Sara Boyd
11.50-12.00	Technical education for the next generation: food safety and quality assurance Linda Nicolaides
12.00-13.00	Discussion

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## Annex 2

### Speaker biographies

#### Special Speeches



**Jong-Jin Kim**  
Official opening address

Mr Kim is the Assistant-Director General and Regional Representative for Asia and the Pacific at the Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific (RAP) in Bangkok, Thailand. He joined FAO in 2013 as Director of South-South Cooperation and Resource Mobilization Division had been serving as a Deputy Regional Representative of the organization before his current post. Prior to joining FAO, he has held several positions of increasing responsibilities particularly in Republic of Korea's Ministry of Food Agriculture, Forestry and Fisheries and Presidential Commission for Agriculture and Rural Policies. He was also appointed as the Minister-Counsellor of the Permanent Mission of the Republic of Korea to the United Nations in Geneva, Switzerland. He holds a Master of Business Administration from Oklahoma State University in the United States of America, and holds a Bachelor of Economics from Korea University.



**Kiattibhoom Vongrachit**  
Welcome address

Mr Vongrachit is the Permanent secretary of the Ministry of Public Health in Thailand. He has extensive experience in the field of mental health and assumed many executive positions over 20 years, notably the Director-General of the Department of Mental Health and Department of Thai Traditional and Alternative Medicine. He holds a degree in Doctor of Medicine and a Master's in Public Administration. Apart from his degrees, has also trained in various executive and administrator training programs.



**Pisan Pongsapitch**  
Final day remarks

Mr Pongsapitch is the Secretary-General of the National Bureau of Agricultural Commodity and Food Standards, at the Ministry of Agriculture and Cooperatives in Thailand. His areas of expertise include national and international food standards, food safety and risk assessment, quality management system in food industry, management of hygiene system and HACCP in food industry, Good Agricultural Practices, Inspection of food industry according to related standards and HACCP system and hygiene system in food factory. He holds a Master's degree in Food Technology from University of New South Wales, Australia.

## Moderator



**Sridhar Dharmapuri**  
Conference moderator

Mr Dharmapuri is the Senior Food Safety and Nutrition Officer and the group leader of the Agriculture and Food Systems team at the Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific (RAP), Bangkok, Thailand. He leads one of the core works to strengthen national food control systems, nutrition sensitive agriculture and urban and rural food systems for safe and healthy diets. He has a Doctorate degree in Life Sciences from Jawaharlal Nehru University, New Delhi, India and a Master of Business Administration from Kansas University, United States of America,

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### Day 1: Tuesday, 17 November 2020

#### Let's talk about government's role in food safety.



**Alan Reilly**  
National food control systems – challenges for countries in Asia and the Pacific

Mr Reilly is the Adjunct Professor at the Institute of Food and Health, University College Dublin; and School of Food Science and Environmental Health, Technological University of Dublin. He has worked at the Food Safety Authority of Ireland (FSAI) for 16 years where he was responsible for setting up and managing this national food regulatory authority. Has been Chief Executive of the authority which is responsible for coordinating the enforcement of national food regulations and the provision of the scientific evidence-base for underpinning national food safety policy. Prior joining the FSAI, he worked in the food safety programme to help various United Nations agencies. He is a graduate of University College, Dublin and of Brunel University in the United Kingdom.



**Shah Mahfuzur Rahman**  
Food safety and quality control system in Bangladesh

Mr Rahman is working with the Institute of Public Health, under the Ministry of Health and Family Welfare, Dhaka, as the Head, Food Safety Unit; and Head, Academic Wing; Department of Food Safety. He has a wide range of experiences in the field of food safety, nutrition and public health over the decades. Earlier, he also worked on lien, as National Advisor, Food Safety Programme of FAO in Bangladesh, where he was responsible for setting up risk-based food inspection and foodborne disease surveillance program in Bangladesh. Along with other colleagues, he developed a number of guidelines and manuals on risk-based food inspection, risk categorization, food safety investigations etc. With his active initiative, an undergraduate course on food safety under the University of Dhaka has been introduced at the Institute of Public Health, which is first ever of its kind in Bangladesh. He received trainings and orientation on food safety, public health and nutrition in home and abroad including Japan, Australia, Thailand, Germany, Philippines, Malaysia, Vietnam, Singapore, China, Ireland, Netherlands and India. He also involved with a number of research works on food safety and quality, and NCDs. He did his PhD in Nutrition from the University of Dhaka. After his graduation in medicine, he also did his post graduations in Management, Public Health and Nutrition. He is also a Fellow of the Royal Society of Public Health.



**Lisa Szabo**

Australia's food control system: success in reducing salmonellosis

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Ms Szabo is the Chief Executive Officer of the New South Wales Food Authority, in Australia. The Food Authority is a statutory authority in Australia's most populous state and is responsible for food regulation across the food supply chain. Prior to this, she worked at the Commonwealth Scientific and Industrial Research Organisation for 11 years. She has been an expert advisor or member on several international, national, and state government inquiries and committees. She has a Bachelor of Science degree and a PhD in Microbiology from the University of Queensland.



**Sabei Htet Htet Htoo**

Food control system in Myanmar

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Ms Htoo is the Deputy Director of the Food and Drug Administration, Ministry of Health and Sports in Myanmar. She has experiences in food safety regulatory and enforcement activities, development of National regulations and policy. She serves as a joint secretary of National Codex Committee and Food Standard Developing Subcommittee. She is also an emergency contact point of the FAO/WHO INFOSAN for Myanmar, and focal point of related committees for prepared foodstuff in ASEAN.



**Mohan Krishna Maharjan**

Food safety and quality control system in Nepal

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Mr Maharjan is a Senior Food Research Officer at the Department of Food Technology and Quality Control, Ministry of Agriculture and Livestock Development in Nepal. He is in-charge of the SPS National Enquiry Point at the Department of Food Technology and Quality Control. He has experience in food safety management systems and in food safety and quality control systems. He has a Masters of Professional Studies in Food and Nutrition Planning from the University of the Philippines -Los Baños, the Philippines and Masters of Science in Botany from Tribhuvan University, Nepal.

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**Day 2: Thursday, 19 November 2020**

**Let's talk about evidence-based food safety.**



**Robert Baker**

Science and technology at Mars

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Mr Baker is the Corporate Food Safety Science and Capabilities Director at Mars Incorporated in Singapore. At Mars, he is responsible for leading the corporate food safety strategy in the areas of Microbial Risk Management, Mycotoxin Risk Management and Food Integrity as well as providing Food Safety leadership, support, consultation and guidance to various corporate partnerships and collaborations. He has held multiple positions of increasing scope and responsibility across his more than 30 years in the area of Quality and Food Safety Management. He holds degrees in Microbiology, Food Science and Food Technology.



**Delia Grace Randolph**  
Risk-based prioritization  
of food hazards

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Ms Randolph is an epidemiologist and veterinarian with more than 20 years of experience in developing countries. She is a Professor for food safety at the Natural Resources Institute, in the United Kingdom of Great Britain and Northern Ireland, and she supports research on agriculture-associated disease at the International Livestock Research Institute in Kenya. Her career has spanned the private sector, field-level community development and aid management, as well as research. She has an MSc at the University of Edinburg, Scotland and a PhD at the Free University Berlin, in Germany.



**Masami Takeuchi**  
Power of data –  
food safety risk analysis

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Ms Takeuchi is a Food Safety Officer at Food and Agriculture Organization of the United Nations (FAO). Her main responsibility lies on food safety risk assessment activities and safety assessment of food/feed derived from new technologies as well as emerging and/or food safety issues. She is also the manager of the FAO GM Foods Platform; which collect the official results of GM food safety assessment from national authorities. She also works on capacity development on various food safety issues for developing countries. Prior her work at FAO, she has worked in academia, researching food safety topics. She holds a PhD in Food Science and Human Nutrition from Washington State University in the United States of America.



**Pathima Udornpijitkul**  
*Clostridium* spore  
germination and  
inactivation – an update

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Ms Udornpijitkul is an Assistant Professor at the Department of Food Science and Technology, Faculty of Agro-Industry of Kasetsart University, in Thailand. She has worked on the areas of food microbiology, food safety, and foodborne pathogens, especially spore-forming bacteria. Her current research is focused on bacterial spore germination and the alternative measures to inactivate foodborne pathogens in food products and food processing environments. She holds her Masters and PhD in Food Science and Technology from Oregon State University, Corvallis, Oregon, United States of America.



**Timothy Barkham**  
*Streptococcus*  
*agalactiae* CC283 in  
humans and tilapia

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Mr Barkham is a medical doctor at Tan Tock Seng Hospital, in Singapore. He works in clinical microbiology/infectious diseases, and outbreak investigation. He also has a part time teaching appointment at the National University of Singapore, and has developed diagnostic assays that are marketed internationally, including for SARS-CoV-2. He has been assisting FAO in organising a Group B *Streptococcus agalactiae* Clonal Complex (CC) 283 Risk Profile, with a group of international experts. He has a degree in Medicine, and specialised as a clinical microbiologist at St. Thomas' Hospital, London.

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**Day 3: Tuesday, 24 November 2020**

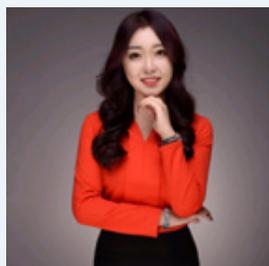
Let's learn from the experts in standard, trade, industry, and small-scale farmers.



**Sanjay Dave**

The national context of food safety

Mr Dave is a food safety Senior International Consultant on sanitary and phytosanitary measures projects for various international organizations. He has a total professional experience of about 45 years which include being the Chairperson of Codex Alimentarius Commission (CAC) and advisor the Food Safety and Standards Authority of India (FSSAI). He was also an adviser for agriculture in the Mission of India to the European Union at Brussels from 1996-1999. He has a Master's degree in Life Sciences, Post-Graduate diploma in International Trade and a degree in Law.



**Hanna Zhang**

Digitalization for resilient food systems

Ms Zhang is a Director of Government Affairs department at Alibaba Local Services BU of Alibaba Group, in China. She is in charge of Ministry of Commerce of China and International Government and Organization. Prior to that, she was a Senior Manager for international Government Affairs department at JD.COM. She obtained her Master's degree in International Business from the University of Hertfordshire, in the United Kingdom of Great Britain and Northern Ireland.



**Villiami T. Manu**

Panellist: food safety in the Pacific Islands

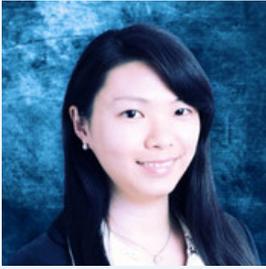
Mr Manu is the deputy director in the Research and Extension Division at the Ministry of Agriculture, Food, Forests and Fisheries, in Tonga. He is the country's National Coordinator for the Codex Alimentarius Commission for more than 20 years, and he was the Regional Coordinator for Codex North America and South West Pacific Coordinating Committee in 2009-2010. He was in charge of the ministry's new food division, which first submitted in 2006, the food bill to parliament. He holds a PhD in soil science from the University of New England, Australia and a Master of Science in Analytical Chemistry (1989) from the University of Canterbury, New Zealand.



**Pulotu Lyndon Chu Ling**

Panellist: food safety in the Pacific Islands

Mr Chu Ling is the chief executive officer of the Ministry of Commerce, Industry and Labour in Samoa. He is the chairman of the Samoa Codex Committee, Samoa National Tripartite Forum, the Apprenticeship Council, Samoa National Employment Policy, and co-chairman of the Trade, Commerce and Manufacturing Steering Committee. He also represents the Ministry at a number of Boards both at the national and international levels. He holds a Master's degree in development studies from the National University of Samoa, Diploma of Government in Project Management and certificate in Training and Assessment from the University of Victoria, Australia. He has also acquired other academic achievements such as Diploma on WTO trade policy, Geneva; Pacific Island fellowship award, University of Adelaide and Samoa Pacific Leadership Program.



**Yi Fan Jiang**

Moderator: food safety in the Pacific Islands

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Ms Jiang is the Head of science and regulatory affairs at Food Industry Asia, in Singapore. She has led Food Industry Asia in providing science-based advocacy to promote regional/global regulatory harmonization in platforms such as the Codex Alimentarius Commission (CAC) and ASEAN. She worked with a global regulatory consulting firm as a regulatory affairs advisor, where she helped clients with regulatory support to market food and health supplement in Asian countries. She was previously also advisor of the International Alliance of Dietary and Food Supplement Associations in advancing harmonisation of standards in ASEAN and Codex Alimentarius. She has a Bachelor's degree in food science and technology in National University of Singapore.

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#### **Day 4: Thursday, 26 November 2020**

**Let's get serious about managing food safety misinformation and communication.**



**Rachel Blundy**

AFP Fact-Check:  
debunking food safety  
misinformation

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Ms Blundy is a Senior Asia Pacific Editor for Agence France Presse (AFP) Fact-Check, based in Hong Kong, China. She has expertise in verifying user generated content on social media. Originally from London, she worked for more than five years in reporting and digital production roles on newspapers in the United Kingdom of Great Britain and Northern Ireland before moving to Hong Kong to work for the South China Morning Post as a reporter.



**William K Hallman**

Communicating the  
uncertainty in  
food safety

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Mr Hallman, is Professor and the Chair of the Department of Human Ecology at Rutgers University, in the United States of America. An experimental psychologist with expertise in science and risk communication, he has served as the director of the Rutgers Food Policy Institute, and chair of the Risk Communication Advisory Committee of the United States Food and Drug Administration (USFDA). He has written extensively about numerous issues concerning food, technology, food safety, foodborne illness, and food recalls. Recent research projects have looked at consumer perceptions and behaviours concerning genetically modified foods, animal cloning, avian influenza, accidental and intentional food contamination incidents, and food recalls. He has acquired a PhD in Experimental Psychology from the University of South Carolina.



**Sara Boyd**

Establishing educational programs for the next food safety generation in Bangladesh

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Ms Boyd is programme Chair and Lecturer at the Technological University Dublin, in Ireland. She has been lecturing in the School of food science and environmental health for 20 years in the areas of environmental health, environmental health professional studies, risk communication and safety and health management. She is involved in curriculum design and development, delivery, examination and review of academic programmes. Her research interests include curriculum design and development, international public health, safety behaviour, training intervention and effective risk communication. She holds a Bachelor's degree in environmental health and currently finishing her PhD on the Impact of Safety Training on Safety Performance.



**Linda Nicolaides**

Technical education for the next generation: food safety and quality assurance

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Ms Nicolaides is the Principal Scientist and programme leader at the Natural Resources Institute of the University of Greenwich in the United Kingdom of Great Britain and Northern Ireland. She is a leading food microbiologist/food safety and quality assurance specialist with over 50 years of experience of working in the area to the developing and developed countries, supporting government development of national food control systems.

# Annex 3

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## Questions and answers

Below were the list of questions and answers that were both addressed in the question and answer box.

1. **Australia is very well-organized in terms of the risk-based food safety management: how is risk prioritization conducted inside the country, particularly for imported food controls?**

**(answered by Liza Szabo)**

In terms of having a risk prioritization, a flowchart is followed which is applicable for every food business in Australia particularly in New South Wales. This is done in order to have all the food businesses ranked. Australia has three tiers of government therefore, we have an activity of audit and inspection as well as our local government officials. We focus on high to medium risk businesses because they're the ones that potentially if something goes wrong they could cause the greatest harm.

The federal government and other agencies was also asked to focus on the poorer performers with regard to the importation.

2. **How does the Australian government control food that's imported in your country and how do they test them that it's not harmful to the consumers?**

**(answered by Liza Szabo)**

Food Standards Australia and New Zealand is the standard setting body; they offer advice on risk to on the importation of food.

If there is a new product coming into Australia and New Zealand there will be a level of testing that's applied to it if you pass that testing, then the frequency of testing is pulled back. If same supplier suddenly has an issue and the testing frequency gets increased again. That is how we respond on a risk basis to imported foods and of course imported foods need to meet the standards that are set in Australia and New Zealand.

3. **Are there any regulations or any discussions happening in terms of the e-commerce of food in Australia?**

**(answered by Liza Szabo)**

During these times, there is a large increase of people who are calling on home deliveries again. In Australia, people are allowed to purchase food via delivery at all the major food retailers. Their food is covered by food acts the difference is coming once again to the food delivery services and the food safety risks they present. At present, most of those food delivery services are covering very short distances so in that respect the authorities not requiring them to be licensed in any way or to be have special precautions put on top of them like any food business they are regarded as being part of the food supply chain and those basic rules around cleaning and sanitation that they do use insulated boxes to deliver their product is very important.

**4. How does the food recall system work in Australia?**

**(answered by Liza Szabo)**

A food recall is taken by a food business to remove unsafe and unsuitable food from distribution, sale and consumption. All food businesses must be able to quickly remove food from the marketplace to protect public health and safety. Food Standards Australia New Zealand coordinates and monitors food recalls in Australia. In New Zealand, food recalls are coordinated by the Ministry for Primary Industries. FSANZ cannot order or force a recall because it has no enforcement powers. These powers rest with the jurisdictions. However, most recalls are initiated by food businesses.

Under the NSW Food Act 2003, we have bestowed power to mandate a food recall.

Further information is provided here:

<https://www.foodstandards.gov.au/industry/foodrecalls/Pages/default.aspx>

**5. How does Australia achieve outstanding standards of food regulatory leadership?**

**(answered by Liza Szabo)**

Through a shared commitment to safe food, a transparent and consultative approach to food policy and standards based on scientific evidence.

**6. How does Australia establish criteria to grade food businesses during food inspections?**

**(answered by Liza Szabo)**

In Australia, we use a risk profiling tool for all businesses.

Detailed information is available at

<https://foodregulation.gov.au/internet/fr/publishing.nsf/Content/risk-profiling-framework>.

**7. Where can a balance be found between compliance to regulations and business profitability?**

**(answered by Liza Szabo)**

In Australia a graduated approach to enforcement is used. It starts with conversation and education and scales up to prosecutions. It is in the business' interest to produce safe food – consumers expect this. Producing unsafe food is a fast route to unprofitability.

**8. How does Myanmar control food safety business at the specific zone?**

**(answered by Sabei Htet Htet Htoo)**

The engagement with the government to the businesses and industry is very important in Myanmar, because in the developing countries, most of the industries are dependent in the government authority in terms of food safety.

**9. What were the reasons to launch the dye free market project in Myanmar, and how was the process designed?**

**(answered by Sabei Htet Htet Htoo)**

In Myanmar, the use of food dye is increasing, and this was the main reason behind the free dye market. First advocacy was made to the authorities and higher level. Then public awareness campaigns were made to engage consumers. A market testing of food samples was also conducted and feedbacks to the shopkeepers was given. Constructive enforcement from the government instead of the punishment approach has contributed to the success of the program.

**10. How does the pesticide act ensure that the quality of vegetables and fresh products are chemical free in Nepal? What are the major criteria?**

**(answered by Mohan Krishna Maharjan)**

The pesticide act ensures the importation, registration, and distribution of quality pesticide as well optimum use of it. The food safety act ensures the safety of vegetables and fresh products regarding pesticide residues and chemical contamination. As per food act, Maximum Residues Limits (MRL) for pesticides are set for food products including fruit and vegetables. The department conducts the monitoring of MRL in fruits and vegetables are as per set limit.

**11. What is the Nepal government view on the safety of synthetic flavours used in food and beverage?**

**(answered by Mohan Krishna Maharjan)**

Food Regulation has provision of maximum limit of edible synthetic flavours used in food and beverage as food additives. The limit for food additives are set as per standards and guidelines of Codex.

**12. The report of the Joint External Evaluations of the International Health Regulation recommends that some countries could improve outbreak and incident investigation. How important is this in controlling/preventing future pandemic?**

**(answered by FAO Secretariat)**

Preparedness is key. A good contingency plan is a good one to develop, together with all the stakeholders and all the relevant partner agencies in your government system. It is also proven that investing into prevention and preparedness is economically much cheaper than putting resources to the outbreak responses, as a reactive activity.

**13. How can countries with no resources to grow their own food can become self-sufficient and create a healthy food security system?**

**(answered by FAO Secretariat)**

It is a tough challenge. However, it is important to think that “if it is not safe, it is not food” so there would be no food security without food safety. It is important for the government to recognize the food safety as a shared responsibility – and involve everyone to work together. Risk-based strategy development would be also helpful to install in the system, when there are only limited resources.

**14. By saying that COVID-19 is not transmitted by food, is it meant that COVID-19 cannot contaminate food through handling by a contaminated staff and that food cannot be considered as a contaminated surface?**

**(answered by FAO Secretariat)**

SARS-CoV-2 is the virus' name that causes COVID-19, and the virus is primarily transmitted human to human. Therefore, people sneezing, coughing and touching surfaces without proper hand-washing would be the cause of this “cross-contamination” and the surface can be anything, food or non-food. Up to date, food is not known to transmit the virus/disease – this means that it is not foodborne. Any surfaces (food or non-food) would have the same situations in terms of cross-contamination possibilities.

**15. Are there international food safety standards for food sold online especially during this time when e-commerce is an increasingly feasible way of accessing food?**

**(answered by FAO Secretariat)**

At the international levels, there are many discussions ongoing in terms of the effective management of e-commerce of food. However, no requests have been made by FAO Members to develop any relevant standards, to date.

- 16. How true is it that COVID-19 can be transmitted through contaminated food surfaces? Is there any global evidence?**

**(answered by FAO Secretariat)**

SARS-CoV-2 is basically transmitted human-to-human. Of course, if it gets on any surfaces (not only food), there is a possibility that it gets moved with the materials/surfaces. Proper hand washing, good social distancing and wearing of masks would be the best set of answers in this situation.

- 17. What is the highest risk food globally?**

**(answered by FAO Secretariat)**

“Risk” is defined as a function of the probability, indicating a likelihood of negative consequence – so a “food” itself cannot be high risk, but potential hazard(s) in food can increase or decrease the risk, depending on how the food is handled.

- 18. Online food delivery is very popular nowadays. How can the risks be addressed for online business?**

**(answered by FAO Secretariat)**

Inclusive management will be effective: the food chain is the same with the exception of process such as additional storage, additional transportation and so forth, which need to be added. Therefore, it is important to have a good education campaign to the general public so that consumers themselves understand they have a role to play, and demand safe food to be delivered to them. Including those who are involved in transportation in such education campaigns can be a good idea.

- 19. Which example of food safety system would be appropriate to Afghanistan context? A country example that we can learn from. We got the approval of establishing the food safety and control authority from Cabinet but need to operationalize it now.**

**(answered by FAO Secretariat)**

There would be no “one-fits-all” system for effective food control, therefore it is recommended that Afghanistan adopt various good practices from different countries, so that pitfalls can be effectively avoided. It would be effective if you learn from, for example, the panelists today from Ireland, Bangladesh, Australia, Myanmar, Nepal to understand what went well and what did not. Then tailor it to your own system.

- 20. How can the risks of using genetically modified organisms (GMOs) in agriculture be addressed?**

**(answered by FAO Secretariat)**

Up to date, there is no known food safety risks of GMOs have been reported. FAO maintains a database called FAO GM Foods Platform (<http://www.fao.org/gm-platform>), which host the records of official GM food safety assessment around the world.

- 21. There are many sellers of UV technology claiming to be able to kill SARS-Cov2, what are your thoughts on this?**

**(answered by FAO Secretariat)**

Even considering a “perfect” coverage of swabbing, any detection technologies may not be sufficient in preventing the spread of the virus/disease. It might give a good validation of cleanliness, but this should not be only specifically about SARS-CoV-2. There are also other bacteria/viruses that can make food unsafe.

**22. What can be done to assure that aflatoxin levels are within limits in raw materials and finished products?**

**(answered by Bob Baker)**

This starts with a deep understanding of where and how the raw materials are grown, harvested, stored and processed before use, as each can have a significant impact on aflatoxin production. Sampling and testing are also critical and need to be validated for the specific material being evaluated. Testing should only be used to verify mycotoxin control processes throughout the value stream and not used as a stand-alone basis of aflatoxin risk and compliance.

**23. What are some examples of “raising the bar” in food safety? Does this have to do with international standards?**

**(answered by Bob Baker)**

Raising the bar does not mean that they are higher than international standards. However, in some instances, local and international standards do not exist. An example of where we have been working to raise the bar is in the area of pet food safety (especially related to micro safety i.e. Salmonella and mycotoxins).

**24. What is the safe maximum level of aflatoxin recommended for fresh milk?**

**(answered by Bob Baker)**

Following the limits specified in the Codex is recommended, as these are risk assessed before implementation. Another reference could be to look at the limits in a particular country the milk is produced. These may be more stringent.

**25. How is food safety for pets considered in comparison to food safety for people at Mars?**

**(answered by Bob Baker)**

Pet food safety cannot be underestimated. Pets eat the same food every day, and the food safety standards must reflect this risk. Additionally, pet foods are typically stored in the same areas as human foods and assessable by young children and could be a vector for transmitting contaminants such as pathogens, i.e. *Salmonella*. This also needs to be built into food safety risk management processes and considerations.

**26. Is there any research program at Mars regarding GMOs and innovative food sources tackling global food security?**

**(answered by Bob Baker)**

Mars have been exploring and developing genomic and metagenomics tools that could help tackle current and future challenges such as AMR.

**27. What kind of food fraud devices has been developed so far in the case of small-scale agri-food manufacturers?**

**(answered by Bob Baker)**

Food fraud management starts with a thorough vulnerability assessment of the raw materials used. This would direct where further testing may be needed. Building strong relations with your suppliers is also key. The outcome of a vulnerability assessment and understanding of supplier relations/risks may show that testing may help. Several tools can be used to assess risks. These tend to be targeted or non-targeted based on an understanding of the actual risk. Association of Official Agricultural Chemists is currently evaluating and validating food fraud tools and methods to help.

**28. How does MARS conduct food recall since its products are sold globally?**

**(answered by Bob Baker)**

There are global standards and procedures, which include how recalls (local, regional, global) are conducted. In particular, recalls are managed by the operational quality team of the producing site, but the execution is performed by the quality teams in the impacted markets in close communication with the operational team.

**29. How can data from neighbouring countries be obtained to be used for exposure assessment?**

**(answered by Masami Takeuchi)**

There are several ways. Through a partnership, or through a regional/international collaborative framework, for example, if there is any a regional body like ASEAN, SAARC or perhaps international mechanisms like Codex community might work to discuss with neighbouring countries to collaborate in terms of data generations/collections/sharing.

**30. How to aggregate and synthesize all data silo or separated data from ad hoc data to be in one united repository with much peer review validated that will be beneficial for references? What will be the main repository for the above data on food safety including all countries in the world?**

**(answered by Masami Takeuchi)**

In order not to mislead anyone, good data, interpretations and analyses are necessary. However, when decisions must be made, some data might be better than nothing. Indeed, it is important to have peer-reviewed and validated data for important decision making, particularly at the international level.

At this moment there is no single repository available, as commodities – risks attributions/combinations are so many. However, some key data collection mechanism at the international level (e.g. FAO/WHO provision of scientific advice) might address some needs.

**31. How can these publications on risk assessment can be obtained from FAO?**

**(answered by Masami Takeuchi)**

Visit the website <http://www.fao.org/food-safety/> and click on the “resources” tab to browse the publications related to food safety.

**32. Is there a platform for chemical exposure data?**

**(answered by Masami Takeuchi)**

A data is available but it is not the raw data. In the Joint FAO/WHO Expert Committee on Food Additives (JECFA), a report is present to find out how the submitted data have been used to set standards which would be useful for many countries.

**33. During the earlier stages of the COVID-19 pandemic, the emphasis on the importance of data sharing of information was highlighted. Do you think a comprehensive regional platform is required to exchange data and information e.g. Agriculture, Livestock, Fisheries and Aquaculture etc.?**

**(answered by Masami Takeuchi)**

The information can be found in this website: <http://www.fao.org/2019-ncov/en/>. The website is constantly updated.

**34. When considering the consumption patterns (e.g. Asian countries consume more rice compared to other continents) so the risks have to be assessed considering the difference of the portions consumed by individuals and also amount consumed per day. Is this considered when determining of maximum limits of chemical hazards in rice, by the Codex? Are there examples other than rice from where we can get reliable and valid data?**

**(answered by Masami Takeuchi)**

Yes, for FAO/WHO provision of scientific advice, it is made sure that there is a geographically diverse data and insights to cover such differences. However, it is correct that one risk assessment based on the exposure data in a particular place may not be the answer for other countries/regions. Therefore, a good validation would be needed.

**35. Besides tilapia, were other types of freshwater fish investigated for *Streptococcus Agalactiae* ST 283? After all, Southeast Asia does produce a wide range of freshwater fish for food.**

**(answered by Tim Barkham)**

There is no comprehensive data present. Hoping that people would get interested that this matter can be looked upon. The team is especially interested to people sampling at the farms, so that findings are not complicated by cross contamination during transport, or during handling.

**36. The fish should not be blamed; people should not eat raw tilapia produced in culture system. Would there be a possibility to conduct a research on traceability of this issue with the people from the fisheries field?**

**(answered by Tim Barkham)**

Many different peoples across SEA enjoy unheated fish. That will be hard to change and it is a little premature to discuss control measures when epidemiological data are greatly needed. It is not known on how, or at what point, tilapia become colonised with ST283; if these were known, then these would have been prevented.

**37. How does the tilapia that is being eaten ensured safe from farm to fork?**

**(answered by Tim Barkham)**

It starts with studying the species. However, it is understood that farms do not have ready access to lab resources to determine what might be causing fish diseases, so it is very difficult to get data. There is a need to get a better grip of the epidemiology, and then consider how best to help the farmers, as well as the consumers.

**38. Are there difficulties in isolating *Streptococcus Agalactiae* ST283 and how could we maximise the isolation rate in food sample?**

**(answered by Tim Barkham)**

*Streptococcus Agalactiae* ST283 grows well on routine media/agar, and it is easily cultured from samples that do not have other bacteria present. However, problems are being experienced in isolating it from food samples that contain other similar bacteria. Oftentimes, the ST283 can be detected by PCR, but cannot find it in cultures, as other bacteria, even when using selective methods swamp it. If whole fish is being focused, then cultures from internal tissues can be very successful, so long as the tissues are sampled without introducing contamination.

**39. In India, what organizations are leading food safety education?**

**(answered by Sanjay Dave)**

Few universities and institutions are giving education in food safety, there are undergraduate programs that are now available in some regions of the country. The courses and certificates were designed and presented to universities. Outlines of the course contents are available online on the website of Confederation of Indian Industries (CII) – National Mission for Food Safety (SKA) (<http://www.cii-ska.in/Default.aspx>), an organization that encourages universities to start these programs.

**40. What should the Pacific Islands focus on in their work to ensure food safety?**

**(answered by Sanjay Dave)**

They should collaborate and find common grounds to enhance food safety and regional trade. It is important that all stakeholders are involved and they work towards a common goal. Aligning to Codex Alimentarius will also be important, and funding possibilities are available to achieve that. Some things that can be done: 1) refer to the plan for STDF program; 2) use the tool “Prioritizing Investments for Market Access” to identify priority areas in each country and as a starting point for further improve.

**41. Is it compulsory for all industries to introduce good practices including primary industry?**

**(answered by Sanjay Dave)**

A good suggestion would be implementing this on a voluntary basis. The industry that implements best practices will gain in the long term.

**42. Which sector/ministry/stakeholders best lead the county’s food safety system?**

**(answered by Sanjay Dave)**

Food Safety is a shared responsibility of everyone and all related Ministries.

**43. There are countries that have food safety regulations scattered across agencies, either depending on the commodity or on whether unprocessed on unprocessed. Is there any way that this system could work?**

**(answered by Sanjay Dave)**

Food safety regulatory programmes should be brought under one umbrella. We had the same problem in India and we changed it.

**44. What are the current food surveillance systems related to food safety in India and is the data accessible for public view?**

**(answered by Sanjay Dave)**

For any inquiries regarding this matter, please send an email to Food Safety and Standards Authority of India (FSSAI).

**45. What progress has been made in tackling milk adulteration in India?**

**(answered by Sanjay Dave)**

There are different ways to do it. Encourage greater production of milk to make it un-remunerative to adulterate. Secondly, enhance surveillance programmes; focus on training of all producers; and finally, impose strict penalties. India has worked in all these areas and this has resulted in a good progress.

**46. Wearing of masks was already a good hygienic practice of a food manufacturing facility specially while processing where food is exposed to the environment, before COVID-19 pandemic, it was not a must after packaging as food is covered. How is the risk of COVID-19 virus, associated with the packages of ready to eat food item? Should consumers, wash the packages of biscuits, ice creams etc.?**

**(answered by Sanjay Dave)**

Proper handling is the key to safety from any virus or bacteria. Every package cannot be washed but can be kept clean through proper handling.

**47. What does CII-SKA stand for?**

**(answered by Sanjay Dave)**

Confederation of Indian Industry – Surakshit Khadya Abhiyan. It is a non-profit industry body implementing the National Mission for Safe Food.

**48. How can digitalization of food delivery impact food safety? What are the potential pitfalls and advantages of digitalization?**

**(answered by Hannah Zhang)**

The system management and distribution of meals on our platform are delivered within 30 minutes as far as possible (within 3km) and at the same time, hot chain supply is adopted. After the meal processing is completed, storage and transportation facilities such as incubators, insulation bags, etc. are immediately placed, when the food is delivered, the centre temperature is guaranteed to be above 60°C. In this time of COVID-19 pandemic, we adopt the electronic seal for meal, maximize use for ensuring that the food will not be opened twice during the delivery process.

Our company has this platform called Eleme that cooperates with authoritative financial institutions to provide users with comprehensive food safety insurance services. If a food safety issue was encountered on Eleme's APP consumption, it will assist in rights protection, so that users can get fast compensation, and effectively protect consumers' legality rights and interests.

Digitalization aims to give consumers a better experience, especially during COVID-19, contactless delivery is a necessary condition, providing a new way of life for people. The big challenge is to convince all restaurants agree to use our solution. Because it not every merchant can understand and it will incur more cost.

**49. Digitalization impacts communication: how can government authorities work with industry to send correct messages in food safety? And what role does traceability play on this?**

**(answered by Hannah Zhang)**

Industry is at the interface of food safety and strong collaboration is required with government to ensure that messages pass through. Traceability systems are implemented in the delivery phase and that kind of data can be easily retrieve. Even regarding traceability, collaboration with the government occurs regularly to ensure that all standards are met.

**50. How are small businesses and company are included in Alibaba's work to ensure food safety?**

**(answered by Hannah Zhang)**

The company considers the food supply chain as a whole and the processes required for the assurance requirements are worked together with the government and various associations. Communication to consumers is also done to promote good practices.

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**52. Can COVID-19 be transmitted through food?**

**(answered by FAO secretariat)**

It is not known to be transmitted through food consumption. It is primarily transmitted through human-to-human.

**53. Is there a Codex or any other internationally accepted guideline on distribution of food, addressing the assurance on protection from COVID-19?**

**(answered by FAO secretariat)**

There is an extensive series of guidance documents provided by FAO, WHO and Codex Alimentarius; which is available on the Codex website.

**54. What can anyone do when they receive an information the person is not sure about?**

**(answered by Rachel Blundy)**

For WhatsApp circulation in particular, one simple thing to do is to copy and paste the message directly on Google to search if it is a hoax and was debunked. The general theme of the post can also be searched for any reliable source backing up that information. Before forwarding, it is important to be sure that the information is correct.

**55. Do you deal with misinformation on food frauds?**

**(answered by Rachel Blundy)**

Yes, it is very common. One important stream on hoaxes on food frauds has to do with foods that are or not allowed.

**56. Misinformation in education courses: how can these be included?**

**(answered by Rachel Blundy)**

How to detect and debunk misinformation is something that could be very helpful to teach. It is a very emerging area that deserves to be addressed notwithstanding the geographical area.

**57. Is there any support or opportunity to a collaborative project to establish food safety educational programmes similar to what was done between the Technical University of Dublin and Bangladesh Agricultural University in other countries?**

**(answered by Sara Boyd)**

It is suggested to talk to regional offices and ask about plans. This should be a collaborative approach – involving national authorities, government departments, universities and experts in curriculum design. The programme must be designed for national requirements.

**58. Is there any data available on the impact of the project between the Technical University of Dublin and Bangladesh Agricultural University?**

**(answered by Sara Boyd)**

The degree program is still in its early stages. The fact the program was approved and is active is a positive impact. Yes, there will be impact measurement reports in the future when the first batch graduates and secure employment.

**59. Does the programme established by the Technical University of Dublin and Bangladesh Agricultural University include from farm to fork food chain or only for agriculture?**

**(answered by Sara Boyd)**

It covers all aspects of farm to fork. Agriculture is included in that.

**60. It takes time to look at the whole comprehensive issues, and food safety is actually many things: how do you teach people to capture food safety as a whole?**

**(answered by Linda Nicolaidis)**

Food safety is the first thing, and it is addressed as a whole. Then, this is connected to other disciplines, and it is good to address the foundations of all possible hazards.

**61. Where can the issue of misinformation be incorporated in curricula?**

**(answered by Linda Nicolaidis)**

It is important to include that the real facts and scientific figures are shared with the students. How to differentiate between facts and fiction is a key skill to be taught. Teach the facts and allow students to be able to reflect and investigate "new or misinformation".

**62. Is it advisable to go after a big data program or AI to strengthen food safety in a respective region?**

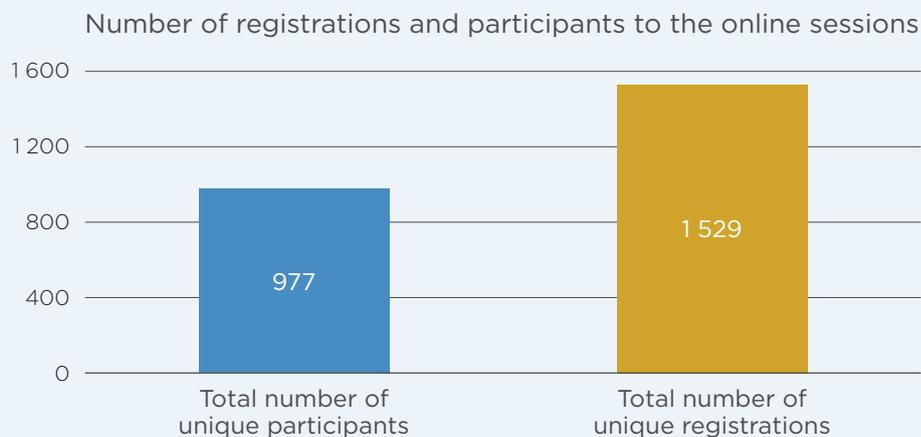
**(Answered by Linda Nicolaidis)**

It depends on what the information is for. Do strong national food control programmes exist in all countries in the region that collaborate when required? Also working closely with local Codex Committees that would support sharing key information and developing a big data programme as required.

# Annex 4

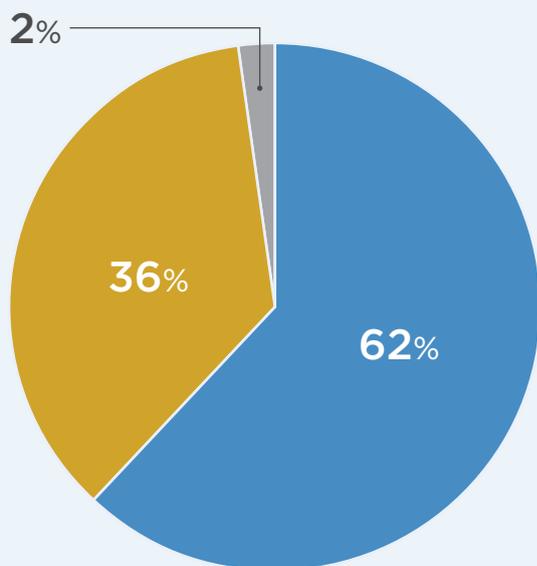
## Demographics

### 1. Participants and registrants to the online sessions



### 2. Gender balance

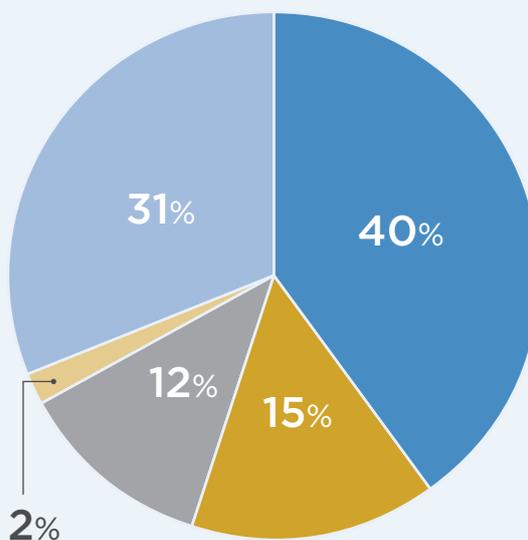
Gender balance of the participants



- Female 62%
- Male 36%
- Prefer not to disclose 2%

### 3. Participation by sector

Participation by sector



- Government sector 40%
- Academia 15%
- Private sector 12%
- International Organizations 2%
- Non-Governmental Organizations and Others 31%

## 4. Participation by region

Region	Percentage
Asia and the Pacific	76%
Other regions	24%

### Countries in Asia and the Pacific

Country	Number of Participants	Country	Number of Participants
Philippines	241	Japan	12
Malaysia	153	Mongolia	10
India	92	Korea, Republic of	10
Thailand	90	Viet Nam	7
Indonesia	75	Tonga	7
Sri Lanka	68	Fiji	7
Singapore	60	Lao People's Democratic Republic	6
Bangladesh	56	Afghanistan	6
China	46	Solomon Islands	4
Bhutan	40	Samoa	4
Myanmar	37	Micronesia (Federated States of)	3
Cambodia	26	Timor-Leste	2
Nepal	23	Papua New Guinea	2
Pakistan	22	Marshall Islands	1
Maldives	16	Brunei Darussalam	1
Australia	14	Niue	1
New Zealand	12		

## Countries from other regions

Country	Number of Participants	Country	Number of Participants
United States of America	119	Liberia	2
Not specified	44	Jordan	2
Nigeria	28	Ghana	2
United Kingdom of Great Britain and Northern Ireland	15	Gambia	2
Italy	14	Dominican Republic	2
Spain	12	Costa Rica	2
Kenya	11	Botswana	2
Canada	7	Belgium	2
Ireland	6	Zimbabwe	1
Colombia	6	Zambia	1
South Africa	5	United Arab Emirates	1
Yemen	4	Turkey	1
Uganda	4	Trinidad and Tobago	1
Portugal	4	Sierra Leone	1
Madagascar	4	Saint Kitts and Nevis	1
Greece	4	Peru	1
France	4	Mexico	1
Egypt	4	Kuwait	1
Tunisia	3	Honduras	1
Libya	3	Haiti	1
Jamaica	3	Estonia	1
Germany	3	Dominica	1
Ecuador	3	Comoros	1
Cameroon	3	Brazil	1
Switzerland	2	Belize	1
Sudan	2	Bahamas	1
Qatar	2	Azerbaijan	1
Netherlands	2	Austria	1
		Argentina	1

## Annex 5

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### Links to the FAO Regional Food Safety Conference for Asia and the Pacific



FAO. 2021. Behind the scenes: FAO Regional food safety conference for Asia and the Pacific [video]. [Cited 4 February 2021]. <https://www.youtube.com/watch?v=yJ8j9agETi4&feature=youtu.be>

FAO. 2020. FAO Regional food safety conference for Asia and the Pacific [video]. [Cited 12 January 2021]. <https://www.youtube.com/playlist?list=PLzp5NgJ2-dK6IbTEG2qS2DXUnzmnsGNwJ>



FAO. 2020. Food safety in the era of COVID-19: Day 1, 17 November 2020 [video]. [Cited 12 January 2021]. <https://www.youtube.com/watch?v=XE94DsNWsk8&list=PLzp5NgJ2-dK6IbTEG2qS2DXUnzmnsGNwJ&index=1&t=6125s>

FAO. 2020. Food safety in the era of COVID-19: Day 2, 19 November 2020 [video]. [Cited 12 January 2021]. <http://www.youtube.com/watch?v=B4HtHxJQddc>



FAO. 2020. Food safety in the era of COVID-19: Day 3, 24 November 2020 [video]. [Cited 12 January 2021]. [https://www.youtube.com/watch?v=uWkFk\\_bTykl](https://www.youtube.com/watch?v=uWkFk_bTykl)

FAO. 2020. Food safety in the era of COVID-19: Day 4, 26 November 2020 [video]. [Cited 12 January 2021]. <http://www.youtube.com/watch?v=EbDskIL1C7k>





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