



**Food and Agriculture Organization
of the United Nations**

**FAO Regional workshop
Development of a set of National Food Safety
Indicators**

19–21 November 2019, Bangkok, Thailand

Meeting proceedings



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Conducted under the FAO project
“Support for capacity building for international food safety and
implementation in Association of Southeast Asian Nations (ASEAN) countries”
(GCP/RAS/295/JPN)

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Abbreviations and acronyms

ASEAN	Association of Southeast Asian Nations
BAFRA	Bhutan Agriculture and Food Regulatory Authority
CAC	Codex Alimentarius Commission
FAO	Food and Agriculture Organization of the United Nations
FAORAP	Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific
FASFC	Federal Agency for the Safety of the Food Chain
FPS–HSFCE	Federal Public Service for Health, Safety of the Food Chain and Environment
FSANZ	Food Standards Australia New Zealand
FSIs	food safety indicators
GAP	good agricultural practices
GFSI	Global Food Safety Initiative
GHP	good hygienic practices
GMP	good manufacturing practices
HACCP	Hazard Analysis and Critical Control Point
INFOSAN	the FAO/WHO International Food Safety Authorities Network
IPPC	International Plant Protection Convention
MRLs	Maximum Residue Levels
NFCS	national food control system
NFSI	National Food safety indicators
OIE	World Organisation for Animal Health
SOFI	The State of Food Insecurity in the World
SOP	standard operating procedure
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures
TWG	Technical Working Group
WFS/MDG	World Food Summit/Millennium Development Goals
WHO	World Health Organization
WTO	World Trade Organization

Executive summary

An effective national food control system (NFCS) is essential for ensuring food safety for consumers and fair practices in food trade. An effective NFCS may apply different approaches, core elements, and components, as appropriate to the national circumstances. Thus, it is important to know where countries / national food administrations stand with regard to their food safety situation in the food chain in order to prioritize the areas that need improvement. In order to measure the “State” of food safety in the food chain, it is proposed to use a set of indicators. Indicators have been introduced in some areas including food security and nutritional aspects. FAO sets food security indicators to capture various aspects of food insecurity. Nutrition global target indicators were set by the World Health Organization (WHO) as problem oriental indicators to monitor, report on and account for progress towards improved nutrition across the Millennium Development Goals agenda.

A Codex Alimentarius guideline entitled “Principles and guidelines for monitoring the performance of national food control systems” (CAC/GL 91-2017), adopted in 2017, describes a framework of planning, monitoring and system review steps for the performance monitoring of an effective NFCS. This guideline also recommends Members to establish food safety indicators for each desired outcome for an effective NFCS.

In order to enhance the understanding of food safety indicators and build the capacity for ASEAN to develop a set of national food safety indicators, FAO RAP, under the FAO Regional project “Support for Capacity Building for International Food Safety Standard Development and Implementation in ASEAN Countries” (GCP/RAS/295/JPN), held the regional workshops on capacity building in Food Safety Indicators from 19 to 21 November 2019.

Over 30 participants from nine countries in the ASEAN region and resource persons from FAO, Belgium and regional food safety indicator pilot countries of Bhutan and Philippines attended the three-day workshop with the objective of enhancing the understanding of food safety indicators and their importance as well as of capacity to develop food safety indicators in the ASEAN member countries. Through technical presentations, experience-sharing of other countries, and a group work session, participants recognized the importance and benefits of food safety indicators. They obtained the knowledge on the objectives and principles of the development of food safety indicators. The workshop enabled participants to discuss the feasibility to develop food safety indicator at ASEAN level as well as the possible areas for setting up food safety indicators. Common ASEAN food safety indicators were drafted in the group work session. The outputs obtained from the panel discussion and the group work will be further discussed in view of developing food safety indicators at ASEAN or at national levels.

Overview

Many ASEAN countries have significant interests in following various food and trade related guidelines developed by the Codex Alimentarius. In particular, the relatively recent Codex text entitled “Principles and guidelines for monitoring the performance of national food control systems” (CAC/GL 91-2017) has drawn technical interests and attention of those countries, as the guidelines specifically suggest countries to develop a set of indicators to evaluate and monitor the effectiveness of national food control systems. Therefore, Food and Agriculture Organization of the United Nations (FAO) organized the regional workshop on “Development of a set of National Food Safety Indicators” from 19 to 21 November 2019 in Bangkok, Thailand.

Two specific objectives of the regional workshop were set for the participants from ASEAN countries to: 1) enhance the understanding of food safety indicators and recognize their potential benefits and practical use; and to 2) understand the mechanisms to select priority food safety indicators and develop the capacity to utilize such food safety indicators. The agenda of this workshop is attached as Annex 1.

The workshop was attended by 34 participants, including government officials from food safety competent authorities from ten ASEAN countries’ agencies, responsible for food safety control and food standard development. The list of participants to the workshop is given in Annex 2.

Highlights of the workshop

Opening session

Dr Masami Takeuchi, Food Safety Officer, FAO, kindly delivered the opening remarks. She pointed out the importance of an effective national food control system, which is essential for ensuring food safety for consumers and fair practices in food trade. Food safety is one of the main issues for which FAO RAP’s technical support is requested by countries from Asia and the Pacific region. However, countries are not able to address what the specific and prominent food safety issues. It is, therefore, important for countries to know where they stand with regard to their food safety capacity level in order to prioritize the areas that need improvement. Further, FAO has received several requests from its Members during various meetings to provide guidance on developing national food safety indicators. Through this three-day workshop, Dr Takeuchi wishes the participants to have an overview of food safety indicators including the importance, the process of the development and its benefits. Further, the participants were asked to brief their colleagues in their country on the key messages obtained from this workshop.

Background and objectives

Ms Panpilad Saikaew, Project Coordinator, presented the background of this workshop. FAO Regional Office for Asia and the Pacific (FAORAP) held a regional consultation with the total of 84 participants from 24 countries in the region on food safety indicators (FSIs) from 6 to 8 December 2017 in Singapore with national food safety competent authorities to review various existing FSIs in the context of their national situations. As a concrete output of the consultation, the experts came up with a draft set of 40 regional FSIs to develop their National Food Safety Indicators (NFSIs). In 2018-2019, five countries namely Bhutan, China, Cook Islands, the Philippines and Republic of Korea have been selected to pilot selected food safety

indicators from the 40 regional FSI to develop a small set of tailored national food safety indicators to fit for their individual country capacities and contexts. The results and experiences of the pilot projects were shared during the FAO Regional follow-up meeting on food safety indicators in Asia-Pacific: Results of the pilot projects and a way forward held in China in November 2019. Lessons learned and experiences gained from the pilot countries are a great resource to the region and FAO will be drafting a regional FSI guide.

In order to strengthen capacity for ASEAN to develop a set of national food safety indicators, this regional workshop was organized under the FAO Regional project “Support for Capacity Building for International Food Safety Standard Development and Implementation in ASEAN Countries” (GCP/RAS/295/JPN). She also informed the objectives of the regional workshop, which are to enhance: 1) the understanding of food safety indicators and emphasize their importance; and 2) the capacity on the development of food safety indicators.

Measuring of food safety

Dr Masami Takeuchi introduced the reasons for measuring. She started this session by asking the question “Why would you measure everything?” The purposes of measuring are as follows:

- to monitor the progress;
- to ensure compliance with the standard; and
- to know how far the current situation is from the goal.

A key message was shared: “What gets measured gets managed” (Peter Drucker). The question remains, however: “what do we measure and how do we measure?” Dr. Takeuchi introduced the concept of food safety indicators and the importance of measuring food safety.

In the area of food safety, measurable indicators are not yet developed. However, Codex published documents related to food safety indicators including “Principles and Guidelines for National Food Control Systems” (CAC/GL 82-2013) and “Principles and guidelines for monitoring the performance of national food control systems” (CAC/GL 91-2017) wherein, indicators are established as part of the performance monitoring framework. For this purpose, technical assistance from FAO was requested to support countries in the region to know where exactly they stand in term of their food safety capacity level. It was underscored that improvement is a significant challenge for countries if a baseline cannot be identified. Further, food safety is too complex, and everything looks extremely important, thus, decisions will have to be made on where to start so that targets are not arbitrarily set. Identifying measurable food safety indicators also presents a key challenge amidst the changing global context and diverse challenges faced by countries.

Dr Takeuchi provided the following information on the progress of work done so far on the initiative of developing food safety indicators:

step 1: Member countries expressed the need of food safety indicators to measure the progress on food safety and to identify gaps on food safety measures implemented by the countries for continual improvement.

step 2: Literature review of previous works done globally and came up with FAO technical working paper which enlisted 139 probable food safety indicators used by different countries.

step 3: Expert opinion elicitation through regional consultation on food safety indicators for Asia and the Pacific held from 6-8 December 2017 in Singapore which identified a set of 40 food safety indicators that could be used in the region.

step 4: Consolidation of the proposed indicators (FAO)

step 5: Series of pilots to develop indicators at national level (Bhutan, China, Cook Islands, the Philippines and Republic of South Korea) and result-sharing meeting in China

step 6: Final review of the proposed indicators (Experts)

step 7: Publication of the regional guide on the indicators (possibly with other relevant international organizations)

Reference was also made to the FAO Technical Paper: Measuring Food Safety. The paper was developed to identify existing food safety indicators based on various literature reviews so that countries will be able to use the paper as a basis to further discuss the potential effectiveness of having regional and national food safety indicators. The paper provides four essential elements for food safety experts from the region to consider when determining: 1) whether or not a set of regional food safety indicators is useful; 2) what types of regional and national food safety indicators can be useful; 3) what criteria can be used in selecting regional and national food safety indicators; and 4) how regional food safety indicators can be used. The paper neither provides any direction nor opinions, and all information in the paper is based on the evidence and statements found in the existing literature. A rapid scoping review has been conducted to compile all of the identified food safety indicators in the literature. In total, 139 published food safety indicators were identified. Following the literature review, the regional consultation on food safety indicators for Asia and the Pacific was held from 6-8 December 2017 in Singapore which identified 40 food safety indicators that could be used in the region. More detail on this consultation is described in the following section.

Introduction of Codex Principles and Guidelines for Monitoring the Performance of National Food Control System

Ms Panpilad Saikaew introduced the Codex documents related to food safety indicators including “Principles and Guidelines for National Food Control Systems” (CAC/GL 82-2013) and “Principles and guidelines for monitoring the performance of national food control systems” (CAC/GL 91-2017).

A Codex Alimentarius guideline entitled “Principles and Guidelines for National Food Control Systems” (CAC/GL 82-2013) has been established to provide generally practical guidance to assist national governments in the design, development, operation, evaluation and improvement of the NFCS. Monitoring and system review of the NFCS are one of the key elements for the competent authority in order to regularly assess the effectiveness and appropriateness of the NFCS in achieving its objectives of protecting the health of consumers and ensuring fair practices in the food trade. Thus, the Codex Alimentarius guideline entitled “Principles and guidelines for monitoring the performance of national food control systems” (CAC/GL 91-2017) was adopted in 2017 to describe a logic framework of planning, monitoring and system review steps for the performance monitoring of an effective NFCS. This guideline also recommends Members to establish food safety indicators for each desired outcome for an effective NFCS. These indicators should fulfil the following criteria: 1) unambiguous, 2) easy to interpret and monitor, 3) transparent, 4) closely linked to the outcomes, 5) meaningful from an organizational

perspective, 6) amenable to independent validation and/or verification and 7) obtainable given the available resources.

Levels of Indicators

Dr Masami Takeuchi started this session by introducing the “Golden Circle” (What-How-Why) as the theory for critical thinking. To illustrate this, examples were given on the existing food security indicators and nutrition global target indicators and how these have been used to measure and set targets for improving the identified areas of concern.

FAO and WHO set clear global food security indicators and nutrition global target indicators. In setting indicators, the following questions and answers may help: *Why do we need indicators?* To monitor the progress, identify the needs, set the priorities, allocate appropriate funds, and effectively communicate with the public on the topic with quantifiable evidences.

Again, using food security indicators as example:

1. *WHY measure food security?*: To monitor progress towards World Food Summit/Millennium Development Goals (WFS/MDG) targets and present it in the State of Food Insecurity in the World (SOFI) report annually (Global level);
2. *HOW are the outputs being used?*: Prioritizations, allocation of funds, rationale for project/activity development;
3. *WHAT is measured?*: The number and proportion of persons below the minimum level of dietary energy requirement (estimates) at global, regional and national levels.

Unlike food security and nutrition indicators, it is difficult to set food safety indicators at global level because of the following differences:

- *Goal*: Clear goals can be set for food security indicators and nutrition indicators, but there are no quantifiable food safety goals that have been set at the international level.
- *Definition*: There is a clear set of definitions for food security and nutrition, however, “food safety” can be interpreted differently by different people/groups.
- *Benchmark*: It would be acceptable for countries to be identified of “food insecure situations” or “malnourished situations” and be compared with other countries. However, countries do not wish to have a label of “unsafe food situations” and to be compared with other countries as it has a direct impact on trade and economy.
- *Needs*: Countries wish to have harmonized and common food security indicators and nutrition indicators at global level, on the other hand, countries wish to have tailored and practical food safety indicators in their country contexts.

Consequently, it can be implied that it is quite difficult to set food safety indicators at the global level. In order to support countries on the development of food safety indicators, FAO may have to consider the following items:

- development of a regional guidance;
- development of a set of indicators for a group of countries;
- scaling up in the piloting countries or widen the coverage of the pilot countries; and
- output of the pilot projects may be used for developing a high-level “food safety investment plan” for many developing countries.

Desired outcomes of having food safety indicators

In this session, Dr Takeuchi shared the experiences from the pilot countries, namely Bhutan, China, Cook Islands and the Philippines, and explained the process and outcome of the desired outcomes set during the process of development of national food safety indicators.

In order to set feasible and effective desired outcomes, several prerequisite steps need to be followed;

- All key agencies and stakeholders understand the clear need to develop and agree on the “desired outcome(s)” by setting national food safety indicators.
- Three to five indicator “areas” from the regional food safety indicator pool are selected by a collective brain-storming process.
- A technical working group (TWG) is formulated to tailor the selected regional indicators to fit into the national contexts and the reality.
- A set of baseline data for each indicator needs to be set, if available, and a series of interventions would follow, in order to assess the practicability of the indicators.
- Final measurement with the indicators analyzed.

As an example, the desired outcomes of the pilot countries were shared;

Philippines: By developing and using food safety indicators, government agencies, food industry and consumers in the Philippines are able to have an overview of the current food safety situations. By monitoring the results regularly, improvement can be systematically reported, which eventually provides confidence to the stakeholders in the Philippines food safety and control system. The systematically collected evidence-based results will serve as a basis for an effective information and communication campaign on food safety, thus further understanding and appreciation on the importance of food safety will be gained. Food safety indicators will be designed to highlight the immediate needs and areas for improvement; therefore they will be useful in prioritization of programmes and activities, particularly for capacity development activities; and the results may be used as inputs to develop a strategic action plan. In addition, it will also be helpful for appropriate budget allocation, as prioritization has been conducted with solid supporting data and sound justifications.

Bhutan: By developing and using national food safety indicators, relevant government agencies are able to systematically identify key food safety issues in Bhutan and establish baseline information to prioritize actions and plan for focused future interventions.

Cook Islands: By developing and using national food safety indicators, relevant government agencies are able to develop evidence-based systems to identify key areas of food safety concern to determine priorities for strategic and collaborative action planning for the Cook Islands. This would also enable appropriate funding allocation and formulation of effective awareness-raising tools and communication strategies, including those for the national government to communicate with the local governments.

China: The desired outcomes are:

- 1) ten-year anniversary of China Food Safety Law coming into force;
- 2) examine the current food safety control system in China;
- 3) regulators, industry and universities work together;
- 4) useful in future communication;
- 5) draw the picture of current food safety status in China;
- 6) examine the performance of current food control system;

- 7) identify the gaps and deficiency in the system; and
- 8) provide advice and recommendations to improve this system in the next five-year national strategic plan.

It may be noticed that the desired outcomes set by the four pilot countries are not very similar to each other and therefore it highlights the fact that indicators can be flexible and can be set for a wide variety of purposes depending on what the country wants to achieve through this.

How to use the outputs

Dr Takeuchi then shared examples of how the pilot countries are utilizing the outputs from the indicators set in their countries.

China: the data obtained from the implementation of the food safety indicators can be used for identifying the food safety problems and setting up the new work plan.

Philippines: Through the pilot project, the development of communication materials on food safety are prioritized and the outputs are used as a tool to gain policy support.

Bhutan and Cook Islands: Similar to the Philippines, the outputs can be used for developing supporting material on food safety including factsheet infographic and stories via social media. The information of the current situation on food safety could be used as input/background for developing a request for support from donor agencies, international organizations and trading partners.

The Regional Consultation on Food Safety Indicators and its outputs

Dr Takeuchi presented the pool of 40 indicators which resulted from the Asia-Pacific Regional Consultation held in Singapore in December 2017. The pool served as a guide for countries to select effective indicators and tailor them to suit the national context.

Dr. Takeuchi reported that all the food safety indicators identified in the technical working paper were reviewed in three working group sessions, in which senior officials from 18 Asian and six Pacific Island countries working in the area of food safety participated. Variations were observed, but content-wise, all groups chose almost the same set of indicator categories. Variations were likewise observed in measuring methods, but suggested data sources are very similar among the 3 groups. The set may be used by countries as a reference pool of indicators, so that each country can select effective indicators and tailor them to fit the national context. The participants were advised, however, that the set needs more work on appropriate wordings. For the purpose of the workshop, the indicators were considered as “priority areas”.

The 40 priority areas, grouped into categories which reflect the nature and scope of the areas of concern, are:

Food safety competent authority(-ies) and partners

1. Presence of a leading food safety agency (entity) to drive the coordination work to ensure food safety
2. Food safety relevant agencies have clearly defined roles and responsibilities for food control management

3. Competent authority is supported by necessary infrastructure and adequate resources (e.g., human and financial resources and lab equipment and materials)

Policy and legal & regulatory framework

4. Presence of enabling national policy and legal & regulatory framework are consistent with international standards, guidelines and best practices (including legally embedded criteria for executing food recall and traceability) and they show government commitment to protect public health and ensure fair practices in food trade.

Principles of the national food control systems

5. National food control system covers the entire food chain (farm-to-table) in an integrated system

6. National food control system is implemented in a transparent manner with mechanisms for information, education, communication and coordination with relevant stakeholders

7. Use of risk analysis paradigm by the competent authority to inform and support risk-based, science-based and evidence-based decision-making and establish food safety control measures with a mechanism for expert consultation to advise government on food safety risk assessment

Codex and functions with other international bodies and platforms

8. Existence of National Codex Committee with allocated budget

9. Level of engagement in the work of Codex

10. Ability to meet and demonstrate compliance with international food safety and quality requirements and obligations (e.g., Codex standards, The World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) and requirements of trade partners)

11. Credible functioning of national contact points for Codex, World Organisation for Animal Health (OIE), International Plant Protection Convention (IPPC) and other relevant international organizations and platforms (e.g. the FAO/WHO International Food Safety Authorities Network (INFOSAN)) with required resources

Food inspection

12. Criteria for risk categorization and prioritization established for food inspection

13. Presence of functioning risk-based food inspection mechanism with well-defined standard operating procedures (SOPs)

14. Number of food inspectors (per population) trained on official food control

15. Number of inspections being conducted for infrastructure, installations and hygiene throughout farm to fork food chain (primary production, processing, distribution, hotels and restaurants and community kitchens)

Food safety certification

16. Presence of functioning food safety certification systems with well-defined SOPs

Testing and analysis

17. Presence of and access to capable diagnostic and analytical laboratories with well-defined SOPs

18. Presence of and access to accredited food testing laboratories with well-defined SOPs

Notifications

19. Presence of notification mechanism on food safety incidents and outbreaks
20. Presence of notification mechanism on food recalls

Support to self-checking systems

21. Presence of monitoring and verification mechanisms by the government on self-checking system of the producers, processors, food industries and food business operators throughout the food chain
22. A recognition system for the producers, processors, food industries and food business operators implementing good food safety practices
23. Presence of effective guidelines for developing good SOPs and instructions concerning good agricultural practices (GAP), good manufacturing practice (GMP), good hygienic practice (GHP) and Hazard Analysis and Critical Control Point (HACCP)

Food monitoring, health surveillance and epidemiology

24. Mechanisms are established and functioning for detecting foodborne disease and food contaminations
25. Existence of One-Health disease surveillance systems (animal plant, human and environmental health)
26. Number of outbreaks of foodborne illness reported
Examples: Salmonellosis in humans, Listeriosis in humans
27. Percentage of reported occurrences in which presence/contamination of hazards are identified (biological, chemical, physical) in all types of food and feed from farm to fork [or, Percentage of commodities (food or animal feed) that comply with regulations (e.g. Maximum Residue Levels (MRLs)), pertaining to pesticides, pesticide residues, veterinary drug residues, food additives, mycotoxins, heavy metals, radiological substances and key chemical, microbiological and physical (non-food) contaminants]
Examples: *Salmonella* spp. in food, *E. Coli* in food, *Listeria monocytogenes* in food (specify a commodity)

Data collection, collation and interpretation

28. Institution(s) exists that is responsible for the collection, collation and interpretation of data on food safety issues (including microbiological, chemical, natural and environmental) at the national level

Food safety emergency preparedness

29. National food safety emergency response capacity supported by a national plan/guidelines/rapid alert system, which state responsibilities, relevant parties and necessary systems and actions including traceability and food recalls

Information, education, communication and trainings

30. Risk-based education and trainings to food business operators related to hygiene and food safety are mandated and provided
31. All stakeholders farm to fork, including consumers, are reached in food safety information activities and are aware of the potential problems and risks related to hygiene and food safety

Shared responsibility - industry, producers, processors, food business operators

32. Percentage of producers, traders and food business operators implementing documented self-checking food safety management system, such as good SOPs on GAP, GMP, GHP, HACCP or any others in accordance with the local context

33. Percentage of food establishments from farm to fork displaying information, education and communication materials or signs on hygiene and food safety within their premises

34. Percentage of producers, processors, traders and food business operators that have implemented a functioning traceability system

35. Percentage of food establishments complying with labelling requirements including allergen risk indications

Access to potable water

36. Percentage of the population with access to potable water

Public trust in food safety

37. Presence of mechanism to understand public perception on the national food control system

38. Levels of public trust in food safety

Food and feed trade

39. Percentage of reported rejections of food exports due to food safety by importing countries

40. Mutual recognition of equivalence systems (e.g., MRA, MoUs for market access) based on international guidelines

Dr. Takeuchi advised that the above is not a final set and further refinement is necessary. She also highlighted that when selecting them for use at national level, it is important to define the outcomes first.

[**Food Safety Barometer**](#)

Dr Wendie Claeys from the Belgian Federal Agency for the Safety of the Food Chain (FASFC) presented the “food safety barometer,” a tool that is based on food safety indicators. It is a concrete example of how national food safety indicators can be developed and used, that participants can adapt to their own governmental setting and situation. Her presentation consisted of three parts namely 1) approach and methodology for developing the food safety barometer; 2) revision of the barometer (version 2); and 3) possible uses of the food safety barometer and indicators, including lessons learned.

The “barometers for the safety of the food chain” were developed by the Scientific Committee, an independent consultation body established at the FASFC and consisting of experts with scientific expertise in different fields, and this at the request of various stakeholders of the food chain including representatives of public administrations and of the various sector and consumer organizations. The barometers are intended as a communication tool to present to both consumers and the food industry a clear picture of the state and evolution of the safety of the food chain in Belgium.

To get a view of the safety of the entire food chain (from farm to plate), food safety as well as animal and plant health need to be considered. Given that the state of these three subareas may differ significantly and are not always interrelated, it was chosen to measure their state separately by means of three different barometers. In the presentation, the food safety barometer was elaborated as a case study, but a similar approach is followed for the animal and plant health barometers. In a preparatory phase relevant

literature, reports, and available results were evaluated. Through regular exchange between and feedback of scientific experts, risk managers, and stakeholders of the food chain, a final set of 30 food safety indicators has been selected. This selection was basically based on the “RACER” criteria - R: Relevant, A: Accepted, C: Credible; E: Easy to monitor and R: Robust. The purpose of the set of 30 food safety indicators was to cover the overall food safety situation from farm-to-plate and includes indicators related to preventive measures such as self-checking systems and inspections, the control of chemical and microbiological hazards in food products and food infections. Results obtained for a number of food safety indicators were shown to illustrate potential possibilities and limitations of food safety indicators.

In order to communicate plainly and understand about the country’s food safety situation, results obtained for the 30 food safety indicators were combined into one value, taking the relative importance or impact of the indicators upon food safety into account. The final food safety barometer value thus provides information on the food safety situation on an annual basis. It is expressed as a comparison to the state of a previous year, as it is difficult to express food safety in absolute figures, since food safety depends, among other things, on standards or action limits defined on a policy-level and liable to changes. Since the beginning of measurements in 2007, the food safety barometer shows overall a positive trend of improvement of the food safety situation in Belgium. Given that the barometer is already in place for several years, the set of food safety indicators has been revised resulting in a new set of 22 food safety indicators (barometer version 2).

In the presentation it was illustrated that the barometer and its indicators enables a helicopter view of the general food safety state. The FASFC uses the food safety barometer primarily as a communication tool. It is not a tool to assess the functioning or performance of the FASFC and it does not include any judgement on the general population’s health situation. Although the barometer has some weaknesses and threats, it also has its strengths and opportunities. It allows short-term (year-to-year monitor) as well as long-term (overall tendency) assessment of the country’s food safety situation, it supports the development of customized databases and it has added value in building confidence and as a promotion tool for the food chain safety approach. Given that food safety indicators can serve different purposes, Dr Claeys recommended in conclusion, defining the specific uses or the SMART objectives first (“Why do you want to measure?”), before developing national food safety indicators.

Examples of the development of national food safety indicators

The Philippines

Dr Edna Zanaida V. Villacorte, President of Philippine College of Veterinary Public Health, started this session by giving the overall information related to the Philippines. Food safety indicators need to be developed in the Philippines in order to provide an overview of immediate need for decision makers and objectively allocate national resources. Dr Villacorte gave the reasons as to why the Philippines joined the pilot project: 1) better perspective on food safety situation in the Philippines, 2) emphasize priorities for budget allocation and 3) raise the level of awareness and advocacy on food safety. All stakeholders, including the Food Safety Regulatory Agencies and Food business operators, involved in the indicator setting process. Technical Working Group (TWG) has been established to identify, develop and implement set of priority food safety indicators. A Kick-off workshop organized in March 2019. The participants were organized into six groups of ten members each, with the grouping pre-determined to ensure balanced

representation of the various sectors in the group discussions. The 40 areas identified in the Regional Consultation were reviewed and narrowed down into five priority areas based on the guide questions below;

- Is it quantifiable?
- Are relevant data already available and accessible?
- Are we on-target (meaningful)? (Example of performance evaluation)
- Are we assuring a certain level of quality as well?
- Can we monitor the measurements over time?

After more consultations with the stakeholders, the TWG selected four food safety indicators based on the data available and the survey conducted for gathering the opinion. A follow-up evaluation between the TWG and the PCVPH evaluated the four selected indicators and finally decided on the following three indicators looking at feasibility and measurability:

- 1) number of meat inspectors trained on official food control doing routine inspection in licensed slaughterhouses in the National Capital Region (#14);
- 2) presence of and access to ISO 17025-accredited central food testing laboratory for chloramphenicol drug residue test in shrimps for export (#18);
- 3) fresh meat stakeholders, including consumers are reached in meat safety information through printed materials and are aware of the potential problems and risks related to meat hygiene and safety (#31).

These will represent the initial set of three national food safety indicators to be developed by the Philippines, with recommended methodologies to measure, keeping in mind the One Health Approach.

Dr Villacorte also mentioned that the existence of food safety indicators has led to the following benefits:

- gaps in current programs identified;
- priorities for future plans earmarked;
- importance of data collection and management realized;
- measurement of effectiveness of programs learned; and
- determination of improvements or decline in program implementation.

In conclusion, food safety indicators can provide the data that will give policy makers substantiated information necessary in prioritizing areas in food safety programs to be funded and thus help in strengthening food safety control and ensuring safe food for consumers.

Bhutan

Ms Dechen Choki, senior food safety officer, Bhutan Agriculture and Food Regulatory Authority (BAFRA), introduced the background of food safety systems in Bhutan and further shared Bhutan's experience in the development of a set of national food safety indicators.

Bhutan, a landlocked country, is a food import dependent economy. In the absence of a robust food import control system in place, there is a need to strengthen the food safety system to protect the health of Bhutanese consumers. Food safety in Bhutan is governed by the Food Act (2005) and the Food Rules & Regulations (2017) and BAFRA under the Ministry of Agriculture and Forests is designated as the National Food Safety Control Authority. In the absence of comprehensive national food standards, these food

legislations empower BAFRA to follow the Codex standards and guidelines for regulation of food safety in the country. According to the Food Act of Bhutan 2005, BAFRA also acts as the food inspectorate, conducts food import and export inspection and certification, and regulates the food business operations to ensure food safety and quality.

Ms Choki gave the reasons as to why Bhutan participated in the pilot project of “Development of national food safety indicators with a One Health Approach” including: 1) there is no existing baseline information on food safety; 2) there is no on-going system to monitor and evaluate the effectiveness of food control system; 3) relevant government agencies are able to systematically identify key food safety issues; and 4) it is timely for Bhutan to develop a set of pilot food safety indicators and assess the progress and effectiveness of food safety measures implemented. A Technical Working Group (TWG) comprising of BAFRA officials and representatives from relevant Government agencies was formed to identify, develop and implement a set of priority food safety indicators. In May 2019, BAFRA organized the inception workshop on the development of national food safety indicators in Bhutan using a One Health Approach as kick off for the pilot project. The inception workshop also included a high-level advocacy seminar wherein, participants were introduced to the concept and importance of food safety culture to improve food safety and quality outcomes. From the group discussions in this workshop, the following four priority areas were identified to be piloted as to determine its measurability and possibility to serve as the initial set of national food safety indicators.

- 1) Self-checking system for cottage and small industries
- 2) Foodborne disease outbreak investigation
- 3) Food Handler’s level of Food Safety Knowledge
- 4) Egg traceability

As a follow up to the workshop, the TWG further developed the comprehensive national food safety indicators to assess performance of implementation of food safety measures and generate information for evidence-based planning and resource allocation to enhance national food safety measures in incremental ways on long-term basis. The action plan for implementation of four pilot food safety indicators were set by TWG in consultation with the national consultant and prepared for implementation and review.

Ms Choki shared the following recognized benefits of the development of the national food safety indicators:

- strengths and weaknesses in the selected food safety measures identified;
- baseline information established;
- evidence-based tool to convince policy makers;
- guide for optimum resource utilization; and
- opportunity to up-scale the pilot food safety indicators across Bhutan.

Food Safety Culture

Dr Takeuchi introduced the concept of food safety culture based on a presentation by Ms Kate Astridge of Food Standards Australia New Zealand (FSANZ).

According to the Global Food Safety Initiative (GFSI), food safety culture is “shared values, beliefs, and norms that affect mindset and behaviors towards food safety across/in/throughout an organization.” The vision is for a culture of excellence in which food safety is recognized as the cornerstone for success, and

food safety and integrity are priorities for all food businesses. In such culture, everything connects – people, processes, systems and data.

The journey to establishing a strong positive food safety culture, however, takes time and care, especially as challenges exist (Campden BRI, *et al.*, 2014):

1. Lack of resources
2. Negative employee attitude
3. Lack of effective communication
4. Multicultural workforce
5. Negative management attitudes
6. High staff turnover
7. Lack of awareness of culture
8. Lack of coordination across company
9. Lack of prioritization of culture
10. Inability to measure culture
11. Lack of technology

The question of “Who initiates the practice: policy maker, regulator, industry, businesses, consumers?” was introduced to ignite thoughts on what roles each one of us can play in food safety. There is no right or wrong answer for this question. She highlighted that there should be an essential paradigm shift in the role of food safety regulators from policing to educating. Practice of food safety must be embedded in culture and for this to be realized, coaches and champions are needed.

The video produced by FAO on “Creating a Food Safety Culture in Bhutan” available at: <https://youtu.be/E88Mnh0MVxE>, was then shown to the participants as a successful case study. In the case of Bhutan, the policy support from the high level and the willingness of the private sector to promote food safety will be influential in the success of food safety culture in Bhutan. The participants congratulated Bhutan on this success and they wished to convey the importance of food safety culture to the high-level officials in their respective countries.

Panel Discussion

Ms Panpilad Saikaew provided an introduction to the panel discussion on the benefits, challenges and feasibility to have common FSIs at ASEAN level. Panel members included Ms Meinneke Karolin, from Indonesia, Ms Hope Ramonina Guerrero Rovina, from the Philippines, Mr Teh Chun Siong, from Singapore and Ms Namaporn Attaviroj, from Thailand. Participants were also able to take part in the discussion. The discussion was moderated by Ms. Dechen Choki and was based on the following two questions.

I. Considering the discussion so far, do you see a feasibility for having food safety indicators (even few ones) for ASEAN?

As evident from the ASEAN slogan “One Vision, One Identity, One Community”, the objectives of food safety in ASEAN are to protect consumers, ensure fair trade and facilitate trade. In general it was discussed that, it would be great to have regional food safety indicator for some common areas. It was also noted that, the development of regional food safety indicators would be challenging due to the differing government structures, legal frameworks and the sensitivity of the data to be shared, which might affect trade. However, the panelists and the participants agreed on the possibility to develop common food

safety indicators at ASEAN level. The 40 draft food safety indicators obtained from the regional consultation can be reviewed and prioritized based on the feasibility. Selected ASEAN Food Safety Indicators can be developed to align with the ASEAN Food Safety Policy with the following purposes:

- to set up ASEAN baselines to facilitate trade;
- to understand the current situation as a whole – a helicopter view;
- to understand the level of public trust in ASEAN;
- to learn good practices from each ASEAN countries;
- to streamline the actions on food safety among stakeholders in ASEAN particularly for food industries and food business operators; and
- to have more ASEAN standards and ensuring there are mechanisms to recognize as the national standards in all ASEAN countries.

II. What types of food safety indicators could be the good ones for ASEAN at this initial stage?

After having confirmed on the possibility to have common food safety indicators at ASEAN level, the following broad areas were considered for the development of potential food safety indicators at this initial stage.

- i. Testing and analysis capacity sharing to help each ASEAN member country
- ii. Public perception and trust among ASEAN countries
- iii. Levels of engagement in Codex work
- iv. Self-checking systems in ASEAN

These broad areas identified during the panel discussion was used as a basis for the group work session. Participants brainstormed on the possible food safety indicators for each broad area identified.

Group work

Following the panel discussion, participants were divided into four groups to brainstorm on the possible food safety indicators for the four possible areas selected from the panel discussion. The output of the group work can be seen in Annex 3.

Conclusions and recommendations

Based on the evaluation form and feedback, participants recognized the importance and benefits of food safety indicators. Through technical presentations, examples of other countries, and group work session, they obtained knowledge on the objectives and principles of the development of food safety indicators. The participants rated the quality of workshop as excellent (77 percent) with very useful technical inputs of the experts (88 percent). The workshop enabled participants to discuss the feasibility on the development of food safety indicator at ASEAN level as well as the possible areas for setting up food safety indicators. The common ASEAN food safety indicators were drafted in the group work session. The outputs obtained from the panel discussion and the group work would be further discussed for developing food safety indicators at ASEAN or at national levels. Suggestions for implementation included more examples and case study on how to develop the food safety indicators, a follow up workshop for further discussion on food safety indicators at regional level, as well as, guidelines on the development of food safety indicators.

The electronic questionnaire was circulated to participants after the workshop, and the participants responded and proposed some follow up activities on food safety indicators and food safety culture as follows:

- write the report on this workshop including the learning obtained from this workshop and share with relevant colleagues;
- organize an official briefing session with colleagues and superiors to inform them about the FAO initiative on the food safety indicators and food safety culture;
- informally discuss with colleagues and superiors to plan some concrete follow up activities on food safety indicators and food safety culture;
- use social media (Facebook, twitter, etc.) to disseminate the idea of food safety indicators and food safety culture; and
- assess the feasibility and seek a support to develop some food safety indicators at the ASEAN level.

Annex 1: Agenda

Time	Item	Note
Day 1		
08:00 – 09:00	Registration	
09:00 – 09:20	Opening session Welcome address	Dr Masami Takeuchi, Food Safety Officer, FAO
09:20 – 09:45	Self-introduction of participants and observers	All
09:45 – 10:30	Group Photo Coffee/Tea Break	
10:30 – 10:45	Background and objective of the meeting	Ms Panpilad Saikaew, Project Coordinator, FAO
10:45 – 11:30	Measuring of food safety	Dr Masami Takeuchi
11:30 – 12:30	Introduction of Codex Principles and Guidelines for Monitoring the Performance on National Food Control System	Ms Panpilad Saikaew
12:30 – 13:30	Lunch break	
13:30 – 14:30	Level of Food Safety Indicators (Global, Regional or National level)	Dr Masami Takeuchi
14:30 – 15:30	Desired outcome of having food safety indicators Experience from pilot country	Dr Masami Takeuchi
15:30 – 16:00	Coffee/Tea Break	
16:00 – 17:00	How to use the output Experience from pilot country	Dr Masami Takeuchi
17:00 – 17:30	Questions and Answers Session	All
Day 2		
9:00 – 9:15	Feedback from Day 1	All
9:15 – 10:15	The regional consultation on food safety indicators and its output	Dr Masami Takeuchi
10:15 – 10:30	Coffee/Tea Break	
10:30 – 12:00	How to develop National Food Safety Indicators	Dr Masami Takeuchi
12:00 – 13:30	Lunch break	
13:30 – 14:30	Food safety indicators – barometers for the safety of the food chain	Dr Wendie Claeys, Scientific expert, DG Control Policy, Belgian Food Safety Agency (FASFC), Belgium
14:30 – 15:15	Example of the development of FSIs-The Philippines	Dr Edna Zenaida Villacorte, President of Philippines College of Veterinary Public Health
15:15 – 15:45	Coffee/Tea Break	
15:45 – 16:30	Example of the development of FSIs-Bhutan	Ms Dechen Choki,

Time	Item	Note
		Bhutan Agriculture and Food Regulatory Authority (BAFRA)
16:30 – 17:00	Questions and Answers Session	All
Day 3		
09:00 – 09:15	Feedback of Day 2	All
09:15 – 10:00	Panel Discussion: Benefits, challenges and feasibility to have common FSIs at ASEAN level	Panellists; - Indonesia, - Philippines (Dr Hope Romonina Guerrero Rovira), - Singapore and - Thailand Moderator: Dr Wendie Claeys
10:00 – 10:30	Coffee/Tea Break	
10:30 – 11:30	Group work: Benefits, challenges and feasibility to have common FSIs at ASEAN level	All
11:30 – 12:30	Introduction of the initiative on “food safety culture”	Dr Masami Takeuchi
12:30 – 14:00	Lunch break	
14:00 – 15:00	Discussion Session: How “food safety culture” can benefit ASEAN	Dr Masami Takeuchi
15:00 – 15:30	Closing session Summary of the meeting	Dr Masami Takeuchi

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Annex 3: Output of the group work

During the 3th day of this regional workshop, group work session was undertaken for brainstorming on the development of the food safety indicators for the four possible area identified during the panel discussion. The proposed food safety indicators for each area are as follow.

- i. ***Testing and analysis capacity sharing to help each ASEAN member country***
 - Number of testing methods for specific parameter (Heavy metals, microbiology, pesticide residue)
 - Number of national reference laboratories in ASEAN
 - Number of national reference laboratories that have been trained by ASEAN reference laboratories
 - Percentage of accredited laboratories for specific parameter in ASEAN
- ii. ***Public perception and trust among ASEAN countries***
 - Number of countries with regular surveillance on food safety awareness
 - Number of countries having mechanism to understand public perception on food control systems.
 - Public survey on trust based on products from ASEAN
- iii. ***Levels of engagement in Codex work***
 - Number of ASEAN countries which participated in electronic Working Group (eWG) and Codex meetings
 - Percentage of eWGs/ Circulated Letters that are responded by ASEAN member countries
 - Defined roles and responsibilities of Codex Contact Points per country
 - Number of ASEAN standards harmonized with Codex standards/documents
 - Presence of national Codex Contact Points
 - Number of countries participate in Codex Committee meeting and working groups
 - Number of platforms related to Codex : CCFICS, CCFA, CCFH, CCCF, CCASIA, CCPR
 - Number of inputs/comments provided by ASEAN Codex Working Group to Codex
 - Percentage of Codex texts adopted as ASEAN standards/Guideline/Code of practices
 - Percentage of existence of SOPs for Codex Contact Point
- v. ***Self-checking systems in ASEAN***
 - Number of Countries with self-checking mechanism in place.
 - Number of SOP available for self-checking system (ex. GAP, HACCP, GMP, GHP, GLP)
 - Number of food business types
 - Number of countries having guidelines/manuals towards self-checking system
 - Number of self-checking documents in ASEAN member countries available or published
 - Percentage of food business with self-checking system based on GMP/GHP.
 - Percentage of farm with self-checking system based on GAP.

Annex 4: Photos

I. Opening Ceremony



II. Workshop – Presentations



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III Panel Discussion and Group Work



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Annex 5: Evaluation on effectiveness of the workshop

Name _____
Agency _____
<p>1. How do you evaluate the quality of the workshop in general?</p> <ul style="list-style-type: none"> <input type="radio"/> Excellent (77 %) <input type="radio"/> Very good (23%) <input type="radio"/> Adequate
<p>2. Was the subject of the workshop useful and relevant to your needs?</p> <ul style="list-style-type: none"> <input type="radio"/> Very useful (85%) <input type="radio"/> Somewhat useful (15 %) <input type="radio"/> Not useful (Please explain why not)
<p>3. Were the materials and handouts useful and the information relevant?</p> <ul style="list-style-type: none"> <input type="radio"/> Very useful (77%) <input type="radio"/> Somewhat useful (23 %) <input type="radio"/> Not useful (Please explain why not)
<p>4. Were the technical inputs by experts useful and relevant?</p> <ul style="list-style-type: none"> <input type="radio"/> Very useful (88%) <input type="radio"/> Somewhat useful (12 %) <input type="radio"/> Not useful (Please explain why not) <hr/>
<p>5. Did you find the group work relevant and useful?</p> <ul style="list-style-type: none"> <input type="radio"/> Very useful (85%) <input type="radio"/> Somewhat useful (15 %) <input type="radio"/> Not useful (Please explain why not) <hr/>
<p>6. Any other recommendations/comments/suggestions for improvements</p> <ul style="list-style-type: none"> • Request to have more examples for the indicators and how to evaluate. • FAO could provide further work on this area for ASEAN as a pilot project based on the issues the workshop proposed. • Request for having follow up workshop for discussing on food safety indicators, perhaps each country prepare a list of draft indicators for further discussion and better refine the list during workshop. So the food safety indicators could be better utilized in region/country. • High level meeting in order to have commitment to develop food safety indicators at national and ASEAN levels. • Guideline on the development food safety indicators would be useful.

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