Food and Agriculture Organization
of the United Nations

Workshop report:

Development of National Food Safety Indicators in Bhutan Using a One Health Approach

2-4 May 2019
Le Meridian Riverfront, Paro, Bhutan

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Abstract

The report presents the proceedings of the two and a half day kick-off workshop on "Development of national food safety indicators (FSIs) with a One Health Approach" organized by the Food and Agriculture Organization of the United Nations (FAO) with its service provider Khesar Gyalpo University of Medical Sciences of Bhutan (KGUMSB) collaboration with Bhutan Agriculture and Food Regulatory Authority (BAFRA), Ministry of Agriculture and Forests (MoAF), Royal Government of Bhutan. Thirty-eight participants from BAFRA, MoAF, Technical Working Group (TWG) representing various agencies for the development of FSIs and relevant stakeholders attended the consultation workshop to understand the concept of measuring food safety, using the 40 FSIs identified during the regional consultation on food safety indicators for Asia and the Pacific held from 6-8 December, 2019 in Singapore.

Following group discussions facilitated by Dr Masami Takeuchi Food Safety Officer of FAO, the workshop identified four priority areas which will be piloted as to determine its measurability and possibility to serve as the initial set of national FSIs. The outcomes and perception of Bhutan's experience of implementing the pilot project on development of national FSIs will be shared with other countries in the region. The concept of food safety culture was also introduced to the participants, which will be further advocated to high-level policy makers to garner their support in promoting food safety culture among the food processors, regulators and consumers.

Keywords: Food safety Indicators; food safety culture; capacity building; FSIs

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Abbreviations and acronyms

BAFRA	Bhutan Agriculture and Food Regulatory Authority
FSIs	Food Safety Indicators
FBD	Foodborne diseases
FBO	Food Business Operators
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Points
IHR	International Health Regulations
JEE	Joint External Evaluation
KGUMSB	Khesar Gyalpo University of Medical Sciences of Bhutan
MoAF	Ministry of Agriculture and Forests
MRLs	Maximum Residue Limits
NPHC	National Post Harvest Centre
SPS	Sanitary and Phytosanitary
TWG	Technical Working Group
WFS	World Food Summit
WTO	World Trade Organization
NEWARSIS	National Early Warning, Alert & Response Surveillance Information System
DoA	Department of Agriculture
DoL	Department of Livestock
BCCI	Bhutan Chamber of Commerce and Industry
OGOP	One Gewog One Product
Q&A	Question and Answer

Executive summary

Food safety has become a national priority worldwide due to increasing number of food safety events associated with food contamination leading to food poisoning and foodborne illnesses, and food frauds. An unprecedented number of food borne diseases (FBD) outbreaks have occurred both within countries and internationally. Data on FBD outbreaks in Bhutan captured through National Early Warning, Alert & Response Surveillance Information System (NEWARSIS) indicated a total of 33 incidents of foodborne illness outbreaks during 2016 to 2018

However, epidemiological data on FBD and laboratory capacity to detect the causes of FBD are currently limited in Bhutan. As a result, many FBD outbreaks often go unrecognized, underreported or uninvestigated. Food Safety is a public health priority and policies and regulatory frameworks to establish and implement effective food safety system is deemed necessary. Currently, limited funds are allocated for food safety in the country. This could be because of the low awareness on the importance of food safety amongst the policy makers.

Chemical threats continue to exist in food and food products from the application of pesticides, veterinary drug residues and other chemicals introduced intentionally or naturally present in the environment. Examples are the current ban imposed on few imported vegetables and seaweed due to high level of pesticides and heavy metals above the Maximum Residue Limits (MRLs). Other challenges include the continued emergence of new threats to food safety and consumer health due to changing technology of food production, processing and distribution, and consumption habits.

Bhutan is a food import dependent economy and do not have a robust food import control systems in place. The risk of Bhutan becoming a dumping ground (especially for sub-standard food that are imported) is foreseen in the absence of stringent food import control system. Thus, there is a need to strengthen food safety system to protect the Bhutanese consumers.

BAFRA under the MoAF is designated as the National Food Control Authority in the country. Food safety in Bhutan is governed by the Food Act (2005) and the Food Rules & Regulations (2017). 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.

As per the Food Act of Bhutan 2005, BAFRA is to act as food inspectorate, conduct import and export inspection and certification of food; inspect wholesale and retail food establishments for ensuring food safety; and to ensure that food-processing businesses comply with food safety and hygiene standards. Currently, there is no adequate food safety surveillance system established in Bhutan, a risk-based approach to preventing, detecting or controlling food hazards (whether biological or chemical) along the food supply chain is not adequately implemented. The existing legislation does not emphasize and explicitly specify the placing of responsibility for the safety and quality of food on the food business operators. As such, current food safety control is not fully compliant with the International Health Requirements 2005 (IHR) standards.

The above observations have clearly been reflected in the final mission report of the Joint External Evaluation (JEE) of IHR Core Capacities of Bhutan held from 11-15 December 2017. This Mission Report clearly recommends the revision of the Food Act of Bhutan 2005 and its regulations to incorporate the full range of requirements of the IHR (2005), and other relevant international standards.

Therefore, BAFRA is in the process of revising the Food Act of Bhutan to address these deficiencies and meet key international requirements. Currently there is no on-going system to monitor and evaluate the effectiveness of food safety control in Bhutan. Development of measurable FSI to evaluate the progress and effectiveness of food control system is necessary. Therefore, development of a set of FSIs suitable for Bhutan is timely and enables to assess the progress and effectiveness of food safety measures implemented in Bhutan.

The Codex Alimentarius guideline "Principles and guidelines for monitoring the performance of national food control systems" (CAC/GL 91-2017) also recommends the member states to establish FSIs for each desired outcome to assess the effectiveness of national food control system.

The goal of strengthening national food control system was discussed during the FAO Regional workshop on FSIs in the Asia Pacific held from 6-8 December 2017 in Singapore. This workshop saw participants from member countries finalize around 40 draft FSIs. Bhutan along with China, Cook Island, Philippines and South Korea volunteered to conduct pilot projects to develop national FSIs and evaluate its usefulness.

Developing a set of national FSIs relevant to Bhutan will have the following benefits:

1. The indicators could be used as a tool for performance evaluation in the area of food safety
2. It could be used to review the current status of food safety in Bhutan
3. It could help Bhutan in identifying the areas that need interventions or improvement.
4. It could help BAFRA understand what data and information are needed to be collected further to allocate resources to priority areas for the enhancement of food control system.
5. It could help in systematically detecting food safety problems in the country
6. The indicators could be used as a tool to convince the policy makers / the Royal Government of Bhutan to allocate much needed resources to strengthening food safety
7. The indicators would help in having a risk-based inspection and import control system
8. The indicators can be used to communicate about the achievement of objectives and/or to monitor trends and patterns for the continuous improvement in the effectiveness of a national food control system

This pilot project is jointly implemented by FAO, Khesar Gyalpo University of Medical Sciences of Bhutan (KGUMSB) and BAFRA. The main objective of this workshop organized as a component of the pilot project was to develop a set of priority FSIs suitable for Bhutan through consultative process. These indicators can be used to gauge the practicality and usefulness for implementation and scaling up to evaluate the effectiveness of Bhutan's national food safety systems. The long-term outcome of developing the national FSIs will be in strengthening the national food control system via remodeling Bhutan food safety system to a more proactive and risk-based approach rather than end product testing.

The workshop opening session was graced by Mr Namgay Wangchuk, Director General of BAFRA. He highlighted on the importance of having national FSIs to show the effectiveness of food safety measures taken and convince the policy makers for budget allocation. The workshop was facilitated by Dr Masami Takeuchi, Food Safety Officer of FAO, Asia Pacific Regional Office of Bangkok and Dr Sithar Dorjee, National Consultant from KGUMSB.

During the workshop, four priority FSIs were developed and plan of action to implement these food safety measures over next six months were developed.

1. Introduction

1.1 Overview

For the countries to be able to come up with effective FSIs considering all the key elements and help them address shortcomings of food control systems, a regional consultation meeting was held on 6–8 December 2017 in Singapore to identify a set of Regional FSIs(40 indicators) for the Asia-Pacific region. The countries of the region may prioritize implementation of these FSIs based on the ground situations.

Following the regional consultation, some countries initiated the process to develop national FSIs based on the indicators discussed at the regional level. Bhutan being a small country felt the need of having national FSIs. It would be easier to implement the pilot project for development of national FSIs, as this system is less complicated. FAO in collaboration with BAFRA and KGUMSB embarked on a project "Development of national food safety indicators with a One Health Approach". The pilot project started with the situation assessment of food import control system in Bhutan and with this inception workshop to kick off the pilot projects from 2-4 May 2019 in Paro, Bhutan.

Thirty-eight (38) participants who hold a stake in food safety initiatives and goals in Bhutan attended the workshop. These include representatives from the government and the private sector namely: BAFRA, which is responsible for implementing the Food Act of Bhutan 2005; the government policy offices and food safety support agencies including the Department of Agriculture (DoA), Department of Livestock (DoL) and Royal Center for Disease Control of the Department of Public Health (DoPH); private sector representatives from Bhutan Chamber of Commerce Industry (BCCI) and One Gewog One Product (OGOP) Office; academicians of Royal University of Bhutan (RUB) and KGUMSB; Office of Consumer Protection, Food Laboratory, and Technical Working Group (TWG) Members.

1.2 Background

The effectiveness of national food safety system can be assessed through development of a set of potential national FSIs. The goal of strengthening the national food control system was discussed during the FAO regional workshop on FSIs in the Asia Pacific held in Singapore where participants from the member countries finalized around 40 draft FSIs. Bhutan along with Cook Island, China, Philippines and South Korea volunteered to conduct the pilot project to develop the national FSIs and assess the practicality of implementation and their usefulness to strengthen food safety.

Although, BAFRA has been implementing the food safety measure throughout the country since 2003, there are no indicators to measure to evaluate the effectiveness of its food control system. BAFRA, as the national food control authority in the country carries out food import and export inspection and certification, inspect food retail and wholesale establishments to ensure food safety, regulate food processing establishments to sure compliance with food safety and hygiene standards as per the Food Act of Bhutan 2005.

The existing capacities and infrastructure required to handle adverse food safety issues in terms of knowledge, awareness, technology and human resource are relatively low in Bhutan. As a result, many foodborne illness and outbreaks often go unrecognized, unreported or uninvestigated. Therefore, BAFRA is in the process of revising the Food Act of Bhutan with a

proactive and risk-based approach to ensure food safety in the country where the FSIs will play a crucial role

Therefore, the development of FSIs will help Bhutan to review its current status of food safety, help identify the areas that need improvements, and serve as a tool to mobilize resources for food safety. A TWG has been formed to identify, develop and implement set of priority food FSIs.

2. Highlights of the workshop

2.1 Workshop structure

The workshop was conducted using combination of presentations on concepts and principles followed by group discussion. The participants were divided into 5 groups of 7 each, with the balanced representation of the different sectors in the group discussions.

Dr Masami Takeuchi, FAO Food Safety Officer, assisted by Dr Sithar Dorjee, National Consultant facilitated the group discussion, guiding the participants in understanding the concept of measuring food safety and in generating the outcomes that are necessary in identifying the priority areas for developing the initial set of FSIs important for Bhutan. The outcomes of the group work were combined to come up with consolidated outcome and outputs. The list of capacity building needs on food safety issues was also generated.

A TWG consisting of BAFRA officials, and representatives from relevant government agencies were actively engaged in developing FSIs through consultative group work sessions.

2.2 Opening Session

The opening session was graced by Mr Namgay Wangchuk, Director General of BAFRA. He highlighted on the importance of having national FSIs to showcase the effectiveness of food safety measures taken and convince the policy makers for budget allocation. In his opening remarks, DG noted the following points:

- BAFRA has been designated as National Food Inspectorate agency in the year 2003. As such, BAFRA is mandated to implement regulatory measures to ensure food safety and quality of all food commodities available in markets and oversee quality control throughout the food chain.
- However, due to limited technical capacity & shortage of human resource BAFRA is faced with many challenges in fully implementing the above-mentioned broad mandates.
- Understanding the importance of food safety and the challenges faced by BAFRA as a new food safety agency in 2003, FAO supported BAFRA to develop Food Act of Bhutan in 2005 & Food Rules and Regulations of Bhutan in 2007. This was followed by several small technical assistance project from FAO that enabled BAFRA to implement food safety measures in Bhutan. Since then BAFRA has come a long way! A lot of food safety initiatives and activities have been carried out.
- BAFRA is still faced with new challenges especially with the introduction of pre-packaged & fast food in the country and increasing food import. In addition, currently BAFRA is not aware as to where we as country stand in the area of food safety.
- Therefore, to gauge the effectiveness of the national food safety system BAFRA has proposed FAO to help develop FSIs suitable to Bhutan and pilot test it to understand where we stand in terms of overall food safety situation in the country.

- FAO having recognized the importance FSIs and understanding the challenges has accepted BAFRA'sproposal to assist on the development of FSIs to strengthen the food safety system in the country.
- The long-term outcome of developing the national FSIs will be in strengthening the national food control system via modernization of Bhutan food safety system to a more proactive and risk-based approach rather than end product testing.
- The development of the national FSIs will directly provide information on the overall food safety situation in the country. It will provide much needed data required for further capacity development activities in the area food safety.
- Most importantly, the results of the pilot project will provide BAFRA the much-needed information for getting the attention of the RGOB to invest more in food safety.
- A strengthened food safety system will not only positively impact the food safety within the country but will also contribute towards a safer cross-border food trade.

The opening session was also addressed by Dr Masami Takeuchi, Food Safety Officer of FAO, Asia Pacific Regional Office of Bangkok, Mr Chadho Tenzin, FAO Country Office, Bhutan and Dr Sithar Dorjee, National Consultant from Khesar Gyalpo University of Medical Sciences of Bhutan.

2.3 Kick off program: Objectives and FAO next steps

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

Step 1: Member countries expressed the need of such FSI to measure the progress on food safety and to identify gaps on food safety measures taken up by the countries for continual improvement.

Step 2: Literature review of previous works around the world in similar line and come up with FAO technical working paper which enlist 139 probable FSIs used by different countries.

Step 3: Expert opinion elicitation through regional consultation on FSIs for Asia and the Pacific held from 6-8 December 2017 in Singapore which identified 40 FSIs that could be used in the region.

Step 4: Consolidation of the proposed indicators (FAO)

Step 5: Series of pilots of the indicators at national level (Bhutan, China, Cook Island, Philippines and South Korea) 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)

Based on technical review done on the subject and consolidated idea drawn from the regional consultation in Singapore in December 2017, Dr Takeuchi presented the objectives and expected outputs of the workshop as follows:

a) Agree on a desired outcome of having/using national FSIs

- Why do we want to measure?
- What are we going to do with the results?

b) Agree on 3-5 priority areas for setting FSIs

- What do we want to measure?
- Who will measure?
- How do we measure?

The above-expected outputs shall form part of Step 5 of the FAO-led initiative. Dr Takeuchi pointed out that the pilot activity in the Philippines is particularly significant because it is the first to involve a big group of multi-sectoral representations from the government and the private sectors, cutting across different fields of disciplines and expertise in the field of food safety.

2.4 Presentations on concepts on food safety and developing FSIs

Following are highlights of the presentations of Dr Takeuchi on the program agenda topics:

Topic A. Measuring Food Safety

Dr Takeuchi introduced the concept of FSIs and the importance of measuring food safety. The presentation aimed to help the participants better understand and appreciate the objectives and desired outcome of the inception workshop. A key message was shared: *"What gets measured gets managed"* by Peter Drucker. The question remains, however: "what do we measure and how do we measure?"

To illustrate, examples were given on existing food security indicators and nutrition global indicators and how these have been used to measure and set targets for improving the identified areas of concern.

"The 1996 World Food Summit called for a 50 percent reduction in the number of undernourished people by 2015 (WFS target).

In 2000, the Millennium Declaration recognized the value of hunger and poverty reduction by setting the MDG target of "halving, between 1990 and 2015, the proportion of people who suffer from hunger".

The following questions and answers were highlighted to help in setting the indicators:

1. Why do we need indicators? To monitor the progress, identify the needs, set the priorities, allocate appropriate funds, effectively communicate on the topic
2. At what level? Global, regional, national, prefectural/provincial, local
3. What is the shape of the eventual outputs? Annual/monthly/weekly reports, factsheets, project proposals, infographics for web/snss
4. How do we use the outputs?

Again, using food security indicators as example:

1. WHY measure food security? To monitor progress towards the WFS/MDG targets and present in the State of Food Insecurity in the World (SOFI) report annually (Global level)
2. WHAT are measured? The number and proportion of persons below the minimum level of dietary energy requirement (estimates) at global, regional and national levels
3. HOW they are measured? Establishing and using food security indicators

4. HOW are the outputs being used? Prioritizations, allocation of funds, rationale for project/activity development

However, in the area of food safety, measurable indicators are yet to be developed. For this purpose, technical assistance from FAO was requested to support countries in the region to know where exactly they stand on 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 FSIs indicators also presents a key challenge amidst the changing global context and diverse challenges faced by countries.

Among these challenges are:

1. Globalization
2. Increased movement of people, agricultural and food products across borders
3. New agricultural production and processing technologies
4. Growing membership of World Trade Organization (WTO)
5. Increased public awareness about sanitary and phytosanitary (SPS) issues

Challenges are also diverse on account of:

1. Existence of hazards/diseases with potential to move across sectors and borders
2. Breakdown in security at one point in the chain, which can have consequences for the rest of the food chain
3. New outbreaks of transboundary disease affecting people, animals and plants
4. Increasing number and stringency of SPS requirements
5. Legal obligations for signatories of international agreements
6. Ensuring protection against uncertainties associated with new technologies
7. High cost of regulation and limited public resources

Thus, can food safety really be measured? A basic principle was offered: "To be measured, the object of measurement must be described clearly, in terms of observables." (Hubbard). The Codex Alimentarius Commission also prescribes some guidelines on a Performance Monitoring Framework1 but it is essential to establish indicators first before a monitoring plan and effective monitoring could be done. The process itself of establishing the indicators needs to be developed, with the capability to measure such indicators likewise clear and practicable.

Dr Takeuchi also cautioned that good measurement can go wrong. It is, thus, essential to have a better reporting system to ensure proper communication of food safety issues and not unduly alarm the population or lead to wrong decisions. She emphasized that the worse thing to avoid is miscommunication.

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*

[1] *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)

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 does not provide 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."

Topic B. A proposed set of the regional FSIs: food safety priority areas

Dr Takeuchi presented the pool of 40 indicators that 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 for the national context.

Dr Takeuchi reported that all the FSIs identified in the technical working paper were reviewed in three (3) working group sessions participated by senior officials from 18 Asian and 6 Pacific Island countries working in the area of food safety. 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 useful to be recognized as a 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 and regulatory framework

4. Presence of enabling national policy and legal and 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 advice 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, WTO SPS Agreement and requirements of trade partners)
11. Credible functioning of national contact points for Codex, OIE, IPPC and other relevant international organizations and platforms (e.g., 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 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 standard operating procedures (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 GAP, GMP, GHP and HACCP

Food monitoring, health surveillance and epidemiology

24. Mechanisms are established and functioning for detecting to 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., 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 to 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.

Topic C. Introduction to food safety culture

Dr Takeuchi introduced the concept of food safety culture based on a presentation by 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

Who initiates the practice: policy maker, regulator, industry, businesses, consumers?

Government plays a lead role. An essential paradigm shift is making the food safety regulators as educators. Practice of food safety must be embedded in culture and for this to be realized, coaches and champions are needed.

Topic D. Pilot project on developing FSIs: South Korea and the Philippines experiences

Dr Takeuchi shared the experiences of South Korea and the Philippines in piloting the development of national FSIs.

South Korea conducted a survey among 100 respondents to identify which among the 40 priority areas are considered most significant. Results of the survey showed the respondents giving high regard for indicators which will measure the capability of government to ensure food safety through the presence of a leading food safety agency. She explained that such

prioritization is explained by a recent reorganization of the country's food safety agency and the respondents needed to have a gauge of its capability and performance.

In Bhutan's case, current issues which pose challenges in measuring FSIs were raised:

1. It was not known what food safety related hazards (microbiological, chemical, etc) are the main problems (killing/sickening people)
2. It was not known what food items are really posing the actual risks to Bhutanese
3. Even if there is capability to detect pathogens and chemicals, etc, there is no means to act upon them (no traceability, recall capacities)
4. Current situation in food trade with neighbouring countries is making the imported food control almost impossible
5. Food inspectors are mainly checking on expiration dates, packaging defects – and seizing the products (local people think inspectors are taking their food and destroying them without enough explanations)

Nonetheless, indicators for the following areas are desired:

1. Presence of the food safety competent authority
2. Trust – food safety culture – the competent authority is not policing food establishments, but it is helping businesses to produce and provide safe food to all
3. Drinking water safety – accessible to everyone
4. Imported food control – risk categorization exists and border control (quarantines, food inspections) is conducted according to the risk categorization
5. Microbiological laboratory capacity – detection/quantification capacity exists on 2 key microorganisms (Salmonella and Campylobacter)
6. First building block for the future traceability system – one step back and one step forward system for retailers

2.5 General process of identifying and prioritizing areas for developing national FSIs

Each presentation was followed by Q&A and group work sessions for:

1. Enhancing understanding and appreciation of the need and rationale for developing FSIs,
2. Statement of desired outcome, identification of possible outputs and use of such outputs,
3. Identification of priority areas upon which the indicators are to be selected (based primarily on data availability and accessibility to allow measurability of the selected indicators), and
4. Identification of the training areas to address gaps and support improvements in food safety initiatives and control

The workshops were:

Workshop 1: Establishing the necessity and reasons for having FSIs

Workshop 2: Identifying the desired outcome, the corresponding outputs, and the target recipients

Workshop 3: Selecting the priority areas for the Bhutan from the 40 areas identified in the Regional Consultation

Workshop 4: Identifying training areas to address gaps

The workshop-specific processes and results are presented in the following section of this report.

2.6 Workshop Results: Outcomes, Outputs, Priority Areas, and Suggested Areas for Training

Most important food safety issues

Remember the first question: what three main food safety issues you think are most important in Bhutan?

What was the basis of your answers?

How can you convince anyone with your answer?

Supporting data and evidences are needed!

Food safety indicators for Bhutan

Q. Does Bhutan need / benefit from FSIs?

All groups confirmed that indicators are necessary and useful for Bhutan

Why?

i. To understand current situation
   - Helps to understand the current food safety scenario / situation in Bhutan
   - Understand the current status of food safety of the country
   - To establish the baseline on food safety standards

ii. To monitor effectiveness and progress
   - To measure the effectiveness of food safety measures
   - To monitor the food safety situations in the country
   - Monitor and evaluate food safety activities
   - To measure the progress in food safety area
   - To monitor the progress of the country on food safety

iii. To prioritize activities
   - To prioritize the activities
   - To develop food safety action plan (plan of activities, prioritize the activities)
   - Output from the use of the indicator would help in public health program planning
   - Link the indicators with individual work plan and sectors specific key results area
   - To prioritize resource allocation and planning

iv. To identify gaps
   - Identify the gaps in the current system
   - Develop corrective actions based on gaps
   - Identify the gaps on the current food safety measures

v. To conduct targeted actions

- To assess the effectiveness of the food inspection system
- More targeted approach to inspection
- Risk-based inspection and targeted inspections
- To assess the effectiveness of the food testing system
- Food testing (lab capacity) for prioritized food can be conducted (not random testing)
- More prioritized / focused food import control
- More focused awareness / advocacy can be conducted
- More targeted capacity building of all actors involved in food supply chain to ensure food safety

vi. To identify key food safety areas

- Identify the key areas that poses food safety hazard in food supply chain
- To identify the specific component of national food control system needing strengthening/improvement.

vii. To make governmental functions effective

- Achieve organized regulatory function
- Evidence-based / informed policy decisions can be achieved

viii. To appropriately allocate budgets

- To allocate budget
- To prioritize and invest limited resources

ix. To have a better coordination

- Identifying priority areas will promote appropriate resource allocation for national level coordination

x. To support research and development

- Identify areas for R&D
- Data generated from the indicators would help in research and policy making

xi. To conduct effective communication and advocacy

- For communication purposes
- Means of communication tools for food safety messages
- Increase consumer confidence in regulators
- To advocate and convince policy makers on importance of food safety through science-based evidences for policy decision- communication materials.

xii. To earn trust, credibility and good reputations

- To build the reputation of the national food control system

Annex: Eventual and possible impacts

- Reduce economic burden of the foodborne illnesses

- Traceability for domestic and imported food can be set up
- Contributes to trade facilitation
- Preparedness to address new / emerging food issues
- To meet international food safety standards and programs
- To ensure quality of food
- Uplifting of safety and quality of products and services
- Strengthen an effective response system for food safety emergencies
- Use for the basis for setting national food standards and guidelines, codes of practices
- Use as key inputs for communication to FBOs and general consumers
- Evidence for risk categorization and risk profiling for FBOs, regulators

Desired outcome

By developing and using national FSIs, 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.

Eventual target outcomes

Consumers – will be able to have an overview of the current food safety situations in Bhutan. (Increased trust and confidence)

Food industry and FBOs – will be able to comply the rules and regulations in the transparent and trusted environment. (Food safety culture)

Academia, researchers – will be able to identify key areas that need researches and data – further evidence-generation may be achieved by them. (Shared responsibility)

Policy makers – will be able to understand which food safety areas require more resources and technical capacity development (Appropriate budget allocations)

Use of FSIs

1. A recognition system for the producers, processors, food industries and food business operators implementing good food safety practices
2. Mechanisms are established and functioning for detecting to foodborne disease and food contaminations
3. Risk-based education and trainings to food business operators related to hygiene and food safety are mandated and provided
4. Percentage of producers, processors, traders and food business operators that have implemented a functioning traceability system

3. Bhutan FSI areas for pilot projects

3.1 Food Safety self-checking system

Target: Restaurants (hotels, bakeries) or small-scale processing plants

What to measure: Number/percentage of [restaurants, hotels, bakeries or small-scale processing plants in selected Dzongkhags or all] with food safety self-checking system (checklist) implemented

Current baseline: Zero

Expectation by the end of Oct 2019

3.2 Completeness of foodborne diseases outbreak investigations

Target: RCDC surveillance data

What to measure: Percentage of reported foodborne disease outbreak successfully investigated

Current baseline: 24% (2018)

Expectation by the end of Oct 2019 or for 2019 data:

3.3 IEC for FBOs

Target: Food handlers or managers of food establishments

What to measure:

1) Level of knowledge on food safety among food handlers or

2) Percentage of hotels and restaurants managers who have been trained on risk-based food safety and hygiene topics

Current baseline: Trainings for food handlers are ongoing, but no data. Also no data on knowledge level of managers

Expectation by the end of Oct 2019:

3.4 Traceability of table eggs

Target: Table egg retailers

What to measure: Percentage (or number) of units (table egg retailers) with one-step forward and one-step back traceability

Current baseline: no data

Expectation by the end of Oct 2019:

3.5 Other potential areas for consideration

1. Criteria for risk categorization and prioritization established for food inspection
2. Existence of One-Health disease surveillance systems (animal plant, human and environmental health)
3. 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

4. Percentage of the population with access to potable water

3.6 Risk categorization

Bhutan largely depends on imported foods. A technical review of risk categorization to prioritize food inspection-at-border is ongoing. Using the established risk categorization to create a list of prioritized commodity-hazard combinations for imported food control would be useful

It is suggested to have this risk categorization work done in connection to this pilot project so that this item can be selected for the next phase.

3.7 Food contamination monitoring

Disease surveillance for human and animal has been regular activities but regular food monitoring has been a challenge for Bhutan. It is difficult to understand what commodity-hazard combinations are the riskiest for Bhutanese.

It is suggested to start looking into a food commodity that has a wide exposure to the Bhutanese population, and pick a hazard with:

a) a complete international risk assessment,
b) Relatively severe health consequences and
c) The existing laboratory capacity**.**

Suggested commodity: dairy products – RTE cottage cheese?
Suggested hazard: *Listeriamonocytogenes* (Do we have a lab capacity?)

3.8 Data collation

Various sets of data exist in Bhutan (food safety data on microbiological, chemical, natural and environmental hazards or risk assessment results of these) but a systematic collation is not in place. Food contamination monitoring data is a good start to advocate the needs of this mechanism.

It is suggested to conduct a preliminary study, in collaboration with universities and researchers, to identify and list available data sources and their owners (agencies), on both regularly generated data sets as well as ad hoc research-type data sets.

Once the list is completed, two activities can follow:

1. Identify gaps for required data for food safety management and
2. Identify a mechanism to collate various data sets for food safety management at the national level.

3.9 Safety of drinking water

Water safety is a critical foundation for food safety. Multiple government agencies are involved in management of water safety and quality in Bhutan. WHO data is indicating that Bhutan is in a good situation in terms of the access and availability of potable water, however few concerns remain:

1. Availability and access for rural populations
2. Potential heavy metal contamination (lead) and
3. Limited available data on safety/quality verifications

It was suggested that the report of this project includes a brief section on this issue and disseminated to those agencies involved in water safety and quality for their feedback and comments.

Depending on the feedback received, consideration can be given to the possible follow-up actions to assure safety of drinking water in food establishments in Bhutan.

4. Way Forward

Based on these learning experiences, national TWG will continue to develop more comprehensive national FSIs 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 TWG members will come up with the plan for implementation of four pilot FSIs in consultation with national consultant and prepare for implementation and review.

5. Closing Session

In her closing remarks, Dr Takeuchi highlighted the main outcomes of the workshop and thanked all TWG members and participants for active participation in the workshop. She also applauded the participants for their valuable contribution in coming up with very good output, that is four indicators and capacity building needs for Bhutan in terms of food safety.

Annex 1. Directory of Participants, TWG Members and Facilitators

Participants- Relevant Agencies and Private Sector

1. Karma Dorji, Sr. Post Production Officer, NPHC
2. Kinley Choki, Sr. Livestock Production Officer, NDRDC
3. Tshering Doma, Communications Officer, ICTD, MoAF
4. Tashi Choden, Nutritionist, Standardization Division, BSB
5. Sonam Tobgay, Sr. Food Technologist, Queens Project Office, Kuengacholing
6. Sonam Wangdi, DAMC, MoAF, Thimphu
7. Dr R B Gurung, Program Director, NCAH, DoL
8. Sangay Zam, Faculty of Nursing and Public Health, Khesar Gyalpo University of Medical Sciences of Bhutan
9. Tshering Wangchuk, Office of Consumer Protection, MoEA

Participants- Technical Working Group

10. Dr Chador Wangdi, Chief, QCQD, BAFRA
11. Gyem Bidha, Deputy CLO, BAFRA
12. Dechen Wangmo, OIC, NFTL, BAFRA
13. Lham Dorji, Sr. RQI (Food), BAFRA, Gelephu
14. Sonam Yangchen, Sr. Livestock Production Officer, DoL
15. Lhendup Dorji, NPPC, DoA
16. Vishal Chhetri, Sr. Laboratory Officer, Food and Nutrition Laboratory, RCDC, DoPH
17. Anooja Nair, College of Natural Resources, RUB, Lobesa
18. Kubir N. Bhattarai, Sr. RQO- Focal Officer, Codex (Bhutan), BAFRA
19. Tashi Yangzom, Sr. RQO, BAFRA HO

Participants- BAFRA

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30. K B Tamang, Sr. RQI, BAFRA, Dagana
31. Sonam Tshering, Sr. RQI, BAFRA, Punakha
32. Sonam Tenzin, Asst. RQO, BAFRA, Bumthang

33. Thinley Zangmo, Asst. RQO, BAFRA, Nanglam
34. Namgay Wangmo, Sr. RQI, BAFRA, Phuentsholing
35. Sonam Choden, Sr. RQI, BAFRA, Wangdue Phodrang

Facilitators

36. Dr Masami Takeuchi, Food Safety Officer, FAO-RAP, Bangkok
37. Dr Sithar Dorjee, Director, KGUMSB
38. Chadho Tenzin, FAO Representative, FAO Country Office, Bhutan
39. Namgay Wangchuk, Director General, BAFRA, Thimphu

Annex 2: Workshop program

Project Kick-off Meeting
Development of National Food Safety Indicators with a One Health Approach

Funded by Food and Agriculture Organization of the United Nations

2 – 4 May 2019

Le Meridian Hotel

Paro - BHUTAN

PROGRAM

Time	Agenda	Facilitator
Day 1: Thursday, 2 May 2019		
08.00 – 09.00	Registration	
09.00 – 09.30	Welcome remarks Opening Address Opening Remarks	Ms Gyem Bidha, BAFRA Mr Namgay Wangchuk, Director General, BAFRA Dr Masami Takeuchi, FAO
09.30 – 10.00	Round call- Participant's introduction	All
10.00 – 10.30	**Group photo session** **Coffee/Tea Break**	
10.30 – 11.30	Introduction/Background 1. Objectives of the meeting 2. About Food Safety Indicators 3. Pilot project in Bhutan 4. Introduction of the Technical Working Group (TWG)	1 & 2. Dr Masami Takeuchi, FAO 3. Ms Gyem Bidha 4. TWG
11.30 – 12.00	Questions and Answers Session	All
12.00 – 13.00	**Lunch Break**	
13.00 – 14.00	Structured discussion: Desired outcome of having food safety indicators	Facilitated by Dr Masami, FAO
14.00 – 15.00	Structured discussion: Indicators as a tool: how to use the outputs (analyses, monitored trends, status, etc) produced using the food safety indicators	Facilitated by Dr Masami, FAO
15.00 – 15.30	**Coffee/Tea Break**	
15.30 – 16.30	Group work1: Developing a proposal of: 1. A desired outcome 2. Effective and practical use of the outputs produced using the food safety indicators	Participants – groups of 5-8 people per group
16.30 – 17.30	Reporting back of Group 1 Wrap up of the Day 1	Facilitated by BAFRA/TWG

Annex 3. Photos

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Opening remarks by Director General, BAFRA.

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Group Photo- all participants

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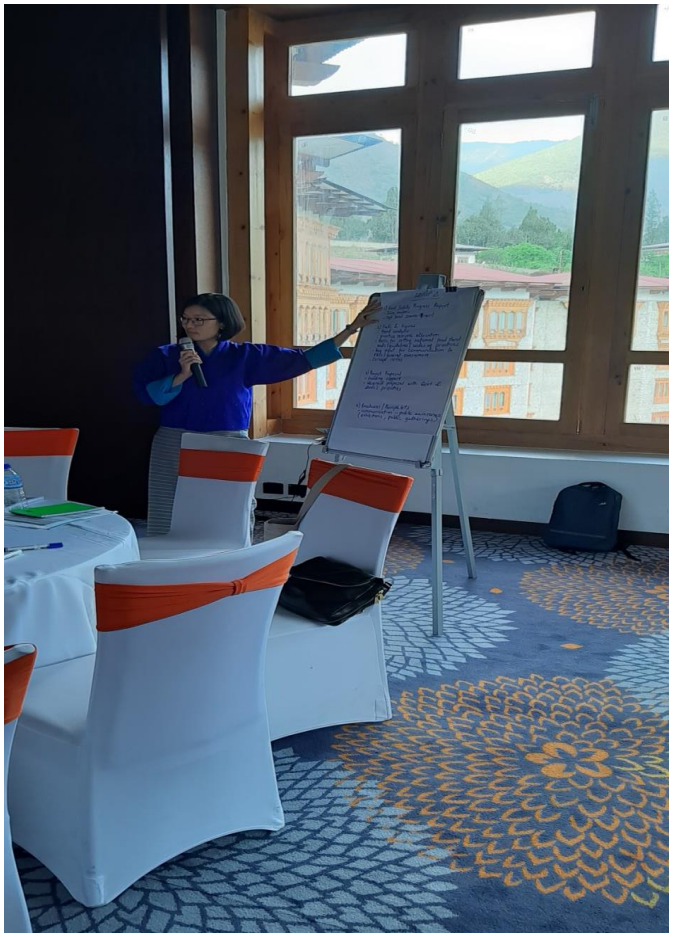
Presentation by Dr Masami Takeuchi on General process for identifying actionable FSIs



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Presentation of outcome of Group Discussion

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