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Food and Agriculture Organization of the United Nations

Measuring food safety

Indicators to achieve sustainable development goals (SDGs)

9

FOOD SAFETY
TECHNICAL TOOLKIT FOR ASIA AND THE PACIFIC

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Food and Agriculture Organization of the United Nations
Bangkok, 2021

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Abstract

Universal access to safe food is a key requirement for the 2030 Agenda for the Sustainable Development Goals. And yet an estimated 600 million people each year fall sick from eating unsafe food and 420 000 of them die. Safe food is also critical for economic development and the international food trade.

Setting and measuring food security indicators have significantly contributed to improving and communicating progress in achieving food security. Considering their success, several countries in Asia and the Pacific region have asked the Food and Agriculture Organization of the United Nations (FAO) to provide guidance on the development of food safety indicators. Following a comprehensive review and a technical consultation on the topic, a pilot project was developed in four countries to establish food safety indicators that fit their country contexts and objectives. The pilot project confirmed the usefulness of food safety indicators in strengthening national food control systems. In contrast to other types of indicators, food safety indicators were not found to be suitable for benchmarking capacities among countries.

The regional guide to develop food safety indicators aims to provide countries with technical advice to develop national food safety indicators that serve country-specific objectives. By reading the guide, food safety competent authorities will be equipped with instruments and experience based tips to effectively develop and use food safety indicators, and to tailor them to fit their countries' contexts.

Keywords

Food safety, indicators, measurement, country, data, results, food control, specific, guide, systematic approach, core team, surveillance, monitoring, consultation, stakeholders, food safety competent authority, capacity development, Codex Alimentarius, Food and Agriculture Organization of the United Nations (FAO), Asia and the Pacific.

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The objectives and the direction of FAO food safety indicators initiative were arrived at through wide consultations with various food safety experts, particularly the 84 experts from 18 Asian and six Pacific Island countries who participated in the first consultative meeting held in Singapore in December 2017. Based on the recommendations, four countries, namely Bhutan, China, Cook Islands and the Philippines, volunteered to participate in the regional food safety indicator pilot project. This document would not have been possible without the insights and advice provided by those countries' counterparts in government agencies, stakeholders who were involved in the pilot projects, and experts.

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Abbreviations and acronyms

FAO	Food and Agriculture Organization of the United Nations
GAP	Good agricultural practices
GHP	Good hygiene practices
GMP	Good manufacturing practices
HACCP	Hazard analysis and critical control points
SDGs	Sustainable Development Goals
SOPs	Standard operating procedures
SPS	Sanitary and phytosanitary measures
WHO	World Health Organization

1 Introduction

1.1 Background

Whatever gets measured, can be better managed. That principle forms a foundation for research and work in countless fields. The use of indicators is essential as data provides evidence for action. Food safety indicators can be vital for national food safety competent authorities to achieve their objectives. Their goals can range from the systematic tracking of food safety systems to more effective communications with relevant counterparts. Food safety indicators can help reveal the realities of national food control systems, thus increasing the understanding of what is needed, what programmes can be pursued, and what priorities may be set. Finally, they can be persuasive tools in advocating for budget allocations and in justifying plans for food safety work.

A good example of effective indicators is the suite of food security indicators launched in the State of Food Insecurity in the World 2012. These were analysed and further developed in the State of Food Insecurity in the World 2013, 2014 and 2015 reports (FAO 2012, 2013, 2014, 2015). Those indicators were formulated to capture various aspects of food insecurity and have proven to be essential in various dimensions, such as monitoring and evaluation, capacity development needs assessment, and identification of priorities. As part of the food security indicators, a global nutrition index was later created to complete the picture of food security from the efforts towards sustainable nutrition aligned with the Sustainable Development Goals (SDGs).

It is important to remember when setting food safety indicators that the objective is not to set an international benchmark. Rather, food safety indicators can be most effective when they are tailored for the specific country context, and used within the country. In fact, food safety indicators are sometimes considered sensitive information. Countries have expressed strong reservations about disclosing results that indicate "insufficiency" of national food control systems. By comparison, they do not generally react that way regarding food security or nutrition indicators. In addition, food safety indicators may not necessarily be simplified to set any quantifiable goal to be achieved at the international level. In other words, there are no standardized or harmonized thresholds for any measurable elements of food safety control and management. This is because there is no precise definition for food safety indicators, meaning that different people and groups can interpret them differently. At the same time, many food safety competent authorities stressed that nobody is interested in disclosing the detailed comparisons of the food safety situations among different countries. The unwanted label of "unsafe food situations" attributed to a country is the worst case of how to use food safety indicators. That label will have a direct and negative impact on trade, tourism and economies.

1.2 What are food safety indicators

What exactly are food safety indicators? They can be referred as to a methodology that could be used to serve a country's particular purpose in the area of food safety. The fact that they are oriented to each singular purpose makes food safety indicators an important tool for the work on food safety.

In Codex Alimentarius's "Principles and guidelines for monitoring the performance of national food control systems," indicators are described in the context of national food control systems. The document recommends establishing such indicators to achieve effective outcomes for effective national food control systems. The document defines the indicators as:

Quantitative variable or qualitative factor that provides a simple and reliable means to measure achievement, to reflect the changes connected to activities, or to help assess the performance of a programme or system (FAO and WHO, 2017).

Along with Codex Alimentarius, the World Health Organization (WHO) also refers to indicators for food safety in the context of a joint external evaluation, through which international health regulations are implemented and monitored:

Indicators refer to detection and responding to the food-related events and enabling environment for putting food safety control mechanisms in place with appropriate legislation, laws, or policies and with the involvement of multiple sectors (WHO, 2005).

The Codex and WHO definitions make it clear that food safety indicators, unlike food security and nutrition indicators, refer to methodologies or approaches rather than numbers to achieve. Food security and nutrition indicators are designed to classify the availability, access, utilization and stability of foods and their nutrition power.

In 2017, FAO conducted an initial consultation on the establishement of food safety indicators. International experts met to draw up a list of food safety areas, with the purpose of understanding if data could be generated and collected.[1] The FAO technical paper provides essential elements that can be considered by food safety experts from the region to determine 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.

[1] Forty areas were identified and are contained in the FAO Technical Paper called "Measuring food safety: food safety indicators for Asia and the Pacific," which is available online as an annex to the report of the consultation (FAO, 2017) and available at http://www.fao.org/3/i9459en/I9459EN.pdf.

One key emerging element of the consultations and technical papers is that food safety indicators can be scalable and flexible to achieve the different desired outcomes of each country. Defining the outcome is key. Without a well-defined outcome, the purpose of the indicators becomes blurred, and their efficacy would be null. Along with the desired outcomes, the results obtained through the indicators are not meant to stand alone. They require a thorough interpretation to determine subsequent actions in a process of continuous growth towards the desired outcomes.

Currently, a list of 40 food safety indicator areas exists (Box 1), and it is frequently referred to in this guide. This list was one outcome of the "Regional consultation on food safety indicators for Asia and the Pacific" of 2017. First, all 139 existing food safety indicators from literature and texts of Codex Alimentarius and international health regulations were identified and considered.[2] Then, international experts discussed each indicator and agreed on a final selection of 40. The selected indicators were used as the basis of four pilot projects in different countries in Asia and the Pacific that further validated their relevance.

1.3 Objectives of the guide

This guide aims at providing countries with the building blocks to develop their own food safety indicators. It offers a set of tools to national food safety competent authorities to establish food safety indicators, including a good understanding regarding practical actions and a thorough understanding of what can be done and not done through food safety indicators. The guide also highlights how national food control systems can benefit from implementing food safety indicators in terms of improvements in food safety and the sustainability of their application. The results are a worthwhile investment for countries.

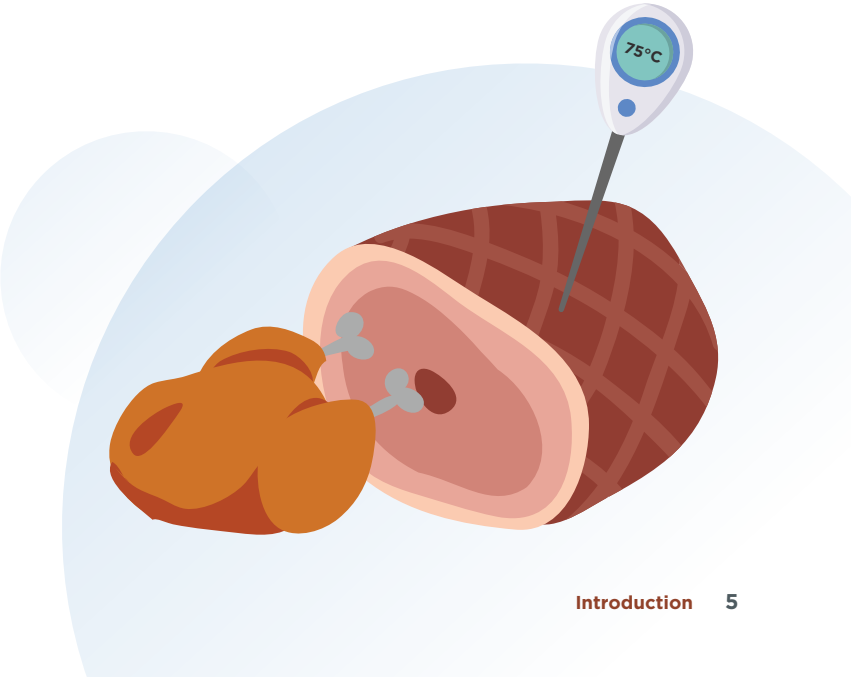
2 This comprehensive list is reported in the FAO Technical Paper "Measuring food safety: food safety indicators for Asia and the Pacific" and available at http://www.fao.org/3/i9459en/I9459EN.pdf.

1.4 Target audience

This guide is geared towards national food safety competent authorities in Asia and the Pacific, providing them with all the necessary instruments to develop, establish and implement food safety indicators.

1.5 Effective use of the guide

The guide is most effective if it is used with a clear understanding that indicators themselves do not provide any final results: food safety indicators are tools to achieve an outcome. This guide presents a step-by-step process to establish food safety indicators, and to measure them with and without interventions. The paper also presents explanations and examples from four different countries that have piloted the development of food safety indicators. The four countries vary widely in their capacities and were chosen to illustrate how food safety indicators are an approach that can be scalable to different realities.



2 A step-by-step guide

2.1 Formulate a core team

The first suggested step would be to recruit a core team to work on formulating and implementing national food safety indicators. As food safety is a multi-sectoral and multi-disciplinary topic, a small planning team of three to five technical officers working in the relevant agencies, including a food safety competent authority, should be involved. The planning team facilitates the delivery of the outputs throughout the establishment and implementation of food safety indicators, and it can function as the secretariat for required meetings during the process.

2.2 Review the regional pool of food safety indicator areas

The next suggested step would be to compile a list of the food safety indicator areas outlined in previous expert work. FAO has consolidated a total of 40 food safety indicator areas as a regional pool for Asia and the Pacific based on expert opinions from two regional consultations with four pilot projects. In each area, many different indicators can be developed, depending on different purposes, priorities and the measurement feasibility in various country contexts (Box 1).

Each core team member conducts an individual review, then engages in a group discussion about the effectiveness of each, and completes the review process. It is important that each member understands 1) the areas identified as priorities, 2) the indicators that can be important for the country, and 3) the indicators that are already measurable with the existing data and information in their national context.

Box 1. Regional pool of 40 food safety indicator areas

Food safety competent authorities 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. The competent authority is supported by necessary infrastructure and adequate resources (e.g. human and financial resources, and lab equipment and materials).

Policy, legal and regulatory framework

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

Principles of the national food control systems

5. Food control systems are integrated into one national food control system that covers the entire food chain (farm-to-table).
6. The national food control system is implemented in a transparent manner with mechanisms for information, education, communication and coordination with relevant stakeholders.
7. Risk analysis paradigms are used 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.

(Cont.)

10. Ability to meet and demonstrate compliance with international food safety and quality requirements and obligations (e.g. Codex standards, World Trade Organization SPS agreement and requirements of trade partners).
11. Credible functioning of national contact points for Codex, World Organisation for Animal Health, International Plant Protection Convention and other relevant international organizations and platforms (e.g. the International Food Safety Authorities Network) with required resources.

Food inspection

12. Criteria for risk categorization and prioritization established for food inspection.
13. Presence of functioning risk-based food inspection mechanisms 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 the 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 mechanisms on food safety incidents and outbreaks.
20. Presence of notification mechanisms on food recalls.

(Cont.)

Support to self-checking systems

21. Presence of monitoring and verification mechanisms by the government on self-checking systems of 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 practices (GMP), good hygiene practices (GHP), and hazard analysis and critical control points (HACCP).

Food monitoring, health surveillance and epidemiology

24. Mechanisms are established and functioning for detecting foodborne diseases and contamination.
25. Existence of One Health disease surveillance systems (animal plant, human and environmental health).
26. Number of outbreaks of foodborne illness reported:
    a. Salmonellosis in humans;
    b. Listeriosis in humans.
27. Percentage of reported occurrences in which the 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, such as maximum residue limits, pertaining to pesticides, pesticide residues, veterinary drug residues, food additives, mycotoxins, heavy metals, radiological substances and key chemical, microbiological and physical or non-food contaminants]:
    a. *Salmonella* spp. in food (specify a commodity for an indicator);
    b. *E. coli* in food (specify a commodity for an indicator);
    c. *Listeria monocytogenes* in food (specify a commodity for an indicator).

(Cont.)

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 for food business operators related to hygiene and food safety are mandated and provided.
31. All stakeholders from 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.

(Cont.)

Public trust in food safety

37. Presence of mechanisms 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. Memorandum of Understanding for market access) based on international guidelines.

2.3 Collect key references

It is a good idea to look for some examples of indicators development that might have already been conducted in other disciplines in the country. There may not be examples of developing food safety indicators, but there might be some indicators for other health-related issues. Collecting such examples would be useful for good practices and lessons learned. If there are no examples within the country, examples from other countries may also be useful.

Legislative references from relevant national laws and regulations as well as international agreements, guidelines, standards and manuals often play critical roles when it comes to determining the measurable elements for indicators (Box 2). The list can be complemented with laws, regulations, directives and guidelines available at the national level.

Understanding the underlying principles behind the national and international requirements and guidelines will be instrumental in establishing the direction and methodologies of the work and the objectives for applying food safety indicators.

Box 2. References from international bodies and organizations

Codex Alimentarius:

- Principles and guidelines for national food control systems (CAC/GL 82-2013) (FAO and WHO, 2013), available at: http://www.fao.org/input/download/standards/13358/CXG_082e.pdf;
- Principles and guidelines for monitoring the performance of national food control systems (CAC/GL 91-2017) (FAO and WHO, 2017), available at: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXG%2B91-2017%252FCXG_091e.pdf.

FAO:

FAO technical paper "Measuring food safety" includes:

- Chapter 1. The need and the importance of developing food safety indicators.
- Chapter 2. Existing food safety indicators.
- Chapter 3. Criteria for selecting effective food safety indicators.
- Chapter 4. The use and applications of food safety indicators.

and available at http://www.fao.org/3/i9459en/I9459EN.pdf.

FAO food security indicators (FAO, 2020), available at http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.X7jTBGgzY2w.

Compendium of indicators for nutrition-sensitive agriculture (FAO, 2016a), available at: http://www.fao.org/3/a-i6275e.pdf.

WHO:

Monitoring and Evaluation Framework Joint External Evaluation tool (JEE tool) first edition (WHO, 2005), available at: http://apps.who.int/iris/bitstream/10665/204368/1/9789241510172_eng.pdf?ua=1.

2.4 Obtain management support

This step is optional; however, all pilot countries reported that it was useful. Obtaining management support, for example, from the senior management of the core group's parent agency or ministry, is an optional step. This would create a clear communication process with the management and also help in advocating for the usefulness of the indicators to improve food safety situations in the country. In order to obtain such support, the core team could:

Make their management aware of the benefits that could result from the establishment of food safety indicators.

Refer to international guidance and discussions referring to the process of relying on a tool to measure food safety that aligns with the SDGs.

Demonstrate through the collected materials how food safety indicators could be a smart investment for the country's food safety.

Establish partnerships with relevant agencies.

Develop a work plan of activities to periodically provide updates on the progress of the work.

Support could be demonstrated through a signed letter or document expressing the commitment from management.

2.5 Prepare for a stakeholder consultation process

2.5.1 Take a collaborative approach

It would probably be a mistake to develop and implement food safety indicators within only one agency. A multi-agency and multi-sectoral consultation process is almost always essential. A good collaboration provides a great path for success. The consultation process helps integrate existing information and data on various food safety topics of interest. A short concept note for developing food safety indicators could be developed by the core team, and a series of informal or formal meetings (physical or virtual) could be held to consult various colleagues with different backgrounds. This multi-sectoral consultation process could discuss and determine 1) why food safety indicators would be needed (objectives); 2) what outcome(s) would be desired (goal-setting); and 3) how the results of measuring food safety indicators would be practically used (outputs).

2.5.2 Draft a few options for a proposed desired outcome

The most important step of all, as explained in Chapter 1, is to set a clear goal of defining why and how food safety indicators would be established and used. Therefore, the core team can develop a draft paragraph defining the desired outcome(s). At this stage, it is useful to understand that this will likely go through further review by many other people in the process, and so more than one option can be proposed. Box 3 provides some examples of desired outcomes from the pilot countries.

Box 3. Examples of desired outcomes

Country A

By developing and using food safety indicators, government agencies, food industry and consumers in Country A acquired an overview of their current food safety situations. By monitoring the results regularly, improvements could be systematically reported, which eventually provided confidence to the stakeholders in the food safety and control system. The results, systematically collected evidence-based, served as a cornerstone of an effective information and communication campaign on food safety. Further understanding and appreciation of the importance of food safety was gained. Food safety indicators were designed to highlight the immediate needs and areas for improvement. They were useful to prioritize programmes and activities, particularly for capacity development. The results could be used as inputs to develop a strategic action plan. They were helpful in requesting appropriate budget allocations, because they provided solid supporting data and sound justifications.

Country B

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

Country C

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

(Cont.)

Country D

By developing food safety indicators, it will be possible:

- To examine the current food safety control system;
- For regulators, industry and universities to work together;
- To hold effective future communications;
- To draw a picture of the current food safety status;
- To examine the performance of the current food control system;
- To identify gaps and deficiencies in the system;
- To provide advice and recommendations to improve the system in the next 5-year national strategic plan.

Among the examples, Country A's desired outcome may look comprehensive with various key elements covered. However, some of the pilot projects have shown that in the real situation, a focused and simple outcome statement has been more effective in developing a practical set of focused and measurable indicators. Therefore, if this was the first attempt to develop food safety indicators, the recommendation is to start from a simple and short outcome statement that targets a clear goal for all. If the country has sufficient experience, capacity and resources, it would be appropriate to aim at wider and comprehensive goals.

2.6 Initiate the multiagency consultation process

2.6.1 Inform and involve relevant stakeholders

Food safety is a shared responsibility and trusted partnerships and collaboration are keys to success. The same applies to developing national food safety indicators. It is important to inform and involve relevant stakeholders from the beginning of the process. Professors and researchers from universities and research institutes would be appropriate experts to bring into the process as they may already have some relevant data that can be used to establish a baseline. They could also be responsible for measuring the established indicators over a period of time for trend analysis. Food businesses, private sector and non-governmental organizations can be essential partners in a collaborative effort to improve food safety practices. Consumer groups have been a driving force in demanding safer food, and it is important to listen to them. Indicator results can be a good tool for communicating with consumers.

Representatives from different sectors and disciplines can play a part in the process. The commitment to collaborative efforts is important in data generation, collection, validation and analysis, and is instrumental to ensure the acceptance of the results provided by the indicators. The results would be used to prioritize and strengthen food safety programmes and activities.

Box 4. Successful examples in involving stakeholders

Country A

In Country A, the development of national food safety indicators involved the participation of stakeholders who have direct interests in food safety, whether in the aspect of policy formulation, regulations and their implementation, or food production, distribution, and/or consumption. Consultations with food business operators, food safety regulatory agencies, and other government offices were essential in the development process. Three pilot food safety indicators were developed through close and regular coordination and consultation with people from a wide variety of sectors, including experts from food business associations, university professors, and several food safety regulatory agencies.

Country B

In Country B, because government agencies had a full agenda for the pilot project period, several universities were invited to take part in developing food safety indicators. For each pilot indicator, a different university took the lead and developed precise instructions in measuring indicators. The food safety competent authority collected the results of the measurements and compiled the report. It was an ideal assigning of roles, and Country B intends to continue using this mechanism to continue monitoring the established indicators.

2.6.2 Prepare for a kick-off meeting

2.6.2.1 Develop an agenda

An official kick-off meeting can be an effective way to developing national food safety indicators, ensuring involvement and consultation with relevant partners. It will most likely require a physical or a hybrid (physical and virtual) format. The kick-off meeting can be used to advocate for the idea of national food safety indicators. The gathering could review the regional pool of food safety indicator areas (Box 1) to jointly identify the priority areas for the country.

Box 5. Sample agenda for the kick-off meeting

- Agenda item 1: Concept of food safety indicators – differences from other indicators, introduction of reference documents including the relevant Codex guidelines.
- Agenda item 2: Formulation of the "technical working group" and its terms of references.
- Agenda item 3: Finalization of the desired outcomes of developing and using national food safety indicators.
- Agenda item 4: Discussion on the criteria to select/develop the national indicators – the "SMART+UP" criteria (Table 1, section 2.7.3.) are recommended.
- Agenda item 5: Preliminary selection of food safety indicator areas from the regional pool.
- Agenda item 6: Working group session to develop measurable indicator(s) from the indicator area assigned to the group – defining the measurement methods for each indicator. Indicators should be measurable with the data that is readily available in the country or that can be collected/calculated without a large-scale preparation. The methods of measurement can also be identified: such as 1–5 scales, yes/no, percentage, etc.
- Agenda item 7: Working group session to identify the source of data needed for the measurement.
- Agenda item 8: Conclusions and next steps.

2.6.2.2 Initiate the formulation process of the technical working group

During the kick-off meeting, one of the most important outputs would be to establish a technical working group. This group would develop practical indicators from the priority indicator areas upon which the consultation meeting agrees. The technical working group may consist of many experts from various sectors that can be nominated by their managers. Therefore, an official invitation letter addressing the relevant agencies/organizations/entities can be sent out prior to the kick-off meeting (Box 6).

Box 6. Points to include in the invitation letter to nominate experts of the technical working group

- Greetings and purpose of the letter;
- Background of the food safety indicators and references to the international support they have received;
- Links to the work and mission of the agency the letter is referred to;
- Invitation to nominate a technical expert;
- Deadline (if applicable);
- Attachment – draft terms of reference for the technical working group.

The experts included in the technical working group would lead the process of developing specific food safety indicators.

Box 7. Sample terms of reference for the technical working group

The technical working group, in consultation with the concerned stakeholders throughout the project implementation, will undertake the following tasks:

1. Be briefed on the food safety indicators project;
2. Guide the drafting process of specific food safety indicators;
3. Review the priority areas identified for the food safety indicators using Specific, Measurable, Achievable, Results-based, Time-bound (SMART) criteria, and ensure their usability to monitor trends and progress in the project;
4. Ensure the alignment of the selected food safety indicators with the overall objectives of the project;
5. Define the subjects to be measured through the food safety indicators and/or identify the agencies that may play a leading role in providing such measurements and in making data available and accessible;
6. Identify the data or information set needed for each food safety indicator by circulating survey questionnaires and guide questions among stakeholders. Collect and review the responses to determine the specific commodities with available and accessible data and information.

2.6.2.3 Invite relevant experts and stakeholders

In addition to the core team members and technical working group members, the kick-off meeting can be most effective if it includes technical officers from relevant government agencies involved in food safety topics, and stakeholders from the private sector, academia, non-governmental organizations and consumer groups. In the pilot projects, a total of 40–50 participants were most effective in reviewing and discussing all the agenda items.

2.6.3 Conduct a kick-off meeting

The kick-off meeting can be facilitated by the core team members, and can be used as the introductory forum to discuss the concept of food safety indicators with all stakeholders. The technical working group can be officially formed from among the nominated members and experts, and its terms of reference officially adopted.

One of the main agenda items would be to review the draft of the desired outcomes prepared by the core team. The draft could be finalized by consensus among all participants. Once all participants have become familiar with the concept and use of indicators, the regional pool of 40 food safety indicators (Box 1) can be introduced, and a preliminary selection of priority areas can be made. If the country is developing food safety indicators for the first time, it is recommended to select only 1–3 areas during the first phase. In order to prioritize an area, it is essential to refer to the agreed outcome, and consider some key food safety concerns in the country. In many developing countries, it is normal that all food safety issues seem equally important. In this case, it is useful to consider the current data availability and feasibility/practicability of measurement so that it mitigates the risk of creating overly ambitious indicators.

Once the priority indicator areas are selected, the participants can be divided into several working groups to develop specific indicator(s). Each working group can be led by a technical working group member to draft specific indicator(s), considering immediate measurability for the baseline data. If the indicator cannot be measured without a large-scale action (i.e., survey, mission, analysis) then the indicator is not yet "measurable" as the relevant data should already exist and be obtainable. Once the draft indicator is developed, it is important to note what kind of measurable data is available (in numerical scores or categorical forms), who (what agency) has the data, who (what agency) can access and interpret the data, and how the data can be monitored and documented over time. Once these are defined, the specific indicator can be drafted in a sentence (Box 8).

The kick-off meeting can conclude when a set of the first phase food safety indicators has been drafted. The next set of actions would require time to complete.

Box 8. Examples of draft indicators

Country A

- Food safety indicator area 14: number of food inspectors (per population) trained in official food control.
- Context-specific food safety indicator for area 14: the number of meat inspectors trained in official food control doing routine inspections in licensed slaughterhouses in a specific region of the country.
- Food safety indicator area 18: presence of and access to accredited food testing laboratories with well-defined standard operating procedures.
- Context-specific food safety indicator for area 18: the presence of and access to an International Organization for Standardization (ISO) 17025-accredited central food testing laboratory for Chloramphenicol drug residue tests in shrimps for export.
- Food safety indicator area 31: all stakeholders from 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.
- Context-specific food safety indicator for area 31: meat stakeholders, including consumers, are reached with meat safety information through printed materials and are aware of the potential problems and risks related to meat hygiene and safety.

Country B

- Food safety indicator area 24: mechanisms are established and functioning for detecting foodborne diseases and food contamination.
- Context-specific food safety indicator for area 24: the completion ratio of the investigations of foodborne outbreaks and food-safety incidents through existing alert systems.

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- Food safety indicator area 30: risk-based education and trainings for food business operators related to hygiene and food safety are mandated and provided.
- Context-specific food safety indicator for area 30: the level of knowledge retained after three months of trainings provided to food handlers.
- Food safety indicator area 34: percentage of producers, processors, traders and food business operators that have implemented a functioning traceability system.
- Context-specific food safety indicator for area 34: the number of egg retailers implementing a basic traceability documentation system.

Country C

- Food safety indicator area 1: presence of a leading food safety agency or entity to drive the coordination work to ensure food safety.
- Context-specific food safety indicator for area 1: the level of awareness on the competent food safety authority, through a survey.
- Food safety indicator area 30: risk-based education and trainings to food business operators related to hygiene and food safety are mandated and provided.
- Context-specific food safety indicator for area 30: the number or percentage of trained food handlers out of all licenced food handlers.
- Food safety indicator area 38: levels of public trust in food safety.
- Context-specific food safety indicator for area 38: the level of trust in the competent authority to manage food safety, and the level of trust in the safety of food in the country, through a survey.

(Cont.)

Country D

- Food safety indicator area 4: the presence of an enabling national policy and a legal and regulatory framework that are consistent with international standards, guidelines and best practices.
- Context-specific food safety indicator for area 4: level of correspondence of food safety standards in terms of number and content with those of the Codex Alimentarius system.
- Food safety indicator area 26: the number of outbreaks of foodborne illnesses reported involving Salmonellosis and Listeriosis in humans.
- Context-specific food safety indicator for area 26: the existence of possible differences between the number of reported food contaminations and the number of reported cases in humans of *Salmonella* and *Listeria*.

2.7 Develop national food safety indicators

2.7.1 Document and share the finalized desired outcomes for the country

Immediately after the kick-off meeting, the finalized desired outcome statement can be fine-tuned using simple wordings. It can be clearly documented and shared among the participants, partner agencies and stakeholders so that the direction of the work is clear to all the relevant parties. When finalizing the desired outcome(s), it is important not to use vague words or phrases. The outcome statement shall be specific: it is most useful when it is directly connected to the food safety indicators to be developed. For example, if the desired outcome of developing and using national food safety indicators is "to maintain consumers' trust towards the national food control system," then the target audience is clearly consumers, and the indicators could contribute to ensuring consumers' trust. If the desired outcome of developing and using national food safety indicators is "to identify priority food safety problems in the country," then the target audience is most likely the food safety competent authorities and the indicators could contribute to identifying priority food safety problems.

An ineffective example of a desired outcome statement would be to set it too broadly, such as "to improve food safety situations." Then, it is difficult to specify the target audience, as the "improved food safety situations" would benefit everyone. That makes it difficult to set a direction for the indicator development process, because any actions may be able to "improve food safety situations" in various sectors at various levels.

2.7.2 Define the desired use of the results measured by the indicators

The results obtained through the indicators may take the form of numbers and percentages. They require thorough analysis to interpret their real meaning and formulate next actions. Therefore, it is important to define the desired use of the results.

For example, using the example of consumer trust in the previous section, let us say that there is an annual consumer survey containing a question about the level of trust in the food safety competent authority to manage food safety risks. This year's result was that 65 percent of the respondents trust the authority. A series of critical questions then arises: does this represent the entire national population? Is 65 percent good or bad? Is the number increasing or decreasing annually? What should be done about the number? Is there anything that needs to be done to further improve the number?

Interpretation and analysis of the results is another key element that makes food safety indicators flexible for the different contexts and situations. As the outcomes and methodologies chosen for the measurements largely depend on the countries' needs and objectives, the results obtained through the measurements and how they are used can also vary. In the example of consumer trust, if 65 percent is considered to be good because it has significantly improved compared to the previous year, then the follow-up actions can include reporting the result to relevant people and stressing the progress. However, if 65 percent were considered bad, then different types of actions to improve the situation would need to follow. Therefore, the step of interpreting the results is critical to their use.

Box 9. Examples of possible uses of the results of food safety indicators

1. To communicate with stakeholders to engage in food safety activities;
2. To communicate with the general public to improve the level of trust in national food control systems;
3. To monitor trends or patterns for preparedness/improvement;
4. To provide information about any progress, achievement obtained through indicators;
5. To verify the effectiveness and performance to report to policy makers;
6. To identify serious gaps to request allocation of funding;
7. To identify training needs to develop better capacity development programmes;
8. To identify areas for improvement to provide intervention ideas and update programmes;
9. To assist internal or external auditors with evidence-based information.

2.7.3 Review and refine the draft set of national food safety indicators

The draft set of national food safety indicators is a key output of the kick-off meeting. The technical working group members can review all the indicators one-by-one to check if each is in line with the desired outcome and if they are measurable. It is important to keep in mind that not all areas of food safety are easy to measure, and even if some data is available, that does not mean it can represent the country situation. A systematic set of criteria can be used to review the draft food safety indicators. The regional consultation of the pilot project recommended the SMART+UP criteria for that purpose.

Table 1. The SMART+UP criteria to select the national food safety indicators

S	Specific	• Does the indicator provide specific (appropriate) valuable information? • Does the indicator provide useful information to a specific target audience? • Is the indicator clear, and not confusing to anyone?
M	Measurable	• Is it quantifiable in numerical scores (numbers, percentages, etc.)? • Does the indicator require certain appropriate evidence/datasets? • Are those evidence/datasets consistent?
A	Achievable	• Is it measurable right now (is the relevant data already available)? • Do you have the capacity to measure the indicator? • Does the indicator provide realistic information?
R	Results-based	• Does the indicator provide a certain direction for improvement? • Is it in line with the agreed-upon desired outcome? • Does it contribute to achieving the objectives of using the indicator?
T	Time-bound	• Can the indicator help achieve the goal in the desired timeframe?
UP	Improvement/ upward progress	• Can the indicator be used repeatedly over time to evaluate the trend or monitor the progress? • Can the indicator be a good measure to assess improvement?

2.7.4 Share and finalize the national food safety indicators

Once the technical working group has revised the indicators using the SMART+UP criteria, each indicator can be put into the template in Table 2. Some examples are also provided in Table 3 from the pilot projects.

Table 2. An example template for the national food safety indicators

No.	Item	National food safety indicators
1.	Indicator area (1–40)	(Select from the Box 1)
2.	Title of the indicator area	(Select from the Box 1)
3.	Title of the food safety indicator	
4.	Data source	
5.	Data owner	
6.	Responsible person (agency, entity, organization) for measurement	
7.	Baseline	(Put the baseline data with the date)
8.	Interpretation of the baseline data	
9.	Measuring methods and approach	
10.	Target (quantifiable goal)	(Put the desired target with the future date)

Table 3. Examples of the finalised food safety indicators from the pilot projects

Country A		
No.	**Item**	**National food safety indicators**
1.	Indicator area (1–40)	14
2.	Title of the indicator area	Number of food inspectors (per population) trained in official food control.
3.	Title of the food safety indicator	The number of meat inspectors trained in official food control conducting routine inspections in licensed slaughterhouses in a specific region of the country.
4.	Data source	College of Veterinary Public Health
5.	Data owner	College of Veterinary Public Health
6.	Responsible person (agency, entity, organization) for measurement	College of Veterinary Public Health
7.	Baseline	In 2016, the ratio of trained meat inspectors to licensed slaughterhouses was calculated as 2.42:1.
8.	Interpretation of the baseline data	There are not enough trained meat inspectors compared to the number of slaughterhouses.
9.	Measuring methods and approach	The number of trained meat inspectors for each licensed slaughterhouse is assessed in the form of a ratio.
10.	Target (quantifiable goal)	Ratio of 3:1 by 2021

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Country B		
No.	**Item**	**National food safety indicators**
1.	Indicator area (1–40)	30
2.	Title of the indicator area	Mechanisms are established and functioning for detecting foodborne disease and food contaminations.
3.	Title of the food safety indicator	Food handlers' food safety knowledge
4.	Data source	Agriculture and Food Regulatory Authority
5.	Data owner	Agriculture and Food Regulatory Authority
6.	Responsible person (agency, entity, organization) for measurement	Agriculture and Food Regulatory Authority
7.	Baseline	Ninety-four percent of trainees scored higher than 70 on the evaluation test at the end of the training, but only 77 scored 70 three months after the training.
8.	Interpretation of the baseline data	The validity of food handler's licenses in the country is too long: trainings need to be organised in modules, they must be made more straightforward and the standard exam should focus on the essentials.
9.	Measuring methods and approach	Comparison of the scores on the evaluation test after the end of the training and three months after the training was provided.
10.	Target (quantifiable goal)	Ninety-four percent of the trainees scored 70 in the evaluation test three months after the training.

(Cont.)

Country C		
No.	**Item**	**National food safety indicators**
1.	Indicator area (1–40)	1
2.	Title of the indicator area	Presence of a leading food safety agency (entity) to drive the coordination work to ensure food safety.
3.	Title of the food safety indicator	The level of awareness on the competent food safety authority, through a survey.
4.	Data source	Ministry of Health
5.	Data owner	Ministry of Health
6.	Responsible person (agency, entity, organization) for measurement	Ministry of Health
7.	Baseline	Seventy percent on 1 August 2019
8.	Interpretation of the baseline data	The level of awareness on the food safety work of the authority needs to be higher.
9.	Measuring methods and approach	A survey among the population was administered.
10.	Target (quantifiable goal)	Ninety-five percent by 31 December 2019

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Country D		
No.	**Item**	**National food safety indicators**
1.	Indicator area (1–40)	4
2.	Title of the indicator area	The presence of an enabling national policy and a legal and regulatory framework that are consistent with international standards, guidelines and best practices.
3.	Title of the food safety indicator	The presence of an enabling national policy and a legal and regulatory framework that are consistent with international standards, guidelines and best practices.
4.	Data source	Country Agricultural University
5.	Data owner	Ministry of Agriculture
6.	Responsible person (agency, entity, organization) for measurement	Country Agricultural University
7.	Baseline	1 260 national food safety standards
8.	Interpretation of the baseline data	The number aligns well with the Codex Alimentarius standards.
9.	Measuring methods and approach	Number and content of food safety standards are compared to those of Codex Alimentarius.
10.	Target (quantifiable goal)	Maintain correspondence with the Codex Alimentarius system in the future scenario.

Once the indicators are developed, it is strongly recommended that the set of indicators is shared with all the participants at the kick-off meeting, relevant partner agencies and stakeholders. The use of food safety indicators is most effective when all the parties are actively engaged in the process. After collecting feedback, the national food safety indicators can be finalized.

2.8 Measure the baselines

In order to compile baselines for measuring progress, some indicators are simple enough that existing numbers can be taken from available data. Using the previous example of consumer trust, it was simply taken from the survey result, which was 65 percent. On the other hand, there might be a need for further calculations to obtain the baseline. For example, Country A has set an indicator as "the number of food inspectors trained in official food control per licensed slaughterhouses," then, the baseline will become the ratio, not the total number of inspectors (Box 10).

Box 10. Baseline measurement for the indicator on the number of food inspectors per slaughterhouse in Country A

Country A has piloted the implementation of the food safety indicator #14: the number of food inspectors trained in official food control. In particular, they aimed at increasing the number of meat inspectors trained in official food controls inspecting in the capitals' slaughterhouses. To use such indicators effectively, Country A decided to monitor the ratio of trained meat inspectors per licensed slaughterhouses. This ratio was a data that could provide comparisons over time to monitor the progress of the implementation of the indicator. The baseline ratio of 2.42: 1 was obtained using data from three years earlier. This ratio provided a starting point upon which to measure progress in improving the number of meat inspectors, and a basis upon which to set feasible targets to achieved for the next 3–5 years (which were set as 3:1 for the ratio of trained meat inspectors to licensed slaughterhouses, and to 1:1 for the ratio of meat control officers to licensed slaughterhouses).

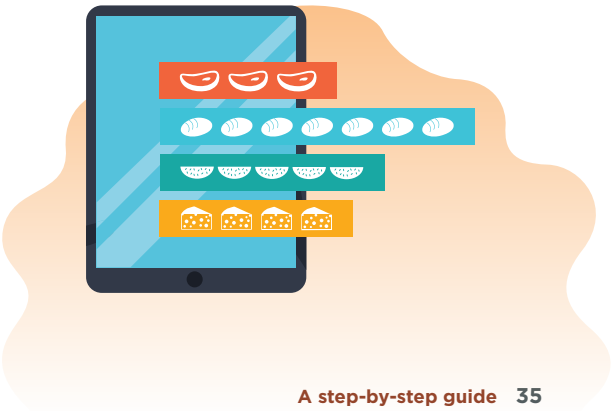
2.8.1 Define the use of the baseline data

After the baseline measurement is obtained and documented, a series of questions (Box 11) could be posed to clearly define the use of the baseline data. If additional data is necessary the methodologies for such collections can be identified. The choice of the data collected may play a significant role in achieving the desired outcomes.

Box 11. Guiding questions to define the use of baseline data

- Are the indicator measurements comparable over time?
- Is it possible to keep the measuring conditions constant to have reliable and comparable data?
- Are the sets of data obtained over time indicative of a trend or a progress?
- Does the data provide an indication that represents the real situation, and if the situation improves, would the data indicate the improvement?
- What can we concretely measure and how can the data be interpreted to explain the food safety situations?
- What are the possible validation methodologies to confirm the correlations between the data and the food safety situations?

It is possible at this stage that the working group may realize that a developed indicator may have a serious limitation for compiling a baseline measurement (Box 12).



Box 12. Baseline measurement for an indicator on the number of outbreaks and food contamination cases in Country D

Country D chose to pilot the food safety indicator on the number of reported Salmonellosis and Listeriosis cases. However, the number of foodborne disease outbreaks can be a tricky indicator for measuring the status of food safety because of under-reporting of cases. In this example, the number of reported contaminations and the number of reported outbreaks were measured. The numbers indicated improvements in limiting contaminations from both microorganisms.

However, the technical working group concluded that apart from the reported cases collected and counted by the surveillance network, a larger number of unreported cases could actually exist. Most foodborne disease outbreaks were reported by clinics, hospitals and public health agencies. Yet, in most cases, when the symptoms were not severe, the consumers would not go to hospitals, creating an unknown number of unreported outbreaks, which many experts believe to be a large number. It became evident that the number of (reported) contaminations alone could not be sufficient for monitoring progress on preventing Salmonellosis and Listeriosis contaminations.

It could be tempting to use the number of food safety cases, outbreaks and contamination cases as an indicator to represent the food safety situation. However, this example demonstrates that approach could lead to inaccurate results. Also, measuring the number of contamination cases and outbreaks is heavily dependent on financial and technical resources. Trying to measure such phenomena when technical capacities are not yet proficient may end up wasting resources without producing satisfactory results. Basing food safety indicators on the number of cases, outbreaks and contaminations is not recommended for most countries where under-reporting is common.

2.8.2 Document the interpretation of the baseline data

Once the baseline measurement is made, the next step is to clearly document what it means. In the previous example of consumer trust, the baseline data was 65 percent. It is important to document what that means. Depending on whether the figure is interpreted as good or bad, then that interpretation will influence whether an action plan can be put together and what desirable/expected future result would be set.

If the baseline measurement sets the overall direction of the work, the subsequent data collection provides another reference to understand if that direction is being followed. These data can be used as a way to flag any necessary interventions or needs to be addressed as well as any opportunities that can be taken in the use of food safety indicators.

2.8.3 Document the needs, opportunities and challenges

After the first set of measurements is complete, all the positive experiences, challenges and lessons learned can be documented. This can include the limitations regarding access to certain datasets, identification of prerequisite activities prior to the baseline measurement, non-practicality of the measurement, high-cost of measurement and so forth (Box 13).

Box 13. A lesson learned in realizing prerequisite activities in Country B

Country B is heavily dependent on food imports. The safety of imported foods is regarded as a priority. The country has initially set a food safety indicator in the area of imported food control. However, when the baseline measurement process started, the technical working group realized that it first needed to conduct a deep situation analysis of the country's imported food control system. The types of commodities imported and the amounts of consignments were still unknown. Also, to effectively gather measurements for the indicator, the technical working group realized that an effective risk categorization of imported food was needed. Inspecting all consignments was not realistic. Only after completing those two activities could a feasible and meaningful indicator be developed. This process led technical officers to drop the setting of a food safety indicator in the area of imported food control. To make effective use of resources, a comprehensive national situation report on imported food control was conducted.

2.9 Conduct short-term interventions

If the baseline data and its interpretation have not been ideal, it is useful to plan for a short-term intervention programme. The pilot projects have demonstrated that often there is no need to plan a large-scale intervention programme with a big budget. The indicator is set to be extremely specific. Therefore, a small-scale targeted intervention often works quite effectively.

For example, if surveys found that consumers' trust towards food safety competent authorities was lower than expected, then the first step for a targeted intervention could be to find out why. If it has something to do with communication with the general public, or the level of collaboration with stakeholders, then an appropriate intervention could be to diversify the channels used for food safety communications and information.

Setting a strict timeframe is essential in short-term intervention planning. Because a small single indicator only shows data at a specific time, taking too long to conduct an intervention would blur results, as more time could allow other factors to possibly affect measurements or outcomes. Pilot projects have generally taken three to eight months to conduct an intervention to compare pre-intervention data and post-intervention data. By taking this short-term approach, it is also possible to identify potential pitfalls in the intervention programme itself. Examples of short-term interventions conducted in pilot projects are provided in Box 14.

Box 14. Examples of short-term interventions

Country A

When measuring the ratio of trained meat inspectors for licensed slaughterhouses, country A noticed that even though that ratio had improved over the years, the results were still unsatisfying. Country A made a comparison with the inspection methods of other countries, which led to the discovery of discrepancies, and subsequently, to identifying gaps in the quality and competency of the inspection services being provided. For this reason, the ideal ratio to be achieved by using the measurements provided by the food safety indicators was adjusted.

Country B

Country B developed a food safety indicator on the awareness of food safety stakeholders. Despite the efforts of the food safety officers, outreach through printed communications had declined over the years. The reason for the decline was investigated. The conclusion was that the dissemination methods were inadequate for the size of the population. As a result, different communication channels were identified, particularly social media, as tools to increase communication outreach.

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Country C
In Country C, a survey determined that 70 percent of the population were unsure about whom they should contact in case of a suspected food safety issue, and which agency is responsible for food safety. An investigation was conducted to find the reasons. Investigators determined there was an insufficient number of communication campaigns and not enough collaboration among stakeholders. This intervention led to increased collaboration among food safety agencies and to a ramping up of communications to ensure that the population has greater awareness and the information it needs.

2.10 Measure the post-intervention data

The same approach and methodologies that were used to obtain the baselines shall be used to measure the post-intervention data. For example, if a survey was used to measure consumer trust in food safety competent authorities, use the same survey with the same questions. This would help to understand if the changes in disseminating food safety communications and information had any impact. The periodic regular measurement of an indicator will eventually generate a trend analysis, providing another good reason to consistently conduct measurements.

In addition, it is also useful to measure specific effects of new interventions. In the example of consumer trust and the intervention of improved provision of food safety information to stakeholders, statistics measuring the provision of food safety information can be useful in understanding if the intervention is achieving its goal. That measurement is unlikely to show a direct correlation with consumer trust, but the data would be essential in evaluating the effectiveness of the intervention.

2.11 Interpret the data and develop action plans

Comparing baseline and post-intervention measurements often provides an understanding about whether the short-term intervention had a significant impact, some impact or no impact. Even in a short period of time, some interventions have worked well and pilot countries have been able to scale them up into larger programmes. Since relevant quantifiable data provided evidence of improvement, the scale-up proposals were well received. If the results of the comparison had not shown significant improvement, then a different type of intervention would have needed to be planned.

All the considerations from this process can be officially documented, with the record serving as a future reference. The usefulness of the indicators, effectiveness of the short-term interventions, challenges encountered throughout the process, and the success of the interventions can be recorded so that the food safety indicators would remain as regular indicators, without requiring too much resources. The periodic measurement of such indicators is an opportunity to gauge progress towards achieving the desired outcomes.

3 Reporting and communicating the results

The results of the food safety indicators can often provide the basis of a good set of communication materials. The indicators provide an evidence-based and reliable source of information because they are specific, results-based, and obtained through a systematic approach. The results can be disseminated to stakeholders and the general public. If stakeholders need to improve any areas, information can be directly targeted to the specific audience. The goal of the improvement can be clearly set based on the indicators. Therefore, it is strongly recommended that a series of communication materials be developed based on the indicator measurements and results, in addition to the official reporting of the results.

4 Key considerations

4.1 Tailor the indicators to fit to the country context

The pilot projects on food safety indicators in four countries provided useful insights that could apply to other countries. All four countries confirmed that the use of food safety indicators has real potential to improve their food safety situations, if the indicators are tailored to their country contexts. Food safety indicators may be used for different purposes. There is no right or wrong. For example, Country A used them to identify the key food safety problems for the purpose of capacity development, while Country B used them as a tool to evaluate the national food control systems.

4.2 Start with a few indicators

When starting work on developing food safety indicators, it is important not to be overambitious. Rather, focus on indicators that are already measurable without large-scale actions. Establishing indicators can be an eye-opening exercise. Many pilot projects encountered challenges in accessing the relevant data and conducting practical measurements. In the initial phase, one to five indicators can be a good number to start with. There is always an opportunity to scale up.

4.3 Do not compare the results with other countries

The regional pool of 40 indicator areas is designed to be scalable to different national contexts and specific situations. The list of indicator areas aims to provide the set of aspects that can be considered from each country to explore more deeply and possibly build upon. Because each country can establish specific food safety indicators, it is important to note that the indicators used by different countries should not be compared. The indicators are neither a scoring system nor as a benchmark for country comparisons. As the word suggests, they only indicate something and they only register information.

4.4 Be aware of a possible pitfall

Pilot projects found that certain indicators are not suitable to illustrate the actual food safety situation. These include the number of foodborne disease cases, outbreaks and contamination cases. For example, if a given country does not have an effective disease surveillance system for foodborne diseases, then the country may not have any data, except for ad hoc reports from a few hospitals. This means the number of reported foodborne diseases in the country could be deceptively low. It does not necessarily mean that the country has a low number of foodborne disease cases. Be aware of such pitfalls when choosing which numbers or data sets to use for indicators.

4.5 Make use of additional benefits from developing indicators

The process of developing food safety indicators has several additional benefits that produce immediate improvements in national food safety work. The pilot projects demonstrated many of these additional benefits:

- understanding current situations;
- monitoring effectiveness and progress;
- prioritizing activities;
- allocating proper resources;
- identifying gaps;
- supporting evidence-based decision-making;
- developing effective communication and advocacy materials.

In some countries, the national food control system is not yet ready for food safety indicators to show results and progress. Nonetheless, the process of developing an indicator can still be fruitful. Through the indicator setting process people can be brought together, immediate needs can be further identified, and competent authorities can better focus on actionable priorities. All of that contributes to improving the food control system.

4.5.1 The process helps multisectoral collaboration on food safety

The indicator development process requires inputs from various people and sources. Several multi-sectoral and multi-disciplinary teams can be formulated along the way. The process also reveals what is missing in the food safety situations even before measuring the indicator. It leads people to focus on immediate and feasible actions to improve the situation.

In Country A, the selection of the priority indicators was done through a consultation meeting with many different government agencies and stakeholders, including the private sector and academia. This fostered multisectoral collaborations. Fifty-eight participants from the various sectors gained an awareness of how the indicators work in improving the situation. They acquired an understanding that data from multiple sources were needed to produce the target indicators. By the end of the consultation meeting, participants formed multi-sectoral and multidisciplinary teams to work on respective indicators.

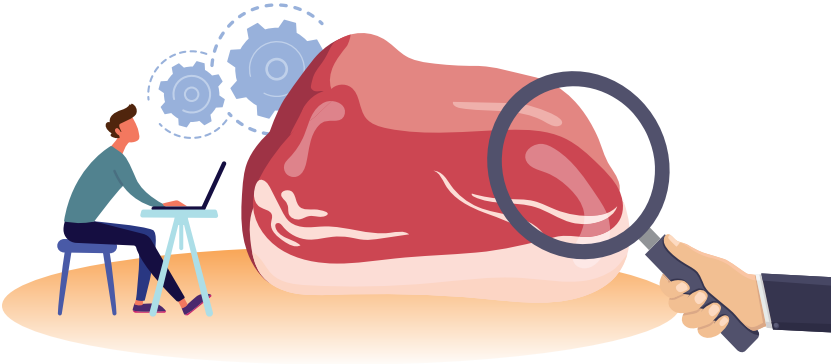
4.5.2 The process helps identify concrete prerequisite activities

The indicators-setting process requires participants to focus on what can actually be achieved within the national food safety context, which can lead to in-depth analyses of key requirements. In Country B, the process of developing an indicator on food import controls highlighted the need for a preliminary assessment on the subject. Country B is heavily dependent on food imports, and introducing a food safety indicator would be of great help. Some commodities are subject to a ban in Country B, and food control activities linked to those bans took a substantial amount of time for food safety officers. As a result, officers in Country B realized that a situation analysis of the country's imported food control needed to be conducted. Following that, an effective risk categorization of food hazards based on the FAO "Risk based imported food controls manual" (FAO, 2016b) could be carried out using a good set of criteria. Only after undertaking these actions could a feasible and meaningful indicator for food imports controls be set.

4.5.3 The process helps focus on the reality

The process of setting food safety indicators can lead to the understanding of the limitations of the national food safety competent authorities, and to identifying methods to overcome those limitations. In Country B, the process of selecting indicators led to the realization that the most efficient actions government's food safety officers can take is to delegate food safety checking mechanisms and sharing responsibility for food safety. While identifying the food safety indicators areas to focus on, the food safety officers found that food businesses operators had no self-checking mechanism. Having one would greatly contribute to the country's food safety. To complement the development of food safety indicators, Country B decided to introduce the concept of a food safety culture in their national food control system with strong support from the high-level officials.

The hard reality is that it is not realistic to plan for the government to check everything, and for inspectors to examine every single food item in the country. If a food safety culture exists, people who produce, transport, store, sell, process, serve and consume food will be aware that food safety is everyone's responsibility. In particular, in food businesses, an established self-checking system is extremely valuable, and the inspectors/regulators can function as advisors rather than as police. Recognizing those benefits, several food entrepreneurs formed a "Food Innovation Group" that works with the government to develop key food safety messages for dissemination among food businesses.



5 Global applications and SDGs relevance

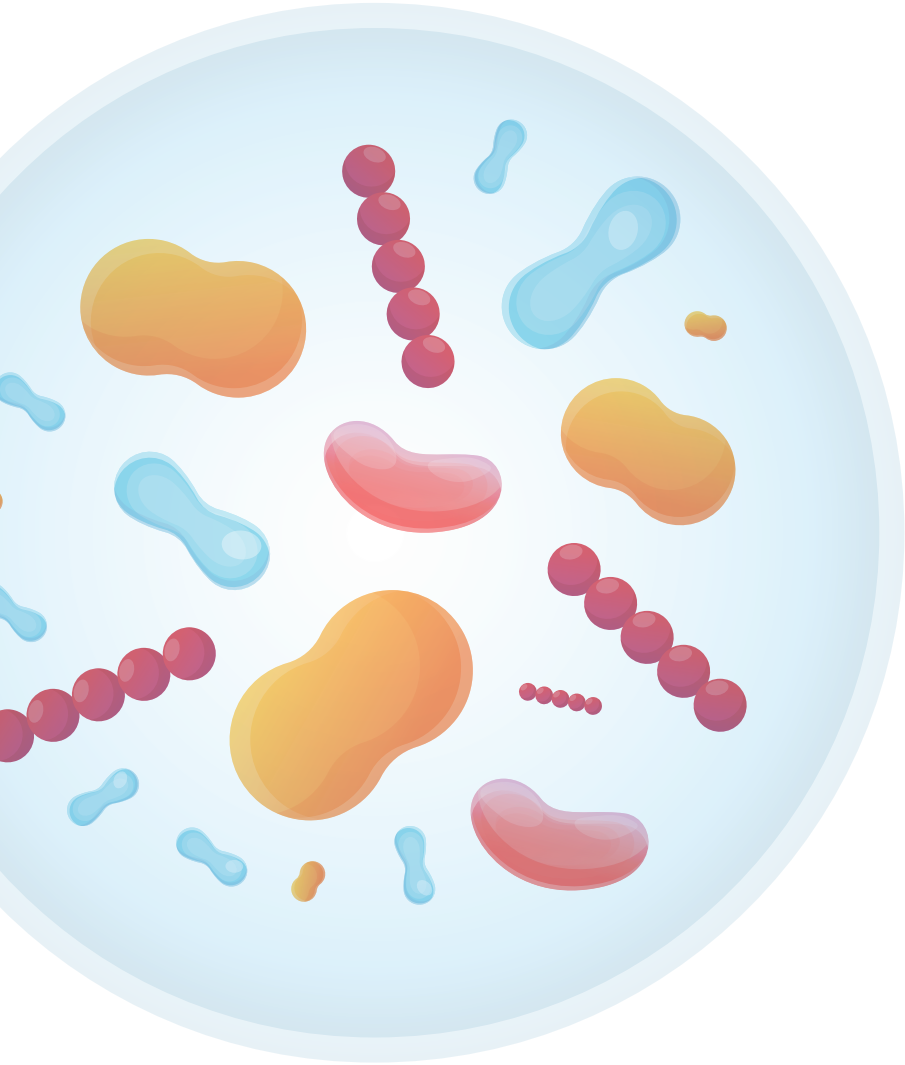
Food safety indicators provide a systematic and constructive approach to national food safety work that is not invasive to existing systems and that can be tailored to specific needs and contexts. Food safety indicators are the product of an approach or a methodology that does not aim at achieving specific results or numbers, but to sustainably support countries in achieving their food safety goals. The results obtained by such indicators can be used for national policy development and they can support project proposals for food safety improvements.

As demonstrated in the pilot projects, food safety indicators provide the opportunity for countries to build sustainable capacities that start from using existing resources and that do not need substantial funding. Instead, they require targeted interventions. It is a method that enables each country to work on particular areas of food safety without the external pressure of achieving international benchmark values. It enables food safety competent authorities to independently take control of the national food safety work.

As described throughout this guide, food safety indicators can be a strategic and sustainable mechanism to improve food safety, because the data they provide is the result of a scientific and systematic approach. The data accurately describes the country situation. It is objective but tailored to the country context. It can be used as a reliable source to communicate with external stakeholders. The descriptions obtained through such data would be unique for each country, but would be well-grounded, evidence-based starting points for improving food safety.

Food safety is one of the key areas of the 2030 Agenda for the Sustainable Development Goals. Safe food directly contributes to the attainment of all SDGs. It is integral to SDG 3 (good health and well-being). It has a significant influence on SDG 1 (no poverty), SDG 2 (zero hunger), and SDG 6 (clean water and sanitation). It contributes to SDG 5 (gender equality), SDG 8 (decent work and economic growth), SDG 9 (industry, innovation and infrastructure), SDG 10 (reduced inequalities), SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption), SDG 14 (life below water), SDG 15 (life on land). It is a minor consideration in attaining SDG 4 (quality education), SDG 7 (affordable and clean energy), SDG 13 (climate action), SDG 16 (peace, justice and strong institutions) (Grace, 2019).

The fact that food safety is linked to so many SDGs shows that it is a truly cross-cutting area. Food safety indicators, therefore, can be used as a tool to collaborate with various partners who play roles in the 2030 Agenda. Furthermore, the scalability of food safety indicators makes them ripe for implementation at the global scale. This guide was created to provide each country with the information it needs to begin the process of developing food safety indicators. As a leader in the area of food safety, FAO will continue to support its member countries that request assistance in this area. Through food safety indicators, FAO aims at providing them with a functional tool to ensure that safe food is achievable for all.



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Measuring food safety

Indicators to achieve sustainable development goals (SDGs)

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