Food and Agriculture Organization of the United Nations

Meeting proceedings

FAO Regional training course on
"Capacity building on risk categorization for ranking risk of ASEAN food hazards for developing the risk-based monitoring protocol for food safety"

23 - 25 April 2019
Bangkok, Thailand

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Conducted under the FAO project
"Support for capacity building for international food safety and implementation in ASEAN countries"
(GCP/RAS/295/JPN)

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Bangkok, 2019

Required citation:
FAO. 2019. FAO *Regional training course on "Capacity building on risk categorization for ranking risk of ASEAN food hazards for developing the risk-based monitoring protocol for food safety"– Meeting proceedings*. Bangkok.

Contents

Acknowledgements

The Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific (FAORAP) would like to express its appreciation to the people who provided valuable input during the preparation of this report. This training course report has been prepared by Ms Panpilad Saikaew, Project Coordinator, FAO RAP, and finalized by Dr Masami Takeuchi, Food Safety Officer of FAO and Dr Sridhar Dharmapuri, Senior Food Safety and Nutrition Officer, FAORAP. The training was organized under the FAO project "Support for capacity building for international food safety and implementation in ASEAN countries (GCP/RAS/295/JPN)" implemented under the overall direction of. Contributions provided by all participants, particularly the ones from Ms Kate Astridge, resource person of this training course are gratefully acknowledged. FAO hereby gratefully acknowledge the generous contribution of the Government of Japan for this important capacity development activities in ASEAN countries.

Abbreviations and acronyms

FAO	Food and Agriculture Organization of the United Nations
FAORAP	Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific
FDA	Food and Drug Administration
FSANZ	Food Standards Australia New Zealand
JEMRA	the Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment
YOPI	Young Old Pregnant and the Immunocompromised

Executive summary

A well-designed risk-based monitoring procedure for food safety hazards is one of the key elements for food safety control system. This procedure would support individual competent authorities to effectively control food safety issue, in both domestic and import food products, to better protect consumer health at national, regional and international levels.

To ensure the success and effectiveness of establishing a monitoring procedure, a risk-based approach in ranking food hazards should be applied during the initial step for developing any monitoring programme. This would permits governmental and regulatory authorities to allocate resources most effectively for food safety control in their country. Various risk-ranking tools, from qualitative, through semi-quantitative to quantitative approaches, are available for assessing food safety risks. The best risk-ranking tool to be used should be selected on the basic of risk management requirements as well as data availability. Risk categorization, or the use of a risk matrix, is an example of a risk ranking tool, which can be applied to microbiological or chemical food safety hazards, when limited quantitative data are available.

In order to strengthen the capacity on risk-based monitoring programme, FAO, in collaboration with Thai Food and Drug Administration (Thai FDA), held the regional training course on “Capacity building on risk categorization for ranking risk of ASEAN food hazards for developing the risk-based monitoring protocol for food safety” from 23 to 25 April 2019 in Bangkok, Thailand.

Over 30 participants attended the three-day training course with the objective of becoming effective at applying risk categorization for ranking of food safety hazards. Through technical presentations, examples of good practices in other countries, and group work session, participants obtained knowledge on the objectives and principles of risk categorization. The training course enabled participants to discuss which approach ASEAN would apply for risk categorization for ranking of ASEAN food safety hazards, which further be used for developing the ASEAN risk-based monitoring procedure for one ASEAN common hazard.

Overview

Food and Agriculture Organization of the United Nations (FAO), in collaboration with Thai Food and Drug Administration (Thai FDA), Ministry of Public Health, organized the regional training course on "Capacity building on risk categorization for ranking risk of ASEAN food hazards for developing the risk-based monitoring protocol for food safety" from 23 to 25 April 2049 in Bangkok, Thailand.

Three specific objectives of the training course were to: 1) enhance understanding on the risk ranking of food safety hazards; 2) strengthen the capacity on risk categorization for ranking of food safety hazards; and 3) share experiences, current examples of national food safety concerns/issues from ASEAN countries, and the current capacity on implementation of monitoring programme in ASEAN countries. The training course was organized by the. The agenda of this training is attached as Annex 1.

The training course was attended by 34 participants, including government officials from food safety competent authorities from ten ASEAN countries' agencies mainly responsible for food safety control, as well as, food standard development. The list of participants to the training course can be seen on Annex 2.

Highlights of the training course

Opening session

Mr Tares Krassanairawiwong, Secretary General of Thai FDA, kindly delivered the welcome remarks. He pointed out the importance of the risk-based monitoring program, which could provide appropriate plan for food safety control. He also mentioned that prioritization of food safety hazards can be reasonable allocate resources. Dr Sridhar Dharmapuri, FAO Senior Food Safety and Nutrition Officer, opened the training course. He emphasized that this training was organized under the second phase regional project funded by Ministry of Agriculture, Fishery and Forestry (MAFF), the Government of Japan. In this phase, FAO RAP would like to transform the activity to be more science based, and this training would be the one of the activities. He stated that understanding of "hazard" and "risk" and their link are necessary as basic knowledge to be able to rank the hazards on the basic of the risk that they post to the consumer health. Participants are expected to understand how risk ranking of food safety hazards could be improved and accordingly, design risk based food safety management actions, both from the level of the regulator, or the government. This would not only ensure the effective of food safety control, but also indirect enhancing the trade of food in ASEAN and ASIA.

Background

Ms Panpilad Saikaew, Project Coordinator, presented the background of this training course, which Thailand as lead country of ASEAN Health Cluster 4 activity on the development of the ASEAN risk-based monitoring procedure for one ASEAN common hazards, requested FAO to support on the matter. The work plan of entire process of the development of monitoring procedure were developed in order to ensure the success and effectiveness of the development of risk-based ASEAN monitoring procedure and long-term project sustainability. She also informed the objectives of the training course, which are to: 1) enhance understanding on the risk ranking of food safety hazards; 2) strengthen the capacity on risk categorization for ranking of food safety hazards; and 3) share experiences, current examples of national

food safety concerns/issues from ASEAN countries, and the current capacity on implementation of monitoring programme in ASEAN countries.

Countries status and challenges for food safety control

Representatives from ten ASEAN countries shared information and country experience on national food safety concerns and national monitoring programme for food safety. There are several relevant agencies involved in the food safety control in every ASEAN countries. Most of ASEAN countries have their own national food safety control, however, the risk ranking are not fully implemented for setting up the monitoring programme. Some ASEAN member countries set priority list of hazard/food combinations based on the surveillance data obtained from previous few years. Apart from the resources, the following challenges for implementation of the monitoring programmed were identified by ASEAN countries.

- Political policy;
- Implementation of the regulations and legislations;
- Effective coordination among relevant agencies;
- Weakness in laboratory services and high cost of laboratory analysis;
- Limited of laboratories networking;
- Lack of information sharing;
- Globalization of food;
- Emerging and diversified types of hazards;

Overview of the risk categorization

Dr Masami Takeuchi, Food Safety Officer, FAO Regional Office for Asia and the Pacific (FAORAP), explained the principles of risk categorization, highlighting that it is one of the initially step in the risk management. It is a tool for systematic prioritization, and communication that requires a transparent and consistent process. She emphasized that the risk categorization does not replace risk assessment. The risk assessment still need to be done in parallel. Dr Takeuchi introduced the following ten steps for conducting the risk categorization:

1) Identify the clear objective(s) of the risk categorization;

2) Develop clear sets of criteria based on the product characteristics and control characteristics;

3) Determine the categorizing scales;

4) Define the specific indicator for each option of the scales above;

5) Determine the risk management actions for each option of the scales above;

6) Apply the criteria and list up high-risk food items, based on evidence (risk assessment results, disease surveillance analysis, consumer concerns, etc.);

7) Apply the criteria and list up the control characteristics;

8) Obtain the consensus of the risk categorization and develop a table of “high-risk food items” with the scales and respective risk management actions (or actions to be taken by the customs officers);

9) Widely communicate the table with all relevant officials (food safety, customs, quarantines, border controls); and

10) Review and regularly update the table according to the trend and updated information on food safety risks.

Examples of risk categorization

With the aim of increasing capacity of the training participants to systematically apply a purpose built risk categorization process for the ranking of ASEAN specific food safety hazards. Three examples of good risk categorization for import food control from New Zealand, the United Kingdom and Singapore were provided by Dr Takeuchi. Ms Kate Astridge, Senior Food Safety Coordinator, FSANZ further provided explanation and provision of Australia examples of food safety specific risk categorization, and subsequent risk prioritization. These examples were provided to allow participants to understand how the categorizing of food hazard/commodity pairs, based on the evidence of risk, occurring in the neighbouring Australian context.

Ms Astridge gave a comprehensive overview of the set-up and workings of the Australian and New Zealand food regulatory system. Key differences in resources and data availability were noted and empathized. Following this an overview of the Codex risk assessment process ('1st choice') was provided, this presentation re-emphasized that where resources (time/people/data) were not available the next best option – as '2nd choice' -- would be to consider an alternative process to define, categorize and rank risks.

To alley some concerns around confusion with terminology, the differences between hazard and risk (i.e. hazard analysis is not the same as risk analysis) was emphasized. The epidemiology triad (i.e. risk requiring the combination of the three; 'hazard', 'host' and exposure') was also reviewed.

A number of examples of hazards were discussed including

- Microbial (including a discussion around special considerations required for living organisms)
- Chemical (including many examples of naturally occurring toxins, added chemicals, and environmental contaminants)
- Physical
- Other (including food fraud and criminal elements)
- And, as particularly relevant to the Australian context, undeclared (unlabelled) food allergens

Host specific and exposure factors were also discussed and explained including the required considerations for vulnerable populations (e.g. YOPI – Young Old Pregnant and the Immunocompromised).

Specific Australian examples provided for the categorization and prioritization of risk included;

- The ranking of imported food for prioritizing food sampling at the Australian border [i.e. into two categories: 1.Low; or 2. Medium to High risk]. This included an overview of the published imported food risk assessment process in Australia (outlining, as an example, the 5x5 risk matrix tool used in Australia during the risk characterisation step in imported food risk assessment).
- The ranking being based on if the risk of the hazard: commodity pairing posed a Medium to High risk [Yes: No].
- Examples of how different control measures may then be imposed based on this ranking output [i.e. testing at the border].

Further examples of risk categorization, in Australia, of were also provided including;

- Primary Production and Processing standard – seafood (three categories of risk)
- Primary Production and Processing standard – dairy (and specifically raw milk products - three categories of risk)
- Along with providing other Australian examples to demonstrate other processes considering risk (likelihood and exposure), and not just hazard (in categorizing risks to prioritize resources)
- Risk profiling during emergency response

- Emerging risk framework
- Active Australian domestic sampling of food (e.g. Australian Total Diet Survey)

Possible criteria for hazard prioritization

In the afternoon session, Ms Astridge gave a second presentation, which was provided, outlining possible criteria, which could be used for prioritizing the risk and reinforcing the different approaches to risk categorization introduced on the first day of the working. This included an overview of the 'ten step plan' and gave multiple examples of possible criteria, such as public health, economic, social, and food security concerns as examples.

Further clarification around terminology was empathized; Risk characterization (estimate of the likelihood and severity of an adverse effect occurring in a given population), Risk categorization (systematic categorizing of foodborne hazards/foods in terms of risk to public health) and Risk prioritization (systematic analysis and ordering of foodborne hazards/foods in terms of risks to public health, whilst taking other factors into account such as economic concerns, consumer perceptions and acceptance of risks, socio-cultural concerns, etc.)

Dr Takeuchi gave an overview of the systematic process used in the "Multi-criteria Ranking of Global Foodborne Parasites" done by the Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment (JEMRA) as a further example of how a systematic and transparent process can be used in categorization and prioritization of risks.

Two 'Kahoot.it' examples were used, to give participants a chance to actively rank risks, and demonstrate that inputs outside of a systematic framework (and in this case 'background knowledge and understanding of risk' and extremely limited time) will lead to differing results. The two examples used were the ranking of a 'higher' risk food businesses; and the ranking of a 'lower' risk imported food to sample. These experiences were provided to emphasis and demonstrate the importance of defining and agreeing on the overall objective for ranking, categorizing and prioritizing of risks.

Group work

- Case study

To facilitate better understanding on risk categorization principles and methods, group work session was then undertaken in using a scenario-based exercise to practice using data and possible criteria to rank the risk based inspection of food businesses in a food court. Participants actively worked together to consider what data was available (limited and based of vague information), the resources at hand and successful justified their reasoning to inspect the venues posing the highest risk (i.e. using a risk categorization and risk prioritization exercise, to recommend a risk management decision).

- Exercise of the risk categorization

Following the case study, participants would conducted the risk categorization as exercise. The ten steps for risk categorization was applied in this group work session. The output of the group work can be seen in Annex 3.

Conclusions and recommendations

Pre-training and post-training questionnaires were administered to measure the knowledge gain of the participants. The questionnaires also included commentary parts on their expectations (pre-training) and recommendations (post-training). Many participants wrote that their expectations for the training course were to:

1) Enhance the understanding on risk categorization for hazards/foods;
2) Know on data requirement for risk categorization;
3) Learn on hazard prioritization;
4) Learn from other ASEAN Member Countries experiences with risk-based monitoring;
5) Obtain the knowledge on food safety management from other ASEAN Member Countries;

As to the knowledge gain assessment, pre-training questionnaire scores (PRE) and post-training questionnaire scores (POST) were analyzed by the t-Test Paired Two Sample for Means tool with the null hypothesis (means of two populations are equal). Those who did not return either one of the questionnaires were excluded from the analysis (N=27). With having the highest score of 14 and the score lowest of 4, the means of PRE and POST were 7.22 (SD 2.12) and 11 (SD 1.86), respectively. At 99% confidence interval, the t critical two-tailed value was calculated to be 2.78 with the degree of freedom of 26. The result showed the two-tailed P value of < 0.0001 and t-stat of -8.5, thus in conclusion, the knowledge gain by the participants was extremely statistically significant.

Post-training comments from the participants showed that the three-day training provided participants with the concrete knowledge on risk categorization for ranking the risk. Based on the evaluation form and the post-training feedback, participants found that it very useful for their work on development of monitoring programme. The participants rated the quality of training course as excellent at 67% with the technical inputs of the experts at 96% very useful. Suggestions for implements included more examples and case studies, and longer time for group work session.

They would apply obtained knowledge for risk categorization for ranking of ASEAN food safety hazards. The hazard categories would later support the work of ASEAN Health Cluster 4, Ensuring Food Safety, to rank the risks for developing the ASEAN risk-based monitoring procedure for one ASEAN common hazard. In future, this guideline or manual would be beneficial for all ASEAN Member States to use as reference to develop national monitoring and surveillance programmes based on common food safety hazards.

Annex 1: Agenda

Tuesday, 23 April 2019	
08.30 – 09.00	Registration, pre-test
09.00 – 09.30	**Agenda Item 1:** Opening session • Welcome Remarks *Mr Tares Krassanairawiwong, Secretary General of Thai FDA* • Opening remark *Mr Sridhar Dharmapuri, Senior Food Safety and Nutrition officer, FAORAP*
	Group photo session
09.30 – 09.45	Introduction of the participants and resource people
09.45 – 10.00	**Agenda Item 2:** Overview of the project, the objectives of the training and work plan *Ms Panpilad Saikaew, Project Coordinator, FAORAP*
10.00 – 10.15	Coffee break
10.15 – 12.30	**Agenda Item 3:** Sharing information and country experience national food safety concerns and national monitoring programme for food safety by some ASEAN countries - Brunei Darussalam - Cambodia - Indonesia - Lao PDR - Malaysia - Myanmar - Philippines - Singapore - Thailand - Vietnam
12.30 – 14.00	Lunch
14.00 – 15.00	**Agenda Item 4:** Different approaches in risk categorization *Ms Masami Takeuchi*
15.00 – 15.15	Coffee Break
15.15 – 17.00	**Agenda Item 5:** Overview of Risk Categorization for prioritization and essential data required *Ms Masami Takeuchi*
18.00 – 20.00	**Welcome Dinner** @ Lin-Fa Chinese Restaurant (G Floor)
Wednesday, 24 April 2019	
09.00 – 09.15	Feedback on the first day training course *Facilitator: Ms Panpilad Saikaew*
09.15 – 10.30	Examples of Risk Categorization (Australia) *Ms Kate Astridge, Senior Food Safety Coordinator, FSANZ*
10.30-10.45	Coffee Break
10.45 – 12.30	**Agenda Item 6:** Food Profiles and Risk profiles and Examples *Ms Kate Astridge*
12.30 – 14.00	Lunch
14.00 – 15.00	**Agenda Item 6:** Food Profiles and Risk profiles (continue) *Group exercise: Case study—Developing food profile or risk profiles*
15.00 – 15.45	**Agenda Item 7:** Possible Criteria and factors applied in risk categorization for hazard prioritization and example *Ms Kate Astridge*
15.45 – 16.00	Coffee Break

16.00- 17.30	**Agenda Item 7:** Possible Criteria and factors applied in risk categorization for hazard prioritization *Group work: select criteria and factors* *Facilitators: Ms Kate Astridge, Ms Masami Takeuchi and Ms Panpilad Saikaew*
Thursday, 25 April 2019	
9.00 – 09.15	Feedback on the second day training course *Facilitator: Ms Panpilad Saikaew*
09.15-10.30	**Agenda Item 8:** Risk Categorization for hazard prioritization *Ms Masami Takeuchi, Ms Panpilad Saikaew*
10.30 – 10.45	Coffee break
10.45 – 11.30	**Agenda Item 8:** Risk Categorization for hazard prioritization (continue) *Group work: case study of the risk categorization for hazard prioritization*
11.30 – 12.30	**Agenda Item 9:** Risk Categorization for prioritizing ASEAN hazards *Group work: Discuss on Criteria and factors which will be applied in the risk categorization and time frame for the work* *Facilitators: Ms Kate Astridge, Ms Masami Takeuchi and Ms Panpilad Saikaew*
12.30 – 14.00	Lunch
14.00 – 15.00	**Agenda Item 9:** Risk Categorization for prioritizing ASEAN hazards (continue) *Group work: presentation of the group work*
15.00 – 15.30	Post-test, feedback & evaluation
15.30 – 16.00	**Agenda Item 10:** Closing session • Summary of the training course and Actions needed for the next steps *Ms Masami Takeuchi and Ms Panpilad Saikaew* • Closing remarks *Mr Sridhar Dharmapuri*

Annex 2: List of participants

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Annex 3: Output of the group work

During the 2nd day and 3th day of the training course, group work session was undertaken for facilitate the understanding on how to conduct the risk categorization.

The ten-step of risk categorization was implemented in the group work. Firstly, the objective was identified. All objectives from four groups were combined to be as follows.

"**The primary objective** to conduct risk categorization is to develop an ASEAN-level monitoring programme (including sampling guidelines) for post-market products for common hazards based on risk-prioritized food-hazard combinations for both chemical and microbiological hazards."

The objective is set for the post-market food items, meaning that it would include imported foods but not foods to be exported. This activity will also contribute to the objectives to facilitate exchange of information on food safety across ASEAN countries and to harmonize food safety standards of inspection programme for ASEAN.

Next, the set of following criteria has been identified based on the above primary objective.

1) Public health impact (# of death, illness, outbreaks)
2) Prevalence and level of contamination
3) Level of exposure (consumption data)
4) Severity of the impact on health (hospitalization, severe consequences)
5) Eating patterns, lifestyle, culture
6) Regulatory costs (available resources) and cost of illnesses
7) Impact on vulnerable population (YOPI)
8) Impact of imported food control
9) Consumer perceptions/concerns
10) Food security
11) Political decisions/issues
12) Value of sales
13) Welfare advocate groups
14) Emerging technologies

The top seven of the above criterial were further used for risk categorization of microbiological hazards and chemical hazards (2 groups). The score scale for each criterion was set. The group further validate the criteria, its score scale by using some microbiological/chemical hazards. To refine these criteria scores, each criterion was weighted and re-validated. Lastly, the participants consider the feasibility of those all prioritized hazard/food combinations to be included in the monitoring programme in ASEAN countries.

The prioritized lists of microbiological and chemical hazards obtained from group work exercise are as follows.

No.	Microbiological hazards	Chemical Hazards
1	*Salmonella* spp. / Chicken, egg, chocolate, pre-cut melon, low moisture food	Food preservative (Benzoic acid) / fresh noodles
2	*Staphylococcus aureus* / Ready-to-Eat Food (RTE food) with poor hygiene	Pesticide residues (Chlorpyrifos) /Pepper, Chili Pesticide residues (Cypermethrin) / Kale
3	*Listeria sp*. / RTE food, cheese, chilled food; *Vibrio parahaemoliticus* / Seafood, shellfish	Aflatoxins / peanuts
4	*Cronobacter sakazakii* / infant formula	Methyl mercury/ Fish
5	Hepatitis A / vegetable, shellfish, ice	Acrylamide / Potato chips

These above lists are the examples for undertaking the group exercise for categorizing and prioritizing the hazard/food combination. ASEAN participants would further apply the obtained knowledge for conducting the risk categorization and prioritization based on their own data available at regional level.

Annex 4: Pre- and post-training questionnaire

Participant No.	PRE- SCORE	POST-SCORE
1	8	13
2	5	13
3	9	10
4	6	12
5	9	10
6	8	9
7	7	11
8	5	6
9	6	10
10	9	12
11	10	11
12	7	12
13	9	14
14	9	12
15	8	8
16	10	13
17	8	11
18	10	12
19	9	11
20	5	12
21	4	9
22	4	12
23	7	9
24	5	11
25	10	14
26	4	11
27	4	9
28	5	
29	4	
30	8	

Annex 5: Evaluation on effectiveness of the training course

Name_____
Agency _____

1. How do you evaluate the quality of the training course in general?
   - Excellent **(67 %)**
   - Very good **(33%)**
   - Adequate

2. Was the subject of the training course useful and relevant to your needs?
   - Very useful **(96%)**
   - Somewhat useful (**4 %)**
   - Not useful (Please explain why not)

3. Were the materials and handouts useful and the information relevant?
   - Very useful **(67%)**
   - Somewhat useful **(33 %)**
   - Not useful (Please explain why not)

     _____

4. Were the technical inputs by experts useful and relevant?
   - Very useful **(96%)**
   - Somewhat useful **(4 %)**
   - Not useful (Please explain why not)

     _____
     _____

5. Did you find the group work relevant and useful?
   - Very useful **(89%)**
   - Somewhat useful **(11 %)**
   - Not useful (Please explain why not)

     _____

6. Any other recommendations/comments/suggestions for improvements
   - Case studies should be included for better understanding
   - This training is useful and very information one.
   - Giving more examples would be helpful for conducting the group work;
   - Participants would be able to join both microbiological and chemical group