ASEAN Food Testing Laboratory Committee

AFTLC BULLETIN

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14th AFTLC Meeting – Philippines

The 14th ASEAN Food Testing Laboratory Committee (AFTLC) Meeting was hosted by Philippines from 17-18 June 2019 at the Marriot Hotel, Manila, Philippines. This meeting was organized back to back with the Processed Food Product Working Group (PFPWG) and its related meetings, and the AFTLC-PTB Planning Workshop on Future Activities held on 16 June 2019.

The Meeting was attended by delegates from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam and the ASEAN Secretariat. The representatives of the Physikalisch Technishce Bundesanstalt (PTB) Germany attended the Meeting to discuss the workplan of PTB-AFTLC for 2019-2021.

Outcomes of the Meeting

1. Appointment of the panel of experts for the six areas of AFRLs (Microbiology, GMO, Heavy Metals and Trace Elements, Pesticide Residues, Veterinary Drug Residues and Mycotoxins) to carry out the 5-year on-site visit.
2. Development of the master list of pool experts for the individual areas of expertise, Thailand and Philippines to take the lead.
3. AFRLs presented their annual activity reports
4. Updates on recent amendment to the AFTLC Manual.
5. Appointment of experts nominated by Singapore (Dr. Pong Boon Kin) and Thailand (Dr. Vithit Pungkun) to be the panel of experts to conduct the on-site visit for the establishment of new AFRL (Radionuclide). The Meeting further agreed that Dr. Pong Boon Kin to be the team leader, Ms. Voon Oi Ling from Brunei Darussalam will be the observer.
6. AFTLC agreed for the Toxins Laboratory of Veterinary Public Health Centre of the ex-Agri-Food and Veterinary Authority of Singapore (AVA) to be the AFRL on Marine Biotoxins and Scombrotoxin and to recommend to the 28th PFPWG for endorsement.
7. Appointment of experts nominated by Viet Nam (Dr. Tran Cao Son) and Malaysia (Dr. Norshifa Bin Shuib) to be the panel of experts to conduct the on-site visit for the extension of scope of AFRL for Mycotoxin to include Phytotoxin. The Meeting also agreed that Dr. Tran Cao Son to be the team leader and have the 5-year on site visit be done at the same time.
8. Updates on the survey conducted for the mapping of food safety testing laboratory network in ASEAM Member States.
9. AFTLC discussed and agreed to propose pesticide residues and microbiology to be the areas for PT Programme to PTB Germany as these are the current needs of ASEAN Member States. AFTLC also noted that all Member States can participate in PT Programme on microbiology as they have the capability to do the testing, while Cambodia, Lao PDR and Myanmar need further training on pesticide residues analysis prior to participating in the PT Programme.
10. Singapore, as the lead for the development of the 2nd issue of the bulletin, to present the bulletin outline at the 15th AFTLC Meeting to be held in Singapore, the printed bulletin will be distributed at the 16th AFTLC Meeting.

15th AFTLC Meeting – Singapore

Participants of the 15th AFTLC Meeting, Concorde Hotel, Singapore 19 – 20 November 2019

Singapore Food Agency was honoured to host the 15th Meeting of the ASEAN Food Testing Laboratories Committee (AFTLC) at the Concorde Hotel, Singapore from 19 – 20 November 2019. A/Prof Joanne Chan (Centre Director, National Centre for Food Science, Singapore Food Agency), opened the session by delivering a welcome address to all the attendees.

The meeting was chaired by Dr. Tran Cao Son (Head, Food Toxicology and Food Allergy Testing Laboratory, National Institute for Food Control, Ministry of Health, Vietnam) and vice-chaired by Ms. Hasinahwati binti Haji Hanafi (Head of Food Chemistry Section, Department of Scientific Services, Ministry of Health, Brunei Darussalam).

Left: *Welcome address by A/Prof Joanne Chan (Centre Director, National Centre for Food Science, Singapore Food Agency, Singapore)*

Right: *15th AFTLC Meeting Chaired by Dr. Tran Cao Son (Head, Food Toxicology and Food Allergy Testing Laboratory, National Institute for Food Control, Ministry of Health, Vietnam) and vice-chaired by Ms Hasinahwati binti Haji Hanafi (Head of Food Chemistry Section, Department of Scientific Services, Ministry of Health, Brunei Darussalam)*

42 delegates from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Philippines, Singapore, Thailand, Vietnam and the ASEAN Secretariat attended the Meeting. Representatives from the Physikalisch Technishce Bundesanstalt (PTB) Germany and International Life Sciences Institute (ILSI) were also invited for their attendance under the specific agenda.

Several key topics discussed during the two-days meeting are briefly highlighted in this report. The respective leaders of the appointed panel of experts for the on-site visits of the ASEAN Food Reference Laboratories (AFRLs) for Mycotoxins and Veterinary Drug Residues, reported the outcome of their visits. In addition, Indonesia proposed two new areas i.e. halal food products and process contaminants for the establishment of AFRLs. The Non-AFRL Members namely Brunei Darussalam, Cambodia, Lao PDR and Philippines presented updates on their countries' activities in relation to food safety laboratory testing.

As a follow-up to the AFTLC-PTB Planning Workshop held in Manila, Philippines on 16th June 2019, representatives from PTB put forth a proposed plan on the joint activities with AFTLC. These activities include a workshop on proficiency testing preparation, training on ISO 17043 and ISO 17034 as well as support for hands-on technical trainings to be conducted in Cambodia, Lao PDR and Myanmar. The meeting discussed and agreed on some of the details for these upcoming joint activities.

Similarly, representatives from ILSI presented a proposal for a 2-phase programme to support AFTLC in the area of laboratory capacity building: Phase 1 - Survey on the national laboratory and Phase 2 - Capacity Building Workshop.

The meeting ended off with a welcome dinner hosted by Dr. Tan Lee Kim (Director-General of Food Administration, Singapore Food Agency) at the Concorde Hotel on the evening of 20 November, 2019. Singapore would like to express appreciation to all who have attended the meeting, for their active participation as well as contributions to the fruitful discussions.

Representatives from Physikalisch Technishce Bundesanstalt (PTB) proposed their workplan to the 15th AFTLC

Representatives from the National Centre for Food Science, Singapore Food Agency

AFRL for Microbiology

QUATEST 3®

ASEAN FOOD REFERENCE LABORATORY (AFRL)

FOR MICROBIOLOGY

Working as AFRL for Microbiology since 2004.

Location: 07, Road 1, Industrial Zone 1, Bien Hoa City, Dong Nai province, Vietnam.

Introduction

The Microbiology and GMO Testing laboratory, which has been designated as an AFRL- ASEAN Food Reference laboratory for Microbiology, belongs to QUALITY ASSURANCE AND TESTING CENTER 3 QUATEST 3), a governmental agency under Directorate for Standards, Metrology and Quality (STAMEQ), Ministry of Science and Technology (MOST), Vietnam. The laboratory's mission is to provide high-quality and professional testing services for microbiological management of authorities and business sectors. Working in line with ISO/IEC 17025 standards, the laboratory was accredited by the Norwegian Accreditation Body (NA) in 2007 and Bureau of Accreditation of Viet Nam (BoA) since 1999. There has been a remarkable increase in capacity development of the laboratory since then.

The laboratory is well-equipped with not only fundamental instruments for basic microbiological analyses but also state-of-the-art systems for advanced tests, such as MALDI-TOF MS and Real time PCR, to name just a few. Being effectively supported by these instruments, the laboratory is more likely to keep up with the current trend of applying rapid, sensitive, accurate and economical (in terms of both labor and costs involved) biomolecular techniques to analyse microorganisms.

Activities

As an AFRL, since 2004, a range of activities have been conducted by the laboratory in order to improve laboratory capacities, provide technical support and knowledge as well as enhance national and international collaboration.

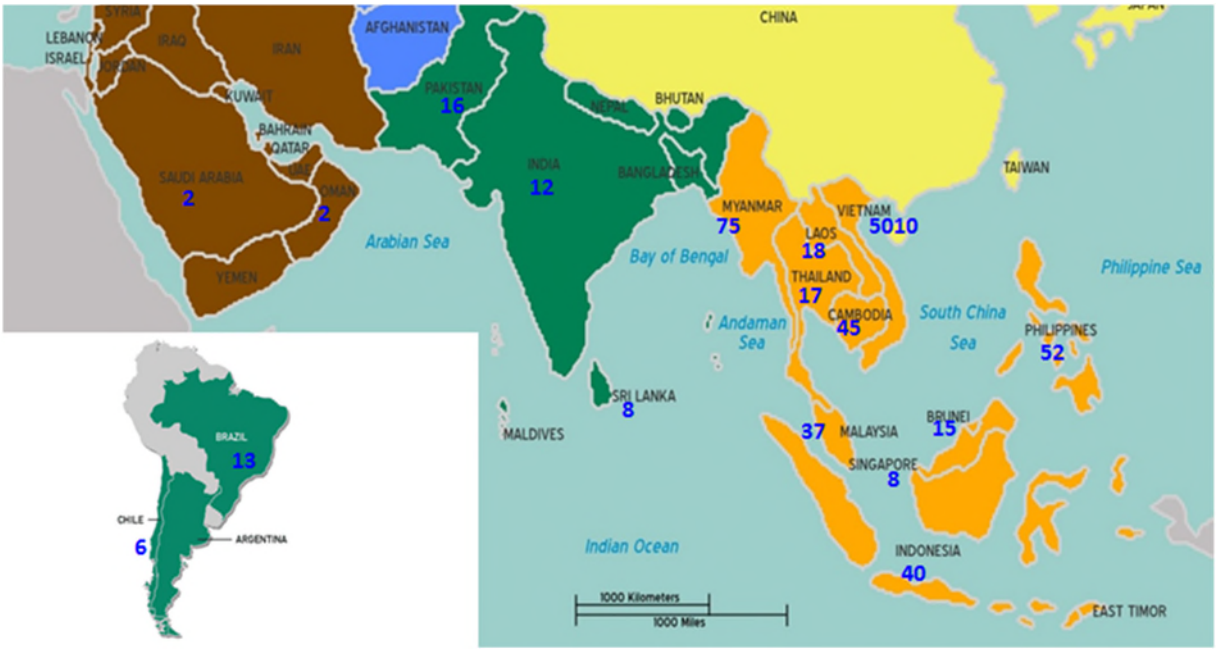
1. Providing Training, Technical Advice and Other Services

Updated information about new methods, new versions of methods, training and proficiency testing (PT) schemes, CRM resources, and other noticeable technical changes have been shared to members annually through e-newsletters. Further discussions on controversial issues have been also organized through e-mails if necessary.

Many PT schemes in microorganisms are organized for ASEAN countries every year. The number of PT schemes attracting laboratories' attention has increased over time. There has been a growth in the number of participants from not only ASEAN but also other regions in the world who take part in each program as shown below.

As an AFRL, at least one PT scheme is offered free of charge annually for ASEAN members to facilitate the evaluation of performance of corresponding methods. The matrices vary from food, water to feedstuffs as following table. The criteria in the programs are mainly determined through ASEAN and national survey of PT needs. After each PT scheme, some comments and technical advices shall be indicated in a final report which is later on sent to participants to improve their testing system if necessary. PT programs which are going to be organized in 2020 are shown in enclosed appendix . Particularly, QPT 08/20 is offered for free for ASEAN members.

For the past 5 years, several training courses, workshops have been carried out to strengthen the capabilities of testing laboratories for many ASEAN Member States, including Brunei, Indonesia, Laos, Malaysia and also for Sri Lanka. The topics are mostly chosen through ASEAN survey of training needs or based on suggestion from participants. In the near future, the laboratory is planning to provide up-to-date training courses or workshops about analyzing microorganisms on the basis of molecular biology.



Numbers of participants in different regions taking part in PT schemes organized by QUATEST

Activities

List of PT schemes organised free of charge for ASEAN Members States

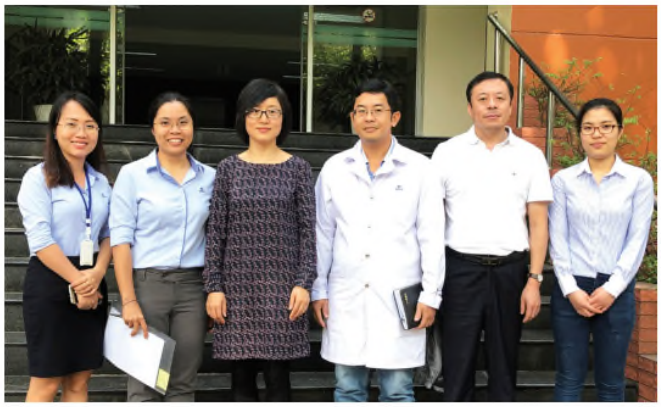
S/N	Date (MM/YY)	Matrix/Test Materials	Analytes	Details of participating labs e.g. No of labs and country	Summary of PT results e.g. % of satisfactory scores
1	05/2014 – 08/2014	***Meat*** QPT 04/14 (Pork 14A14 & 14B14)	Detection of *Salmonella* spp.	No. of labs: 15 - Vietnam: 7 labs; - Myanmar, Philippines: 02 labs/country - Brunei Darussalam, Cambodia, Laos, Singapore: 01 lab/country	*- 14/15 (93,3 %) satisfactory* *- 1/15 (6,7 %) unsatisfactory*
2	04/2015 – 07/2015	***Milk powder*** QPT 06/15 (Milk 15E15)	Enumeration of *Enterobacteriaceae*	No. of labs: 26 - Vietnam: 20 labs; - Malaysia: 03 labs; - Philippines: 02 labs; - Thailand: 01 lab.	- *24/26 (92,3 %) satisfactory* - *2/26 (7,7 %) unsatisfactory*
3	03/2016 – 06/2016	***Aquatic product*** QPT 07/16 (Fish 16A16 & 16B16)	Detection of *Salmonella spp.*	No. of labs: 18 - Vietnam: 11 labs; - Indonesia: 03 labs; - Myanmar: 02 labs; - Brunei Darussalam, Philippines: 01 labs/country.	*18/18 (100 %) satisfactory*
4	05/2017 – 08/2017	***Milk powder*** QPT 12/17 (Milk 17E17)	Enumeration of presumptive *Bacillus cereus*	No. of labs: 20 - Vietnam: 16 labs; - Cambodia: 02 labs; - Indonesia, Singapore: 01 lab/country.	*- 21/24 (*) (87.5 %) satisfactory* *- 2/24 (8.3 %) questionable* *- 1/24 (4.2 %) unsatisfactory*
5	04/2018 – 08/2018	***Aquatic product*** QPT 19/18 (Fish 18D18 & 18E18)	Detection of *Vibrio parahaemolyticus*	No. of labs: 26 (exclude: 02 labs in Thailand did not receive samples - their local point received samples late and did not send to laboratories). - Vietnam: 08 labs; - Thailand: 02 labs; - Brunei Darussalam, Indonesia, Malaysia, Philippines: 01 lab/country.	*- 21/24 (87.5 %) satisfactory* *- 3/24 (12.5 %) unsatisfactory*
6	06/2019 – 10/2019	***Meat*** QPT 17/19 (Chicken 19D19)	Total anaerobic mesophilic count	No. of labs: 16 - Vietnam: 15 labs; - Cambodia: 01 lab	*- 05/05 (100 %) satisfactory* *- 0/05 (0 %) unsatisfactory*
			Anaerobic sulfite reducing bacteria		*- 07/09 (77,8 %) satisfactory* *- 01/09 (11,1 %) unsatisfactory*
			Clostridium perfringens		*- 14/15 (93,3 %) satisfactory* *- 1/15 (6,7 %) unsatisfactory*

Activities

2. Developing New Methods

Playing a role of an AFRL, method development is an integral part of activities in the laboratory. New methods are verified and developed every year. Not only have methods for food testing been developed, the ones for various types of matrices, such as chopsticks, hand dishwashing, cosmetics, some sorts of consumable products, etc. have also been verified. Some of noticeably new methods that have been applied in the laboratory are detection of staphylococcal enterotoxins, detection of Aspergillus flavus, detection of Vibrio paraheamolyticus and Vibrio cholerae by PCR/ RT-PCR technique, and detection of Salmonella spp. by rapid method.

3. Building Collaboration



Representatives of QUATEST 3 and ACAS (China)

MoU Signing Ceremony between QUATEST 3 and Shin Nihon Kentei Kyokai (SK)

ACHIEVEMENTS

The laboratory has been accredited to ISO/IEC 17025 since 1999 and it's capacity has been continuously expanded over the years since then. Moreover, the organization successfully obtained ISO/ IEC 17043 accreditation as a PT provider in 2013. This accreditation ensures that all PT schemes it provides are fit for purpose. The participants can make use of technical advice in PT schemes to their method development and capacity building. If needed, after the programs, further assistance in improving methods or testing procedures is also provided for struggled laboratories.

The laboratory has built up close-knit relationships and become a reliable partner of many organizations. On December 25th, 2018, QUATEST 3 had an honor to welcome the delegates of Analysis Capability Assessment System (ACAS), Chinese Academy of Inspection and Quarantine (CAIQ), China to visit and prepare for setting up a cooperation of providing proficiency testing programs and other organizations in testing such as Shin Nihon Kentei Kyokai (SK) - Japan, Korea Conformity Laboratories (KCL), etc.

Challenges

One of the most concerned challenges is to find a source of sufficient budget to maintain training courses regularly for ASEAN members. In the past, all training courses were financially supported by the EU. This support, however, ended in 2009.

Secondly, the publish of many updated guidance for method validation, method verification, measurement of uncertainty in microbiological analyses and the appearance of a vast array of innovative testing methods using chromogenic media, rapid test kits, molecular biology techniques, etc. create both opportunities and challenges for laboratories in verifying and implementing new methods. Therefore, the laboratories in ASEAN are in need of technical support and expertise from professional experts to catch up with and implement fundamental changes.

QUATEST 3 has gone through more than 40 years of development along with over 700 personnel of professional experience and expertise. QUATEST 3 has always been paying high attention to international cooperation programs with the purpose of integrating advanced technology from other countries. To these days, QUATEST 3 has taken part in and expanded its cooperative activities with prestigious organization all over the world such as US UL, JQA, TUV SUD PSB, TUV Rheiland, SK, KCL, KSA, KILT, NEMKO.

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PT Schemes for 2020

No.	Name of PT program/Matrix	Code of PT program	Characteristics	Expected date of sending sample
1	***Cereal***	**QPT 01/20**	☐ Enumeration of total aerobic plate count ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Feb 2020
2	***Cereal***	**QPT 02/20**	☐ Enumeration of Coagulase-positive Staphylococci	May 2020
3	***Cereal***	**QPT 03/20**	☐ Enumeration of total yeast and moulds	Jul 2020
4	***Cereal***	**QPT 04/20 (*)**	☐ Enumeration of *Pseudomonas aeruginosa*	Jul 2020
5	***Milk powder***	**QPT 05/20**	☐ Detection of *Salmonella* spp.	Feb 2020
6	***Milk powder***	**QPT 06/20**	☐ Enumeration of Coagulase-positive Staphylococci	Mar 2020
7	***Milk powder***	**QPT 07/20**	☐ Enumeration of total yeast and moulds	Mar 2020
8	***Milk powder*** (free of charge for ASEAN members)	**QPT 08/20**	☐ Enumeration of total aerobic plate count ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Jun 2020
9	***Milk powder***	**QPT 09/20**	☐ Enumeration of *Presumptive Bacillus cereus*	Jun 2020
10	***Milk powder***	**QPT 10/20**	☐ Enumeration of Enterobacteriaceae	Jul 2020
11	***Liquid milk***	**QPT 11/20**	☐ Enumeration of total aerobic plate count ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Apr 2020
12	***Liquid milk***	**QPT 12/20**	☐ Detection of *Salmonella* spp.	Aug 2020
13	***Drinking water***	**QPT 13/20**	☐ Enumeration of total plate count ☐ Enumeration of Coliforms ☐ Enumeration of Fecal Coliforms(*) ☐ Enumeration of *Escherichia coli*	Jul 2020
14	***Drinking water***	**QPT 14/20 (*)**	☐ Enumeration of *Staphylococcus aureus*	Jul 2020
15	***Drinking water***	**QPT 15/20 (*)**	☐ Enumeration of Enterococci (Fecal Streptococci)	Aug 2020
16	***Drinking water***	**QPT 16/20 (*)**	☐ Enumeration of spores of sulfite-reducing anaerobes	Aug 2020
17	***Drinking water***	**QPT 17/20 (*)**	☐ Enumeration of *Pseudomonas aeruginosa*	Sep 2020

PT Schemes for 2020

No.	Name of PT program/Matrix	Code of PT program	Characteristics	Expected date of sending sample
18	***Waste water***	**QPT 18/20**	☐ Enumeration of Coliforms	Jun 2020
19	***Tap water***	**QPT 19/20**	☐ Enumeration of Coliforms ☐ Enumeration of Fecal Coliforms(*) ☐ Enumeration of *Escherichia coli*	Oct 2020
20	***Meat***	**QPT 20/20**	☐ Enumeration of total anaerobic bacteria(*) ☐ Enumeration of anaerobic sulfite-reducing bacteria (*) ☐ Enumeration of *Clostridium perfringens*	May 2020
21	***Meat***	**QPT 21/20**	☐ Detection of *Salmonella* spp.	Jun 2020
22	***Meat***	**QPT 22/20**	☐ Enumeration of total aerobic plate count ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Aug 2020
23	***Aquatic product***	**QPT 23/20 (*)**	☐ Detection of *Escherichia coli*	Mar 2020
24	***Aquatic product***	**QPT 24/20**	☐ Enumeration of total aerobic plate count ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Mar 2020
25	***Aquatic product***	**QPT 25/20**	☐ Detection of *Vibrio parahaemolyticus*	Apr 2020
26	***Aquatic product***	**QPT 26/20**	☐ Detection of *Salmonella* spp.	Apr 2020
27	***Aquatic product***	**QPT 27/20**	☐ Detection of *Listeria* spp.(*) ☐ Detection of *Listeria monocytogenes*	Jun 2020
28	***Aquatic product***	**QPT 28/20**	☐ Enumeration of Coagulase-positive Staphylococci	Sep 2020
29	***Aquatic product***	**QPT 29/20**	☐ Enumeration of Enterobacteriaceae	Oct 2020
30	***Feedstuffs***	**QPT 30/20 (*)**	☐ Enumeration of total yeast and moulds	Sep 2020
31	***Feedstuffs***	**QPT 31/20 (*)**	☐ Detection of *Salmonella* spp.	Sep 2020
32	***Feedstuffs***	**QPT 32/20**	☐ Enumeration of total aerobic plate count(*) ☐ Enumeration of Coliforms ☐ Enumeration of *Escherichia coli*	Sep 2020
33	***Fertilizer***	**QPT 33/20**	☐ Enumeration of *Escherichia coli*	Aug 2020
34	***Fertilizer***	**QPT 34/20**	☐ Detection of *Salmonella* spp.	Oct 2020

AFRL for Mycotoxins & AFRL for Pesticide Residues

Introduction to the Hosting Institute

– National Centre for Food Science, Singapore Food Agency

National Centre for Food Science Complex

Designated as AFRLs for:

- Foodborne Environmental Contaminants
- Marine Biotoxins & Scombrotoxin
- Mycotoxins
- Pesticide Residues

Locations:

- 10 Perahu Road, Singapore
- 11 Outram Road, Singapore

The Singapore Food Agency (SFA) was formed as a statutory board under the Ministry of the Environment and Water Resources (MEWR) on 1st April 2019, to oversee food safety and food security from farm-to-fork in Singapore. The agency brings together food-related functions which were previously carried out by the former Agri-Food and Veterinary Authority (AVA), the National Environmental Agency (NEA) and the Health Sciences Authority (HSA).

The National Centre for Food Science (NCFS) was established under SFA to provide leadership in comprehensive food diagnostic testing capabilities as well as research and development in food safety. The Centre oversees the application of science and technology to enable a science-based and data-driven approach in ensuring food safety, in partnership with local and overseers research institutions as well as other relevant stakeholders to address emerging food safety and security concerns.

With the re-organisation, NCFS hosts the OIE Collaborating Centre for Food Safety and the WHO Collaborating Centre for Food Contamination Monitoring. The four ASEAN Food Reference Laboratories (AFRLs), namely AFRL for Foodborne Environmental Contaminants, AFRL for Marine Biotoxins and Scombrotoxin, AFRL for Mycotoxins, and AFRL for Pesticide Residues previously residing under AVA and HSA are now consolidated under NCFS.

NCFS is fully committed to continue supporting all the 4 AFRLs for their respective role and responsibilities in strengthening the technical competency of laboratories in the ASEAN region, by providing for scientific leadership and capacity building programmes. To better support the National Food Reference Laboratories in ASEAN, a new Laboratory Competency Development (LCD) Specialist Team has been established in NCFS to coordinate the regional capacity building activities of the 4 AFRLs hosted by NCFS.

Introduction to AFRL for Mycotoxins

The AFRL for Mycotoxins was one of the first six AFRLs established since 2004. The AFRL for Mycotoxins was established under the purview of the Health Sciences Authority (HSA) but starting from 1 Apr 2019 amid the re-organization and establishment of the Singapore Food Agency (SFA), the AFRL for Mycotoxins was subsequently subsumed into the National Centre for Food Science (NCFS). Since its establishment over 15 years ago, the AFRL has expanded its capability and technical expertise with 27 methods of analysis for Mycotoxins and Phytotoxins accredited with ISO/IEC 17025:2017 standard under the Singapore Accreditation Council's Singapore Laboratory Accreditation Scheme (SAC-SINGLAS). The AFRL had organized 10 mycotoxins proficiency tests from 2010-2019 for laboratories in AMSs.

In Oct 2019, the AFRL for Mycotoxins welcomed the panel of experts appointed by the ASEAN Food Testing Laboratories Committee for an on-site visit as part of the 5-year periodic assessment on its competency and eligibility to continue to be accorded as the AFRL for Mycotoxins. The on-site visit also covered the assessment of the Lab's request for expansion of its scope to include Phytotoxins.

Regional Technical Training Workshops

The laboratory in its capacity as AFRL for Mycotoxins has in place a multi-disciplinary team of scientists and is well-equipped laboratory for mycotoxins testing. The instrument deployed include UPLC-PDA, HPLC-FLD, LC-MS/MS and LC-TOF-MS for the detection and confirmation of a whole range of mycotoxins as well as phytotoxins. The test methods used are ISO/IEC 17025 accredited and benchmarked through the participation in proficiency tests organized by internationally recognized proficiency testing providers.

Over the years, the laboratory organized multiple technical training workshops on mycotoxins analysis. The main objectives of the trainings are to improve the food safety testing capability of national laboratories among ASEAN Member States.

Some of the regional training activities conducted by the AFRL of Mycotoxins in 2014 - 2018

Year	Workshop/training	Details of participating labs
2018	On-site training on Aflatoxin B&G	Food and Drug Administration (FDA), Myanmar
	Technical training on multi-mycotoxin	Quatest 3, Vietnam
2017	Technical training on mycotoxin analysis	Food and Drug Administration (FDA), Myanmar
2016	Technical assistance on mycotoxin testing	Food and Drug Administration (FDA), Myanmar
2015	Technical training on mycotoxin testing	Department of Scientific Services, Ministry of Health, Brunei Darussalam
2014	Technical training on mycotoxin testing	AVA (Singapore)

Regional Technical Training Workshops

1. On-site Training on Aflatoxins B&G at Myanmar FDA in 2018

Training was conducted on-site for FDA, Myanmar from 22-24 May 2018 for 12 participants on the analysis of Aflatoxin B&G by 2 scientists from AFRL for Mycotoxins. The training programme consisted of hand-on training, troubleshooting for the method set-up as well as on knowledge sharing on measurement uncertainty, QC procedures and PT programmes.

On-site Training on Aflatoxins B&G at Myanmar FDA in 2018

Quality sharing and hands-on training on Aflatoxins B&G

2. Training at AFRL for Mycotoxins in 2018

Training was conducted for Quatest 3 participants from the Ministry of Science and Industry, Vietnam (sponsored by International Atomic Energy Agency, IAEA). The officers from Quatest 3, Ms. Nguyen Hong Thao and Mr. Nguyen Cong Tuan received training from 9-13 July 2018 for Multi-Mycotoxins Training.

The training covers multi-mycotoxins testing, including Aflatoxins BGs, Ochratoxin A, Fumonisins B1 and B2, Deoxynivalenol and Zearalenone in Cereals by LC-MS/MS with isotopic dilution assay technique and method validation. During the training, there was also a sharing on emerging mycotoxins contamination in food supply and the latest trend in multiple mycotoxins testing.

Multi-mycotoxin training at Singapore HSA in 2018

3. Training at AFRL for Mycotoxins in 2017

The training was conducted for representatives from the Food and Drug Administration (FDA), Myanmar from 4-15 September 2017. The officers receiving the training were Mrs. Khin Soe Mar (FDA, Food Chemical Laboratory, Yangon) and Mrs. May Thu Khang Thant Zin (FDA, Food Chemical Laboratory, Nay Pyi Taw). Areas of training included Aflatoxin B&G in Nuts, Patulin in Juice, Ochratoxin A in coffee and Aflatoxin M1 in milk.

Regional Technical Training Workshops

Benefiting Laboratories from AMSs

The laboratories from AMSs provided feedbacks that they had benefited greatly from these training workshops. One such example was the Food Chemical Lab from FDA, Nay Pyi Taw, Myanmar, whose officers received technical training in 2017 and 2018. The lab has since been able to use HPLC for the determination of Aflatoxin B&G, apart from ELISA. The lab passed the 2019 Aflatoxin B PT with flying colours, for the quantification of Aflatoxin B using the HPLC method the lab was trained with.

Technical training for Food Chemical Lab from FDA Myanmar in 2017 and 2018

Participation in International Forums

Scientists from the AFRL for Mycotoxins participated actively in various international forums and technical seminars, in forms of both oral and poster presentation on mycotoxins method development and test findings.

2020 – 12th Conference of the World Mycotoxin Forum - WMFmeetsASIA in Bangkok, Thailand, 13-15 January 2020. Presentations done included: 1. “Trends in the occurrence of mycotoxins in various food commodities: recent findings from Singapore’s food safety monitoring programme” (oral presentation); and 2). “ASEAN Proficiency Testing Programme for Mycotoxin Analysis in Foodstuffs” (poster presentation).

2018 - Food Control Conference in Ha Noi, Vietnam in Oct. Organised by the National Institute for Food Control (NIFC) Vietnam. Ms Angela Li presented a talk on the “Natural Toxins – Occurrence of Mycotoxins and Phytotoxins in Food”.

2018 - APEC workshop on Food Safety and Food Adulterated with drugs in Sep in Chinese Taipei, Taiwan. Organized by the Taiwan Food and Drug Administration (TFDA). Ms Yat Yun Wei presented a talk titled “Current state of Mycotoxins and Phytotoxins testing in Singapore’’.

2018 – 40th International Conference on Environmental & Food Monitoring (ISEAC-40), Santiago De Compostela, Spain in June 2018. Presented a poster on the “Exposure Assessment of Mycotoxins in Vending Machine Fruits and Fruit Juices”.

Presentation by Ms. Angela Li at Food Control Conference in 2018 on ‘‘Natural Toxins – Occurrence of Mycotoxins and Phytotoxins in Food”

Presentation by Ms. Yat Yun Wei at APEC workshop on Food Safety and Food Adulterated with drugs in 2018 on “Current state of Mycotoxins and Phytotoxins testing in Singapore’’

International Collaborations

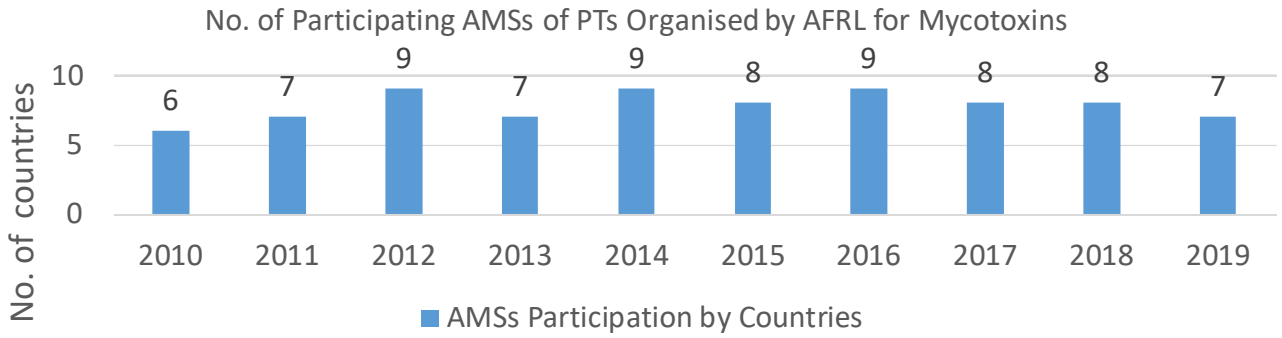
The AFRL for Mycotoxins had collaborated with various international agencies and scientific bodies, resulting in the publication of journal articles and review papers on mycotoxins detection and its occurrences, which are exemplified in the following Table.

AFRL for Mycotoxins' International Collaboration Activities

S/N	Year	Name of collaborating organisation	Details of collaboration
1	2017	JAOAC (Special Edition)	Invited review paper edited by USFDA entitled "Analytical methods for mycotoxin detection in Southeast Asian Nations (ASEAN)"
2	2017	Joint Research USDA-HSA-NRI	Research project entitled "Development of an LC-MS/MS determination method for T-2 toxin and its glucoside and acetyl derivatives for estimating the contamination of total T-2 toxins in staple flours"
3	2017	Inter-Agency Research HSA-NEA	Research project entitled "Survey on prevalence of mycotoxins in cooked food, with reference to food handling practises and risk assessment arising from consumption"
4	2017	Joint Research (Singapore)	Research project entitled "Survey Study on the occurrence of tropane alkaloids in infant cereals"
5	2017	Joint Research (Singapore)	Research project entitled "Analysis of amatoxins and phallotoxins in mushrooms"
6	2017	Book Chapter	"Mycotoxin detection in Asia" for the book titled "Analysis of Food Toxins and Toxicants"
7	2015	Journal of Agriculture and Food Chemistry	Multi-Mycotoxin screening reveals separate occurrence of aflatoxins and ochratoxin A in Asian rice
8	2015	John Wiley & Sons Journal of Agriculture	Submitted manuscript for book chapter entitled "Mycotoxins detection in Asia"
9	2015	Food Chemistry	Quantitative assessment of Moniliformin in Cereals via alternative precipitation pathways aided by targeted and untargeted mass spectrometry
10	2014	JAOAC	Determination of Ochratoxin A in Capsicum spp. (paprika and chilli) by Immunoaffinity column cleanup and liquid chromatography
11	2013 to 2015	Joint Research NIHS (Japan)-HSA-Phenomenex (USA)	Multi-Mycotoxin in Asian rice

Providing ASEAN Mycotoxins Proficiency Testing Programmes

AFRL for Mycotoxins has been organising Proficiency Tests (PTs) programmes in mycotoxins testing for the AMSs annually since 2010. The number of AMSs participating in the Proficiency Tests (PTs) had increased from 6 countries in 2010 to an average of 8 countries presently. A summary of the number of AMSs participating in PTs over the years is shown in Figure below. The PT results of the various PTs organized by the AFRL are presented in the following Table.



Summary of AMSs participation of PTs organised by AFRL for Mycotoxins

PT results of various PTs organized by the AFRL

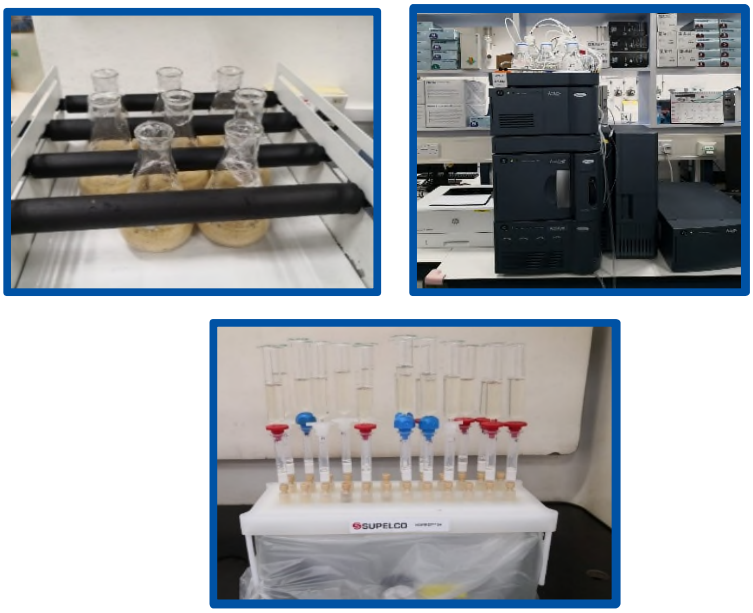
Year	Matrix	Analyte	No. of Labs Participated	No. of Labs Submitted Results	No. of Labs with z-score < 2 (%)			
					B1	B2	Total BG	OA
2019	Maize	Aflatoxins B & G	16	B1 results – 16 B2 results - 14	14(87.5)	14(100)	13 (92.9)	-
2018	Chilli	Ochratoxin A	15	15	-	-	-	14 (93)
2017	Corn Powder	Aflatoxins B & G	21	21	17 (81)	13 (62)	17(81)	-
2016	Rice Flour	Aflatoxins B & G	23	23	19 (83)	20 (87)	19 (83)	-
2015	Nutmeg	Aflatoxins B & G	18	18	12 (67)	-	-	-
2014	Peanut	Aflatoxins B & G	21	21	16 (76)	17 (81)	17 (81)	-
2013	Chilli	Aflatoxins B & G	17	15	13 (76)	5 (29)	15 (88)	-
2013	Chilli	Ochratoxin A	17	10	-	-	-	9 (53)
2012	Nutmeg Powder	Aflatoxins B & G	16	16	2 (12.5)	4 (25)	4 (25)	-
2011	Peanuts	Aflatoxins B & G	14	14	13 (93)	12 (86)	12 (86)	-

Over the years, the performance of the participating laboratories had shown steady improvement in their z-scores as shown in Table 3. One such example is the improvement in the competency in analysing mycotoxins in nutmeg. In 2012, low percentage of satisfactory scores was observed from majority of the participants in quantifying Aflatoxin B1, Aflatoxin B2 and Total Aflatoxins B & G in nutmeg. The AFRL for Mycotoxins assessed that nutmeg was a challenging matrix for some participating labs. Hence, hands-on training and technical consultancy was provided by AFRL for Mycotoxins as part of the follow-up actions. Subsequently in 2015, results received for the PT in nutmeg reflected an improved passing rate of 67% amongst the ASEAN participating labs.

Providing ASEAN Mycotoxins Proficiency Testing Programmes (Continued)

PT sample preparation (Aflatoxin B&G) and Verification

PT material for 2019 ASEAN PT programme



PT material preparation for 2019 PT programme

Participation in the Submission of Mycotoxins Monitoring Data to WHO/FAO for Setting CODEX MLs

The AFRL for Mycotoxins has concurrently served as the WHO Collaborating Centre for the Western Pacific Region. The Lab submits mycotoxins testing data to WHO/FAO on both regular and ad hoc basis to the Global Environment Monitoring System (GEMS) - Food Contamination Monitoring and Assessment Programme, which are being used as part of the global monitoring data for supporting the establishment of CODEX maximum limits (MLs) for mycotoxins.

AFRL for Mycotoxins has been actively submitting the monitoring data to GEMS database since 2008. Most recently, the AFRL for Mycotoxins submitted data for total aflatoxins in cereals and cereal-based products (maize grain destined for further processing and flour, meal, semolina and flakes derived from maize; sorghum; husked and polished rice), and cereal-based foods for infants and young children in support of setting the pertinent CODEX MLs.

Food and Agriculture Organization of the United Nations

World Health Organization

Aflatoxins in cereals and cereal-based products, including food for infants and young children

Request for data on total aflatoxins in cereals and cereal-based products (maize grain destined for further processing and flour, meal, semolina and flakes derived from maize; sorghum; husked and polished rice), and cereal-based foods for infants and young children

Issued 5-July-2019

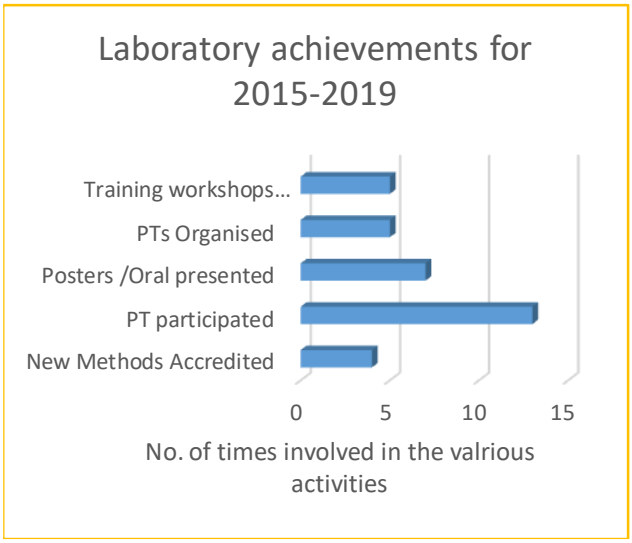
5-year On-site Assessment and the Extension of Scope for Phytotoxins

The AFRL for Mycotoxins welcomed the 2-member panel of experts, Dr. Tran Cao Son from Vietnam and Dr Norshifa Bin Shuib from Malaysia was for on-site assessment on 1-2 October 2019 as part of the 5-year periodic monitoring review by AFTLC and for the extension of scope of AFRL for Mycotoxins to include phytotoxins. The purpose of this visit was to verify that the conformity of AFRL for Mycotoxins to the Terms of Reference of AFRL and its readiness for expanding its scope to include phytotoxins for supporting the emerging ASEAN regional needs in the related capacity building activities. The one and half day assessment was completed with positive findings and areas for improvements.

On-site assessment by 2-member panel of experts for Mycotoxin AFLR and extension of scope for Phytotoxins

Achievements

The achievements for the AFRL for Mycotoxins for the period from 2015 to 2019 are summarised in the Figure. A number of ASEAN regional proficiency test rounds were organised, which have helped verify and strengthen the laboratory capabilities in mycotoxins testing among AMSs. During the same period of 5 years, several technical training workshops were conducted for the scientists from AMSs including Brunei, Myanmar and Viet Nam. The laboratory capabilities of trainees were enhanced through both hands-on laboratory training as well as on the exchange of the latest domain knowledge. The AFRL for Mycotoxins had also been constantly benchmarking its technical competency by participating in international PTs. Several new test methods have been developed and implemented to address the emerging needs for food safety controls.



AFRL's achievements (2015 – 2019)

Future Plans

The AFRL for Mycotoxins aims to achieve ISO/IEC 17043 accreditation for its PT programmes in the next few years. For the existing accredited tests (e.g. phytotoxins), where commercially PT services are currently unavailable, the AFRL intends to seek inter-laboratory comparison studies within the regional and internationally. The AFRL will conduct a survey in 2020 to solicit for interests of AMSs in participating in such comparison studies.

Introduction to AFRL for Pesticides Residues

The AFRL for Pesticide Residues has been established since 2004. It was established under the previous name of Veterinary Public Health Centre (VPHC) of the former Agri-Food and Veterinary Authority of Singapore (AVA). In April 2019, after the re-organisation and establishment of the Singapore Food Agency (SFA), the AFRL for Pesticide Residues was subsequently placed under the National Centre for Food Science (NCFS). Since its establishment over 15 years ago, the AFRL has enhanced its capability and technical expertise in both multi-residue and single residue methods, employing the latest triple quadruple and high-resolution mass spectrometry technology. For the past few years, the AFRL for Pesticide Residues had conducted several training programmes at both ASEAN regional level and individual AMS level. Proficiency testing programmes were also organised for laboratories in AMSs.

AFRL for Pesticide Residues has been ISO/IEC 17025 accredited under the chemical and biological field of testing by SAC-SINGLAS since 2000. The renewal assessment according to the new ISO17025:2017 standards was completed in August 2019. To enhance the quality of the proficiency testing programme, the laboratory plans to achieve ISO/IEC 17043 accreditation in the next few years.

Establishment of ASEAN Laboratory Network

AFRL for Pesticide Residues has been active in engaging with the national laboratories for pesticide residues analysis in AMS. The established ASEAN laboratory network ensures the communication efficiency of AFRL for Pesticide Residues during the organization of regional capacity building activities. The list of members of the network is as shown in the following Table.

ASEAN Network on Pesticide Residues

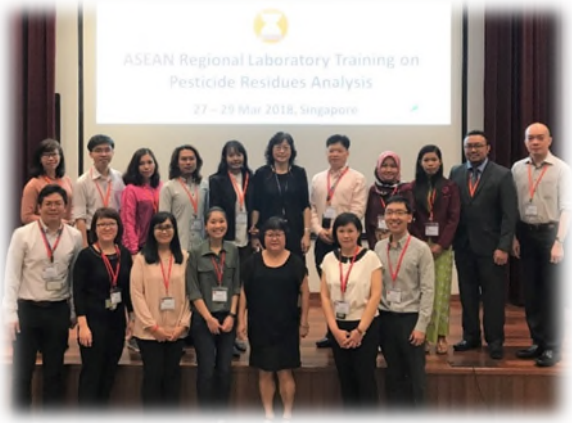
Country	Laboratory
Brunei Darussalam	Food Chemistry Section, Department of Scientific Services, MOH
Cambodia	Laboratory, Directorate-General of CAMCONTROL, Ministry of Commerce
	Industrial Laboratory of Cambodia (ILCC), Institute of Standards of Cambodia (ISC), Ministry of Industry and Handcraft
Indonesia	National Quality Control Laboratory of Drug and Food (NQCLDF)
	Balai Pengujian Mutu Barang, Ministry of Trade
	Fish Quarantine Inspection, Standard Examination Laboratory (FQISEL)/Fish Quarantine Inspection Agency (FQIA), MMFA
Lao PDR	Food and Drug Quality Control Centre
	Plant Protection Centre & Animal Health Centre, MOAF
Malaysia	Food Quality Division, Department of Chemistry, MESTECC
	Public Health Laboratory, Department of Chemistry, MESTECC
	Food Safety & Quality Laboratory, MOH
	National Public Health Laboratory, MOH
	Veterinary Public Health Laboratory (VPHL), Department of Veterinary Services, MOAA
	Agriculture Research Centre, Department of Agriculture, Sarawak
Myanmar	Agricultural Product Analytical Laboratory, Department of Agriculture, MOALI
Philippines	Bureaus of Plant Industry = PPSSD, DOA
	Food Development Centre, DOA
	SGS Philippines & Affiliates, Sentrotek
Singapore	Pesticide Residues. National Centre for Food Science, Singapore Food Agency, MEWR
Thailand	Bureaus of Quality and Safety of Food (BQSF), Department of Medical Sciences, Ministry of Public Health
	Veterinary Public Health Laboratory, Bureau of Quality Control of Livestock Products, MOA
	Coastal Aquaculture Research and Development Division, MOA
	Plant Standard and Certification Division, DOA, MOA
Vietnam	Quality Assurance and Testing Centre 3 (Quatest 3)
	National Institute for Food Control

Training Activities

AFRL for Pesticide Residues has been conducting capacity building activities for AMS over many years. Some of these training activities were organised in partnership with international organisations such as EU Reference Laboratories for Pesticide Residues, FAO, IAEA and the World Bank.

With a wide array of analytical equipment ranging from conventional GC-FPD, NPD, ECD, HPLC-FLD systems to the latest triple-Quad GCMSMS and LCMSMS systems, AFRL for Pesticide Residues is well-equipped for providing training for national laboratories of AMS.

Attachment training on Pesticide Residues for two officers from Bureau of Quality Control of Livestock Products (BQCLP) of Thailand, Singapore 2019



Regional Laboratory Training Course on Pesticide Residues Analysis in Singapore 2018.

Hands on training in Sample Preparation

Hands on training in Pesticide Residues Analysis by GC-MSMS

Training Activities (Continued)

AFRL for Pesticide Residues has conducted several training programmes for the past few years. Some of these trainings were organised at ASEAN level, and the rest were rendered to individual AMS to cater for the specific needs of the national laboratories in AMS. Participants have given positive feedback on these training activities. Most have commented that they have benefitted a lot from these training programmes and will apply the knowledge gained to their testing work to support their national pesticide residues monitoring and enforcement programme. The following Table shows the training activities conducted in the last few years.

Training activities for the past few years

Year	Title of workshop/training	Details of participating labs
2019	Training on Pesticide Residues Analysis	2 officers from Bureau of Quality Control of Livestock Products of Thailand.
2019	Global Food Safety Partnership (GFSP) Training Workshop on Pesticide Residues	10 participants from 3 countries including 2 officers from Lao DPR's Department of Agriculture and Food and Drug Department (Cambodia was invited but with no response).
2018	Regional Laboratory Training Course on Pesticide Residues Analysis	9 Labs from 5 AMSs (Brunei, Indonesia, Myanmar, Philippines and Vietnam) attended.
2017	Laboratory training on Pesticide Residues Analysis	1 Officer from Department of Chemistry, Ministry of Science, Technology and Innovation (MOSTI) of Malaysia.
2016	Laboratory training on Pesticide Residues Analysis	2 Officers from Pesticide Residues Lab under Consumer Protection and Trade Compliance, Ministry of Trade, Indonesia.

Challenges Encountered during Laboratory Training

Facilities and capabilities of pesticide residues laboratories vary among the AMSs. Triple quad GC-MSMS and LC-MSMS instruments, which are increasingly becoming the mainstream testing techniques for pesticide residues analysis, are only available in some AMSs. Furthermore, the analytical coverage for pesticide residues are insufficient in many laboratories partly due to the lack of funding for procurement of pesticides reference materials. Some laboratories need more detailed training in method validation to ensure the extraction methods used are robust with satisfactory recovery, and the methods for detection and calibration employed are able to produce reliable analytical results.

AFRL for Pesticide Residues plans to run ASEAN regional capacity-building programmes every year, in the form of either an analytical training course or a PT programme.

In 2019, the World Bank in partnership with Singapore Cooperation Programme, funded a GFSP pesticide residues training workshop conducted in Singapore by AFRL for Pesticide Residues. On the special request of AFRL for Pesticide Residues, GFSP extended an invitation to Cambodia and Laos PDR to participate as these two countries missed an earlier regional training conducted in Singapore due to various logistical and financial constraints. As discussed at the 15th AFTLC meeting, AFRL for Pesticide Residues is exploring with our international partners on the possibility to conduct on-site training and to set up pesticide residues test methods for supporting the related national food safety control programmes.

Proficiency Testing Programmes

NCFS has conducted 2 proficiency testing (PT) programme in pesticide residues in the last two years. A pilot PT was conducted in 2018, participated by those who attended the regional training course held in Singapore. Another PT round was initiated in October 2019, and is still on-going at the time of this report. Details of PT programmes and their results are shown in the Table below.

Proficiency testing programmes organised by AFRL for Pesticide Residues

Year	Matrix	Analyte	No. of Labs Participated	No. of Labs Submitted Results	Results
2018	Long Bean	Azoxystrobin Bifenthrin Chlorfenapyr Chorpyrifos Cypermethrin Cyromazine Myclobutanil Profenofos	6	4	Lab 1: detected 7 out of 8, all Z-scores within 2.0 Lab 2 : detected 6 out of 8, 3 with Z-scores within 2.0 Lab 3 : detected 5 out of 8 pesticides, 3 with Z-scores within 2.0 Lab 4 : detected 2 out of 8 (with Z-scores out of 2.0). Z-scores were satisfactory following method improvement Lab 5 and Lab 6 : No return of test results.
2019	French Bean	PT is on-going (started 14 Oct2019)	13 registered	PT is on-going	PT is on-going at the time of this report

International Collaborations

AFRL for Pesticide Residues has actively engaged and networked with other international and regional reference laboratories to exchange technical information and to promote collaborative studies. Besides supporting the AMSs, AFRL for Pesticide Residues has also contributed actively in supporting the international programmes of NCFS under its role as OIE Collaborating Centre for Food Safety as well as WHO Collaborating Centre for Food Contamination Monitoring.

Two examples of collaborative projects for setting up Codex pesticide MRL standards are as below:

2013 – 2017

ASEAN-WTO Pilot Project on Pesticide Residue Data Generation for Setting Codex MRLs of Selected Pesticide-Tropical Fruits Combination.

This is an ASEAN regional-wide project for pesticide field trial studies leading to the setting of 6 Codex MRLs standards related to dragon fruit, lychee and mango.

2016 – 2018

IAEA Technical Cooperation Programme INT 5154 Project : Working Group on Setting Maximum Residue Limit Standards of Pesticides for Minor Use Species and Related Plant Products of Public Health and Trade Importance.

Singapore is the lead country in the Working Group comprising 17 countries from Asia, Africa, and Latin America.

Participation in International Forums

AFRL for Pesticide Residues is actively involved in international forums e.g. the ASEAN Expert Working Group on the Harmonisation of Maximum Residue Limits of Pesticides among ASEAN Countries (EWG-MRLs), the Codex Committee on Pesticide Residues (CCPR).

Left: *Poster Presentation at the 12th European Pesticide Residues Workshop (12th EPRW) Munich, Germany 2018*

Right: *23rd Expert Working Group on Harmonisation of Maximum Residues Limits for Pesticide among ASEAN Member States (23rd EWG-MRLs), Singapore*

AFRL for Pesticide Residues also participates regularly in the European Pesticide Residues Workshop (EPRW). EPRW serves as a platform for AFRL for Pesticide Residues to showcase the work with the European and international counterparts. Recent posters presented at EPRW are as below:

2018 - 12th European Pesticide Residues Workshop (12th EPRW) Munich, Germany
Poster presentation: Development of a Rapid LCMSMS Method for Reliable Pesticide Residues Analysis of Fresh Produce

2015 - EURL/NRL Workshop 2015 Stuttgart, Germany
Poster presentation: Development of a Rapid GCMSMS Method for Reliable Pesticide Residues Analysis of Fresh Produce

Our Commitment

AFRL for Pesticide Residues is committed to the continuous expansion and enhancement of our expertise in pesticide residues analysis to keep ourselves abreast of international development. Some areas of development work include enhancing and broadening applicable sample matrices of existing test methods as well as developing test capabilities for newly emerging pesticides. In particular, AFRL for Pesticide Residues will further develop our analytical capabilities for the determination of highly polar pesticides by harnessing novel sample extraction techniques as well as innovative chromatographic separation and detection.

Department of Scientific Services, Brunei Darussalam

(FOOD CHEMISTRY SECTION AND MICROBIOLOGY SECTION) OF THE DEPARTMENT OF SCIENTIFIC SERVICES AND VETERINARY LABORATORY SERVICES, DEPARTMENT OF AGRICULTURE AND AGRIFOOD, IN BRUNEI DARUSSALAM

Reported by: Hjh Hasinahwati Hj Hanafi
Head of Food Chemistry Section, Department of Scientific Services
Ministry of Health, Brunei Darussalam

INTRODUCTION

Department of Scientific Services (DSS) in Brunei Darussalam through Food Chemistry Section and Microbiology Section have been actively participating in the ASEAN Food Testing Laboratory Committee (AFTLC) meetings over the years. Department of Scientific Services (DSS) under the Ministry of Health is a science-based government agency providing scientific laboratory support services in public health safety and law enforcement in Brunei Darussalam.

Laboratory consolidation in Brunei Darussalam on the 1st April 2017 has brought food laboratories from Ministry of Primary Resources and Tourism, and from the Department of Energy and Industry of Prime Minister's Office to be consolidated under the management of the Ministry of Health; consolidating with the Food Safety Section and Microbiology Section of the Department of Scientific Services. Since then the Department of Scientific Services of the Ministry of Health, has become One-Stop Centre for receiving food samples and food analysis.

One of the objectives of the Department of Scientific Services (DSS) is to provide excellent and accurate analytical services that are needed in line with current developments in the fields of health science, metrology and in assisting to fulfill food export requirement. Quality Policy implemented in DSS is to provide its customers accurate, effective and efficient scientific services of the highest level of professionalism, confidentiality and integrity and to continually improve the quality of the management system.

Laboratories in the Health Science Division that have been consolidated include laboratories from Food Chemistry Section and Microbiology Section which are now both appointed as national reference laboratories and have been accredited with ISO/IEC 17025 since 2018 with the renewal of accreditation after the laboratory consolidation. Food Chemistry Section of DSS is responsible for providing analytical support services in the analysis of food additives, contaminants, nutrition, compositions and adulterants to ensure the quality, safety and halal status of local and imported food in Brunei Darussalam. Meanwhile, the Microbiology Section provides analytical support services which include Food Microbiology, Water Microbiology and Pharmaceutical Microbiology performing analysis on food, water, pharmaceuticals, stools, swabs and cosmetics.

Meanwhile, Veterinary Laboratory Services of the Department of Agriculture and Agrifood under the Ministry of Primary Resources and Tourism is responsible for testing food products of animal origin in supporting veterinary public health program. The laboratory is also responsible for chemistry testing on veterinary drug residues/antibiotics and microbiology testing (i.e. food pathogens). The Veterinary Laboratory under the Department of Agriculture and Agrifood is also an ISO/IEC 172025 accredited laboratory.

PARTICIPATION IN TRAINING PROVIDED BY ASEAN FOOD REFERENCE LABORATORIES

ASEAN Food Reference Laboratories provide platform for national laboratories in Brunei Darussalam in establishing and strengthening specialized areas in scientific services. As Brunei Darussalam is an ASEAN member state (AMS), both the Department of Scientific Services (DSS) and the Department of Agriculture and Agrifood (DoAA) are committed to participate in the laboratory trainings and proficiency testing programs conducted by ASEAN Food Reference Laboratories (AFRLs). Through these ASEAN collaborations with AFRLs, it has benefitted laboratories in DSS in the capacity building, enhancing the technical skill and upgrading staff competency.

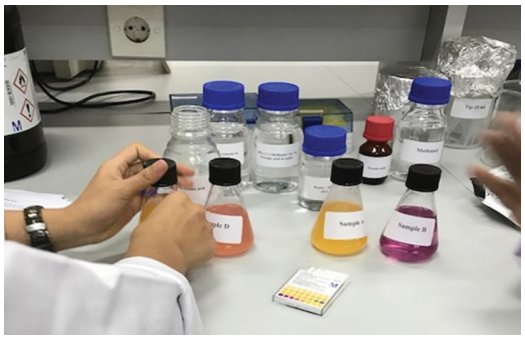
The list and details of training conducted by AFRLs and participated by Brunei Darussalam in 2018/2019, are as summarized in the table below:

No	Title	Date	Conducted by AFRL
1	ASEAN Food Contact Material training on the analysis of plasticizers in food contact materials and food products	19 - 23 March 2018	Department of Science and Service, Ministry of Science and Technology (MOST), **Thailand**
2	ASEAN Regional Laboratory training on pesticide residue analysis	27 - 29 March 2018	Singapore Food Authority (SFA) formerly known as Veterinary Public Health Centre of Agri-Food & Veterinary Authority of Singapore (AVA), **Singapore**
3	ASEAN Training for VDR Workshop 2018: Nonsteroidal Anti-Inflammatory Drug Residues in Animal Product	17 - 20 July 2018	Veterinary Public Health Laboratory, Bureau of Quality Control of Livestock Products, **Thailand**
4	ASEAN training on the Analysis of Food Additives (Food Colors) and Illegal Dyes in Food Products	23 - 27 July 2018	National Quality Control Laboratory of Drug and Food (NQCLDF), The National Agency of Drug and Food Control (NADFC), **Indonesia**
5	ASEAN Regional Training on analysis of indicator Polychlorinated Biphenyls (PCBs) in Food	15 - 17 October 2018	Veterinary Public Health Laboratory, Agri-Food & Veterinary Authority of **Singapore**
6	ASEAN FCM Training 2019: Food Contact Regulations for Rubber Products	18 - 21 March 2019	Department of Science Service (DSS), Ministry of Science and Technology, **Thailand**
7	ASEAN Food Reference Laboratory for Veterinary Drug Residue Workshop 2019: Method Validation for Veterinary Drug Residues	30 July - 2 August 2019	Veterinary Public Health Laboratory, Bureau of Quality Control of Livestock Products, **Thailand**

The participation by Brunei Darussalam in the trainings has benefitted laboratories in Brunei Darussalam. The trainings have provided analytical methods or procedures including the application of analytical instrument with specific detectors used for a particular analysis that can be implemented in the DSS laboratory. Laboratory staffs were given opportunity to learn new methods and techniques in the sample preparation with 'hands on training' on sample extraction up to the interpretation of results.

PARTICIPATION IN TRAINING PROVIDED BY ASEAN FOOD REFERENCE LABORATORIES (CONTINUED)

As an example, laboratory training on pesticide residue analysis has provided the participants from DSS, particularly Food Chemistry Section's lab personnel to increase their capacity building by learning about the effective strategies on focusing and narrowing down on pesticide residues analysis to be performed and also the importance of multi residue analysis.



ASEAN training on Veterinary Drug Residue Workshop in Bangkok in 2019

ASEAN training on veterinary drug residue workshop in Bangkok in 2019, specifically touched on method validation for veterinary drug residues. It was attended by Brunei participants from both the Department of Scientific Services of the Ministry of Health and Department of Agriculture and Agrifood of the Ministry of Primary Resources and Tourism.

The training has benefitted Brunei participants with the methodology that can be adopted and implemented to be used for analysis in the laboratory and a potential for new scope of test method for accreditation.

ASEAN training on the Analysis of Food Additives (Food Colors) and Illegal Dyes in Food Products

The training has provided participants with the knowledge on regulations of illegal dyes in other AMS. The 5-day training provided was comprehensive which included lectures on method validation and method verification on illegal dyes and 'hands on analysis' in the laboratory. This enabled DSS laboratory to make a comparison between the current method practiced in the laboratory and the methods studied during the training in terms of techniques in sample preparation and qualitative & quantitative analysis.

PARTICIPATION IN TRAINING PROVIDED BY ASEAN FOOD REFERENCE LABORATORIES (CONTINUED)

ASEAN training on the Analysis of Food Additives (FoodColors) and Illegal Dyes in Food Products 23rd-27th July 2018, Indonesia

ASEAN Regional Training on Analysis of indicator Polychlorinated Biphenyls (PCBs) in Food, 15-17th October 2018, Veterinary Public Health Laboratory, Agri-Food & Veterinary Authority of Singapore, now known as Singapore Food Agency

ASEAN training on the Analysis of Food Additives (Food Colors) and Illegal Dyes in Food Products, 23rd-27th July 2018, National Quality Control Laboratory of Drug and Food (NQCLDF), Indonesia

CONSTRAINTS AND CHALLENGES

1. Gaps in Microbiology Training

In 2018-2019, Brunei Darussalam has the opportunity to participate in the training for Chemistry testing, however, there was no participation made for microbiology testing.

2. Lack of Test Demands

As a government laboratory, testing in DSS laboratory and the expansion of the scope of analysis are based on the requirement of clients. As for example, the analysis of food contact materials (FCM) i.e. on the migration of the food contact materials to the food samples have been studied in the training, however, due to the lack of demand for this type of analysis in the country, the method has not been validated by the laboratory.

Analysis on Polychlorinated biphenyls (PCBs) contents in food also has not been requested by any clients up till now. In addition currently there is no regulations on PCBs in food in Brunei Darussalam.

Brunei Darussalam's participants had the opportunity to attend a 3-day ASEAN-EU joint training workshop on GMO on Quantitative Detection held in Veterinary Public Health Centre, AVA Singapore, held in June 2019. So far, up till now, GMO testing have not been conducted in any laboratories in Brunei Darussalam as there has not been any requests for this particular test. The training, however, has benefitted Brunei Darussalam as the techniques of molecular work for GMO can be adopted and applied to halal related analysis i.e. in sample preparation, quantification of target DNA and in performing method validation.

3. Establishment of Potential Area for AFRLs

Training on molecular biology on authentication such as DNA meat species identification and protein immunoassay have not been conducted as AFRL has not been established for these particular food testing. Food Chemistry Section of Department of Scientific Service is interested to expand the knowledge on the molecular work by continuous training participation particularly for training on food authenticity especially on halal related analysis by applying molecular techniques in sample preparations followed by the quantification and identification of targeted DNA in the food samples.

Brunei Darussalam has identified gaps for certain analysis and there is a need to have policies or regulations in place, in order for enforcement agencies of laws/regulations to impose any non-compliance in the food standards.

ACTIVITIES OF FOOD CHEMISTRY SECTION AND MICROBIOLOGY SECTION, DSS

The Department of Scientific Services through Food Chemistry Section and Microbiology Section have been actively participating in Brunei Halal Showcase (BruHAS) which is annually organized by the Ministry of Energy and Industry of Brunei Darussalam. The objective of the participation for both Sections is to introduce and to expose laboratory services related to Halal Science in the scope of Halal Thayyiban.

During the expo the Department shares information and exhibits laboratory services on molecular biology testing and analytical chemistry particularly for halal food related analysis and microbiology testing for the scope of food safety, quality and food hygiene.

Brunei Halal Showcase 2019
11-15th November 2019

Brunei Halal Showcase 2018

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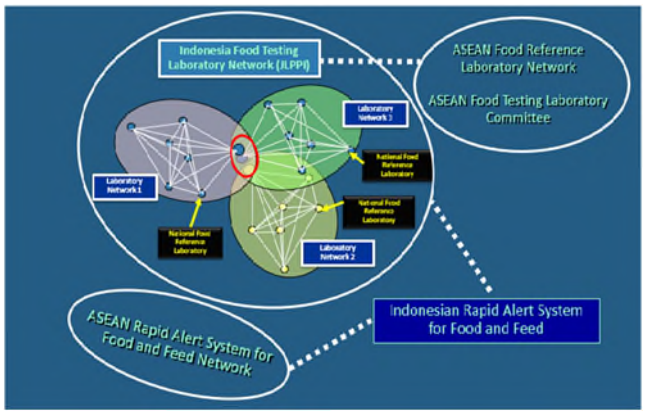
Indonesian Food Testing Laboratory Network

About JLPPI

The Indonesian Food Testing Laboratory Network (JLPPI) is a network that enables the collaboration and connectivity of Indonesia food laboratories. The laboratories consist of all centers and provincial laboratories and some private laboratories. The Network was established in 2014 and initiated by the government of Indonesia 5 Ministries and 3 Agencies i.e. Ministry of Industry, Ministry of Trade, Ministry of Marine and Fishery, Ministry of Agriculture, Ministry of Health, and National Agency of Drugs and Food Control. The Network is formalized under Minister of Industry No 12/2014 about JLPPI. Its primary role is to integrate and increase Indonesia food testing laboratories in order to ensure the quality and safety of Indonesia food products to support the international trade. Moreover, the goal is also to strengthen the performance of all laboratories within the network. The creation of JLPPI refers to the ASEAN Food Testing Laboratory Committee (AFTLC) establishment.

JLPPI connectivity covers external and internal areas. In the external areas, the JLPPI connects



The JLPPI Network

with the Indonesian Rapid Alert System for Food and Feed (INRASFF) and AFTLC.

The connection with INRASFF is aimed for updating knowledge on food safety issues, while connection with AFTLC for updating information on ASEAN Food Reference Laboratory (AFRL) activities.

Meanwhile, in internal areas, its committee consist of government institutions that have food laboratories in different areas. Whereas private laboratory is connected to JLPPI by being a member of a National Food Reference Laboratory (NFRL) based on its testing expertise.

National Food Reference Laboratories (NFRLs) established by JLPPI

JLPPI established National Food Reference Laboratory (NFRL). By 14 September 2018, approved 10 NFRLs for different competences which are derived from the AFRLs. In addition, the area of competence is determined by urgent needs related to food safety issues in Indonesia as well. Only government laboratories may apply as the NFRL.

Some government institutions may apply for new NFRLs for specific testing areas. The area is not necessary to be included in HS 16 - 22, however it should be classified as food depends on the needs of food safety issues in Indonesia. For example, it is agreed that the JLPPI will endorse 2 new NFRLs for quality of grains of rice and fish and fish products endorsed next year.

Each NFRL is linked to an AFRL based on its area of competences by being the member of AFRL network. Meanwhile, members of NFRLs are laboratories from the NFRL institution, laboratories across ministries/ agencies either in center or provincial level, and private laboratories. The task and function of NFRL refer to the Industrial Minister of the Republic of Indonesia Decree No 14/2014 and those of AFRLs', which includes provision of training, organizing proficiency testing, and information sharing.

National Food Reference Laboratories (NFRLs) established by JLPPI

To enhance the knowledge and skill, NFRLs also encourage their members to attend regional and international meetings, participate in training or proficiency testing programs, and be a member of regional and international organizations. NFRLs which participate in activities conducted by regional or international organization or agencies, including AFRL, are mandatory to transfer their knowledge and skill to their laboratory networks. The list of NFRLs is as follows:

No	Institution	Area of NFRL	Matrices
1	Center for Developing Testing of Food and Drugs, National Agency of Drugs and Food Control	Food Additives	Processed Food
2	Center for Developing Testing of Food and Drugs, National Agency of Drugs and Food Control	Microbiology	Processed Food
3	Center for Developing Testing of Food and Drugs, National Agency of Drugs and Food Control	GMO and DNA specific species	Processed Food
4	Center for Developing Testing of Food and Drugs, National Agency of Drugs and Food Control	Mineral and Heavy Metal	Processed Food
5	Center for Developing Testing of Food and Drugs, National Agency of Drugs and Food Control	Mycotoxins	Processed Food
6	Center for Agro-Based Industry, Ministry of Industry	Mycotoxins	Raw Materials and Intermediate Materials
7	Center for Agro-Based Industry, Ministry of Industry	Heavy Metal	Raw Materials and Intermediate Materials
8	Center for Chemicals and Packaging, Ministry of Industry	Food Packaging	-
9	Fish Quarantine and Inspection Standard Examination Laboratory (FQI SEL), Ministry of Marine Affairs and Fisheries	Microbiology	Fish and fish products
10	Directorate of Standardization and Quality Control, Ministry of Trade	Pesticide Residues	

NFRL Activities

To achieve the goal of JLPPI, NFRLs conduct many activities to strengthen the laboratories within their networks. NFRLs conduct a provision of training for laboratories to improve the competence of laboratory personnel, organizing proficiency testing programs to improve a laboratory performance, and workshop/ FGD to share updated information on related areas. In order to share information on conducted activities among them, NFRLs are required to report all activities annually to the JLPPI committee. The committee has experts to monitor, review, and evaluate NFRLs' activities.

Training programmes

Training on Food Additives

Proficiency Testing Program

Sample Preparation for Proficiency Testing Program

JLPPI Seminar

JLPPI Seminar

On the other hand, JLPPI itself also holds seminars/workshops to promote the JLPPI programs and activities, it's NFRLs, and of course share information on food safety to related stakeholders, such as government, association, business, and other food testing laboratories. A complete information on JLPPI, NFRLs, and any other essential information on food safety in Indonesia could be found in JLPPI website, www.jlppi.or.id.

Physikalisch-Technische Bundesanstalt – The National Metrology Institute of Germany

In Braunschweig and Berlin, time comes from atomic clocks, lengths are measured far into the nano-world, scientists do research on fundamental questions concerning the physical units, and the employees in the laboratories calibrate measuring instruments, meeting the most demanding requirements.

Therefore, the Physikalisch-Technische Bundesanstalt is among the top names in metrology worldwide. As Germany's national metrology institute, PTB is Germany's highest authority when it comes to correct and reliable measurements for more than 125 years. It is the supreme technical authority of the Federal Ministry for Economic Affairs and Energy (BMWi) and employs a total of approx. 1900 staff members.

International Cooperation of PTB

For more than 50 years, PTB has shared its core competence in international development cooperation. It supports developing and emerging economies in the comprehensive field of quality infrastructure. PTB contributes to sustainable economic, social and ecological development. PTB is committed to the development policy of the German Government and acts according to international goals (Sustainable Development Goals, Paris Declaration).

Quality infrastructure. A complex network.

Quality can be measured. It provides information about the degree to which products or services comply with existing requirements. The features are objective and measurable, and they are legally or contractually defined. Proving compliance of products and services with national and international specifications requires a consistent network, known as quality infrastructure. It consists of various institutions that provide services for state, industry and consumers.

Conformity assessments are based on a recognized quality management system. Industrial production requires measurement devices whose accuracy has been verified. Test laboratories are needed whose competence is confirmed. Those who offer calibration, inspection and certification services as well as those which grant accreditation must also prove their abilities. This all forms a complex system that is firmly linked to international standards. An internationally recognized quality infrastructure serves objectives in terms of safety, environment, health and consumer protection and, in developing countries and emerging economies, contributes to sustainable economic, ecological and social development.

Strengthening Quality Infrastructure in ASEAN

For more than 10 years, PTB provides support to the Association of Southeast Asian Nations (ASEAN) and the ASEAN Consultative Committee on Standards and Quality (ACCSQ) respectively to build up a regional quality infrastructure. The current project has started in January 2019 and will last until December 2021. The project is funded by the German Ministry for Economic Cooperation and Development (BMZ).

Objective

Members States are enabled to gear trade-relevant procedures of quality infrastructure to regional guidelines and international good practices, with special emphasis on the CLM countries and food safety.

Approach

The ten Member States of the ASEAN Economic Community (AEC) are striving towards economic integration to enable the free movement of goods and services as well as the free movement of capital and labour. One prerequisite for the trade of goods and services is that these comply with agreed standards and technical regulations. The basis for this is a well-functioning quality infrastructure. Quality infrastructure refers to all the processes that are necessary for quality assurance and the protection of consumers. In addition to standards and technical regulations, it also includes metrology, accreditation, certification and testing. Compliance must, on the one hand, be harmonized at the regional level and, on the other hand, it must be verifiably implemented at the national level.

This project marks the third phase of cooperation between PTB and the ASEAN Sectoral Body under the purview of the ASEAN Economic Ministers – the ASEAN Consultative Committee on Standards and Quality (ACCSQ). The project supports the ACCSQ and its related working groups on 1) Standards, 2) Accreditation and Conformity Assessment, 3) Legal Metrology and 4) the Prepared Foodstuff Product Working Group (PFPWG) in developing regionally harmonized guidelines and mechanisms which are aligned with international standards and best practices.

To enable practical implementation of regionally harmonized guidelines at the national level, it provides capacity building through technical train-the-trainers seminars. With the objective of reducing heterogenicity, it supports ASEAN's efforts to narrow down the development gap by providing specific trainings and consultancy services to the CLM countries (Cambodia, Lao PDR and Myanmar). In addition, there will be awareness raising activities on quality infrastructure for the private sector, regulatory authorities and consumers.

Impact

Through an increasingly harmonized set of regulations and the development of national capacities in the field of quality infrastructure, ASEAN will be supported in the process of regional harmonization. Thanks to improved capacities at the national and regional levels, the ASEAN Member States will benefit more readily from the ASEAN Economic Community's trade potential. In particular, small and medium-sized enterprises, which depend on locally available QI services to support their participation in the regional and international markets, will have access to better services. Ultimately, consumers in ASEAN benefit as well, gaining better access to services and reaping the benefits of improved product quality, better overall health and consumer protection.

Acknowledgements

From the Editorial Team

AFTLC Bulletin, Second Issue (2020)

The editorial team would like to thank various parties for their contributions and involvement in the development of the bulletin.

We would like to express our appreciation to PTB for their contribution to the content and providing support for the printing of the bulletin.

We are also very grateful to the AFRLs for Microbiology (Vietnam), Mycotoxins (Singapore), Pesticide Residues (Singapore) and the NFRLs from Brunei Darussalam and Indonesia for providing with timely responses and sharing highlights and updates of events happening in the laboratories.

In addition, we are also very thankful for the support provided by the management of National Centre for Food Science, Singapore Food Agency, in the development of the bulletin.

Last but not the least, the editorial team wishes to thank all readers for taking time to read through this bulletin. We hope that you would be updated on the capability building activities carried out in the ASEAN Member States.

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