

FULL-YEAR REPORT ON THE ACTIVITIES OF THE AFRL FOR HEAVY METALS AND TRACE ELEMENTS
DEPARTMENT OF MEDICAL SCIENCES (DMSc)
THAILAND
(OCTOBER 2023 – SEPTEMBER 2024)

No.	Program	Activities		Period & location	Comments / Outcome
		ASEAN/ International level	National level		
1	Recommendation on new analytical methods	Ready to inform if requested	Ready to inform if requested	-	-

2	AFRL's organization / coordination of Proficiency Testing (PT) or Comparative Testing (CT) Programs	-	Organization of PT scheme (BQSF WA 01-67): 10 heavy metals and trace elements (total As, Cd, Cu, Fe, Mn, Pb, Ag, Cr, Ni and Zn) in water, 61 participants from private and public laboratories, 60 submitting laboratories (accredited in compliance with ISO/IEC 17043: 2010)	Feb – May 2024	<u>PT results:</u> The participants achieved satisfactory z-scores: - 95.1% for total As, - 89.1% for Pb - 81.0% for Cd - 86.1% for Cr - 95.1% for Cu - 90.6% for Mn - 91.4% for Ni - 80.6% for Ag - 90.3% for Fe - 87.5% for Zn <u>Follow-up actions:</u> Suggested the participating labs to find out the corrective actions.
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			Organization of PT scheme (BQSF CB 02-67): 4 heavy metals and trace elements (Pb, Cd, total As, total Hg) in cannabis/hemp/products, 32 participants from private and public laboratories (accredited in compliance with ISO/IEC 17043: 2010)	Mar - Jun 2024	PT results: The participants achieved satisfactory z-scores: - 93.8% for total As; - 87.5% for Pb; - 87.5% for Cd; - 81.3% for total Hg;
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		Organization of PT scheme (BQSF ME 01-67): heavy metals (8 metals: total As, iAs, Cd, Cu, Fe, Pb, total Hg and Zn) in Seaweed at both national and ASEAN levels - Applied to PT: 53 laboratories (29 labs from private and public laboratories in Thailand and 24 labs from 7 AMSs) - Submitting results: 48 laboratories; 28 labs from private and public laboratories in Thailand and 20 labs from 7 AMSs as follows: Indonesia = 7 laboratories Laos = 2 laboratories Vietnam = 1 laboratory Malaysia = 1 laboratory Myanmar = 6 laboratories Brunei = 2 laboratories Singapore = 1 laboratories Thailand = 28 laboratories (accredited in compliance with ISO/IEC 17043: 2010)		Mar – Jun 2023	<u>PT results:</u> The final PT report was sent in July 2024 The participants achieved satisfactory z-scores as follows: 64.9% for total As; 62.5% for Cd; 75.0% for Cu; 62.9% for Fe; 55.6% for Pb; 65.6% for Zn; 50% for total Hg (assigned value = 0.0123 mg/kg) Note: The Z-score of iAs was not assessed due to the lack of minimum testing numbers. <u>Follow-up actions:</u> Suggested the participating labs to find out the corrective actions.
3	Provision of training at ASEAN or national level	-	Workshop on “Determination of heavy metals in food with ICP-MS and inorganic arsenic in food with HPLC-ICP-MS”	6 – 10 Nov 2023	Provided practical training for 9 scientific officers from 4 Regional Medical Science Centers (RMSCs)

		“Technical Training of Quantitative Heavy Metals Analysis in Rice” (Online) - 51 participants from 9 AMSs	-	17-19 Jul 2024 (online)	- Joint activity with the Bureau of Quality and Safety of Food, Ministry of Public Health of Thailand under the ASEAN – PTB Phase IV Workplan for AFTLC, AFRL for Heavy Metals and Trace Elements held the online meeting based on the needs of CLMV, supported by PTB The invitation letter was sent in May 2024 to NFRLs and the lab network for participation in the training by PTB. There were 51 participants from 9 AMSs: Indonesia, Vietnam, Laos, Brunei, Thailand, Myanmar, the Philippines, Cambodia, and Malaysia, who attended the training. The online training had three sessions as follows: 1) Technical instruments and heavy metals analysis in rice 2) Method validation/verification 3) Measurement uncertainty
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4	Information dissemination on Certified Reference Materials [CRM] and other areas	Ready to inform if requested (no request received)	-	-	-
5	Participation in national and international forums to strengthen technical capabilities	Participation in the 23rd AFTLC (3 persons) Participation in the 17th Codex Committee on Contaminants in Foods (CCCF), held in Panama (2 person) Participation in the 24th AFTLC (2 persons)	Participation in the 32nd Annual Medical Sciences Conference (3 persons)	19 - 20 Oct 2023 (on-line) 15-19 Apr 2024 (on-site) 20-21 Mar 2024 (on-line) 5-7 Jun 2024 (on-site)	- Update the process in the development of MLs related to heavy metals in foods - 3 poster presentations

6	Collaborative programs with other agencies	The project of Strengthening Quality Infrastructure in ASEAN”, Phase IV, 2023-2026 is implemented by the Physikalisch-Technische Bundesanstalt (PTB), Germany, and AFRL for Heavy Metals and Trace Elements, BQSF, DMSc under the ASEAN Consultative Committee on Standards and Quality (ACCSQ) to provide the technical support, regarding the Heavy metals analysis in food for CLMV, based on their needs and gap analysis. Thus, this project focused on strengthening the lab capacities as a step to get accreditation of ISO/IEC 17025	7	Project period: 2023 to 2026	AFTLC-PTB requested Technical Training in Heavy Metals Analysis for CLMN to improve the CLMV based on the identified gap analysis. The AFTLC assigned AFRL for Heavy Metals and Trace Elements to provide the training in collaboration with PTB. PTB decided to set the 2 minimum training as follows: -Online technical training on technical instruments and heavy metals analysis in food, method validation/verification, and measurement uncertainty. (2 experts from AFRL for HMTE) -Onsite technical training on technical instruments and heavy metals analysis in food, method validation/verification, and measurement uncertainty, using AMS laboratory (2 experts from AFRL for HMTE) Outputs: - Method verification plan for quantitative analysis of heavy metals in Food - MV and MU report - SOP
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7	AFRL's participation in PT/CT programs.	PT FAPAS for heavy metal analysis of As (total), Cd, Cu, Fe, Pb, Mn, Hg (total), Ni, Se, Zn in Nutritional Food Supplement		Nov 2023	Satisfactory z-score results: As (total) = -0.7, Cd = -0.9 Cu = 0.6, Iron = -0.1 Pb = -1.4, Mn = 0.2 Hg (total)= 1.2, Nickel = 0.0 Se = -1.4, Zn = 0.8
		PT FAPAS for routine metal analysis for Al, Pb, Cd, Cu, Zn, Cr, Ni, Fe and Mn in drinking water		Jan 2024	Satisfactory z-score results: Al = 0.5, Cd = -0.6, Cr = -0.3, Cu = 0.0 Fe = -0.1, Pb = 1.0 Mn = 0.0, Ni = -0.7 Zn = 0.4
		PT FAPAS for heavy metal analysis of As (total), Cd, Cu, Pb, Hg (total), Ni, Zn in Coffee (Ground)		Jan 2024	Satisfactory z-score results: As (total) = -1.2, Cd = -0.4 Cu = 0.2, Pb = 1.7 Hg (total) = -0.3, Ni = -0.1 Zn = 0.4
		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Hg (total) in Canned Crab Meat		Jan 2024	As (total) = 1.4 As (inorganic) = 0.8 Cd = 0.3 Hg (total)= 0.3

		PT FAPAS for heavy metal analysis of As (total), Cd, Fe, Pb, Mn, Ni, Cd, Hg (total), Methyl Mercury in Salt		Mar 2024	Satisfactory z-score results: As (total) = 0.7, Cd = 0.6 Iron = 0.3, Pb = 1.2, Mn = 1.2, Ni = 0.2, Cd = 0.2, Hg (total) = 0.0, Methyl Mercury = 0.1
		PT FAPAS for heavy metal analysis of Sb, Cd, Cr, Pb, Ni, As (total), As (inorganic), Hg (total) in Infant Formula		Apr 2024	Satisfactory z-score results: Sb = 0.5, Cd = -0.3 Cr = 1.7, Pb = 0.8 Ni = -0.9, As (total) = 0.3 As (inorganic) = -0.1 Hg (total) = 0.2
		PT FAPAS for heavy metal analysis of As (total), Cu, Fe, Pb in Vegetable Oil		Jun 2024	Satisfactory z-score results: As (total) = -1.4, Cu = -1.0 Iron = -1.1, Pb = 0.4
		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Cu, Fe, Pb, Mn, Hg (total), Ni, Zn in Powdered Brown Rice		Jul 2024	Satisfactory z-score results: As (total) = 0.2 As (inorganic) = 0.0 Cd = -0.6, Cu = 0.1 Iron = 0.2, Pb = 1.0 Mn = -0.1, Hg (total) = -0.9 Nickel = 0.3, Zn = 0.9

8	Status of accreditation by AFRL under ISO/IEC 17025	-	-	-	- ISO/IEC 17025: 2017 accredited since March 2020-Present - Scope extension ISO/IEC 17025: 2017 heavy metals (Pb Cd, As in herbs since 2021-Present - ISO/IEC 17043:2010 accredited since Aug 2012-Present - Scope extension ISO/IEC 17043: 2010 of heavy metals in cannabis/hemp/their products since Feb 2023 - Present
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9	Other activities	-	On-site visit to RMSC for strengthening food laboratory testing capacity in heavy metal analysis to 3 RMSCs (Saraburi, Surat Thani and Ubon Ratchathani)	27 May – 2 July 2024	Supervised RMSCs officers based on the demand of RMSCs, regarding heavy metals and trace elements analysis in food - Internal quality control - Technical assistance - Analytical instrument (window and wavelength selection)
			Participated in the training on the topic “ISO/IEC 17043: 2020”	1-2 Feb 2024	
			Participated in lab safety assessment under the Enhancement of Safety Practice of Research Laboratory (ESPreL) project, Thailand	2022-present	Experimented safely in the laboratory, involving management system, infrastructure, chemicals, and inventory

- a. Major changes at the AFRL (in terms of technical staff, policy, location, instrumentation, scope of work etc.)
- Mrs. Wischada Jongmevasna, new Director of the Bureau of Quality and Safety of Food (BQSF)
- b. Recommendations
none

Information provided by: Mr. Sirichai Sunya and Mr. Kanphirom Lertbumroonchai

Representative of AFRL: Mr. Supat Sangsuay and Mr. Sirichai Sunya

Designation: AFRL for Heavy metals and Trace elements

Date: 8 October 2023