

FULL-YEAR REPORT ON THE ACTIVITIES OF THE AFRL FOR HEAVY METALS AND TRACE ELEMENTS
DEPARTMENT OF MEDICAL SCIENCES (DMSc)
THAILAND
(OCTOBER 2022 – SEPTEMBER 2023)

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 33-66): 10 heavy metals and trace elements (total As, Cd, Cu, Fe, Mn, Pb, Ag, Cr, Ni and Zn) in water, 58 participants from private and public laboratories (accredited in compliance with ISO/IEC 17043: 2010)	Feb – May 2023	<u>PT results:</u> The participants achieved satisfactory z-scores: - 97.6% for total As, - 85.4% for Cd - 95.1% for Cu - 91.4% for Fe - 90.2% for Mn - 95.7% for Pb - 89.7% for Ag - 88.2% for Cr - 96.9% for Ni - 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 07-66): 4 heavy metals and trace elements (Pb, Cd, total As, total Hg) in cannabis/hemp/products, 33 participants from private and public laboratories (accredited in compliance with ISO/IEC 17043: 2010)	Jan - Jun 2023	PT results: The participants achieved satisfactory z-scores: - 97.0% for total As; - 90.6% for Pb; - 97.0% for Cd; - 90.6% for total Hg;
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		Organization of PT scheme (BQSF ME 06-66): heavy metals (7 metals: Cd, Pb, total Hg, total As, Fe, Mn and Zn) in Rice Flour at both national and ASEAN levels - Applied to PT: 51 laboratories (19 labs from 7 AMSs and 32 labs from private and public laboratories in Thailand) - Submitting results: 50 laboratories (18 labs from 7 AMSs and 32 labs from private and public laboratories in Thailand) (accredited in compliance with ISO/IEC 17043: 2010)		Feb – Jun 2023	<u>PT results:</u> The final PT report was sent in June 2023 The participants from AMS achieved satisfactory z-scores as follows: 96% for Cd; 89% for Mn; 87% for Zn; 82% for Pb; 80% for total As; 78% for Fe; 44% for total Hg (assigned value = 0.0158 mg/kg). <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-OES in compliance with national food law, the notification of the Ministry of Public Health (No. 414) B.E. 2563 (2020)”	12 – 13 Jan 2023	Provided practical training for 33 scientific officers from 14 Regional Medical Science Centers (RMSCs) and Bureau of Quality and Safety of Food (BQSF), Thailand

		Workshop on “Determination of the amounts of inorganic arsenic in aquatic animals with HPLC-ICP-MS” (Online) - 98 participants from 10 AMSs - 94% of the participants passed the post-test and obtained the certificate of attendance.	-	2 May 2023 (online)	- A questionnaire was sent in mid-Aug 2022 to NFRL and the lab network to survey their interests and their expectations in this workshop (13 Responses from 6 AMSs: BN, IND, Lao, MY, MYN, VNM). - Overview of the collaboration and roles of AFRL for HMTE - Pre-test - Lecture on the determination of the amounts of inorganic arsenic in aquatic animals with HPLC-ICP-MS - Online practical training (demonstration in lab testing step-by-step) - Post-test
		Training on analysis of metals and water by AAS at National Center of Food and Drug Analysis, Lao PDR (2 experts from AFRL for HMTE)	-	7-12 May 2023 At NCFDA, Lao PDR (supported by ARISE Plus)	On-site visit on the topic “Method verification on the determination of metals in water by the AAS technique”

		On-site visit for 2 officers from NCFDA, Lao PDR on “A knowledge sharing mission between DMSc and NCFDA”.	-	15-16 Jun 2023 at AFRL for HMTE, Thailand (supported by ARISE Plus)	On-site visit on the quality control assurance in the accredited laboratory
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 21 st AFTLC (3 persons)		12 - 13 Sep 2022 (through Video Conference)	-
		Participation in the 22 th AFTLC (2 persons)		22-23 Feb 2023 (through Video Conference)	-
		Participation in the 15 th Codex Committee on Contaminants in Foods (CCCF) (1 person)		9-13, 24 May 2022 (through Video Conference)	Update the process in the development of MLs related to heavy metals in foods
			Participation in 31 st The Annual Medical Sciences Conference (3 persons)	21-23 Jun 2023 (on-site)	2 Poster presentations 1 Oral presentation
			Participation in the National Conference of Consumer Protection in Health Products (2 persons)	30 Aug - 1 Sep 2023 (on-site)	2 Oral presentations

6	Collaborative programs with other agencies	-	A collaborative project between AFRL for Heavy Metals and Trace Elements, Department of Medical Sciences (DMSc) and National Center for Food and Drug Analysis (NCFDA), Lao PDR, with the support of ARISE-Plus. This collaborative project is focused on the implementation of ISO/IEC 17025:2017 quality system in NCFDA chemical food testing laboratory, i.e. laboratories of heavy metals in water.	Project period: Jun 2021 to Nov 2022, with the project extension to Nov 2023	-Training on analysis of metals and water by AAS at National Center of Food and Drug Analysis, Lao PDR (2 experts from AFRL for HMTE) -Study visit for 2 officers from NCFDA, Lao PDR on “A knowledge sharing mission between DMSc and NCFDA”. Outputs: -Method verification plan for quantitative analysis of 8 heavy metals (Pb, Cd, As, Fe, Cu, Cr, Hg and Mn) in water -MV reports of determination of metals in water by AAS -MU reports of determination of metals in water by AAS
7	AFRL’s participation in PT/CT programs.	PT FAPAS for heavy metal analysis for As (total), Cu, Cd, Pb, Hg (total) and Fe in Sugar	-	Dec 2022	As (total) = 0.2, Cu = -0.8, Cd = 0.4, Pb = 1.8, Hg (total) = 0.4, Fe = 0.1

		PT FAPAS for routine metal analysis for Al, Pb, Cd, Cu, Zn, Cr, Ni, Fe and Mn in drinking water	-	Jan 2023	Satisfactory z-score results: Al = 0.6, Pb = 0.3, Cd = -0.7, Cu = -1.8, Zn = -1.0, Cr = -1.2, Ni = -1.2, Fe = 0.7, Mn = -0.7
		PT FAPAS for heavy metal analysis for As (total), Cd, Pb, Hg (total) and Fe in milk powder	-	Jan 2023	Satisfactory z-score results: As (total) = -0.8, Cd = -0.7, Pb = 0.6, Hg (total) = -0.3
		PT FAPAS for heavy metal analysis for Cd, Pb, Fe and Sn in tomato paste		Feb 2023	Satisfactory z-score results: Cd = 0.1, Pb = -0.8, Fe = 0.0, Sn = -0.3
		PT FAPAS for metal analysis for Ag, Ba, As, Se, Sb, Sn, and Hg in water	-	Mar 2023	Satisfactory z-score results: Ag = -1.3, Ba = -0.2, As = -0.1, Se = -1.1 Sb = 0.9, Sn = 1.5. Hg = -1.4
		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Pb, Hg (total) and Ni in rice cake	-	Apr 2023	Satisfactory z-score results: As (total) = 0.9, As (inorganic) = -0.3, Cd = 0.6, Pb = -0.1, Hg (total) = 1.9, Ni = -0.1
		PT FAPAS for heavy metal analysis of Al, As (total), Cd, Pb and Ni in tea (dried)	-	May 2023	Satisfactory z-score results: Al = 0.3, As (total) = 0.5, Cd = 0.2, Pb = 0.5, Ni = -0.3

		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Cu, Fe, Pb, Mn, Hg (total) Ni and Zn in powdered brown rice	-	July 2023	Satisfactory z-score results: As (total) = 0.6, As (inorganic) = 0.1, Cd = 0.2, Cu = 0.4, Fe = 0.1, Pb = 0.1 Mn = 0.2, Hg (total) = 0.9, Ni = 0.3, Zn = 0.2
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

9	Other activities	-	On-site visit to RMSC for strengthening food laboratory testing capacity in heavy metal analysis to 7 RMSCs Participated in the training on the topic “ISO/IEC 17043: 2020” Participated in lab safety assessment under the Enhancement of Safety Practice of Research Laboratory (ESPreL) project, Thailand	May - June 2023 2021 Sep 2023 2022-present	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) Experimented safely in the laboratory, involving management system, infrastructure, chemicals, and inventory
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- a. Major changes at the AFRL (in terms of technical staff, policy, location, instrumentation, scope of work etc.)
- Dr. Yongyut Thammawut, MD; new Director General of Department of Medical Sciences (DMSC)
 - Mrs. Lekha Prasartthong, the former Director of the Bureau of Quality and Safety of Food (BQSF), has retired. Ms. Vanida Yurayart (acting director of 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: 10 October 2023