

FULL-YEAR REPORT ON THE ACTIVITIES OF THE AFRL FOR HEAVY METALS AND TRACE ELEMENTS
DEPARTMENT OF MEDICAL SCIENCES (DMSc)
THAILAND
(OCTOBER 2021 – SEPTEMBER 2022)

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 31-65): 10 heavy metals and trace elements (total As, Cd, Cu, Fe, Mn, Pb, Ag, Cr, Ni and Zn) in water, 57 participants from private and public laboratories (Accredited in compliance with ISO/IEC 17043: 2010)	Feb – May 2022	<u>PT results:</u> The participants achieved satisfactory z-scores: - 97% for total As, - 89% for Cd - 95% for Cu - 88% for Fe - 94% for Mn - 86% for Pb - 93% for Ag - 87% for Cr - 96% for Ni - 89% 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 04-65): 4 heavy metals and trace elements (Pb, Cd, total As, total Hg) in cannabis, 29 participants from private and public laboratories (accredited in compliance with ISO/IEC 17043:2010)	Jan-Jul 2022	PT results: The participants achieved satisfactory z-scores: - 82% for total As; - 86% for Pb; - 92% for Cd; - 82% for total Hg;
		Organization of PT scheme: heavy metals (6 metals: Cd, Pb, total Hg, total As, Mn and Zn) in Fish powder at both national and ASEAN levels - Applied to PT: 62 laboratories (25 labs from 8 AMSs and 37 labs from private and public laboratories in Thailand) - Submitting results: 60 laboratories (24 labs from 8 AMSs and 36 labs from private and public laboratories in Thailand) NB: The PT scheme of heavy metals in food has been accredited complying with ISO/IEC 17043:2010		Feb – June 2022	<u>PT results:</u> The final PT report was sent in June 2022 The participants from AMS achieved satisfactory z-scores as follows: 84% for Zn; 82% for total Hg; 81% for Mn; 68% for Cd; 65% for total As; 46% for Pb <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 Trace metals and Elements in cannabis by ICP-OES”	30 June – 1 July 2022	Provided practical trainings for 2 scientific officers from Regional Medical Science Center (RMSc) 12, Ubon Ratchatani

		Workshop on “Determination of Trace metals and Elements in Food by ICP-MS and ICP-OES” (2 scientific officers from Department of Scientific Services, Ministry of Health, Brunei Darussalam)	-	5-9 September 2022 at BQSF, DMSc, Thailand (5 days)	- To lecture an introduction for the contamination of metals in food and Principles of ICP-MS and ICP-OES - Hands-on training: a) Determination of sodium in food products by ICP- OES. b) Determination of Trace metals; Pb, Cd, As, Cu, Zn and Sn, in foods: rice flour, fresh seafood, Dietary supplement and CRM by ICP-OES c) Determination of Trace metals; Pb, Cd, total As, and total Hg, in foods: rice flour, fresh seafood, dietary supplement and CRM by ICP-MS
		Up-coming training: On- line Training on Determination of Inorganic Arsenic in Seafood by HPLC-ICP- MS		Expected to be organized in May 2023 (On-line)	The questionnaire on the training needs was sent to NFRs in mid-Aug 2022. It will greatly assist in better designing the training programme.

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 19th AFTLC (2 persons) Participation in the 20th AFTLC (2 persons) Participation in the 15th Codex Committee on Contaminants in Foods (CCCF) (1 person) Participation in the 6th ASEAN Health Cluster 4 Ensuring Food Safety (AHC4) (1 person)	- Participation in the 30th The Annual Medical Sciences Conference (3 persons)	27-28 Sept 2021 (through Video Conference) 1-2 Mar 2022 (through Video Conference) 9-13, 24 May 2022 (through Video Conference) 10-11 Aug 2022 (through Video Conference) 22-24 June 2022 (on-site)	- - Update the process in the development of MLs related to heavy metals in foods - - 2 Posters' presentation

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 support of ARISE-Plus. This collaborative project is focused on the implementation of ISO/IEC 17025:2017 quality system into NCFDA chemical food testing laboratory, i.e. laboratories of heavy metals and mycotoxins in food.	Project period: June 2021 to Nov 2022	Phase 1: Gap analysis of laboratories for metals and mycotoxin, as well as the current quality management system of NCFDA, was carried out. Phase 2: provided 5 trainings/workshops -On-line workshops on method validation and estimation of measurement uncertainty -On-line trainings on ISO/IEC 17025:2017 requirements, risk management in laboratory, statement of conformity and decision rule
7	AFRL's participation in PT/CT programs.	PT FAPAS for heavy metal analysis for Al, Cd, Cr, Cu, Fe, Mn, Ni and Zn in water	-	Jan 2022	Satisfactory z-score results: Al = -1.1, Cd = -0.4, Cr = 0.0, Cu = -0.3, Fe = 0.5, Mn = 0.2, Ni = -0.6 and Zn = 0.8
		PT FAPAS for heavy metal analysis for Sb, total As, Ba, Se, Ag and Hg in water	-	March 2022	Satisfactory z-score results: Sb = 0.2, total As = 0.5, Ba = 0.0, Se = -0.1, Ag = -0.5 and Hg = -0.2

		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Pb, Hg (total) and Ni in seaweed	-	Oct 2021	Satisfactory z-score results: As (total) = - 0.3, As (inorganic) = - 0.5, Cd = -0.4, Pb =-1.2, Hg (total) = -1.2, Ni =-0.4
		PT FAPAS for heavy metal analysis of Cd, Cr, Pb and Hg (total), Ni in Nutritional Food Supplement	-	Dec 2021	Satisfactory z-score results: Cd = 0.8, Cr = 1.5, Pb = 1.2, Hg (total) = -0.6, Ni = -0.2
		PT FAPAS for heavy metal analysis of Aluminum, Cadmium, Chromium, Lead, Tin, and Nickel in Infant Formula	-	April 2022	Satisfactory z-score results: Al = -0.9, Cd = -0.1 Cr = 1.0, Pb = 1.1, Ni = -1.2, Sn = -1.1
		PT FAPAS for heavy metal analysis of Arsenic (total), Copper, Iron, Lead in Vegetable Oil	-	June 2022	Satisfactory z-score results: As (total) = 1.0, Cu = -0.3, Fe = -1.1, Pb = 0.0
		PT FAPAS for heavy metal analysis of Aluminum, Arsenic (total), Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Zinc in Cocoa Powder	-	June 2022	Satisfactory z-score results: Al = 0.2, As (total) = 0.5, Cd = 0.5, Cr = 0.5 Cu = -0.7, Fe = -1.2, Pb = 1.5, Mn = -0.7, Ni = -0.3, Zn = 0.0

8	Status of accreditation by AFRL under ISO/IEC 17025	-	-	-	ISO/IEC 17025: 2017 accredited since March 2020-Present ISO/IEC 17043:2010 accredited since Aug 2012-Present
9	Other activities		Strengthening of laboratory capacity in heavy metal analysis of AFRL staff: -Workshop on the requirements of ISO/IEC 17043:2010 and preparation for external audit (11 persons)	Feb 2022 (2 days)	

a. Major changes at the AFRL (in terms of technical staff, policy, location, instrumentation, scope of work etc.)

- Mr. Aran Tanunkat, the former Director of the Bureau of Quality and Safety of Food (BQSF), has retired. Currently, Mrs. Lekha Prasartthong is a Director of BQSF.

b. Recommendations

none

Information provided by: Mr. Sirichai Sunya

Representative of AFRL: Ms. Kannika Jittiyodsara, Mr. Supat Sangsuay and Mr. Sirichai Sunya

Designation: AFRL for Heavy metals and Trace elements

Date: 7 September 2022