

FULL-YEAR REPORT ON THE ACTIVITIES OF THE AFRL FOR HEAVY METALS AND TRACE ELEMENTS
DEPARTMENT OF MEDICAL SCIENCES (DMSc)
THAILAND
(OCTOBER 2020 – SEPTEMBER 2021)

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 29-64): 10 heavy metals and trace elements (Fe, Pb, Cd, Cu, Mn, total As, Ag, Cr, No and Zn) in water, 53 participants from private and public laboratories (accredited in compliance with ISO/IEC 17043: 2010)	Feb – May 2021	<u>PT results:</u> The participants achieved satisfactory z-scores: - 100% for total As; - 93% for Pb; - 92% for Cu and Ag; - 91% for Mn; - 90% for Cr; - 89% for Cd, Fe, Ni & Zn. <u>Follow-up actions:</u> Suggested the participating labs to find out the corrective actions.

		Organization of PT scheme: heavy metals (10 metals: Cd, Pb, total Hg, total As, Cr, Cu, Zn, Fe, Ni and Mn) in Fish at both national and ASEAN levels - Applied to PT: 60 laboratories (20 labs from 8 AMSs and 40 labs from private and public laboratories in Thailand) - Submitting results: 51 laboratories (12 labs from 8 AMSs and 39 labs from private and public laboratories in Thailand) (accredited in compliance with ISO/IEC 17043: 2010) (in process of ISO/IEC 17043 accreditation, audited on June 14-15, 2021)		Jan – July 2021	<u>PT results:</u> The final PT report was sent in July, 2020. The participants from AMS achieved satisfactory z-scores as follows: 91% for Cu; 89% for Cd; 87% for Mn; 83% for Pb; 81% for Fe & Hg (total); 79% for Ni; 69% for Zn; 59% for Cr; 55% for total As; <u>Follow-up actions:</u> Suggested the participating labs to find out the corrective actions.
3	Provision of training at ASEAN or national level	-	Trainings on heavy metal analysis in herbs using Flame-AAS, Mercury analyzer, ICP-OES and ICP-MS, including the quality control system and reporting the results (through zoom meeting)	June 2021 (1 day)	-Provided practical trainings for 24 medical scientists from 12 Regional Medical Science Centers (RMSc); -Provided a Reference Material of Dried Plant, served as quality control sample, to these RMSc. -Provided standard solutions of heavy metals to these RMSc.

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 17 th AFTLC (3 persons) Participation in the 18 th AFTLC (3 persons)	-	9-10 Nov 2020 (through Video 4-5 Mar 2021 (through Video Conference)	-
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.

7	AFRL's participation in PT/CT programs.	PT scheme organized by Department of Science Service, Ministry of Higher Education, Science, Research and Innovation for As, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Se and Zn in water	-	Jan 2021	Satisfactory z-score results: As= 0.31; Cd= 0.19; Cr= 0.06; Cu= -0.19; Fe= -0.11; Mn= 0.10; Ni= -0.07; Pb= -0.24; Se=0.30; Zn= 0.56
		PT FAPAS for heavy metal analysis (DWC070: drinking water) of Bromide, Bromate, Chlorite, Chlorate, Silver, Barium, Boron, Beryllium, Arsenic, Selenium, Antimony, Lithium, Cobalt, Tin and Mercury in water	-	March 2021	Satisfactory z-score results: Br = 0.0; BrO ₃ ⁻ = -0.4; ClO ₂ ⁻ =-0.2; ClO ₃ ⁻ =-0.2; Ag = -0.3; Ba = 0.0; B = -0.2; Be = 0.3; As = -1.3; Se=-0.5; Sb =-1.4; Li=0.1; Co=-0.3; Sn=-0.3; Hg -0.4
		PT FAPAS for heavy metal analysis of As (total), As (inorganic), Cd, Pb, Hg (total) and Ni in seafood	-	Jan 2021	Satisfactory z-score results: As (total) = 0.2; As (inorganic) = 1.4; Cd = -0.1; Pb=0.2; Hg (total) = -0.3; Ni=0.3

		PT FAPAS for heavy metal analysis of As (total), Cd, Pb and Hg (total) in soya lecithin (liquid)	-	Feb 2021	Satisfactory z-score results: As (total) = 1.5; Cd = 0.7; Pb=-0.2; Hg (total) = 0.7
		PT FAPAS for heavy metal analysis of Aluminum, Arsenic (total), Cadmium, Copper, Iron, Lead, Mercury (total), Nickel & Zinc (all natural/low levels) in wheat flour	-	July 2021	Satisfactory z-score results: Al (total)=-1.6; Cd = -0.5; Cu=-0.2; Fe=-0.4; Hg (total) = 0.2; Ni=0.1; Zn=0.5
		PT FAPAS for heavy metal analysis of Aluminium, Arsenic (total), Cadmium, Copper, Iron, Lead, Manganese, Nickel & Zinc (all natural levels) in Cocoa Powder	-	June-Aug 2021	Satisfactory z-score results: Al=1.0; As (total) = 0.0; Cd = -0.2; Cu=-0.1; Fe=0.3; Pb = 1.7; Mn= 0.1; Ni=0.4; Zn=0.7
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 (8 persons) -Workshop on Agilent 5800 ICP-OES Spectrometer ICP Expert Familiarization (4 persons)	Feb 2021 (1 day) Mar 2021 (2 days)	
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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 Prasarthong is a Director of BQSF.
- New instrument: Agilent 5800 ICP-OES
- New head of metals and trace elements' section: Ms. Kannika Jittiyodsara

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: 21 September 2021