World Organisation for Animal Health

Sang-Ho Cha - - KOREA_(REP_OF)

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Foot and mouth disease
***Address of laboratory:**	
***Tel:**	+82549120774
***E-mail address:**	virusmania@korea.kr
Website:	
***Name (including Title) of Head of Laboratory (Responsible Official):**	Jung-hee Kim, Commissioner of APQA
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Sang-Ho Cha, Head of FMD Reference Laboratory
***Which of the following defines your laboratory? Check all that apply:**	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
ELISA (SP Antibody)	Yes	680251	0
ELISA (NSP Antibody)	Yes	776383	51
Direct diagnostic tests		Nationally	Internationally
Virus isolation	Yes	0	40
Realtime RT-PCR	Yes	643	113

VP1 gene sequencing	Yes	0	35

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
VDRD FMDV 3Diff/PAN Rapid kit	FMDV Rapid test	Median Diagnositcs/APQA	690 tests	50 tests	1	CAMBODIA,
FMDV PAN-3Type Dx/DDx direct qRT-PCR	Direct rRT-PCR	OPTOLANE/APQA	32 tests	48 tests	3	BANGLADESH, MONGOLIA, VIETNAM,

4. Did your laboratory produce vaccines?

Not applicable

5. Did your laboratory supply vaccines to WOAH Members?

Not applicable

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
FMDV PAN-3Type Dx/DDx direct qRT-PCR	On-site Molecular Test for Foot-and-Mouth Disease Detection, Serotyping, and Foot-and-Mouth Disease-like Vesicular Diseases Test for Foot-and-Mouth Disease Detection, Serotyping, and other Vesicular Diseases (SVV, SVD)

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

No

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAH Member Countries involved other than your country
Comparative studies for avian influenza virus and FMD virus between Korea and Vietnam	2014-2024	Studies on genetic characterization of foot and mouth disease viruses and avian influenza virus in Vietnam	NCVD (National Center for Veterinary Diagnosis)	VIETNAM
Comparative studies for avian influenza virus and FMD virus between Korea and Cambodia	2023-2027	Studies on genetic characterization of foot and mouth disease viruses and avian influenza virus in Cambodia	NAHPRI (National Animal Health and Production Research Institute)	CAMBODIA
Comparative studies for avian influenza virus and FMD virus between Korea and LAO PDR	2023-2027	Studies on genetic characterization of foot and mouth disease viruses and avian influenza virus in LAO PDR	NAHL (National Animal Health Laboratory)	LAOS
Resource celloection and genetic characterization of FMD in Pool2	2020-2024	Studies on genetic characterization of foot and mouth disease viruses in Bangladesh	CDIL(Central Disease Investigation Laboratory)	BANGLADESH
Collection and genetic characterization of FMDV circulating in Mongolia	2024~2028	Studies on genetic characterization of foot and mouth disease viruses in Mongolia	SCVL(State Central Veterinary Laboratory)	MONGOLIA

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

No

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
Epizootiological data(sampling time, location and species) relating to the samples received for scientific research (see ToR5)

was collected

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
sampling time, location and species

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

2

Re-emergence of foot-and-mouth disease in the Republic of Korea caused by the O/ME-SA/Ind-2001e lineage. Ryoo S, Kang H, Lim DR, Kim JM, Won Y, Kim JY, King DP, Di Nardo A, Cha SH. Front Vet Sci. 2024 Apr 10;11:1378769. doi: 10.3389/fvets.2024.1378769. eCollection 2024.

Multiple incursions of foot-and-mouth disease virus serotype O into the Republic of Korea between 2010 and 2019. Di Nardo A, Lim DR, Ryoo S, Kang H, Mioulet V, Wadsworth J, Knowles NJ, Kim JM, King DP, Cha SH. Infect Genet Evol. 2024 Oct;124:105664. doi: 10.1016/j.meegid.2024.105664. Epub 2024 Aug 30.

b) International conferences:

5

Complementary Metal-oxide-semiconductor Photosensor-Integrated On-site Molecular Test for Foot-and-Mouth Disease Detection, Serotyping, and Foot-and-Mouth Disease-like Vesicular Diseases Differentiation, Ryoo SY et al., AKC 2024

National Serosurveillance of Foot-and-Mouth Disease in Korea, in 2023, Noh J et al., EuFMD OS24

Genetic Analysis of Foot-and-Mouth disease virus O isolated from Cambodia from 2023 to 2024, Lim DR et al., EuFMD OS24

The prevalence of Foot-and-mouth disease and genetic analysis in Vietnam from 2014 to 2023, Eom T et al., FAVA 2024

The first detection of the foot-and-mouth disease virus A/ASIA/Iran-05 lineage in Bangladesh, Kang H et al., FAVA 2024

c) National conferences:

11

Recent FMD outbreaks and trans-pool spread in Asian countries, Ryoo SY et al., The Korean Society of Veterinary Science 2024
Nationwide FMD serosurveillance of pigs in Korea, 2021 to 2023, Noh J et al., The Korean Society of Veterinary Science 2024
Evaluation of ELISA kits for the Detection of Vaccine Antibodies after Homologous and Heterologous of a Foot-and-mouth Disease Routine Vaccine in pigs, Jeong MK et al., The Korean Society of Veterinary Science 2024
Identification of Foot-and-mouth disease virus (FMDV) O/ME-SA/PanAsia lineage circulating in Lao PDR, 2023, Lee H et al., The Korean

Society of Veterinary Science 2024
Comparative evaluation of ELISA developed for the detection of antibodies against structural protein of serotype Asia 1 foot-and-mouth disease virus, Lee GM et al., The Korea Society of Preventive Veterinary Medicine
Sero-surveillance of food and mouth disease antibodies in wild animals collected in Republic of Korea in 2023, Kim TE et al., The Korea Society of Preventive Veterinary Medicine
Emergency vaccinations monitoring for evaluation of food-and-mouth disease herd Immunity level in Republic of Korea in 2023, Moon KH et al., The Korea Society of Preventive Veterinary Medicine
Comparative analysis of foot-and-mouth structural protein antibodies in outbreak and non-outbreak areas over the past three years, Kang E et al., The Korea Society of Preventive Veterinary Medicine
Genotypic identification of Foot and mouth disease virus isolated from Cambodia and Laos between 2018 and 2023, Lee H et al., The Korea Society of Preventive Veterinary Medicine
Serological analysis of structural protein antibodies to foot-and-mouth disease Virus type O in domestic outbreaks and other regions over the past three years (2021-2023), Kang E et al., The Korean Society of Veterinary Service 2024
Development of a semiconductor biosensor-based on-site molecular diagnostic system for foot-and-mouth disease, Ryoo SY et al, The Korean Society of Veterinary Service 2024

d) Other (Provide website address or link to appropriate information):

1
Monthly National sero-surveillance results for overall population immunity and prevalence of infection surveillance (in Korean, www.qia.go.kr)

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 0

b) Seminars : 13

c) Hands-on training courses: 13

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
B	MALAYSIA	3
C	MALAYSIA	3
B	MONGOLIA	2
C	MONGOLIA	2
B	KAZAKHSTAN	2
C	KAZAKHSTAN	2
B	PHILIPPINES	2
	PHILIPPINES	

C		2
B	SRI LANKA	1
C	SRI LANKA	1
B	THAILAND	1
C	THAILAND	1
B	SINGAPORE	2
C	SINGAPORE	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
KS Q ISO/IEC 17025	PDF	KOLAS 공인기관 인정서_영문 (KT372_Animal_and_Plant_Quarantine_Agency_PM_Eng)_20241121.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Antigen detection(Realtime RT-PCR, RT-PCR, Antigen ELISA)	KOLAS(Korean Laboratory Accrediation)
Antibody detection(SP ELISA, NSP ELISA)	KOLAS(Korean Laboratory Accrediation)

20. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

All work with FMDV is undertaken in high-containment facilities licensed by the KDCA

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
WOAH/FAO Reference Laboratory Network Annual Meeting	2024-09-24	Rome, Italia	Speaker	FMD-related activities in 2024 of Animal and Plant Quarantine Agency

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Yes

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
Foot-and-mouth disease	Member of WOAH/FAO FMD reference Laboratory network	22	All 12 of the designated WOAH FMD Reference Laboratories and the WOAH Collaborating Center (Sciensano)

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
FMD Diagnosis	Participant	-	Pirbright Institute

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	**Role of your reference laboratory (organizer/participant)**	**No. participating laboratories**	**Name of the test**	**WOAH Member Countries**
National Proficiency test for Diagnosis of FMD	Organizer	46	Proficiency test for Diagnosis of FMD	KOREA (REP. OF),

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

No

29. Additional comments regarding your report:

No