

OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Foot and mouth disease
Address of laboratory:	Xujiaping No.1, Yanchangpu Lanzhou, Gansu province 730046 CHINA (PEOPLES REP. OF)
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Name (including Title) of Head of Laboratory (Responsible Official):	Dr.Haixue Zheng, Director General of Lanzhou Veterinary Research Institute,CAAS
Name (including Title and Position) of OIE Reference Expert:	Dr.Xiangtao Liu,deputy director of Lanzhou Veterinary Research Institute;head of the national reference laborratory for FMD
Which of the following defines your laboratory? Check all that apply:	Governmental Research Academic

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
LPB-ELISA(type O)	yes	3070	0
LPB-ELISA(type Asia1)	yes	1000	0
LPB-ELISA(type A)	yes	3070	0
NSP-3ABC ELISA	yes	3070	0
Direct diagnostic tests		Nationally	Internationally
Virus isolation	yes	11	0
Antigen typing ELISA	yes	15	0
Real Time-RT-PCR	yes	2171	0
VP1 sequencing	yes	52	0

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Guinea pig antisera (against FMDV type O and A)	ELISA	produced	10 ml	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV immune sera(type O)	ELISA	produced	30 ml	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV infected sera	ELISA	produced	20 ml	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV cell culture(inactivated)	RT-PCR	produced	15 ml	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMD LBP-ELISA kit(Type O,A,Asia1)	ELISA for FMDV Antibody detection	produced	13541 kits	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

FMDV-NSP 3ABC LISA kit	ELISA for FMDV NSP Antibody detection	produced	1428 kits	2 kits	2	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
SPCE(type O)	ELISA for FMDV Antibody detection	produced	113 kits	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Conventional MultRT-PCR	RT-PCR for FMDV RNA detection	produced	30 kits	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV real time RT-PCR kit	qRT-PCR for FMDV molecular detection	produced	2295 kits	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Typing real-time RTPCR	QRT-PCR for FMDV RNA detection, type O,A and Asia1	produced	187 kits	3 kits	4	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
Competition ELISA Kit for Detecting Foot and Mouth Disease Virus Type O Antibodies	No. 346, Official Announcement, MARA, China http://www.moa.gov.cn/govpublic/xmsyj/202010/t20201029_6355360.htm
Development of an indirect chemiluminescence immunoassay using multi-epitope recombinant protein to specifically detect antibodies against foot-and-mouth disease virus serotype O in swine	Journal of Clinical Microbiology,doi:10.1128/JCM.02464-20

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
CHINA (PEOPLE'S REP. OF)	FMD vaccination and PVM in 2020 in China	meeting, draft plan
CHINA (PEOPLE'S REP. OF)	FMD Active surveillance in 2020 in China	training courses, meetings, draft plan
CHINA (PEOPLE'S REP. OF)	Revision of the technical specifications for the prevention and control of foot and mouth disease	meeting,draft
MALAYSIA	FMDV sero-typing detection	email
MYANMAR	FMDV sero-typing detection	email
VIETNAM	FMDV sero-typing detection	email
KOREA (REP. OF)	FMDV strain information sharing	email

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Research and development of an attenuated edible FMD vaccine using salmonella as the vector	3 years	Research and development of an attenuated edible FMD vaccine using salmonella as the vector	Korea Atomic Energy Research Institute/Prof. Seo HoSeong	KOREA (REP. OF)
Cooperative creation and application studies of new products for prevention and control of major transboundary animal diseases	3 years	Cooperative creation and application studies of new products for prevention and control of major transboundary animal diseases	Kazakh National Agrarian University, Kazakhstan/Prof. Gulnaz Ilgekbayeva	KAZAKHSTAN
Immunological modification and mechanism of DC-recruiting foot and mouth disease virus like particles	3 years	Research and development of FMD viral like particle (VLP) fused with the specific DC targeting domain	Korea Atomic Energy Research Institute/Prof. Seo HoSeong	KOREA (REP. OF)
Exchange of vaccine technology for the delivery of oral vaccines to mucosal surface	3 years	To explore the potential of plants and OMVs for production of antigens for oral vaccination	University of East Anglia	UNITED KINGDOM

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:

The general situation of FMD in China is stable with spodic. Total 5 type O FMD outbreaks notified during 2020, and 3 epidemic strains found: O/Mya-98(n=2), O/Ind-2001(n=2) and O/CATHAY(n=1). There were no reports of outbreaks due to serotypes A and Asia 1 during 2020. 52 VP1 sequences of FMDV were found to comprise O/SEA/Mya-98, O/CATHAY and O/ME-SA/ind-2001.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:

Report FMD outbreaks to MARA, China and OIE. Sharing cases information including strains information with WRLFMD, SEACFMD member countries.

**13. What method of dissemination of information is most often used by your laboratory?
(Indicate in the appropriate box the number by category)**

a) Articles published in peer-reviewed journals: 1

Fan Yang, Zixiang Zhu, Weijun Cao, Huanan Liu, Ting Wei, Min Zheng, Keshan Zhang, Ye Jin, Jijun He, Jianhong Guo, Xiangtao Liu, Haixue Zheng. Genetic Determinants of Altered Virulence of Type O Foot-and-Mouth Disease Virus. J Virol. 2020 Mar 17;94(7):e01657-19.

b) International conferences: 2

Experts or participants from LVRI, reported the current situation of FMD in China, exchange the information with other laboratories at the international meetings including SEACFMD NCP virtual meeting 2020, OIE/FAO FMD reference laboratory network virtual meeting 2020

c) National conferences: 8

The national conferences on FMD control and prevention, vaccinee and vaccination, diagnosis technique and the training courses at national(1), regional(2) and provincial level(5), respectively.

d) Other:

(Provide website address or link to appropriate information) 11

(2020)official veterinary bulletin, published by MARA, China

<http://www.moa.gov.cn/gk/sygb/>

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries

To recommend the prescribed and alternative tests or vaccines as OIE Standards

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 9

b) Seminars: 158

c) Hands-on training courses: 20

d) Internships (>1 month): 2

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
a	China	9
b	China	158
c	China	20
d	China	2

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO/IEC 17025:2017	17025-EN-web.jpg
CMA	CMA Qualification Certificate.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
LPB ELISA for FMDV antibody detection	CNAS
ELISA for FMDV NSP antibody detection	CNAS
FMDV Antigen detection ELISA	CNAS
RT-PCR for FMDV	CNAS
Real-time RT-PCR for FMDV	CNAS
FMDV 1D Gene sequencing	CNAS
SPC ELISA for FMDV antibody detection	CNAS
virus isolation(VI)	CNAS
virus neutralization test(VNT)	CNAS
FMDV Vaccine safety and efficacy testing	CNAS

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

Yes

(See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
23th SEACFMD NCP Virtual Meeting (1st session)	06/2020	Virtual Meeting	Speaker	Update on regional pilot testing of molecular diagnosis for FMD
23th SEACFMD National Coordinators (NC) Virtual Meeting (2&3 session)	07/2020	Virtual Meeting	Speaker	FMD Reference Laboratory Report LVRI, China
15th OIE/FAO FMD Reference Laboratory Network meeting	12/2020	Virtual Meeting	Speaker	Report on National/OIE Foot and Mouth Disease reference Laboratory LVRI, China

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

No

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

Yes

Title of the project or contract	Scope	Name(s) of relevant OIE Reference Laboratories
Monitoring and analysis of the genetic and antigenic evolution of the FMDV from China (OIE/FAO FMD Reference lab network MOU)	Evaluation of the efficacy of the current vaccine; selection of the new vaccine strains; Effective control of Foot-and-Mouth Disease.	The World reference laboratory for FMD, The Pirbright Institute, UK
Testing and validation of the molecular diagnostic methods for recommending application in SEA region	To evaluation the the specificity and sensitivity of FMDV serotyping qRT-PCR, lineage specific qRT-PCR and primers and probes for sequencing methods.	The OIE reference laboratories for FMD in Korea; The OIE regional reference laboratories for FMD in Thailand; The World reference laboratory for FMD, UK

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: <http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons ¹	No. participating laboratories	Region(s) of participating OIE Member Countries
Monitoring the provincial laboratory capacity in China for FMDV antibody detection	37	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Confirm detection and analysis on FMDV field samples	7	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

Yes

Kind of consultancy	Location	Subject (facultative)
SEACFMD roadmap(2021-2025)	China	Comments and suggestions on SEACFMD roadmap(2021-2025)
Molecular diagnostic technologies for FMDV detection	China	Provided primers and probes of FMD serotyping qRTPCR to Vietnam,Myanmar and Malaysia for testing and validation
Review of OIE code revision	China	Review of OIE code revision 2020
SEACFMD labnet and Epinet	China	SEACFMD LabNet and EpiNet online surveys

25. Additional comments regarding your report:

None