World Organisation for Animal Health

Bakkali Kassimi Labib - - FRANCE

WOAH Reference Laboratory Reports Activities 2024

This report has been submitted: 14 janvier 2025 11:46

LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Foot and mouth disease
***Address of laboratory:**	14 rue Pierre et Marie Curie, 94700 Maisons-Alfort France
***Tel:**	+330149771317
***E-mail address:**	labib.bakkali-kassimi@anses.fr
Website:	www.anses.fr
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Stéphan Zientara
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Labib BAKKALI KASSIMI
***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 NSP	Yes	23	391
ELISA Type O	Yes	21	0
Séroneutralisation	Yes	5	0
Direct diagnostic tests		Nationally	Internationally
RT-PCR en temps réel	Yes	0	

			22
Isolement viral	Yes	0	2

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?

No

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

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
rtRT-PCR SAT2/V	Test de RT-PCR en temps réel pour la détection spécifique du topotype SAT2/V de FMDV (https://eurl-fmd.anses.fr)
rtRT-PCR O/EA-3	Test de RT-PCR en temps réel pour la détection spécifique du topotype O/EA-3 de FMDV (https://eurl-fmd.anses.fr)
rtRT-PCR O/ME-SA/SA-2018	Test de RT-PCR en temps réel pour la détection spécifique du lignage O/ME-SA/SA-2018 de FMDV (https://eurl-fmd.anses.fr)

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

No

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?

Yes

Name of WOAH Member Country seeking assistance	Date	Which diagnostic test used	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
MAURITIUS	2024-06-14	RT-PCR temps réel Isolement viral ELISA	10	22

CHAD	2024-10-17	ELISA	381	0

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
Improved control of priority animal diseases: Novel vaccines and companion diagnostic tests for African horse sickness, peste des petits ruminants and foot and mouth disease (SPIDVAC)	2022-2026	Develop innovative vaccines and companion diagnostic tests for three priority animal diseases listed as notifiable terrestrial diseases by the World Organisation for Animal Health (WOAH): African horse sickness (AHS), peste des petits ruminants (PPR) and foot and mouth disease (FMD)	FLI; CIRAD, CICbioGUNE, IDvet; BI; NOTT); CSIC, CISA-INIA; WBVR, UP; UoS; ISRA; LCV; ANSES	GERMANY SENEGAL SOUTH AFRICA SPAIN THE NETHERLANDS UNITED KINGDOM
From proteogenomic host response signatures of persistent foot-and-mouth disease virus (FMDV) infection to diagnostic markers and therapeutic control (FMDV_PersistOmics)	2021-2024	Identification of host response signatures infection, diagnostic markers and therapeutic control of persistent foot-and-mouth disease virus (FMDV)	SLU, FLI, SAP, Sciensano, ANSES	BELGIUM GERMANY SWEDEN TURKEY

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:
Identification d'introduction du virus SAT3/I à l'Ile Maurice

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:
Identification d'introduction du virus SAT3/I à l'Ile Maurice

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:

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1-Al-Rawahi W. A., Elshafie E. I., Baqir S., Al-Ansari A., Wadsworth J., Hicks H., Knowles N., Di Nardo A., King D. P., Zientara S., Al Salloom F., Sangula A., Bernelin-Cottet C., Bakkali L., Al Riyami B. (2024). Detection of foot-and-mouth disease viruses from the A/AFRICA/G-I genotype in the Sultanate of Oman. Preventive Veterinary Medicine, 223:106113*

2-Litz B., Sehl-Ewert J., Breithaupt A., Landmesser A., Pfaff F., Romey A., Blaise-Boisseau S., Beer M., Eschbaumer M. (2024). Leaderless foot-and-mouth disease virus serotype O did not cause clinical disease and failed to establish a persistent infection in cattle. Emerging microbes & infections, 13(1).

3-Romey A., Zientara S., Bakkali Kassimi L. (2024). Proceedings of the International Symposium of the World Association of Veterinary Laboratory Diagnosticians, 2023. Virologie, 28(1):39-43.*

4-Sarry M., Laloy E., Relmy A., Romey A., Bernelin-Cottet C., Salomez A.-L., Huet H., Hägglund S., Valarcher J.-F., Bakkali L., Blaise-Boisseau S.* (2024). Susceptibility of primary ovine dorsal soft palate and palatine tonsil cells to FMDV infection. Frontiers in Veterinary Science, 11:1299379.*

b) International conferences:

9

1-Litz B., Michaud C., Alvarez I., Sehl-Ewert J., Breithaupt A., Landmesser A., Romey A., Huet H, Bernelin-Cottet C., Salomez A.-L., Relmy A., Girault, G., Zientara S., Pfaff, F., Bakkali Kassimi L., Beer M., Hägglund S., Valarcher J.-F., Eschbaumer, M., Blaise-Boisseau, S. The leader protein is necessary for the establishment of persistent infection by type O foot-and-mouth disease virus. Epizone, 16th annual meeting 2024, Epizone, Sep 2024, Uppsala, Sweden.

2-Deshayes T., Romey A., Salomez A.-L., Bernelin-Cottet C., Relmy A., Blaise-Boisseau S., Bakkali Kassimi L., Girault G. Development of real-time RT-PCR assays for the rapid characterization of Foot-and-mouth disease virus. EUFMD Open Session 2024, EuFMD, Oct 2024, Alcala de Henares (Madrid), Spain.

3-Litz B., Michaud C., Alvarez I., Sehl-Ewert J., Breithaupt A., Landmesser A., Romey A., Huet H, Bernelin-Cottet C., Salomez A.-L., Relmy A., Girault, G., Zientara S., Pfaff, F., Bakkali Kassimi L., Beer M., Hägglund S., Valarcher J.-F., Eschbaumer, M., Blaise-Boisseau, S. The Leader protein is necessary for the establishment of persistent infection by type O Foot-and-mouth disease virus. EuFMD Open Session 2024, EuFMD, Oct 2024, Alcala de Henares, Spain.

4-Romey A., Foglia E.A., Salomez A.-L., Relmy A., Bernelin-Cottet C., Girault G., Grazioli S., Bakkali Kassimi L., Blaise-Boisseau S. Safe and cost-effective shipment of FMDV suspected samples to diagnostic laboratories: evaluation of the process on lfd produced by different manufactors. EUFMD Open Session 2024, EuFMD, Oct 2024, Alcala de Henares (Madrid), Spain.

5-Bakkali Kassimi L. Overview of currently used FMD diagnostic tools and current approaches for improved control. GFRA forum 2024, GFRA, Oct 2024, Alcala de Henares, Madrid, Spain.

6-Romey A., Ularamu H., Bulut A., Jamal S., Khan S., Ishaq M., Eschbaumer M., Belsham G., Bernelin-Cottet C., Relmy A., Gondard M., Benfrid S., Girault G., Wungak Y., Hamers C., Hudelet P., Zientara S., Bakkali Kassimi L., Blaise-Boisseau S.. Safe and cost-effective

protocol for shipment of FMDV suspected cases for laboratory diagnostics. Microbes 2024, SFM, Oct 2024, Lille, France.
7-Blaise-Boisseau S. Molecular Interplays of FMDV with the type I IFN Response: Importance of the model & potential links with viral persistence. 2024. Webinar GFRA, 11 décembre 2024.
8-Michaud C., Alvarez I., Litz B., Landmesser A., Romey A., Huet H., Bernelin-Cottet C., Salomez, A.-L., Relmy A., Zientara S., Pfaff F., Bakkali Kassimi L., Eschbaumer M., Valarcher J.-F., Hägglund S., Blaise-Boisseau S. La protéine leader est nécessaire à l'établissement d'une infection persistante par le virus de la fièvre aphteuse. XXVIiemes Journées francophones de virologie, Apr 2024, Bruxelles, Belgique. Virologie, 2024
9-Salomez A.-L., Romey A., Relmy A., Bernelin-Cottet C., Girault G., Blaise-Boisseau G., Bakkali Kassimi L. Validation of disinfectants in BSL3 laboratories handling live Foot-and-Mouth-Disease Virus. EuFMD Open Session 2024, Oct 2024, Alcala de Henares, Spain

c) National conferences:

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

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 : 1

b) Seminars : 1

c) Hands-on training courses: 2

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
A	MOROCCO	6
B	ALGERIA	2
B	MOROCCO	3
B	TUNISIA	4
B	LIBYA	2
B	MAURITANIA	1
C	GEORGIA	2
C	ARMENIA	1
C	AUSTRIA	1

C	GREECE	1
C	CROATIA	1
C	SLOVAKIA	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	cf fichier attaché	Diplôme d'accréditation multi-sites 1-7341.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
ELISA	COFRAC
rtRT-PCR	COFRAC

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

Yes

Le laboratoire dispose d'un système de gestion des risques biologique et répond aux normes de biosécurité de l'OMSA et de l'EuFMD.

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
Réunion annuelle des laboratoires de référence	2024-09-25	Rome	Orateur	*New approaches to facilitate shipping of samples between labs – update on bio-safe protocols and risk assessments *Overview of RL activities

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
Réseau OMSA/FAO pour la fièvre aphteuse	Participant	16	Afrique du Sud; Argentine; Botswana; Brésil; Canada; Rép de Corée; France; Italie; Royaume-Uni; Russie; Chine; Etats-Unis d'Amérique

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
Diagnostic sérologique et virologique de la fièvre aphteuse	Organisateur	3	Anses

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**
Virological and serological diagnostic of FMD	Organisateur	45	isolement viral RT-PCR ELISA Ag Séroneutralisation ELISA NSP ELISA SP Séquençage	ALBANIA, ALGERIA, AUSTRIA, BELGIUM, BULGARIA, CROATIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, GEORGIA, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, KOSOVO, LATVIA, LITHUANIA, MALTA, MOLDOVA, MONTENEGRO, MOROCCO, NORTH MACEDONIA (REP. OF), NORWAY, POLAND, PORTUGAL,

ROMANIA, SERBIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, TUNISIA, UKRAINE, UNITED KINGDOM,

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Réponse à des questions spécifiques	En ligne	Recommandations pour amender le code
Mise à jour du manuel	En ligne	Mise à jour

29. Additional comments regarding your report:

No