World Organisation for Animal Health

Arnaud Bataille - - FRANCE

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Peste des petits ruminants
***Address of laboratory:**	TA-A117/E, Campus International de Baillarguet , 34398 Montpellier, France
***Tel:**	+33 (0)4 67 59 37 98
***E-mail address:**	arnaud.bataille@cirad.fr
Website:	
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Nathalie Vachiery
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Arnaud Bataille
***Which of the following defines your laboratory? Check all that apply:**	Research agency

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	Yes	4	18
SNT	Yes	0	11
Direct diagnostic tests		Nationally	Internationally
RT-PCR	Yes	0	42
RT-qPCR	Yes	0	56
Partial gene sequencing	No	0	42
full genome sequencing	No	0	48

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
						BOSNIA AND

inactivated PPRV strains	PCR	Produced/ provide	0	2 ml	4	HERZEGOVINA, CROATIA, FINLAND, GREECE,
cells	isolation	Produced/ provide	0	25ml	1	UNITED ARAB EMIRATES,
serum	ELISA, SNT	Produced/ provide	0	2 ml	2	BOSNIA AND HERZEGOVINA, ZIMBABWE,
kit	ELISA, RNA extraction, PCR	provide	0	1kit	1	MONGOLIA, NIGERIA, UKRAINE, ZIMBABWE,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

TOR3: NEW PROCEDURES

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

No

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?

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

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
FRANCE	2025-01-02	ELISA	4	0
CROATIA	2025-01-02	ELISA, SNT	0	13
KOSOVO	2025-01-07	ELISA et RT-qPCR, PCR, sequencing	0	19
ALBANIA	2025-01-06	RT-qPCR, PCR, sequencing	0	9
ROMANIA	2025-01-07	RT-qPCR, PCR, sequencing	0	7
HUNGARY	2025-01-01	RT-qPCR, PCR, sequencing	0	8

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

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
ALBANIA CROATIA HUNGARY KOSOVO ROMANIA	Interprétation des résultats de diagnostic, amélioration des pratiques d'échantillonnage et de diagnostic, stratégies de vaccination	Mission sur le terrain, visio, emails
NIGERIA	Diagnostic, design d'échantillonnage, enquêtes sur le terrain	projet LIDISKI
ALGERIA	possibilités de collaborations, Analyses d'échantillons dans le cadre de recherche	Visio, échanges face à face
MONGOLIA	PPR vaccine production, detection de la PPR par diagnostic en laboratoire	échanges par email, mission sur place
SEYCHELLES	Interprétation des résultats de diagnostic	emails

AUSTRIA	Methode de séquençage NGS	Mails, échanges lors du worhsop LRUE
VIETNAM	Activités d'appui possible de la part du labo de ref WOAH lors d'émergence PPR	emails

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
Study of virulence of peste des petits ruminants virus in relation to variability of host response	6 years	Study of virulence of peste des petits ruminants virus in relation to variability of host response	IVI Bern, WUR, CISA-INIA	SPAIN SWITZERLAND THE NETHERLANDS
SPIDAV	4 years	development of innovative vaccines	FLI, LNERV	GERMANY SENEGAL
Interwater and survireaumics	2 years	Development of method to detect FAST disease in water samples	SCVL, University of zimbabwe	MONGOLIA ZIMBABWE
RFOROA One health	2 years	diagnostic support	IRED, Smithsonian Institute	CHAD UNITED STATES OF AMERICA
EU-PAHWs	2 years	Study of PPRV pathogenesis, its persistence of PPRV in water and non-invasive detection of PPRV	WUR, CISA-INIA	SPAIN THE NETHERLANDS
evolution of PPRV	2 years	Full genome sequences of historical and recent samples from Africa to study the evolution and spread of PPRV in the region	NVRI, LCV, CVRL, IAEA, CNRA, LANAVET, JOVAC, AVL, IRVT, LNERV, INRAPE	CAMEROON COMOROS GHANA JORDAN MALI NIGERIA SENEGAL SUDAN TUNISIA
emergence of PPR in Europe	5 years	Full genome seuqencinga nd phylodynamic analyses of PPRV from outbreaks in Europe to investigate origin and dynamic of spread	NRLs and veterinary authorities of Romania, Greece, Bulgaria, Hungary, Austria, Albania, Kosovo, Croatia	ALBANIA AUSTRIA BULGARIA GREECE HUNGARY KOSOVO ROMANIA

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

Yes

Research need : 1

Please type the Research need: -Survie du PPRV dans l'environnement -Role des hotes atypiques dans la circulation de la maladie Guide pour orienter les pays sur les test à réaliser en cas de faux positifs obtenus par sérologie lors de sérosurveillance PPR - Diagnostic kits and methods should be validated using appropriate field samples (including penside/field tests); serological tests must be validated for use with samples from atypical and wildlife hosts) - Development of DIVA vaccines and DIVA tests should be completed - Clear WOAH guidelines are needed concerning PPR thermotolerant vaccines (increased thermostability in lyophilised form) to clarify to countries how and when to use them. - Improved data and sample collection is required in affected countries to determine the extent and spread of PPRV infection and increase PPRV sequence data availability - Data is required to inform assessment of the risks of indirect PPR transmission from different materials (meat, waterholes, fomites, etc.) - PPR virulence and host susceptibility need to be studied, notably to evaluate risk when emerging in a new area

Relevance for WOAH Disease Control,

Relevance for the Code or Manual Code, Manual,

Field Epidemiology and Surveillance, Diagnostics, Vaccines,

Animal Category Terrestrial,

Disease:

Peste des petits ruminants

Kind of disease (Zoonosis, Transboundary diseases) Transboundary diseases,

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer: Chapter: 14.7. Infection with peste des petits ruminants virus; Chapter: 3.8.8. Peste des petits ruminants (infection with small ruminant morbillivirus)

Notes:

Answer:

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:

1) genetic diversity and evolution of PPRV genetic lineages; 2) Variability in immune response to PPR; 3) epidemiology of PPR et role de la mobilité animale au Nigéria; 4) phylogenomic analysis of the emergence of PPR in Europe

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:

1) Données de sequences génomes PPRV
PPR GREN 7th and 8th (Abud Dhabi, Jan 2025; Qingdao, Nov 2025), « activities of the WOAH ref lab, CIRAD »
Curated dataset on the website of the OIE PPR reference laboratory network
Guendouz S, Kwiatek O, Kirtzalidou A, Katsifa A, Gianniou M, Ancuceanu C, et al. Genomic analysis of peste des petits ruminants virus in Europe: Common origin for emergence in Greece, Romania, and Bulgaria. Infection, Genetics and Evolution. 2025 2025/08/01/;132:105774.

Kirtzalidou A, Katsifa A, Komitas G, Xexaki A, Konstantinidis A, Vourvidis D, et al. Identification of peste des petits ruminants virus, Greece, 2024. Research in Veterinary Science. 2025 2025/10/01/;194:105840.

Presentations for GF-TADs events on PPR emergence in Europe (see GF-TAD website for presentations)

2) Données sur réponse immunitaire
Eloiflin R-J, Grau-Roma L, Lasserre V, Python S, Talker S, Totte P, et al. Peste des petits ruminants virus virulence is associated with an early inflammatory profile in the tonsils and cell cycle arrest in lymphoid tissue. Microbiology Spectrum. 2025;0(0):e03124-24.

3) Données de mobilité animale au Nigéria
Ijoma SI, Mesdour A, Bolajoko M-B, Nwosuh C, Bordier M, Bataille A, et al. Combining market surveys and participative approaches to map small ruminant mobility in three selected states in northern Nigeria. PLOS ONE. 2025;20(9):e0311030.

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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Guendouz S, Kwiatek O, Kirtzalidou A, Katsifa A, Gianniou M, Ancuceanu C, et al. Genomic analysis of peste des petits ruminants virus in Europe: Common origin for emergence in Greece, Romania, and Bulgaria. Infection, Genetics and Evolution. 2025 2025/08/01/;132:105774.

Kirtzalidou A, Katsifa A, Komitas G, Xexaki A, Konstantinidis A, Vourvidis D, et al. Identification of peste des petits ruminants virus, Greece, 2024. Research in Veterinary Science. 2025 2025/10/01/;194:105840.
Eloiflin R-J, Grau-Roma L, Lasserre V, Python S, Talker S, Totte P, et al. Peste des petits ruminants virus virulence is associated with an early inflammatory profile in the tonsils and cell cycle arrest in lymphoid tissue. Microbiology Spectrum. 2025;0(0):e03124-24.
Ijoma SI, Mesdour A, Bolajoko M-B, Nwosuh C, Bordier M, Bataille A, et al. Combining market surveys and participative approaches to map small ruminant mobility in three

selected states in northern Nigeria. PLOS ONE. 2025;20(9):e0311030.

Kock R, Fine A, Caron A, Bataille A, Willett BJ, Keyyu J, et al. PPR Infection Crossing Between Domestic and Wild Hoofed Mammals: Does This Matter for Virus Eradication? In: Munir M, Abubakar M, editors. Peste des Petits Ruminants Virus. Cham: Springer Nature Switzerland; 2025. p. 99-127.

Kodo ZM, Rayyanu UA, Olabode MP, Ifende VI, Weka RP, Gukut MY, et al. When farmers' knowledge matters: Improving epidemiological understanding of Peste des petits ruminants in northern Nigeria. Preventive Veterinary Medicine. 2025 2025/11/01/;244:106633.

b) International conferences:

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- *Presentations for 3 GF-TADs events on PPR emergence in Europe (march, July, sept 2025)*
- *Presentation on PPR reference laboratories activities for Roadmap meeting for SADC countries (Oct 2025)*
- *Presentation on PPR reference laboratories activities for Joint Workshop of the GF-TADs West Eurasia for Foot and Mouth Disease and Peste des Petits Ruminants Regional Roadmaps (Nov 2025)*
- *Presentation on PPR diagnosis for the workshop Managing PPR, High-Impact and Zoonotic Diseases at the Wildlife-Livestock interface (Oct 2025)*
- *Participation to episystem workshop for China, Mongolia, Central Asia (April 2025*
- *Presentation on PPR reference laboratories activities for Roadmap meeting for Middle East (April 2025)*
- *Webinar of the OMSA network of PPR ref lab (online, April 2025) « molecular epidemiology and episystem identification»*
- *Workshop of the EURL-PPR (Belgique, Oct 2025) (1) « PPR emergence in EU: insight from field and genetic investigations"*
- *PPR GREN 7th and 8th (Abud Dhabi, Jan 2025; Qingdao, Nov 2025), « activities of the WOAH ref lab, CIRAD »*
- *Workshop of the OMSA network of PPR ref lab (online, Dec 2025) « PPR emergence in EU: insight from field and genetic investigations »*
- *CGD webinars of SLU(Sweden, online, march 2025) « PPR emergence in EU: insight from field and genetic investigations »*

c) National conferences:

0

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

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- *Site web Reference Laboratory of the European Union for Peste des Petits Ruminants (EURL-PPR)*
- *Site web projet LIDISKI*
- *Site web the OIE PPR reference laboratory network*
- *site de l'UMR ASTRE*
- *Site du CIRAD : https://www.cirad.fr/les-actualites-du-cirad/actualites*

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 : 2

b) Seminars : 100

c) Hands-on training courses: 20

d) Internships (>1 month) 3

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	SUDAN	1
A	NIGERIA	1
B		100
C	AUSTRIA	2
C	LATVIA	2

C	NORTH MACEDONIA (REP. OF)	16
D	FRANCE	3

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO 17025	certificat d'accréditation.pdf	Porté générale 1-2207.pdf

19. Is your quality management system accredited?

Yes

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

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

Yes

contact biorisk manager for CIRAD Vincent Michaud (vincent.michaud@cirad.fr)

TOR9: SCIENTIFIC MEETINGS

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

Yes

National/ International	Title of event	Co-organiser	Date	location	No. Participants
International	annual workshop of the WOAH network for PPR ref lab	PI, CAHEC, AU-PANVAC, ICAR-NIVEDI	2025-01-11	online	38

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
7th PPR gren meeting	2024-12-31	abu dhabdi	speaker	update on activities of CIRAD
8th PPR gren meeting	2025-01-10	china	speaker	update on activities of CIRAD
Roadmap meeting for SADC countries	2025-01-09	online	speaker	support from WOAH ref labs
Joint Workshop of the GF-TADs West Eurasia for Foot and Mouth Disease and Peste des Petits Ruminants Regional Roadmaps	2025-01-10	online	speaker	support from WOAH ref labs
episystem workshop for China, Mongolia, Central Asia	2025-01-03	Mongolia	speaker	molecular epidemiology and episystems
Roadmap meeting for Middle East	2025-01-03	online	speaker	support from WOAH ref labs
workshop Managing PPR, High-Impact and Zoonotic Diseases at the Wildlife-Livestock interface	2025-01-09	onlione	speaker	PPR diagnostic in wildlife
GF-TAD meeting	2025-01-08	Serbia	speaker	genetic insight on PPR emergence in EU
Virtual Learning Center of FAO on PPR	2025-01-10	onlinne	speaker	introductory talk on PPR and emergence in EU
ADAFSA workshop	2025-01-11	online	speaker	importance of proficiency tests
Western Balkan workshop on PPR	2025-01-08	North Macedonia	speaker	role of ref lab in PPR surveillance and control

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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. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
PPR	organiser	22	CAHEC, PI, ICAR NIVEDI

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
ELISA, PCR	organiser/ participant	52	Organiser: CIRAD; participant: CIRAD, PI, ICAR-IVEDI
ELISA for camels	participant	12	organiser: ADAFSA

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?

Yes

Title of the project or contract	Scope	Name(s) of relevant WOAH Reference Laboratories
PPRV sequence curation	Site web du réseau OMSA des labos de ref PPR	Pirbright Institute
Organisation of the network of OIE ref lab for PPR	network of OIE ref lab for PPR	CAHEC, PI, ICAR-IVEDI
DISCONTOOLS on PPR	revision of discontools documents with experts	Pirbright Institute

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
ELISA, PCR	organizer/participant	52	ELISA, PCR	ALBANIA, AUSTRIA, BELGIUM, BOSNIA AND HERZEGOVINA, BRUNEI, BULGARIA, CHINA (PEOPLE'S REP. OF), CROATIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GEORGIA, GERMANY, GHANA, GREECE, INDIA, IRELAND, KAZAKHSTAN, KOSOVO, LATVIA, LITHUANIA, MOLDOVA, MOROCCO, NIGERIA, NORTH MACEDONIA (REP. OF), NORWAY, POLAND, PORTUGAL, ROMANIA, SENEGAL, SERBIA, SLOVAKIA, SLOVENIA, SOUTH AFRICA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, TURKEY, UKRAINE, UNITED STATES OF AMERICA,
ELISA for camels	participant	12	ELISA	UNITED ARAB EMIRATES,
ELISA, PCR	participant	50	ELISA, PCR	AUSTRIA,

TOR12: EXPERT CONSULTANTS

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

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29. Additional comments regarding your report: