World Organisation for Animal Health

Support from WOAH Reference Laboratories for CBPP

Regional Training Workshop on
WOAH Procedures for Official Status Recognition, Endorsement of Official Control Programmes and their Maintenance with regard to Contagious Bovine Pleuropneumonia (CBPP)

30 March – 1 April 2026, Lusaka, Zambia

Lucía Manso-Silván, CIRAD, France

Flavio Sacchini, IZS Teramo, Italy

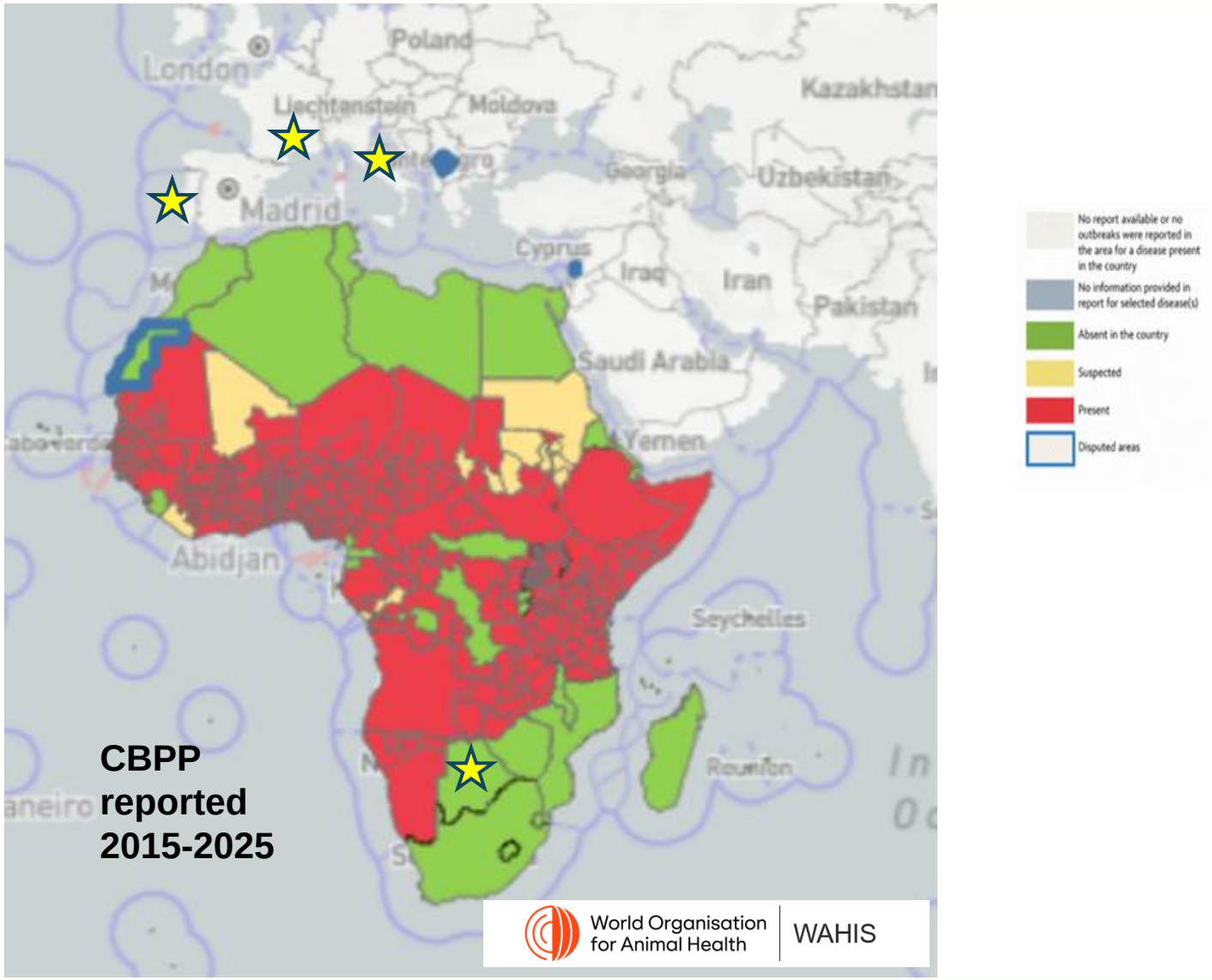
Role of WOAH Ref Labs for CBPP

To provide and promote validated diagnostics and control tools, reference materials, training, expertise and international coordination to support CBPP surveillance, research and control in accordance with WOAH Standards.

WOAH Ref Labs for CBPP

Italy - IZS Teramo
France - CIRAD
Portugal - INIAV

Botswana - BNVL



To use, promote and disseminate diagnostic methods validated according to WOAH Standards

Table 1. Laboratory methods currently used for diagnosis of CBPP and their purpose

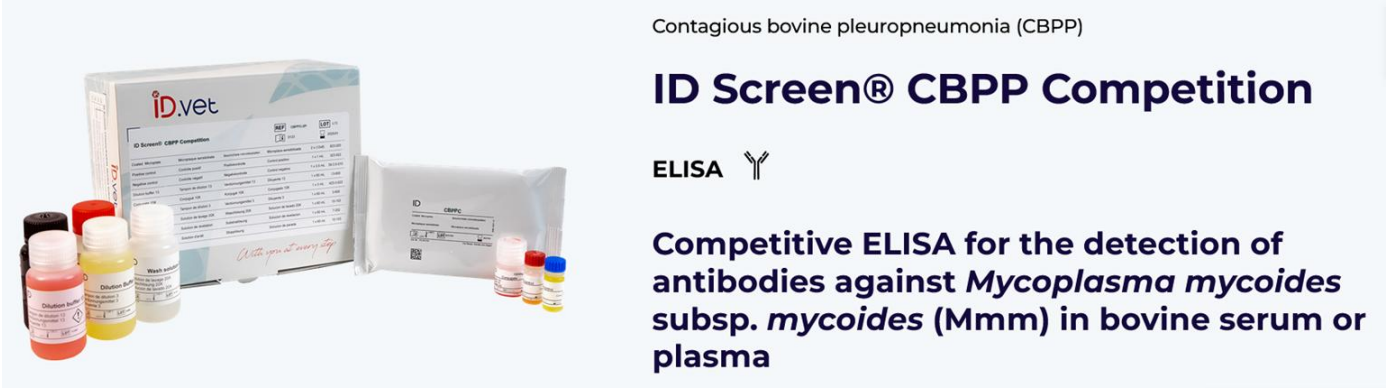
Method	Purpose					
	Population freedom from infection	Individual animal freedom from infection prior to movement	Contribution to eradication policies	Confirmation of clinical cases	Prevalence of infection – surveillance	Immune status in individual animals or populations post-vaccination*
Detection of the agent[(a)]						
In-vitro culture isolation (followed by species identification tests)	+	–	–	+++	–	–
Direct molecular test (PCR)	–	–	–	++	–	–
Detection of immune response						
CFT	+++	++	+++	++	+++	–
Immunoblotting	++	++	++	++	++	–
C-ELISA	+++	++	+++	++	+++	–

Perform direct and indirect diagnostic tests accredited according to ISO/IEC 17025 (Quality Assurance Management) for initial and confirmatory diagnosis

Suport NVL implementing CBPP diagnosis by providing training, protocols (SOPs), reference materials, and reagents to increase their CBPP diagnostic capacity

To use, promote and disseminate diagnostic methods validated according to WOAH Standards

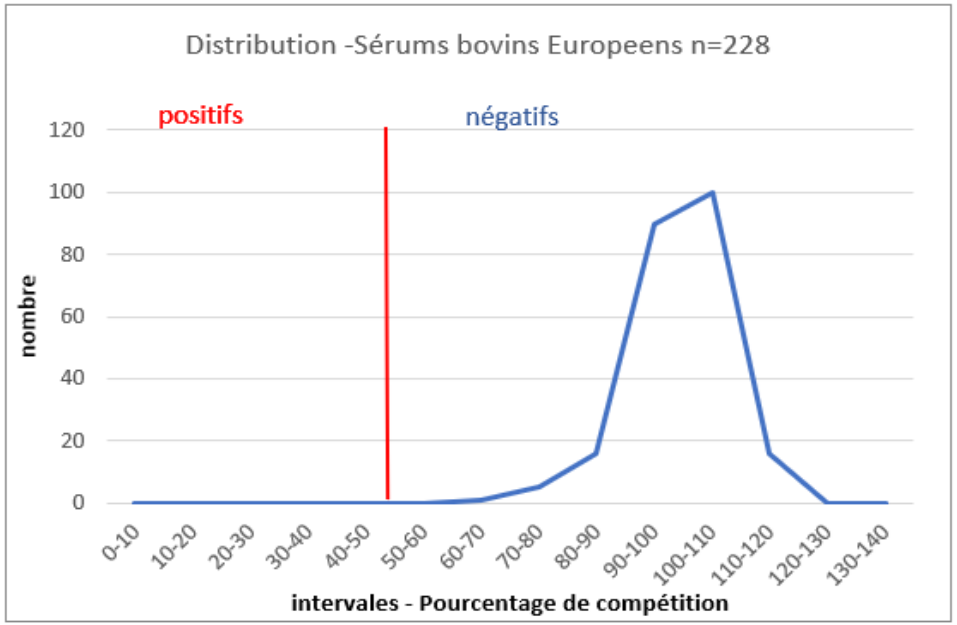
CBPP c-ELISA



- Commercially available as ready-made kit
- Previous Kit produced by IDEXX discontinued in July 2022. New kit produced by IDvet available in April 2024 and validated by CIRAD.
- No possibility for serological surveillance for nearly 2 years in Countries exclusively relying on c-ELISA (c-ELISA testing maintained at the Ref Lab at CIRAD)

To develop, standardise and validate according to WOAH Standards new procedures for diagnosis and control

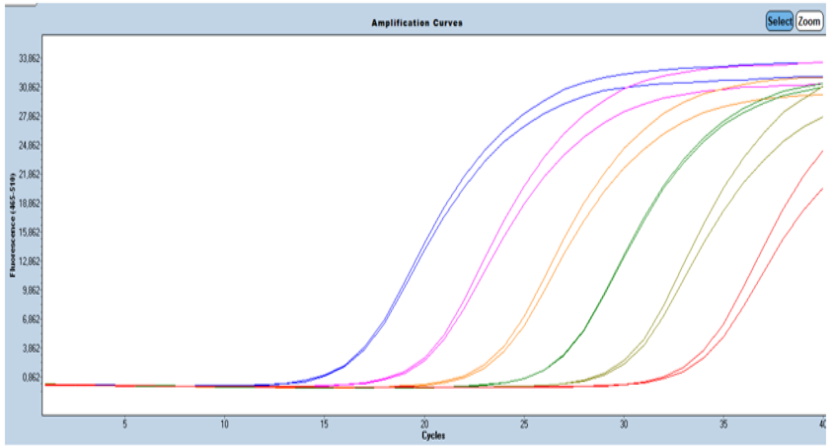
- **Validation of the new c-ELISA kit by the Ref Lab at CIRAD (ISO/IEC 17025):**
  - **100% specificity**, even from serum samples that had tested positive for other diseases (BVDV, *M. bovis*...)
  - **64% sensitivity**
  - Good repeatability, and intra- and **inter-lab reproducibility**

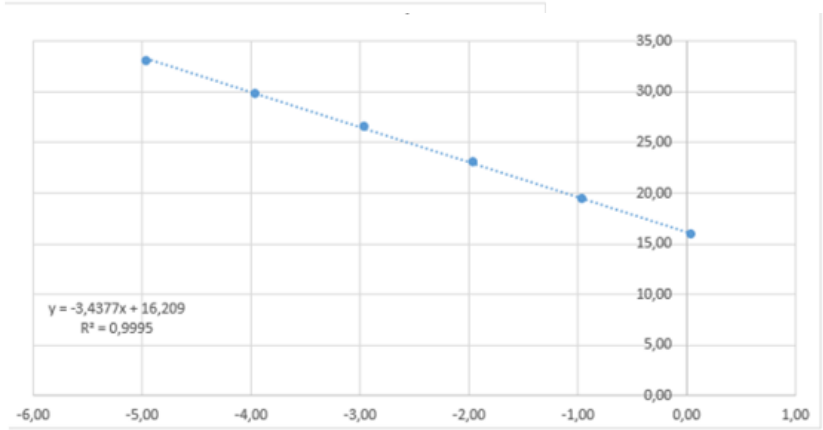


The c-ELISA must be used for <u>interpretation at herd level</u>

To develop, standardise and validate according to WOAH Standards new procedures for diagnosis and control

- **Development of a new TaqMan real-time PCR assay by CIRAD** currently under validation according to ISO/IEC 17025 standards:
  - Improved specificity
  - Direct detection from clinical samples and bacterial cultures
  - Internal control (host DNA detection)

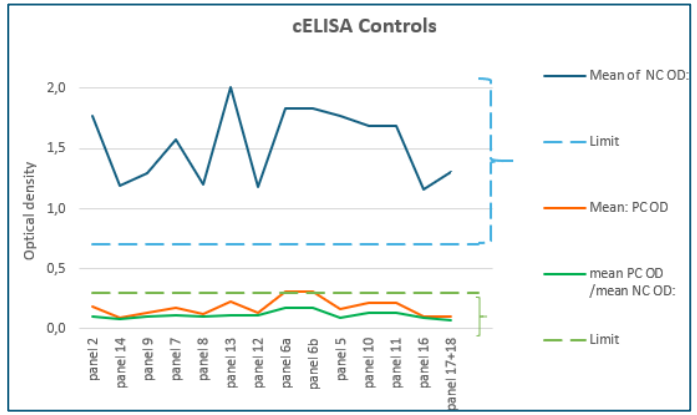




To organise inter-laboratory proficiency testing to ensure equivalence of results among CBPP diagnostic Labs

- IZS-Teramo & BNVL
  - CFT
  - PCR
- CIRAD
  - c-ELISA
  - Vaccine titration
  - PCR

Inter-laboratory testing also contributes to assay validation



n° panel	outliers	controls	specificity	sensitivity	dose effect	repetability	Conclusions
panel 2	3	✓	✓	X	X	X	not satisfactory
panel 14	1 in duplicate	✓	✓	✓	✓	✓	Satisfactory with remark
panel 9	1	✓	✓	✓	✓	(✓)	Satisfactory with remark
panel 7	0	✓	✓	✓	✓	✓	Satisfactory
panel 8	0	✓	✓	✓	✓	✓	Satisfactory
panel 13	2	✓	✓	X	(✓)	✓	Satisfactory with remarks
panel 12	1	✓	✓	✓	✓	✓	Satisfactory with remark
panel 6a	0	✓	✓	✓	✓	✓	Satisfactory with remark
panel 6b	0	✓	✓	✓	✓	✓	Satisfactory
panel 5	0	✓	✓	✓	✓	✓	Satisfactory
panel 10	0	✓	✓	✓	✓	✓	Satisfactory
panel 11	0	✓	✓	✓	✓	✓	Satisfactory
panel 16	0	✓	✓	✓	✓	✓	Satisfactory
panel 17*	0	✓	✓	✓	✓	✓	Satisfactory
panel 18*	0	✓	✓	✓	✓	✓	Satisfactory

To develop, store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control

Supply of reagents for CBPP diagnosis

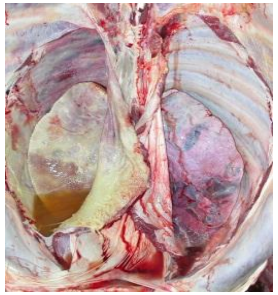
- CFT antigen
- Positive and negative reference sera (CFT and c-ELISA)
- Positive and negative PCR controls
- Kits and diagnostic reagents

Ex. CFT reagents produced by IZS Teramo provided to CVRI and BNVL & cELISA kits and reference sera from CIRAD provided to Angola to support sero-surveillance activities

To provide scientific and technical training for personnel from WOAH Member Countries

CAPACITY BUILDING and NETWORKING

- Laboratory diagnosis of CBPP is only part of the surveillance sistem
- Considering the characteristic nature of the lesions, post-mortem inspection represents the most cost effective approach for CBPP surveillance



- Correct sample collection is a prerequisite for confirmation of suspected cases
- Training on disease recognition and sample collection increase surveillance sensitivity

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IZS TERAMO
WOAH Reference Laboratory for CBPP

Training on abattoir surveillance for CBPP

Angola

Namibia

Namibia regional training course

Training courses on CBPP recognition and sample collection

ILRI Kenya: training during a CBPP trial

CVRI Zambia: during a CBPP trial

Mauritania

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On-site Workshop on CBPP ; Support to the Libyan Veterinary Services

Contagious Bovine Pleuropneumonia: How to Recognise the Disease

IZS TERAMO

WOAH Reference Laboratory for CBPP

3 events

From December 9th to 17th - 2024

World Organisation for Animal Health

cirad LA RECHERCHE AGRONOMIQUE POUR LE DÉVELOPPEMENT

WOAH Reference Laboratory for CBPP

IZS TERAMO

Regional Training Course on Abattoir Surveillance for Contagious Bovine Pleuropneumonia (CBPP)

24 – 27 March 2026, Nairobi, Kenya

GUIDELINES ON HARMONISED PROCEDURES FOR ANTE MORTEM AND POST MORTEM INSPECTION AS A SURVEILLANCE TOOL FOR CONTAGIOUS BOVINE PLEUROPNEUMONIA

Version 1.0
November 2025

Prepared by: Lucía Manso-Silván, Garoma Desa Hedeta, Geoffrey M. Muuka and Massimo Scacchia.

World Organisation for Animal Health | Regional Representation for Africa rr.africa@woah.org | Nairobi, Kenya 24 – 27 March 2026

DEVELOPMENT OF STANDARDISED REPORTING TEMPLATES FOR ABATTOIR SURVEILLANCE OF CONTAGIOUS BOVINE PLEUROPNEUMONIA

Operational Manual
Version 2
October 2025

Prepared by: Lucía Manso-Silván, Garoma Desa Hedeta, Geoffrey M. Muuka and Massimo Scacchia.

World Organisation for Animal Health | Regional Representation for Africa rr.africa@woah.org | Nairobi, Kenya 24 – 27 March 2026

COMESA SPS Project

World Organisation for Animal Health

Regional Training Course on Abattoir Surveillance for Contagious Bovine Pleuropneumonia (CBPP)

24 – 27 March 2026, Nairobi, Kenya

Building disease knowledge and trainers skills and shearing experiences

Clinical and ante-mortem inspection

Post-mortem inspection and sample collection

From theory to practice

COMESA SPS Project

World Organisation for Animal Health

IZS TERAMO

Regional Training Course on Abattoir Surveillance for Contagious Bovine Pleuropneumonia (CBPP)

24 – 27 March 2026, Nairobi, Kenya

Laboratory diagnosis

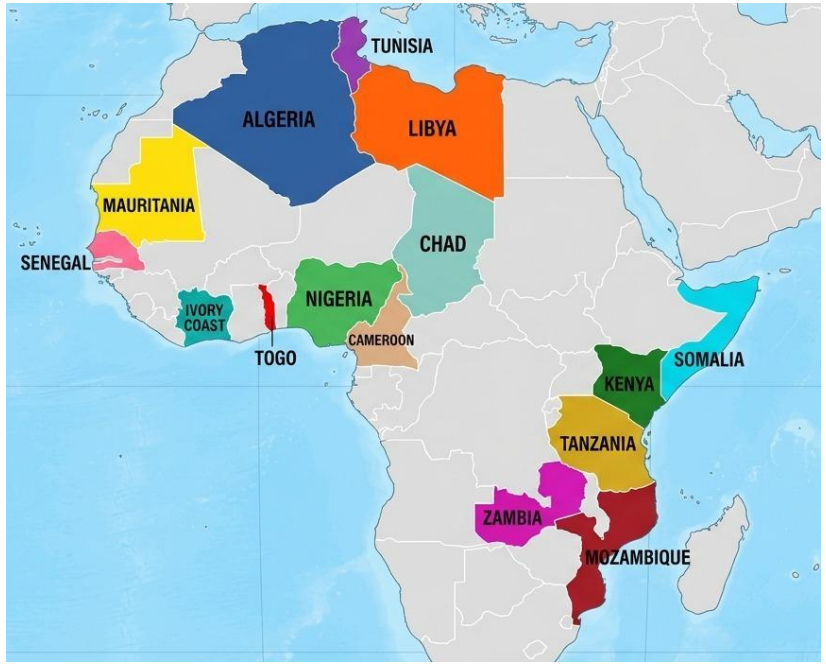
From theory to practice

COMESA SPS Project

World Organisation for Animal Health

Enhancing capacity for CBPP control

15 countries involved



Technical laboratory training

IZS TERAMO
WOAH Reference Laboratory for CBPP

Next CBPP laboratory training in Senegal in August 2026

CBPP CFT and CFT Ag production Training 2023 - NVL Gaborone (Botswana)

Angola, Mauritania, Etiopia, Senegal, Tanzania e Zambia

Technical laboratory training

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- Practical laboratory training sessions on diagnostic techniques are proposed every year at the Ref Lab at CIRAD, France.
- Regional and local on site regional training courses are also organised (SADC, Mali, Mauritania, Angola…)

World Organisation for Animal Health

Technical training under the Regional Sahel Pastoralism Support Project: PRAPS I & II (2016-2026)

- Definition, adoption and interpretation of sero-monitoring protocols for the evaluation of national vaccination campaigns against CBPP
- Control of T1 vaccines by titration
- Monitoring of antimicrobial sensitivity of field strains

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Online Training courses on CBPP ; Italian Veterinary Officers

3 events
Dates: January 25th, February 8th and 15th - 2022

Participants: 335

"CBPP questionnaire 5g) CBPP Surveillance. Provide details of the oversight of surveillance programmes by the Veterinary Services including training programmes for personnel involved in clinical and slaughterhouse/abattoir surveillance, and the approaches used to increase community involvement in CBPP surveillance programmes."

Ongoing training is required also in CBPP-free countries

ERFAN Online Training:
Is CBPP a Health Threat for North Africa?

For North African Veterinarians

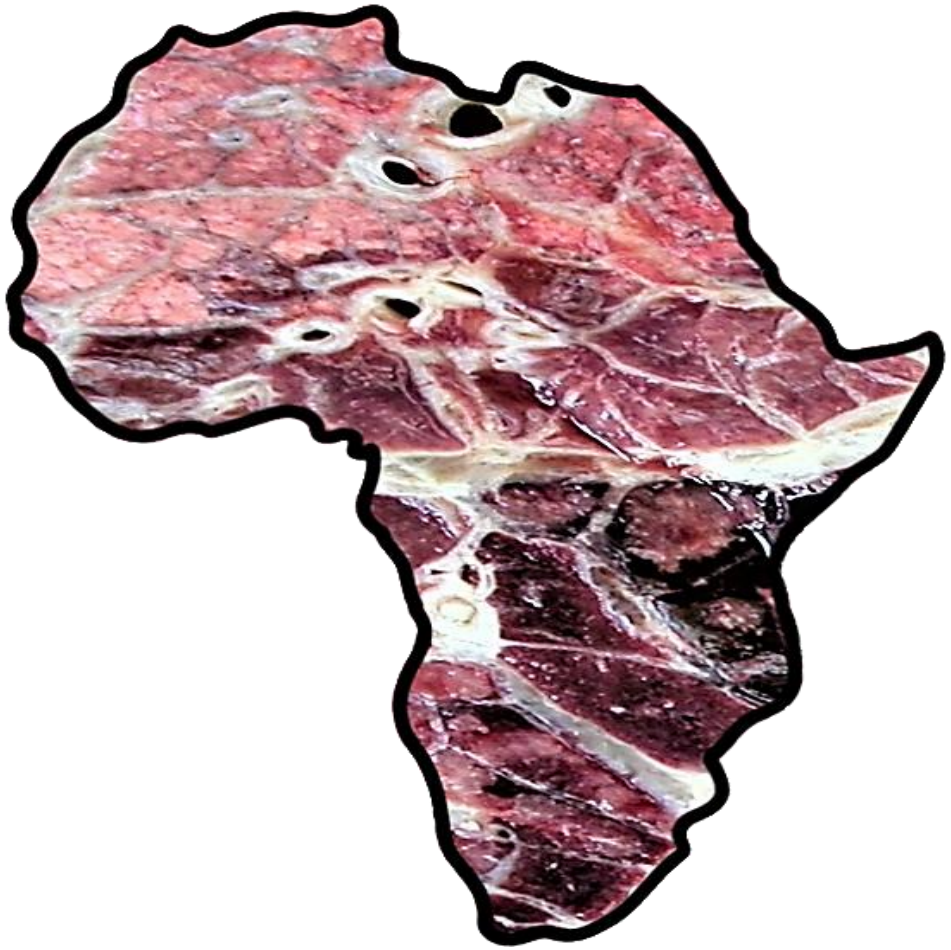
To increase awareness and surveillance in CBPP-free areas

Organised by WOAH Sub-Regional Office in Tunisia
Date: 29 April 2024, First Event

Participants: 221

To organise and participate in scientific meetings on behalf of the WOAH

ERFAN Online Dialogues: CBPP Fora; Synchronous mode



In collaboration between 3 CBPP WOAH RL:
BNVL, CIRAD and IZSTE

7 events
Dates: 25/11/23 - 13/03/24

Registered: 284

To organise and participate in scientific meetings on behalf of the WOAH

GF-TADs for Africa

Contagious bovine pleuropneumonia (CBPP)
Standing Group of Experts (SGE)
for Africa

Inaugural meeting

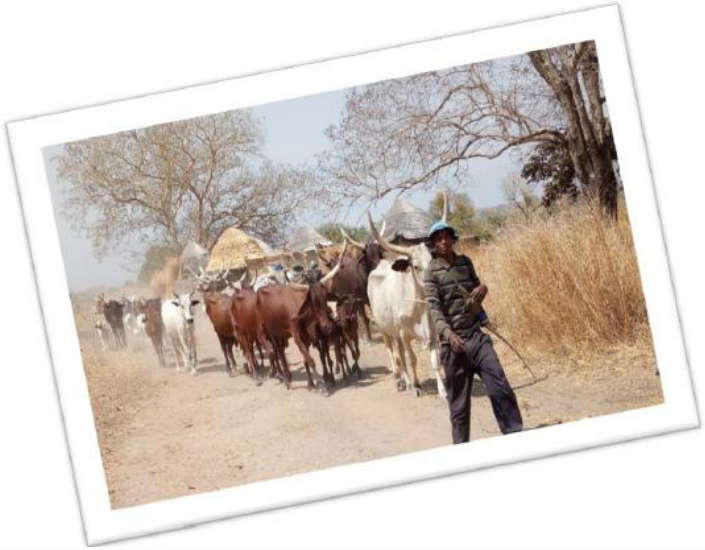
6 – 15 June 2023

GF-TADs for Africa

Contagious bovine pleuropneumonia (CBPP)
Standing Group of Experts (SGE)
for Africa

Second meeting

23 – 25 July 2024 Lusaka, Zambia



To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to WOAH Member Countries

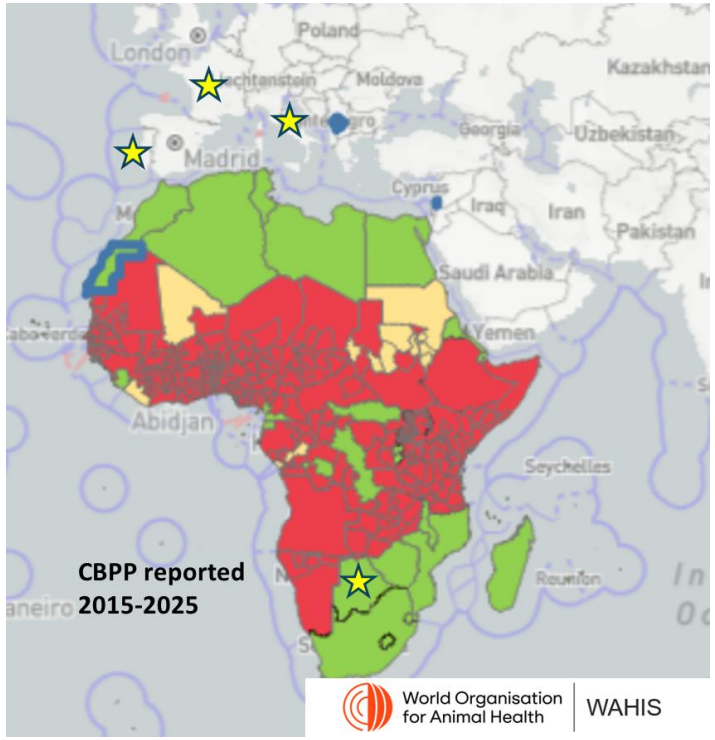
«CBPP questionnaire 4b) CBPP diagnosis: If CBPP *laboratory* diagnosis is not carried out in the country, provide the names of the *laboratories* in other countries providing the service as well as the arrangements in place, including logistics for shipment of samples and the time frame for reporting results.»

This is applicable to CBPP-free countries

In infected countries, where massive testing is required tu support CBPP control or eradication, it is essential to build diagnostic capacity locally

Need of more WOAH Ref Labs in Africa to support CBPP control and eradication strategies

- **WOAH Laboratory Twinning Projects**



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Ministero della Salute

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ERFAN

Scientific collaborations in Africa

Enhancing Research For Africa Network

CBPP Working Group

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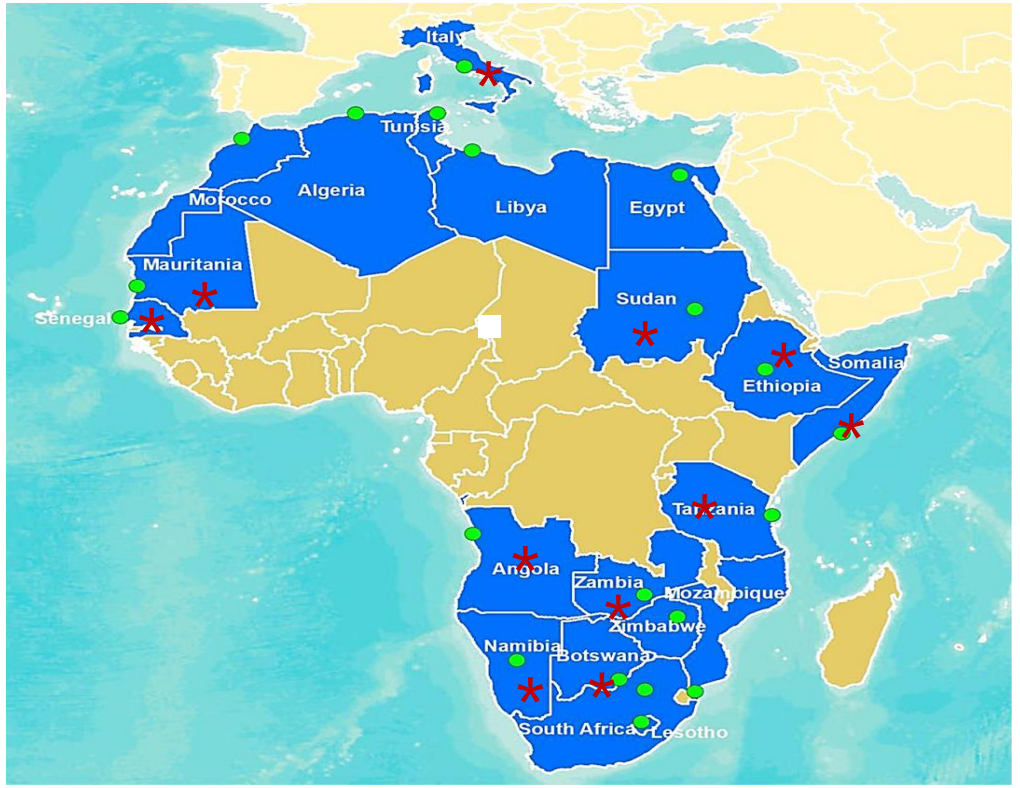
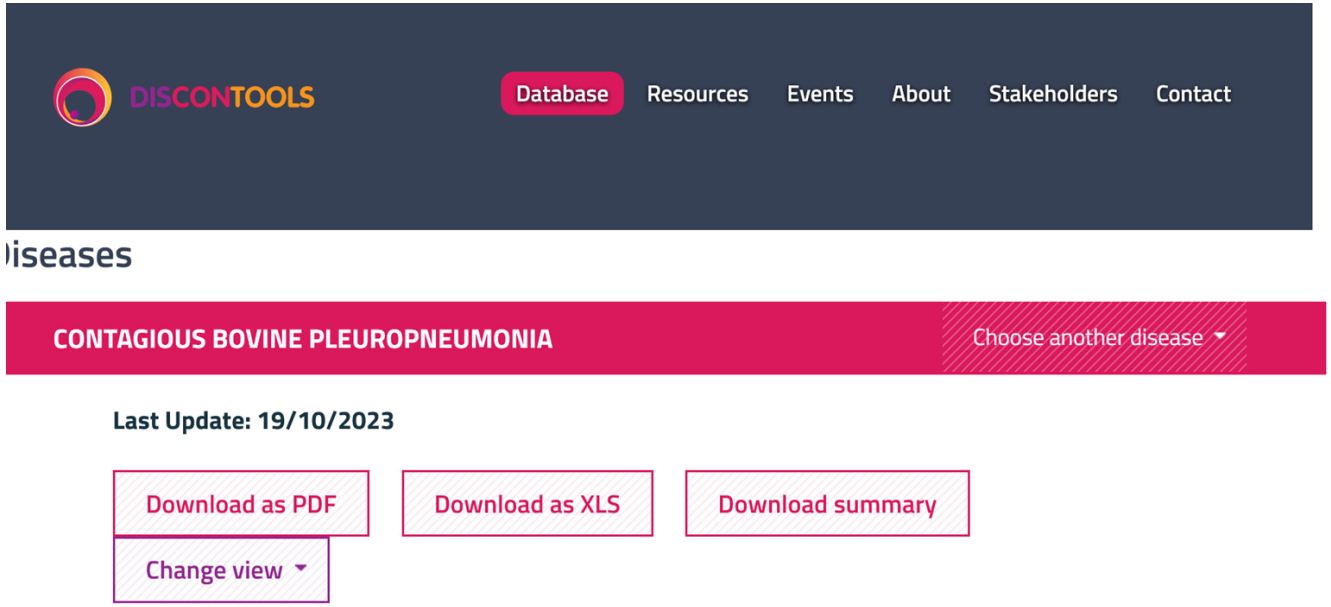


To establish and maintain a network with other WOAH Reference Laboratories for CBPP

Discontools

CBPP gap analysis by a group of 10 experts

Sharing knowledge and points of view



To place expert consultants at the disposal of the WOAH

Ad hoc Group on the evaluation of contagious bovine pleuropneumonia (CBPP) status and endorsement of official control programmes of Members

Evaluation of applications for official recognition of CBPP-free status

Evaluation of applications for the endorsement of official control programmes

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

REVIEW Open Access

Review and comprehensive analysis of knowledge, tools, and implementation gaps for the control of contagious bovine pleuropneumonia

Lucía Manso-Silván[1,2*], William Amanfu[3], Andrea Apolloni[1,2], Loïc Comtet[4], Martin Heller[5], Geoffrey M. Muuka[6], Lamya Rafi[7], Karl M. Rich[8], Flavio Sacchini[9], Elise Schieck[10] and Philippe Totté[1,2]

Contents lists available at ScienceDirect

Vaccine 42 (2024) 1868–1872

Journal homepage: www.elsevier.com/locate/vaccine

Deep sequencing and variant frequency analysis for the quality control of a live bacterial vaccine against contagious bovine pleuropneumonia, strain T1

François Thiaucourt [a,b], Antoni Exbrayat [a,b], Etienne Loire [a,b], Anne Boissi`ere [a,b], Nick Nwankpa [c,1], Lucía Manso-Silvan´ [a,b,*]

•CIRAD, UMR ASTRE, F-34398 Montpellier, France
•ASTRE, Univ Montpellier, CIRAD, INRAE, F-34398 Montpellier, France [c]
•Pan-African Veterinary Vaccine Centre of the African Union (AU -PANVAC), PO Box 1746, Bishoftu, Ethiopia

PLOS ONE

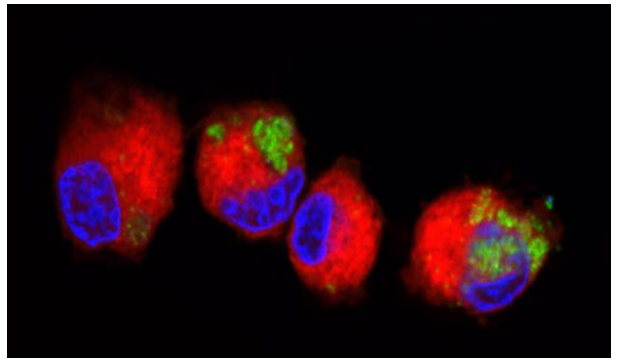
RESEARCH ARTICLE

Interactions between *Mycoplasma mycoides* subsp. *mycoides* and bovine macrophages under physiological conditions

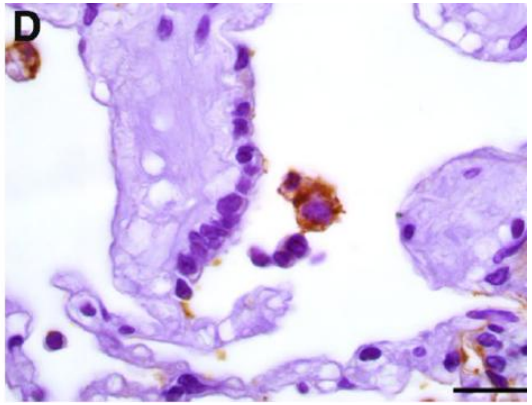
Philippe Totté*, Tiffany Bonnefois, Lucia Manso-Silván

ASTRE, CIRAD, INRAE, Univ Montpellier, Montpellier, France

* philippe.totte@cirad.fr



Bonnefois 2016: fluorescent Mmm cells inside bovine macrophages

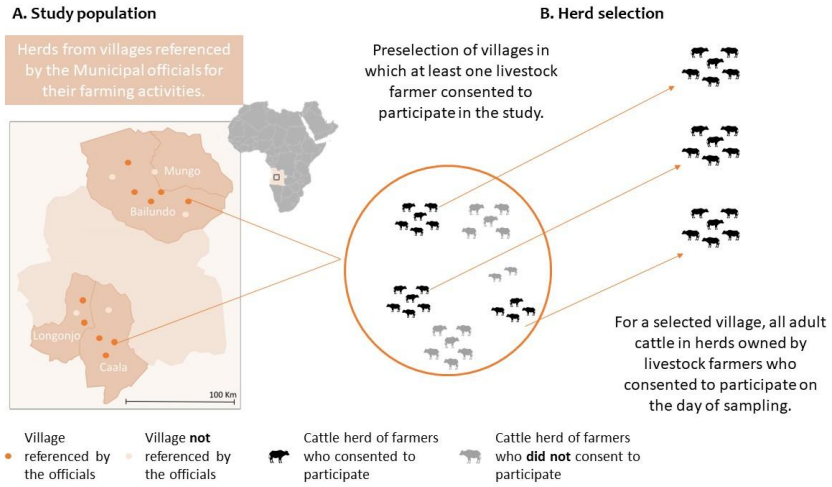


Di Teodoro 2018: pulmonary explants

To collect, process, analyse, publish and disseminate CBPP epizootiological data

Technical support, training at CIRAD and in Angola, provision of SOPs, reference materials and reagents, and technical assistance to the PhD student and laboratory staff throughout the project, culminating in the PhD viva and publication in a peer-reviewed journal.

Pedro AVF, L Manso-Silván, T Lurier, ML Catombela, A Peyraud, A Ravel, D le Grand, MK Noel and F Ayral (2026). Contagious bovine pleuropneumonia: seroprevalence and potential risk factors in the Huambo province of Angola. Accepted for publication in *Scientific Reports*



Université Claude Bernard Lyon 1

THESE de DOCTORAT DE L'UNIVERSITE CLAUDE BERNARD LYON 1

Ecole Doctorale N° accréditation
Nom complet Ecole Doctorale

Discipline : Physiologie et biologie des organismes

Soutenue publiquement le 17 décembre 2025, par :

Antónia Virgínia Francisco Pedro

Epidémiologie et appui à la gestion de la péripneumonie contagieuse bovine, Huambo, Angola

Thank You! Merci!

WOAH / FAO Reference Lab. for CBPP at IZS Teramo, Italy

M. Scacchia

IZS TERAMO
WOAH Reference Laboratory for CBPP
Reference Centre World Organisation for Animal Health

WOAH / FAO Reference Lab. for CBPP at CIRAD, Montpellier, France

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Collaborators