



Food and Agriculture
Organization of the
United Nations



World Organisation
for Animal Health
Founded as OIE

EU Reference laboratory for Peste des Petits Ruminants



Funded by
the European Union



8th PPR GREN

Diagnostic tools available for PPR
surveillance at the wildlife/livestock
interface

CIRAD
EU / WOAHA / FAO Reference Laboratory for
peste des petits ruminants
Montpellier, France

Arnaud Bataille



WOAH

Reference Laboratory
Network for PPR

WOAH Reference Laboratory
for peste des petits ruminants

Reference Centre



World Organisation
for Animal Health
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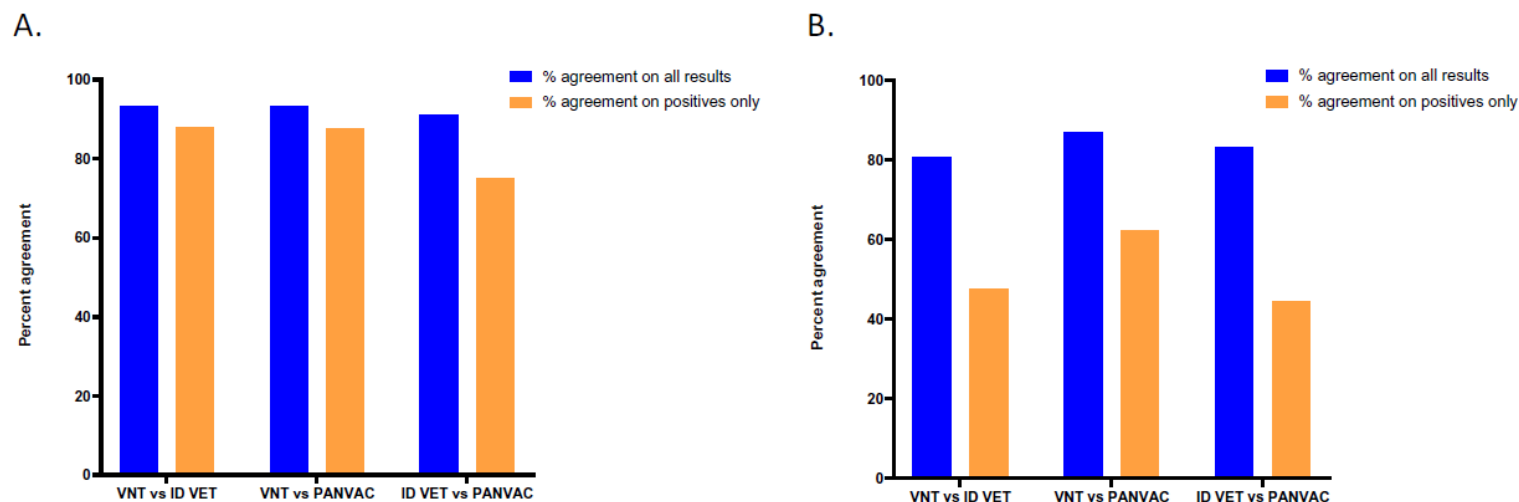
Surveillance at the wildlife/livestock interface: focusing efforts

Important points regarding **serological tools**:

No serological assay validated for wildlife species

For every single species: need to use known negative and positive serum samples for validation (costly and complicated)

Tully et al: 5 serological assays tested: VNT, cELISA, bELISA, PVNA, LIPS (91 SR and 702 wildlife serum samples)



scientific reports

OPEN

The evaluation of five serological assays in determining seroconversion to peste des petits ruminants virus in typical and atypical hosts

Matthew Tully^{1,2}, Carrie Batten¹, Martin Ashby¹, Mana Mahapatra¹, Krupali Parekh¹, Satya Parida^{1,2}, Felix Njeumi³, Brian Willett³, Arnaud Bataille⁴, Genevieve Libeau⁴, Olivier Kwiatek⁴, Alexandre Caron⁴, Francisco J. Berguido⁵, Charles E. Lamien⁵, Giovanni Cattoli⁶, Gerald Misinzo⁶, Julius Keyyu⁷, Daniel Mdetete⁸, Francis Gakuya⁹, Sanne Charles Bodjo¹⁰, Fatima Abdelazeem Taha¹¹, Husna Mohamed Elbashier¹², Abdelmalik Ibrahim Khalafalla^{13,14}, Abdinasir Y. Osman^{15,16} & Richard Kock¹⁶

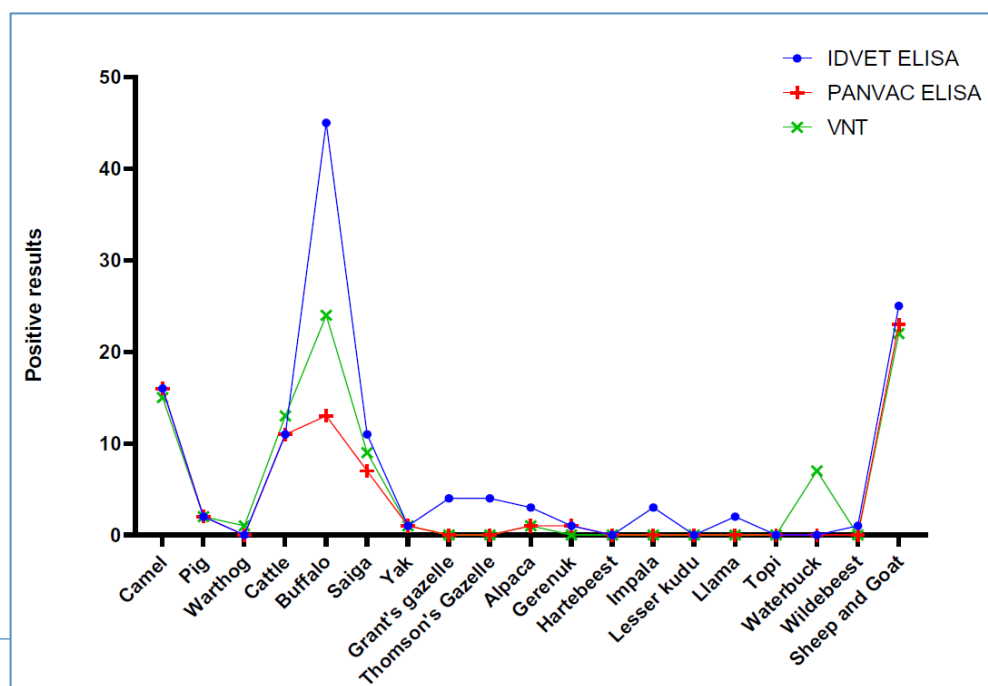
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➤ Past contact of wildlife with PPR hard to studied with serology without validation

➤ Hard to use wildlife as sentinel based on serosurveillance



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Option as sentinel using serosurveillance: **cattle**

IDvet ELISA kit now validated for cattle

ID Screen[®]
PPR Competition



ELISA de compétition pour la détection d'anticorps dirigés contre la nucléoprotéine du virus de la Peste des Petits Ruminants (PPRV)

Usage *in vitro*

Mai 2025

» Ajout de la possibilité de tester des échantillons bovins (note : les données de validation sont disponibles sur demande)

Ces modifications sont signalées dans la notice par le symbole »

Restent inchangés par rapport à la version 0821 :

- le reste de la procédure d'essai,
- les critères de validation et d'interprétation.

Surveillance at the wildlife/livestock interface: focusing efforts

Important points regarding **virological tools**:

- PCR on organ and swab most sensitive way to detect virus genetic material (including for wildlife)
- Penside tests should work with similar sensitivity for wildlife than for small ruminant samples
- Issue: getting the samples (capture is expensive)
- Special care in sample storage (virus preservation method if no cold storage option)

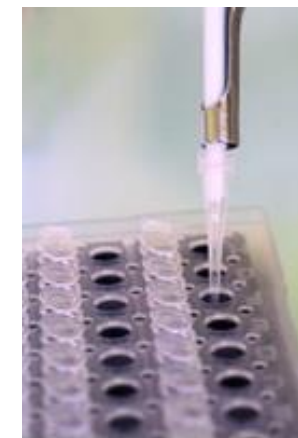


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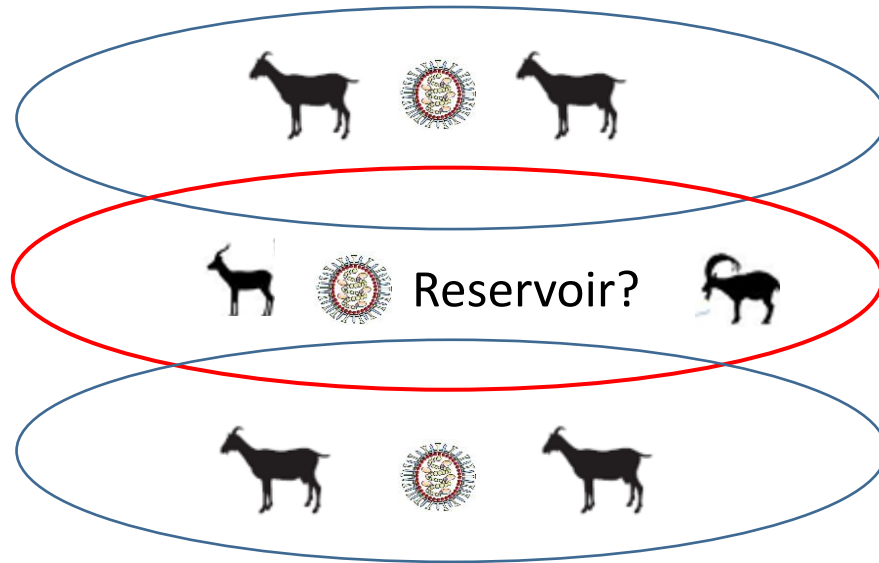
➤ Surveillance at interface could focus on investigation of dead/diseased animals, and on non-invasive sampling



Developing non-invasive diagnostic methods for PPRV

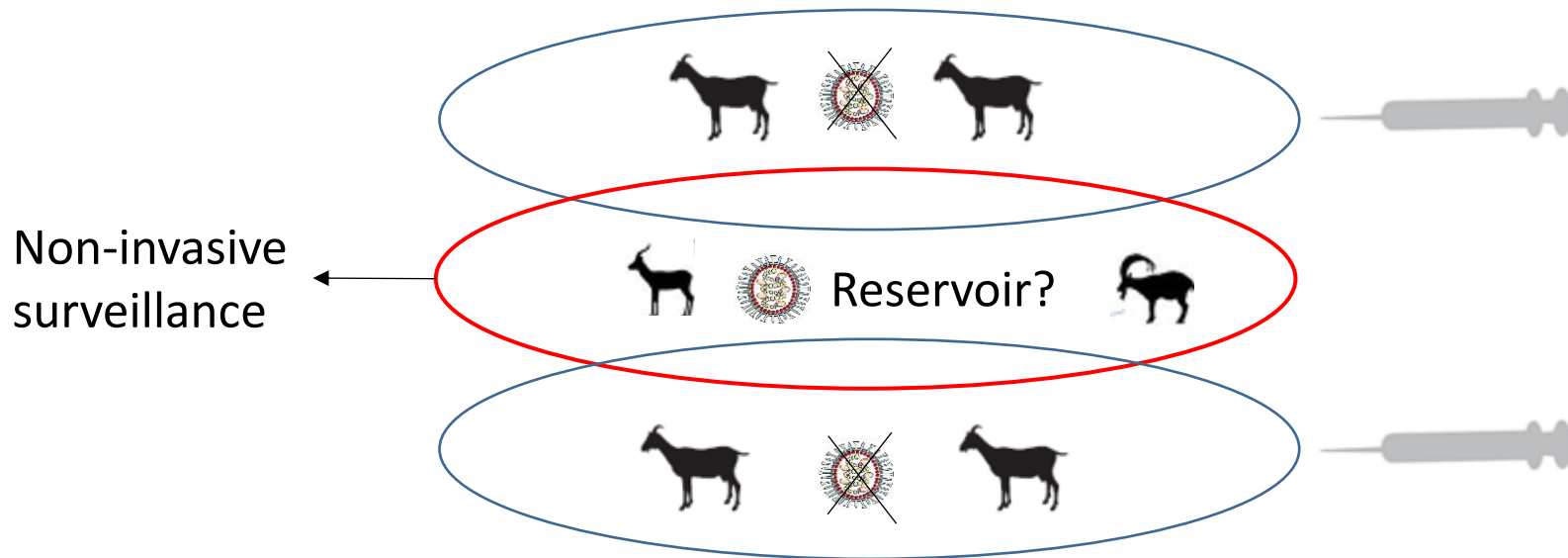
Most cost-effective method for surveillance at interface for

- Using wildlife as sentinel
- Monitoring circulation in wildlife during control efforts in livestock
- Evaluating risks for biodiversity



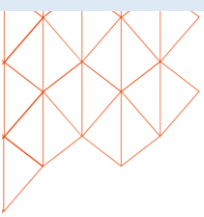
Developing non-invasive diagnostic methods for PPRV

- Most cost-effective method for surveillance at interface for
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Promising non-invasive approaches: environmental sampling



Best for PPR surveillance at the interface (if such surveillance is relevant)

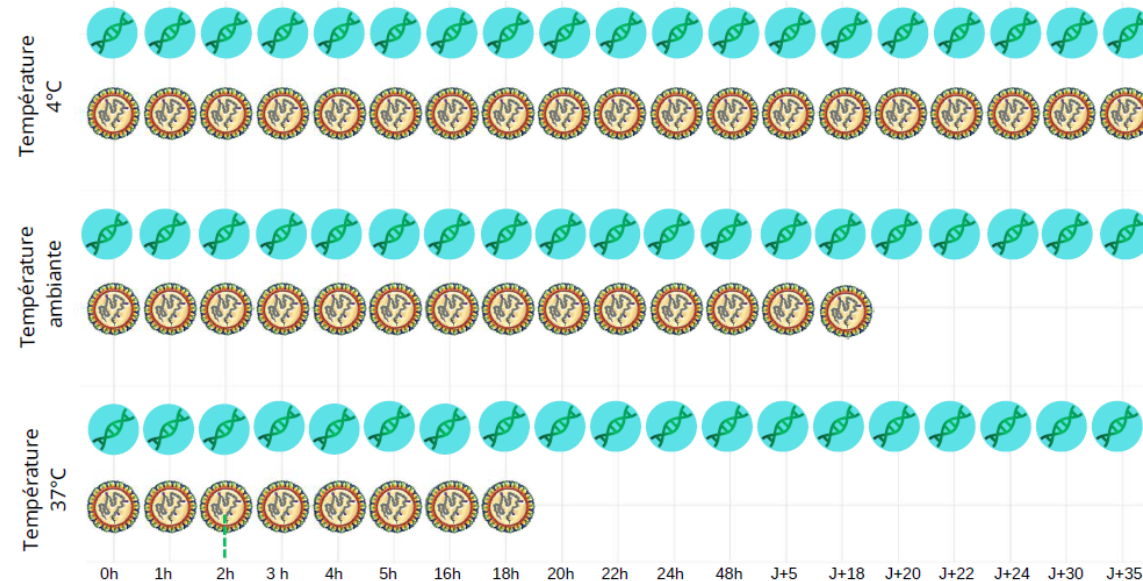
- Fecal samples possible but needle in haystack issue
- Best: one sample representing multiple individuals and with good RNA preservation

Promising non-invasive approaches: environmental sampling

Best for PPR surveillance at the interface (if such surveillance is relevant)

- Fecal samples possible but needle in haystack issue
- Best: one sample representing multiple individuals and with good RNA preservation
- Strong option: **Water points at the interface** – risk of transmission and RNA preservation

Tests in laboratory
with vaccine and
wild strain:

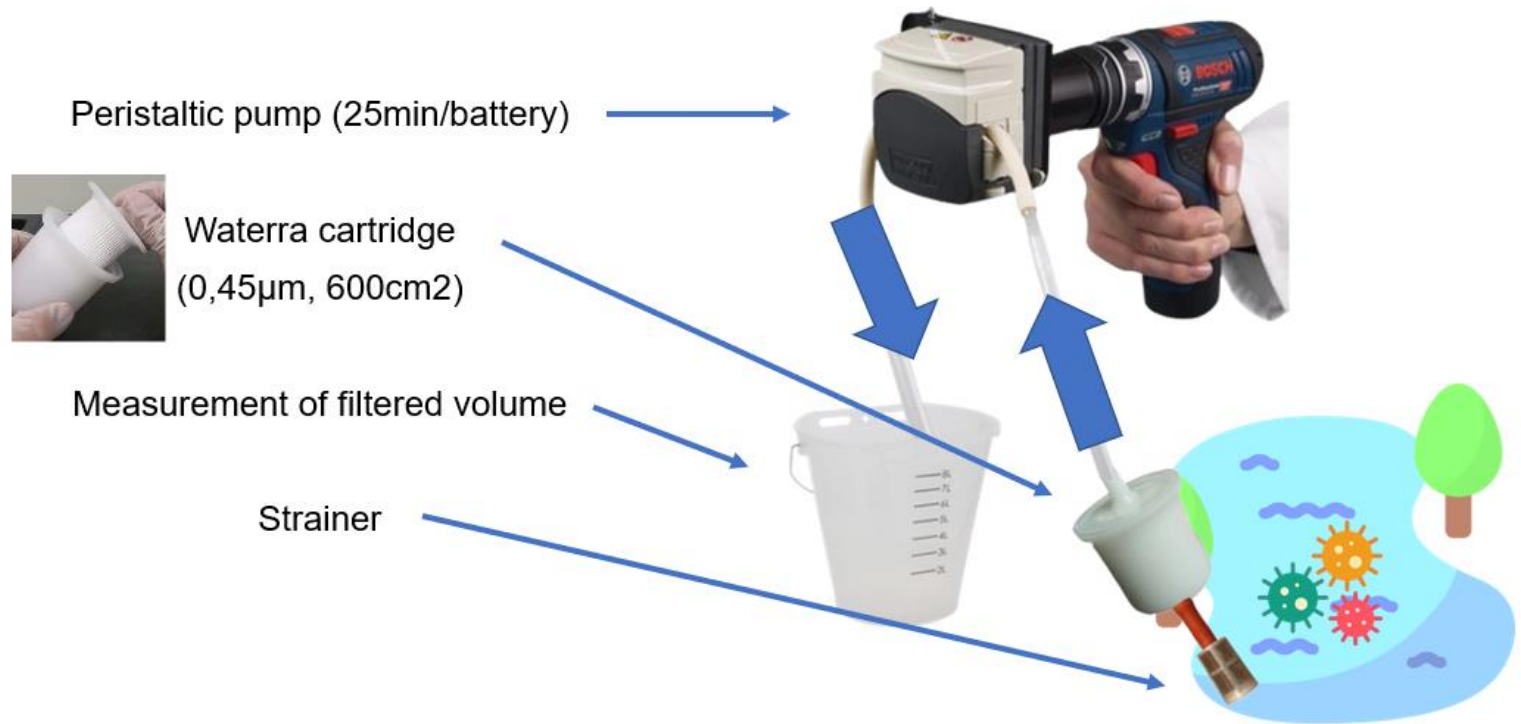


Development of water sampling and pathogen detection method

Survireaumics and Interwater projects, funded by CIRAD, EU and FAO

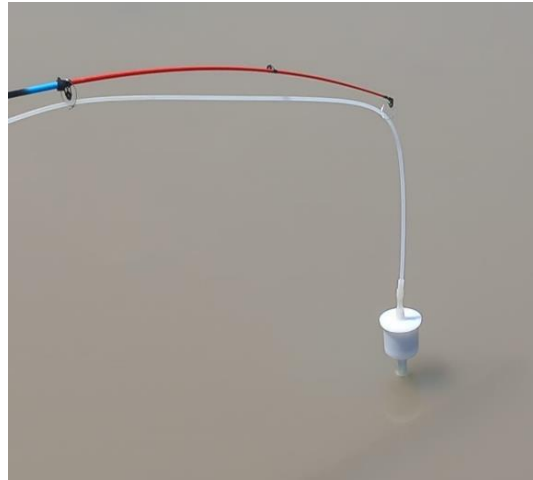
Validated in the lab

**Adapted to the field
with limited
ressources**



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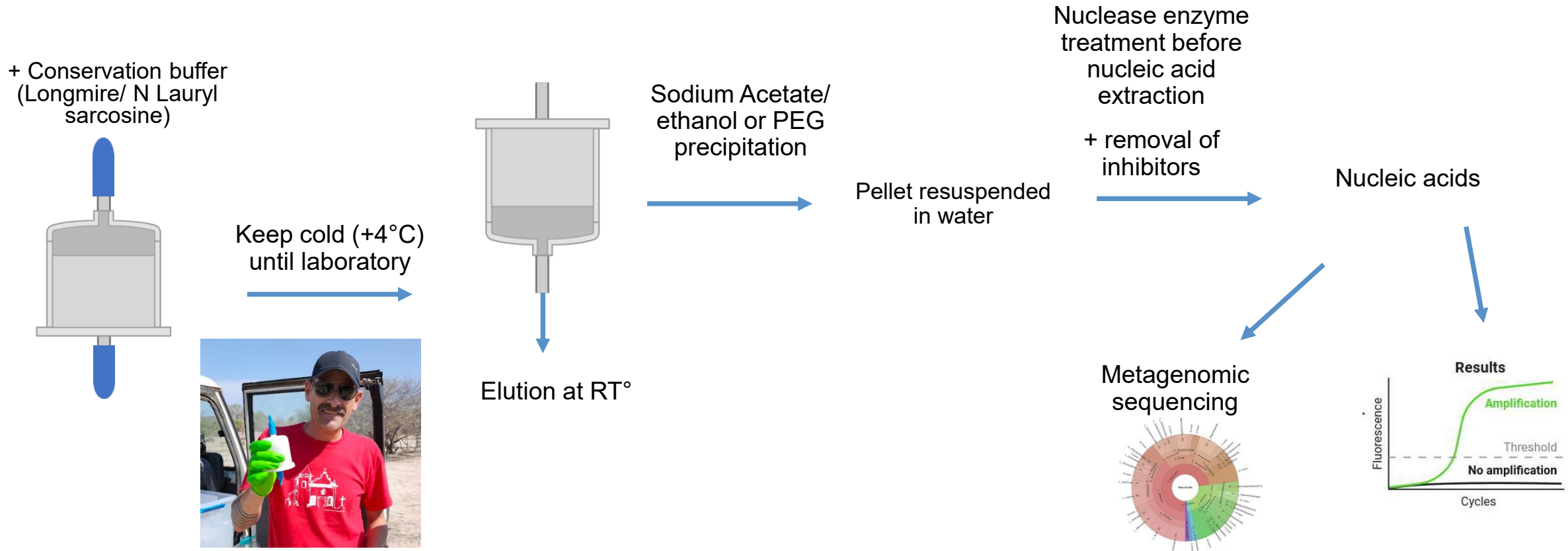


Pumping during 20 min
Good flow: 5L
Water charged in particles:
2-2.5L



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Method under field test in Mongolia (Interwater project, EU and FAO funds, collaboration with SCVL) - in Saiga range and Gobi desert, in areas with previous PPR outbreaks

Best suited for small standing water point used by wildlife and livestock (short-term or permanent)

Information on circulation of PPR in an area, should be integrated with camera trap info when possible



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Promising non-invasive approaches: environmental sampling

Other options easily applicable for livestock: dust collection (in farms, markets, trucks...)

Application at interface? Dust collection system?

To be validated against inhibitors

ACCESS MICROBIOLOGY
an open research platform

SHORT COMMUNICATION

Brown et al., *Access Microbiology* 2024;6:000872.v3
DOI 10.1099/acmi.0.000872.v3



Environmental sampling for the detection of capripox viruses and peste des petits ruminants virus in households and livestock markets in Plateau State, Nigeria

Emma Brown¹, David Ehizibolo², Banenat B. Dogonyaro², Yiltawe Wungak², Olumuyiwa Oyekan², Adeyinka Adedeji², Sandra Ijeoma², Rebecca Atai², Moses Oguiche², Mark Samson², Fabrizio Rosso³, Anna B. Ludi¹, Georgina Limon¹, Andrew E. Shaw¹, Claire Colenutt¹ and Simon Gubbins^{1,*}

Received: 7 April 2021 | Accepted: 20 July 2021

DOI: 10.1111/tbed.14257

Transboundary and Emerging Diseases

WILEY

SHORT COMMUNICATION

Environmental sampling for the detection of foot-and-mouth disease virus and peste des petits ruminants virus in a live goat market, Nepal

Claire Colenutt¹ | Emma Brown¹ | David J. Paton¹ | Mana Mahapatra¹ | Satya Parida¹ | Noel Nelson² | Jenny Maud³ | Paolo Motta³ | Keith Sumption³ | Bishnu Adhikari^{3,4} | Sharmila Chapagain Kafle⁵ | Mukul Upadhyaya⁶ | Samjana Kafle Pandey⁷ | Simon Gubbins¹

Conclusions

- More work needed to have **validated serological tools** to be able to include with confidence wildlife in serosurveillance
- PPR surveillance in wildlife should **concentrate on detection of genetic material** in dead/ diseased animals, and on environmental samples (most cost effective surveillance)
- **Environmental samples at water point** may be a solution for non-invasive, efficient surveillance at the interface, but also in other areas to detect PPR circulation. Protocol to be published and disseminated in 2026
- **Other environmental samples** also of interest (e.g. fomites in markets/trucks), but more work needed to validate such method



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THANK YOU

To receive information on the disease, on appropriate sampling, on laboratory methods, and available supports:

EU and WOA/FAO reference laboratory for PPR

CIRAD, Montpellier, France

email: contact-eurl-ppr@cirad.fr ; arnaud.bataille@cirad.fr

website: <https://eurl-ppr.cirad.fr/>

<https://www.ppr-labs-oie-network.org/>



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