Oral fluid as a non-invasive alternative diagnostic medium for disease monitoring in pigs

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Introduction

Current disease surveillance in UK pigs involves individual blood sampling by vets for subsequent laboratory diagnostics.

Pen-based oral fluid sampling may provide a more cost effective alternative by allowing farmers to collect their own samples for widespread testing at a fixed cost.

In the US, oral fluids are now being used for routine monitoring of PRRSv, PCV-2, M. hyo, PEDv, ASFv.
Aim & Objectives

**AIM**: Development & optimisation of oral fluid (OF) diagnostics in UK pig populations

- Establish representative OF collection protocols for large pig populations kept in diverse housing types
- Further develop laboratory tests for disease detection in pig OF, incl. sample handling & storage methods
- **Field validation of OF against blood serum to gauge performance & reliability of OF testing**
**PRRS OF Field Validation**

**AIM:** To validate performance of porcine OF compared to blood serum for detection of anti-PRRS antibody

**METHOD**

33 one-time farm visits
30 minute OF collection
Diagnostic blood samples

IDEXX PRRS X3 Ab Test Kit
IDEXX PRRS X3 Ab Test Kit for Oral Fluids (1\textsuperscript{st} data)
RESULTS
By pen:
Se = 90%, Sp = 76%

By farm:
Se = 91%, Sp = 70%

INTERPRETATION
False +ve results (OF⁺ serum⁻) in younger pigs may be due to:

• ↑ population representation in OF
• OF contaminants trigger +ve results
• Maternal Ab detectable in OF
PRRS OF Longitudinal Study

**AIM**: To track anti-PRRS antibody dynamics over time using porcine OF

**METHOD**
8 commercial systems (4 breeding sources)
5 OF collections over 10 weeks, 1 blood collection

Nursery → Grower

4-7 pens/unit, 25-540 pigs/pen
30 min rope chew
IDEXX PRRS X3 ELISA
Anti-PRRS antibody detection patterns differ within & between systems. Patterns may be used to distinguish between clinical PRRSv infection & maternal antibody. ! OF data from young pigs must be interpreted with care to avoid misdiagnosis.
Industry Focus

OF diagnostics facilitate farmer-driven investigation of disease dynamics on farm

Cost of PRRS Testing
(based on conventional system, pen size <30)

Using blood: 86p/pig (plus labour & vet cost)
Using OF: 17p/pig (plus labour)

Longitudinal antibody monitoring allows farmers to generate pathogen “footprints”

↓ stress, ↑ welfare = ↑ productivity/profitability
Conclusions: This year

OF shows good agreement (94% F, 72% N) with serum for anti-PRRSv antibody detection

The method can be used to monitor antibody dynamics in pig populations over time

Maternally-derived, as well as disease-associated antibody can be detected in OF from young pigs
Final Conclusions

Investigations into collection methods have demonstrated the applicability/adaptability of OF diagnostics for the range of UK housing systems.

Safe, simple-to-implment storage of samples at ambient temperatures was achieved under experimental conditions.

Large scale & longitudinal validation studies have shown that OF is comparable with blood serum for the assessment of PRRS status.
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Any Questions?