Testing swine oral fluids is a convenient and cost-effective method for PRRS monitoring and surveillance in commercial herds

By collecting the oral fluids remaining after a pig chews on a rope hanging within the pen, individual or groups of pigs can be surveyed for exposure to the porcine reproductive and respiratory syndrome (PRRS) virus.

- Cost-effective and convenient
- Less invasive sample collection
- Optimized for detection of antibodies in less than four hours
- 98% specificity and sensitivity
- For disease monitoring and surveillance

Testing oral fluids provides a more comprehensive picture of herd status compared to bleeding a random selection of the herd. It is also a less invasive means of sample collection. In this comparison, results show that the new IDEXX PRRS Oral Fluids Ab Test (PRRS OF) is optimized for the detection of antibodies to PRRSV from individual or pen samples of swine oral fluids in less than four hours (Figure 1).

Figure 1. Comparison of Test Protocols
This assay follows a similar protocol to the IDEXX PRRS X3 Ab Test with the following key modifications:

- Sample input is 50 μl/well (diluted 1:2 in sample diluent to a final volume of 100 μl.)
- There is a 2-hour sample incubation step at room temperature.
- The final substrate color changes from blue to yellow, so final absorbance is read at 450 nm with a reference wavelength (A<sub>ref</sub>) range between 620 nm and 650 nm (A<sub>450</sub> - A<sub>ref</sub>).

An S/P ≥ 0.4 is considered a positive result.

Sample Set 1 (Figure 2)
Oral fluids reference standards: These reference standards are composed of a temporal series of pooled oral fluids collected from pens of pigs vaccinated with type 2 modified live vaccine (Ingelvac<sup>®</sup> PRRS<sup>®</sup> MLV, Boehringer Ingelheim Vetmedica, Inc.) and collected at 0, 10, 15, 20, 28, 35, 41, 49, 56, 75 and 91 days postvaccination (DPV).<sup>2</sup>

Sample Set 2 (Figure 3-1 through 3-4)
Oral fluids from individual boars: A set of temporal samples from day 7 to day 21 (postinfection or vaccination) of paired oral fluids and serum was collected from 72 boars and divided into three sets (24 boars per trial). Two of the sets were infected with type I (D09-012131) or type II strain (MN-184; GenBank<sup>®</sup> accession no. AY656992); the third set was vaccinated with type 2 MLV.<sup>3</sup>

Sample Set 3 (Figure 4)
Oral fluids from a pen prevalence study: Analysis of performance on pen samples according to prevalence of antibody-positive pigs in a pen was based on a study of 625 pigs divided into pens of 25 pigs each.<sup>4</sup> Briefly, pigs vaccinated with modified live vaccine 14 days prior to the day of the study (at peak of seroconversion for antibodies) were introduced into pens of pigs seronegative for PRRS antibodies at a different prevalence of antibody-positive pigs (0%, 4%, 12%, 20%, and 36%), with five pens for each of the prevalence values. All pigs were bled for confirmation of serum antibody titers. Oral fluids were collected from each pen by hanging a cotton rope on the pen for 30 minutes. Five successive 30-minute replicate collections were done per pen by hanging a new rope for each collection event.

The IDEXX PRRS OF Ab Test detects PRRS antibodies in ≥96% of all collection events in pens of at least 20% prevalence, and ≥85% in pens of 12% prevalence.

Sample Set 4 (Figure 5)
Oral fluids from individual field samples: Diagnostic specificity and sensitivity were established with a sample set of paired oral fluids and serum comprised of 147 samples from a PRRS-positive farm and 151 samples from a PRRS-negative sow farm, for a total of 298 sets of paired samples.
Figures 3-1 through 3-4. Type I and Type II PRRSV Strains: Antibody Conversion in Serum and Oral Fluids

Figures 3-1 through 3-4 show a selection of pigs individually inoculated with type I and II PRRSV strains, representing the typical conversion of antibodies in both serum and oral fluids. Analysis indicates little difference between the time of detection of anti-PRRSV antibodies in serum and in oral fluids, as well as a similar ability to detect antibodies to both type I and II PRRSV strains.

### Table

<table>
<thead>
<tr>
<th>Prevalence level (rate of PRRS antibody-pos pigs % of pen)</th>
<th># of pens</th>
<th>Total # of collection events</th>
<th>Average serum S/P of vaccinated pigs (from PRRS X3)</th>
<th>Oral fluids: rate of pos events (%) prevalence level</th>
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<tbody>
<tr>
<td>0</td>
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<td>25</td>
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<td>5(5)</td>
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<td>4(5)</td>
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<td>20</td>
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<td>32–36</td>
<td>5(5)</td>
<td>25</td>
<td>1.33</td>
<td>24/25(96%)</td>
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Figure 3-1: Performance Based on Prevalence

**Serum**

**IDEXX PRRS X3 Ab Test** Sample Set 2

**Oral Fluids**

**IDEXX PRRS OF Ab Test** Sample Set 2

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Figure 3-2

Figure 3-3

Figure 3-4

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Figure 4. Performance Based on Prevalence

Sample Set 3
Figure 5: Sensitivity and Specificity

Figure 5 summarizes the performance of the new PRRS Oral Fluids ELISA compared to results obtained with the serum-based PRRS X3 assay on paired samples of oral fluids and serum, collected from individual commercial sows. The new PRRS Oral Fluids ELISA had a sensitivity of 100.0% and a specificity of 98.7% (with minimum sensitivity and specificity of 96.9% and 96.3%, respectively, at 95% confidence interval).

Summary

The IDEXX PRRS OF Ab Test accurately detects PRRS antibodies in oral fluid samples providing results in less than four hours, using a non invasive sampling technique.

References:

Exposure Status

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95% Confidence Limits

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<tr>
<td>Sensitivity</td>
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<td>Specificity</td>
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For more information about the IDEXX PRRS OF Ab Test, please contact your IDEXX representative or visit idexx.com/prrs.