Field Comparison of Two Commercial Vaccines for Controlling Mutant Porcine Circovirus Type 2 Viremia

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Introduction:
Recently, a new strain of porcine circovirus Type 2 has been identified in the U.S. based on genetic sequencing. This virus has a similar sequence pattern to a virus previously identified in China and is often referred to as the “Chinese mutant” or mutant PCV2 (mPCV2). Some concern has been expressed regarding the ability of current U.S. commercial vaccines to protect against this new strain. As part of a producer-initiated PCV2 vaccine evaluation, we were provided the opportunity to monitor the PCV2 viremia and antibody status of pigs undergoing field exposure to mPCV2.

Materials and Methods:
The pigs originated from a herd free of PRRSv and Mycoplasma hyopneumoniae (Mhp) and were part of a larger field evaluation comparing the performance between two commercial PCV2 vaccines: Fostera™ PCV (FOST) (Zoetis, Florham, NJ) and Circumvent® PCV (CVENT) (Merck Animal Health, Summit, NJ). This study used a “barn level” design. The pigs that were monitored for PCV2 viremia by PCR and PCV2 antibody by 4-dilution IFA were housed in two adjacent finisher barns. The FOST pigs were vaccinated once at weaning (3 weeks of age). For CVENT vaccination, the producer elected to administer the two vaccinations at processing (3 days of age) and at weaning. The pigs were tagged after arrival to separate nurseries, and the same pigs were sampled at 4, 11, 16 and 19 weeks of age. Forty pigs from the source sow herd were sampled at 10 days of age. All laboratory testing was performed by routine methods at the ISU-VDL. Samples for PCR were tested in pools of five. To confirm the presence of mPCV2 in each barn, oral fluids from five pens and blood from 10 lightweight, non-tagged pigs were collected at 19 weeks of age. Several positive samples were sequenced and all sequences indicated mPCV2. Based on serotesting at 19 weeks of age, the pigs remained free of PRRSv and Mhp. Statistical analysis was performed by ANOVA and a P value <0.05 was considered significant.

Results:
The 10-day-old pigs from the source herd were not viremic and had a geomean IFA titer of 190.3. The following table presents the PCR and IFA results from the tested serum.

<table>
<thead>
<tr>
<th>Test:</th>
<th>Unit Group</th>
<th>Age (in weeks)</th>
<th>4</th>
<th>11</th>
<th>16</th>
<th>19*</th>
<th>19**</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR-Pools</td>
<td>CVENT</td>
<td>0/5</td>
<td>0/5</td>
<td>0/4</td>
<td>0/5</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOST</td>
<td>0/5</td>
<td>0/5</td>
<td>5/5</td>
<td>5/5</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>Geomean IFA Titers</td>
<td>CVENT</td>
<td>498.7*</td>
<td>560.8*</td>
<td>266.6*</td>
<td>216.3*</td>
<td>139.3*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOST</td>
<td>131.8*</td>
<td>86.9*</td>
<td>139.3*</td>
<td>844.3*</td>
<td>735.2*</td>
<td></td>
</tr>
</tbody>
</table>

* If different within a row, P < 0.05. *Tagged pigs. **Lightweight pigs.

Conclusions and Discussion:
The data presented clearly illustrates the ability of CVENT to protect against mPCV2 viremia. In addition, the declining IFA titers in the CVENT pigs indicate protection. This finding was reported in a previous field study that compared non-viremic, CVENT-vaccinated pigs (declining titers) to viremic, non-vaccinated controls (rising titers). The oral fluid results indicate a lower level (approximately 1,000 times less) of virus shedding in the CVENT barn.

References: