INTRODUCTION

Production of seronegative pigs from a PRRS positive breeding herd is a good intermediate step for herds pursuing PRRS elimination. A positive PRRS farrow-to-finish genetic multiplier herd experienced a clinical outbreak of PRRS in November, 1998. In response to the PRRS outbreak, a goal was established to produce PRRS negative offspring by eliminating vertical transmission of PRRS virus from the breeding herd.

MATERIALS AND METHODS

Upon diagnostic confirmation of PRRS, all finishing pigs weighing 200 pounds or more were sold or moved off-site. All pigs remaining on-site, including the entire breeding herd and all stages of growing pigs, were vaccinated with PRRS MLV (Ingelvac PRRS) in March and again 30 days later in April 1999. The procedure for new replacement animal introduction was modified to provide extended time post-vaccination. In November 1999, naive replacement gilts were introduced into the breeding herd after several months of utilizing PCR testing and establishing declining titers on numerous animals. Initial PRRS ELISA testing was performed on a monthly sampling from a random selection of 40 sows beginning in June 2000. In October 2000, the sow herd sampling was restricted to only those females that had not previously received PRRS MLV. These females served as sentinel pigs to detect any potential horizontal transmission within the breeding herd. Further, beginning in October 2000, 10 pigs were randomly selected on three monthly samplings from each finishing group (approximately 1000 pigs) to represent early (12-14 weeks of age), middle (16-20 weeks of age), and late (22-24 weeks of age) stages of finishing. The selected pigs were bled and tested using PRRS ELISA. Five finisher rooms were sampled each month. The calculated S/P ratio from the IDEXX PRRS ELISA was charted (Figure 1) and analyzed with the X-barR chart (average and range chart). X-barR charts were also generated to represent each of the three stages (early, middle, and late) tested in finishing. Figure 2 is a bar chart representing the middle stage of finishing.

RESULTS

The PRRS serology for the breeding herd is represented in Figure 1. Beginning with the testing of naïve, non-vaccinated replacement gilts in October, 2000, the process is predictable with little variation. The central line (cl) representing the mean s/p ratio is 0.08, with an upper control limit (ucl) of 0.04. The cl, ucl, and number of positive samples for each of the three stages of finishing are represented in Table 1. One sample in the middle age group initially tested positive on ELISA (s/p = 0.49 based on an ELISA cutoff s/p ≥0.40), but was negative on retest ELISA and PRRS PCR, as well as seronegative at the third sampling 5 weeks later. These results are consistent with the published assay specificity (1). The range chart (bottom Figure 2) for the middle stage of finishing depicts a signal associated with the positive sample described above.

DISCUSSION

The use of Ingelvac PRRS MLV and entry of stable, but positive, gilts was successful in stabilizing field PRRS virus in this sow herd and enabling production of seronegative offspring through grow/finish. There is no indication of horizontal transmission in the sow herd as represented by 13 months of predictably negative “sentinel” results. There is also no indication of vertical transmission from the sow herd as represented by 20 consecutive finishing groups with predictably negative results.

Figure 1. PRRS ELISA s/p ratio XbarR chart from breeding herd

![Figure 1](image1)

Table 1. PRRS ELISA s/p ratios from offspring in finishing

<table>
<thead>
<tr>
<th>Stage</th>
<th>Age (weeks)</th>
<th>Central limit</th>
<th>Upper limit</th>
<th>% Positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>12 – 14</td>
<td>0.01</td>
<td>0.06</td>
<td>0.00% (0/250)</td>
</tr>
<tr>
<td>Middle</td>
<td>16 – 20</td>
<td>0.02</td>
<td>0.07</td>
<td>0.38% (1/260)</td>
</tr>
<tr>
<td>Late</td>
<td>22 – 26</td>
<td>0.01</td>
<td>0.05</td>
<td>0.00% (0/200)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>0.14% (1/710)</td>
</tr>
</tbody>
</table>

Figure 2 PRRS ELISA s/p ratio XbarR chart offspring 16-20 wks

![Figure 2](image2)

CONCLUSIONS

The strategic use of Ingelvac PRRS MLV vaccine and entry of stable replacement animals provided for successful production of PRRS seronegative pigs from this herd. The ongoing process measurement techniques provide additional assurance within a PRRS risk management effort. The next goal for this herd is to eliminate PRRS positive animals from the breeding herd towards a goal of PRRS elimination.

REFERENCES

1. IDEXX Laboratories, Inc. Westbrook, Maine, USA.