An ever-shifting disease, swine influenza continues to cause respiratory problems and decrease profitability in U.S. swine herds. Control of swine influenza virus (SIV) in breeding females through pre-farrowing vaccination is a common strategy used to help protect suckling and growing pigs from SIV. This method helps boost piglet maternal antibodies, helping provide them with early immunity. However, recent studies show that SIV can be present at higher levels than expected. SIV can persist in sow farms due to the continual infection of young susceptible pigs. A recent study found that while SIV was not detected in adult breeding animals 30 days after the appearance of clinical signs, a high proportion of suckling pigs were infected. Those most affected were pigs greater than 11 days of age – 63 percent were infected at weaning. In another instance, a high frequency of SIV was detected in recently weaned pigs. A change in strategy may be needed to address these concerning results.

Pig health and economics deem that SIV not be ignored. One study in a large production system measured the cost of SIV through closeout to be $3.23 per pig. Another production system estimated the cost of SIV to be $10.31 per market pig. At her keynote address at the 2011 Allen D. Leman Swine Conference, Dr. Montse Torremorell recommended addressing the sow herd with new strategies toward the goal of producing SIV-negative pigs.

An alternative control strategy to help boost population immunity and produce SIV-negative pigs is to utilize a two-dose whole breeding herd vaccination protocol. Recent results showed that this approach can achieve SIV-negative pigs as early as 8 weeks after starting the program.

**Swine breeding herd vaccination – a case report**

**Case description**

A 1,200-sow farrow-to-wean herd in southern Minnesota experienced an outbreak of respiratory disease – SIV H1N2 was detected through RRT-PCR and isolated from nasal swabs – in piglets in December 2010. An autogenous swine influenza vaccine was being used in sows 5 weeks pre-farrowing and in gilts 5 and 3 weeks pre-farrowing. Clinical signs persisted in suckling pigs and in the off-site nursery. The consulting veterinarian and herd manager concluded that the control strategy was not working. A new strategy, including a two-dose whole breeding herd vaccination protocol, along with a change from an autogenous SIV vaccine to FluSure XP® , was implemented. 

**Figure 1: Summary of the sampling protocol and vaccination timeline**

<table>
<thead>
<tr>
<th>Breeding Female Sampling</th>
<th>Breeding Herd Vaccination</th>
<th>Suckling Piglet Sampling</th>
<th>Calendar Week 2011</th>
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<tbody>
<tr>
<td>2</td>
<td>4</td>
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Materials and methods

Both the breeding herd and the suckling pig population were monitored for presence of swine influenza A virus in nasal secretions and oral fluids. See Figure 1. A total of 120 nasal swabs from breeding females before and after the breeding herd vaccination were collected. Additionally, 60 paired serum samples were collected from these females and tested for swine influenza antibodies through hemagglutination inhibition.

Suckling pigs were monitored by collecting 30 nasal swabs from 14- and 21-day-old pigs every other week targeting parity 1 and 2 litters. Monitoring started two weeks after the first dose of vaccine was given to breeding females.

Results

Data collected shows that 6 weeks after the second breeding herd vaccination, SIV-negative pigs were achieved. See Figure 2. Prevalence of nasal shedding in sows also decreased below detectable levels.

Discussion

Vaccinating an entire breeding herd simultaneously with an effective vaccine can aid in the control of disease by decreasing the number of susceptible individuals and increasing antibody levels, thus lowering transmission within the herd.

Field experience in a 3,600-sow commercial herd demonstrates economic impact.

Case description

An Iowa production system experienced problems with swine respiratory disease throughout the winter of 2010 and into the spring of 2011. Multiple diagnostic submissions indicated a number of pathogens including both Porcine Reproductive and Respiratory Syndrome (PRRS) and SIV. Clinical signs were noted in suckling piglets and on arrival at the nursery or wean-to-finish barn. Performance in the nursery phase was very poor, particularly in pigs that experienced both PRRS and SIV infections.

Materials and methods

Diagnostic testing on one sow farm (3,600 sows) included nasal swab sampling of piglets in late lactation. Nasal swabs were collected from pigs within one week of weaning that were showing clinical signs including coughing, lethargy, clear nasal discharge and rectal temperatures above 103 °F. Coughing was readily noted in nursing piglets at this time. Samples yielded SIV Cluster IV H3N2 and Delta 1 H1N2.

This system had been using FluSure XP approximately 3 weeks pre-farrowing in all sows and gilts. While this strategy had been successful in previous years, the production staff and consulting veterinarian felt that a change was warranted.

All sows and gilts on this farm were vaccinated with FluSure XP in April and 3 weeks later in early May.
Results

During the time of the initial two-dose breeding herd vaccination, clinical signs were monitored and nasal swabs collected from piglets in late lactation. Prior to implementation, greater than 10 percent of the pigs were estimated to be coughing and nasal swabs yielded both SIV H1N2 and H3N2. At the time of the second vaccination, clinical signs were limited in nursing pigs and no SIV was isolated.

In June, 8 weeks after the first vaccination (5 weeks after second vaccination), clinical signs had almost ceased and it was difficult to find coughing piglets in lactation. No SIV was isolated from piglets at this time.

An evaluation was made of mortality in the nursery phase during this process. From the beginning of the year until June 1, mortality in the first 7 weeks post-weaning averaged 12.6 percent. Beginning with pigs weaned on June 6 (5 weeks after the second vaccination) nursery phase mortality dropped to an average of 4.4 percent. See Figure 3.

Economics

With the new SIV control strategy in place, the potential increase in income per year for this operation was more than $200,000 for a $7,200 investment, which equates to a potential 28 to 1 return on investment. See Table 1.

Table 1: Economic impact breakdown of new SIV control strategy

<table>
<thead>
<tr>
<th>Weekly change</th>
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<tr>
<td>Weaned pigs/wk</td>
<td>1,400</td>
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<tr>
<td>Improved mortality</td>
<td>8.2%</td>
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<tr>
<td>Increased feeder pigs/wk</td>
<td>115</td>
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<tr>
<td>Revenue from extra pigs/wk</td>
<td>$50/feeder pig $5,750.00</td>
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<tr>
<td>Feed cost for extra pigs/wk</td>
<td>$15/head ($1,725.00)</td>
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<tr>
<td>Cost of vaccination/wk</td>
<td>5 doses X $0.40 per dose X 3,600 sows / 52 wks* ($138.46)</td>
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<tr>
<td>Total increase in revenue/wk</td>
<td>$3,886.54</td>
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*Labor not included

Annual ROI

| Potential revenue increase for the year | $202,100.80 |
| Vaccine cost per year                  | $7,200.00   |
| Potential return on investment         | 28 to 1     |
Summary

SIV, because of its ever-shifting nature, can be challenging to control. Addressing the sow herd with the goal of producing SIV-negative pigs may lead to greater success than current protocols. Real-world examples of changing the strategic approach to controlling SIV have been successful, producing SIV-negative pigs as early as 8 weeks after initiating the two-dose FluSure XP whole breeding herd vaccination protocol.

Strategic breeding herd vaccination producing SIV-negative pigs can lead to healthier pigs at weaning and throughout the finishing phase. Decreased viral challenge can help maximize performance during finishing, which can lead to more pounds of pork.

Making a change to control SIV doesn’t have to mean putting time and effort into creating an autogenous vaccine. When used in a two-dose whole breeding herd vaccination program, FluSure XP helps effectively control SIV, boost population immunity, produce SIV-negative pigs and make a solid, positive impact on your bottom line.

References