



Mitchell E. Daniels, Jr., Governor
Bret D. Marsh, DVM, State Veterinarian

INDIANA STATE BOARD OF ANIMAL HEALTH

Office of the State Veterinarian
Discovery Hall, Suite 100
1202 East 38th Street
Indianapolis, IN 46205-2898
Phone: 317/544-2400

ANIMAL HEALTH ADVISORY

Options for Gilt Acclimation and Isolation With Emphasis on PRRS Management

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The Indiana Swine Health Committee's scientific subcommittee on Porcine Reproductive and Respiratory Syndrome (PRRS) has collaborated with the Indiana State Board of Animal Health to identify options for consideration in managing the PRRS status of replacement gilts. Advantages and disadvantage of various methods are described below. Terminology used for classifying PRRS exposure status is consistent with the definitions jointly developed by the American Association of Swine Veterinarians (AASV) and the United States Department of Agriculture (USDA) PRRS Coordinated Agricultural Project and approved by the AASV Board of Directors on March 9, 2010.

For purposes of this document, PRRS exposure status is the only status recognized and is defined as below:

Exposure Status: naïve (negative) or exposed (positive) based on serological testing:

- Naïve—no evidence of exposure to field or vaccine viruses, assessed by absence of antibodies to virus in samples tested.
- Exposed—evidence of exposure to field or vaccine viruses, assessed by presence of antibodies to virus in samples tested.
 - Until a differential diagnostic test or differentiable vaccines become available, no clear distinction is possible between results that are serologically positive due to live or killed vaccine usage versus those positive due to wild-type virus; thus no distinction is made (AASV).

Options for PRRS exposure in Replacement Gilts— Pros and Cons

1. Naïve (negative) PRRS Exposure Status in the Gilts

To maintain a negative PRRS exposure status in replacement gilts:

Pros:

- Higher success in areas of low infection rate
- Provides a lower risk to neighbors than some other methods of acclimation
- Some producers want a herd with no exposure and no vaccine usage

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Cons:

- Always has a higher risk upon introduction of new gilts because of a lack of immunity in the herd and the gilts
- Location of the herd is very important; Producer must have a place to acclimate gilts to other diseases in the herd with minimal PRRS risk

RECOMMENDATIONS: for maintaining a negative herd status without using other measures:

- Communicate and work with a veterinarian
 - Consider using a PRRS risk assessment tool, such as PADRAP
- The foundation of maintaining a negative herd is proper isolation, testing and acclimation of incoming breeding stock
 - On-site isolation: minimum distance of 300 feet from other swine and good biosecurity
 - Off-site isolation: minimum of 1 mile separation from other swine and good biosecurity
 - Greater distance is better
- Testing expectations and results:
 - Adequate testing before and after receiving new animals

Incoming Breeding Stock

- Purchases from source herds of unknown PRRS status (no routine testing), should have a PCR test and ELISA test within a week prior to movement to isolation
- Purchases from source herds that are testing monthly using the ELISA test:
 - *Source herds with occasional sales*—both the monthly herd ELISA and a PCR test on animals to be sold should be done close to the time of sale, prior to movement
 - *Source herds with frequent sales*—a weekly PCR protocol (rope test) for groups of animals about to be sold should be established
 - This is especially important for naive herds
- For all replacement gilts, a second PCR test 14 to 30 days after entering isolation (via pooled blood test or rope test) will provide greater confidence in status of the breeding stock
- Immediately prior to moving gilts to the sow site (within 5 to 7 days), verify animals are still PRRS-negative using a PCR (rope) test

Semen Purchases

- All semen purchases should be sourced from a PRRS-monitored facility
- Individual PCR semen/serum test would provide added protection
- Practice good biosecurity
 - Buy animals from PRRS test-negative source herds
 - Maintain high health status through veterinary monitoring
 - Do not become lax by relying on negative status
 - Minimize transportation risk
 - Trailers/vehicles present risk of virus introduction. Consider any and all methods for minimizing possible exposure.
 - Truck washes do not necessarily disinfect vehicles
 - Ask if wash water is recycled, which could present exposure risk
 - Drying is an important step to disinfection
 - Consider use of air filtration in the swine barns used by the operation

- Additional biosecurity guidance:
 - Compliance by *all* individuals within the operation is critical
 - References and sources:
 - Biosecurity Guide for Pork Producers and other biosecurity references at <http://www.pork.org/Resources/102/SecurityandBiosecurity.aspx>
 - Good practices for Biosecurity in the Pig Sector at <http://www.fao.org/docrep/012/i1435e/i1435e00.pdf>
 - Biosecurity of Pigs and Farm Security by Levis and Baker at <http://www.ianrpubs.unl.edu/live/ec289/build/ec289.pdf>

2. Exposed (positive) PRRS Exposure Status in the Herd and Gilts

a. **Natural Exposure to the Virus (MLV):** Inoculation of gilts by exposing them to swine that are infected with PRRS virus

Pros:

- Typically provides herd-specific immunity

Cons:

- Introduction of live virus into negative animals creates new PRRS infection
- Could expose the pigs to diseases other than just PRRS
- Inconsistent exposure to the virus and inconsistent herd immunity; no guarantee that all animals will be exposed at the same time or the same level of infection
- May result in prolonged/protracted viremia (virus circulating in the blood which can increase shedding) because animals are not exposed on the same day
- Biosecurity measures are necessary to minimize risk of inadvertent movement of the virus within and between herds

RECOMMENDATIONS to consider when using natural exposure of gilts to live virus:

- Communicate with a veterinarian to develop a management plan for using this technique

b. Vaccination

i. **Modified Live Virus:** Inoculation of gilts with a PRRS virus that has been modified

Pros:

- Provides consistent exposure within the vaccinated group by exposing all animals at the same time to a consistent amount of vaccine
- Ease of application
- Currently available USDA-approved vaccine
- May reduce the duration of viremia in the vaccine group of gilts

Cons:

- May cause the introduction of a new virus strain into the herd
- Interferes with interpretation of testing of the herd as this may cause animals to test “positive” when they do not have ongoing infection
- Virus migration and potential mutation may make the vaccine less effective or ineffective

- Cross protection against other strains of the virus is not predictable
- Cost of vaccine can be prohibitive
- Vaccination of incoming gilts entering a stable herd presents a risk of destabilizing the group
- Biosecurity measures are necessary to minimize risk of inadvertent movement of the modified-live virus to other animals or herds
- At this time no clear distinction is possible between serology test results that are positive due to live or killed vaccine usage versus those positive due to wild-type virus; thus no distinction is made (AASV)

ii. *Killed Virus: Inoculation of gilts with a PRRS virus that has been killed*

Pros:

- No introduction of new virus to the herd
- Less interference with future PRRS testing interpretation
- No risk of disease spread within an area or to neighboring swine farms
- Safe for the gilts and boars
- May reduce the duration of viremia (virus circulating in the blood which can increase shedding) within the vaccinated group of animals compared to a natural infection

Cons:

- Limited or no cross-protection to other strains, since the antigen is fixed and will not mutate or change
- Killed virus vaccination may be ineffective on naïve gilts
- Limited peer-reviewed research has been done on this form of vaccination
- At this time no clear distinction is possible between serology test results that are positive due to live or killed vaccine usage versus those positive due to wild-type virus; thus no distinction is made (AASV)

RECOMMENDATIONS to consider when using any vaccination strategy to acclimate gilts:

- Communicate and work with a veterinarian
- Verify the status of herd additions *prior* to any vaccination through appropriate testing
- Testing results should be interpreted with consideration for vaccination methods used

iii. *Live virus or serum inoculation (LVI): Inoculation of gilts with live PRRS virus*

Pros:

- Ensures all animals are exposed to the virus consistently and at the same time
- Provides strategic consistent exposure
- Exposure interval is shortened

Cons:

- Introduction of live virus into negative animals creates new PRRS infection
- Immunity is unpredictable if a new strain is introduced
- Biosecurity measures are necessary to minimize risk of inadvertent movement of the virus within and between herds

RECOMMENDATIONS to consider when using live virus inoculation:

- Should be used only when working directly with a veterinarian
- Use should be re-evaluated by the veterinarian and producer on a regular basis
- Gilts should be exposed to the specific virus strain found on the destination sow site(s)

Other Important Factors that Affect Gilt Acclimation:

Age of Gilts/Duration of Acclimation

- **Multi-age gilts:**
 - Continuous flow of gilts into the acclimation unit requires fewer introductions of the virus compared to an all-in/all-out system, which would require more frequent introductions of the virus to the environment to acclimate the new animals
- **Weaned gilts:**
 - Acclimation of weaned gilts allows for a lower selection rate and, therefore, requires purchasing of more animals to yield the number of replacements needed
- **Full-sized gilts:**
 - Must try to estimate the time interval to establish immunity and stop virus shedding before gilts can be moved into the sow barn
 - Acclimation window is narrow
 - Full-sized gilts have a higher retention rate and fewer animals are needed to yield the replacements needed

On-Site Isolation/Off-Site Isolation

- **Off-site:** Some off-site gilt sites are less bio-secure than the sow sites, so the gilts are at a greater risk for disease
- **On-site:** Risk to the sow herd is greater because of the proximity to the gilts

Additional Considerations:

- **Goals/Objectives:**
 - **Isolation:** Prevents introduction of disease by verifying health status of new introductions through observation and/or testing
 - **Acclimation:** Allows for development of immunity to herd-specific diseases prior to putting the animals into the sow herd
- Isolation and acclimation periods may occur at single or multiple sites
- Set-backs for gilt isolation facilities:
 - **On-site isolation:** minimum distance of 300 feet from other swine accompanied by high-level biosecurity
 - **Off-site isolation:** minimum of 1 mile from other swine accompanied by high-level biosecurity

Recommendations Regarding Change in PRRS Status

Producers who become aware of a change in PRRS status of a neighbor's swine herd

Communicate with herd veterinarian about recommended practices, which might include:

- Change to traffic patterns
 - on the farm
 - between farms
 - when shipping pigs
- Evaluate movements of all on-farm traffic, such as rendering trucks, deliveries, feed, manure handlers, etc.
 - Producers, particularly those with multi-site production systems, may change some production practices
 - At-risk sites may need more testing
 - Communicate with feed supplier about changing feed truck/worker movement patterns (which farm to visit first) to minimize potential exposure
 - Alter management within a site to control the disease
- Close air filtration systems beyond the regular schedule
- Avoid contact with/visiting other farms following a disease break
- Evaluate on-farm biosecurity practices, including employee awareness
- Consider doing additional surveillance within the herd (e.g., testing)

Producers whose herds have had a break/change in PRRS status:

Communicate with herd veterinarian about recommended practices, which might include:

- Change to traffic patterns
 - on the farm
 - between farms
 - when shipping pigs
- Evaluate movements of all on-farm traffic, such as rendering trucks, deliveries, feed, manure handlers, etc.
 - Producers, particularly those with multi-site production systems, may change some production practices
 - At-risk sites may have more testing
 - Communicate with feed supplier about changing feed truck/worker movement patterns (which farm to visit first) to minimize potential exposure
 - Alter management within a site to control the disease
- Close air filtration systems beyond the regular schedule
- Avoid contact with/visiting other farms following a disease break
- Evaluate on-farm biosecurity practices, including employee awareness
- Assess normal shipping route(s) when moving pigs to minimize community risk
- Consider doing additional surveillance within the herd (e.g., testing)
- Evaluate manure handling/disposal practices to minimize any risk of aerosolizing waste that could contain virus particles
- Consider a contingency plan for movement of pigs to alternate site(s) to minimize community risk

- Producer may redirect positive animals to infected location (such as double-stocking weanlings for a few weeks until shedding stops, then move half the herd to a “clean” area) to reduce risk to neighbors