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**INTERNATIONAL PLATFORM
FROM FEED TO FOOD**

What is the best practice about PRRS Monitoring, Control and Eradication

VIV Master Class Viet Nam

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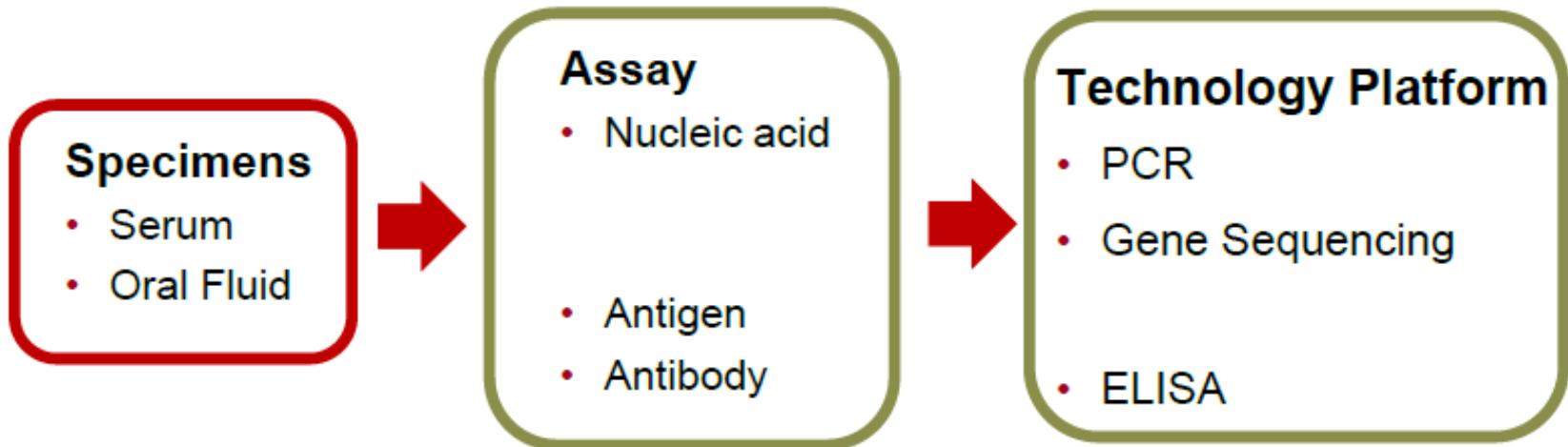
Agenda

- PRRS Monitoring using ELISA Data
- PRRS Control or Eradication





Diagnostic Tools for Monitoring



PRRS Monitoring Rationale



- Whatever your herd status or "PRRS plan" you need to know what PRRSV is doing on a continual basis.
- PRRSV has taught us how quickly things can change.





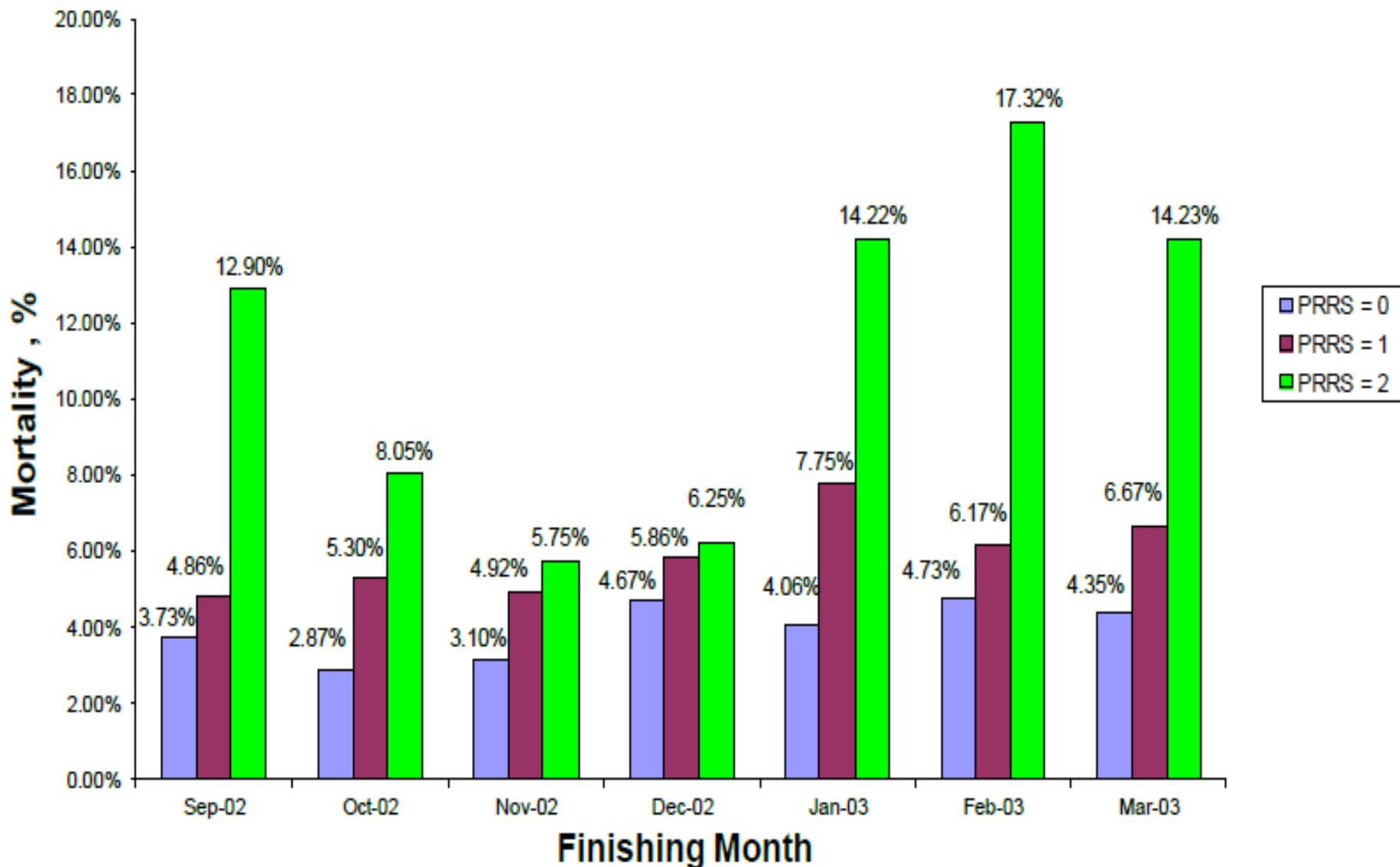
Impact of “PRRS Status” on Wean-to-Finish Performance (R Main, ISU Swine Disease Conf. 2003)

- Status 0 = Predominantly Negative Through Finishing
- Status 1 = Predominantly “Negative” Through Nursery & Seroconvert in Finisher
- Status 2 = Seroconvert & Clinical PRRS effects in Nursery



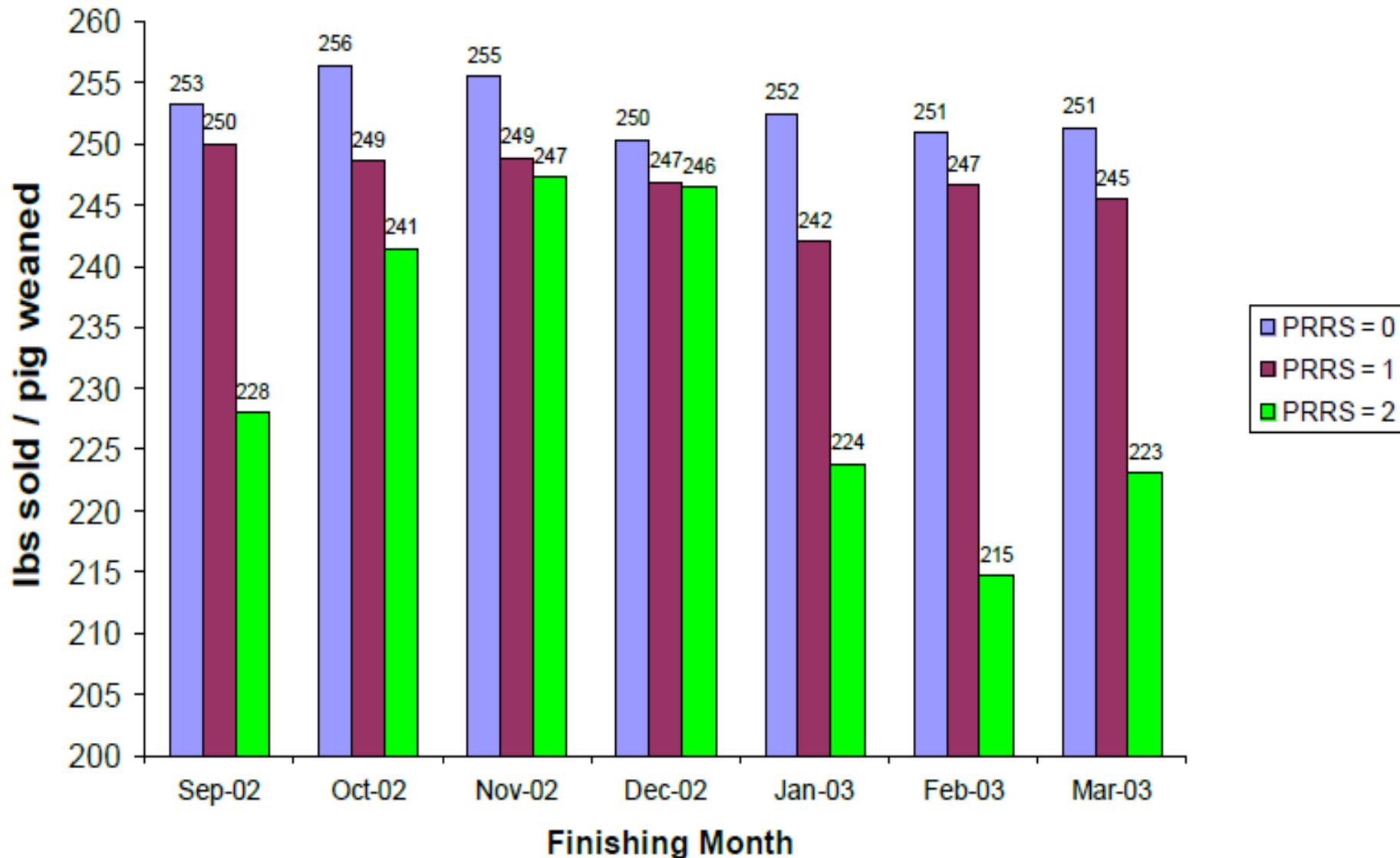
PRRS Status on Wean-to-Finish Mortality

PRRS 0 = 3.93%; PRRS 1 = 5.93% PRRS 2 = 1.25%; SED = 1.45%, Linear P < 0.001



PRRS Status on Weight Sold Per Pig Weaned

PRRS 0 = 253: PRRS 1 = 247: PRRS 2 = 232: SED = 2.9. Linear P < 0.001



PRRS Ab Monitoring Guideline



3 Steps in PRRS Monitoring:

1. Determine PRRS antibody status using either using IDEXX PRRS X3 Ab Test or the IDEXX PRRS OF Ab Test at your diagnostic laboratory.
2. Implement a comprehensive and routinely monitored animal health management and biosecurity program.
3. Establish a sustainable PRRS antibody monitoring program
 - a. **For Sows:**
 - Monitor maintenance of PRRS negativity.
 - Monitor maintenance of PRRS stability or identify re-infection or new PRRSV introductions.





b. For Gilts:

- Ensure freedom from PRRS in gilts entering PRRS-negative herds.
- Ensure homogenous PRRS virus exposure and antibody decay for PRRS-positive herds

c. For Growing Pigs:

- Monitor the maintenance of PRRS negativity in PRRS-negative growing pig flows.

- Monitor for PRRS seroconversion. Causes include sow farm instability, vaccination with a modified live vaccine, re-infection or new PRRS virus introductions.

d. For Boars:

- Monitor maintenance of PRRS negativity.
- Monitor maintenance of PRRS stability.



Gilts Ab Monitoring Strategy



In Isolation Barns (4-6 weeks duration):

- a. 1st week: Confirm health and start immunization
- b. Subsequent weeks: Monitor every 2 weeks
- c. 3-5 days prior to Sow Herd entry

In Gilt Development Units (GDU) – Monitor every two weeks

- a. For Serum samples: 30 animals for groups of 200 or more pigs, 25 for groups between 100 and 200 pigs, and 25% for groups of 100 pigs or fewer (assuming a disease prevalence of $\geq 10\%$, and using a 95:10 sampling strategy).
- b. For Oral fluid Samples: 1 rope per pen of 30 animals with at least 2 pens sampled in every age group of gilts. For testing consistency, always monitor the same pens.





Data collection and analysis:

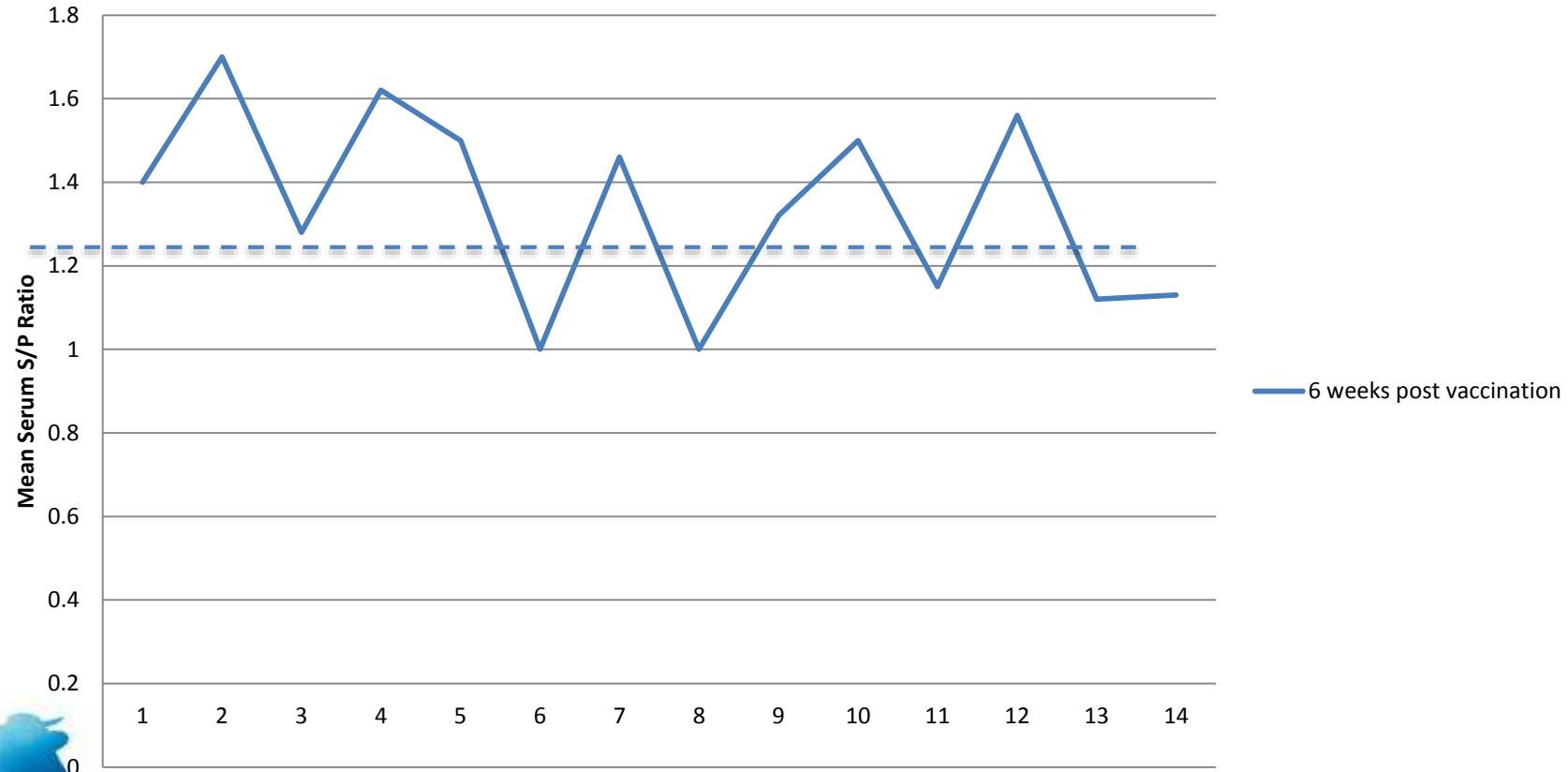
- Calculate the mean and variation (standard deviation) of each sample set (same or similar age group).
- Chart results:
 - By age group (that is, each age group on a separate chart)
 - By time of sampling (that is, cross section of the barn at each time point)





Gilt Monitoring for PRRS Exposure

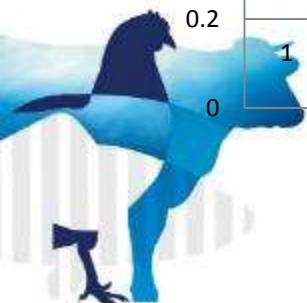
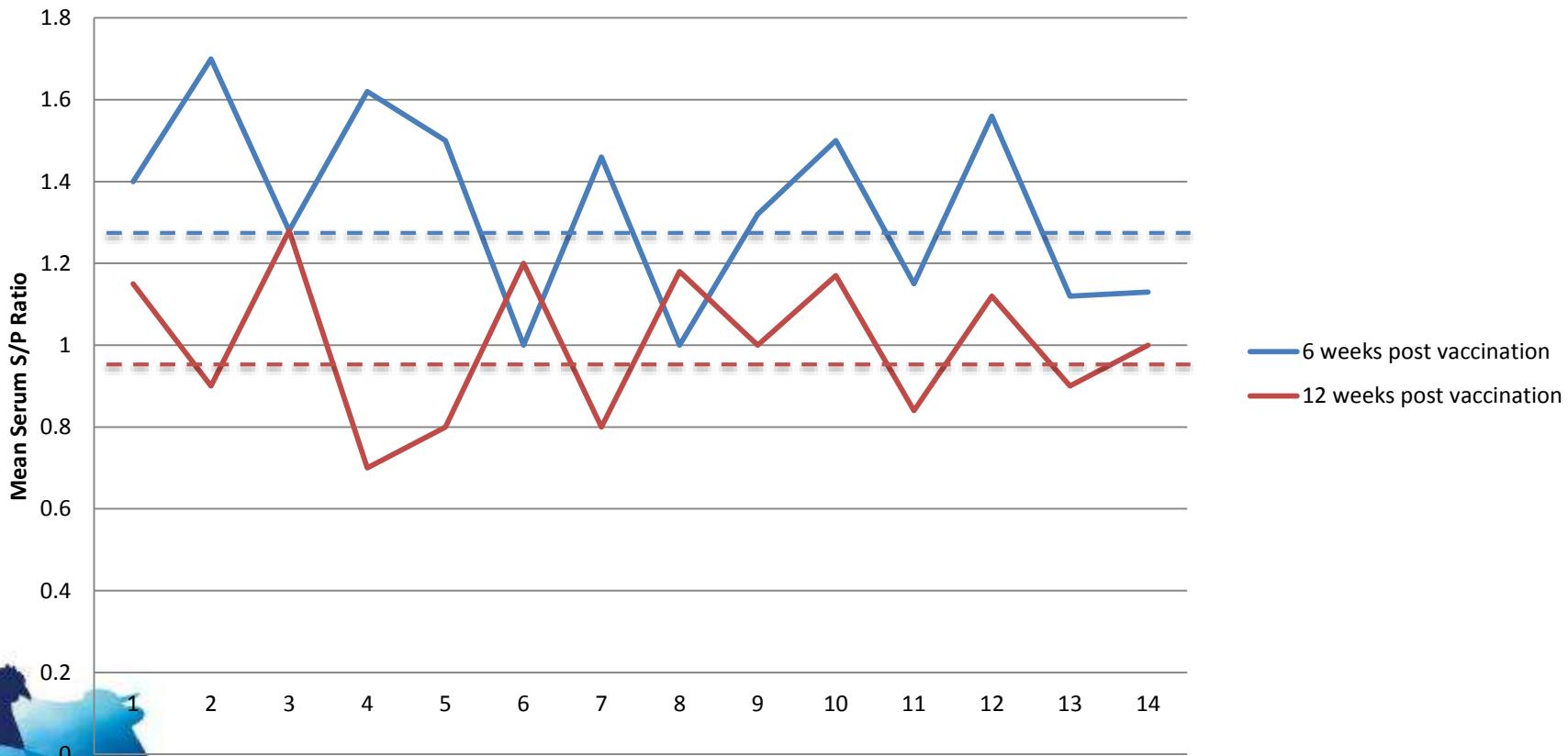
Mean Replacement Gilt Serum S/P Ratios Post Vaccination





Gilt Monitoring for PRRS Ab Decline

Mean Replacement Gilt Serum S/P Ratios Post Vaccination



PRRS Sow Ab Monitoring Strategy



Gestation Barns:

- For individually housed sows, collect 30 serum or oral fluid samples each month across all gestation barns.
- Sample systematically to facilitate the results interpretation.
 - Sample across all gestation barns.
 - For individual samples, choose younger parities (P0–P5) at each sampling time point for ≥60% of the samples.

Farrowing Barns:

- Collect samples of oral fluids every 2 weeks from 10 litters of piglets (at least 18 days of age) in weaning rooms



Data collection and analysis:



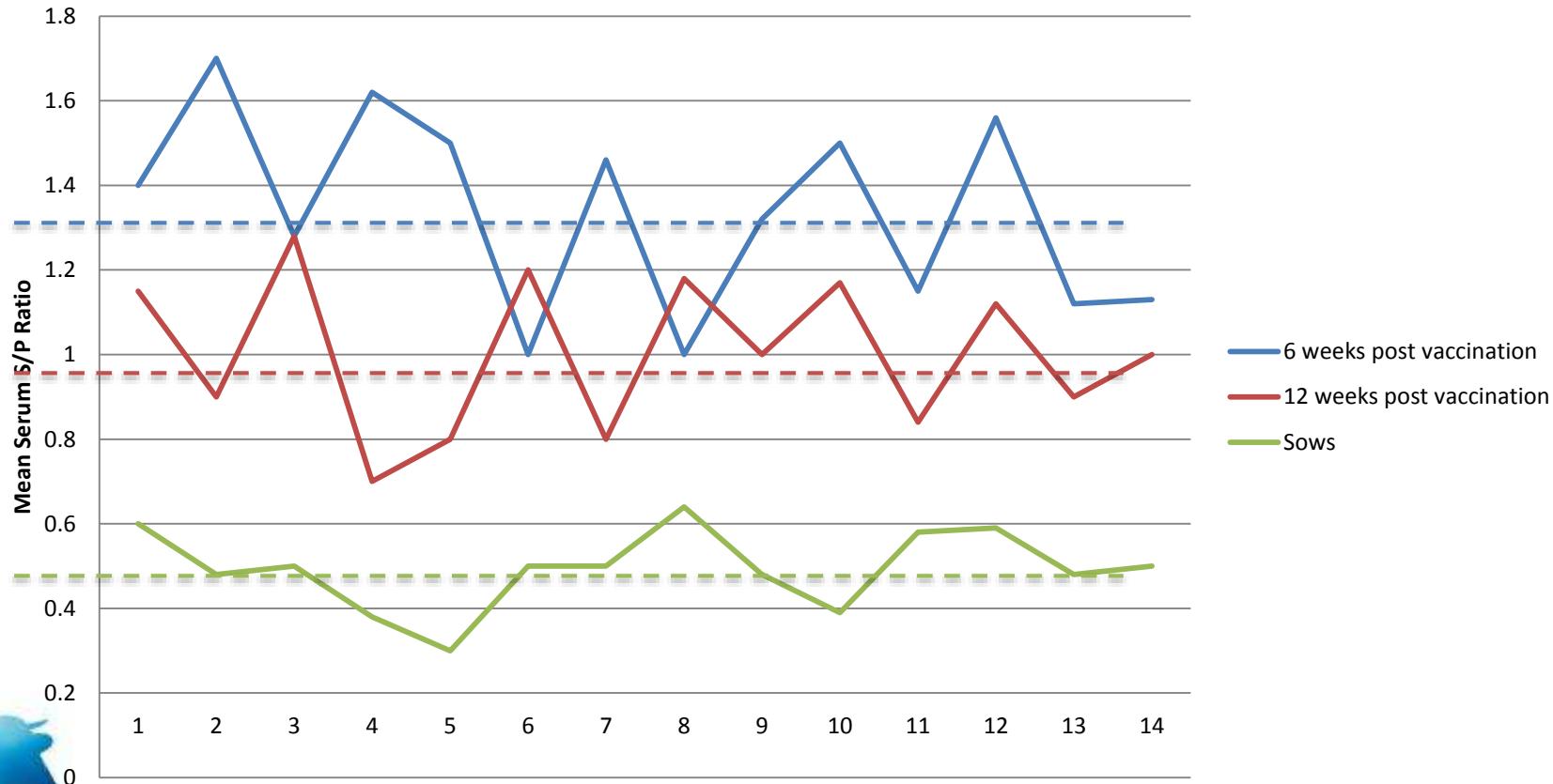
- Calculate the mean antibody S/P ratios of the group, as well as the variation or standard deviation at each sampling.
 - Chart these data by sampling time.





Sow Herd Monitoring for PRRS Stability

Mean Replacement Gilt Serum S/P Ratios Post Vaccination



PRRS Growing Pigs Ab Monitoring



Strategy

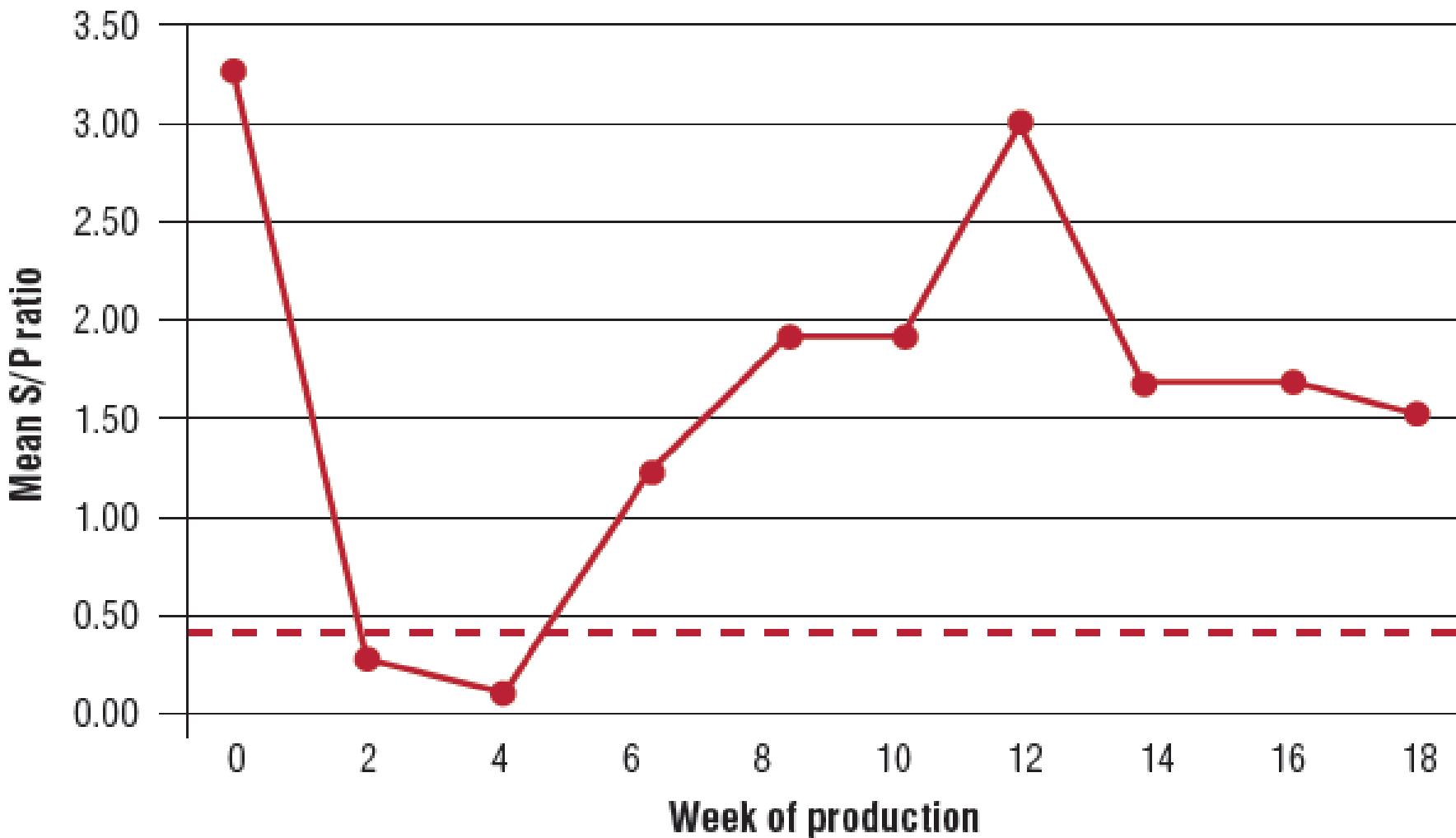
- **For Individual AI-AO Barns:**
 - Collect 10 samples of oral fluids from each barn every 2 weeks.
 - For pens of up to 30 pigs, use 1 rope per pen; for large pens (100–150 animals), use 3–5 ropes per pen.
 - Hang ropes systematically throughout the barn at first collection; choose pens to represent all areas of the barn. For testing consistency, monitor the same pens each sampling period. Do not pool oral fluids samples.
- **For multiple all-in-all-out barns on one site**
 - Sample all barns on the site.
 - Collect at least 3 oral fluid samples per barn every week. More frequent monitoring with oral fluids in PRRS-negative sites improves the likelihood of prompt detection of a new PRRSV entry.





Data collection and analysis:

A. For Individual AI-AO barns





B. For multiple all-in-all-out barns on one site

- Calculate the mean antibody sample-to-positive (S/P) ratio, as well as the variation or standard deviation for each barn at each sampling.
- Chart these data by barn and sampling date or pig age.
- Update charts after each sampling period.
- Monitor changes in mean antibody values (S/Ps) to confirm seroconversion due to PRRS exposure or vaccination



Establishing Baselines



- Determine the oral fluid (OF) sample-to-positive (S/P) baseline of the entire farm using cross sectional sampling of all barns/phases of production.
 - Perform the cross-sectional sampling at least twice over a 4– to 6–week period.
 - Once the initial baseline is created, sample every 2 weeks thereafter.
- Use a sample size that is manageable and includes all barns housing pigs.†
 - For growing pigs, OF sampling ropes should be placed so that each rope represents a group of approximately 30 animals.
- Sample the same pens each sampling event in the nursery site, the finisher site and the gilt development or quarantine barns.
 - If the sow farm contains loose-housed sows, obtain samples in a similarly consistent fashion.





Data collection, analysis and next steps:

- Graph and compare at least 2 sampling times to create a solid baseline data set.
- Create and implement an action plan for herd health improvement/PRRS management.
- Initiate a routine PRRS antibody monitoring program, sampling every 2 weeks, following IDEXX PRRS antibody monitoring guides for sows, gilts and growing pigs.





Figure 2. Monitoring identified PRRS infection in 16-week-old pigs.

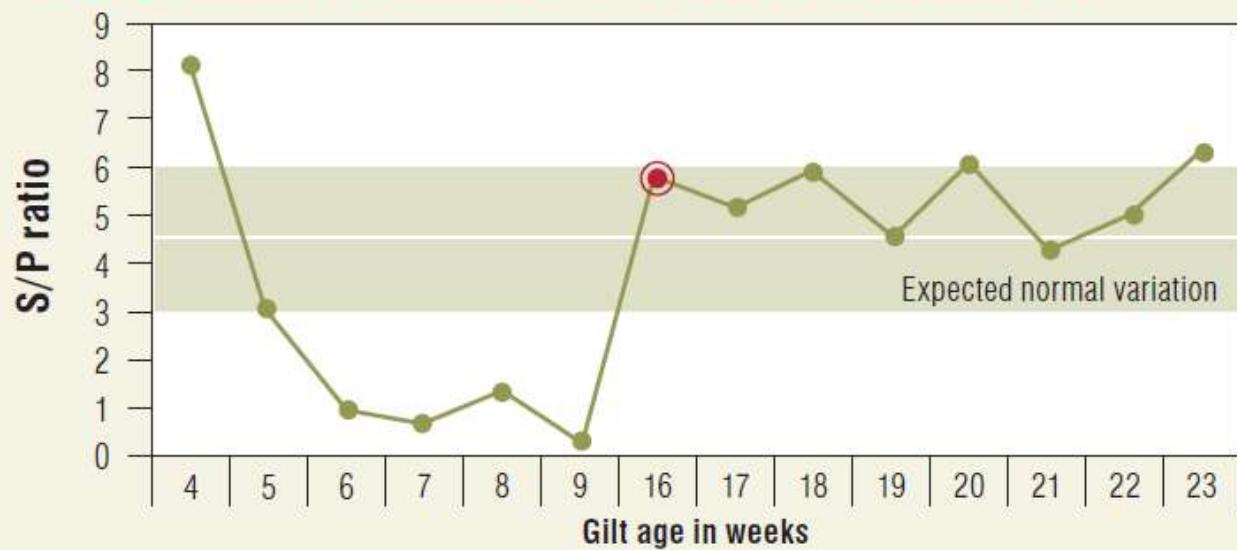
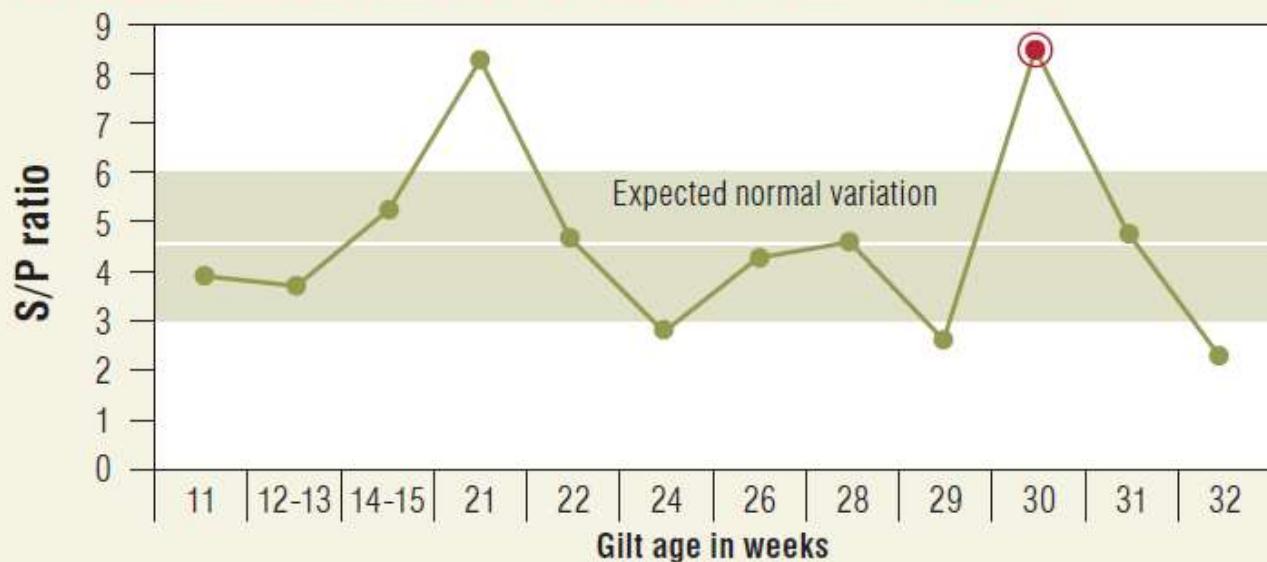
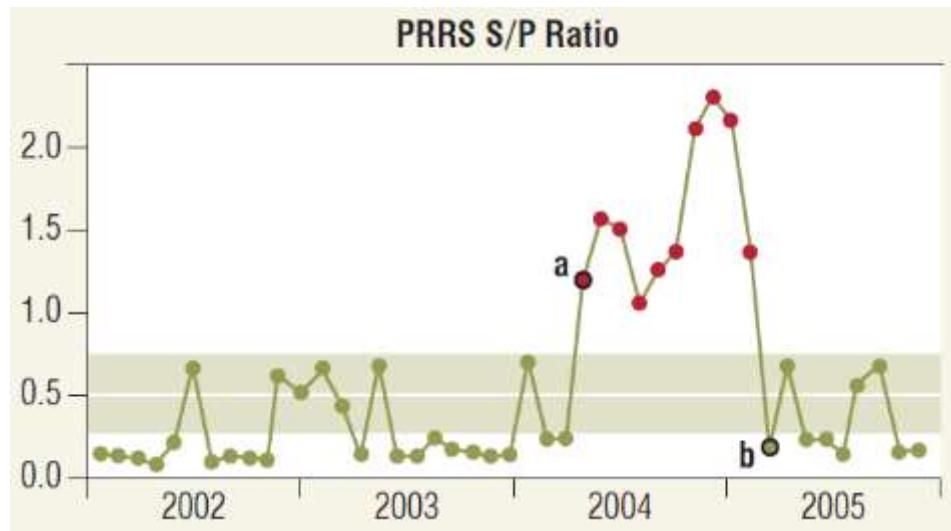
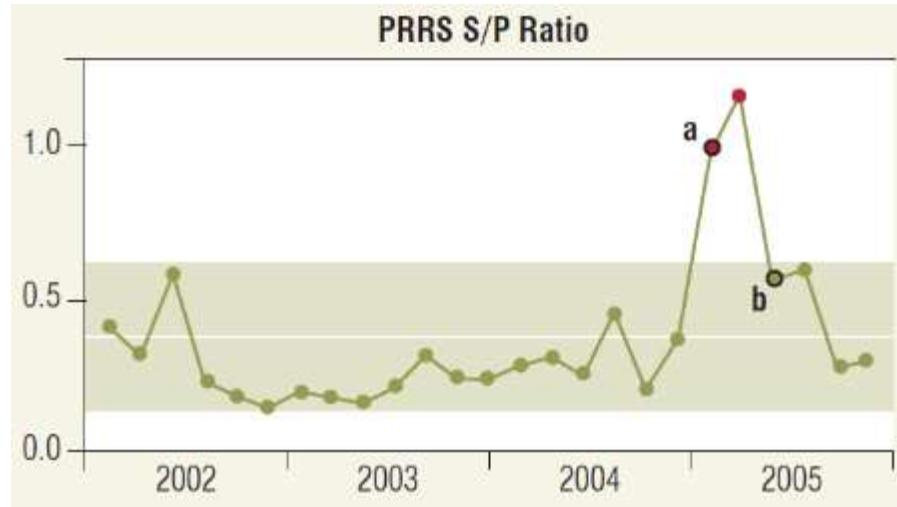
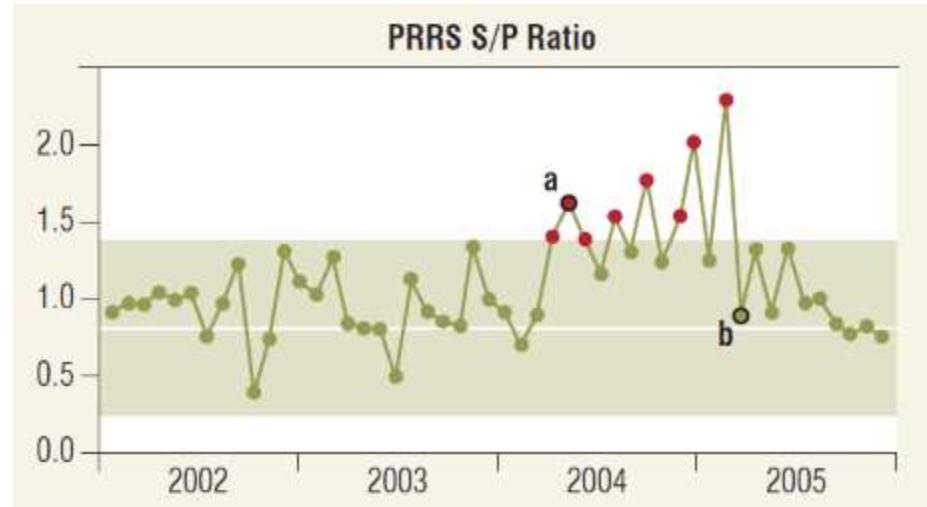


Figure 3. Monitoring revealed recirculation of PRRSV in GDU.



Case Study—Antibody monitoring in a farrow-to-nursery pig operation





PRRS CONTROL/ERADICATION





PRRS Control Basics

- PRRSV Negative semen
- McRebel (Management Changes to Reduce Exposure to Bacteria or Eliminate Losses)
- Gilt Acclimation
- Vaccination, routine effective exposure
- Biosecurity – focus on continuous Improvement





Boar Studs

Must haves:

- PRRS negative (naïve) animals
- Monitor for PRRSV (serology/OF) continuously
- Have strict biosecurity measures in place and *monitored*



Semen from Studs **MUST be PRRSV negative** to effectively manage PRRSV at the sow farm level



Sow Barns

- More barns/animals more challenging to stabilize and create uniform immunity
- Commit to halt/limit pig movement
- Biosecurity critical, but more difficult to control



**Monitoring provides continuous information to help ensure good management



Gilt Development* Drives Sow Herd Health



- Single source with stable (PRRS negative) health
- Rigorous attention to isolation and GDU biosecurity protocols
- Early acclimation and monitoring to confirm exposure and cool-down
- Ongoing biosecurity to prevent new disease introduction



*Assuming PRRS negative semen source!



Methods for PRRS Elimination

- **Depopulate/Repopulate** – NOT A VIABLE OPTION COMMERCIALLY
 - Highest cost
 - Lowest chance of success (re-infection of PRRS common)
- **Test and Remove**
 - Farms are much larger (barn #)
 - Many more sows/farm - ↑ Cost of routine 100% testing
 - Virus can “hide” in LN for >200 days – shedding can take place between tests
- **Herd Closure and Roll-over Load-Close-Homogenize – minimum 6 months for >70% chance success**
 - Having housing (in-farm or on-site) for additional gilts provides the extra time, if commit to closure





PRRS Elimination Fundamentals

- Know Risks: PADRAP (Production Animal Disease Risk Assessment Program)

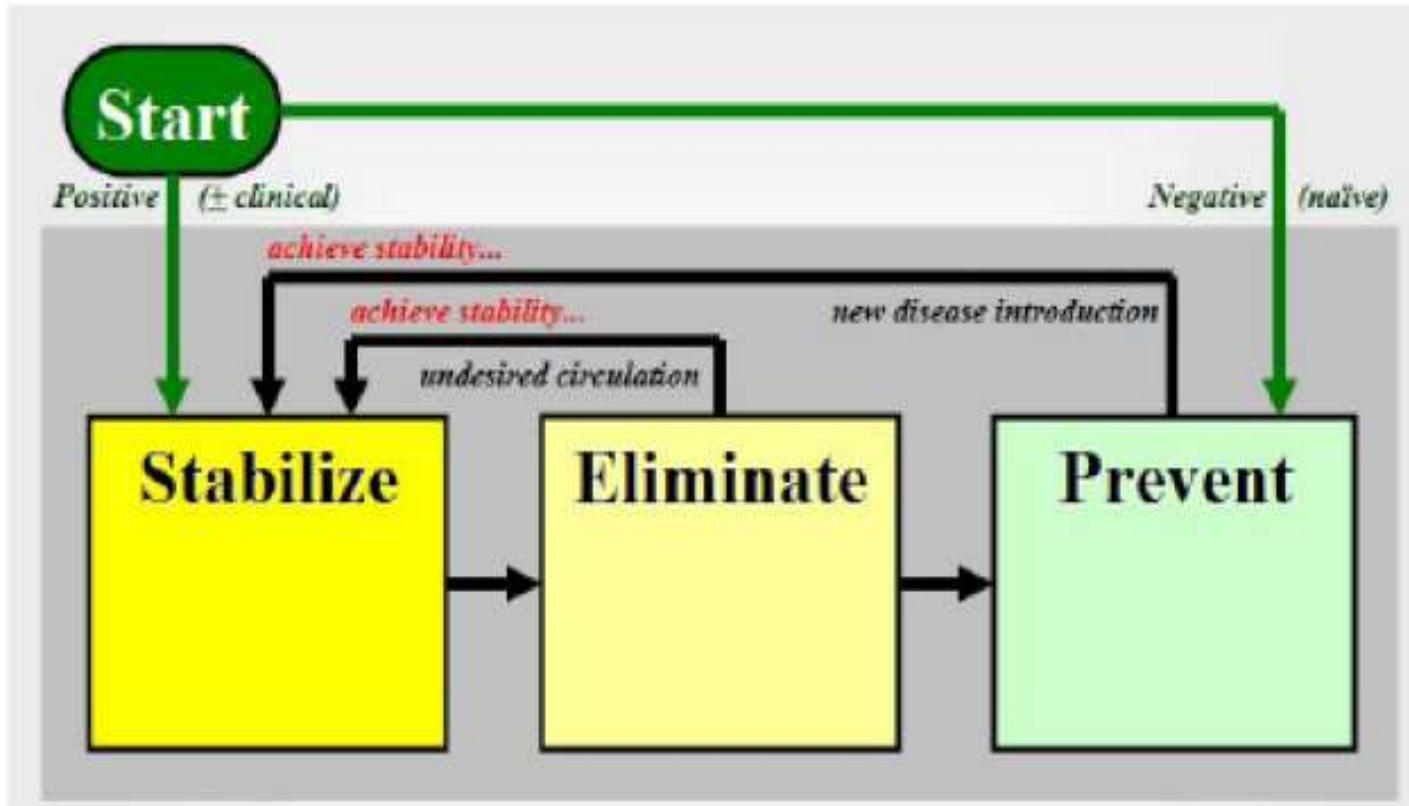
PADRAP USES

- Evaluate current biosecurity protocols +/- develop new ones
- Demonstrate improvement in Biosecurity over time
- Justify \$\$ for resources on biosecurity improvements
- Aid in decision to initiate breeding herd elimination project
- Identify risk factors that can be improved to ↑ likelihood that an elimination project will be successful *long term*
- Aid in decision to use a site for genetic animals
- Due diligence for purchasing or contracting agreements



Health Management Model

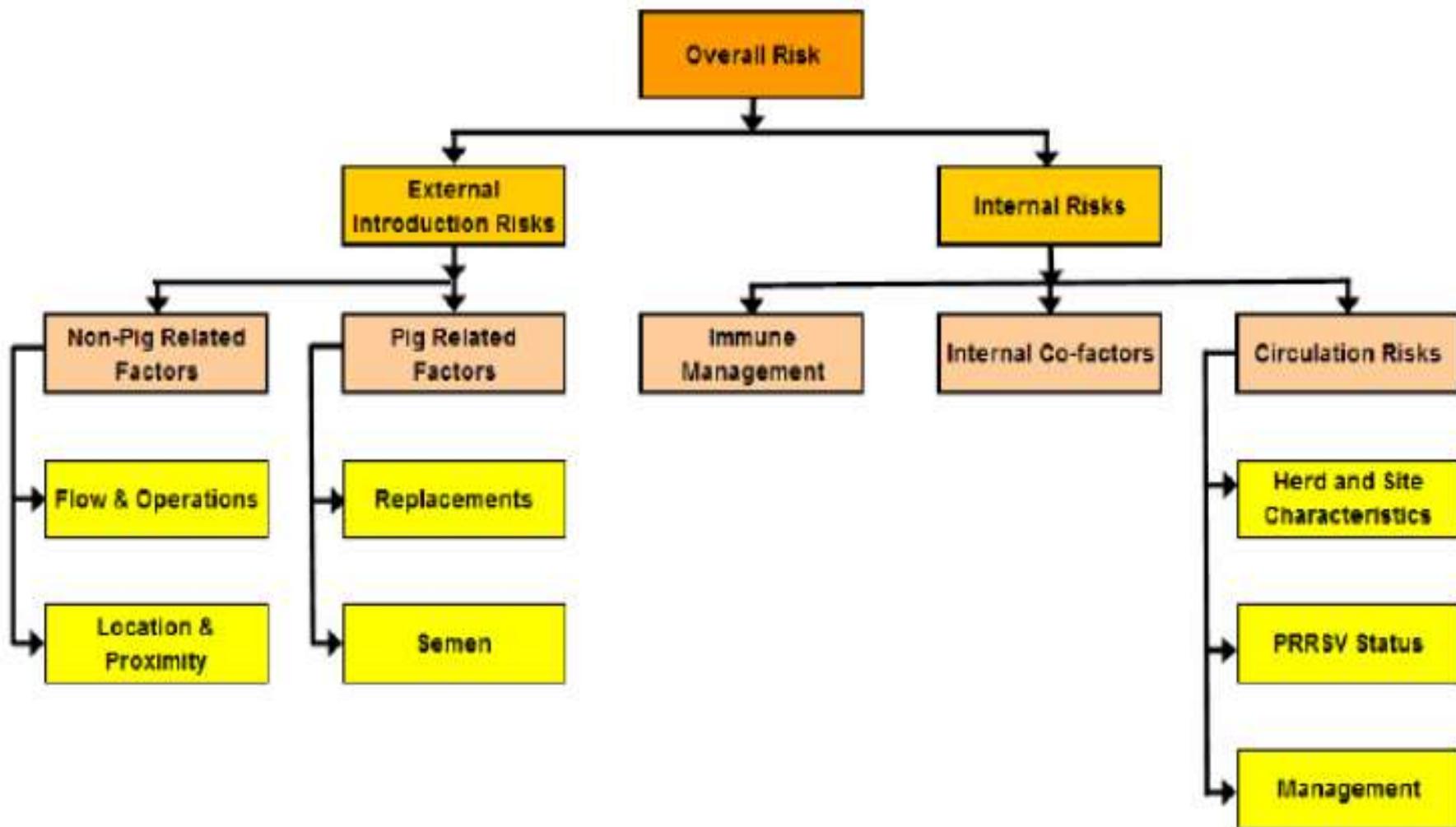
(Polson et al., G Young Conf 2006)





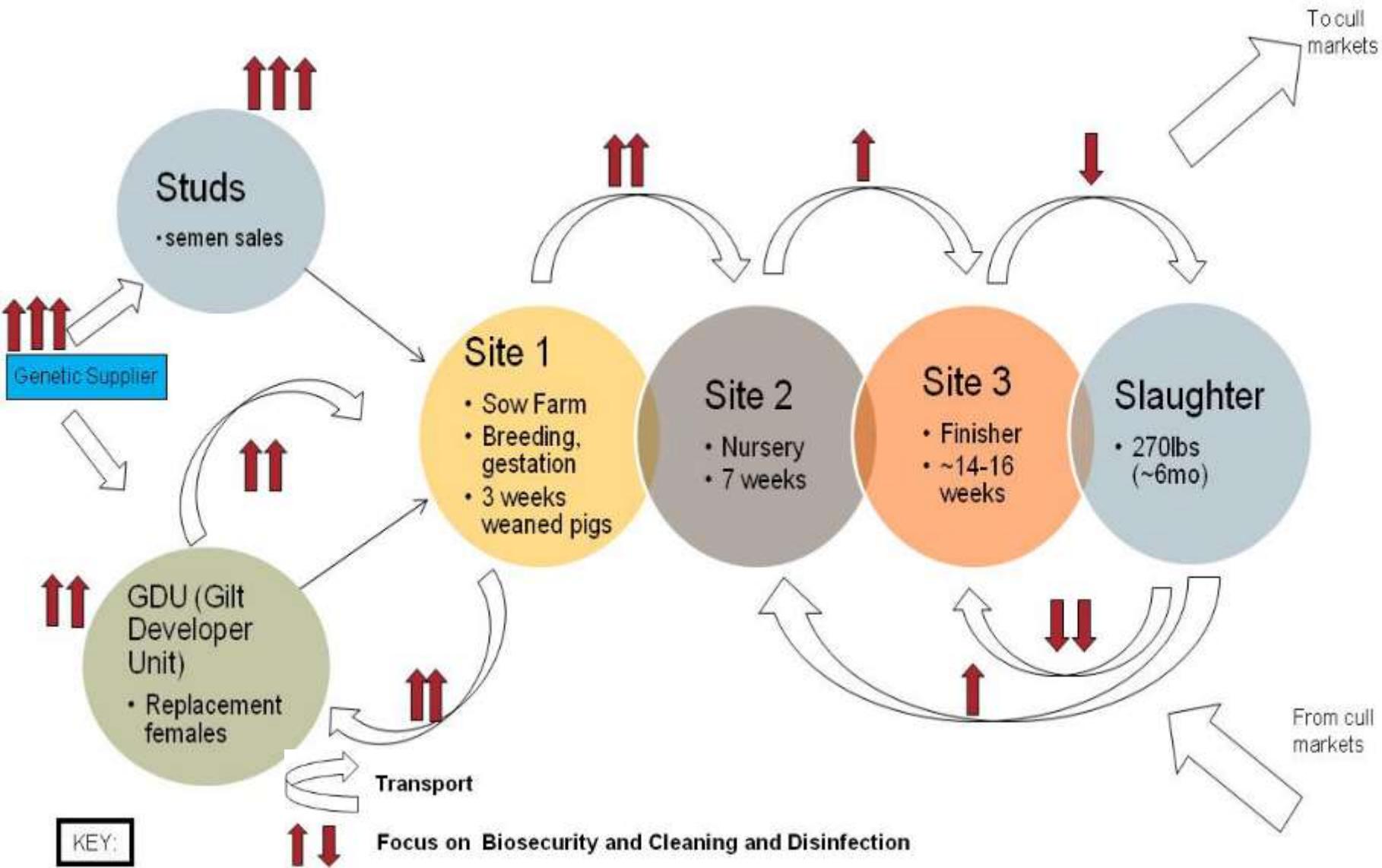
Risk Category Hierarchy

(Polson et al., G Young Conf, 2006)



System Biosecurity Monitoring Improves Focus

(Find weaknesses/vulnerabilities, make changes)



Keeping Farms Negative or Stable



- Location, Location, Location (external risk)
- Negative semen, monitored daily before use (external risk)
- Negative Gilt source (external risk) serologically monitored PRRS negative source (routine)
- Isolation with rigorous testing at entry and before exit
- Designated transportation for internal movements – clean and inspected trailers
- Developed a robust on-farm biosecurity program - continuous monitoring Internal audits daily/weekly (farm manager)
- Monthly (minimum) audits by non-farm biosecurity manager
- Truck washes – must be included in the plan Internalize for internal movements *minimum*
- Understand existing wash facilities: inspect, swab (bacterial) and decide if need alternatives
- Continuous communication – reports/hot sheets

