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# Risk factors for boar studs becoming infected with PRRS

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## Rationale

During the past five years, the majority of stud populations have become PRRS-negative through sourcing, depopulation, or rollover. All of the major breeding stock companies have production of PRRS-negative sources, allowing depopulation and/or stocking of new studs PRRS-negative. However, during fall/winter/spring of 2001-2002, a number of boar studs became infected with PRRS. The majority of these occurred during the cold weather season. The entrance of the virus in this many unrelated studs and wide geographical area is alarming.

The sudden PRRS infection of boar stud populations is perplexing. In the majority of studs, the biosecurity is higher and risk of infection lower than sow populations. Studs are usually well located with consideration of risk factors, such as aerosol transmission, traffic, etc. Isolation of incoming stock is generally longer. Isolation populations are frequently 100% sampled rather than statistically sampled. Decisive actions of sacrifice and further testing of serum and tissues of any suspected "false positives" are routinely completed. Monthly or more frequent monitoring is maintained within the stud population. Stud population per facility is low in comparison to a typical sow unit. Routine biosecurity procedures are easier to implement, maintain, and monitor because education and dedication of staff with a low number of employees and turnover is the norm.

The impact of PRRS infection in studs can be far-reaching. The impact of PRRS infection of stud populations depends on the number of herds receiving virus-contaminated semen, receiving herd status, homogeneity of virus, and rapidity of identification of stud infection and sow herd actions. The impact on herds that have been depopulated or successfully eliminated PRRS through test and removal, rollover, or herd closure can be huge. All of these strategies require one to three years of effort.

## Boar stud health questionnaire

At the 2002 annual meeting, a group of veterinarians met for a discussion of risk factors that might be involved in PRRS infection of boar stud populations. With this discussion, in cooperation with the "disease" committee of AASV, a questionnaire was developed in an attempt to identify risk factors. Requests for participation were made through the AASV electronic newsletter on three different occasions. Veterinarians who agreed to participate but did not respond in a timely manner were contacted by phone. Thirty-seven usable questionnaires were completed. The questionnaire is reproduced here. The analysis is being completed by University of Minnesota but will not be finished prior to this A. D. Leman Conference.

*Questionnaire appears on the following six pages...*

## Boar Stud Health Questionnaire

**Instructions: For studs that have developed PRRS infection, please complete biosecurity questions as they would have been prior to the infection. For studs that have remained PRRS-negative, please complete as current status.**

**Attending Veterinarian** _____
**Phone** _____
**Email** _____
**Stud Code** _____

### Status

Date stud was infected with PRRS _____
What is the current PRRS status of this stud _____
How long has PRRS status been negative _____

Is the stud ISO 9000 ☐ Yes ☐ No
Has stud been scored by the 1000-point system ☐ Yes ☐ No
Is stud ☐ Commercial ☐ Multiplication ☐ Both

### Stud Capacity

What is stud capacity (head) _____

### Stud Location

Is stud outside of sow unit (i.e. stand-alone) ☐ Yes ☐ No
Distance from other swine _____ miles
Distance from closest road _____ miles
Distance from closest road with regular swine traffic _____ miles
Distance from slaughter plant _____ miles

Pig density (one-time capacity) within:

| | *Distance* | *Capacity* |
|---|---|---|
| ☐ | < 1 mile | _____ |
| ☐ | 1 mile | _____ |
| ☐ | 1 – 2 miles | _____ |
| ☐ | 2 – 3 miles | _____ |
| ☐ | 3 – 4 miles | _____ |
| ☐ | 4 – 5 miles | _____ |

Health status of closest pigs if known

**Facility**

| | |
|---|---|
| Is stud shower in/shower out | ☐ Yes ☐ No |
| Do laboratory personnel shower separately from boar personnel | ☐ Yes ☐ No |
| Is stud separate from laboratory | ☐ Yes ☐ No |
| Are "keep out/high health" signs posted on the perimeter | ☐ Yes ☐ No |
| Does facility have an inner fence | ☐ Yes ☐ No |
| Type of inner fence | ☐ Chain Link<br>☐ High Tensile<br>☐ Other |
| Height of inner fence | _____ ft |
| Does facility have an perimeter fence | ☐ Yes ☐ No |
| Distance of perimeter fence from building | _____ ft |
| Type of perimeter fence | ☐ Chain Link<br>☐ High Tensile<br>☐ Other |
| Height of perimeter fence | _____ ft |
| Is perimeter gate locked | ☐ Yes ☐ No |
| Are feed deliveries outside of interior perimeter fence | ☐ Yes ☐ No |
| Are interior doors locked | ☐ Yes ☐ No |
| Is rodent control outsourced | ☐ Yes ☐ No |
| Is the facility curtain or solid wall | ☐ Yes ☐ No |
| Does the facility have evaporative cooling | ☐ Yes ☐ No |
| Is the boar housing air conditioned | ☐ Yes ☐ No |
| Does a trash collector enter the perimeter fence | ☐ Yes ☐ No |
| How are deads disposed of | _____ |

**Isolation**

| | |
|---|---|
| Separation from stud (actual distance) | _____ ft/miles |
| Is isolation connected to stud | ☐ Yes ☐ No |
| Do stud personnel care for isolation | ☐ Yes ☐ No |
| Is isolation operated all-in/all-out | ☐ Yes ☐ No |
| Shower in and out separate into isolation | ☐ Yes ☐ No |

**Sourcing**

| | |
|---|---|
| How many genetic companies supply stud population | _____ |
| How many herd sources supply current stud population | _____ |
| Was stud populated with PRRS-negative animals | ☐ Yes ☐ No |
| If stud was originally PRRS-positive, was it depopulated | ☐ Yes ☐ No |
| If stud was depopulated, how many days downtime | _____ |

## Water

Source for animals
- ☐ Shallow Well
- ☐ Deep Well
- ☐ Rural
- ☐ Pond/Lake

Is water chlorinated ☐ Yes ☐ No

Is extender water
- ☐ Purchased
- ☐ Deionized

## Stud Population Monitoring

Veterinarian visits the stud how frequently _____

*During monitoring, serum samples are submitted for which agent at what frequency*

| | | | | | | |
|---|---|---|---|---|---|---|
| Pseudorabies | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| PRRS | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| SIV | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| TGE | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| Brucellosis | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| Lepto | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| Circovirus | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| Other: | | | | | | |
| _____ | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| _____ | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |
| _____ | ☐Yes ☐No | ☐ Weekly | ☐ Biweekly | ☐Monthly | ☐Bimonthly | ☐Quarterly |

Number or percentage of animals profiled for PRRS with each sampling _____

During monitoring, semen samples are submitted for PRRS PCR at what frequency _____

How many serum samples into a single PCR pool _____

Percentage of individual boars collected submitted for PCR _____

How many semen samples into a single PCR pool _____

Are all PRRS false-positives euthanized ☐ Yes ☐ No

Are all deads necropsied ☐ Yes ☐ No

When appropriate, are tissues submitted at necropsy ☐ Yes ☐ No

## Isolation Population Monitoring

Veterinarian visits isolation how many times during isolation _____

| Individual boars are profiled for | *How many times* | *Percentage* |
|---|---|---|
| ☐ PRRS | _____ | _____ |
| ☐ Brucellosis | _____ | _____ |
| ☐ Pseudorabies | _____ | _____ |
| ☐ SIV | _____ | _____ |
| ☐ *Mycoplasma hyopneumoniae* | _____ | _____ |
| ☐ Lepto | _____ | _____ |
| ☐ Circovirus | _____ | _____ |
| ☐ Other _____ | _____ | _____ |

**Isolation Population Monitoring (Cont'd)**

Which PRRS tests are utilized
- ☐ ELISA
- ☐ IFA
- ☐ PCR

Serum PRRS PCR is requested how frequently _____

Serum PRRS PCR is pooled in how many _____

| | |
|---|---|
| IFA and PCR are requested 100% of the time | ☐ Yes ☐ No |
| IFA is requested only as a clarification for apparent ELISA false-positives | ☐ Yes ☐ No |
| PCR is requested only as clarification for apparent ELISA false-positives | ☐ Yes ☐ No |

Semen samples are submitted for PRRS PCR how often _____

Percentage of semen samples tested for PRRS by PCR _____

| | |
|---|---|
| All apparent ELISA false-positives are euthanized and tissue submitted to laboratory | ☐ Yes ☐ No |
| Are PRRS false-positives allowed into stud | ☐ Yes ☐ No |
| Are all deads necropsied and tissues submitted | ☐ Yes ☐ No |

**Employees**

Do employees live with other pig farm workers ☐ Yes ☐ No

| | *Overnights:* 1 | 2 | 3 | > 3 |
|---|---|---|---|---|
| Downtime for employees after non-pig-contact meetings | ☐ | ☐ | ☐ | ☐ |
| Downtime for employees with pig contact | ☐ | ☐ | ☐ | ☐ |
| Downtime for personnel from other pigs | ☐ | ☐ | ☐ | ☐ |

Number of employees _____

**Visitors**

Is a log book kept ☐ Yes ☐ No

| | *Overnights:* 1 | 2 | 3 | > 3 |
|---|---|---|---|---|
| Downtime for visitors | ☐ | ☐ | ☐ | ☐ |

**Feed**

| | |
|---|---|
| Is feed from a non-pig mill | ☐ Yes ☐ No |
| Is feed pelleted | ☐ Yes ☐ No |
| Is meat and bone meal included in diet | ☐ Yes ☐ No |
| Is meat and bone meal used in other mill diets | ☐ Yes ☐ No |
| Is fat used in diet | ☐ Yes ☐ No |
| Type of fat | ☐ Choice White<br>☐ Vegetable<br>☐ Animal Blend |
| How long is feed stored before use | _____ days |
| Are you using any topdress to enhance or increase sperm output | ☐ Yes ☐ No |
| Is topdress in bags and stored before entry | ☐ Yes ☐ No |

## Stud Supplies

| | Unloaded Inside Stud | | Days Stored 1 | 2 | 3 | >3 | Disinfected | |
|---|---|---|---|---|---|---|---|---|
| Extender | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |
| Insemination tubes/catheter bags | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |
| Shipping containers | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |
| Vaccines, antibiotics | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |
| Bottled water | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |
| Topdress | ☐ Yes | ☐ No | ☐ | ☐ | ☐ | ☐ | ☐ Yes | ☐ No |

## Semen Transport

Is semen
- ☐ Single-bagged
- ☐ Double-bagged
- ☐ Paper Bags
- ☐ Plastic Bags

| | | |
|---|---|---|
| Does courier pick up semen in a separate entry of stud | ☐ Yes | ☐ No |
| Is semen transferred to courier from a separate building | ☐ Yes | ☐ No |
| Do couriers wear plastic boots during transfer | ☐ Yes | ☐ No |
| Do couriers drop semen inside of sow barn offices | ☐ Yes | ☐ No |
| Are couriers required to wash vehicle | ☐ Yes | ☐ No |

Vehicle is washed at what frequency _____

| | | |
|---|---|---|
| Are producers allowed to pick up semen at stud | ☐ Yes | ☐ No |
| Are used semen coolers brought back to stud | ☐ Yes | ☐ No |
| Are floors and mats washed | ☐ Yes | ☐ No |

How frequently are floors and mats washed _____

## Animal Transport

| | | |
|---|---|---|
| Is the transport trailer used to haul any other pigs besides boars entering or exiting the stud | ☐ Yes | ☐ No |
| Does the Facility have a separate trailer for transporting from isolation to stud | ☐ Yes | ☐ No |
| Is the same trailer that transports from isolation to stud used for transport of culls | ☐ Yes | ☐ No |
| Are culls off-loaded onto another trailer | ☐ Yes | ☐ No |

## Vaccinations

| Isolation population is vaccinated for | *Disease* | *How many times* |
|---|---|---|
| | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |

**Vaccinations (Cont'd)**

| Stud population is vaccinated for | *Disease* | *Frequency* |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

What percentage of population is vaccinated at one time _____

Once the stud was considered PRRS-negative, was the population vaccinated with PRRS modified live ☐ Yes ☐ No

Once the stud was considered negative, was the population vaccinated with killed PRRS ☐ Yes ☐ No

**Stud Laboratory**

Are recording/dilutions, etc. computerized ☐ Yes ☐ No

**Animal Monitoring**

| | | |
|---|---|---|
| Are rectal temperatures taken daily | ☐ Yes | ☐ No |
| Are animals off feed recorded | ☐ Yes | ☐ No |
| Is water disappearance recorded | ☐ Yes | ☐ No |
| Is feed disappearance recorded | ☐ Yes | ☐ No |

| **For PRRS Outbreaks Only** | | |
|---|---|---|
| Did initial boars involved in PRRS infection go off feed | ☐ Yes | ☐ No |
| Did initial boars involved in PRRS infection have elevated temperatures | ☐ Yes | ☐ No |
| Did initial boars involved in PRRS infection have a cough | ☐ Yes | ☐ No |
| Was there an increase in lameness | | |
| Did personnel note increase in rejected samples at time of PRRS infection | ☐ Yes | ☐ No |
| Clinical signs noted | | |
| | | |
| | | |
| | | |

| **Sow Herds** | |
|---|---|
| How many negative sow herds became infected due to affiliation with this stud | |
| How many negative sow herds became infected (from other source) | |
| How many sow herds remained PRRS-negative | |
| | |

| **Virus** | | |
|---|---|---|
| Has virus been sequenced | ☐ Yes | ☐ No |
| Can you get permission to allow sequence comparison | ☐ Yes | ☐ No |

**Thank you for your cooperation.**

**PRRS Committee, AASV**