RESEARCH REPORT

SWINE HEALTH

**Title:** **Quantifying risk factors for PRRS virus introduction into swine herds through the use of the PRRS Risk Assessment – NPB #08-255**

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## Industry Summary

The total cost of productivity losses due to PRRS virus in the US national breeding and growing pig herd was recently estimated to be $664 million annually. Fifty-five percent, or $365 million of the total was attributed to the growing pig herd. In the same study, it was also estimated that 60 percent of pigs in the U.S. were negative for PRRS virus at weaning but 58 percent of those that were negative at weaning became positive before they were marketed. Therefore, 34.8 percent of all pigs marketed in the U.S. were PRRS virus negative at weaning but become infected by lateral introduction of the virus prior to marketing. Relative to pigs that are negative at weaning and remain negative all the way to market, the cost of productivity losses for pigs that are negative at weaning but become positive prior to marketing was estimated to be $2.61 per pig placed and for pigs that are positive to PRRS virus at placement the cost was estimated to be $4.90 per pig placed. While there is opportunity to increase the percentage of growing pigs that are negative at weaning, the greater opportunity may be to improve upon the 58% of pigs that are negative at weaning but become positive before marketing. In 2011, 106.6 million pigs were marketed. If, as estimated, 34.8 percent were PRRS virus negative at weaning but infected prior to marketing this represents 37.1 million pigs marketed or about 38.9 million pigs placed assuming a 5 percent mortality rate. If these pigs were kept negative to the PRRS virus to marketing, the cost of productivity losses attributed to PRRS virus would be reduced by $101.5 million annually. Application of effective bio-security measures has been inhibited by the lack of understanding of what key practices must be implemented to reduce PRRS VIRUS introduction into production premises. This single reality has cost the industry hundreds of millions of dollars, both through in our inability to limit the spread of

new PRRS virus into swine herds and in expensive and inconsistently effective bio-security practices. Therefore, the objective of this study was to assess and quantify which risk factors are the most common causes of lateral introduction of PRRS virus into growing pig production premises using the American Association of Swine Veterinarians (AASV) PRRS Risk Assessment for the Growing Pig Herd to collect information about individual risk factors.

One-hundred and twenty groups of pigs that were negative at placement were enrolled in the study. For wean-to-finish groups, the negative status of the pigs was determined by the reported status of the breeding herd(s) from which the pigs were sourced. For groups of finishing pigs, the pigs were tested for the presence of antibodies to the PRRS virus by enzyme-linked immuno-sorbent assay (ELISA) to confirm their PRRS virus-negative status. Other criteria for including groups of pigs in the study were specified for the premises at which the pigs were raised. Because the ELISA test is not able to distinguish between antibodies induced by vaccines and those induced by wild-type virus, only non-vaccinated groups of pigs were included in the study. To eliminate the possibility that there were not already infected pigs on the premises where negative pigs were placed, only groups of pigs at premises that were flowed all-in-all-out by premises and premises that had no breeding animals were included in the study. The primary outcome variable for the study was whether the pigs were infected before marketing. To determine if a group was infected with PRRS virus, each group was sampled just prior to when the group was closed and the pigs were marketed. Each sampling consisted of 15 serum samples that were tested by ELISA for the presence of antibodies to the PRRS virus. Any group with 1 or more true-positives was considered infected. Version 1 of the AASV PRRS Risk Assessment for the Growing Pig was used to collect information about risk factors for each premises in the study. A risk assessment was completed when the first group at each premises was enrolled in the study. The association between the risk factors and the outcome variable were assessed using univariate logistic regression.

Variables that were significantly associated with the PRRS virus status of groups of pigs before marketing included washing of facilities between all-in-all-out groups, disinfection of vehicles and trailers that transport incoming pigs, ownership of truck washes where vehicle and trailers used to transport incoming pigs are washed, frequency of service visitor and delivery vehicle visits per month to the site, sanitation procedure for maintenance service personnel and visitors entering the site, downtime required of on-site employees after visiting other pig sites, periodic formal retraining of all employees on biosecurity procedures and topography at the site.

## Keywords:
PRRS virus; growing pigs; risk factors; logistic regression

## Scientific Abstract
The total cost of productivity losses due to PRRS virus in the US national breeding and growing pig herd was recently estimated to be $664 million annually. Fifty-five percent, or $365 million of the total was attributed to the growing pig herd. In the same study, it was also estimated that 60 percent of pigs in the U.S. were negative for PRRS virus at weaning but 58 percent of those that were negative at weaning became positive before they were marketed. Therefore, 34.8 percent of all pigs marketed in the U.S. were PRRS virus negative at weaning but become infected by lateral introduction of the virus prior to marketing. Relative to pigs that are negative at weaning and remain negative all the way to market, the cost of productivity losses for pigs that are negative at weaning but become positive prior to marketing was estimated to be $2.61 per pig placed and for pigs that are positive to PRRS virus at placement the cost was estimated to be $4.90 per pig placed. While there is opportunity to increase the percentage of

growing pigs that are negative at weaning, the greater opportunity may be to improve upon the 58% of pigs that are negative at weaning but become positive before marketing. In 2011, 106.6 million pigs were marketed. If, as estimated, 34.8 percent were PRRS virus negative at weaning but infected prior to marketing this represents 37.1 million pigs marketed or about 38.9 million pigs placed assuming a 5 percent mortality rate. If these pigs were kept negative to the PRRS virus to marketing, the cost of productivity losses attributed to PRRS virus would be reduced by $101.5 million annually. Application of effective bio-security measures has been inhibited by the lack of understanding of what key practices must be implemented to reduce PRRS VIRUS introduction into production premises. Therefore, the objective of this study was to assess and quantify which risk factors are the most common causes of lateral introduction of PRRS virus into growing pig production premises using the American Association of Swine Veterinarians (AASV) PRRS Risk Assessment for the Growing Pig Herd to collect information about individual risk factors.

One-hundred and twenty groups of pigs that were negative at placement were enrolled in the study. Groups of pigs that were negative at placement were identified for inclusion in the study. For wean-to-finish groups, the negative status of the pigs was determined by the reported status of the breeding herd(s) from which the pigs were sourced. For groups of finishing pigs, the pigs were tested for the presence of antibodies to the PRRS virus by enzyme-linked immuno-sorbent assay (ELISA) to confirm their PRRS virus-negative status. Other inclusion criteria for the groups enrolled were specified for the premises at which the pigs were raised. Because the ELISA is not able to distinguish between antibodies induced by vaccines and those induced by wild-type virus, only non-vaccinated pigs were enrolled. To eliminate the possibility that there were not already infected pigs on the premises where negative pigs were placed, enrollment was limited to groups of pigs at premises that were flowed all-in-all-out by premises and premises that had no breeding animals. For some premises, multiple groups of pigs were enrolled in the study. The primary outcome variable for the study was whether the pigs were infected before marketing. To determine if a group was infected with PRRS virus, each group was sampled and tested by ELISA for the presence of antibodies to the PRRS virus just prior to when the group was closed and the pigs were marketed. Any group with 1 or more true-positives was considered infected. Version 1 of the AASV PRRS Risk Assessment for the Growing Pig was used to collect information about risk factors for each premises in the study. A risk assessment was completed when the first group at each premises was enrolled in the study. The questions about risk factors for PRRS in the assessment were treated as categorical variables for the analysis. The association between the questions and the outcome variable were assessed using univariate logistic regression. P-values for each of the questions (variables) were reported. Odds ratios for the categorical responses to each question and 95% confidence intervals were also reported.

Variables that were significantly associated with the PRRS virus status of groups of pigs before marketing included washing of facilities between all-in-all-out groups, disinfection of vehicles and trailers that transport incoming pigs, ownership of truck washes where vehicle and trailers used to transport incoming pigs are washed, frequency of service visitor and delivery vehicle visits per month to the site, sanitation procedure for maintenance service personnel and visitors entering the site, downtime required of on-site employees after visiting other pig sites, periodic formal retraining of all employees on biosecurity procedures and topography at the site.

## Introduction

The total cost of productivity losses due to PRRS virus in the US national breeding and growing pig herd was recently estimated to be $664 million annually (Holtkamp, 2012a). Fifty-five percent, or $365 million

of the total was attributed to the growing pig herd. In the same study, it was also estimated that 60 percent of pigs in the U.S. were negative for PRRS virus at weaning but 58 percent of those that were negative at weaning became positive before they were marketed. Therefore, 34.8 percent of all pigs marketed in the U.S. were PRRS virus negative at weaning but become infected by lateral introduction of the virus prior to marketing. Relative to pigs that are negative at weaning and remain negative all the way to market, the cost of productivity losses for pigs that are negative at weaning but become positive prior to marketing was estimated to be $2.61 per pig placed and for pigs that are positive to PRRS virus at placement the cost was estimated to be $4.90 per pig placed (Holtkamp, 2012b). While there is opportunity to increase the percentage of growing pigs that are negative at weaning, the greater opportunity may be to improve upon the 58% of pigs that are negative at weaning but become positive before marketing. In 2011, 106.6 million pigs were marketed (USDA, 2012). If, as estimated, 34.8 percent were PRRS virus negative at weaning but infected prior to marketing this represents 37.1 million pigs marketed or about 38.9 million pigs placed assuming a 5 percent mortality rate. If these pigs were kept negative to the PRRS virus to marketing, the cost of productivity losses attributed to PRRS virus would be reduced by $101.5 million annually.

For those groups of pigs that are negative at weaning, success in keeping them negative to market has been inconsistent and unpredictable. Application of effective bio-security measures to mitigate risk factors has been inhibited by the lack of understanding of what key practices must be implemented to reduce PRRS virus introduction into production premises. This single reality has cost the industry hundreds of millions of dollars, both through in our inability to limit the spread of new PRRS virus into swine herds and in expensive and inconsistently effective bio-security practices.

Although several studies have evaluated a limited set of risk factors for breeding herds on a relatively small set of herds, (Evans, 2008; Hurd, 2001; Goldberg, 2000; Mortensen 2002) many aspects of the epidemiology of transmission of virus between herds and clinical outbreaks of PRRS remain poorly understood. Observational studies to assess and quantify which risk factors are the most common causes of lateral introduction of PRRS virus into growing pig production premises evaluating a broad set of risk factors in a large number of groups of pigs have not been done.

Over the last 3 years, with the development of the AASV PRRS Risk Assessment for the Growing Pig Herd, progress has been made in assessing high and low risk premises for PRRS virus introduction. With this tool, a focused list of potential risk factors has been identified but to date individual risk factors have not be validated or prioritized.

## Objectives

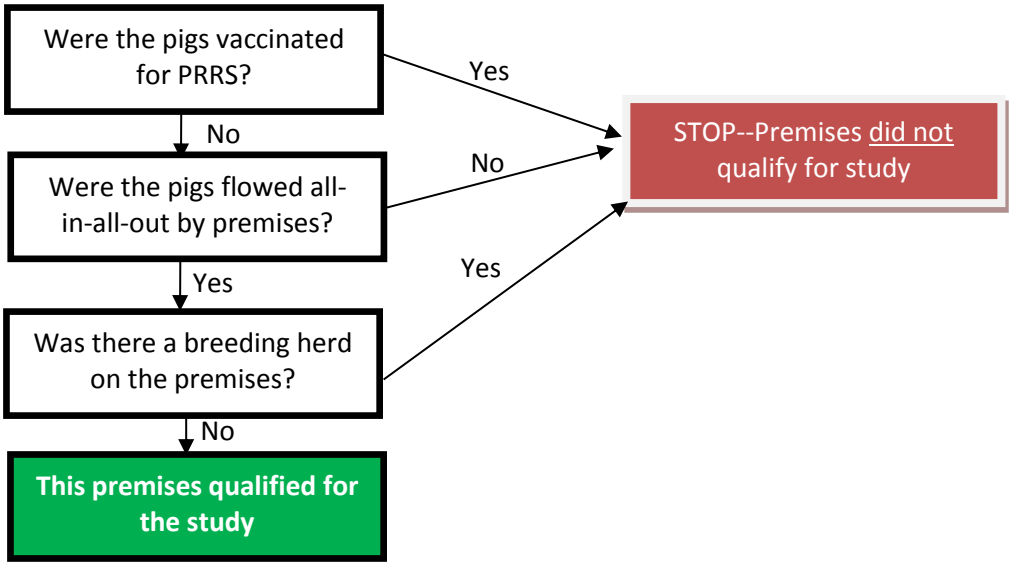
The objective of this study was to assess and quantify which risk factors are the most common causes of lateral introduction of PRRS virus into growing pig production premises using the American Association of Swine Veterinarians (AASV) PRRS Risk Assessment for the Growing Pig Herd to collect information about individual risk factors.

## Materials and Methods

### Selection of premises and groups

The unit of concern for the study was a group of pigs. In the U.S. nearly all pigs are raised in groups where all of the pigs are placed and removed at approximately the same time. Groups enrolled included 3

possible phase(s) of production. Depending on the facilities at the site, nursery groups (from approximately 3 to 10 weeks of age), finisher groups (from approximately 10 to 24 weeks of age) or wean-to-finish groups (from approximately 3 to 24 weeks of age) were enrolled. Groups of pigs that were negative at placement were identified for inclusion in the study. For nursery and wean-to-finish groups, the negative status of the pigs was determined by the reported status of the breeding herd(s) from which the pigs were sourced. To be considered negative, the pigs must have been sourced from AASV/PRRS-CAP category III (provisional negative) or IV (negative) breeding herds (Holtkamp, 2011). For groups of finishing pigs, the pigs were tested at placement to confirm their PRRS virus-negative status. Each sampling consisted of 15 serum samples collected via routine vena puncture. The samples were tested with a commercially available enzyme-linked immuno-sorbent assay (ELISA) kit (IDEXX PRRS X3 Ab Test; IDEXX Laboratories, Westbrook, Maine) for the presence of antibodies to the PRRS virus at a commercial veterinary diagnostic laboratory. If 3 or fewer of the 15 samples were positive (S:P$\geq$0.4) or suspect (S:P $\geq$0.2 and S:P<0.4) the positive and suspect samples were retested by ELISA and with the North American and European PRRS IFA tests to rule out false positives. Other inclusion criteria for the groups enrolled were specified for the premises at which the pigs were raised. They are described in Figure 1. Because the ELISA is not able to distinguish between antibodies induced by vaccines and those induced by wild-type virus, only non-vaccinated pigs were enrolled. To eliminate the possibility that there were not already infected pigs on the premises where negative pigs were placed, enrollment was limited to groups of pigs at premises that were flowed all-in-all-out by premises and premises that had no breeding animals. For some premises, multiple groups of pigs were enrolled in the study. All premises and groups of pigs enrolled in the study were selected by a convenience sample. Identification and recruitment of collaborating producers with premises and groups that met the criteria was based on the principal investigator's and co-investigator's knowledge of the industry. Producers were offered free sample collection and diagnostic testing in exchange for collaborating in the study.




Additional requirement for **finisher premises:**

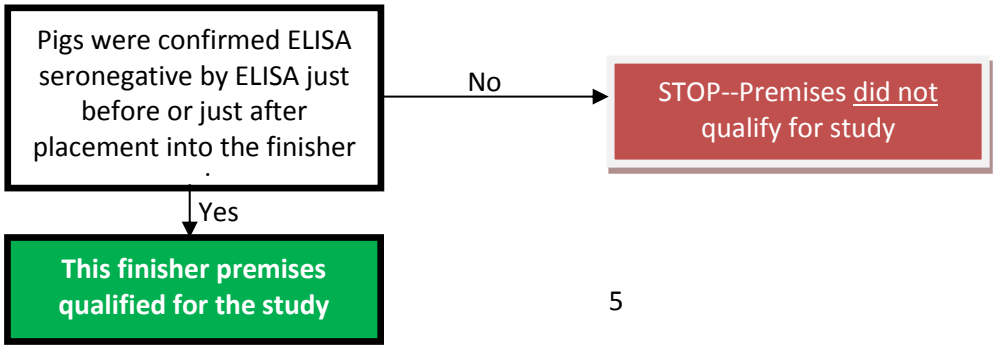


**Figure 1.** Inclusion criteria for nursery, wean-to-finish and finishing premises that receive groups of pigs that are PRRS virus-negative at placement.

## Data

Data for 120 finishing and wean-to-finish groups of pigs were included in the analysis. Nursery groups were excluded because only 5 nursery groups had been enrolled. The primary outcome variable for the study was binary and determined by whether the pigs were infected and became seropositive or remained seronegative to the PRRS virus throughout the growing period (OUTCOME = Pos or Neg). To determine if a group was infected with PRRS virus, each group was sampled just prior to when the group was closed and the pigs were marketed or moved to the finisher in the case of nursery groups. Each sampling consisted of 15 serum samples collected via routine vena puncture. The samples were then tested by ELISA (IDEXX) for the presence of antibodies to the PRRS virus with false positives ruled out as described earlier. Any group with 1 or more true-positives was considered infected.

Version 1 of the AASV PRRS Risk Assessment for the Growing Pig was used to collect information about risk factors. A risk assessment was completed when the first group at each premises was enrolled in the study. The respondents were asked to provide responses for the premises that apply at the time the group was established. All surveys were completed by veterinarians or veterinary students that had been trained.

Version 1 of the PRRS Risk Assessment for the Growing Pig Herd survey was first offered through PADRAP (www.padrap.org) in 2009. The survey was developed specifically for assessing growing pig herds. The survey instrument was developed using a group consensus approach with the aid of the PRRS Risk Assessment Working Group composed of 6 swine veterinarians and researchers with expertise in PRRS virus. By the use of a Delphi survey approach, 186 questions were selected to be included in the final survey (see Appendix A for a complete list of questions in the final survey, supplementary material). The estimated importance of each question was used to narrow the list of questions to be included in the final survey. The Delphi approach is a multistage approach designed to elicit group consensus based on expert opinion (Keeney et al., 2001). The list of questions in the final survey are those with the highest estimated importance based on the consensus of expert opinion and considered an initial estimate. Of the 186 questions, 50 capture information about internal risk factors and 136 about external risk factors. The section of the survey about internal risk factors includes questions about bio-management factors that are important when the virus is already present in the herd. External risk factors include those factors that are important for excluding the virus from a herd that is free of the virus or new strains of the virus from a herd where the virus is already present. Version 1 of the PRRS Risk Assessment for the Growing Pig Herd survey is available on-line to trained AASV member veterinarians. Training consists of a half-day session at the end of which the veterinarians are given access to the program allowing them to complete surveys. Completed surveys are maintained in a database at Iowa State University, College of Veterinary Medicine for AASV. Approximately 1 h per site is required to complete the survey. The unit of concern of the survey is the growing pig premises because information captured by the survey is the same for all barns on a site.

The questions about risk factors for PRRS in the PRRS Risk Assessment for the Growing Pig Herd were treated as categorical explanatory variables for the analysis. Of the 186 questions about risk factors in the PRRS Risk Assessment for the Growing Pig Herd, 55 were selected as potential explanatory variables to be included in the statistical analysis. The variables selected were expected by the study investigators to be potentially important for explaining lateral introduction of PRRS virus. The explanatory variables selected are in Table 1. The responses for the questions in the survey were either categorical, with up to 6

possible responses, or continuous. All questions originally with continuous responses were transformed to categorical explanatory variables using cutoff values identified by the PRRS Risk Assessment Working Group for the purpose of quantifying and reporting risk scores.

### Statistical Analysis

The association between the 55 explanatory variables and the outcome variable were assessed using univariate logistic regression. The logistic regression modeled the probability of the group becoming positive before marketing (OUTCOME=Pos). The referent is identified in Table 1. A chi-square statistic was calculated to test the hypothesis that the explanatory variable (question) was associated with the outcome. The association between the outcome variable and the explanatory variable was considered significant if $p < 0.05$ for the chi-square statistic. Odds ratios for each of the possible responses relative to the referent were calculated for each explanatory variable (question). Responses associated with increased odds of OUTCOME=Pos have odds ratios greater than one. The univariate logistic regression analyses was performed in R using the glm function in the base package (R Development Core Team, 2009).

## Results

The 120 groups of pigs included in the analysis were raised at 73 premises located in Iowa and Minnesota were enrolled in the study and included in the analysis. Nearly 75 percent (89) of the groups were not infected and remained sero-negative at market and the remaining 25 percent (31) were infected and sero-positive at market. The majority of the groups were finishing only (96 groups) and the remainder were wean-to-finish (24 groups). Nearly 90 percent of the groups (108) were raised by contract producers that owned or leased the facilities and provided labor. The remaining 12 were raised by independent producers or production systems that owned the pigs and facilities and provided the labor.

Results of the univariate logistic regression are reported in Table 1. Variables that were significantly associated with the PRRS virus status of groups of pigs before marketing included washing of facilities between all-in-all-out groups, disinfection of vehicles and trailers that transport incoming pigs, ownership of truck washes where vehicle and trailers used to transport incoming pigs are washed, frequency of service visitor and delivery vehicle visits per month to the site, sanitation procedure for maintenance service personnel and visitors entering the site, downtime required of on-site employees after visiting other pig sites, periodic formal retraining of all employees on biosecurity procedures and topography at the site.

## Discussion

The results suggest that several of the questions in the PRRS Risk Assessment for the Breeding Herd are significantly associated with whether groups of pigs are infected with PRRS virus during the growing period.

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**Table 1.** Results of univarite logistic regression analysis.

| | | | 95% CI | |
|---|---|---|---|---|
| | **P-value, Chi² Test** | **Odds ratio** | **upper** | **lower** |
| Site type | 0.58 | | | |
| Finisher | | 1.33 | 4.13 | 0.49 |
| W F | | reference | reference | reference |
| Number of groiwng pigs on premises | 0.3 | | | |
| >= 5000 and < 10000 | | 6.7 | 912.47 | 0.65 |
| >= 1000 and < 5000 | | 4.53 | 598.66 | 0.5 |
| < 1000 | | reference | reference | reference |
| Stages of production at premises | 0.58 | | | |
| Wean to finish | | 0.75 | 2.03 | 0.24 |
| Finisher only | | reference | reference | reference |
| Ownership of site and pigs | 0.18 | | | |
| Contract producer owns or leases facilities but not pigs and provides labor (self, employees, or subcontract) | | 0.07 | 0.9 | 0 |
| Production system owns or leases facilities and pigs, provides labor | | 0.04 | 0.81 | 0 |
| Independent producer owns facilities and pigs, provides labor | | reference | reference | reference |
| Facilities washed between every all-in-all-out group | 0.04 | | | |
| Yes compliance is less than 95 | | 15.17 | 2115.79 | 1.19 |
| Yes compliance is greater than or equal to 95 | | reference | reference | reference |
| Facilities allowed to dry completely before animals are placed | 0.25 | | | |
| Yes compliance is less than 95 | | 2.97 | 20.01 | 0.44 |
| Yes compliance is greater than or equal to 95 | | reference | reference | reference |
| Typical overstocking of wean to finish facilities at initial placement | 0.17 | | | |
| Frequently | | 0.14 | 2.9 | 0 |
| Sometimes | | 0.57 | 3.97 | 0.08 |

| | | | | |
|---|---|---|---|---|
| Never | | reference | reference | reference |
| In coldest months what is the washing frequency of vehicles and trailers used to transport incoming pigs | 0.36 | | | |
| Site is farrow to feeder or farrow to finish and pigs are not hauled between stages of production | | 0.3 | 2.95 | 0 |
| All trucks washed between every load | | reference | reference | reference |
| If washed what disinfectant is used on vehicles and trailers that transport incoming pigs | 0.05 | | | |
| No disinfectant used | | 12.72 | 1775.72 | 1 |
| Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used | | reference | reference | reference |
| In coldest months what is the drying time of vehicles and trailers used to transport incoming pigs | 0.39 | | | |
| Vehicles and trailers allowed to dry completely before next load but compliance is greater than or equal to 95 | | 1.69 | 6.88 | 0.54 |
| Assisted drying technology is used to dry washed vehicles and trailers | | reference | reference | reference |
| In the warmest months what is the drying time of vehicles and trailers used to transport incoming pigs | 0.39 | | | |
| Vehicles and trailers allowed to dry completely before next load but compliance is greater than or equal to 95 | | 1.69 | 6.88 | 0.54 |
| Assisted drying technology is used to dry washed vehicles and trailers | | reference | reference | reference |
| Ownership of truck washes where vehicles and trailers used to transport incoming pigs are washed | 0.02 | | | |
| One or more are not owned by but dedicated to production system | | 3.63 | 15.4 | 1.08 |
| One or more but not all are not owned and not dedicated to production system | | 1.11 | 4.79 | 0.31 |
| All are owned by and dedicated to production system | | reference | reference | reference |
| Are the truck and trailer cleaning procedures formally audited QA inspection for vehicles used to transport incoming pigs? | 0.48 | | | |
| Yes audited by personnel affiliated with the truck wash | | 0.2 | 4.53 | 0 |
| Yes audited by personnel with production system but not directly affiliated with the truck wash | | 0.35 | 2.33 | 0.05 |

| | | | | |
|---|---|---|---|---|
| Yes audited by independent party not associated with production system | | reference | reference | reference |
| Boot and clothing restrictions on feed truck drivers between sites | 0.07 | | | |
| No requirements | | 0.02 | 0.43 | 0 |
| Required to change boots or boot covers but not clothing between sites | | 0.07 | 0.94 | 0 |
| Required to change clothing and boots or boot covers between sites | | reference | reference | reference |
| Approximate frequency of service visitor and delivery vehicle visits per month to this site | 0.05 | | | |
| >= 30 | | 0.04 | 0.59 | 0 |
| >= 15 and < 30 | | 0.1 | 1.26 | 0 |
| >= 3 and < 5 | | 0.04 | 1.54 | 0 |
| < 3 | | reference | reference | reference |
| Frequency with which dead animals are picked up for off-site disposal | 0.19 | | | |
| Daily | | 4.26 | 611.79 | 0.33 |
| Dead animals are disposed of on-site and never stored prior to disposal | | 1.92 | 262.68 | 0.18 |
| Pickup every 2 6 days | | 5.4 | 732.91 | 0.52 |
| Pickup every 7 13 days | | 4.09 | 623.31 | 0.24 |
| Less frequently than 20 days | | reference | reference | reference |
| Location of pick up site for dead animals disposed of off site | 0.14 | | | |
| At a dedicated site between one half mile 0 8 km and a mile 1 6 km from this site | | 2.33 | 22.82 | 0.18 |
| At this site or less than one half mile away | | 2.89 | 10.98 | 0.88 |
| Dead animals are disposed of on site | | 1.3 | 5.4 | 0.33 |
| At a dedicated site more than one mile 1 6 km from this site | | reference | reference | reference |
| Management of manure removal | 0.92 | | | |
| All manure removal equipment is managed by production system or contractor | | 1.84 | 259.09 | 0.14 |
| Outsourced to third party, service exclusively to production system or contract producer but equipment near facilities managed by production system or contract producer | | 1.92 | 302.73 | 0.1 |
| Outsourced to third party, service exclusively to production system or contractor | | 2.12 | 299.56 | 0.16 |
| Outsourced to third party, service non exclusively to production system or contract producer but equipment near facilities managed by production system or contract producer | | 0.56 | 119 | 0 |
| Outsourced to third party, service non exclusively to production system or contractor | | 1 | 224.94 | 0 |
| Outsourced to third party, service exclusively to production system or contract producer | | reference | reference | reference |

| | | | | |
|---|---|---|---|---|
| but equipment near facilities managed by production system or contract producer | | | | |
| Manure removal equipment and or vehicle allowed to enter the farm | 0.79 | | | |
| No requirements | | 0.89 | 2.23 | 0.37 |
| Equipment and or vehicle is not shared between sites | | reference | reference | reference |
| Flow of manure removal equipment | 0.94 | | | |
| All of the equipment used at this site may be used at other sites but with minimum downtime and sanitation requirements | | 0.75 | 3.24 | 0.15 |
| Equipment near facilities is dedicated to this site no restrictions on all other equipment used at this site may be used at other sites | | 0.54 | 7.89 | 0 |
| No restrictions all of the equipment used at this site may be used at other sites | | 1.04 | 3.06 | 0.38 |
| All equipment is dedicated to this site | | reference | reference | reference |
| Washing requirements of manure removal equipment that is moved between sites | 0.99 | | | |
| No requirements | | 1.05 | 155.91 | 0.05 |
| All equipment is dedicated to this site | | 1.11 | 171.18 | 0.05 |
| Washed and flushed between every site less than 95 compliance | | 1.22 | 189.81 | 0.06 |
| Washed and flushed between every site greater than or equal to 95 compliance | | reference | reference | reference |
| Disinfectant use on manure removal equipment and or vehicles used to haul manure that is moved between sites | 0.88 | | | |
| No disinfectant used | | 0.58 | 6.55 | 0.07 |
| All equipment is dedicated to this site | | 0.62 | 7.7 | 0.07 |
| Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used | | reference | reference | reference |
| Drying time requirements following wash of manure removal equipment that is moved between sites | 0.45 | | | |
| Allowed to dry completely less than 95 compliance | | 9 | 1374.65 | 0.57 |
| No requirements | | 3.09 | 415.76 | 0.31 |
| All equipment is dedicated to this site | | 3.34 | 466.38 | 0.29 |
| Allowed to dry completely greater than or equal to 95 compliance | | reference | reference | reference |
| Boot and clothing restrictions between sites on manure removal personnel | 0.68 | | | |
| No requirements | | 0.85 | 9.05 | 0.13 |

| | | | | |
|---|---|---|---|---|
| Manure removal is done by on site employees not involved in manure removal at any other pig sites | | 0.18 | 4.33 | 0 |
| Required to change clothing and boots between sites | | 1.21 | 14.49 | 0.16 |
| Required to change clothing but not boots between sites | | 0.78 | 28.48 | 0 |
| Required to shower with change of clothing and boots between sites | | reference | reference | reference |
| Approximate frequency of visits per month by maintenance service personnel to this site | 0.33 | | | |
| >= 15 and < 30 | | 0.57 | 7.31 | 0 |
| >= 3 and < 5 | | 8.61 | 1269.74 | 0.45 |
| < 3 | | reference | reference | reference |
| Sanitation procedure for maintenance service personnel entering site | 0.51 | | | |
| Boot wash/disinfection prior to entry | | 0.38 | 3.82 | 0.03 |
| Coverall and or boot change only | | 0.34 | 2.28 | 0.05 |
| Coverall and boot change, hands are washed prior to entry of pig facilities on site without a demarcation line | | reference | reference | reference |
| Downtime hours required of maintenance service personnel | 0.88 | | | |
| = 0 | | 0.59 | 6.67 | 0.08 |
| > 0 and <= 12 | | 0.56 | 7.61 | 0.05 |
| > 12 and <= 24 | | reference | reference | reference |
| Sanitation procedure for non-maintenance service personnel and visitors entering site | 0.01 | | | |
| Coverall and boot change hands are washed prior to entry of pig facilities on site without a demarcation line | | 0.14 | 0.6 | 0.03 |
| Coverall and or boot change only | | 0.32 | 1.41 | 0.07 |
| Shower in with boot and clothes changed prior to entry of pig facilities on site | | reference | reference | reference |
| Downtime hours required of non-maintenance service personnel and visitors | 0.42 | | | |
| = 0 | | 1.48 | 8.51 | 0.35 |
| > 0 and <= 12 | | 1.29 | 14.22 | 0.09 |
| > 12 and <= 24 | | 0.7 | 4.23 | 0.15 |
| > 24 and <= 48 | | reference | reference | reference |
| Sanitation procedure for on-site employees entering site | 0.15 | | | |

| | | | | |
|---|---|---|---|---|
| Boot wash /disinfection prior to entry | | 0.27 | 2.55 | 0.02 |
| Coverall and boot change hands are washed prior to entry of pig facilities on site without a demarcation line | | 0.22 | 1.01 | 0.04 |
| Coverall and or boot change only | | 0.19 | 0.77 | 0.04 |
| Shower in with boot and clothes changed prior to entry of pig facilities on site | | reference | reference | reference |
| Downtime hours required of on site employees after visiting other pig sites | 0.04 | | | |
| = 0 | | 1.13 | 6.56 | 0.27 |
| > 0 and <= 12 | | 3.18 | 17.36 | 0.85 |
| > 12 and <= 24 | | reference | reference | reference |
| Written biosecurity protocols | 0.69 | | | |
| Written protocols and communications to on site employees are sometimes provided in all languages spoken as first language by employees | | 0.56 | 7.07 | 0 |
| Written protocols and communications to on site employees are always provided in all languages spoken as first language by employees | | reference | reference | reference |
| New employees receive formal training on biosecurity procedures | 0.07 | | | |
| No | | 0.26 | 1.11 | 0.03 |
| Yes | | reference | reference | reference |
| All employees periodically receive formal retraining on biosecurity procedures | 0.05 | | | |
| No | | 0.24 | 1.02 | 0.03 |
| Yes | | reference | reference | reference |
| Employee compliance with biosecurity procedures is periodically audited | 0.39 | | | |
| No | | 0.59 | 1.85 | 0.15 |
| Yes more frequently than annually by production system or other entity with common ownership or management | | reference | reference | reference |
| Sanitation requirements on employees service personnel delivery personnel and visitors moving inside and outside the facilities | 0.06 | | | |
| No requirements | | 0.28 | 0.78 | 0.09 |
| Change of boots required | | 0.43 | 1.19 | 0.14 |
| Coverall and boot change hands are washed prior to entry of pig facilities on site without a | | 0.32 | 1.27 | 0.06 |

| | | | | |
|---|---|---|---|---|
| demarcation line | | | | |
| Coverall and boot change hands are washed prior to entry of pig facilities on site with a demarcation line | | reference | reference | reference |
| Procedures for introducing transferred tools and supplies | 0.13 | | | |
| Direct introduction into the farm no disinfection no quarantine | | 0.4 | 1.24 | 0.1 |
| No tools and or supplies are transferred between pig sites | | 0.4 | 1.24 | 0.1 |
| Disinfection prior to introduction into the farm but no quarantine | | reference | reference | reference |
| Pig density swine sites within 1 mile radius of this site | 0.3 | | | |
| >= 3 | | 4.75 | 55.47 | 0.58 |
| = 2 | | 1.24 | 3.14 | 0.48 |
| = 1 | | 0.64 | 1.88 | 0.2 |
| = 0 | | reference | reference | reference |
| Pig density swine sites in 1 to 3 mile radius of this site | 0.89 | | | |
| >= 5 | | 1.52 | 5.12 | 0.45 |
| >= 1 and < 3 | | 1.23 | 4.24 | 0.35 |
| >= 3 and < 5 | | 1.02 | 3.02 | 0.36 |
| = 0 | | reference | reference | reference |
| Pig density swine sites in 3 to 5 mile radius of this site | 0.25 | | | |
| >= 11 | | 2.79 | 18.68 | 0.38 |
| >= 6 and < 11 | | 1.08 | 7.85 | 0.09 |
| >= 1 and < 6 | | 2.82 | 11.35 | 0.92 |
| = 0 | | reference | reference | reference |
| Distance miles to nearest swine farm | 0.4 | | | |
| <= 0.5 | | 2.11 | 8.68 | 0.57 |
| > 0.5 and <= 1.0 | | 0.74 | 2.99 | 0.2 |
| > 1.0 and <= 3.0 | | 1.07 | 4.4 | 0.29 |
| > 3.0 and <= 5.0 | | 1.93 | 9.75 | 0.39 |
| > 5.0 or 'Unknown | | reference | reference | reference |

| | | | | |
|---|---|---|---|---|
| Number of finished pigs housed at nearest swine farm | 0.65 | | | |
| >= 7500 and < 15000 | | 0.56 | 119 | 0 |
| >= 1000 and < 7500 | | 1.83 | 255.62 | 0.14 |
| < 1000 | | reference | reference | reference |
| Number of nursery pigs housed at nearest swine farm | 0.63 | | | |
| Unknown | | 1.53 | 40.12 | 0.01 |
| >= 7500 and < 15000 | | 1.53 | 40.12 | 0.01 |
| >= 1000 and < 7500 | | 3.63 | 41.06 | 0.54 |
| < 1000 | | reference | reference | reference |
| Number of commercial breeding females housed at nearest swine farm | 0.34 | | | |
| Unknown | | 3 | 99.77 | 0.02 |
| >= 3000 | | 1.8 | 46.77 | 0.01 |
| >= 1000 and < 3000 | | 9 | 204.37 | 0.5 |
| >= 300 and < 1000 | | 27 | 4836.06 | 1 |
| < 300 | | reference | reference | reference |
| Number of replacement breeding animals housed for acclimation to PRRSV at nearest swine farm | 0.24 | | | |
| Unknown | | 0.04 | 1.62 | 9.94E-05 |
| < 1000 | | reference | reference | reference |
| Estimated loads of pigs per week on nearest public road (paved or unpaved) | 0.89 | | | |
| >= 42 | | 0.71 | 2.45 | 0.17 |
| >= 28 and < 42 | | 2.74 | 35.73 | 0.21 |
| >= 14 and < 28 | | 1.01 | 3.7 | 0.23 |
| >= 3 and < 14 | | 1.06 | 2.72 | 0.4 |
| < 3 | | reference | reference | reference |
| Topography at the site | 0.03 | | | |
| Flat | | 5.45 | 735.75 | 0.54 |
| Gentle rolling hills | | 1.87 | 255.05 | 0.18 |

| | | | | |
|---|---|---|---|---|
| Steep hills | | reference | reference | reference |
| Forestation around the site | 0.2 | | | |
| No trees | | 2.11 | 8.46 | 0.69 |
| Moderate forestation | | reference | reference | reference |

**Appendix A.** PRRS Risk Assessment for the Growing Pig Herd

**INTERNAL RISKS**

*Internal Risks GF-> Circulation Risks GF->> Herd and Site Characteristics-> Characteristics of the Herd*

1. Age spread (age of oldest pig in days minus age of youngest pig) of pigs placed in nurseries or wean-to-finish facilities at site

_____

Enter "N/A" if no nurseries or wean-to-finish on site

**N W**

Instructions for Internal Section

When you see a bold letter (N W F), it indicates what type of facilities this question applies to:

-"N" indicates nurseries
-"W" indicates wean-to-finish facilities
-"F" indicates finisher facilities
(A question could be required by all three types)

***If the question is not required for your type of facilities, enter "N/A" or select "Not Applicable". For example, if you only have nurseries on-site and the questions does not have an "N", enter "N/A" or select "Not Applicable".

2. Age spread (age of oldest pig in days minus age of youngest pig) of pigs placed in finishers at site

_____

Enter "N/A" if no finisher on site

**F**

*Internal Risks GF-> Circulation Risks GF-> Herd and Site Characteristics-> Characteristics of the site*

3. Stages of production at this site
   a. Farrow-to-finish
   b. Farrow-to-feeder
   c. Wean-to-finish
   d. Finisher only
   e. Nursery only

**N W F**

4. Number of nursery spaces at site

[Instructions: Enter number without commas (i.e. XXXX vs. X,XXX). For example, 1,000 would be entered as 1000.]

_____

Enter "N/A" if no nurseries on site

**N**

5. Number of finisher spaces at site

[Instructions: Enter number without commas (i.e. XXXX vs. X,XXX). For example, 1,000 would be entered as 1000]

_____

Enter "N/A" if no finisher on site

**F**

6. Number or wean-to-finish spaces at site

[Instructions: Enter number without commas (i.e. XXXX vs. X,XXX). For example, 1,000 would be entered as 1000]

_____
Enter "N/A" if no wean-to-finish facilities on site

**W**

7. Number of nursery air spaces at this site
[Instructions: Air space = smaller of room or building]
_____
Enter "N/A" if no nurseries on site or outdoor facilities

**N**

8. Number of wean-to-finish or finisher air spaces at this site
[Instructions: Air space = smaller of room or building]
_____
Enter "N/A" if no finisher or wean-to-finish on site or outdoor facilities

**W F**

9. Layout of nursery buildings on site
a. All nursery buildings have a single room
b. Combination of multiple and single room buildings
c. All nursery buildings have multiple rooms
d. Not applicable (select if no nurseries on site or outdoor facilities)

**N**

10. Layout of finisher or wean-to-finish buildings on site
a. All finisher buildings have a single room
b. Combination of multiple room and single room buildings
c. All finisher buildings have multiple rooms
d. Not applicable (select if no finishers or wean-to-finish facilities on site or outdoor facilities)

**W F**

11. Ownership of site and pigs
a. Contract producer owns or leases facilities but not pigs and provides labor (self, employees, or subcontract)
b. Contract producer owns or leases facilities but not pigs, labor provided by owner of pigs
c. Production system owns or leases facilities and pigs, provides labor
d. Independent producer owns facilities and pigs, provides labor

**N W F**

12. Type of pig raised at site
a. Majority of animals raised are for commercial production
b. Majority of animals raised are used for genetic replacements

**N W F**

*Internal Risks GF->Circulation Risks GF-> PRRSV Status-> Current and Historical PRRSV Status of the Site*

13. PRRS virus status of piglets at placement in nursery or wean-to-finishers
a. Unknown, diagnostics not routinely done
b. Some positives for PRRS virus antigen (PCR, IHC, or VI) and antibodies (ELISA or IFA)
c. Some positives for PRRS virus antigen (PCR, IHC or VI)
d. Some positives for PRRS virus antibodies (ELISA, IFA of FFN)
e. All negative for PRRS virus antigen (PCR, IHC, or VI) and PRRS virus antibodies (ELISA, IFA or FFN)
f. Not applicable (select if no nurseries or wean-to-finish on site)

**N W**

14. PRRS virus status of piglets at placement in finishers
    a. Unknown, diagnostics not routinely done
    b. Some positives for PRRS virus antigen (PCR, IHC, or VI) and antibodies (ELISA or IFA)
    c. Some positives for PRRS virus antigen (PCR, IHC or VI)
    d. Some positives for PRRS virus antibodies (ELISA, IFA of FFN)
    e. All negative for PRRS virus antigen (PCR, IHC, or VI) and PRRS virus antibodies (ELISA, IFA or FFN)
    f. Not applicable (select if no finisher on site)

**F**

15. Typical occurrence of respiratory disease (not associated with PRRS) in nursery phase at this site in last two years
    a. Occurs in 8-10 groups (greater than 80%)
    b. Occurs in 5-7 out of 10 groups (50-79%)
    c. Occurs in 2-4 out of 10 groups (20-49%)
    d. Occurs in 0-1 out of 10 groups (0-19%)
    e. Not applicable (select if no nurseries or wean-to-finish on site)

**N W**

16. Typical occurrence of respiratory disease (not associated with PRRS) in finisher phase at this site in last two years
    a. Occurs in 8-10 groups (greater than 80%)
    b. Occurs in 5-7 out of 10 groups (50-79%)
    c. Occurs in 2-4 out of 10 groups (20-49%)
    d. Occurs in 0-1 out of 10 groups (0-19%)
    e. Not applicable (select if no finisher or wean-to-finish on site)

**W F**

*Internal Risks GF-> Circulation Risks GF-> Management -> Management Practices*

17. Maximum number of nursery pigs cared for per full-time equivalent (40 hrs/wk) employee at this site (excluding specialized crews-vaccination, loading & washing)
    [Instructions: Enter number without commas (XXXX vs. X,XXX), for example, 1,000 would be entered as 1000. Full-time equivalent = 40 hrs/week]
    _____
    Enter "N/A" if no nurseries or wean-to-finish on site

**N W**

18. Maximum number of finishing age pigs cared for per full-time equivalent (40 hrs/wk) employee at this site (excluding specialized crews – vaccination, loading & washing)
    [Instructions: Enter number without commas (XXXX vs. X,XXX), for example, 1,000 would be entered as 1000. Full-time equivalent = 40 hrs/week]
    _____
    Enter "N/A" if no finisher or wean-to-finish on site

**W F**

19. Facilities are washed between every AIAO group
    a. Never
    b. Yes, compliance is less than 95%

c. Yes, compliance is greater than or equal to 95%
d. Not applicable (select if continuous flow)

**N W F**

20. Detergent used when washing facilities
a. No
b. Yes
c. Not applicable (select if facilities are never washed)

**N W F**

21. If washed, what disinfectant is used when washing facilities
a. No disinfectant used
b. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
c. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
d. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used
e. Not applicable (select if facilities are never washed)

**N W F**

22. Are facilities allowed to dry completely before animals are moved into area
a. Never
b. Yes, compliance is less than 95%
c. Yes, compliance is greater than or equal to 95%
d. Not applicable (select if facilities are never washed)

**N W F**

23. Restrictions on movement of employees, service personnel and visitors between areas of production (i.e. breeding/gestation, farrowing, nursery, finishing) at this site
a. Not restricted
b. Employees are restricted to their area of production at this site, compliance is less than 95%
c. Employees are restricted to their area of production at this site, compliance is greater than or equal to 95%
d. Not applicable (select if only one stage of production at this site)

**N W F**

24. Sanitation requirements on employees, service personnel and visitors moving between area of production within this site (i.e. breeding/gestation, farrowing, nursery, finishing)
a. No requirements when moving between areas of production
b. Use of boot baths required when moving between areas of production
c. Change of boots or boot covers required when moving between areas of production
d. Hand wash and/or change of gloves with change of boots or boot covers and clothing required when moving between areas of production
e. Shower with change of boots and clothing required when moving between areas of production
f. Not applicable (select if only one stage of production at this site or if employees are restricted to their area of production)

**N W F**

25. Sanitation requirements on employees, service personnel and visitors moving between facilities on site (i.e. movements between barns)

a. No requirements when moving between areas of production
b. Use of boot baths required when moving between areas of production
c. Change of boots or boot covers required when moving between areas of production
d. Hand wash and/or change of gloves with change of boots or boot covers and clothing required when moving between areas of production
e. Shower with change of boots and clothing required when moving between areas of production
Not applicable (select if only one facility at this site)

**N W F**

26. Frequency with which needles are changed when used on pigs
a. Same needle used on an average of more than 25 animals or changed only when bent
b. Same needle used on an average of 10-25 animals
c. Same needle used on an average of 2-10 animals
d. Separate needle used for each individual animal
e. Use needle-less syringe

**N W F**

*Internal Risks GF-> Circulation Risks GF-> Management -> Flow of Animals*

27. Restrictions on movements of pigs in farrowing at breeding herd from which pigs at this site are sourced
a. No restrictions on piglet movements between litters or unknown
b. In the first 24 hours piglet movement between litters is allowed and after 24 hours piglets can only be placed into nurse litters (i.e. no swapping between litters)
c. Piglet movement between litters is only allowed in the first 24 hours of age
d. No pig movement from litter to litter

**N W F**

28. Fill time to form an AIAO group of pigs (days)
_____
Enter "N/A" if continuous flow

**N W F**

29. Stocking density in nurseries (sp. ft. per pig)
[Instructions: 1 sq. ft. = .09 sq. m]
_____
Enter "N/A" if no nurseries on site

**N**

30. Stocking density at placement in wean-to-finish facilities (sq. ft. per pig). If overstocking, enter target stocking density once overstocked pigs are removed
[Instructions: 1 sq. ft. = .09 sq. m]
_____
Enter "N/A" if no wean-to-finish facilities on site

**W**

31. Stocking density at placement in finisher (sq. ft. per pig)
[Instructions: 1 sq. ft. = .09 sq. m]
_____
Enter "N/A" if no finisher on site

**F**

32. Typical overstocking of wean-to-finish facilities at initial placement
a. Always

b. Frequently
c. Sometimes
d. Never
e. Not applicable (select if no wean-to-finish on site or if overstocking is not done)

**W**

33. Typical duration of time wean-to-finish facilities are overstocked (weeks)

_____

Enter "N/A" if no wean-to-finish on site or if overstocking is not done

**W**

34. Typical percentage of overstocking of wean-to-finish facilities at initial placement (enter as a % over target number of pigs once overstocked pigs are removed)

[Instructions: For example, if no overstocking was done, the answer would be 0. If you overstocked twice the target, the answer would be 100. Enter percentage as whole number. For example, 100% would be entered as 100.]

_____

Enter "N/A" if no wean-to-finish on site or if overstocking is not done

**W**

35. Movement of slow growing pigs from on AIAO group to another at this site prior to removal of their cohort group (rolling)

a. Frequently done
b. Occasionally done
c. Never, strict AIAO is practiced
d. Not applicable (select if continuous flow)

**N W F**

36. Flow of pigs in nursery

a. Continuous flow
b. All-in-all-out by room
c. All-in-all-out by barn
d. All-in-all-out by site
e. Not applicable (select if no nurseries on site)

**N**

37. Flow of pigs in finisher

a. Continuous flow
b. All-in-all-out by room
c. All-in-all-out by barn
d. All-in-all-out by site
e. Not applicable (select if no finishers on site)

**F**

38. Flow of pigs in wean-to-finish

a. Continuous flow
b. All-in-all-out by room
c. All-in-all-out by barn
d. All-in-all-out by site
e. Not applicable (select if no wean-to-finish on site)

**W**

39. Downtime required between AIAO groups
    a. No requirement
    b. Downtime is required between AIAO groups, compliance is less than 95%
    c. Downtime is required between AIAO groups, compliance is greater than or equal to 95%
    d. Not applicable (select if facilities are continuous flow)

**N W F**

40. Typical downtime required after facilities are washed and/or disinfected before next AIAO group is loaded (hours)

    _____
    Enter "N/A" if continuous flow or no downtime required between AIAO groups

**N W F**

*Internal Risks GF-> Circulation Risks GF-> Management -> Facility Condition*

41. Winter temperature control in nursery phase
    a. Temperature often fluctuates more than 10% above or below target
    b. Temperature occasionally fluctuates more than 10% above or below target
    c. Temperature almost never fluctuates more than 10% above or below target
    d. Not applicable (select if no nurseries or wean-to-finish on site)

**N W**

42. Winter air quality in nursery phase
    a. Humidity often excessive as indicated by condensation on pipes and walls
    b. Humidity occasionally excessive as indicated by condensation on pipes and walls
    c. Humidity almost never excessive as indicated by condensation on pipes and walls
    d. Not applicable (select if no nurseries or wean-to-finish on site)

**N W**

*Internal Risks GF-> Internal Co-factors GF-> Other Disease Challenges-> Presence of Other Pathogens and Exposure to Toxins*

43. Mycoplasma hyopneumoniae status of pigs being placed into nursery or wean-to-finishers
    a. Positive
    b. Unknown
    c. Negative

**N W F**

44. Typical occurrence of problems with PCVAD at this site in last two years
    a. Occurs in 8-10 out of 10 groups (greater than 80%)
    b. Occurs in 5-7 out of 10 groups (50-79%)
    c. Occurs in 2-4 out of 10 groups (20-49%)
    d. Occurs in 0-1 out of 10 groups (0-19%)

**N W F**

45. Typical occurrence of problems with swine influenza virus at this site in last two years
    a. Occurs in 8-10 out of 10 groups (greater than 80%)
    b. Occurs in 5-7 out of 10 groups (50-79%)
    c. Occurs in 2-4 out of 10 groups (20-49%)

d. Occurs in 0-1 out of 10 groups (0-19%)

**N W F**

*Internal Risks GF-> Immune Management GF-> Managed Exposure-> Modified live PRRSV vaccine use at this site*

46. Pigs are vaccinated with commercial modified live PRRSV vaccine
    a. Not vaccinated with commercial modified live PRRSV vaccine
    b. Last does in finisher
    c. Last dose in late nursery (6-8 weeks post weaning)
    d. Last dose in mid nursery (3-5 weeks post weaning)
    e. Last dose in early nursery (less than 3 weeks post weaning)
    f. Last dose prewean or at weaning

**N W F**

47. Number of doses of commercial modified live PRRSV vaccine used per pig
    [Instructions: Enter number of times that you administer the vaccine. For example, if you administer 50% of the recommended vaccine two different times, you would enter 2]
    _____
    Enter "N/A" if no commercial modified live PRRSV vaccine used

**N W F**

48. Percentage of labeled dose used for commercial modified live PRRSV vaccine
    a. Less than 25%
    b. 26% - 50%
    c. 51% - 75%
    d. Less than a full dose but more than 76%
    e. Full dose or more
    f. Not applicable (select if no commercial modified live PRRSV vaccine used)

**N W F**

*Internal Risks GF-> Immune Management GF-> Managed Exposure-> Other Vaccine Use at this Time*

49. Commercial or autogenous Mycoplasma hyopneumoniae vaccine used (at any time from birth to market)
    a. Not vaccinated with commercial or autogenous Mycoplasma hyopneumoniae vaccine
    b. Last dose in finisher
    c. Last dose in late nursery (6-8 weeks post weaning)
    d. Last dose in mid nursery (3-5 weeks post weaning)
    e. Last dose in early nursery (less than 3 weeks post weaning)
    f. Last dose prewean or at weaning

**N W F**

50. PCV2 vaccine used on pigs (at any time from birth to market)
    a. Not vaccinated with commercial or autogenous Mycoplasma hyopneumoniae vaccine
    b. Last dose in finisher
    c. Last dose in late nursery (6-8 weeks post weaning)
    d. Last dose in mid nursery (3-5 weeks post weaning)
    e. Last dose in early nursery (less than 3 weeks post weaning)
    f. Last dose prewean or at weaning

**N W F**

**External Risks GF**

*External Risks GF-> Pig Related GF-> Live Animals-> Source of Pigs*

1. Source(s) of pigs

a. Some or all purchased from auctions or other markets where pigs are gathered for sale

b. Some or all purchased or contracted directly from other production system(s)

c. All from other sites within the same production system, non from outside the same production system

d. All from a single site within production system

**N W F**

2. Number of breeding herd from which pigs are sourced at this site

[Instructions: Enter 1 for single source sites and 0 for closed sites]

_____

**N W F**

3. PRRS virus status of breeding herd(s) from which pigs at this site are sourced

a. One or more sources positive unstable

b. One or more sources with unknown status, none positive unstable

c. One or more sources are positive stable, none positive unstable or unknown status

d. One or more sources are provisional negative or negative, none positive stable, positive unstable or unknown status

e. All sources are negative

**N W F**

Herd Classification

I: Positive Unstable

Herds that do not meet the criteria for any of the other categories (II through IV) are category I by default.

II: Positive Stable

Starts after a 90 day period of sustained lack of viremia in weaning age pigs and no clinical signs of PRRS in the breeding herd.

III: "Provisional Negative"

Starts 60 days after "negative breeding replacements" are first introduced during a herd rollover with diagnostic evidence that they remain uninfected.

IV: Negative

All breeding animals in the herd are seronegative by ELISA.

4. Testing of piglets leaving breeding herd(s) from which pigs at this site are sourced for PRRSV antigen by PCR or serum

a. Never

b. Less than 25% of groups or only in response to clinical outbreaks

c. 25% to 75% of groups tested

d. More than 75%, but not all groups tested

e. Every group tested

**N W F**

5. Testing of pigs in nursery phase for PRRSV antigen by PCR or serum

a. Never

b. Less than 25% of groups or only in response to clinical outbreaks
c. 25% to 75% of groups tested
d. More than 75%, but not all groups tested
e. Every group tested

**W F**

6. When pigs are comingled from multiple breeding herd sources do the pigs have the same PRRSV status
a. Unknown, not consistently confirmed with diagnostics
b. Never same status, consistently confirmed with diagnostics
c. Sometimes same status, consistently confirmed with diagnostics
d. Always same status, consistently confirmed with diagnostics
e. Not applicable (select if pigs at this site are never comingled from multiple breeding herd sources)

**N W F**

*External Risks GF-> Non-pig Related GF-> Operations -> Transportation of Live Animals*

7. Flow restrictions on vehicles/trailers used to transport incoming pigs (i.e. from breeding herd or nursery facilities)
a. Unknown
b. No restrictions, the same vehicle/trailer may haul PRRSV positive and negative animals
c. The same vehicle/trailer can haul PRRSV positive and negative animals but a downtime is required before visits to negative sites following last visit to positive site
d. The same vehicle/trailer never hauls both PRRSV positive and negative animals
e. Truck(s) are dedicated to this site or the breeding herd(s) from which pigs are sourced and do not haul animals from other sites
f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

For this section of questions, INCOMING pigs refer to pigs coming from a breeding herd or nursery.
-For a nursery or wean-to-finish facility, this section would generally apply to pigs coming from a breeding herd.
-For a finisher, this section would generally apply to pigs coming from a nursery or an overstocked wean- to-finish facility

8. Transit and route restrictions on vehicles/trailers used to transport incoming pigs
a. Unknown
b. No route restrictions and no restrictions on when and where vehicles may stop
c. No route restrictions, but there are restrictions on when and/or where vehicles may stop
d. Routes are outlines proactively to avoid roads with swine and swine-related sites along the route, but no restriction on when and where vehicles may stop
e. Routes are outlines proactively to avoid roads with swine and swine-related sites along the routes, and there are restrictions on when and/or where vehicles may stop
f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

9. Use restrictions on vehicles/trailers used to transport incoming pigs
a. Unknown
b. Vehicles/trailers used to transport incoming pigs may transport other types of swine (e.g. market animals, culls, or genetic animals)

c. Vehicles/trailers used to transport incoming pigs may NOT transport other types of swine (e.g. market animals, culls, or genetic animals)

d. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages of production)

10. In coldest months, what is the washing frequency of vehicles/trailers used to transport incoming pigs

a. Unknown

b. Never or rarely

c. All truck washed at least once per 20 loads

d. All trucks washed at least once per 10 loads

e. All trucks washed between every load

f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages or production)

11. In the warmest months, what is the washing frequency of vehicles/trailers used to transport incoming pigs

a. Unknown

b. Never or rarely

c. All truck washed at least once per 20 loads

d. All trucks washed at least once per 10 loads

e. All trucks washed between every load

f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages or production)

12. Pre-rinse with water to flush away loose organic material prior to wash of vehicles/trailers used to transport incoming pigs

a. Unknown

b. Yes, recycled water used

c. No, pre-rinse not done

d. Yes, fresh water used

e. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages of production)

13. If washed, what disinfectant is used on vehicles/trailers that transport incoming pigs

a. Unknown

b. No disinfectant used

c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used

d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used

e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used

f. Not applicable (select if facilities are never washed)

14. In coldest months, what is the drying time of vehicles/trailers used to transport incoming pigs

a. Unknown

b. No requirements – vehicles/trailers not allowed to dry completely before next load

c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%

d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%

e. Assisted drying technology is used to dry washed vehicles/trailers

f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages of production)

15. In the warmest months, what is the drying time of vehicles/trailers used to transport incoming pigs

a. Unknown

b. No requirements – vehicles/trailers not allowed to dry completely before next load

c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%

d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%

e. Assisted drying technology is used to dry washed vehicles/trailers

f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish AND pigs are not hauled between stages of production)

16. Restrictions on movement of drivers of vehicles used to transport incoming pigs

a. Unknown

b. No restrictions

c. Not allowed to enter buildings

d. Not allowed to cross a perimeter fence or some other defined limit

e. Not allowed to leave cab of vehicle

f. Not applicable (select if loadout is an unattached animal transfer station located away from the swine buildings or if site is farrow-to-feeder or farrow-to-finish)

17. Cleaning inside of cab in coldest months when vehicles/trailers used to transport incoming pigs are washed

a. Unknown

b. No requirements

c. Swept but not washed between sites

d. Washed between sites

e. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

18. Cleaning inside of cab in warmest months when vehicles/trailers used to transport incoming pigs are washed

a. Unknown

b. No requirements

c. Swept but not washed between sites

d. Washed between sites

e. Not applicable (select if sites is farrow-to-feeder or farrow-to-finish)

19. Disinfectant used on inside of cab between sites for vehicles/trailers used to transport incoming pigs

a. Unknown

b. No disinfectant used

c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used

d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used
f. Not applicable (select if facilities are never washed)

20. Boot and clothing restrictions between sites on drivers of vehicles/trailers used to transport incoming pigs

a. Unknown
b. No requirements
c. Required to change clothing but not boots or boot covers between sites
d. Required to change boots or boot covers but not clothing between sites
e. Required to change clothing and boots or boot covers between sites
f. Required to shower with change of clothing and boots between sites
g. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

21. Ownership of truck wash(es) where vehicles/trailers used to transport incoming pigs are washed

a. Unknown
b. One or more but not all are not owned and not dedicated to production system
c. One or more but not all are owned by, but not dedicated to production system
d. One or more are not owned by but dedicated to production system
e. All are owned by and dedicated to production system
f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

22. Are the truck and trailer cleaning procedures formally audited (QA inspection) for vehicles/trailers used to transport incoming pigs

a. Unknown
b. No
c. Yes, audited by personnel affiliated with the truck wash
d. Yes, audited by personnel with production system but not directly affiliated with the truck wash
e. Yes, audited by independent party not associated with production system
f. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

23. Documented trailer ID of vehicles/trailers used to transport incoming pigs

a. Unknown
b. No requirements (i.e. no ID or not tracked)
c. Individual trailers have a unique ID, but are not tracked
d. Individual trailers have a unique ID and are tracked
e. Not applicable (select if site is farrow-to-feeder or farrow-to-finish)

24. Average annual frequency of visits to site by vehicles/trailers used to transport incoming pigs (trips/year)

_____

Select "N/A" if site is farrow-to-feeder or farrow-to-finish

25. Flow restrictions on vehicles/trailers used to transport exiting pigs less than standard weight

a. Unknown
b. No restrictions, the same vehicle/trailer may haul PRRSV positive and negative animals
c. The same vehicle/trailer can haul PRRSV positive and negative animals but a downtime is required before visits to negative sites following last visit to positive site
d. The same vehicle/trailer never hauls both PRRSV positive and negative animals

e. Truck(s) are dedicated to this site or the breeding herd(s) from which pigs are sourced and do not haul animals from other sites
f. Not applicable (select if no pigs less than standard weight exit this site)

For this section of questions, EXITING PIGS LESS THAN STANDARD WEIGHT refers to overstocked pigs, culls, genetic animals, or roaster pigs.
There may be scenarios where pigs are not moved out prior to closeout (i.e. nursery facilities) – please mark "Not applicable" in these cases.

For standard market weight pigs in finishers or wean-to-finish facilities: this section does NOT refer to first cut, but rather any pigs that are removed PRIOR to standard market weight

26. Transit and route restrictions on vehicles/trailers used to transport exiting pigs less than standard weight
a. Unknown
b. No route restrictions and no restrictions on when and where vehicles may stop
c. No route restrictions, but there are restrictions on when and/or where vehicles may stop
d. Routes are outlined proactively to avoid roads with swine and swine-related sites along the route, but no restrictions on when and where vehicles may stop
e. Routes are outlines proactively to avoid roads with swine and swine-related sites along the route, and there are restrictions on when and/or where vehicles may stop
f. Not applicable (select if no pigs less than standard weight exit this site)

27. Use restrictions on vehicles/trailers used to transport exiting pigs less than standard market weight
a. Unknown
b. Vehicles/trailers used to transport exiting pigs less than standard market weight may transport other types of swine (e.g. market animals or genetic animals)
c. Vehicles/trailers used to transport exiting pigs less than standard market weight may NOT transport other types of swine (e.g. market animals or genetic animals)
d. Not applicable (select if no pigs less than standard weight exit this site)

28. In the coldest months, what is the washing frequency of vehicles/trailers used to transport exiting pigs less than standard market weight
a. Unknown
b. Never or rarely
c. All trucks washed at least once per 20 loads
d. All trucks washed at least once per 10 loads
e. All trucks washed between every load
f. Not applicable (select if no pigs less than standard weight exit this site)

29. In warmest months, what is the washing frequency of vehicles/trailers used to transport exiting pigs less than standard market weight
a. Unknown
b. Never or rarely
c. All trucks washed at least once per 20 loads
d. All trucks washed at least once per 10 loads
e. All trucks washed between every load
f. Not applicable (select if no pigs less than standard weight exit this site)

30. Pre-rinse with water to flush away loose organic material prior to wash of vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. Yes, recycled water used
c. No, pre-rinse not done
d. Yes, fresh water used
e. Not applicable (select if no pigs less than standard weight exit this site)

31. If washed, what disinfectant is used on vehicles/trailers that transport exiting pigs less than standard market weight

a. Unknown
b. No disinfectant used
c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used
f. Not applicable (select if no pigs less than standard weight exit this site)

32. In the coldest months, what is the drying time of vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. No requirements – vehicles/trailers not allowed to dry completely before next load
c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%
d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%
e. Assisted drying technology is used to dry washed vehicles/trailers
f. Not applicable (select if not pigs less than standard weight exit this site)

33. In warmest months, what is the drying time of vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. No requirements – vehicles/trailers not allowed to dry completely before next load
c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%
d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%
e. Assisted drying technology is used to dry washed vehicles/trailers
f. Not applicable (select if not pigs less than standard weight exit this site)

34. Restrictions on movement of drivers of vehicles used to transport exiting pigs less than standard market weight

a. Unknown
b. No restrictions
c. Not allowed to enter building
d. Not allowed to cross a perimeter fence or some other defined limit
e. Not allowed to leave cab of vehicle
f. Not applicable (select if loadout is an unattached animal transfer station located away from the swine buildings OR no pigs less than standard weight exit this site)

35. Cleaning inside of cab in coldest months when vehicles/trailers used to transport exiting pigs less than standard weight are washed

a. Unknown
b. No requirements
c. Swept but not washed between sites
d. Washed between sites
e. Not applicable (select if no pigs less than standard weight exit this site)

36. Cleaning inside of cab in warmest months when vehicles/trailers used to transport exiting pigs less than standard market weight are washed

a. Unknown
b. No requirements
c. Swept but not washed between sites
d. Washed between sites
e. Not applicable (select if no pigs less than standard weight exit this site)

37. Disinfectant used on inside of cab between sites for vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. No disinfectant used
c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used
f. Not applicable (select if no pigs less than standard weight exit this site)

38. Boot and clothing restrictions between sites on drivers of vehicles/trailers used to transport exiting pigs less than standard market weight

a. No requirements or unknown
b. Required to change clothing but not boots or boot covers between sites
c. Required to change boots or boot covers but not clothing between sites
d. Required to change clothing and boots or boot covers between sites
e. Required to shower with change of clothing and boots between sites
g. Not applicable (select if no pigs less than standard weight exit this site)

39. Ownership of truck wash(es) where vehicles/trailers used to transport exiting pigs less than standard market weight are washed

a. Unknown
b. One or more but not all are not owned and not dedicated to production system
c. One or more but not all are owned by but not dedicated to production system
d. One or more are not owned by but dedicated to production system
e. All are owned by and dedicated to production system
f. Not applicable (select if no pigs less than standard weight exit this site)

40. Are the truck and trailer cleaning procedures formally audited (QA inspection) for vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. No
c. Yes, audited by personnel affiliated with the truck wash
d. Yes, audited by personnel with production system but no directly affiliated with the truck wash
e. Yes, audited by independent party not associated with production system
f. Not applicable (select if no pigs less than standard weight exit this site)

41. Documented trailer ID of vehicles/trailers used to transport exiting pigs less than standard market weight

a. Unknown
b. No requirements (i.e. no ID or not tracked)
c. Individual trailers have a unique ID, but are not tracked
d. Individual trailers have a unique ID and are tracked
e. Not applicable (select if no pigs less than standard weight exit this site)

42. Average annual frequency of visits to site by vehicles used to transport exiting pigs less than standard market weight (trips/year)

_____

Enter "N/A" if no pigs less than standard weight exit this site. Examples include overstocked pigs, culls, or roaster pigs

43. Flow restrictions on vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No restrictions, the same vehicle/trailer may haul PRRSV positive and negative animals
c. The same vehicle/trailer can haul PRRSV positive and negative animals but a downtime is required before visits to negative sites following last visit to positive site
d. The same vehicle/trailer never hauls both PRRSV positive and negative animals
e. Truck(s) are dedicated to this site and do not haul animals from other sites

For this section of questions, EXITING STANDARD WEIGHT PIGS refer to pigs removed during closeout and/or market loads

-For nursing facilities, this section would apply to animals being removed at closeout of nursery

-For standard market weight pigs in the finisher or wean-to-finish facilities: this section includes first cut pigs as well as the final closeout. IF THE RESPONSES FOR ANY QUESTION DIFFERS BETWEEN FIRST AND FINAL CUTS, ANSWER FOR FIRST CUT.

44. Transit and route restrictions on vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No route restrictions and no restrictions on when and where vehicles may stop
c. No route restrictions, but there are restrictions on when and/or where vehicles may stop
d. Routes are outlined proactively to avoid roads with swine and swine-related sites along the route, but no restrictions on when and where vehicles may stop
e. Routes are outlined proactively to avoid roads with swine and swine-related sites along the route, and there are restrictions on when and/or where vehicles may stop

45. Use restrictions on vehicles/trailers used to transport exiting standard weight pigs
a. Unknown
b. Vehicles/trailers used to transport exiting pigs may transport other types of swine (e.g. culls or genetic animals)
c. Vehicles/trailers used to transport exiting pigs may NOT transport other types of swine (e.g. culls or genetic animals)

46. In coldest months, what is the washing frequency of vehicles/trailers used to transport exiting standard weight pigs
a. Unknown
b. Never or rarely
c. All trucks washed at least once per 20 loads
d. All trucks washed at least once per 10 loads
e. All trucks washed between every load

47. In the warmest months, what is the washing frequency of vehicles/trailers used to transport exiting standard weight pigs
a. Unknown
b. Never or rarely
c. All trucks washed at least once per 20 loads
d. All trucks washed at least once per 10 loads
e. All trucks washed between every load

48. Pre-rinse with water to flush away loose organic material prior to wash of vehicles/trailers used to transport exiting standard weight pigs
a. Unknown
b. Yes, recycled water used
c. No, pre-rinse not done
d. Yes, fresh water used

49. If washed, what disinfectant is used on vehicles/trailers that transport exiting standard weight pigs
a. Unknown
b. No disinfectant used
c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used

50. In coldest months, what is the drying time of vehicles/trailers used to transport exiting standard weight pigs
a. Unknown
b. No requirements – vehicles/trailers not allowed to dry completely before next load
c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%
d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%
e. Assisted drying technology is used to dry washed vehicles/trailers

51. In the warmest months, what is the drying time of vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No requirements – vehicles/trailers not allowed to dry completely before next load
c. Vehicles/trailers allowed to dry completely before next load, but compliance is less than 95%
d. Vehicles/trailers allowed to dry completely before next load, and compliance is greater than or equal to 95%
e. Assisted drying technology is used to dry washed vehicles/trailers

52. Restrictions on movement of drivers of vehicles used to transport exiting standard weight pigs

a. Unknown
b. No restrictions
c. Not allowed to enter buildings
d. Not allowed to cross a perimeter fence or some other defined limit
e. Not allowed to leave cab of vehicle
f. Not applicable (select if loadout is an unattached animal transfer station located away from the swine buildings)

53. Cleaning inside of cab in coldest months when vehicles/trailers used to transport exiting standard weight pigs are washed

a. Unknown
b. No requirements
c. Swept but not washed between sites
d. Washed between sites

54. Disinfectant used on inside of cab between sites for vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No disinfectant used
c. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
d. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
e. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used

55. Boot and clothing restrictions between sites on drivers of vehicles/trailers used to transport exiting standard weight pig

a. Unknown
b. No requirements
c. Required to change clothing but not boots or boot covers between sites
d. Required to change boots or boot covers but not clothing between sites
e. Required to change clothing and boots or boot covers between sites

56. Ownership of truck wash(es) where vehicles/trailers used to transport exiting standard weight pigs are washed

a. Unknown
b. One or more but not all not owned and not dedicated to production system
c. One or more but not all, owned by but not dedicated to production system
d. One or more not owned by but dedicated to production system
e. All are owned by and dedicated to production system

57. Are the truck and trailer cleaning procedures audited (QA inspection) for vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No
c. Yes, audited by personnel affiliated with the truck wash
d. Yes, audited by personnel with production system but not directly affiliated with the truck wash
e. Yes, audited by independent party not associated with production system

58. Documented trailer ID of vehicles/trailers used to transport exiting standard weight pigs

a. Unknown
b. No requirements (i.e. no ID or not tracked)
c. Individual trailers have a unique ID, but are not tracked
d. Individual trailers have a unique ID and are tracked

59. Average yearly frequency of visits to site by vehicles used to transport exiting standard weight pigs (trips/year)

_____

*External Risks GF-> Non Pig Related GF-> Operations-> Transportation of Feed*

60. Flow of feed trucks

a. No restrictions, the same truck may deliver feed to PRRSV positive and negative sites
b. The same truck can deliver feed to PRRSV positive and negative sites but a minimum downtime is required before deliveries to negative sites following last delivery to positive site
c. The same truck never delivers feed to PRRSV positive and negative sites
d. Feed truck is dedicated to this site

61. Restrictions on movement of feed truck drivers (for bag and/or bulk feed)

a. No restrictions
b. Not allowed to enter buildings
c. Not allowed to cross a perimeter fence or some other defined limit
d. Not allowed to leave cab of vehicle
e. Not applicable (select if feed truck is dedicated to this site)

62. Boot and clothing restrictions on feed truck drivers between sites

a. No requirements
b. Required to change clothing but not boots or boot covers between sites
c. Required to change boots or boot covers but not clothing between sites
d. Required to change clothing and boots or boot covers between sites
e. Not applicable (select if feed truck is dedicated to this site)

63. Does the feed mill have biosecurity protocols in place

a. No
b. Yes (e.g. not allowing pigs to be weighed on scale, separation of incoming dump and load out facilities, bird and rodent control program)

*External Risks GF-> Non-Pig Related-> Operations-> Employee and Service Vehicles*

64. Approximate frequency of service, visitor and delivery vehicle visits per month to this site

[Instructions: Exclude primary pig care employee and live animal transport vehicles/trucks. This DOES include feed truck, propane, maintenance, production service personnel, visitors, supply delivery, consultant, and veterinarian vehicles]

_____

*External Risks GF-> Non-Pig Related-> Operations-> Disposal of Dead Animals*

65. Dead animals disposed of on-site (i.e. buried, composted or incinerated)
    a. No
    b. Yes

66. Dead animals are moved to disposal site using equipment dedicated to this site
    a. No
    b. Yes

67. Frequency with which dead animals are picked up for off-site disposal
    a. Daily
    b. Pickup every 2-6 days
    c. Pickup every 7-13 days
    d. Pickup every 14-20 days
    e. Less frequently than 20 days
    f. Not applicable (select if dead animals are disposed of on-site and never stored prior to disposal)

68. Type of storage for dead animals awaiting pickup or disposal
    a. Left on ground, no enclosure
    b. Left on ground in area with perimeter fence
    c. Open container
    d. Covered container or shed
    e. Covered container or shed with perimeter fence
    f. Not applicable (select if dead animals are disposed of on-site and never stored prior to disposal)

69. Management of trucks that pick up dead animals for off-site disposal
    a. Truck managed by third party
    b. Trucks managed by production system
    c. Not applicable (select if dead animals are disposed of on-site)

70. Design of dead animal disposal site
    a. Equipment used to remove dead pigs from site to disposal site does cross paths with rendering vehicles
    b. Equipment used to remove dead pigs from site to disposal site does not cross paths with rendering vehicles
    c. Not applicable (select if dead animals are disposed of on-site)

71. Location of pick up site for dead animals disposed of off-site
    a. At this site or less than on-half mile away
    b. At a dedicated site between one-half mile (0.8 km) and a mile (1.6 km) from this site
    c. At a dedicated site more than one mile (1.6 km) from this site
    d. Not applicable (select if dead animals are disposed of on-site)

*External Risks GF-> Non-Pig Related GF-> Operations-> Manure Management*

72. Management of manure removal
    a. Outsourced to third party that provides service non-exclusively to production system or contract producer
    b. Outsourced to third party that provides service non-exclusively to production system or contract producer but equipment near facilities is managed by production system or contract producer
    c. Outsourced to third party that provides service exclusively to production system or contract producer

d. Outsourced to third party that provides service exclusively to production system or contract producer but equipment near facilities is managed by production system or contract producer
e. All manure removal equipment is managed by production system or contract producer

73. Manure removal equipment and/or vehicle allowed to enter the farm
a. No requirements
b. Not allowed to cross a designated 'line' that is less than 20 yards (18.3 m) from the buildings
c. Not allowed to cross a designated 'line' 20 to 50 yards (18.3 to 45.7 m) from the buildings
d. Not allowed to cross a designated 'line' more than 50 yards (45.7 m) from the buildings
e. Not applicable (select if equipment and/or vehicle is not shared between sites)

74. Flow of manure removal equipment
a. No restrictions, all of the equipment used at this site may be used at other sites
b. All of the equipment used at this site may be used at other sites but with minimum downtime and sanitation requirements
c. Equipment near facilities is dedicated to this site, no restrictions on all other equipment used at this site, may be used at other sites
d. Equipment near facilities is dedicated to this site, other equipment used at this site may be used at other sites but with minimum downtime and sanitation requirements
e. All equipment is dedicated to this site

75. Washing requirements of manure removal equipment that is moved between sites
a. No requirements
b. Washed and flushed between every site, less than 95% compliance
c. Washed and flushed between every site, greater than or equal to 95% compliance
d. Not applicable (select if all equipment is dedicated to this site)

76. Disinfectant use on manure removal equipment and/or vehicles used to haul manure that is moved between sites
a. No disinfectant used
b. Phenol-based compound (BioPhene, Environ, Tek-Trol, Laro, Lysol) or aldehydes (DC&R, Cidex, Formaldegen) used
c. Hypochlorite (Clorox, Halazone, Chloramine-T), quaternary ammonium (Roccal, Germex, Zephiran, Hi-Lethol, BioSentry) or iodine (Wescodyne, Premise, Iofec, Iosdyn, Losan) used
d. Peroxygen (Virkon) or quaternary ammonium combinations (Synergize, Aseptol) used
e. Not applicable (select if all equipment is dedicated to this site)

77. Drying time requirements following wash of manure removal equipment that is moved between sites
a. No requirements
b. Allowed to dry completely, less than 95% compliance
c. Allowed to dry completely, greater than or equal to 95% compliance
d. Not applicable (select if all equipment is dedicated to this site)

78. Boot and clothing restrictions between sites on manure removal personnel
a. No requirements
b. Required to change clothing but not boots between sites
c. Required to change boots but not clothing between sites
d. Required to change clothing and boots between sites
e. Required to shower with change of clothing and boots between sites
f. Manure removal is done by on-site employees, not involved in manure removal at any other pig sites

*External Risks GF-> Non-Pig Related GF-> Operations-> Employees and Visitors*

79. Approximate frequency of visits per month by maintenance service personnel to this site

_____

This section of questions refers to maintenance personnel. This includes personnel that enter the site to conduct work such as welders, electricians, etc.

80. Sanitation procedure for maintenance service personnel entering site
    a. Unrestricted entry
    b. Coverall and/or boot change only
    c. Boot wash/disinfection prior to entry
    d. Coverall and boot change, hands are washed prior to entry of pig facilities on site without a demarcation line (i.e. Danish system/without bench or other demarcation)
    e. Coverall and boot change, hands are washed prior to entry of pigs facilities on site with a demarcation line (i.e. Danish system/with bench or other demarcation)
    f. Shower in with boot and clothes changed prior to entry of pig facilities on site

81. Downtime requirements for maintenance service personnel depend upon circumstances
    a. Same downtime requirements regardless of health status, location, ownership, management or type of production of other pig sites visited previously
    b. Downtime requirements differ depending upon health status, location, ownership, management, or type of production of other pig sites visited previously

82. Downtime (hours) required of maintenance service personnel, if requirement is dependent upon circumstances enter shortest time interval

[Instructions: Enter 0 if downtime is not required]

_____

83. Approximate frequency of visits per month by non-maintenance service personnel to this site

_____

This section of questions refer to non-maintenance personnel. This includes personnel and visitors that enter the site to conduct work or observe such as veterinarians, consultants, production service personnel, etc.

84. Sanitation procedure for non-maintenance service personnel and visitors entering site
    a. Unrestricted entry
    b. Coverall and/or boot change only
    c. Boot wash/disinfection prior to entry
    d. Coverall and boot change, hands are washed prior to entry of pig facilities on site without a demarcation line (i.e. Danish system/without bench or other demarcation)
    e. Coverall and boot change, hands are washed prior to entry of pig facilities on site with a demarcation line (i.e. Danish system/with bench or other demarcation)
    f. Shower in with boot and clothes changed prior to entry of pig facilities on site

85. Downtime requirement for non-maintenance service personnel and visitors depend upon circumstances
    a. Same downtime requirements regardless of health status, location, ownership, management or type of production of other pig site visited previously
    b. Downtime requirements differ depending upon health status, location, ownership, management or type of production of other pig sites visited previously

86. Downtime (hours) required of non-maintenance service personnel and visitors, if requirement is dependent upon circumstances enter shortest time intervals

[Instructions: Enter 0 if downtime is not required]

_____

87. Approximate frequency of visits per month by delivery personnel to this site

_____

This section of questions refers to delivery personnel. This includes personnel that deliver supplies such as feed, postal, fuel, etc.; exclude live animal vehicle drivers.

88. Downtime requirements for delivery personnel depend upon circumstances

a. Same downtime requirements regardless of health status, location, ownership, management or type of production of other pig sites visited previously

b. Downtime requirements differ depending upon health status, location, ownership, management or type of production of other pig sites visited previously

89. Sanitation procedure for on-site employees entering site

a. Unrestricted entry

b. Coverall and/or boot change only

c. Boot wash/disinfection prior to entry

d. Coverall and boot change, hands are washed prior to entry of pig facilities on site without a demarcation line (i.e. Danish system/without bench or other demarcation)

e. Coverall and boot change, hands are washed prior to entry of pig facilities on site with a demarcation line (i.e. Danish system/with bench or other demarcation)

f. Shower in with boot and clothes changed prior to entry of pig facilities on site

90. Downtime requirements for on-site employees after visiting other pig sites depend upon circumstances

a. Same downtime requirements regardless of health status, location, ownership, management, or type of production of other pig sites visited previously

b. Downtime requirements differ depending upon health status, location, ownership, management or type of production of other pig sites visited previously

91. Downtime (hours) required of on-site employees after visiting other pig sites, if requirement is dependent upon circumstances enter shortest time interval

[Instructions: Enter 0 if downtime is not required]

_____

92. Average annual turnover of on-site employees at site for last two years

[Instructions: Enter percentages as a decimal value. For example, 49% would be entered as 0.49]

93. Written biosecurity protocols

a. Written protocols and communications to on-site employees are never provided in all language(s) spoken as first language by employees or not provided

b. Written protocols and communications to on-site employees are sometimes provided in all language(s) spoken as first language by employees

c. Written protocols and communications to on-site employees are always provided in all language(s) spoken as first language by employees

94. New employees receive formal training on biosecurity procedures
    a. No
    b. Yes

95. All employees periodically receive formal retraining on biosecurity procedures
    a. No
    b. Yes

96. Employee compliance with biosecurity procedures is periodically audited
    a. No
    b. Yes, less frequently than annually by production system or other entity with common ownership or management
    c. Yes, less frequently than annually by independent party not associated with site
    d. Yes, more frequently than annually by production system or other entity with common ownership or management
    e. Yes, more frequently than annually by independent party not associated with site

97. Restrictions on on-site employees after visiting other pig sites
    a. No restrictions (can visit pig sites within or outside the production system)
    b. Only allowed to visit other pig sites within the production system. Order of sites visited is not restricted
    c. Only allowed to visit other pig sites within the production system. Order of sites visited always based on health status at placement
    d. Only allowed to visit other pig sites within the production system. Order of sites visited always based on known current status
    e. Not allowed to visit other pig sites

98. Sanitation requirements on employees, service personnel, delivery personnel, and visitors moving inside and outside the facilities (such as when hauling out deads, checking bins, water meters, generators, etc.)
    a. No requirements
    b. Use of boot baths required
    c. Change of boots required
    d. Coverall and boot change, hands are washed prior to entry of pig facilities on site without a demarcation line (i.e. Danish system/without bench or other demarcation)
    e. Coverall and boot change, hands are washed prior to entry of pig facilities on site with a demarcation line (i.e. Danish system/with bench or other demarcation)
    f. Shower with change of boots and clothing required

99. Entry of pork meat products by employees, visitors, service and delivery personnel
    a. No restrictions on entry of pork meat products
    b. Not allowed to enter uncooked fresh pork products, but can enter cooked fresh or processed pork
    c. Not allowed to enter uncooked or cooked fresh pork products, but can enter processed pork
    d. No pork meat products allowed

*External Risks GF-> Non-Pig Related GF-> Operations-> Entry of Supplies*

100. Storage and delivery of new supplies
    a. New supplies always delivered directly to site from external suppliers
    b. Supplies delivered from central warehouse and/or delivered directly to site from external suppliers
    c. New supplies usually delivered to site from central warehouse or storage managed by the production system, supplies are allowed to return to warehouse and/or delivery order not defined

d. New supplies always delivered to site from central warehouse or storage managed by the production system, supplies not allowed to return to warehouse and delivery order defined

101. Procedures for introducing new tools and supplies
    a. Direct introduction into the farm (no disinfection, no quarantine)
    b. Disinfection prior to introduction into the farm, but no quarantine
    c. Quarantine for 24 hours or more, but no disinfection
    d. Disinfection prior to introduction into the farm, and quarantine for 24 hours or more

102. Do you allow tools and/or supplies to be transferred between pig sites
    a. Yes
    b. No, but compliance is less than 95%
    c. No, and compliance is greater than or equal to 95%

103. Procedures for introducing transferred tools and supplies
    a. Direct introduction into the farm (no disinfection, no quarantine)
    b. Quarantine for 24 hours or more, but no disinfection
    c. Disinfection prior to introduction into the farm, but no quarantine
    d. Disinfection prior to introduction into the farm, and quarantine for 24 hours or more
    e. Not applicable (select if no tools and/or supplies are transferred between pig sites)

104. Are technology instruments (i.e. cell phone, laptops, camera, etc.) allowed inside the facilities at the site

    a. Yes
    b. Yes, restricted to office, but compliance is less than 95%
    c. Yes, restricted to office, and compliance is greater than or equal to 95%
    d. No, but compliance is less than 95%
    e. No, and compliance is greater than or equal to 95%

*External Risks GF-> Non-Pig Related GF-> Operations-> Facilities*

105. Finisher or wean-to-finish facility type
    a. Outside contact
    b. Total confinement
    c. Not applicable (select if no finisher or wean-to-finish on site)

106. Restrictions to entry of site
    a. None
    b. Signage only
    c. Perimeter fence with unlocked gate
    d. Perimeter fence with locked gate only at night
    e. Perimeter fence with locked gate at all times, compliance less than 95%
    f. Perimeter fence with locked gate at all times, compliance is greater than or equal to 95%

*External Risks GF-> Non-Pig Related GF-> Operations -> Biovectors*

107. Restriction of birds from buildings
    a. Birds are often present in facilities
    b. Birds are only occasionally seen inside facilities
    c. Barriers are sufficient to restrict entry of birds into facilities

*External Risks GF-> Non-Pig Related GF-> Location/Proximity-> Density of Pig Farms in the Area*

108. Pig density (swine sites) within a 1 mile radius of this site (1 mi = 1.6 km)
[Instructions: Enter number of sites within a 1 mile (1.6 km) radius]
_____

109. Pig density (swine sites) within a 1 to 3 mile (1.6 to 4.8 km) radius of this site
[Instructions: Enter number of sites within a 1 to 3 mile (1.6 to 4.8 km) radius]
_____

110. Pig density (swine sites) within a 3 to 5 mile (4.8 to 8.0 km) radius of this site
[Instructions: Enter number of sites within a 3 to 5 mile (4.8 to 8.0 km) radius]
_____

*External Risks GF-> Non-Pig Related GF-> Location/Proximity-> Neighboring Pig Farms*

111. Distance (miles) to nearest swine farm
[Instructions: If no known sites within 20 miles (32.2 km) enter 999]
_____

112. Number of finished pigs housed at nearest swine farm (if wean-to-finish facilities, count as finisher pigs)
[Instructions: Enter "N/A", "Unknown", or number of finishing pigs housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]
_____
Enter "N/A" if finisher pigs are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

113. Number of nursery pigs housed at nearest swine farm
[Instructions: Enter "N/A", "Unknown", or number of nursery pigs housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]
_____
Enter "N/A" if nursery pigs are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

114. Number of commercial breeding females housed at nearest swine farm
[Instructions: Enter "N/A", "Unknown", or number of commercial breeding females housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]
_____
Enter "N/A" if breeding animals are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

115. Number of genetic breeding females housed at nearest swine farm
[Instructions: Enter "N/A", "Unknown", or number of genetic breeding females housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]
_____
Enter "N/A" if breeding animals are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

116. Number of replacement breeding animals housed (for isolation or development) at nearest swine farm

[Instructions: Enter "N/A", "Unknown", or number of replacement breeding animals housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if breeding replacements are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

117. Number of replacement breeding animals housed (for acclimation to PRRSV) at nearest swine farm

[Instructions: Enter "N/A", "Unknown", or number of replacement breeding animals housed at nearest swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if breeding replacements are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

118. Number of boars (in boar studs only) housed at nearest swine farm

[Instructions: Enter "N/A", "Unknown", or number of boars housed at nearest swine farm]

_____

Enter "N/A" if boars (in boar studs only) are not housed at nearest swine site or if no known sites within 20 miles (32.2 km)

119. Distance (miles) to nearest PRRSV positive swine farm

[Instructions: If no known sites within 20 miles (32.2 km) enter 999]

_____

120. Status of nearest PRRS positive pig farm

a. Unknown
b. PRRSV positive, acute active clinical break within 3 months
c. PRRSV positive, post-acute active (clinical break more than 3 months but less than 6 months ago)
d. PRRSV positive but currently stable (no evidence of virus circulation)
e. Not applicable (select if no known sites within 20 miles (32.2 km))

121. Number of finishing pigs housed at nearest PRRSV positive swine farm (if wean-to-finish facilities, count as finisher pigs)

[Instructions: Enter "N/A", "Unknown", or number of finishing pigs housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if finisher pigs are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

122. Number of nursery pigs housed at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of nursery pigs housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if nursery pigs are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

123. Number of commercial breeding females housed at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of commercial breeding females housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if commercial breeding females are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

124. Number of genetic breeding females housed at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of genetic breeding females housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if breeding animals are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

125. Number of replacement breeding animals housed (for isolation or development) at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of replacement breeding animals housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if breeding replacements are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km) positive swine farm

126. Number of replacement breeding animals housed (for acclimation to PRRSV) at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of replacement breeding animals housed at nearest PRRSV positive swine farm. Enter number without commas (XXXX vs. X,XXX)]

_____

Enter "N/A" if breeding replacements are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

127. Number of boars (in boar studs only) housed at nearest PRRSV positive swine farm

[Instructions: Enter "N/A", "Unknown", or number of boars housed at nearest PRRSV positive swine farm]

_____

Enter "N/A" if boars (in boar studs only) are not housed at nearest PRRSV positive swine site or if no known sites within 20 miles (32.2 km)

128. Are there any exhibition pigs housed within a 5 mile radius (8.0 km) radius of the site

a. Unknown
b. Yes, and animals are sometimes brought in from exhibition (shows)
c. Yes, but they are only taken to the exhibition and not brought back (i.e. terminal fairs)
d. No

*External Risks GF-> Non-Pig Related GF-> Location/Proximity-> Distance to Pork Industry*

129. Distance (miles) to a public road with significant (>3 loads/week) live pig transportation

[Instructions: Enter miles (1 km = 0.6 miles)]

_____

130. Distance (miles) to nearest swine market, slaughter plant or collection point

[Instructions: Enter miles (1 km = 0.6 miles)]

_____

131. Nearest public road carries significant (greater than 3 loads/week) traffic related to nearest market, slaughter plant or collection point

a. Yes
b. No

132. Distance (miles) to nearest swine manure application field that receives manure from sites other than this site

[Instructions: Enter miles (1 km = 0.6 miles)]

_____

133. Estimated loads of pigs per weeks on nearest public road (paved or unpaved)

[Instructions: Exclude loads to or from this site. This does include loads from the same production system]

_____

*External Risks GF-> Non-Pig Related GF-> Location/Proximity-> Topography and Forestation of Surrounding Area*

134. Topography at the site

a. Flat
b. Gentle rolling hills
c. Steep hills
d. Mountains

135. Forestation around the site

a. No trees
b. Moderate forestation
c. Dense forestation

136. Presence of feral pigs near this site

a. Frequently (at least once per month) observed near the site
b. Occasionally (every 1 to 6 months) observed
c. Rarely (less than once every 6 months to a year)
d. There are no feral pigs near this site