Biosecurity screening tool: Benchmarking PRRSv biosecurity vulnerability using a short survey
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Key Points:
- New methods allow estimation of the overall PRRS-vulnerability risk score by asking a few questions (20 or less questions, which takes a few minutes per herd)
- This can help producers and veterinarians to (a) measure and benchmark key biosecurity aspects, and (b) to identify sites at relatively higher (or lower) risk of PRRSv introduction

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Study Summary: This study aimed to identify a small set of biosecurity aspects that, when combined, have a strong association with the frequency of PRRSv introduction into swine breeding herds.

Preliminary Results: A cross-sectional study assessed biosecurity aspects in 84 breeding herds from 14 production systems in 2017. Models were trained to predict whether a farm had or not reported a PRRS outbreak in the past 5 years, given a set of biosecurity aspects. Two methods were used, and both models were able to classify the herds with a great overall performance based on few biosecurity aspects. The method A, using 20 variables had an accuracy of 76.3% (Figure 1, A). Method B, with 6 variables outperformance the model 1 with accuracy of 80% (Figure 1, B).

The variables used by both methods were related to the frequency of risk events in the farm, swine density around the farm, farm characteristics/requirements to visitors, and operational connections to other sites (Figure 1). When comparing the predicted positive value (PPV) obtained by the models, they showed a strong positive correlation (0.7 and 0.76, respectively) with the frequency of past outbreaks (Figure 2). The results suggest that the PPV can be used as a PRRS-risk score, and higher the score the greater the frequency of PRRSv outbreaks.
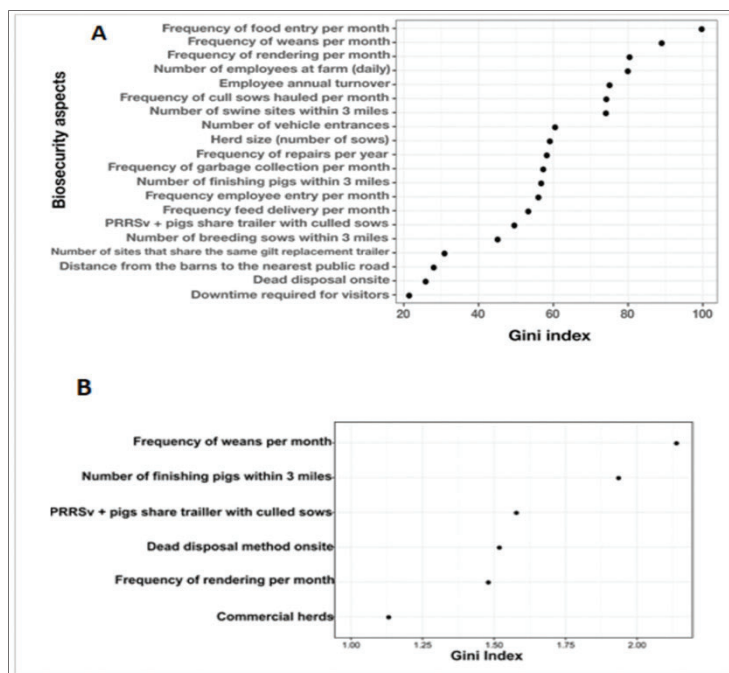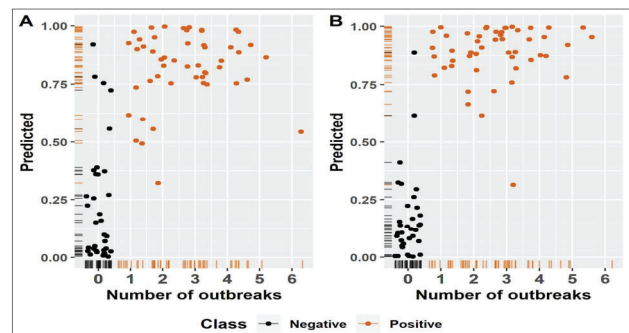

Figure 2. Relationship between the predicted positive value (vulnerability index) and the number of PRRSv outbreaks in the past 5 years. Panel A generated the index with 20 questions, and Panel B using 6 questions.

Enroll on our follow-up study: Study farms will be asked to fill a short survey. Using the methods above, the PRRS-vulnerability risk score will be generated for each farm enrolled. For each farm, a report will be provided and the score will be used to benchmark farms within and between production systems. At the end of the PRRS season (2019) the performance of the risk score among all participants will be evaluated. The information will be collected via an Excel file and the name of the farms and production systems will be kept confidential.

To enroll or request additional information please contact: Gustavo Silva (gustavos@iastate.edu) or Daniel Linhares (linhares@iastate.edu) at Iowa State University.

Figure 1. Biosecurity aspects used by model A and B.

This work was made possible due to funding from the Swine Health Information Center