

Assessing the relative vulnerability of swine breeding herds to the introduction of PRRS virus

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Key points:

- A model to quantify and identify biosecurity vulnerability in breeding herds is now available
- Events related to swine movements, transmission by air and water, and people movements were the variables most associated with PRRS outbreak
- Biosecurity vulnerability scores may help producers/veterinarians prioritize biosecurity investments

Study Summary:

Herd-specific biosecurity assessments are needed to determine herd-specific risk for PRRS outbreaks. Thus, we developed and validated a biosecurity vulnerability score (BVS) that measures the relative vulnerability of swine breeding herds to PRRSv introduction.¹

The BVS was based on a multi-criteria decision algorithm that ranked risk events associated with outbreaks (Table 1). A comprehensive biosecurity assessment was used to obtain information of the biosecurity practices from each participating herd. The practices performed in each herd were weighted by the relative importance of each event obtained from an expert opinion panel resulting in a score that identifies the events that should be prioritized.

In two independent datasets, the scores consistently revealed that farms with higher scores had a higher frequency of PRRS outbreaks. In addition, results suggest that events related to swine movements, transmission by air and water, and people movements should be prioritized (Table 2).

The BVS may be a useful tool to assess vulnerabilities on biosecurity protocols in order to reduce the frequency of PRRS outbreaks and may help producers and veterinarians prioritize investments in improving biosecurity practices over time.

Follow-up study: We are developing a new screening tool to validate the minimum number of questions associated with frequency of PRRS outbreak. Study farms will be asked to fill out a short survey. This can help producers and veterinarians to identify sites at relatively higher risk of PRRSv introduction

To enroll or to request additional clarification please contact:

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References

1. Silva GS, et al. Development and validation of a scoring system to assess the relative vulnerability of swine breeding herds to the introduction of PRRS virus. *Prev Vet Med.* 2018;160:116-122.

Table 1. List of risk events on swine breeding herds related to PRRS virus introduction.

List of risk events by category

1. Swine movements

- I. Semen delivered to premises
- II. Breeding replacement animals delivered to premises
- III. Cull breeding animals hauled from premises
- IV. Weaned pigs hauled from premises

2. Pickups and deliveries

- I. Dead animals removed from premises
- II. Feed or feed ingredients delivered to premises
- III. Propane and fuel delivered to premises
- IV. Garbage collected from premises
- VI. Electrical meter read on premises
- VII. New tools and supplies delivered to premises
- VIII. Tools and supplies transferred from other swine premises delivered to premises

3. People movement

- I. On-farm employees enter premises
- II. Repair, maintenance, electrical and plumbing personnel enter premises
- III. Veterinarians, off-site production managers, vendors and other visitors enter premises

4. Pork and food product entry

5. Manure removal

6. Wild animals, domestic animals and insects

- I. Wild animals
- II. Domestic animals
- III. Insects

7. Air and water

- I. Entry of air
- II. Entry of water

Table 2. Categories of risk events with higher vulnerability in the evaluated herds.

Events that should be prioritized*	# of farms
Swine Movements	55 (44%)
Air and water	42 (34%)
Swine Movements; Air and water	8 (6%)
Swine Movements; People movement	6 (5%)
Pickup/ Deliveries	5 (4%)
Swine Movements; Pickup/ Deliveries	4 (3%)
People movement	3 (2%)
Air and water; Pickup/ Deliveries	1 (1%)
People Movements; Pickup/ Deliveries	1 (1%)

* Events listed in the same line had the same importance.

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