

Enhancing U.S. swine farm preparedness for infectious foreign animal diseases with rapid access to biosecurity information

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Key points:

- The Rapid Access Biosecurity application (RABapp™) currently represents 42% of the U.S. commercial swine population across 31 states (Fig. 1). 76% (234/307) of U.S. Agricultural Statistics Districts were identified as "biosecurity deserts," where less than half of the swine population is represented in RABapp™.
- Reduced PRRSV/PEDV occurrence was linked to footwear/clothing change requirements, having multiple carcass disposal sites, greater distance from neighboring swine farms, use of rodent bait, and carcass burial.
- Rendering carcasses and certain manure management practices (deep pit or tank storage, land application) were associated with increased odds of infection.

Introduction:

Biosecurity serves as the primary defense against the introduction of pathogens into livestock. Biosecurity plans, such as the voluntary U.S. Secure Pork Supply (SPS) Plan, are critical for maintaining business continuity and controlling disease spread in the event of an outbreak of foreign animal disease, such as African Swine Fever (ASF). However, the U.S. swine industry lacks knowledge of individual-farm biosecurity and the efficacy of existing national-level measures. This study aimed to demonstrate the national importance of RABapp™ as a centralized repository, map SPS plan adoption, catalog individual farm biosecurity measures, and evaluate associations between biosecurity measures and reports of porcine reproductive and respiratory syndrome virus (PRRSV) and porcine epidemic diarrhea virus (PEDV).

Materials & methods:

We used the RABapp™ database to analyze 5,514 SPS biosecurity plans and demographic data from 7,781 premises collected between 2019 and 2025. Coverage was assessed by cross-referencing RABapp™ data with the 2022 Census of Agriculture to identify "biosecurity deserts". Multivariable logistic regression was used to evaluate associations between 27 biosecurity variables and reported outbreaks of PRRSV and PEDV, with infection status provided by producers or MSHMP. Read the full manuscript here ([link](#))

Results:

The analysis revealed that while RABapp™ has significant national coverage, there remain geographic gaps (Fig. 1). The regression model found that requiring changes in clothing and footwear (OR: 0.44; CI: 0.32-0.60), carcass burial (OR: 0.17; CI: 0.05-0.55), and the use of rodent bait (OR: 0.20; CI: 0.14-0.30) were the most effective measures for reducing infection odds. Increased distance from neighboring swine farms (OR per km: 0.92; CI: 0.88-0.95) and number of carcass disposal locations (OR: 0.89; CI: 0.80-0.99) also contributed to lower disease risk. Conversely, rendering carcasses (OR: 3.55; CI: 2.71-4.65), deep pit manure storage (OR: 1.93; CI: 1.33-2.80), tank manure storage (OR: 1.68; CI: 1.03-2.72), and land application of manure (OR: 7.19; CI: 4.97-10.42) were associated with significantly higher odds of a premises experiencing an outbreak.

Conclusion:

This study demonstrates the value of RABapp™ as a centralized tool for standardizing and auditing biosecurity plans at a national scale. By identifying specific high-risk practices and effective protective measures, the industry can prioritize biosecurity improvements. Reducing the prevalence of endemic diseases like PRRSV not only improves current farm health but also significantly strengthens U.S. preparedness for potential foreign animal disease emergencies.

Fig. 1. Total capacity, in head of swine, of the RABapp™ premises in each state as a proportion of the December 31, 2022, total hog inventory of that state as reported in the 2022 Census of Agriculture.

