

Biosecurity for all: Creating biosecurity plans for swine exhibitors based on secure pork supply templates

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Key Points

- A modified, condensed three-page Secure Pork Supply (SPS) plan was developed and utilized to help swine exhibitors create personalized biosecurity plans.
- Only 31.8% of participating swine exhibitors reported having a biosecurity plan on their premise prior to the study.
- Exhibitors with an existing biosecurity plan had more than 3-fold higher odds (OR=3.52, P=0.03) of acknowledging a potential for feral swine contact compared to those without a plan.
- 70.2% of all participants indicated a possibility for feral swine contact at their site.
- The study underscores the need for increased efforts and tailored education to help this niche group create and implement biosecurity measures.

Introduction

The U.S. swine industry faces a continuous threat from Foreign Animal Diseases (FADs), including African swine fever (ASF), foot-and-mouth disease (FMD), and classical swine fever (CSF) (Brown et al., 2021; Li et al., 2022). Implementing rigid biosecurity measures is essential for animal health, food supply safety, and business continuity. While frameworks like the Secure Pork Supply (SPS) exist for large commercial operations, their guidelines are not appropriate for smaller producers like swine exhibitors. Swine exhibitors are a unique group who maintain small herds, often not year-round, and travel extensively, resulting in frequent interstate movement and constant mixing of animals from various sources. The direct economic impact of this sector is estimated at \$1.2 billion annually, meaning disease outbreaks could have a significant negative financial impact on the U.S. swine sector. Exhibitions can amplify and geographically disperse pathogens quickly; for instance, swine exhibitions have been linked to the spread of influenza A virus (IAV).

Methods

Data was conveniently collected from 161 participants who chose to complete biosecurity plans at 12 swine exhibition events between June 2022 and November 2023. These events primarily focused on organizational shows, such as those run by the National Swine Registry and the OH-Pigs show circuit. The researchers adapted the official ten-page SPS plan into a modified, condensed three-page document suitable for exhibitors' biosecurity features. The key modifications included changing questions to multiple-choice options instead of written responses, merging similar sections, and omitting practices uncommon for show swine exhibitors (e.g., GPS coordinates, pre-movement isolation). Participants were assisted in identifying site-specific map features, such as the Line of Separation (LOS) and Perimeter Buffer Area (PBA), using satellite view maps. Information gathered included participants' state/region, number of swine, type of housing, presence of other animal species, risk of feral swine exposure, and prior existence of a biosecurity plan. A mixed logistic regression model was used to investigate the association between having a previous biosecurity plan on site and demographic factors, with the exhibition used as a random effect.

Results

A total of 161 participants completed biosecurity plans. The majority of participants were from the Midwest (56.6%) and the South (39.8%). The median number of pigs reported was 10.0 (Interquartile Range (IQR): 19.5), with a range of 1 to 4000. Regarding housing, 60.7% housed swine exclusively inside, 30.4% housed them inside and outside, and 8.9% housed them exclusively outside. Only 31.8% (41/129) of participants reported having a biosecurity plan prior to the session. Among those with a pre-existing plan, 56.1% utilized veterinary oversight. The final model showed that show pig exhibitors with an existing biosecurity plan on site had higher odds of also having swine housing conditions where contact with feral swine was a possibility (OR=3.52, P=0.03). No significant relationship was found between demographic factors (number of pigs, type of housing, or geographical region) and having a previous biosecurity plan. In terms of compliance and practices: 70.2% of participants indicated potential for feral swine contact. 59.2% had other animals on the premise. 31.7% had misplaced map features or missing features on their biosecurity plan. 81.0% implemented an ideal placement of Cleaning and Disinfection stations.

Discussion

The results indicate that a majority of swine exhibitors sampled do not have biosecurity plans in place, necessitating targeted outreach efforts. The finding that exhibitors with pre-existing plans were more likely to acknowledge the possibility of feral swine contact (OR=3.52) is significant. This association suggests that the presence of feral swine in the immediate geographic area may prompt more preventive thinking and motivate the creation of a biosecurity plan, possibly in collaboration with a veterinarian who has regional knowledge. The high percentage of multi-species sites (59.2%) and the common practice of off-site carcass disposal (36.5%) represent additional disease transmission risks that biosecurity plans must address. The study's three-page condensed SPS plan was effective in facilitating plan creation. However, the finding that nearly a third of participants had misplaced features on their biosecurity map suggests a remaining barrier in translating written guidelines into practical, logistically sound site maps. Future efforts should focus on providing educational resources and events to increase awareness and measure the actual on-farm implementation of these biosecurity measures.

The full article can be found at: <https://www.sciencedirect.com/science/article/pii/S0167587725003162>

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