# Bench system biosecurity compliance assessment: A pilot project

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Biosecurity refers to those actions implemented in farms to reduce the risk of pathogen introduction into populations. In the swine industry, many biosecurity actions are part of the health program. These measures have evolved over time as the epidemiology of swine diseases has been better understood. Bench systems, shower-in/shower-out, and use of specific farm clothing at farm entrances are some of the biosecurity protocols that have been implemented across a range of production systems and farms. Biosecurity protocols have also been included for a farm's required resources such as feed, water, and air when these are considered a possible threat to the farm. Addition planning regarding loading and unloading practices, trucks, feed delivery, and feed bin locations are also part of a robust biosecurity program. Altogether these practices represent tools available for producers and veterinarians to reduce the probability of pathogen introduction. Producers are investing time and money into biosecurity programs in order to maintain a constant level of productivity. However, diseases like the porcine reproductive and respiratory syndrome virus (PRRSv) continue to evade these biosecurity measures generating important economic losses.

This year, more than any other, has highlighted the importance of biosecurity compliance, particularly "personal biosecurity". Unfortunately, available data highlights compliance concerns in different fields. Data shows that compliance varies by person, as hospital personnel were not 100% compliant when hand hygiene practices were assessed (Kingston et al., 2017), and compliance was significantly reduced when nursing staff had reached high levels of workload saturation (Manomenidis et al., 2017). In animal health, few studies have been conducted related to biosecurity compliance. Video surveillance has been used to evaluate whether farm employees followed entry and exit biosecurity protocols in poultry barns (Racicot et al., 2011). The measured lack of compliance in other fields suggests the likelihood of similar personal biosecurity gaps in swine barn personnel.

Swine production companies have begun installing cameras in pig farms to assess compliance of different procedures. We conducted a "pilot project" on a sow farm where the objective was to assess compliance in different areas of the farm. Access to different cameras was granted in order to understand which camera could provide data for this project. The camera that was chosen for this project was the one located at the farm entrance in which we could observe personnel entering the building and going through the bench system. Farm personnel were required to take off their shoes on the dirty side of the bench and without letting their feet touch the floor on the dirty side of the bench step into the clean side of the bench. A non-compliant event was defined as personnel feet touching the dirty side of the bench as it is a surface that could be contaminated. The 21-day assessment was performed during the morning, a time when all employees would enter onto the farm within a narrow window of time facilitating the assessment.

During the 21-day project, non-compliant events were observed every day. The number of non-compliant events per day ranged from 1 to 6. On 8 separate days there were 4 daily non-compliant events (Table 1).

Further analysis showed that there was no significant association between non-compliance events and gender. In addition, there was no relationship between non-compliant events and whether it was a week or weekend day. However, there was a strong association between non-compliance events and whether employees went through the bench system by themselves or accompanied. Employees that went through the bench system alone were 2.92 times more likely to not comply compared to employees going through the system as a group.

Lowering the risk of pathogen introduction will continue to be a challenge. Personnel awareness and training are fundamental pieces of the biosecurity program. Therefore, tools that can aid in monitoring compliance will always be valuable. However, the implementation of video surveillance by itself was not enough to inhibit non-compliance event, as evidenced by a lower non-compliance rate when employees were accompanied than when they were alone. Real-time monitoring and immediate feedback might mitigate this effect by including such footage during the training sessions.

**Table 1.** Non-compliant events per day distribution during a 21-day assessment.

| Number of Non-Compliant Events per day | Number of Days |
|---|---|
| **1** | 2 |
| **2** | 5 |
| **3** | 3 |
| **4** | 8 |
| **5** | 2 |
| **6** | 1 |

References
1. Kingston LM et al. Hand hygiene: Attitudes and practices of nurses, a comparison between 2007 and 2015. Am J Infect Control. Dec 1. 2017.
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