SDEC Partners Research Update

Project Update: Indirect transmission of influenza A virus
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Funded by: National Institutes of Health (NIH), Minnesota Center of Excellence for Influenza Research & Surveillance (MCEIRS)

Background

- Influenza virus is a common cause of respiratory disease in pigs. A recent active surveillance project of growing pigs in the Midwestern United States identified 29/32 (90.6%) enrolled farms as IAV positive at least once based on monthly testing for 12–24 consecutive months (C. Corzo et al., 2013).
- Limited information is available regarding transmission of influenza A virus (IAV) via different routes in pig populations. This information is critical to help understand intervention measures to reduce influenza virus transmission.
- Indirect routes (aerosol, fomites) have been suspected in field outbreaks of IAV, however; limited research exists assessing these routes in pigs.

Objective

The objective of this study was to evaluate the role of fomites (such as clothing and PPE) in influenza virus transmission between pig populations separated by two different biosecurity settings—low biosecurity (LB) and medium biosecurity (MB) sentinel groups.

Results

- Influenza virus RNA was detected on 11/144 (8%) fomite samples collected following contact with infected pigs
- One replicate of each sentinel groups LB and MB were infected with influenza virus. In each of these replicates, all five pigs were infected over time and confirmed positive by RRT-PCR. All pigs in the negative control and the remaining replicates of sentinel groups LB and MB remained virus negative via RRT-PCR and seronegative via ELISA.
Results

Figure 1. Study diagram and movement from infected pigs to MB and LB groups

Figure 2. Interaction of an infected pig with fomites

Table 1. RRT-PCR results from the infected group and LB-Rep 2 (infected over time)

Conclusions

- Fomites can be contaminated with influenza virus following interaction with infected pigs and influenza virus can be transmitted via fomites to non-contiguous groups of sentinel pigs
- The addition of specific biosecurity measures used in this study did not prevent transmission in one of two replicates following immediate movement of personnel from infected pigs to sentinel pigs

Implications

- This study highlights the need to focus on indirect routes as well as direct routes of transmission for influenza virus in the field
- Biosecurity measures aimed at indirect routes of transmission, including fomites, should be incorporated and further assessed as part of comprehensive biosecurity protocols