

PDCoV Monitoring

- There were 0 breaks this week with 19 of 26 systems reporting.
- There was 1 retrospective herd break (2/12/2016).

Project Update: Indirect transmission of PEDV via personnel as fomites

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Background:

- Porcine epidemic diarrhea virus (PEDV) spread rapidly after being diagnosed in the US for the first time in April of 2013.
- Transmission of PEDV occurs predominately via the fecal-oral route, and can be disseminated by contaminated vehicles, feed and air.
- Impact of biosecurity protocols on the transmission of PEDV via personnel is poorly understood.

Objectives:

To assess the efficacy of low, medium and high biosecurity protocols on the transmission of PEDV via personnel.

Methods:

- Personnel moved from a PEDV infected group (INF) of pigs to naïve sentinel groups following various levels of biosecurity. In the low biosecurity (LB) group, personnel moved from the infected group to the sentinel group without changing clothes, boots, disposable gloves or washing hands. In the medium biosecurity (MB) group, personnel washed hands and face, and changed boots, gloves and coveralls. In the high biosecurity (HB) group, personnel took a shower and changed clothes and coveralls. There was a negative control group (NEG) that housed negative pigs and had no contact with the PEDV infected pigs.
- All groups were housed in independent isolation rooms and each treatment group had 10 pigs, with 2 pigs per room and 5 rooms per group (replicas). Infected group had 12 pigs (10 experimentally infected and two direct contacts), and negative group had 6 pigs. Pigs in infected group were inoculated intragastrically with NVSL strain (mucosal scraping).
- Study personnel had contact with the pigs in INF room for 45 min per session, and did 1 movement/day from the INF room to the LB and MB rooms, and 2 movements per day from the INF room to the HB room.
- Samples from pigs (rectal swabs) and fomites (Tyvek coverall, nitrile gloves, plastic boots, hair and face) were collected daily and assessed by rRT-PCR for virus presence

Results:

- All experimentally challenged pigs shed PEDV in feces at 24 hours post challenge. Contact pigs shed PEDV at 2 days post contact. Shedding was high despite the limited clinical signs of diarrhea observed (Figure 1).
 - Pigs in the low biosecurity group shed PEDV in feces at 1 day after movement of personnel between the INF and the LB group had taken place. PEDV PCR positive swabs were detected from coveralls (100%), hands (93%), boots (100%), and face/hair (66%).
 - None of the pigs in the MB or the HB tested PEDV positive. However, PCR positive swabs were obtained from face/hair (15%) of the MB personnel but not from other personnel protective equipment. None of the samples from the HB group tested PCR positive.

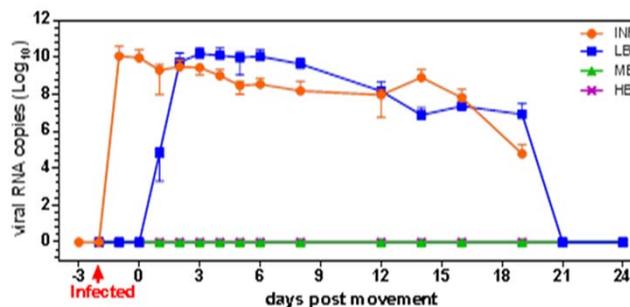


Figure 1. Shedding of PEDV across groups INF (infected), LB (low biosecurity), MB (medium biosecurity), and HB (high biosecurity).

Conclusions:

- Transmission of PEDV by direct contact was fast as demonstrated by contact pigs in INF rooms shedding PEDV within 2 days post infection
- Without strict biosecurity procedures, transmission of PEDV happened right away as demonstrated after the first movement of personnel from the infected room into the low biosecurity groups of pigs.
- However, biosecurity measures consisting of washing hands and face, and changing boots and coveralls or taking a shower were effective at preventing transmission of PEDV
- In conclusion, risk of spreading PEDV via personnel can be mitigated if basic biosecurity measures consisting of washing hands and face, and changing boots and coveralls are followed.