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Swine Disease Eradication Center

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## **SDEC Partners Research Update**

### **Project Update: Detection of Airborne Influenza A virus in experimentally infected pigs with maternally derived antibodies**

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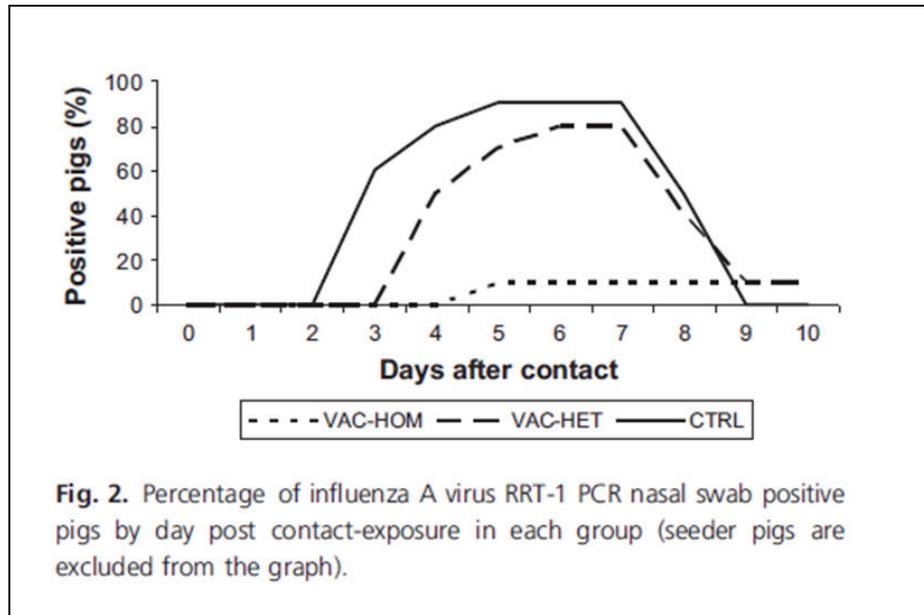
#### **Background**

- Influenza virus infections in swine cause respiratory disease and decreased growth performance. Transmission, which can be through direct nose-to-nose contact or through aerosols, remains a constant risk to swine populations and to humans.
- Neonatal pigs play a key role in the transmission of virus. Dam vaccination is a common approach for controlling influenza by not only protecting the breeding animals but by generating maternally derived antibodies (MDA) to protect the newborn piglets.
- Research suggests that pigs with MDA and challenged with homologous or heterologous influenza strains may have reduced clinical signs but viral shedding may or may not be affected. Other studies suggest that homologous immunity can reduce transmission in neonatal pig populations.
- The importance of aerosol transmission of swine influenza has been demonstrated but needs to be further characterized.

#### **Objective**

**To determine whether pigs with MDA are able to generate detectable levels of infectious influenza aerosols under experimental conditions**

## Results



- Figure 2 shows the % of positive RT-PCR pigs based on nasal samples by day post contact exposure. Most of the PCR positive pigs were found in the non-vaccinated pigs and pigs with partial immunity (heterologous immunity)
- Virus could be detected in the air by PCR from samples collected from the pigs with partial immunity (heterologous) for 5 days and 4 days for the non-vaccinated pigs. In both groups, viable virus was isolated from air samples.
- Virus was not isolated or PCR detected from the pigs vaccinated with the homologous vaccine.
- Overall these results indicate that pigs with partial maternal immunity are able to generate infectious influenza aerosols.

## Conclusions

- The results suggest that aerosol transmission can take place in herds with pigs with MDA immunity and weaned pig populations
- The presence of influenza RNA and viable viral particles in air samples from pigs with and without MDA highlights the potential risk of aerosol transmission in pigs..
- Pigs without obvious clinical signs of influenza infection can also generate infectious aerosols.

## Implications

- This study indicates that pigs with MDA may generate infectious aerosols. However, the risk that aerosols generated by pigs with maternal immunity represents for transmission under field conditions needs to be evaluated.
- For more information on this study please see: Corzo CA, Allerson M, Gramer M, Morison RB and Torremorell M. Detection of airborne influenza A virus in experimentally infected pigs with maternally derived antibodies. *Transbound Emerg Dis* 2012 July 25 epub ahead of print.