



UNIVERSITY OF MINNESOTA

Swine Disease Eradication Center

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SDEC Partners Research Update

Project Update: Effect of the EPI® technology on decreasing PRRS, influenza and PED viruses in aerosols from experimentally infected pigs
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Funded by: UMN Signature Program College of Veterinary Medicine , National Pork Board, and Swine Disease Eradication Center

Background

- There is a need to validate technologies to minimize the spread of pathogens from infected farms
- There are air sanitation technologies that have the potential to decrease the load of viruses found in the air of infected farms
- The electrostatic particle ionization (EPI®) technology, patented as a dust reducer, was tested to evaluate its impact on airborne virus reduction

Objectives

To quantify the impact of the EPI technology at removing PRRS, influenza and PED viruses from aerosols generated by experimentally infected pigs

Methods

- Twelve 6-week-old pigs were inoculated with H1N1 IAV, 1-8-4 PRRSV and PEDV and air samples were collected for 24 days
- Total airborne particles, total airborne viruses and virus particles as a function of size were measured with the EPI system on and off.
- The removal efficiency of the EPI system for IAV, PRRSV and PEDV was calculated



Results

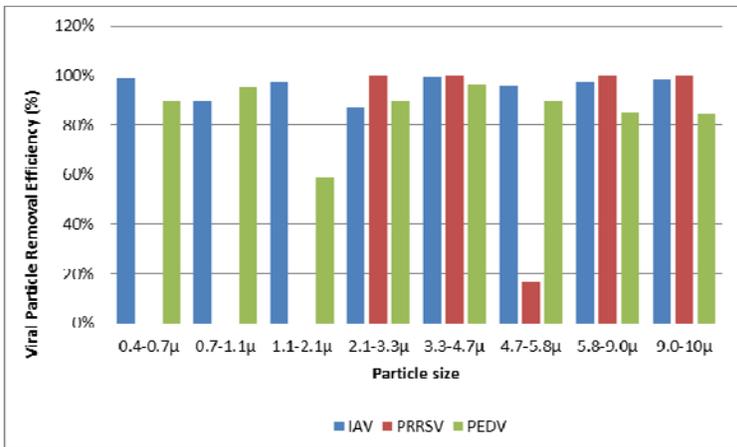


Figure 1. Removal Efficiency (%) of the EPI system by particle size for IAV, PRRSV and PEDV in experimentally infected pigs

$$\text{Removal Efficiency} = \frac{\text{Viral concentration EPI OFF} - \text{Viral concentration EPI ON}}{\text{Viral concentration EPI OFF}}$$

Figure 2. Removal Efficiency (%) of the EPI system for total airborne particles by particle size measured with an optical particle counter during the 24 days of the study

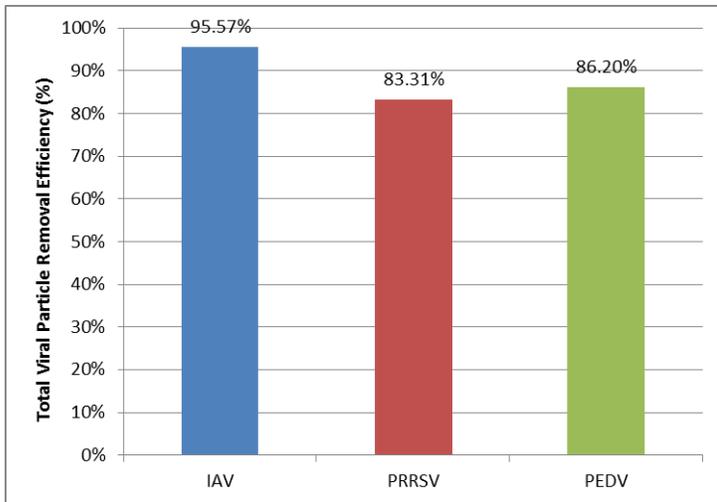
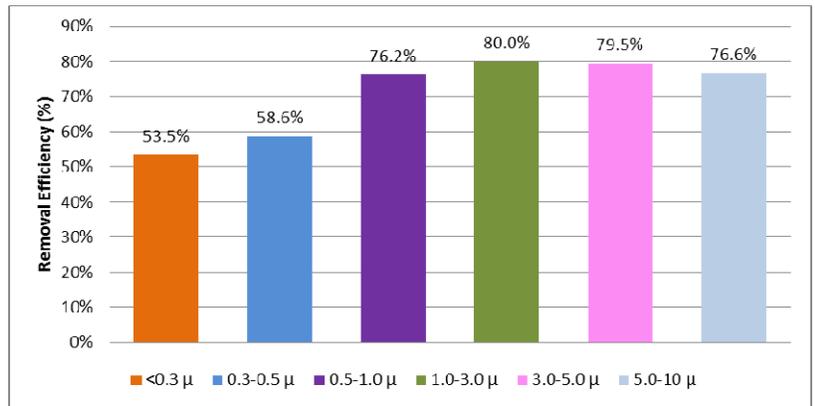


Figure 3. Total viral particle removal efficiency (%) for IAV, PRRSV and PEDV

Conclusions

- The EPI system was effective at reducing influenza, PRRSV and PEDV from the air
- There was a reduction of 1 to 2 logs of viral particles from the air and this reduction was influenced by virus type
- There was a higher efficiency of the EPI technology at removing larger particles

Implications

- The EPI system has the potential to reduce the spread of pathogens from infected sites