

Title: An evaluation of back-drafting of non-filtered air as a source of PRRSV infection to pigs housed in filtered facilities and whether selected intervention strategies can reduce this risk –
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Scientific Abstract: Porcine reproductive and respiratory syndrome virus (PRRSV) is an economically significant pathogen of pigs that can be transported via the airborne route out to 9.1 km. To reduce this risk, large swine facilities have started to implement systems to filter contaminated incoming air. A proposed means of air filtration failure is the retrograde movement of air (back-drafting) from the external environment into the animal air space through non-filtered points such as idle wall fans; however, this risk has not been validated. Therefore, the purpose of this study was threefold: 1. to prove that PRRSV introduction via retrograde air movement through idle fans is a true risk; 2. to determine the minimum retrograde air velocity necessary to introduce PRRSV to an animal airspace from an external source; and 3. to evaluate the efficacy of different interventions designed to reduce this risk. A retrograde air movement model was used to test a range of velocities and interventions, including a standard plastic shutter, a plastic shutter plus a canvas cover, a nylon air chute, an aluminum shutter plus an air chute and a double shutter system. Results indicated that retrograde air movement is a real risk for PRRSV introduction to a filtered air space; however, it required a velocity of 0.76 m/s. In addition, while all the interventions designed to reduce this risk were superior when compared to a standard plastic shutter, significant differences were detected between treatments.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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