

## SWINE HEALTH

**Title:** Use of a production region model to evaluate biosecurity protocol efficacy for reducing the risk of porcine reproductive and respiratory syndrome virus and *Mycoplasma hyopneumoniae* spread between farms – NPB #07-110 & 09-152\*

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**Scientific abstract:** Porcine reproductive and respiratory syndrome virus (PRRSV) and *Mycoplasma hyopneumoniae* (M hyo) are economically significant pathogens of pigs that can be spread between herds via the airborne route. As area/regional control and eradication programs for these pathogens move forward, it becomes critical to understand conditions associated with airborne spread and to develop strategies to reduce this risk. While MERV 16-based air filtration is a potential intervention, it is costly venture has only been evaluated against PRRSV. Therefore, it is important to test current and alternative filtration strategies against multiple pathogens to enhance their application in the field. To address this issue, we used a production region model to evaluate meteorological risk factors associated with airborne spread as well as the ability of mechanical and antimicrobial filters to protect susceptible populations against PRRSV and M hyo. In summary, conditions common to both pathogens included cool temperatures, the presence of PRRSV or M hyo in source population air and wind direction. PRRSV-positive air days were also characterized by low sunlight levels, winds of low velocity in conjunction with gusts and rising humidity and pressure. In regards to filter efficacy, while all types tested successfully prevented airborne transmission of PRRSV and M hyo, differences were observed in their ability to prevent airborne transport. These data provide a better understanding of the aerobiology of two important diseases of pigs and validate several air filtration technologies for protecting susceptible populations against the airborne challenge of PRRSV and M hyo.

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