





Comparative adsorption of Porcine Reproductive and Respiratory Syndrome Virus strains to Minnesota soils

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## Introduction

Porcine reproductive and respiratory syndrome (PRRS) has become the most significant disease in the US swine industry. Data from the Morrison Swine Health Monitoring Project (MSHMP) indicate an increasing trend of PRRS cases between October and December, time when manure is pumped and spread on soils. It is known that PRRSV can be found in feces and manure pits, but there is scarce data on whether PRRSV present in the manure could percolate once it has been spread and reach groundwater. The aim of this study was to compare different strains of PRRSV for their percolating ability through different soil types.

## **Material & Methods**

We used three different PRRS viruses (RFLP 1-7-4, 1-4-4, and 1-26-2), which were grown and titrated in MARC-145 cells. A total of 13 soils were used; 6 from sites surrounding pig farms and 7 obtained from the UMN Agronomy Department. Vertical glass column model was used in which 5g, 10g and 20g of each soil was placed inside the glass column with a filter paper in the bottom end. Enough water was added to the soil columns until the soil was moist and the air bubbles were removed. Then a solution containing virus and water (1:1 v/v) was added to the glass column and percolated water was collected and titrated. Results were analyzed through ANOVA and multiple linear regression.



## Results

We were able to isolate virus in the percolates regardless of the PRRS strain and amount of soil added (5g, 10g, & 20g) (Figure 1). For the 1-26-2 strain, the initial titter decreased from 5.17 to 3.50 log10TCID50/100  $\mu$ L after diluted. We were able to isolate the virus from all samples at 5g and 10g, and in 11 out of 13 of the 20g soil samples. For the 1-4-4 strain, the initial titter decreased from 5.50 to 3.17 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from all the 5g soil samples, 6 out of 13 10g soil samples and 3 out of 13 of the 20g soil samples. For the 1-7-4 strain, the initial titter decreased from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 3.83 log10TCID50/100  $\mu$ L after diluted. The virus was isolated from 6.50 to 5.80 to 5.80

## Conclusions

All PRRS virus strains were able to percolate through all amounts and types of soil. There is an inversely proportional relationship between viral titer and amount of soil.



