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Infectivity of PRRSv in pig manure and in cell culture media at different temperatures

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Introduction

PRRSv is an economically important swine pathogen which can be disseminated from infected pig herds via movement of contaminated manure.

The process of manure handling and inadequate cleaning of transport vehicles are commonly implicated as sources of PRRSv transmission. Stability of PRRSv in pig manure at different temperatures is unknown.

The objective of this study was to determine PRRSv-infectivity half-life in manure and a cell culture medium at 4, 20, 60 and 80°C.

Materials and Methods

To assure sample consistency across the study, all samples were prepared from common homogenized solutions (MEM and manure) and frozen at -20°C.

Samples were thawed, transferred to a water bath set at a specific temperature, inoculated with 100µl of PRRSv at designated time points and then tested for virus infectivity.

Regression models were created to estimate PRRSv half-life based on incubation temperature.

Results and Discussion

There was an exponential decrease in PRRSv infectivity with increasing temperature.

At every temperature tested, PRRSv had shorter half-life when incubated in manure compared to MEM. PRRSv half-life in MEM and manure was estimated at 112.6

and 120.5 hours at 4°C, 14.6 and 24.5 hours at 20°C, 1.6 and 1.7 hours at 40°C, 2.9 and 8.5 minutes at 60°C, and 0.36 – 0.59 min at 80°C, respectively.

Results of this study can be used as basis for developing strategies to inactivate PRRSv present in manure-contaminated environments using heating treatments.

For example, these data suggest that submitting transport trailers to temperature of 50 °C for 8 hours would decrease PRRSv from 10^6 TCID₅₀/ml to less than 10^1 TCID₅₀/ml.

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