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PRRSV CONTAMINATION OF MORTALITY STORAGE AREAS PRIOR TO DISPOSAL BY RENDERING IN HIGH AND LOW DENSE SWINE PRODUCTION REGIONS

James F. Lowe, DVM ,MS[1]
[1]*Lowe Consulting, Ltd. , Albers, IL, USA*

Introduction

Many production sites become infected with PRRSV. There are multiple potential routes of PRRSV transmission into new populations that have been well described. The challenge facing producers is determining which routes of transmission are the most likely so that appropriate measures can be implemented to reduce the chance of infection. There is a lack of published data about the contamination rates of common fomites under commercial conditions. This paper describes the status of thirty-nine sites located in Iowa and Illinois and the potential risk that using rendering to dispose of mortality poses to the health of the pigs during a period of frequent PRRS transmission.

Materials and Methods

A total of 44 wean to finish sites (AASV Stage 4 PRRS source herds) where rendering is used for mortality disposal were selected from two geographic regions. Over a 4 week period in Dec 2011 and Jan 2012 two environmental samples, Mortality Storage (MS) ("Swiffer", ~1 m^3, external contact point of MS) and a Positive Control (PC) ("Swiffer", plywood,1 dose of PRRS MLV vaccine) were collected for each site. "Swiffer's" were moistened with 20cc of sterile saline and stored in a -20°C until testing. Five oral fluid samples were collected from each site to confirm swine infection status.

All samples were sent to a commercial diagnostic laboratory for PRRS PCR testing. Five of the 44 PC samples were negative; those sites were excluded from analysis.

Area density was estimated with the number of pig farms per square mile in each county (USDA 2007 Census of Agriculture). High-density counties were those in the top quartile of all counties in the two states. High-density counties have a median density of 1 farm/5.35 mi^2 (interquartile range (IQR)=1 farm/10.60 $mile^2$). Low-density counties have a median density of 1 farm/18.55 $mile^2$ (IQR= 1 farm/ 26.17 $mile^2$).

Results

Pigs on 17 of the 39 sites included in the final analysis were infected with PRRS at the time of sampling. Of the 17 infected sites, 10 were infected with North American lineage (NA) PRRS, 2 with European lineage (EU) PRRS, and 5 were infected with both NA and EU viruses. Only 2 of the MS samples were PRRS PCR positive, one with a NA virus and one with a EU virus. Pigs on the two sites with POS MS samples were infected with NA PRRS virus.

Pigs on sites in high-density counties were more likely to be infected than pigs on sites in low-density counties (82.3% vs. 13.6% PRRS PCR Pos., χ^2=15.73, P=0.0001). The two positive MS samples were located in Iowa. One was located in a high-density county (Franklin, EU virus) and the other in a low-density county (Wright, NA virus). The positive MS samples were from adjoining counties that share many common resources including rendering services.

Conclusions and Discussion

The prevalence of PRRS infection was very high in the high-density regions (15/18). This was not unexpected. The rate of contamination of mortality storage facilities was low (2/39) for all facilities but was 10% in Iowa sites. One of the two positive MS samples was not the same lineage as the virus found in the pigs and can be assumed to be from an external source. The other positive MS could have been due to infected pigs from the site contaminating the MS facility. The power of the study was limited (90% confidence of detecting a prevalence of 5.4%) so a precise estimate of MS PRRS contamination prevalence cannot be made. But these results do demonstrate that MS facilities are a potential source of novel PRRS virus for a production site. Based on these data the use of rendering to dispose of mortalities appears to be a higher risk for PRRS introduction in swine dense areas than in low-density areas.

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