

## Describing and Estimating Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in Alternative Pig Farms (APFs)

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### Key Points:

- “Alternative” pig farms (APFs) include niche, pasture-raised, and USDA organic-certified, among others.
- About 200 APFs in MN were identified, and out of 25 tested farms, there was a 36% herd seroprevalence for PRRSV.

### Introduction:

The United States (US) swine industry has shifted to raising hogs indoors in large premises. Yet, there are still farmers who have chosen the alternative to raise their hogs outdoors. These “alternative” pig farms (APFs) include niche, pasture-raised, and USDA organic-certified, among others. As the US swine industry seeks to strengthen their defenses against the spread of Porcine Reproductive and Respiratory Syndrome (PRRS), understanding the role that APFs play in disease transmission is important. However, information on APFs is scarce in the US so the current prevalence of PRRS in APFs along with any risk factors associated with PRRS in this population is unknown.

### Materials and Methods:

A process was developed to identify and create an APF database that served as the study’s target population. This population was then emailed an online survey using Qualtrics (Provo, UT) in December 2022 to gather information about their on-farm practices and invited to participate in a PRRS prevalence study with a sample size of 41 farms (n=200, 0.25/90/10). Interested producers were visited and oral fluid (OF) or serum samples (n=≤30, 0.05/90) were collected, pooled by ≤5 if serum, and tested via PRRSV ELISA and RT-PCR. Farms were classified as PRRS positive if there was at least one positive ELISA positive sample (>0.4 S/P) and/or at least one positive RT-PCR positive sample (<40 Ct). Apparent prevalence was calculated by ELISA and RT-PCR individually. To determine if there were any associations between different on-farm practices and PRRSV status, univariable logistic regression was performed to calculate odds ratio from pre-selected variables based on t-test or fisher’s exact tests.

### Results:

About 200 APFs were identified, of which 58 (29%) responded to the survey and 25 were tested for PRRSV via ELISA and RT-PCR. Five (21%) farms yielded at least one RT-PCR, and four additional farms (36%) were positive only by ELISA (Table 1). Hoop barns were associated (OR=13.5, CI95% 1.34-135.98) with PCR positive status whereas using a farm specific vehicle may have a sparing effect for ELISA status (OR=0.148, CI95% 0.020-1.08).

### Conclusions and implications:

As expected, the PRRS virus is also present in APFs; however, the majority of the on-farm practices that were evaluated were not found to have an association with PRRS status. It is possible that other practices that were not evaluated, such as pig movement and farm location, may increase odds of disease. Therefore, more information is needed to determine how connected APFs are to the broader swine industry and their role in disease transmission.

**Table 1. ELISA and RT-PCR PRRSV results for positive farms.**

Herd Size	Sample (Pool)	Result ELISA (S/P)	Result RT-PCR (Ct)
614	Tissue	-----	POS 13
400	29 (n=4-5)	25 POS 0.53-1.75 4 NEG 0.09-0.28	4 POS 25.14-35.76 2 NEG
6	6 (n=1 ELISA, n=3 PCR)	5 POS 0.91-1.96 1 NEG 0.34	2 POS 32.11 -34.11
120	3 (OF)	3 POS 1.77-4.79	POS 34.21 2 NEG
5	3 (healthy n=2, acute death n=1)	2 NEG Healthy POS 0.58	Healthy Pooled—NEG NEG (tissues)
25	16 (n=4)	4 POS 1.78-2.40	4 NEG
25	18 (n=3)	6 POS 0.74-2.06	4 POS 31.33-35.23 2 NEG
370	29 (n=3-5)	6 POS 0.82-2.01 1 NEG	7 NEG
1030	5 (OF)	4 NEG 1 POS 3.813	5 NEG