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Investigation of the use of sow off-feed events and number of abortions to early detect Porcine Reproductive and Respiratory Syndrome (PRRSV) outbreaks in breeding herds

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Objective

The objective of this study was to investigate weekly data on sow feed intake and abortion as early indicators of PRRSV outbreaks in breeding herds.

Materials and Methods

A retrospective study was conducted using production data from two breed-to-wean farms in the U.S. Midwest. The number sow off-feed and abortions/week were compared to the PRRSV status. The outbreaks were reported between weeks 49 and 51 of 2021, one event per farm. The outbreak definition was the evidence of clinical infection (increase in abortions, increase in preweaning mortality) and virus detection by Polymerase Chain Reaction. The Exponentially Weighted Moving Average (EWMA) was used to investigate deviations of the explanatory variables in the weeks before the outbreak. The sigma (σ) parameter was set to 3 and the smoothing parameter (λ) to 0.40. The baseline was fifteen weeks and ten weeks without signals in the EWMA before the outbreak for each farm, respectively. A total of 53 weeks representing the year 2021 were used. Model performance was assessed comparing the EWMA signals and the PRRS virus status/week.

Results

The time-to-detect significant deviations on the number of abortions was two to five weeks before the outbreak report, and two to four weeks before for the number sows off-feed events per week. The overall performance for abortions/week had a sensitivity of 100%, specificity of 95% and accuracy of 95%. Sows off-feed events had a sensitivity of 100%, specificity of 68% and accuracy of 71%.

Conclusion

This study demonstrated that swine producers can monitor sow production data collected routinely to identify PRRSV outbreaks weeks early. This would lead to early implementation of biocontainment and bioexclusion measures to control the outbreak and virus spread to other sites, decrease production and economic losses, and lead to early stability.

Key words: Outbreak, early detection, off-feed, performance