

Investigating PRRS summer outbreaks in the US

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Key Points

- Each year approximately 3% of the sow farms have a PRRS outbreak during the summer.
- The incidence of summer PRRS breaks has been constant over the last 9 years.
- There are geographical areas with higher or lower risk of summer breaks.

Introduction

Porcine reproductive and respiratory syndrome virus (PRRSV) has different epidemiological patterns ranging from a yearly-seasonal trend in some regions to an unpredictable yearly pattern in other regions (4; 1). Although a higher PRRSV incidence can be observed during fall and winter months, breaks during the summer still occur. During the 2017 summer there were concerns of an apparent increase in the number of PRRSV outbreaks. Therefore, the objective of this study was to temporally and spatially describe the occurrence of summer PRRSV outbreaks.

Materials and Methods

A summer outbreak was defined as a PRRS case (category 1 – unstable) that occurred between June 21st and September 21st of any year. The incidence of summer outbreaks was estimated for each year using as the total number of participant farms at risk for that specific summer as the denominator. The temporal trend of summer outbreak incidence was assessed visually and statistically using the Mann-Kendall test for trend. Additionally, an adaptive kernel smoothing technique was used to estimate the density of farms that had an outbreak during the summer (cases) and farms that did not have an outbreak during the summer (controls). The ratio of these two densities was used to identify geographical areas of high and low incidence of summer PRRSV outbreaks (2; 3)

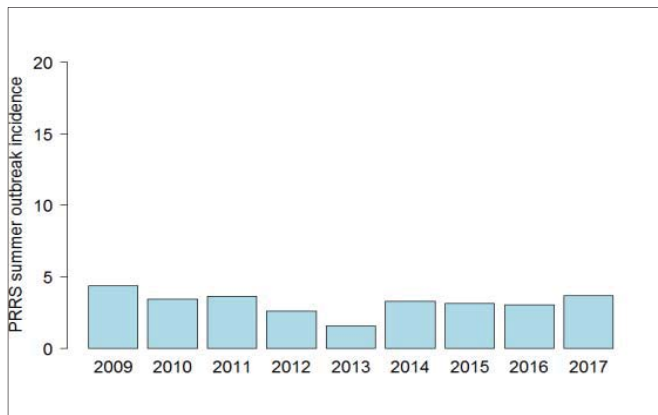


Figure 1: Incidence of PRRSV summer outbreaks from 2009 to 2017.

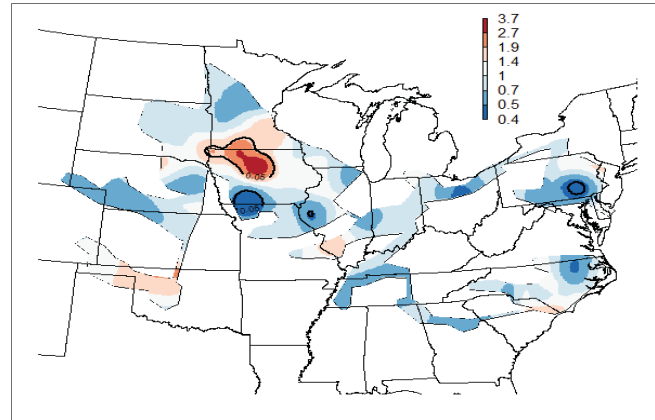


Figure 2: Geographical areas with higher (red) and lower (blue) PRRSV incidence risk

Results

Since 2009, a total of 182 (13.7%) out of 1329 PRRS outbreaks occurred during summer. The 182 summer outbreaks occurred in 154 farms from 24 systems. The mean incidence of summer outbreaks between 2009 and 2017 was 3.2% and ranged between 1.6% and 4.4%. No increasing or decreasing trend in the incidence of summer outbreaks across the study period was observed (Figure 1). Consequently, the Mann-Kendall test for trend was largely non-significant ($p=0.47$). Geographically, an increased risk (red area) of PRRS summer outbreaks was observed in central-north and north-west Iowa together with central-south, south-west Minnesota (Figure 2). In this area, the density of farms that had an outbreak during summer was 3.7 times higher than the density of controls (i.e. farms that had an outbreak in another season or where no outbreaks were recorded). Additionally, areas of low risk (blue area) of summer outbreaks were also identified in south-east Pennsylvania and south-west Iowa. In these areas the density of farms that experienced summer outbreaks was 0.4 times lower than the underlying density of control farms.

Conclusion

PRRSV incidence during summer has remained constant throughout the years at a mean level of 3.2%. Therefore, it is expected that each year 3% of farms will have a PRRSV outbreak over summer. Swine producers should maintain biosecurity measures throughout the year.

References

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