Uterine prolapses trend in production sow herds

Carmen Alonso (alonso.carmen@outlook.com), Ginger Pelger (pelgerga@elanco.com), Jason Bargen

Keypoints:

- Uterine prolapse primarily affects sows around parturition and is still defined by an uncertain list of verified etiologies
- Since early 2013, swine companies have been experiencing an increase in the incidence of uterine prolapses in their herds
- Understanding the trends and potential risk factors would be crucial to improve the economics and welfare of the affected sow farms

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Background

Uterine prolapses are a rare event. Historically, prolapse rates have been estimated to be less than 1% of total sows dead (1); however, producers have been experiencing a worrying increase in this type of prolapse over the past years. Elanco Knowledge Solutions (EKS) Analytics Team was contacted by a group of swine companies to help interpret the data. The objectives of the study, were: 1) to analyze the trends in prolapses of sows from 2012 to 2016, and 2) to evaluate the role of management practices, production parameters, and PRRS and PED disease status as covariates in the trend analysis of uterine sow prolapses

Materials and methods

Sow herds from 7 production systems representing the major swine production states were voluntarily enrolled. Participant farms were asked to share their retrospective monthly production data as well as some of their feeding and management practices including parity, total born, toxic binder present, assistance during farrowing or "sleeving", and sow feed intake during gestation and lactation. Farms were considered positive for a disease if any month had a positive within the year otherwise their status was considered negative or "NA" if missing. All data sets were consolidated and analyzed using a Generalized Linear Mixed Model (GLMM) in SAS®. The computed model had "sows dead with prolapses over total sows dead" and "sows dead with prolapses over total sows farrowed" as response variables. The model also included "month" (1 to 12) and "year" (2012 to 2016) as fixed effect. Additionally, "system", "farm within system", and "year within farm and system" were entered as nested random effects. Both types of variables (fixed and random) were used to predict sows with prolapses per sows farrowed and p-values were adjusted by using Tukey Kramer's method.

Results and discussion

A total of 4,343,512 sow farrowing events from 153 farms in 2012 and 167 between2013 to 2016 were included in the study. The average percent of prolapse deaths out of total deaths within system ranged from 10.9 in 2012 to 19.5 in 2016. These rates increased over time. Each year was statistically different from other years, with the exception of 2013 and 2014 (p value=0.56). Month was also significant in the model demonstrating an important seasonal pattern (Fig1). Total born, the use of toxin binder, assistance during farrowing, and PED health status had an association to sow deaths with prolapse per sows farrowed (Table1). Results across years were demonstrated for each of the variables.

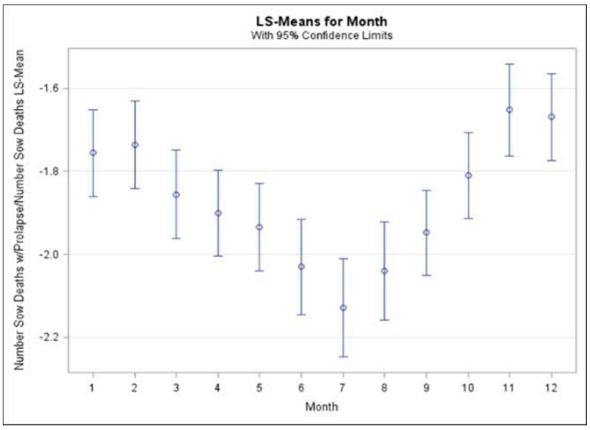

Figure 1. Monthly plot of proportion of sows with prolapses by total sows dead (log odds) estimate across 2012 and 2016.

Variable tested	Result	OR (95%CI)
Parity	*NS	
Total Born	Significant	1.03 –1.11
Toxin Binder (N vs Y)	Significant	0.78 –0.96
Assistance (Y vs. N)	Significant	1.02– 2.25
PED (neg vs. pos)	Significant	0.83– 0.99
PRRS (neg vs. pos)	NS	0.83– 1.01

Table1. Summary table of covariates odds ratio tested in the model.

Conclusion

Results from this study indicate that the percentage of prolapsed sows has consistently increased every year (significant from 2014-2106) as a percentage of total deaths with the incidence being higher during the winter months and the lowest during the summer months. Results from this study for the first time show an association to the covariates for the percentage of uterine prolapsed deaths per sow farrowed. Due to the limitations of this voluntary observational study, we cannot conclude that these associations are cause and effect relationships.

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References

1. Mahan-Riggs et al. (2016) AASV, 3: 23-24