Understanding Sow Mortality: Part 1

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Sow mortality has been a growing concern over the past decade. Studies have shown that the majority of deaths occur the week before and the first three weeks after farrowing (Deen & Xue, 1999; Sasaki & Koketsu, 2008). Mortality tends to increase during summer (Chagnon et al., 1991; Deen & Xue, 1999). We analyzed a decade of PigChamp herd performance records from four commercial farms to describe relationships in sow mortality. The farms had an average herd size of 3,700 for Farm 1; 2,437 for Farm 2; 2,505 from Farm 3; and 5,442 from Farm 4. We assessed over 350,000 PigChamp service records corresponding to 85,608 sows of which 11,852 died.

Deaths occurred at a median of 116 days (Interquartile range (IQR): 94 – 125) from last service, or 26 days (IQR: 5 – 103) post-partum. The distribution of deaths had two peaks, with the highest peak at 1-10 days post-partum followed by a much smaller peak at 131-140 days from last farrow. The second peak in mortality is likely representative of deaths that occurred during the prepartum phase of potentially unrecorded services or nonproductive sows that were unnecessarily kept in the herd. Additionally, the median parity upon death was 2 (IQR: 1 – 4), with 12.5% of all deaths recorded comprising of sows that never farrowed and a subsequent periparturient risk peaking after the first farrowing with over 20% of the deaths comprising sows that farrowed only once. Authors' experience suggest that the losses of younger females is common and is a factor that hinders cost-competiveness of the sow farms operations, as female break-even cost is typically at or after their third litter.

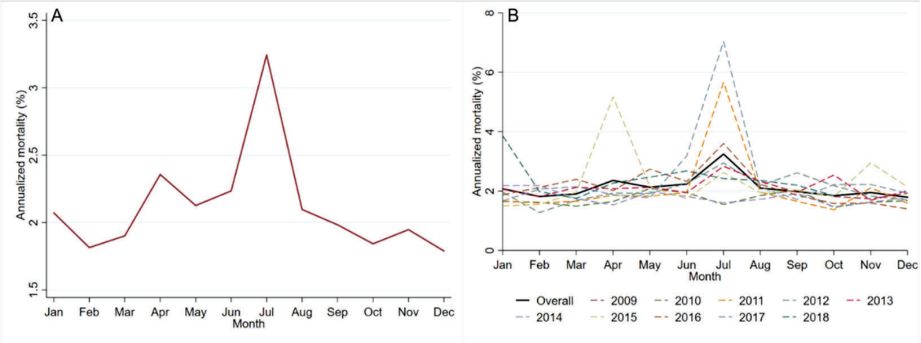

Figure 1. Overall (A) and yearly (B) annualized sow mortality by month.

The average annualized mortality per month represents the average percent mortality in 12 months if all deaths that occurred in a given month amongst the four farms regardless of year remained fixed throughout the course of one year. It ranged from 1.79% to 3.29% for all farms combined (Figure 1A). A higher mortality peak was observed in July (summer) as previously reported in the literature, but we also observed a smaller peak during April (spring). The spring peak was explained by a higher mortality in 2015 that was not observed in other years (Figure 1B). Similarly, the magnitude of the summer peak in mortality was not consistently high throughout the years, some years even presenting no peak at all during summer months. This was also evidenced when looking at mortality at the farm level. A higher mortality during warmer months is likely related to factors aggravating thermal stress (D'Allaire et al., 1996), in which case management practices such as higher ventilation and cooling can translate to lower mortality. Those factors can potentially explain why mortality is so high in some summers but not in others. However, to truly assess that association, further investigations on the actual barn temperatures and humidity and interventions in relation to monthly mortality are needed.

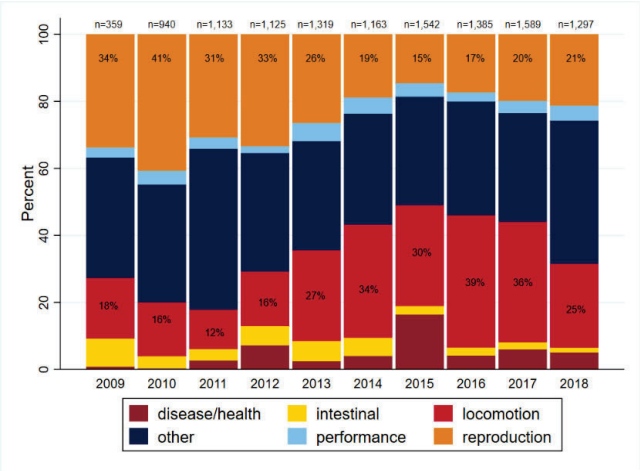

Figure 2. Removal reasons amongst deaths by year.

We also classified removal reasons amongst deaths into six categories as previously described by Ketchem et al. (https://www.nationalhogfarmer.com/animal-health/time-overhaul-sow-removal-records). Overall, the main reasons for death were locomotion (n=3,190; 27%) and reproduction (n=2,846; 24%), with disease/health, intestinal and performance reasons each accounting for less than 6% of all deaths. Of course, these proportions were not consistent throughout the years, with reproduction reasons decreasing from 34% to 21% and locomotion reasons increasing from 18% to 25% in 2009 and 2018, respectively (Figure 2). We also looked at percent of death removals due to pelvic organ prolapse over the years. This percentage fluctuated between 4% and 13% and, although it had been consistently increasing during 2015-2016, it is still within the range of the observed in the previous years. Of note, overall, 36% of the deaths were classified as due to "other reason", which included unknowns, depopulations, and behavior problems, among others. Other than completion often being an issue with retrospective studies using production records, the decision regarding cause of death involves several aspects such as the recorder's training, knowledge and availability of supporting data for such diagnosis. Thus, these limitations must be considered when describing sow mortality.

For part two of this article, we will explore environmental, farm-level and individual-level factors possibly associated with sow mortality using different methodological approaches and discussing its limitations and implications.

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