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Sow mortality in the US: An industry-wide perspective

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Sow mortality rates have reportedly been increasing on many swine farms. The reported sow mortality rates exceed those historically reported in the literature[1,2]. The purpose of this project was to re-evaluate sow mortality to see if there was an upward trend and define some of the factors currently involved.

The reason for this study is that sow mortality is a real—and probably increasing—expense on most sow farms. The expense involved in losing a sow, either due to culling or death, can be categorized in three major areas. The first is simply the cost of replacing that animal. In most cases this will be with a gilt, but when gilts are in short supply this will mean the retention of a sow that should be culled. If a sow dies during gestation there are also the opportunity costs involved in a shortfall in production of piglets. Replacement costs plus opportunity costs can easily equal for $400–$500 per sow that dies. In addition to that we should not forget that increased mortality rates are often also a concern to employees and can negatively affect morale.

Technique

For the purpose of this study we collected approximately 3.6 million sow parity records from across the United States industry for the years 1996 to 1998. Records were relatively good for hard data as the record-keeping systems were used for inventory purposes as well. In this study we decided not to examine soft data—such as recorded reasons for mortality—as the reasons differed widely between systems and farms. Instead, hard data such as seasonality, stage of reproductive cycle, and parity were analyzed.

Results and discussion

Figure 1 illustrates the average mortality rates seen across the database. It appears that there has been a significant increase in sow mortality in the systems examined—no system appeared to be free of this trend. These rates are also significantly higher than reported as industry average rates in much of the literature[1,2]. Reported annualized rates of less than 5% are not seen in this database.

Some seasonality is evident, as a shown in **Figure 2**. There were significant differences between systems and areas as to the extent of the increase in summer sow mortality. This trend has been previously reported and is widely recognized as a problem[3].

There is also some interaction between season and stage of the reproductive cycle as a risk factor in mortality. **Figure 3** shows the cumulative proportion of mortality as it occurs during the period post-farrowing date. As can be

Figure 1. Monthly mortality rates, 1996–1998

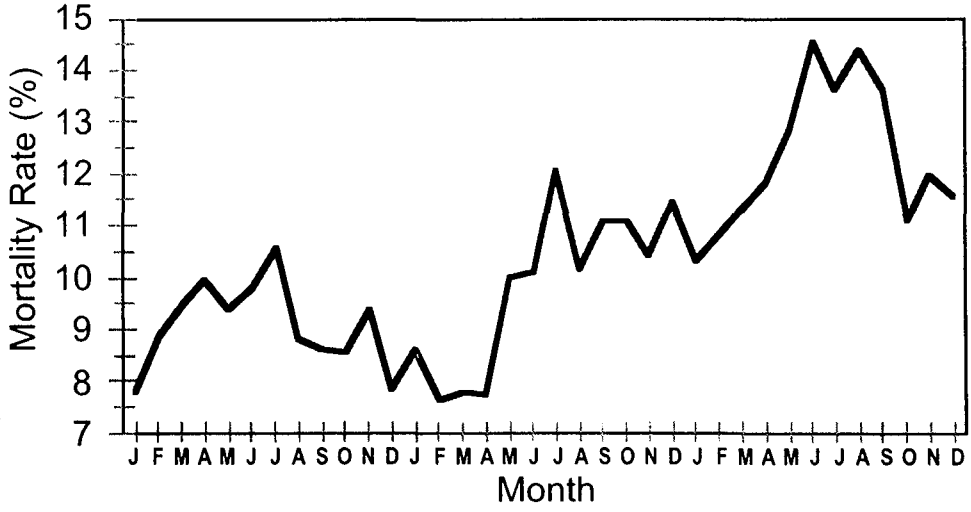


Figure 2. Seasonality of sow mortality

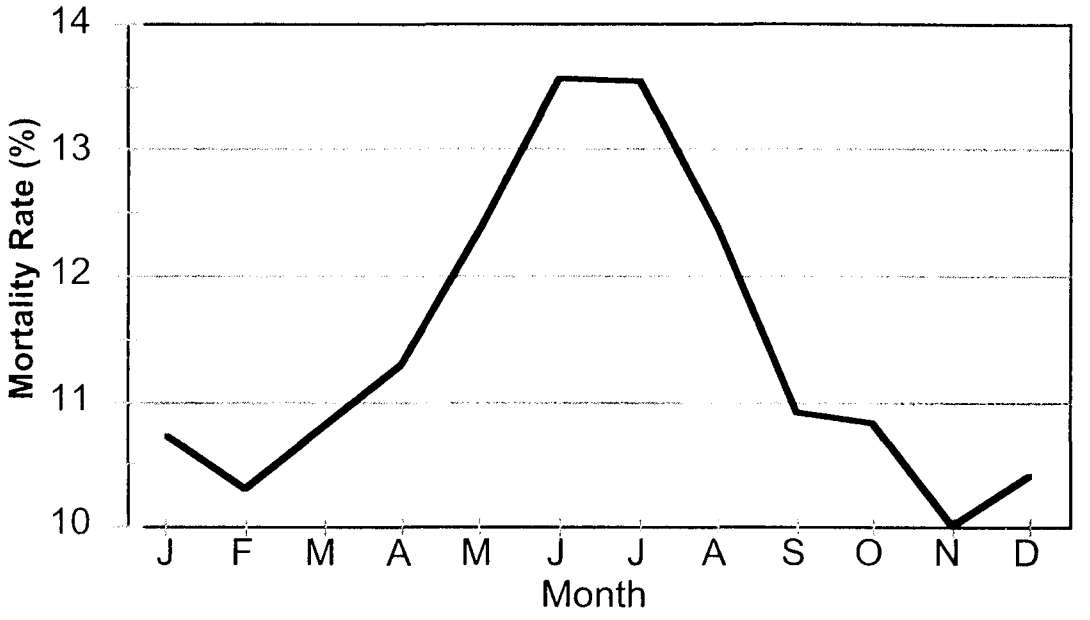
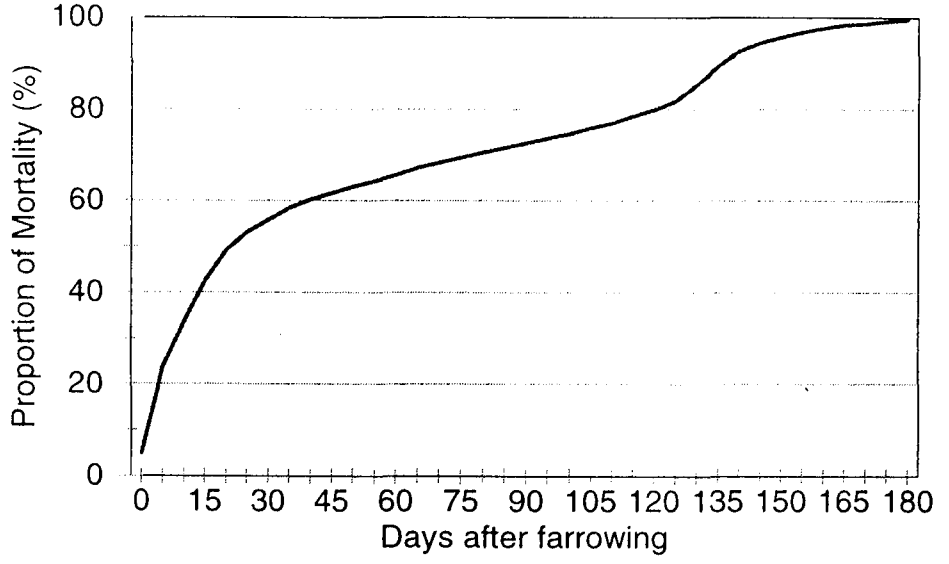


Figure 3. Cumulative proportion of mortality after farrowing



seen, approximately half of the mortality occurs during the first three weeks after farrowing. For those sows that farrowed during the summer months, this proportion goes up to approximately 65%.

Of course, not all sows reached the point of farrowing before mortality occurs. In this database, approximately 27% of the mortality occurred in sows that never farrow. The distribution of proportion of mortality in these sows is shown in **Figure 4**. There appears to be some initial insult and then a subsequent periparturient risk.

This initial parity is the major parity at risk in most systems. **Figure 5** shows the average mortality rate per parity. There appears to be a wide variation in these numbers, however. In some farms higher parities are at a much higher risk of mortality. This appears to be associated with the culling practices on the farm. In one of these systems, we showed that the risk of mortality for a breeding group was inversely related to the gilt pool size at time of breeding. In other words, if the gilt pool is too low at time of weaning, the sow is more likely to die during the next parity record as it was probably retained too long.

Figure 4. Mortality rates between entry and farrowing

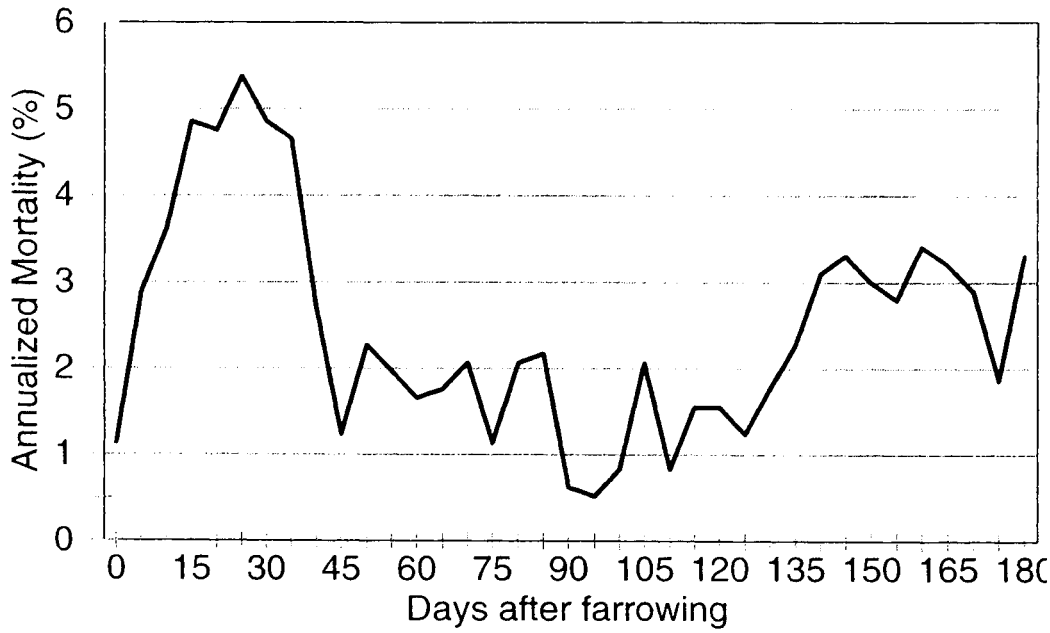
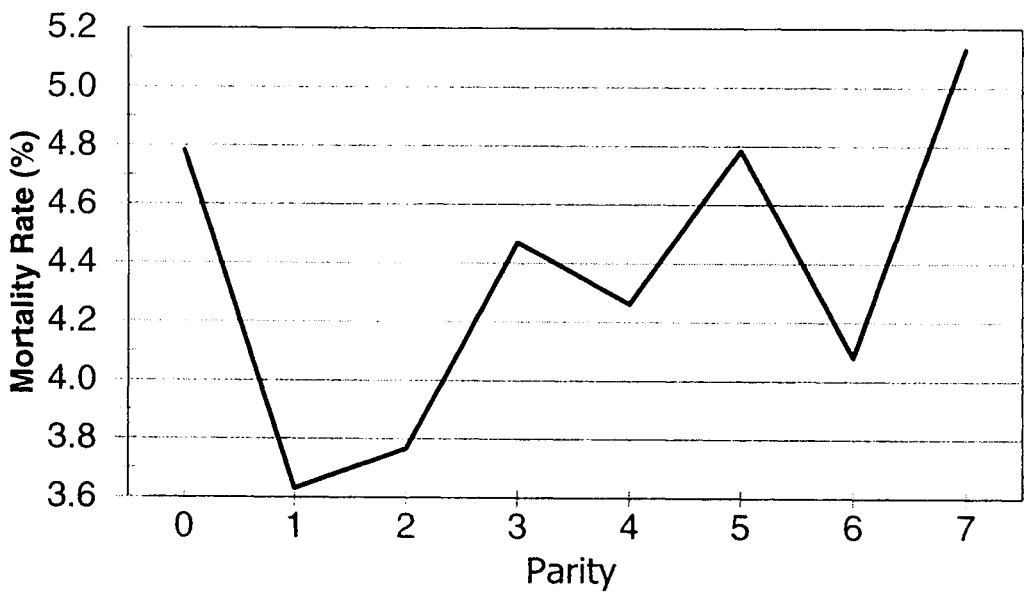


Figure 5. Parity level mortality rates



It will be useful to analyze more farm system level practices. At the sow level there are more identifiable sources of risk. When age is recorded, the risk of mortality is increased with decreasing age at first farrowing, with the odds increasing by 0.2% per day of age. Sows that have more stillbirths are also more likely to die subsequent to the stillbirths—the odds increase by 24% when one or more stillbirths occur. Finally, when farrowing condition was recorded, this also was related to the risk of mortality, and sows were more likely to die with a lower condition at time of farrowing. All these indiviual level variables are statistically significant at $p<.0005$, though their economic benefit for intervention still needs to be examined.

Summary

There is not one unique pattern of mortality available in this database. Nor is there a distinct pattern through which mortality has increased. It appears that there are risk factors that have increased with the advent of changes in sow management and pig production. It appears that there are times of real risk, especially in the periparturient phase, during periods characterized by warm ambient temperatures, and, sometimes, in young parities. The statistical

analysis does not suggest a single agent model, but it does show opportunities for improvement.

References

1. Abiven, N. et al., Risk factors for high sow mortality in French swine herds.Preventive Veterinary Medicine. 1998; 33: 109–119.
2. Christensen,G. Vraa-Andersen,L. Mousing J. Causes of mortality among sows in Danish pig herds. Veterinary Record. 1995; 16: 395–399.
3. D'Allaire, S, Drolet, R, Brodeur, D, Sow mortality associated with high ambient temperatures. Can Vet J 1996;37: 237–239.