Abstract

The purpose of this study was to examine the effect of periparturient sow factors on the longevity of sows. This study followed sows from time of entry into the farrowing crate until a subsequent farrowing event or removal from the herd. We focused on younger parity sows (1 through 3) as inaccurate or improper culling is of the highest cost in these parities.

As a generalization, three four of sows can be considered for retention in early parities. The first is sows with no problems in reproductive performance or physical condition. The second is sows with problems of physical condition. The third is sows with historically poor reproductive performance. The fourth class are sows with a combination of for reproductive performance and problems in physical condition. This latter class of sounds is large and culling is too often simply attributed to problems in reproductive performance.

The recommendations of this study are twofold. The first is to recognize causative factors for poor physical condition. We saw a great deal of lameness, and particularly claw lesions, leading to poor feed intake and subsequent poor reproductive performance. Secondly, historic reproductive performance is poor predictor of subsequent performance and should not drive culling decisions.
Introduction

The economic disadvantages associated with poor sow longevity are exacerbated when sows are removed at very lower parities, before highest productivity levels are attained. Yet levels of removal are high in many herds. Therefore it is important to validate the removal decisions of sows. The removal decisions based on production can be evaluated based on predetermined production criteria and subsequent performance of the herd. However, the decisions made based on welfare reasons are difficult to evaluate since there are only few predetermined criteria to aid the producer.

Poor welfare ultimately leads to poor production performance and thus it is possible to validate the decisions made to remove or retain a sow based on subsequent performance. The present study proposes to analyze the association between sow longevity and risk factors during the periparturient period. It is also proposed to validate the welfare related removal/retention decisions made based on conditions prevalent at periparturient period when the risk of removals are reported to be high.

Objectives

1. To identify and analyze the association between periparturient risk factors and sow longevity in breeding herds.

2. To validate the retention decisions made at the periparturient period.

Materials and Methods

This observational study was conducted at a commercial farrowing facility in Eastern Minnesota which has a herd size of greater than 7000 sows. This farrowing facility was supplied by 4 gestation sites. Data on the conditions affecting the longevity and welfare of the sow during the periparturient period were collected over a period of 5 months starting from December 2005 from observation of sows during the periparturient period. Sows were inspected on entry into the farrowing crate and then they were monitored for the development of conditions through the lactation period. Data collected included incidence of diseases, treatments given, duration of treatment, outcomes of treatment, parity, litter size, pre-weaning mortality and lactation length. Details of feed intake on days prior to farrowing and during lactation were collected from the feed card of each sow. Data on farrowing induction and farrowing assistance as risk factors of sow longevity in the herd were also collected. The PigCHAMP database of the unit was also used to supplement the data collection process. Additional data on shoulder lesions, and on the type and severity of claw lesions among the sows included in the study were also collected, guidelines for claw lesion scoring are seen in Figure 1. In addition, retrospective data (from 2002 to 2005) on parity, farrowing performance, farrowing induction and assistance and longevity of sows in the herd were also collected.

Correlation analyses and proportion tests were performed to identify the individual factors associated with longevity, and subsequent breeding and production performance. The association between the identified factors and longevity of these sows will be analyzed using multivariate logistic regression model (SAS V 8.1). The use of multivariate models was a universal requirement as the linkages of performance was complex and found to be correlated
Results

What became readily evident in the analyses was that productivity and welfare conditions are far from independent of the productivity concerns of the farm. Conditions at time of farrowing were a large concern, and intervening conditions of feed intake and subsequent reproductive performance are major determinants of likelihood of retention.

Analysis involving parity of sows, piglets born alive, presence of mummies and stillborn, season of farrowing, farrowing induction and farrowing assistance indicated that sows that did not need assistance in farrowing were 10% less likely (P<0.5) to be removed than those requiring assistance for farrowing. Farrowing induction was found to be beneficial in that induced sows were 18% less likely to be removed than non-induced sows. Results also suggested that the likelihood of removal from the herd decreased by 10% with the birth of every live piglet. The likelihood of removal from the herd was 64 and 52% lower for sows of parity 1 and 2, and 3-5 compared to sows of parity >5. Sows farrowing in the 2nd and 3rd quarter of the year had higher likelihood of removal from the herd than sows farrowing in the last quarter (Odds ratios 1.088 and 1.341 respectively). Sows with no stillborn piglets were 12% less likely to be removed from the herd than those with stillborn piglets.

Results also indicated that the likelihood of removal from the herd decreased with an increase in average daily feed intake and in the number of piglets born alive. The likelihood of removal from the herd decreased by 11% with every 1 lb increase in average feed intake during lactation. Similarly, the odds of removal from the herd decreased by 7% with every additional piglet born alive. Other factors such as mummies, stillborn, reported incidences of diseases during lactation, farrowing induction, farrowing assistance and lactation length did not appear to influence sow longevity in this study. Sows consuming < 9 lbs feed on a single day during the first 2 weeks of lactation were found to have 27% higher likelihood of removal from the herd. The study suggests that measures to ensure adequate feed intake from the start of lactation may minimize sow removals in breeding herds. Inadequate consumption on a single day can reduce sow longevity.

The sows involved in this study were housed in 4 farms during gestation and were brought to a single farrowing facility where observational data were collected. The proportion of sows with lesions on different claw areas among the farms was compared (Figure 2). Figure 3 presents the proportion of sows (all farms together) with lesions on different claw areas. Figure 4 shows the proportion of sows with different intensities of lesions on different claw areas. Claw lesions, particularly vertical cracks and white line lesions were found to be associated with culling land analyzed using pathway analysis, using feed intake and condition scores as intervening variables.

Though the link with longevity was not analyzed, the data collected indicated that the likelihood of shoulder lesions increased by 16% with one day increase in lactation length. Sows with body condition score ≤ 2 had higher likelihood of shoulder lesions than sows with score >2. Similarly non-lame sows had 73% lower likelihood of shoulder lesions.

Lay Interpretation

The purpose of this study was to examine the effect of periparturient sow factors on the longevity of sows. This study followed sows from time of entry into the farrowing crate until a
subsequent farrowing event or removal from the herd. We focused on younger parity sows (1 through 3) as inaccurate or improper culling is of the highest cost in these parities.

As a generalization, four categories of sows can be considered for retention in early parities. The first is sows with no problems in reproductive performance or physical condition. The second is sows with problems of physical condition. The third is sows with historically poor reproductive performance. The fourth class are sows with a combination of for reproductive performance and problems in physical condition. This latter class of sows is large and culling is too often simply attributed to problems in reproductive performance.

The recommendations of this study are twofold. The first is to recognize causative factors for poor physical condition. We saw farrowing problems and claw lesions leading to poor feed intake and subsequent poor reproductive performance and poor sow condition. Secondly, historic reproductive performance is poor predictor of subsequent performance and should not drive culling decisions.

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Figure 1: Scoring system for claw lesions
Figure 2: Comparison of the proportion of sows with claw lesions on different claw areas among the 4 farms
Figure 3: Proportion of sows (all farms together) with lesions on different claw areas
Figure 4: Proportion of sows (all farms together) with different intensity of lesions on different claw areas.