

Better colostrum distribution increases piglet survival in high prolific sows

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Introduction

Colostrum intake is critical for the survival of the piglet. During the first days, the colostrum provides the nutrients for homeostasis and growth. For a much longer period the colostrum immunoglobulin fraction passively protects the piglets from disease (1). Only during the first 24 to 48 hours of life, these colostrums IgG's can pass the piglets gut. The colostrum intake per kg body weight (BW) ranges between 210 to 370 gram, but the capacity of a piglet to ingest colostrum is exceeding 450 gram/kg BW (2). The total colostrum yield of sows varies between 1.91 and 5.31 kg (3). Because litter size does not affect colostrum yield (3), in hyper prolific sow breeds, a high variation in colostrums uptake is difficult to avoid.

The aim of this study was to investigate the impact of colostrum distribution on pre-weaning piglet survival in high prolific sows.

Materials and Methods

In a 1600 sow farm, the litters of 220 sows were included in the study. At 3 days of age, individual blood samples were retrieved from the docked tail of six randomly chosen litter mates. The IgG titre of the samples was measured with a DAS-ELISA test (Colostrum Quality Counter™). This IgG titre, determined after the phase of colostrums IgG passage through the gut, can be used as a measure of colostrum intake (4). Of each litter, the average IgG titre and the standard deviation was calculated. By dividing the standard deviation by the average, the coefficient of variance of piglet serum IgG (CV IgG) was calculated. This coefficient is a measure for variation in IgG intake within the litter, and therefore represents the variation of colostrum intake. During the lactation period piglet mortality in each litter was recorded. The statistical analysis was performed with the SAS® program. A Poisson regression model on the number of dead piglets per sow was used. The total number of piglets was included as covariate.

Results

The CV IgG amongst litter mates ranged from 18 to 208%, with an average of 55%. In Table 1, the impact of colostrum distribution on piglet mortality is shown. Sows with a CV IgG of less than 50% (average 36%) were compared to those with a CV IgG of more than 50% (average 76%). With the same average litter size, the mortality was found to be statistically significant lower in litters with a low CV IgG.

Table 1: Impact of colostrum distribution on pre-weaning piglet mortality

CV IgG	Number of litters	Piglets with sow	Mortality (%)
≤50%	117	12.5	5.1 ^a
>50%	103	12.6	7.7 ^b

^{ab}: difference with p-value of 0.0259

The mortality rate over all litters was highly correlated with the number of piglets with the sow ($p < 0.0001$).

Discussion

These results clearly demonstrate that an even distribution of the available colostrum amongst littermates has a positive impact on the pre-weaning survival rate. The high number of piglets born alive, often in combination with low birth weight and low vitality as seen in highly prolific sows, reduces the chances of equal colostrums uptake amongst littermates. This leads to piglet loss mainly in the first days after birth. The ability of the sow to give all her piglets equal drinking opportunity is therefore a key factor. Even with a good colostrum distribution, mortality increases with the litter size, demonstrating that an increasing number of piglets calls for a higher colostrum yield, an increasing number of functional teats and sufficient drinking space. On the other hand, piglet suckling might also be promoted by reducing or eliminating all stress related behavior during the colostrum intake phase enabling the sow to optimally nurse her offspring.

All measures that improve the transfer and equal distribution of the available colostrum to each piglet should be taken into account to improve piglet survival.

References

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