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The Investigation of Sow Herd Replacement

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Abstract. The objective of present study was to investigate the impact of the sow herd replacement in a Hungarian commercial swine farm with 1200 sows comparing with other 3 farms that belong to same management. Data were obtained from 2003 to 2011 considering that a total herd replacement has been carried out in the examined farms in 2005. In the paper were observed the annual mean of the main breeding indicators: number of mating/sow, number of farrowing/sow, farrowing rate, litter size/parturition, feeding indicators like the feed intake/sow, feed intake/fattening pig and some economic indicators in terms of herd replacement: medicine cost/sow, feed cost/living weight in all farms. The results showed that the sow replacement had a positive effect for each examined breeding indicator, which was observed during 2-3 years. Furthermore, this herd replacement decreased significantly the cost of medicine, too.

Keywords: sows, herd replacement, breeding and feeding indicators, economic indicators

INTRODUCTION

Nowadays the animal replacement problem is one of the most important challenges in herd management. The replacement decisions have not only a direct economical impact for the farmer, but also for the meat supply chain where herd production is integrated (Rodríguez *et al.*, 2011).

Replacement of sows is basically defined as a management decision determining the optimal time to replace a sow, based on the characteristics of individual sows (e.g. farrowing rate, litter size). This decision will influence the expected lifetime of sows, the annual replacement rate, the piglet production capacity and other important key figures for planning of the pork supply chain (Szőke *et al.*, 2009).

Several models focusing in the sow replacement decision have been developed and published in literature, which made use of different mathematical methodologies to optimize management alternatives or to explore new ones. However the main aim of these studies focused to describe the construction and application of different models (Plá, 2007; Kristensen and Søllested, 2004a,b), against this in present study was examined in the past occurred herd replacement without modeling.

The aim of the investigation was to present the impact of a total herd replacement in case of an exist farm comparing with other farms.

MATERIALS AND METHODS

The data in this study were collected from 4 farms in the Alföld region of Hungary, which are members of big swine integration with common management. Between the

examined farms there are one nucleus (Herd A) and three fattening (Herd B, C and D) farms which one of this (Herd D) a total herd replacement was performed in the second half of 2005. The cause of the necessary of herd replacement was the below average performance indicators of the sows.

In each farm the genetics of the sows were the same crossbred: Dutch Large White × Dutch Landrace but the average sow number per year was in Farm A 750, Farm B 750, Farm C 3000 and Farm D 1200. Because of the farms have different livestock size, thus the calculation of examined parameters was performed per sow or living weight.

Source data were from on farms led recording paper (in Excel format), which included several information of the animals, the production and the costs relating to the last years. The examined period was from January 2003 to November 2011 except in the case of the cost parameters, which were available only from January 2005. The data between 2003 and 2011 were divided into three parts: interval before the replacement; interval of the replacement and the entering in production of the new gilts and interval after the replacement. In the study focusing on the Farm D were investigated breeding, feeding and cost parameters using the MS Excel spreadsheet and creating diagrams to represent the results.

RESULTS AND DISCUSSIONS

The results of the research are presented in line diagrams. In these diagrams the darkest line shows the annual values of Farm D where the full herd was replaced in second half of 2005. The interval of the herd replacement and entering the new gilts was marked with gray stripe in each figure like a less important period in terms of the investigation.

From the main breeding parameters the number of the annual average mating per sow showed an improving tendency by each farm (Fig 1). The worst value (2.9) was observed in Farm D in 2003 that followed the interval of the herd replacement when the new gilts had to mated more times, thus the number of mating increased more. After the entering in production of the new gilts the Farm D closing up the other farms achieved the best value (2.5) in 2008 than stayed on the level of the fattening farms.

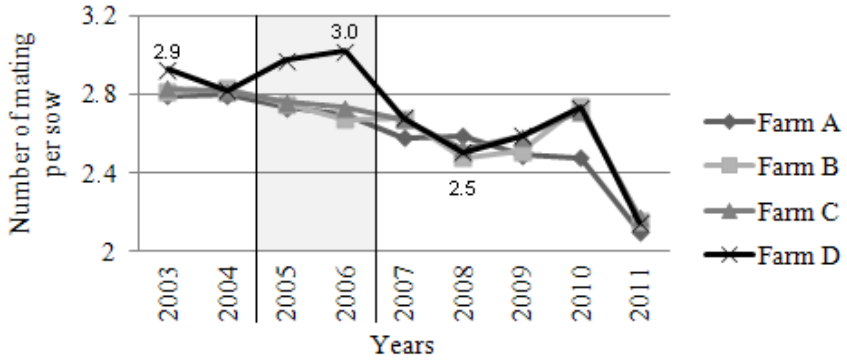

Fig. 1. The annual average number of mating per sow

The number of annual average farrowing per sow presented a similar result (Fig 2.) than the number of mating per sows. Farm D had the lowest farrowing value (2.17) that increased significantly after the replacement period getting the best value between the farms in 2008 (2.38).

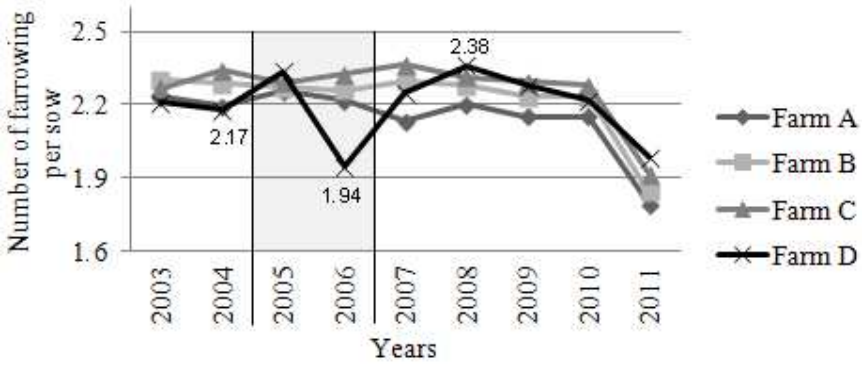

Fig. 2. The annual average number of farrowing per sow

The farrowing rate that can calculate as dividing the number of farrowing by the number of mating gives answer about the success of the conception. In present investigation the annual farrowing rate was over 80% at the beginning of observation except for the Farm D where this value was about only 75%. Naturally this value was smaller (under 70%) in 2006 due to the new gilts. However, after the entering the new gilts there was experienced a continuous development. The farrowing rate improved year by year which can be explained with the decreasing necessity of mating. The effect of previous that Farm D exceeded the value of 90% after the replacement period and it had the highest farrowing rate (94%) in 2008.

In case of the other farms, it can say that the nucleus farm performed at the weakest level (80-90%) because of the smaller average number of farrowing. The conception rate of fattening farms was uniformly about 90% which value characterized also the Farm D after the herd replacement.

From the examined breeding parameter the average number of piglets per litter can see in Fig. 3. The average litter size was the worst in Farm D, but it increased from 10.5 piglets to 12 piglets per sow due to impact of herd replacement. From 2008 the Farm D performs at an average level similar to the Farm B. In additional there was observed, that the fattening Farm C with 3000 sows had the best litter size (12.5 piglets), whilst the sows of nucleus Farm A farrowed one piglet less per parturition.

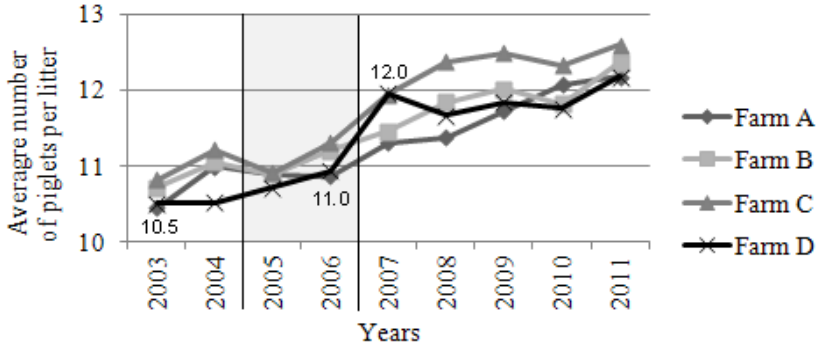

Fig. 3. The annual average number of piglets per litter

The following examined parameter was the feed intake, which was observed from 2003 in each month. The values of this feeding indicator showed difference neither by the sows nor by the fattening pigs during the examined period. Although there was some smaller fluctuation (bigger feed intake in winter), but generally was experienced similar values in all farms (3.2-3.4 kg feed by sows and 2.9-3.1 kg feed by fattening pigs).

Finally the two most important cost parameters were investigated which were the medicine cost per sow and the feed cost per 1 kg living weight. These data were available only from January 2005. The monthly cost data were compared with the starting value (basic value was January 2005) and the proportion of the change was calculated in each month in all farms.

The change of the medicine cost shows the Figure 4. Though there was available little information about the period prior to replacement but the difference is evident. The medicine cost decreased by half in the Farm D after the herd replacement and except for some extreme values it stayed at the level of the starting period after 2009, too. Against the previous, there was not observable significant change in Farm A, however, in fattening farms the change of medicine cost was double and three-fold in some months.

The change of feed cost per living weight showed a same tendency (Fig. 5) in case of each farm (expect for Farm D in the replacement period and during the entering of new gilts). It can see an increase in 2008, which is the consequence of more expensive feed.

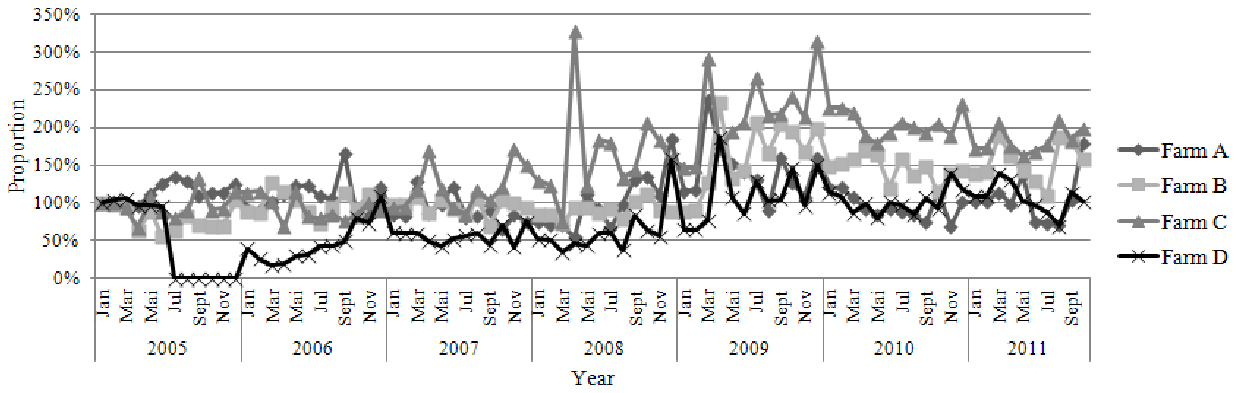

Fig. 4. Proportion of medicine cost per sow (January 2005 = 100%)

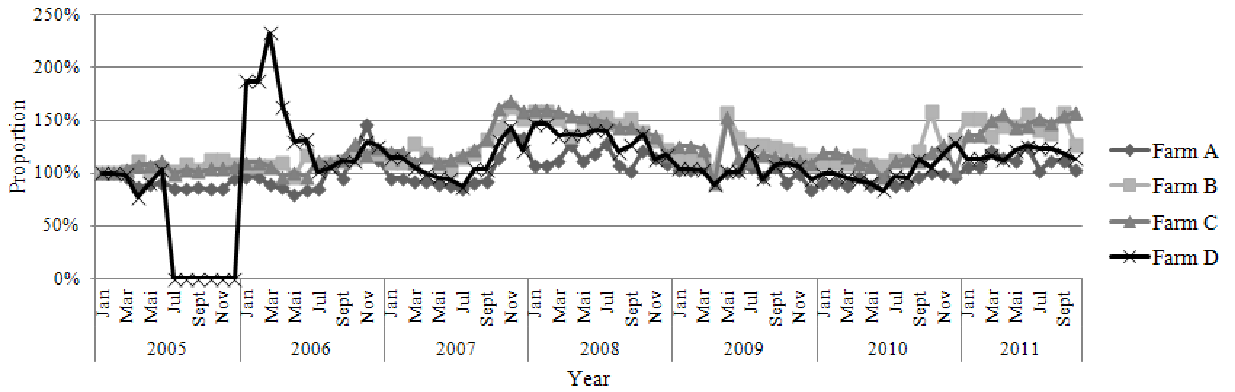

Fig. 5. Proportion of feed cost per living weight (January 2005 = 100%)

CONCLUSION

In summary, it can conclude, that before the herd replacement there was a backwardness in Farm D, having the worst performance indicators, thus there was reasonable the decision of management about the full herd replacement.

After the replacement, when the new sows entered in production, there was observed a significant improvement by the examined breeding parameters in the replacement following 2-3 years. The best values of the investigated parameters were achieved in 2008, which values surpassed the performance of the other farms.

Similarly there was a significant positive effect of the herd replacement on the medicine cost that decreased by half after the replacement.

However, there was not observed the effect of replacement on the feed intake and the feed cost.

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