

Investigation of Lifetime Performance in Dutch Large White × Dutch Landrace Crossbred Sows

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Abstract

The aim of present study was to show the main production parameters of sows based on 4359 crossbred Dutch Large White and Dutch Landrace pigs. The data were collected from 2004 to 2010 from Hungarian nucleus farms to analyze the lifetime performance of removed sows. The paper has studied the frequency of different culling reasons, the average lifespan of removed sows and the number of piglets born alive according to the parity. The result showed that the most frequent reasons for sow removal were the different fertility problems (29.5%) and productivity problems (26.8%). In addition, it was detectable that the 35% of culling occurred after the first farrowing or before this and there were removed 95% of the examined sows after the 8th parity. The highest litter size was observed at the 6th parity when the mean of lifespan of sows was 1210 days.

Keywords: crossbred sows, culling, lifetime performance.

1. Introduction

Pig-farming has a long tradition in Hungary. Similarly to other countries, the pig-breeding is based on purebred crossing programs and hybrid pigs which genetics come from inside or foreign countries. However, in all cases can be said, that the main aim of farmers is to achieve an economically efficient production.

The genetics of sows is one of the most important factors of the maintaining herd production at a constantly high level. The more productiveness herd with higher number of litters per sow will increase the mean age of the herd and increase also the income per year.

The performance of a sow has been measured in several ways, e.g. number of litters produced in a lifetime, lifespan and length of productive life (longevity) [5].

Productive lifetime can be described as the length of time from some initial event like herd entry, first

mating, first farrowing, etc. until the animals is culled from the herd or is a mortality.

Improving the lifetime performance of sows is an important way to increase the productivity and profitability of a sow herd [2].

The culling rate of sows in commercial herds was particularly high in early parities (approximately 30% of sows were culled before the third parity) [1] and that first parity animals had the highest overall culling rate of all parities (approximately 15-20%) [3].

Current the sow culling rates are excessive and often sows are removed from the breeding herd before reaching their breakeven parity. Longevity of a sow is determined by many factors [4]. Not only the sow's biology, but also season, management and housing are important. In addition, it is the herdsman's subjective decision that determines whether a sow will be removed.

The objective of this paper was to report the lifetime performance of crossbred Dutch Large White and Dutch Landrace sows, in aspect of frequency of farrowing.

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2. Materials and methods

Lifetime performance of sows was examined using a data set consisting of individual parameters for 4359 culled Dutch Large White and Dutch Landrace crossbred pigs.

The analysis was based on data from commercial nucleus farms which are situated in the Great Plain region of Hungary. These farms are the members of a big swine integration; the management of farms is common, and the main traits of farms (feeding system, breeding technologies) are also similar.

The source data of the culled sows was collected electronically from the farm-led monitoring program.

The time period examined was from 2004 to 2010, in which time were recorded the date of birth and culling, the reasons for culling, the number of farrowing and the number of piglets born alive in case of all sows.

To the calculations, the MS Excel spreadsheet and the SPSS 17.0 statistical package were used.

3. Results and discussion

In first part of our work we investigated the reasons for removal. There was found several culling reasons in the farm-led monitoring program. To the analysis we separated into five main groups these different reasons, which are the following:

1. Problems with fertility, that include no observed puberty in gilts, anoestrus of sows, return to estrus, negative pregnancy diagnosis and abortion.
2. Low productivity, that means low number of pigs born alive, low number of weaned pigs, mammary problems, inadequate performance, thin sow syndrome and old age.
3. Leg weakness, claw problems, lameness.
4. Mortality, that means the death and the compulsory slaughter.
5. Other reasons for culling and removal, that mean the less frequent problems and the not recorded reasons.

According to the previous categories of removal, Figure 1 represents the distribution of five groups of culling reasons.

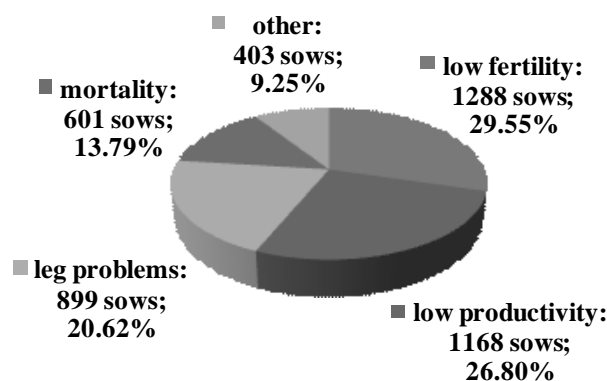


Figure 1. Graphical illustration of frequency of different reasons for removal

The result of pie chart shows that the most sows (more than 50% of overall animals) were culled due to their reproductive performance (low fertility or low productivity).

In studies from other authors [1, 3, 8] the most commonly reported reason for removals was also the reproductive failure accounting for about 30% of all removals, followed by lameness and leg problems (11–14%).

In our examination the higher rate of reproductive problems was because our classification differed from the grouping of previous studies: culling due to low productivity includes also the sows culled due to old age.

In additional, there was also significant number the sows that culled due to different leg problems (20.64%). It is almost the double of the reported value. However, the study [6], which monitored the production and reproduction traits of sows in Czech Large White breed and Czech Landrace, published that the most frequent reason of culling was the leg problems (27–28 % of overall sows), followed by low pregnancy and low fertility.

The lifespan of sows at culling is demonstrated in Figure 2. It can be seen that the most sows were removed in early period of their lifetime. The reasons of the high culling in this period can explain with the proportion of culled sows due to low fertility. The gilts or sows, which have some kind of problem with fertility, cannot take part in production.

At the end of the sows production (about 1500 days) can be also observed a higher frequency of culled sows.

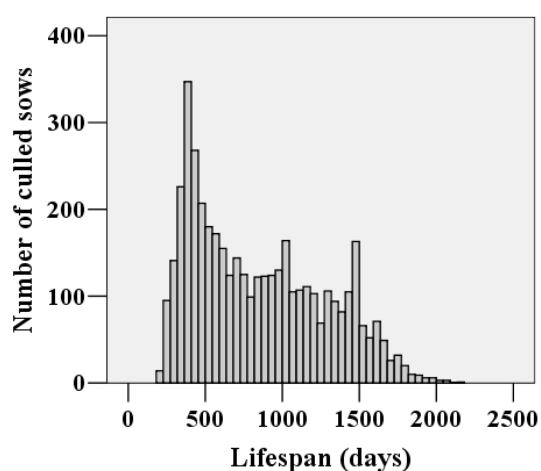


Figure 2. Distribution of sows lifespan at culling

It is the consequence of management policy. The observation of management is that the most effectiveness production is realized if the sows do not remain in production after 8th parity. Examining the lifetime performance of culled sows according to the number of farrowing was summarized in Table 1.

The table includes the data of animals in the aspect of how many times farrowed the sow before was culled. The results show, that the 17 % of pigs were removed because of failing piglet production (mean of lifespan 346 ± 60 days) and further 18% were culled after the first farrowing when the mean of sows lifespan was 465 ± 70 days.

The explanation is again the high rate of culling due to different fertility and productivity problems.

In additional, there can be observed a higher frequency in case of the sows which farrowed 8 times before were culled (mean of lifespan 1490 ± 61 days), following from the management policy. After this productive time the most sows were selected with the exception of some excellent sows (5 % of overall sows).

By other authors the optimal time of sow culling is also recommended at parity 7 and 8 to maximize the herd productivity.

Table 1. Performance data of culled sows according to the number of farrowing

| | Number of gilts/sows | Mean of lifespan | Mean of piglets |
|------------------------|----------------------|------------------|-----------------|
| Not farrowed gilts | 747 (17.14 %) | 346.35 ± 60.38 | |
| 1 times farrowed sows | 781 (17.92 %) | 465.17 ± 69.66 | 9.50 ± 3.41 |
| 2 times farrowed sows | 468 (10.74 %) | 622.36 ± 69.88 | 19.75 ± 5.69 |
| 3 times farrowed sows | 404 (9.27 %) | 776.66 ± 74.14 | 31.64 ± 6.35 |
| 4 times farrowed sows | 393 (9.02 %) | 932.58 ± 73.44 | 43.54 ± 7.30 |
| 5 times farrowed sows | 388 (8.90 %) | 1058.27 ± 70.87 | 54.18 ± 7.79 |
| 6 times farrowed sows | 325 (7.46 %) | 1209.78 ± 77.60 | 67.49 ± 8.81 |
| 7 times farrowed sows | 272 (6.24 %) | 1355.63 ± 64.43 | 77.83 ± 9.74 |
| 8 times farrowed sows | 344 (7.89 %) | 1490.40 ± 61.36 | 89.93 ± 10.13 |
| 9 times farrowed sows | 157 (3.60 %) | 1638.67 ± 60.12 | 100.80 ± 9.59 |
| 10 times farrowed sows | 60 (1.38 %) | 1791.07 ± 58.31 | 113.67 ± 9.42 |
| 11 times farrowed sows | 20 (0.46 %) | 1964.94 ± 50.92 | 124.56 ± 12.16 |

As an important indicator of reproductive performance, the table includes the mean of piglets born alive per sows in case of the overall lifetime. The average number of piglets was 10-11 pigs per parity. The highest value (more than 11 piglets per parity) can be observed by the sows which farrowed 6 times before were removed from the herd.

The average litter size was similar by the sows which farrowed more than 6 times. It means that the way of selection was effective in these herds and really just the most productive sows were kept in production.

4. Conclusions

In summary, it can say, that the herd management have a significant effect on sows lifetime performance. The decision of management influence the sow's parity number, production, reproductive status, health status, and herd structure, as well as access to replacement gilts of relevant reproductive status.

Acknowledgements

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