

ANALYSIS OF REASONS FOR CULLING OF SOWS IN PRODUCTION HERD

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Abstract

The objective of this work was to analyse reasons for culling of sows from a basic herd of a selected production farm. From the total number of 540 sows (maternal line Topigs 40) in basic herd, 119 sows were culled during the observation period. Culling was evaluated in aspects of parity order and causes. Evaluation according to the parity order showed that the highest levels of culling were reached after the 1st and the 2nd parity, with 22 % or 21 % of sows culled from the basic herd, respectively. In the aspect of specific causes of culling, the most frequent ones were reproductive disorders (34 %), followed by musculoskeletal disorders (27 %) and low performance (18 %). Other causes (bad condition of mammary gland, health condition) each represented less than 10 % of the cases. The most frequent reproductive disorders were sterility (47 %), anestrus (38 %), difficult farrowings (10 %) and other problems – conception issues, abortions (5%).

Key Words: Sow, reproduction, longevity, culling

Breeding of sows is a key part of whole pig breeding, since the level of reproductive performance influences all production system. At the same time, it is the most demanding part from the breeding aspects. A prerequisite of its effectiveness is creation of optimal conditions in individual phases of reproductive cycle of sows for full exploitation of their reproductive potential. Achievement of adequate results is affected by many factors such as quality genetic material, nutrition, housing conditions and health status. Another equally important matter is the level of renewal in the basic herd of sows. As reported by Mote *et al.* (2009), management of herd renewal is a key factor for maximizing of production profitability.

The level of culling is associated to the longevity of sows. Besides litter size and weight, Rodriguez-Zas *et al.* (2003) consider longevity a fundamental indicator of profitability in breeding of sows. According to Houška (2010), longevity expresses the time period for which a sow stays in basic herd. With increasing culling intensity, mean age of sows in herd decreases, sows with lower parities prevail and numbers of weaned piglets per sow decrease, as same as overall production of piglets. Increasing culling intensity is associated to the tendency of growing number of unproductive days. At the same time the expenses per a reared piglet grow and consequently the expenses per a pig carcass increase. Čerovský (2004) states that controlled renewal of basic herd should respect the ratio of the number of risk litters to the number of productive litters. Pražák (2005) considers yearly renewal of 35 – 40 % of sows economically recommendable, however in reality the renewal varies in wide range and depends on conditions and management of each herd.

Mote *et al.* (2008) recommend to gain at least three litters from each sow so that the investment to the sow is returned. The authors also assume that the main reasons for culling do not change significantly in time, which is documented by publications over the years. Svendsen *et al.* (1975) describe reproductive disorders (41 %) and low performance (17 %) as the two most frequent causes of culling in sows. Later works, e.g. by Friendship *et al.* (1986), name reproductive disorders (43 %), limb problems (12 %) and low performance (7 %) among the most frequent causes. Stupka *et al.* (2005) report that the most frequent causes of culling in factory farms were reproductive issues (44 %), musculoskeletal issues (19 %) and other reasons such as milkiness, health condition and age (28 %).

Material and Methods

The aim of the work was to analyse the reasons for culling of sows. The evaluation was performed on a selected production pig farm. The evaluated basic herd counted 540 sows of maternal line Topigs 40 from Topigs Norsvin company. According to the company Topigs Norsvin CZ, s.r.o. (2014), the sows of maternal line Topigs 40 are robust and vital parental sows reaching good results even in higher temperatures with good performance also in more challenging breeding conditions. They are characterized by high feed intake, pronounced signs of estrus, easy insemination, high numbers of litters with high numbers of piglets with fast growth intended for fattening with good carcass quality, low requirements for nursing and easy manipulation. Results of mean reproductive performance of sows achieved in the selected herd are shown in Table 1. In the year of evaluation, total

number of 119 sows of the basic herd were culled. Observed criteria of culling were parity order (1st – 6th parity) and subsequently culling according to specific causes.

Results and Discussion

Culling of sows according to parity order

From the total number of 540 sows in basic herd, 119 sows were culled during the year of observation, which represented mean yearly culling rate of 22 %. Overview of culling with regard to parity order is displayed in Fig. 1. The results indicate that the highest rate of culling was observed after the 1st parity, exactly 26 sows (i.e. 22 % of the total number of culled sows). After the second parity, the culling rate recorded a mild decrease to the level of 25 sows (21 %). Significant decrease started after the third parity with 19 sows culled (16 %) and reached the minimum rate of 13 sows (11%) after the fourth parity. Subsequently the rate of culled sows increased to 19 pieces (16 %) after the fifth parity, followed by a slight decrease after the sixth parity to the level of 17 sows (14 %).

The achieved results correspond to the conclusions of Engblom *et al.* (2008) who performed evaluation in Swedish crossbred (Landrace x Yorkshire) sows. High culling rate was recorded after the first litter, with a decrease up to the fourth parity, when the number of culled sows was the lowest. From the fifth litter they recorded increasing tendency, while the culling rate was the highest after the ninth litter. Engblom *et al.* (2007) state that 15 – 20 % of sows produce only one litter. Mote *et al.* (2008) add that only 67.5 % of sows reach the third parity, Boyle *et al.* (1997) even state that 40 – 50 % of sows are culled before the third parity. Mote *et al.* (2009) recommend not to exclude more than 10 % of sows after each parity and add that

the aim of each breeder should be 75 % of sows reaching the third parity.

Mean number of litters per sow during their productive period in our observation was 3.2 and mean lifespan of sows was 490 days, which corresponds to productive period of 270 days. Svendsen *et al.* (1975) described in their analysis of herds of sows lifespan corresponding to 3.6 parities, the publication by Lucia *et al.* (2000) declares 3.3 parities. Bečková and Václavková (2008) documented 3.21 litters per a lifespan of CLW sows and 3.02 litter in CL sows.

Culling of sows according to specific causes

Besides evaluation of culling with regard to the parity order, also analysis of specific causes leading to culling of sows from herd was performed. As mentioned above, the total number of 119 pieces were excluded from the basic herd of 540 sows. Specific causes are presented in Fig. 2. The most significant cause were reproductive disorders found in 41 sows (i.e. 34 % from the total number of culled sows). Other important reasons were disorders of musculoskeletal system in 32 sows (27 %), low performance in 22 sows (18 %), also bad condition of mammary gland in 9 sows (8 %), health problems in 7 animals (6 %), bad condition in 6 animals (5 %) and metabolic disorders in one sow. Only one sow was excluded for old age.

Similar results were published by Lucia *et al.* (2000) who named reproductive problems (33 %) as the most important cause of culling, then low performance (20 %) and musculoskeletal disorders (13 %). Also Mote *et al.* (2008) included reproductive problems (35 %) and problems with limbs (22 %) between the most important causes of culling of sows. Holendová and Čechová (2010) analysed reasons for culling in a herd of purebred Czech Large White sows. They described musculoskeletal disorders (27 %), age (19 %) and low conception rate (16 %) as the most frequent reasons for culling.

Table 1. Results of reproductive performance in sows

Number of litters (sow/year)	2.28
Total number of born piglets (pcs/sow/year)	32.2
Total number of born piglets (pcs/litter)	14.1
Number of live-born piglets (pcs/sow/year)	29.4
Number of stillborn piglets (pcs/sow/year)	2.8
Number of reared piglets (pcs/sow/year)	25.3
Losses of piglets before weaning (pcs/sow/year)	4.1
Conception after the 1 st insemination (%)	94.9

Figure 1. Culling of sows according to parity order

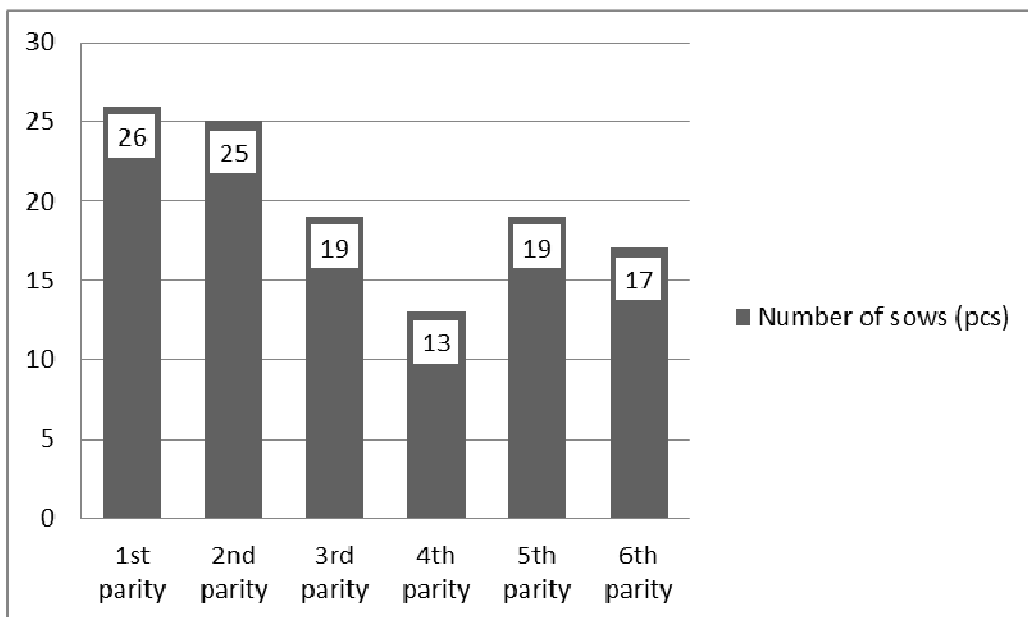


Figure 2. Culling of sows according to specific causes

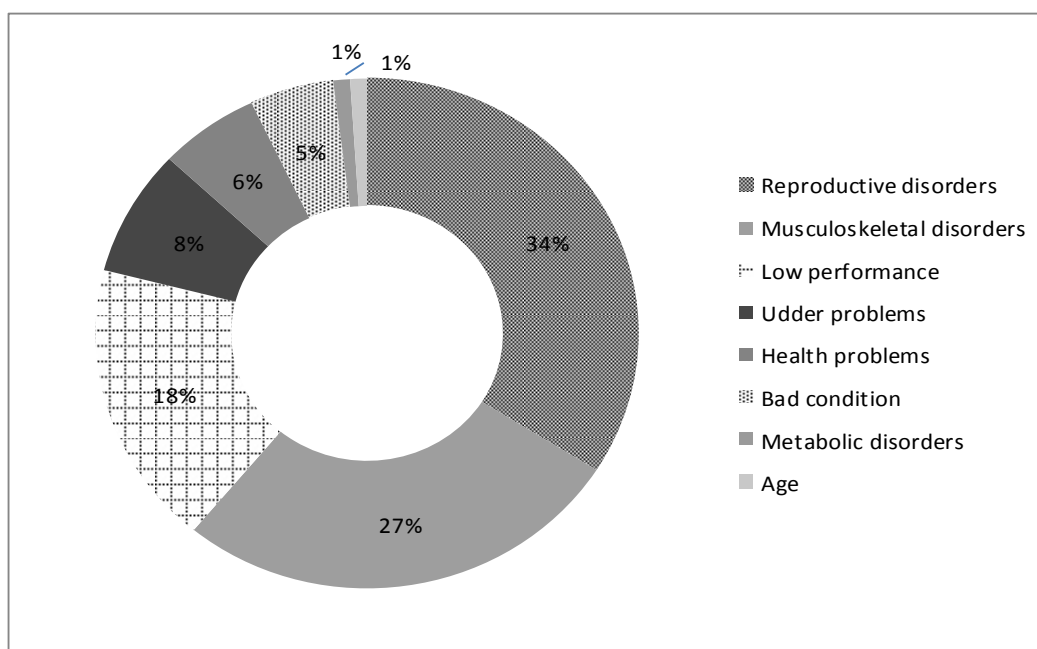


Fig. 3 shows reproductive disorders as the most frequent reason for culling of sows in more detail. As evident from the graph, the most frequent cause was sterility in 18 animals (i.e. 47 %). Also anestrus in 15 sows (38 %), difficult farrowings in 6 sows (10 %) and other reproductive problems in 2 sows (5 %), which included conception failure and abortion. Koketsu *et al.* (1997) named conception problems (37 %), anestrus (25 %), difficult farrowings (15 %) and abortions (7 %) as the most frequent reproductive problems leading to culling of sows. Bečková and Václavková (2008) say that low conception and fertility are the most frequent causes of culling related to reproduction.

Culling of sows according to specific causes after individual parities

Development of individual causes of culling in dependence to parity order is shown in Fig. 4. Reproductive disorders were the main cause after the first parity and despite decreasing tendency they stayed the major reason up to the third parity. After the sixth and later parities, no sow was excluded for reproductive disorders. Musculoskeletal disorders as reasons for culling recorded increasing tendency up to the third parity. Later, the intensity decreased and after the sixth parity, only one sow was culled for these reasons. Opposite trend compared to reproductive disorders was observed in culling for

the reason of low performance, which showed continuously increasing tendency with the highest number of culled sows after the sixth parity. After the sixth parity, low performance was the most important reason for exclusion of sows from the herd.

Similar tendencies were observed by Lucia *et al.* (2000) with the highest share of musculoskeletal disorders as the causes of culling observed after the first parity with subsequent decrease up to the fourth parity. Also in the case of low intensity as the reason for culling they observed the same increasing trend up to the 5th - the 6th parity. However, they described different trends than those observed in our work in the musculoskeletal disorders with increasing tendency from the first parity. Holendová and Čechová (2010)

named musculoskeletal disorders as the most frequent causes of culling after the first two parities. Wolfová (1997) added to the matter of musculoskeletal disorders, that they do not occur as the reasons for culling after the fourth and later parities. This is confirmed by Fukawa and Kusuhara (2001) who conclude that sows show higher risk of culling for limb problems mainly after the first three parities. Engblom *et al.* (2008) observed tendencies of reasons for culling with regard to parity order with following results: reproductive disorders are the most frequent after lower parities, with increasing parity the risk of mastitis and mammary gland issues grows and also the percentage of mortality raises with increasing parity.

Figure 3. Reproductive disorders of sows in more detail

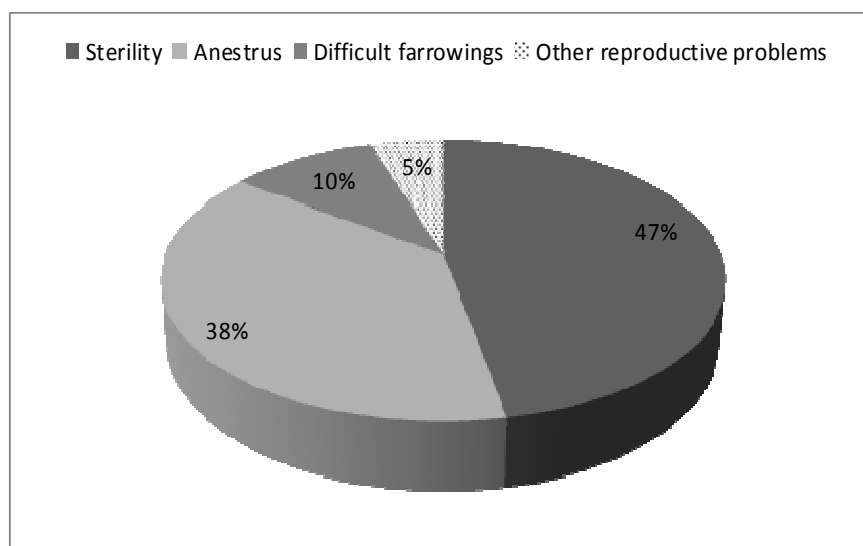
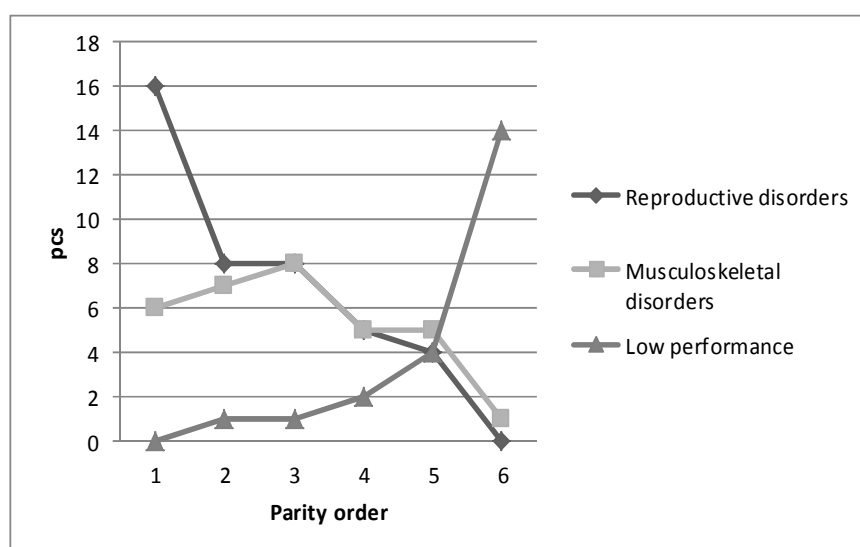


Figure 4. Culling of sows according to specific causes after individual parities



Conclusion

The aim of the work was to analyse the reasons for culling of sows from a production herd, while the levels of culling were evaluated with regard to parity order and specific causes. Observed results indicate that high percentage of sows are culled after the first two parities, thus earlier than they reach productive litters, which is negatively reflected in achieved results of piglet production and in economical aspects. It is also evident that the most frequent reasons for culling still remain reproductive and musculoskeletal disorders. Therefore, it is important to focus on preparation of sows before their inclusion into reproductive cycle, i.e. to ensure rearing of gilts leading to appropriate body development and onset of reproductive functions. Also creation of optimal conditions for sows in individual phases of reproductive cycle should be a matter of course.

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