THE EFFECT OF AGE AT THE FIRST MATING ON THE LONGEVITY OF CZECH LANDRACE AND CZECH LARGE WHITE SOWS

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Abstract

The aim of the present study was to retrospectively analyse the effect of age at the first mating on lifetime reproduction efficiency in Czech Large White and Czech Landrace sows. Data about Czech Large White (CLW) and Czech Landrace (CL) sows were obtained from breeding herds and their document registration. The average number of parities (achieved in productive life of sows) decreased with increasing age at the first mating. CLW sows mated at the age about 210 days achieved the highest number of parities (3.49 ± 2.31) and CL sows achieved the highest number of parities (3.16 ± 2.14) at the mating age 211-220 days. The culling rate after the first parity was also monitored in our experiment. 32.31% of CLW sows and 29.94% of CL sows were replaced after the first parity. The average number of piglets in the first litter (total born, live born and weaned) was higher in CL breed compared to CLW breed.

Key Words: longevity, first mating, culling rate, sow

Sow longevity plays an important role in piglet production for several reasons. First, length of productive life is directly related to the number of piglets produced during a sow´s productive lifetime (Serenius and Stalder, 2006). Lifetime prolificacy is related to longevity of the sow (the greater the number of parities the sow remains in the herd, the greater the likelihood of an increased number of piglets it will produce during its productive lifetime). Sow longevity can be defined as "stayability" or length of productive herd life-the number of days between a beginning event, such as date of birth or date of first farrowing and culling of a sow (Serenius and Stalder, 2004). The second importance of sow longevity is its economy aspect. Sow longevity plays an important role in economically efficient piglet production. The heritability estimates indicate that genetic variation exists for sow longevity (Tholen et al., 1996; Yazdi et al., 2000). A lot of studies show that it is possible to select for sow longevity. However, the magnitude of heritability estimates vary between different sow longevity trait definitions and among populations studied (Lopez-Serrano et al., 2000; Yazdi et al., 2000; Guo et al., 2001; Serenius and Stalder, 2004).

Material and methods

Data about Czech Large White (CLW) and Czech Landrace (CL) sows were obtained from breeding herds and their document registration. Sows were monitored from the birth to culling from the herds (from year 2001 to 2006). The complete data set included information on 31387 CLW and 9059 CL sows-the age at the first mating, number of piglets in the first litter, culling rate after the first parity and lifetime number of litters. The statistical programmes SAS 8.02 and QCExpert were used for obtained data analyses.

Results and discussion

The basic statistical characteristics of the studied groups of sows are given in Table 1. Results illustrated in the table can be summarized:

- Czech Landrace (CL) gilts were first mated 6.3 days earlier than Czech Large White (CLW) gilts
- Number of litters achieved during production life was higher in CLW sows (3.21 ±2.23 vs. 3.02 ± 2.11)
- Number of total born piglets in the first litter was higher in CL breed (11.10 ± 3.25 vs. 10.42 ± 3.22)
- Number of piglets born alive in the first litter was also higher in CL breed (10.28 ± 3.11 vs. 9.72 ± 3.09)
- Number of weaned piglets in the first litter was higher in CL breed (9.14 ± 2.93 vs. 8.77 ± 2.94)

Differences between CL and CLW breeds are statistically significant ($P<0.01$). According to Schukken et al. (1994), the optimal age at the first successful mating is between 200 and 260 days. Vidovic (1997) considers 220-250 days (average 235 days) as optimal age for the first mating of Landrase gilts.

The effect of age at the first mating on lifetime reproduction efficiency is illustrated in Figure 1. The average number of litters (achieved in productive life of sows) decreased with every 10 days of later age at the first mating. The highest number of parities (3.49 ± 2.31) was observed in CLW sows mated at the age of 210 days. However, similar results were monitored in case of later mating (from 211 to 230 days of age). In CL sows was the highest number of litters (3.16 ± 2.14) achieved at the age of mating 211-220 days. The effect of age at first mating on sow longevity was studied by Babot et al. (2003). The influence of age at the first mating on the longevity and on the total number of parities of the sow

were evident. The youngest class of age at the first mating (<210 days) showed a younger culling age. The class of sows younger than 210 days at the first mating had significantly fewer parities than the sows with an age at the first mating ranging from 221 to 240 days.

The culling rate after the first parity was also monitored in our experiment. 32.31% of CLW sows and 29.94% of CL sows were replaced after the first parity. The highest number of sows was culled by reason of poor body development and subsequent slaughter. The second reason of culling was reproduction disorders. Indispensable number of sows was removed from herds by reason of leg weakness (Figure 2 and 3). Stadler et al. (2004) mentioned that leg weakness is the next most common reason (after reproductive failure) for involuntary culling of sows.

Table 1. Basic statistical characteristics of the studied group of Czech Large White and Czech Landrace sows

	Czech Large White		Czech Landrace		Statistical significance
	mean	SD	mean	SD	
Age at first mating	243.97	32.89	237.69	29.99	**
Number of parities	3.21	2.23	3.02	2.11	**
Number of total born piglets in 1st parity	10.42	3.22	11.10	3.25	**
Number of piglets born alive in 1st parity	9.72	3.09	10.28	3.11	**
Number of weaned piglets in 1st parity	8.77	2.94	9.14	2.93	**

Figure 1. Effect of age at the first mating on the number of parities of Czech Large White and Czech Landrace sows

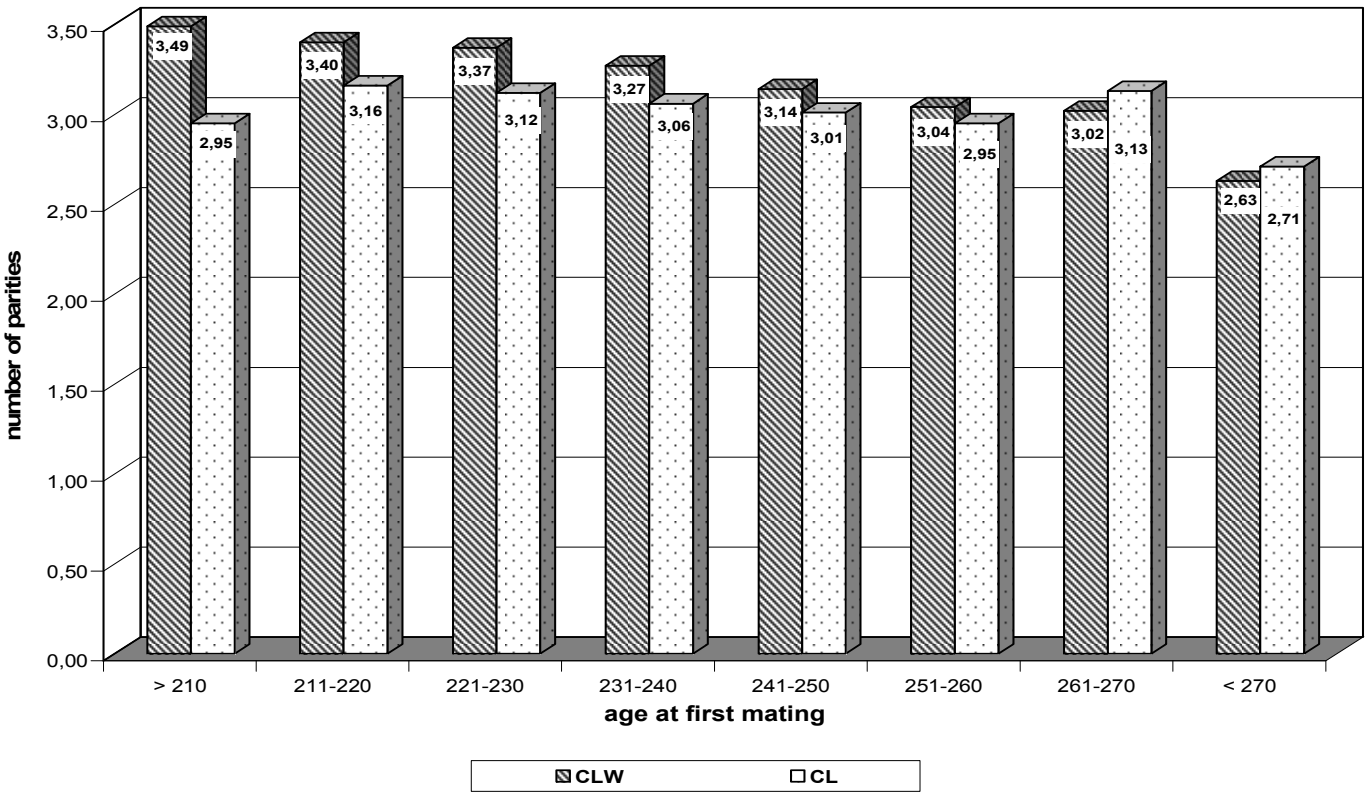


Figure 2. Reasons for culling after the first parity - Czech Large White sows

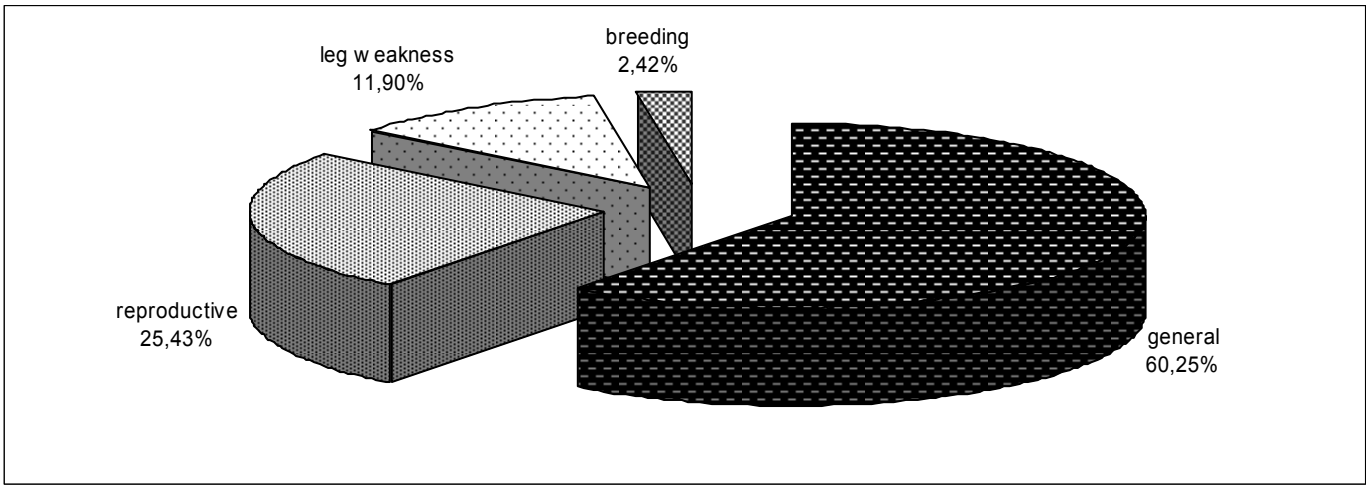
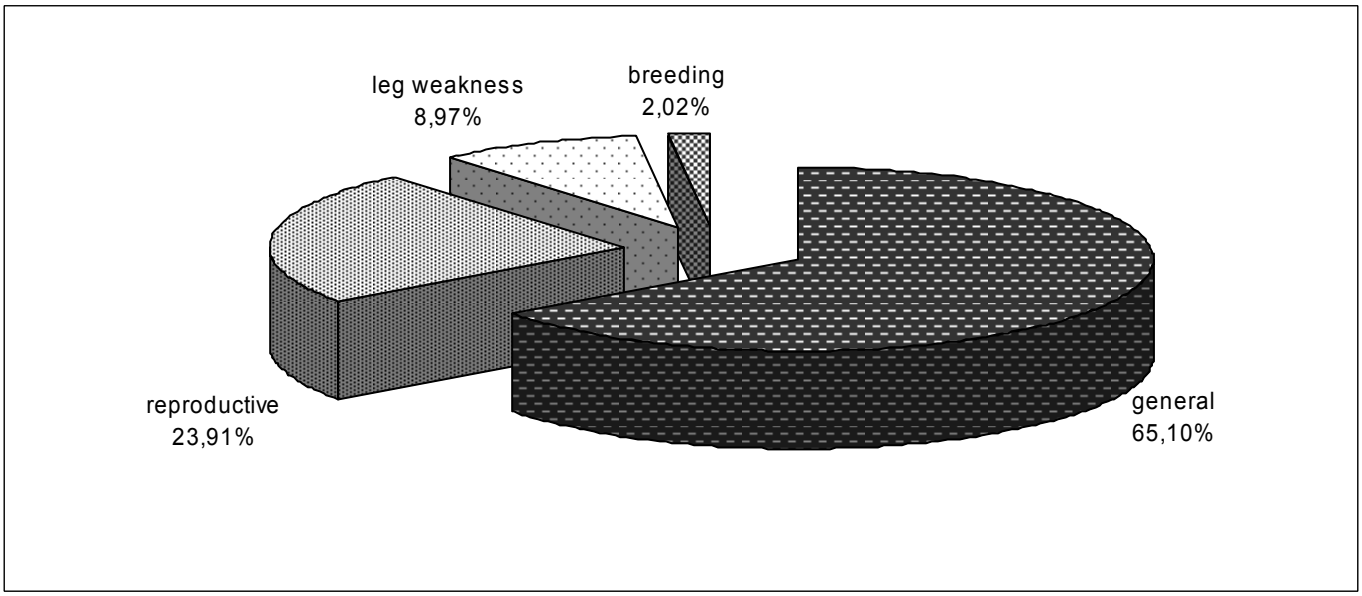


Figure 3. Reasons for culling after the first parity - Czech Landrace



The average number of piglets in the first litter (total born, live born and weaned) was higher in CL breed compared to CLW breed. In CL breed, the number of total born piglets increased with the age of first mating until 260 days. The highest number of total born (11.32 ± 3.36) piglets was monitored in the interval 251-260 days (Figure 4). In CLW breed, was observed the similar tendency-the greater the age at first mating, the higher the number of piglets (total born, alive born and weaned) in the first litter. Sows mated at the age 261 days and more had the highest number of piglets in the first litter (Figure 5). Koketsu et al. (1999) and Tummaruk et al. (2001) mentioned that the total number of piglets produced per sow and the parity number at culling decrease with age at the first mating. Babot et al. (2003) observed increasing trend of the number of born piglets in the first parity. Sows with the age at first mating over 240 days had the greatest number of piglets born alive. But at weaning, the number of piglets at the first parity showed no significant differences as the age at the first mating increased from less than 210 to more than 270 days.

Figure 4. Effect of age at the first mating on number of piglets in the first litter-Czech Landrace

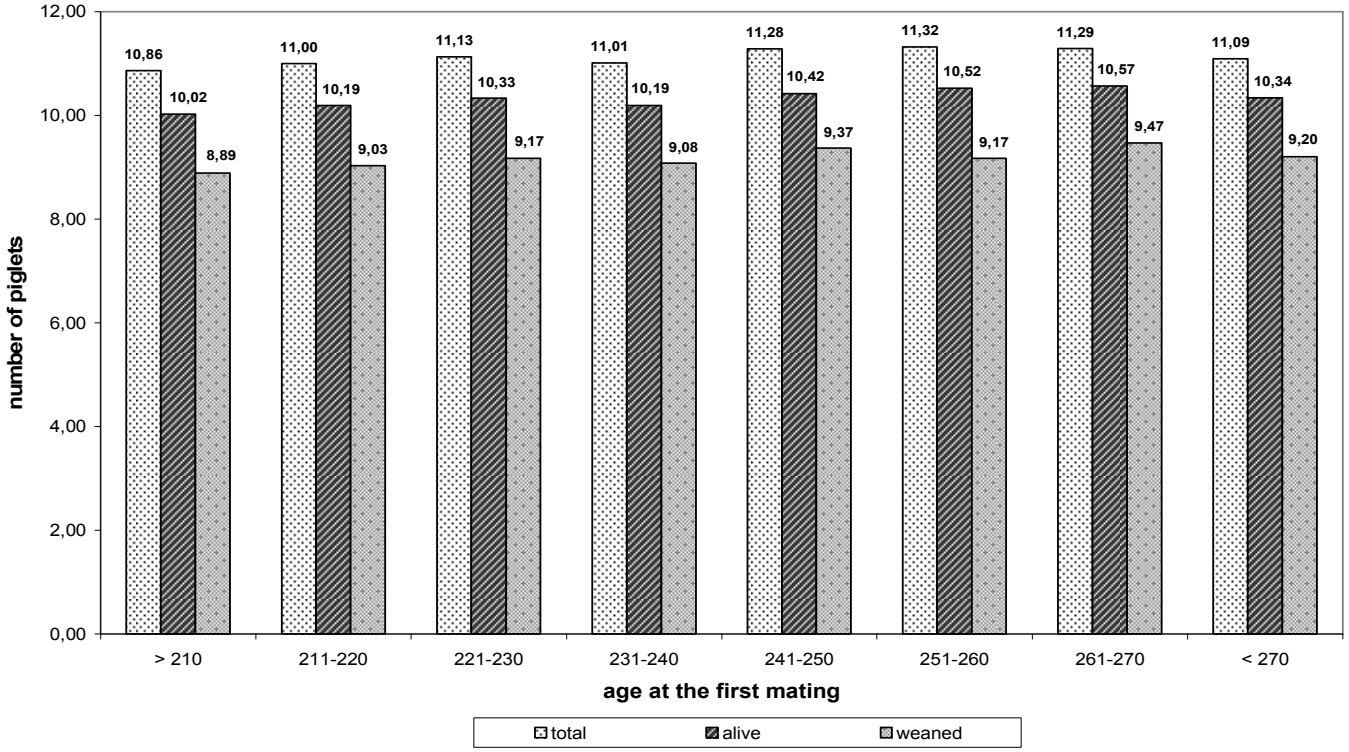
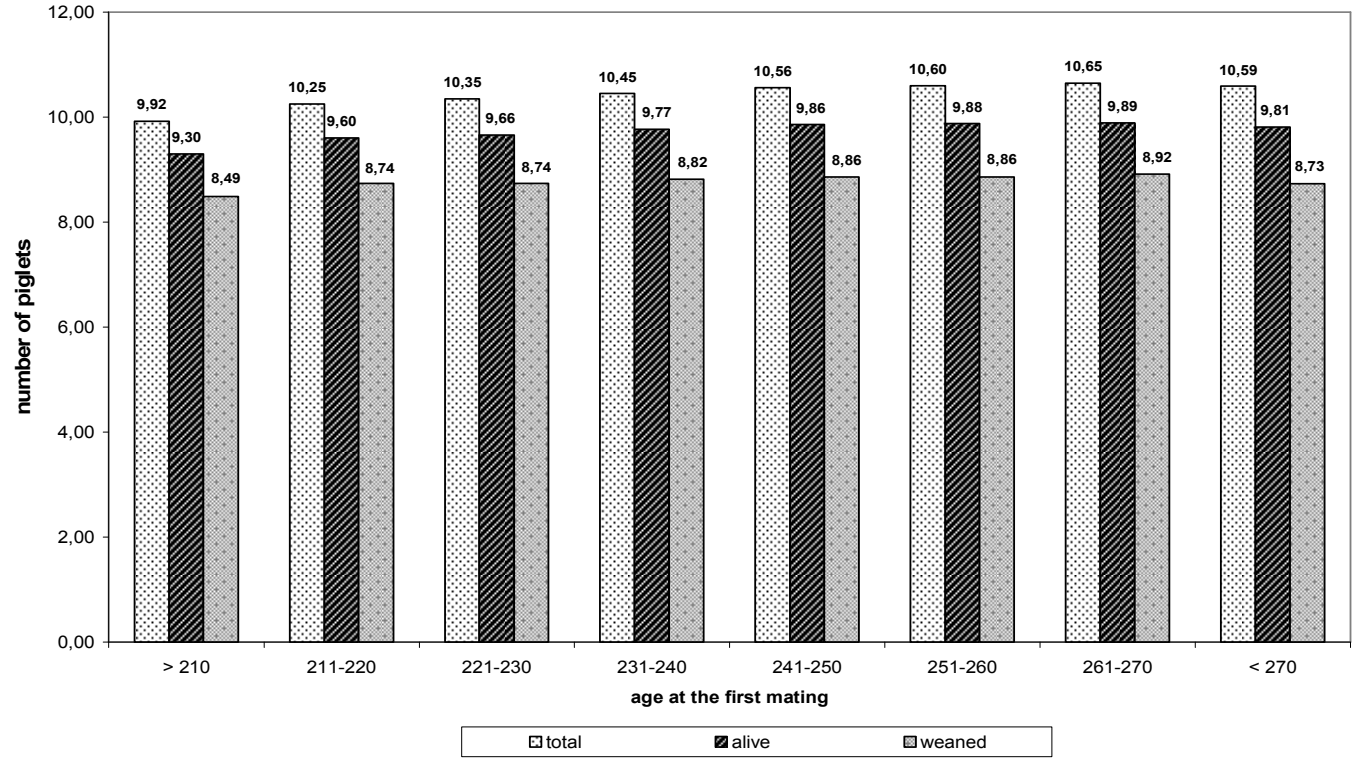


Figure 5. Effect of age at the first mating on number of piglets in the first litter-Czech Large White



Conclusion

Sow longevity plays an important role in economically efficient piglet production. The present study demonstrated that age at the first mating affect lifetime productivity of sows. According our observation, it can be concluded:

- The average number of litters (achieved in productive life of sows) decreases with every 10 days of later age at firs mating.
- In both Czech large White and Czech Landrace sows, the number of total born, born alive and weaned piglets in the first litter increase with increasing age at the first mating
- In Czech Landrace sows, the highest number of total born (11.32 ± 3.36) piglets is monitored in the interval 251-260 days of the first mating
- Czech Large White sows mated at age 261 days and more have the highest number of piglets born and weaned in the first litter
- The culling rate after the first parity is higher in Czech Large White sows; the main reasons are- poor body development, reproductive failure and leg weakness

The age at the first mating is very important for the sow´s performance in the first parity and for sow´s lifetime performance.

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