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REPRODUCTION AND PRODUCTION PERFORMANCES IN LARGE WHITE SOWS AND IN LANDRAS x LARGE WHITE CROSSBRED SOWS

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Abstract

The aim of research was to study, for a period of 24 months, sows' reproduction and production performances. In total 120 Large White sows and Landrace x Large White crossbred sows reared in the same conditions, were used in the study. Monitored and registered parameters were: the duration of the reproductive cycle; the birth rate and mortality; production efficiency of the sow etc. The crossbred sows (Landrace x Large White) showed: the lowest number of unproductive days, versus Large White sows, respectively 6.24 vs 9.52 and the lowest percentage of mortality respectively 4.31 vs 4.96. The crossbred sows had also the highest number of piglets born alive/sow/year, than pure breed sows, respectively 25.59 vs 24.89, highest number of weaned piglets/sow/year, respectively 10.33 vs 9.38, and highest weight of weaned piglets, reapectively 6.65 vs 6.42. Independently from the genetic type, piglets born from fifth delivery sows, resulted the heaviest at birth and weaning time. Growing photoperiod reduced calving interval, and neonatal deaths.

Key words*: sow, crossbred, reproductive cycle, birth rate, weaning piglets.*

INTRODUCTION

The process of reproduction is complicated and involves many highly specific biological functions. The external environment (diet, housing, social surroundings, temperature, disease, etc.) has a far greater influence on reproductive performance than on any other biological process because the newborn of any species require special protection from environmental extremes. The size of the first litter was the best indicator of reproductive potential if 9.5 or more pigs were born (Thompson, 2010). The quality and quantity of meat production depends on the mode of treatment and management of sows. To get maximal production of sows is important to do the optimization of all phases of the reproductive cycle. To do so we must control all the parameters that expressing reproductive effectiveness, and the different stages of growth (Seren and Mattioli, 1998; Tarocco, 1994, Tarocco, 1998; Kim et al., 2000; Scheepens and Rozzen, 2008).

MATERIALS AND METHODS

The aim of research was to study, for a period of 24 months, sows' reproduction and production performances. In total 120 Large White sows and Landras x Large White crossbred sows reared in the same conditions, were used in the study.

Monitored and registered parameters were: the duration of the reproductive cycle, the birth rate and mortality, production efficiency of the sow, etc. During the test, piglet weaning age was 28 days. Their diet was based on starter feed. To evaluate the effect of photoperiod the data of reproductive cycle, were analysed for the growing and reduced photoperiod. To evaluate the effect of genetic type, effect of "the born alignment'' and effect of photoperiod the data were analysed according the general linear model (GLM, STATGRAF Centurion XVI.), as follow:

$$Y_{ijkln} = \mu + a_i + b_j + yk + e_{ijkln}$$

where:

Y_{ijkln} - reproductive and productive characteristic

μ - theoretical average

a_i - effect of genetic type (1.2)

b_j - effect of "the born alignment'' (1...6)

yk - effect of photoperiod (1.2

e_{ijkln} - residual effect

RESULTS AND DISCUSSIONS

The genetic type

The analysis of variance proved difference between two groups of the sows with different genetic types. The ANOVA results, for reproductive characteristics, are presented in Table 1.

Table 1. The average values of reproductive characteristics

The genetic type	pregnant days	No. of unproductive days	calving interval	repeat breeder sows	weaned piglets
Large White sows	113.51a	9.52A	151.78A	27.03A	28.72
Landrace X Large White crossbred sows	113.64b	6.24B	149.02B	23.88B	28.52
Means	113.57	7.88	150.4	25.48	

ab = P≤ 0.05; AB = P≤ 0.01

The crossbred sows (Landrace x Large White) showed: the lowest number of unproductive days, and repeat breeder sows versus Large White sows, respectively 6.24 vs 9.52 and 23.88 vs 27.03; the highest calving interval than pure breed sows 149.02 vs 151.78. (P≤0.01).

Results of some authors to this problem are the same (Freschi et al., 1999), but other authors report for a reduced calving interval (Thomson, 2010; Kim et al., 2000). The average values of reproductive and productive characteristics are presented in Table 2.

The data of Table 2 showed that the crossbred sows had also the highest number of piglets born alive/sow/year, and number of weaned piglets/sow/year than pure breed sows, respectively 25.59 vs 24.89, & 10.33 vs 9.38. The difference is evident for the weight at 28 days in favour of crossbred sows. respectively 6.65 vs 6.42 and the lowest percentage of mortality, respectively 4.31 v.s 4.96. (Deckert and Sciopioni, 1996) (P≤ 0.01).

Table 2. The average values of reproductive and productive characteristics

Parameters	Large White sows	Crossbred sows	Means
Percentage of calving	94.78	95.33	95.05
Percentage of mortality	4.96	4.31	4.63
No. of piglets born alive/sow/year	24.89	25.59	25.24
No. of piglets bor alive /calving /sow/year	10.37	11.18	10.77
No. of weaned piglets/sow/year	9.38	10.33	9.85
The mummified piglets	2.01	1.92	1.96
Weight of born	0.81	0.83	0.82
Weight of weaned piglets (28 days)	6.42	6.65	6.53

P≤ 0.01

The born alignment

Independently from the genetic type, the effect of the born aligment is significant for reproductive and productive characteristics of sows. The average values of this effect were estimadet from analysis of variance and are presented in Table 3.

As seen in Table no. 3, the effect of factor "born alignment" is significant regarding the calving interval, the number of unproductive days, the number of piglets born alive calving/sow/year, the repeat breeder sows, the number of piglets born alive/sow/year, the weight of born, the weight at 28 days.

The sows to the first, second and three parturition show; the highest calving interval compared with sows to the fifth parturition, respectively 155.7 d; 151.70 d, 149.33 d. vs 146.72 d, and the number of unproductive days 12.62d; 5.78, 9.95d vs 4.65d.

Table 3. The average values of reproductive and productive characteristics

The 'born alignment'	pregnant days	No.of unproduc tive days	calving interval	repeat breeder sows	No. of piglets born alive / calving /sow/year	litter size /sows /year	No. of piglets born alive /sow /year	No. of weaned piglets/ sow/ year	Weight of born	weight of weaning time
1	113.57	12.62	155.7	53.97	9	2.3	20.7	9.8	0.74	6.46
2	113.62	5.78	149.33	35.76	9.7	2.25	21.83	7.32	0.77	6.82
3	113.33	9.95	151.70	15.77	10.22	2.33	23.81	11.3	0.79	6.88
4	113.24	5.86	147.70	21.57	10.87	2.3	25	12.98	0.83	6.89
5	113.55	4.65	146.72	19.26	10.94	2.3	25.16	11.74	0.9	7.7
6	113.43	5.16	149.13	7.13	10.94	2.35	25.71	11.54	0.77	7.5

(P≤ 0.05) (P≤ 0.01) (P≤ 0.001)

Statistically proven difference (P≤ 0.001) were observed for number of piglets born alive/calving/sow/year which grows progressively from the first parturition (9 heads) to the fifth and six parturition (10.94 heads). Piglets born from fifth delivery sows, resulted the heaviest at birth (0.9 kg) and weaning time (7.7 kg) (Figure.1)

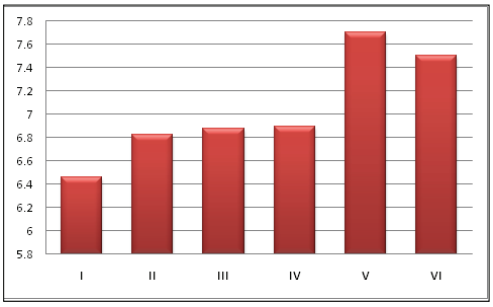

Figure 1. Live weight at weaned piglets

The Photoperiod

Effect of photoperiod on the reproductive activity of farm animals is studied by various authors (Tarocco, 1994; 1998; Barbari et al., 1995; Seren and Mattioli, 1989; Frechi et al. 1999). In Table 4 included data for the effect of fotoperiodes in sows performance.

Table 4. Effect of fotoperiodes in sows performance

Fotoperiodes	pregnant days	No. of unproduc tive days	Calving Interval (d)	No. of piglets born alive/sow/year	neonatal deaths.
Growing photoperiod	113.45a	7.87	150.68	11.00	0.74
The reduced	113.64b	9.33	152.03	10.69	0.84

ab=(P≤ 0.05)

As seen in Table 4 growing photoperiod reduced calving interval, from 152.03 days to the 150.68 days and neonatal deaths from 0.84 to the 0.74.

The positive result of growing photoperiod is clearly visible for the lowest number of unproductive days 7.87d vs 9.33 and the highest number of piglets born alive/sow/year 11.00 heads vs 10.69 heads.

CONCLUSIONS

Management and selection must be used to create an environment that enables swine to express their reproductive potential, and we must develop new means of determining reproductive potential in order to propagate the more prolific lines. Improving of the evaluation methods of the sows reproductive efficiency are very necessary to increase production. The sows that will be bred to produce potential replacement gilts should be selected according to the number of pigs farrowed and weaned in their first litters, for soundness of feet and legs, and for teat number and proper functioning. The current genetic progress in litter size at birth increases the need for a broader breeding program which includes piglet survival and growth genetic makeup of their daughters

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