

EFFECTS OF LINE, PARITY AND FARROWING SEASON ON REPRODUCTION ABILITY IN DANUBE WHITE SOWS

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SUMMARY

Effects of line, parity and farrowing season on the sow were studied. 806 litters of Danube White (DW) sows from all nine lines of breeding herd were used to study factors affecting reproduction traits. There was significant effect of line on piglets born alive per litter and litter weight at 21 days. Significant effect of parity on piglets born alive per litter, litter weight at birth and at 21 days was found. However, farrowing season had significant effects only on litter weight at birth and at 21 days.

INTRODUCTION

Reproduction performances and especially litter size and litter weight are of important value for efficiency of pig breeding. This traits are affected simultaneously by genetic and environmental factors.

Shostak and Benkov, 1992 found significant influences of breed and line on reproduction in pigs. Parity also had an significant effect on reproduction traits according results of Cerna et al., 1980; Benkov, 1984 and others. There were contradictory results on influence of farrowing season on reproduction traits (Kaplon and Rozycki, 1988; Shostak and Benkov, 1992).

MATERIAL AND METHODS

Data used in this study embraced 806 litters of Danube White (DW) sows from breeding herd Gerana (North Bulgaria region). The sows were from all nine genealogical lines of the stock, and they were kept in the same conditions and fed with the same diet according their physiological status.

Reproduction traits - litter size (piglets born alive), litter weight at birth and litter weight at 21 days were recorded according The instruction for pig breeding in Bulgaria. Litters were not standardized and any cross-fostering was made.

Data were grouped into lines, parity and farrowing season. The latter was made in next periods - spring (22.3.-21.6.); summer (22.6.-22.9.); autumn (22.9.-21.12.); winter (22.12-21.3.). Data were analyzed using factor analysis.

RESULTS AND DISCUSSION

Mean values of piglets born alive per litter, litter weight at birth, litter weight at 21 days and values of F distribution of this traits are given in Table 1. It is seen that there was significant effect of the line on piglets born alive per litter. Litters of line 2 were with the highest number of piglets born alive - 9.72 and these of line 7 were with the lowest number - 8.8 and difference between these lines was highly significant.

Table 1. Litter size (piglets born alive/litter) and litter weight at birth and at 21 days of DW sows

Factors	n	Litter size	Litter weight	
		$\bar{x} \pm S\bar{x}$	$\bar{x} \pm S\bar{x}$	
			at birth	at 21 day
I. Line				
F		2.393*	0.858	2.226*
1	93	9.41±0.11	11.81±0.15	36.60±0.62
2	96	9.72±0.12	12.19±0.16	40.39±0.66
3	88	9.02±0.21	11.92±0.28	37.67±0.60
4	85	9.10±0.19	12.25±0.24	38.66±0.43
5	85	9.49±0.22	12.02±0.22	36.80±0.99
6	78	9.41±0.16	12.30±0.24	39.27±0.72
7	90	8.88±0.18	12.04±0.24	39.60±0.42
8	95	9.38±0.19	12.32±0.27	37.07±0.22
9	96	9.52±0.35	12.31±0.43	35.33±0.51
II. Parity				
F		3.731**	6.228***	7.587***
I	227	9.21±0.08	11.61±0.13	36.38±0.56
II	213	9.40±0.09	12.26±0.13	40.02±0.58
III	140	9.54±0.12	12.18±0.17	39.17±0.70
IV	90	9.67±0.15	12.39±0.23	40.72±0.53
V	86	9.87±0.17	12.64±0.22	40.11±0.87
III. Season				
F		1.182	4.023**	4.375**
Spring	209	9.60±0.11	12.34±0.16	38.97±0.66
Summer	184	9.28±0.11	11.60±0.15	36.41±0.53
Autumn	165	9.39±0.12	12.41±0.15	39.95±0.78
Winter	248	9.35±0.18	11.99±0.13	39.38±0.58

* p<0.05 ** p<0.01 *** p<0.001

For the most of the lines coefficients of variation of number of live born pigs ranged from 14.3% to 18.3% and it was smaller than typical variation of the trait, about 25%. We find possible explanation that this is within line variation. The highest level of phenotypic variation of the litter size was in line 9 - 22%. This result together with high level of litter size, compared to other lines, indicate for possibilities of improvement of the line.

There was significant effect of parity on litter size. The latter was the smallest at first litter - 9.21 live born pigs, and had tendency of increasing up to 9.87 live born pigs at fifth litter. Similar type of effect of parity on litter size had been established in other studies (Cerna et al., 1980; Shostak et al., 1990; Daza et al., 1993).

The results shows that farrowing season had no effect on piglets born alive per litter. Differences between lines on litter weight at birth were modest and not significant. There was significant effect of the parity on this trait. The lowest litter weight at birth was at first litter, and the highest at fifth litter. Alteration of litter weight at birth with subsequent litters was a result of respective increasing of litter size with the parities. Differences between litter weight at birth at first litter and at next litters were highly significant. Farrowing season had effect on litter weight at birth. The heaviest litters were obtained at spring and autumn, and the lightest at summer.

Litter weight at 21 days was significantly influenced by line. There were highly significant differences in this trait between line 2 (the highest value 40.4 kg) and line 5 and line 9. Line 2 had also the largest litter size at birth and this pointed on good surviving ability of pigs up to 21 day. Sows of this line according this results had the best mothers ability. The stronger effect on litter weight at 21 days had parity. At first litter there was the lowest level of the trait and differences between this value and that of next litters were significant. Vangelov et al., 1973 and Holtman et al., 1975 obtained similar results.

There was significant influence of farrowing season on litter weight at 21 days. This result well coincides with that in other studies (Bereskin and Frobish, 1981 and Schneider et al., 1982).

The following conclusions could be made from this study:

Line origin of sows in the herd was a factor with effect on piglets born alive per litter and litter weight at 21 days;

The parity had strong effect on number of piglets born alive per litter, litter weight at birth and litter weight at 21 days;

The farrowing season had effect mainly on litter weight at birth and at 21 days. The existent differences between lines on litter size at birth and litter weight at 21 days apply good possibility of selection for these traits in the herd. Effects of farrowing season and parity on reproduction performances of DW sows could be take on account for the best reproduction of the herd.

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