

Effect of Non-Genetic Factors on the Performance of Large White Yorkshire Piglets

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ABSTRACT

An attempt was made to establish the effect of non-genetic factors on performance for Large White Yorkshire piglets. The data were collected from PGRIAS, Kattupakkam. The overall least square means of birth weight, weaning weight and pre-weaning average daily gain were 1.307 ± 0.003 kg, 7.522 ± 0.026 kg and 147.927 ± 0.605 g, respectively. The period, season and sex factors had significant sources of variation in both birth and weaning weights of piglets. The period of season had no significant effect on the pre-weaning average daily gain.

Keywords: LWY Piglets, Production traits, Non-genetic factors

INTRODUCTION

The pig population in India was 9.06 million as per the 20th livestock census, and it has declined by 12% over the previous census. Pig farming is a more profitable occupation because of minimum capital investment, low feed cost, less labour, high prolificacy, high feed conversion ratio, high growth rate and marketing value (Devendran *et al.*, 2015). Pig rearing and consumption of pork are popular in the north-eastern states of India (Toshimongla *et al.*, 2020). The production and reproductive performance of pigs determine the profitability of piggery farming. Reproductive traits are considered important factors because meat production is directly associated with breeding efficiency, influenced by different environmental factors (Ramesh *et al.*, 2012). This study was performed to find the effect of period, season and parity on production

and reproduction performance of Large White Yorkshire pigs in an organized farm.

MATERIALS AND METHODS

Data were collected from the Pig Breeding Unit, Postgraduate Research Institute in Animal Sciences, Kattupakkam, Tamil Nadu, for the period from 2016 to 2022. All the pigs were reared under an intensive system with standard feeding, housing, breeding and other management practices. Birth weight and weaning weight were recorded on day zero and day 42, respectively. In this study, the individual traits such as birth weight (kg), weaning weight (kg) and pre-weaning average daily gain (g) were recorded and analysed. The collected data were classified into four periods (2015-2016, 2017-2018, 2019-2020 and 2021-2022). To assess the variations due to season, (Season I: January - February, Season II: March - May, Season III: June - September; Season IV: October - December), seasonal factors were included in the study. The least squares analysis of variance technique (Harvey, 1990) was carried out to study the effect of sex, season of birth, and period of birth. The statistical analysis was performed using SPSS software version 23.

RESULTS AND DISCUSSION

The Large White Yorkshire pig is popular throughout the world for its ability to withstand and adapt to all environmental conditions and is widely used for crossing the local pigs in India. The overall mean and non-genetic factors' effect on birth weight (kg), weaning weight (kg) and pre-weaning average daily gain (g) were presented in Table I.

Table I: Least Square Means for Individual Traits in Large White Yorkshire Piglets

Effect	Birth weight (kg)		Weaning weight (kg)		Pre-weaning average daily gain (g)	
	N	Mean \pm SE	N	Mean \pm SE	N	Mean \pm SE
Overall mean	5466	1.307 \pm 0.003	5296	7.522 \pm 0.026	5296	147.927 \pm 0.605
Year	**		**		**	
2015-2016	952	1.285 \pm 0.006	902	8.395 \pm 0.058	902	169.184 \pm 1.367
2017-2018	1695	1.190 \pm 0.004	1621	7.641 \pm 0.043	1621	153.49b9 \pm 1.01
2019-2020	1502	1.343 \pm 0.005	1488	6.870 \pm 0.046	1488	131.568 \pm 1.077
2021-2022	1317	1.408 \pm 0.005	1285	7.088 \pm 0.048	1285	137.458 \pm 1.145
Season of birth	**		*		NS	
Winter	738	1.328 \pm 0.006	716	7.584 \pm 0.065	716	148.909 \pm 1.525
Summer	1328	1.323 \pm 0.005	1293	7.547 \pm 0.048	1293	148.092 \pm 1.145
Southwest monsoon	2005	1.273 \pm 0.004	1959	7.410 \pm 0.039	1959	146.054 \pm 0.914
Northeast monsoon	1395	1.303 \pm 0.005	1328	7.549 \pm 0.047	1328	148.654 \pm 1.108
Sex	**		**		*	
Male	2728	1.325 \pm 0.003	2629	7.600 \pm 0.035	2629	149.321 \pm 0.824
Female	2738	1.288 \pm 0.003	2667	7.445 \pm 0.034	2667	146.533 \pm 0.812

SE: Standard error; N: Number of observations; *Significant; **Highly significant; NS: Not significant

Birth Weight

The overall mean birth weight of LWY piglets was 1.307 \pm 0.003 Kg. Among all, the highest and the lowest birth weight were noticed in 2021-2022 and 2017-2018 with 1.408 \pm 0.005 kg and 1.190 \pm 0.004 kg, respectively. Archana *et al.* (2018) reported slightly higher birth weight. All the non-genetic factors in the study period, season and sex had a highly significant effect on the birth weight of the piglets. The mean birth weights of males and females were 1.325 \pm 0.003 kg and 1.288 \pm 0.003 kg, respectively and significantly male shows a higher weight over female. Dissimilar to these findings, the lowest birth weight of 1.15 \pm 0.03 kg was reported by Shende *et al.* (2022).

Weaning Weight

The overall mean weaning weight was 7.522 \pm 0.026 kg. Kalitha *et al.* (2015) reported a weaning weight of 7.38 \pm 0.27 on 42 days of weaning in LWY piglets at Mizoram. The value for weaning weight found in the present study is almost similar to that of Ashitha *et al.* (2019). The period of birth and sex of the piglets had a highly significant effect ($p < 0.01$), and season of birth had a significant effect on weaning weight. However, the lowest weaning weight was reported by Shende *et al.* (2022), as 6.88 \pm 0.22 in pure LWY piglets reared in Hyderabad. Significantly higher weaning weight was noticed in the year 2016-2017 and lowest in the year 2019-2020. Hence, the changes in the weaning weights of piglets could be attributed to the non-genetic factors.

Pre-weaning Average Daily Gain

The pre-weaning average daily gain in large white Yorkshire piglets in the study is similar to that of Kalitha *et al.* (2015) and Sandhu *et al.* (2018). The period and sex of the piglets were found to have significant effects, and the season of the birth had no significant effect on pre-weaning average daily gain in LWY piglets. The overall highest and lowest pre-weaning average daily gain were noticed significantly in the period 2015-2016 and 2019-2020, respectively. The findings of this study are not in agreement with Jayashree and Shivakumar (2013) and Shende *et al.* (2022) because of the lowest average daily weight gain. The variations in pre-weaning average daily gain might be due to milk produced by sows and also the mothering ability of the sows.

CONCLUSION

Scientific management practices play a key role in the growth performance of pigs. From the results of this study, it is concluded that non-genetic factors such as period, season and sex were found to be the significant sources of variation in birth to weaning weight. To reduce the variation in performance of piglets, more attention may be given to better farm management, especially on period and seasons.

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