COMPARATIVE EVALUATION OF LITTER TRAITS IN DESI AND LARGE WHITE YORKSHIRE PIGS

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Pigs are important meat producing livestock, which are versatile animals capable of withstanding diverse managemental and agro-climatic conditions. High prolificacy, shorter generation interval, faster growth rate and utilisation of non-competitive feed offer pigs high potential for meat production. These biological advantages of pigs play an important role to meet the animal protein deficiency in India at a very low cost.

A lot of differences exist in terms of adaptability between the pigs of tropical and temperate regions. The results of experiments revealed that climatic stress would be a limiting factor for the expression of genetic potential of the Large White Yorkshire (LWY) pigs (Mathew, 1997). Indigenous or Desi pigs are rich in genetic variability and are endowed with many positive aspects like disease resistance, tolerance to high atmospheric temperature and humidity. But, these animals are poor in production performance like litter weight at birth and weaning and mature body weight.

The litter size at birth and weaning, total and average litter weight at birth and weaning and pre-weaning mortality are basically fitness traits contributing to the multiplication and perpe- tuation of the species. In view of the above factors, a comparative study on the performance of the LWY and Desi pigs was done for evaluating these breeds.

Materials and Methods

The data on 50 litters each of LWY and Desi pigs were collected from the Centre for Pig Production and Research (CPPR), Kerala Agricultural University, Mannuthy. In order to avoid seasonal variation in litter traits, only those litters which were born in the cooler months of the year *viz.*, October, November, December and January during the period from 1996 to 1999, were considered.

Data on litter size and litter weight at birth, average birth weight, litter size and litter weight at weaning, average weaning weight and pre-weaning mortality were collected and were subjected to statistical analysis as per Snedecor and Cochran (1985).

Results and Discussion

The results obtained in the present study are summarized in Tables (1 and 2).

The litter size at birth was significantly higher in Desi than in LWY. Gopinath (2001) also reported larger litter size for Desi over LWY and crosses. The LWY had a significant advantage in average weight at birth and weaning, litter weight at birth and weaning over Desi.

The higher litter weight of LWY over Desi, which had a significantly higher litter size at birth indicated higher birth weight in case of LWY piglets in comparison with Desi. The lower litter weight in Desi may be a breed effect as Desi are smaller in body size at all

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Table 1. Mean and standard error litter traits for LWY and Desi

Traits	Mean with SE		
	Desi	LWY	Overall
Litter size at birth	8.540 ± 0.34**	7.220 ± 0.34**	7.880 ± 0.25
Litter weight at birth	6.919 ± 0.39**	9.375 ± 0.39**	8.147 ± 0.30
Average birth weight	0.809 ± 0.03**	1.318 ± 0.03**	1.064 ± 0.03
Litter weight at weaning	45.638 ± 2.36*	52.646 ± 2.36*	49.142 ± 1.69
Average weaning weight	6.708 ± 0.26**	8.276 ± 0.26**	7.492 ± 0.20
Litter size at weaning	6.920 ± 0.33^{NS}	6.600 ± 0.33^{NS}	6.760 ± 0.23
Pre-weaning mortality	1.620 ± 0.22**	0.620 ± 0.22**	1.120 ± 0.16

*** 1% level* * *5% level* *NS - Non-significant*

Table 2. Correlation (r) between litter traits and regression (b)

Traits	Desi		LWY		Overall	
	r	b (kg)	r	b (kg)	r	b (kg)
Litter size and litter weight at birth	0.8093**	0.759	0.7919**	1.094	0.5811**	0.711
Mean birth and weaning weight	0.2716	3.261	0.1027	0.711	0.4066**	2.477
Litter weight at birth and weaning	0.7401**	6.020	0.7109**	3.121	0.7032**	3.939
Litter size at birth and pre-weaning mortality	0.3253*	0.259	0.5079**	0.225	0.4205**	0.280

*** 1% level* * *5% level*

ages. Lakhani and Jogi (2001) reported a highly significant association of birth weight with genetic groups. The significantly higher average birth weight of LWY further supported this explanation.

No significant difference was observed between Desi and LWY with respect to weaning litter size, even though litter size at birth was significantly different. This was due to higher rate of pre-weaning mortality in Desi than LWY. The higher mortality in Desi piglets indicated the necessity for investigation of feed requirement and other management practices to obtain optimum reproductive performance from Desi sows as they can perform better on adverse management conditions like scavenging and occasional feeding.

The survival rate among LWY piglets was significantly higher than the Desi piglets. This seems to be due to the existence of a genetic environmental interaction between these breeds and Desi failed to perform better in respect to maternal traits due to the over deposition of fat as a result of overfeeding and lack of exercise, both of which are lacking in their natural habitat.

A highly significant positive correlation existed between litter size and litter weight at birth in Desi, LWY and in combined estimation of both the breeds, which were self-explanatory. For unit increase in litter size, the litter weight increased by 0.759 kg in Desi, 1.094 kg in LWY and 0.711 kg when data of both the breeds combined. Chhabra *et al.* (1989) and Mukho-padhyay *et al.* (1991) reported similar results.

The correlation between birth weight and weaning weight of individual piglets was not significant both in Desi and LWY. This was in disagreement with Jayarajan and Ulaganathan (1992) who reported significant positive genetic and phenotypic correlation among body weight of all the ages. But on

combined analysis of data the correlation was significant and positive. This might be due to the confounding effect of breed difference in body weight. For every one kg increase in birth weight, the weaning weight increased by 2.477 kg on an average for each piglet.

There was highly significant positive correlation between the litter weight at birth and weaning litter weight in Desi, LWY and both combined. For every one kg increase in litter weight at birth, the weaning litter weight increased by 6.020 kg in Desi, 3.121 kg in LWY and 3.939 kg in combined case. This was in full agreement with Gaur and Chhabra (1994) who reported highly significant correlation between these two traits and with regression of birth weight on weaning weight, prediction of weaning weight were carried out with an accuracy of 68.18 per cent

Significant positive correlation was observed between the litter size at birth and pre-weaning mortality. For unit increase in litter size at birth, pre-weaning mortality increased by 0.259 in Desi, 0.225 in LWY and 0.280 in overall case. This was in agreement with Knol (2001) and Kotirathnam *et al.* (2001) who also reported a negative correlation of survival rate with litter size.

Summary

Litter traits of 50 sows each of Desi and LWY farrowed during October to January for a period of 4 years were included in the study. Desi had a highly significant advantage over LWY in litter size at birth. In litter weights at birth and weaning and average birth and weaning weights LWY had a significant advantage over Desi. But litter size at weaning did not vary significantly. Desi recorded a high rate of pre-weaning mortality compared to LWY. Highly significant correlation between litter size and litter weight were observed in both the breeds. Correlation between mean birth and weaning weight was not significant in both the breeds, but combined analysis of both the breeds gave a significant effect, might be the confounding effect of breed effect. Both the breeds expressed a highly significant correlation between litter weights at birth and weaning and the correlation between litter size at birth and pre-weaning mortality in both the breeds were significant.

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