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Production and sow performance of landrace pigs under north eastern agro climatic conditions of Tamil Nadu

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Abstract

A study was conducted to evaluate the production and reproduction performance of landrace pigs under north-eastern agro-climatic conditions of Tamil Nadu. Data on 1115 animals for the period from 2003 to 2017 were collected from the Pig Breeding Unit, functioning at Postgraduate Research Institute in Animal Sciences, Kattupakkam, Tamil Nadu. Effect of various non-genetic factors on birth weight, weaning weight, litter size at birth, litter size at weaning, litter weight at birth and litter weight at weaning were studied using least-squares analysis. The least-squares mean for the traits were 1.394±0.01 kg, 8.628±0.08 kg, 7.948±0.18, 7.485±0.21, 11.022±0.37 kg, 64.833±1.99 kg respectively. Period had significant influence on all the traits studied. Season was a significant source of variation for birth weight and weaning weight and sex had significant influence only on birth weight. Litter size at birth was maximum in summer season.

Keywords: Landrace pigs, production performance, sow performance, Tamil Nadu

Introduction

Performance evaluation in pigs has been done in different parts of the world. However studies on pigs especially Landrace pigs in India is very scanty. The Landrace breed was developed in Denmark by crossing the native pig with the Large White. This cross was then improved on during years of testing and breeding under strict government control. This type of pig has white skin and black hair was not noticed. They are meant for excellent ham and ears are drooped (lop-eared). A few studies have been carried out on the performance of Landrace [12, 21, 22]. Their superior reproductive performance and mothering ability provides scope for their use in the improvement of desi pigs through crossbreeding. Study of the production and sow performance of landrace pigs helps us in understanding their performance in this environment and help us to proceed with the effective measures for their improvement. This paper documents the production and sow performance of landrace pigs at Pig Breeding Unit functioning at Post Graduate Research Institute in Animal Sciences, Kattupakkam. with an objective to evaluate the breed's performance under hot and humid conditions prevailing in the region.

Materials and Methods

Data on 1115 landrace pigs for a period of fourteen years from 2003 to 2017 were collected from the Pig Breeding Unit functioning at the Post Graduate Research Institute in Animal Sciences, Kattupakkam, Tamil Nadu. All the pigs were farm-bred and raised under normal feeding, housing and other management practices. Weaning of the piglets was carried at 42 days of age. The traits studied were birth weight, weaning weight, litter size at birth (LSAB), litter size at weaning (LSAW), litter weight at birth (LWAB), and litter weight at weaning (LWAW). Effect of various non-genetic factors on these traits were studied using least-squares analysis.

Statistical Models**Production Traits**

$$Y_{ijk} = \mu + P_i + S_j + e_{ijk}$$

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Sow Performance Traits

$$Y_{ijklm} = \mu + P_i + S_j + Q_k + R_l + e_{ijklm}$$

P_i - Effect of ith period; S_j - Effect of jth season; Q_k - Effect of kth sex; R_l - Effect of lth litter size at birth and e_{ijk} and e_{ijklm} - Random error associated with each observation

Results and Discussion

An analysis of several studies on performance and genetic parameters of swine in the tropics reports Large White Yorkshire and Landrace as the breeds with good production and reproduction potential for the tropics [2]. In India, literature on performance of exotic breeds were in general less and those available were from Kerala, Andhra Pradesh and North Eastern states [6, 8, 13-15]. This is the first study from Tamil Nadu regarding production and reproductive performance of Landrace pigs. In this study majority of swine litter traits including 4 individual and 5 sow performance traits have been evaluated under the hot and humid conditions prevailing in the region.

The least squares analysis of the traits studied are given in tables 1 and 2. The overall mean of birth weight, weaning weight, litter size at birth, litter size at weaning, litter weight at birth and litter weight at weaning were 1.394±0.01 kg, 8.628±0.08 kg, 7.948±0.18, 7.485±0.21, 11.022±0.37 and 64.833±1.99 kg respectively and ranged from 1.37 – 1.41 kg, 8.63±0.08 kg, 7.58 – 8.32, 7.06 – 7.91, 10.30 – 11.75 kg and 60.88 – 68.79 kg, respectively. LSAB of Landrace pigs in Uttar Pradesh and Assam were estimated as 9.48 ± 0.07 and 9.48 ± 0.10 respectively [21], while LSAW were reported as 7.89 ± 0.11 and 8.36 ± 0.11 respectively. Number born alive in Landrace pigs based on study done at Thailand was 9.80 ± 0.11 [12]. Both these reports indicated better performance

compared to our study. Litter weight at birth and weaning of Landrace pigs in West Bengal was reported as 9.64 ± 0.18 kg and 36.04 ± 2.01, respectively [22], which was very low compared to the performance of Landrace pigs at Kattupakkam in this study. Eventhough the litter size at birth and weaning were comparatively lower in the present study, higher litter weights observed could be due to the better individual weights. This is evident from the better performance of Landrace in terms of birth weight and weaning weight. It was found to be better than most of the studies on exotic breeds [5, 7, 9, 10, 16, 17, 19, 20] in other parts of India. Search of the literature showed paucity of studies on other traits in Landrace pigs. Moreover, the sows are able to maintain a good proportion of piglets up to weaning, the difference between LSAB and LSAW was only 0.47 indicating good mothering ability, for which the breed is known for.

Period had a significant effect on all the traits studied. Non-significant effect of the period was noticed by Chhabra *et al.* [3] in other exotic breed. Absence of effect of season on all the litter traits indicate that management was uniform throughout the year. Season had a high significant effect on birth and weaning weight. The piglets born during winter had the lowest birth weight significantly different from all other seasons. Nevertheless, these piglets were able to regain their superiority at weaning. Weaning weights were maximum during north-east monsoon and winter seasons. Birth and weaning weight were found to be higher in males than the females. Reports of Pandey *et al.* [16] and Chhabra *et al.* [4] indicated the absence of sex effect on birth weight in Large White Yorkshire pigs.

Table 1: Sow Performance of Landrace Pigs

Effect	Birth Weight (Kg)		Weaning Weight (Kg)	
	N	Mean ± SE	N	Mean ± SE
Overall Mean	1115	1.39±0.01	1010	8.63±0.08
Period	**		**	
2003-2008	101	1.38±0.02 ^b	86	9.51±0.20 ^a
2008-2012	634	1.44±0.01 ^a	590	8.37±0.07 ^b
2013-2017	380	1.36±0.01 ^b	334	8.00±0.10 ^b
Season	**		**	
Summer	314	1.39±0.02 ^a	279	8.22±0.13 ^c
South-West monsoon	253	1.45±0.02 ^a	219	8.49±0.13 ^{bc}
North-East monsoon	244	1.43±0.02 ^a	228	9.08±0.14 ^a
Winter	304	1.30±0.01 ^b	284	8.73±0.11 ^{ab}
Sex	*		NS	
Male	575	1.41±0.01	523	8.72±0.10
Female	540	1.37±0.01	487	8.53±0.10

* - <0.05 (Significant)

** - <0.01 (Highly Significant)

NS – Not Significant

N – number of observations

Table 2: Production Performance of Landrace Pigs

Details	Litter Size at Birth		Litter Weight at Birth (kg)		Litter Size at Weaning		Litter Weight at Weaning (kg)	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Overall Mean	135	7.95±0.18	135	11.02±0.37	135	7.48±0.21	135	64.83±1.99
Period	**		**		**		*	
2003-2008	14	7.05±0.46 ^b	14	9.83±0.90 ^b	14	6.23±0.52 ^b	14	59.82±4.94 ^b
2008-2012	79	8.81±0.20 ^a	79	12.57±0.39 ^a	79	8.37±0.23 ^a	79	71.00±2.13 ^{ab}
2013-2017	42	7.98±0.27 ^a	42	10.66±0.52 ^{ab}	42	7.86±0.30 ^a	42	63.67±2.85 ^a
Season	NS		NS		NS		NS	
Summer	27	8.17±0.34	27	11.81±0.67	27	7.24±0.39	27	62.21±3.65
South-West monsoon	37	7.74±0.32	37	10.74±0.62	37	7.53±0.36	37	66.98±3.41
North-East monsoon	31	7.82±0.31	31	10.50±0.62	31	7.52±0.36	31	67.14±3.40
Winter	40	8.06±0.31	40	11.04±0.60	40	7.66±0.35	40	63.01±3.29

* - <0.05 (Significant)

** - <0.01 (Highly Significant)

NS – Not Significant

N – number of observations

Conclusion

The better litter size at weaning compared to LSAB indicates good mothering ability of the breed. Analyzing these attributes will be very useful in understanding the performance of the breed under unique conditions prevailing in the region and help in suggesting suitable management and crossbreeding plans for the genetic group.

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