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Sow and Litter Performance of Pure Bred and Cross Bred Pigs in Sri Lanka

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Abstract: The main objective of this study was to evaluate the sow and litter performance of pure and cross bred pigs maintained in the mid-country area of Sri Lanka. Pure large white, landrace and their reciprocal crosses were the breeds represented in this study. Data was collected from records of 36 sows maintained at Victoria farm from 1976 to 1980 inclusive. Pure breds had larger litter sizes at birth and at 8 weeks than the cross breds. Pure large white had the largest litter size at birth (9.92) and at 8 weeks (8.1). Also pure breds had significantly higher litter weight at birth and at 8 weeks than the cross breds. Litter weight at birth was significantly higher in the landrace (14.09 kg) than the large white (12.76 kg). However, no difference was observed on the litter weight at 8 weeks between these breeds. Weaning to oestrus interval was significantly shorter in the pure breds with large white pure recording the shortest interval (8.24 days). Analysis also reveals significant parity effects on litter weight at birth, 8 weeks and weaning to oestrus interval.

1. Introduction

In order to meet the animal protein requirements of Sri Lanka, it becomes necessary to focus our thinking into various lines of meat production. Pig industry assumes a great importance in this respect. Among the farm animals, the pig has been identified to be a very efficient converter of cereal feed into meat. This is true because a single exotic breed of sow producing 16 baconers per annum slaughtered when seven months old produced a total live weight of 3,200 lbs of pig meat.[4]

The first step towards the expansion of a pig industry in Sri Lanka was started in 1959 with the establishment of a state Pig farm at Welisara. The initial breeding stock of exotic breeds large white, landrace and Berkshires were kept on this farm for supplying breeding material for the future expansion of the industry. At present 40% of our pig population is made up of these exotic breeds and their crosses.[4] Very little information is available regarding the production parameters of these breeds. Such data is necessary to select ideal breed or breeds of pigs for future expansion programmes and to achieve high efficiency. Therefore the present study was undertaken in one of the major pig farms in Sri Lanka to evaluate the sow and litter performance of large white, landrace and their reciprocal crosses.

2. Experimental

The data for this study was obtained from the sow performance records maintained at Mahaberiatenne Farm, National Livestock Development Board, Teldeniya, Sri Lanka. The elevation in this area is about 300 M above sea level, the temperature ranges from 20-29°C, relative humidity 72% and the annual rainfall is between 1300 to 1800 mm.

The general management practices adopted in the farm are as follows:- The gilts and sows in the farm are kept indoors and maintained in the fattening pens in groups of four, before breeding and during the early stages of pregnancy. Before breeding, they are given locally mixed feed containing 16% crude protein at the rate of 5 lbs per sow/day. They are observed for signs of oestrus daily and they are bred twice during oestrus. The amount of concentrate is increased by 1 lb every month of pregnancy with a maximum of 8 lbs. One week before the expected date of farrowing, they are transferred into individual farrowing pens. Sufficient care is given at farrowing and thereafter to prevent loss of piglings. For lactating sows, a maximum of 12 lbs of feed is offered. A creep feed of crude protein content of 20-21% is gradually introduced to the piglings one week after farrowing and given ad-lib upto 2 months of age when they are weaned from the sow and transferred to the fattening unit.

Nine sows each were selected at random from Large White, Landrace, Large White x Landrace, (where Large White is the male) and Landrace x Large White (where Landrace is the male) breeds.

The sows selected were those which had at least five litters. The boar effect was neglected in the analysis. Analysis of variance was done for each of the following parameters to detect difference among breeds. The parameters studied are litter size and weight at birth, and at 8 weeks, mortality from birth to 8 weeks, weaning to oestrus interval, services per conception and litter index, which is the number of litter per year/sow.

3. Results and Discussion

The overall sow and litter characteristics of the present study compared with others' findings are given in Table 1. The differences in sow and litter performances, among the breeds studied, are shown in Table 2. The parity effects on the above parameters are illustrated in Figure 1.

TABLE 1. Sow and Litter Characteristics with Means and Standard Errors Compared with Averages from Other Sources

Sow and litter characteristics	Present Study X	SE	Fahmy & Bernard X	SE	Strang X	SE
Litter size at birth	9.42	0.38	8.60	0.12	10.90	0.13
Litter size at 8 weeks	7.62	0.32	7.09	0.12	8.81	0.11
Average litter wt. at birth (kg)	1.34	0.02	1.04	0.01	—	—
Average litter wt. at 8 weeks (kg)	10.92	0.35	13.50	0.12	16.78	0.21
Litter wt. at birth (kg)	13.07	0.48	9.40	0.13	—	—
Litter wt. at 8 weks (kg)	86.29	2.44	92.69	1.74	143.88	2.39
Mortality, (%) 0-8 weeks	18.93	0.30	17.0	0.16	18.40	0.77

TABLE 2 Sow and Litter Characteristics of Large White, Landrace and Their Reciprocal Crosses (Mean — X, Standard Error — SE)

Sow and litter Characteristics	BREED Large white (LW) $\bar{X}$	SE	Landrace (LR) $\bar{X}$	SE	LW x LR $\bar{X}$	SE	LR x LW $\bar{X}$	SE
Litter size at birth	9.92[a]	0.22	9.82[a]	0.44	9.26[a]	0.31	9.39[a]	0.58
Litter size at 8 weeks	8.10[a]	0.18	7.72[b]	0.38	7.14[c]	0.26	7.50[c]	0.48
Litter wt. at birth (kg)	12.76[a]	0.28	14.09[b]	0.56	12.16[a]	0.39	13.28[a]	0.72
Litter wt. at 8 weeks (kg)	90.74[a]	1.39	88.77[a]	2.79	81.17[b]	1.98	84.49[b]	3.61
Mortality 0-8 weeks (absolute value)	1.41[a]	0.17	2.92[b]	0.35	1.82[b]	0.24	1.58[a]	0.45
Weaning to oestrus interval (days)	8.24[a]	2.52	19.30[a]	5.07	31.75[c]	3.57	13.77[b]	6.52
Services per conception	1.10[a]	0.03	1.18[a]	0.06	1.25[a]	0.06	1.16[a]	0.57
Litter index	1.99[a]	0.07	1.91[a]	0.07	1.89[a]	0.07	2.01[a]	0.05

The superscripts indicates differences and similarities along rows significant level $P < 0.05$

3.1 Litter size at birth and at 8 weeks.

Large white and Landrace had larger litter sizes at birth and at 8 weeks, compared to their reciprocal crosses. Large white breed had the largest litter size at birth (9.92) and at 8 weeks (8.1). Parity had significant effects on litter size at birth and at 8 weeks. Litter size at birth decreased after the third farrowing and litter size at 8 weeks decreased after the fourth farrowing. The values observed for litter size at birth and at 8 weeks in this study are in agreement with western standards.[1,2,5] The reason for the decline in litter size at birth and at 8 weeks is not clear, however many factors such as ovulation rate, fertilization rate, implantation rate and refractoriness of the ovaries to gonadotrophins could have contributed to this difference.

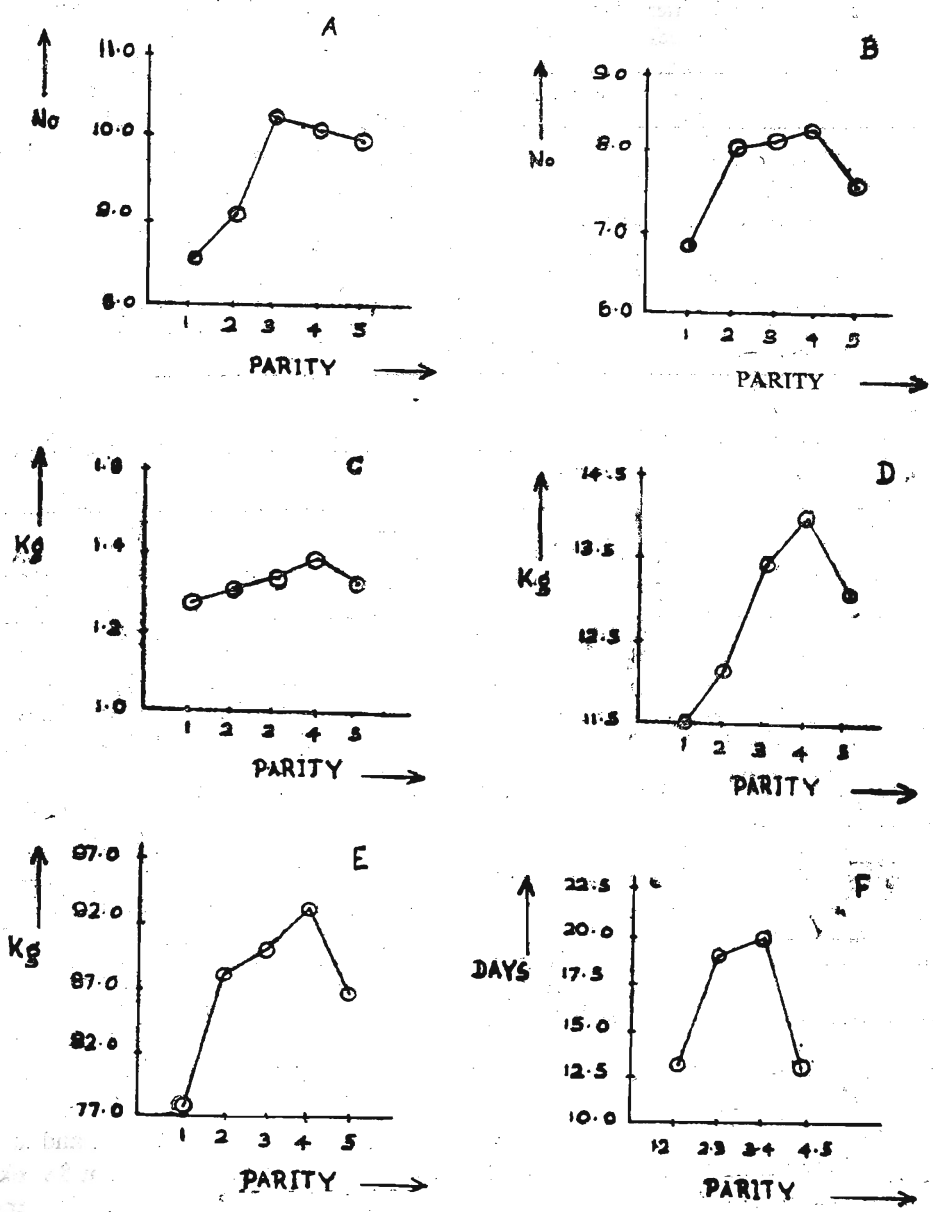

Figure 1. Effect of Parity on Litter size at birth (A), Litter size at 8 weeks (B), Average pig weight at birth (C), Litter weight at birth (D), Litter weight at 8 weeks (E), Weaning to onset of oestrus (F).

3.2 Litter weight at birth and at 8 weeks

The litter weight at birth was significantly greater in Landrace and Landrace X large white than large white and large white X Landrace cross. However the litter weight at 8 weeks was higher in large white compared to Landrace (90.74 vs 88. 77 kg). Parity had significant effect on litter weight at birth and 8 weeks. The litter weight at birth and at 8 weeks decreased after the fourth farrowing. Significant breed X parity interaction was also observed on the litter weight at 8 weeks. The average litter weight at birth of all breeds studied was greater than the values reported in the literature.[1,4] On the contrary, the weaning weight at 8 weeks was much below the values reported by above workers. The difference may be attributed to (*a*) poor quality of sow and weaner ration fed and (*b*) the effect of climate.

3.3 Piglet mortality

The mortality was highest in Landrace (2.92) and lowest in large white (1.41). The overall mortality observed was comparable to values reported by others.[1 5] This low mortality reflects the high standard of management adopted at farrowing and thereafter. It has been reported that the larger the litter size the greater the mortality. However, in the present study, large white breed had the largest litter size at birth and also the lowest mortality rate.

3.4 Weaning to oestrus interval

Pure large white breed had significantly shorter weaning to oestrus interval (8.24 days). Parity had significant effect on weaning to oestrus interval. The weaning to oestrus interval was longer upto third farrowing and decreased thereafter. The average weaning to oestrus interval observed in this study (13.77 days) was in agreement with values (15.4 to 24 days) reported in the literature.[1] It has been observed in this study as well as by others[1,4] that the interval decreases in length with the advance of parity. It is also observed in this study that 60% of the total population of sows come into oestrus within 10 days after weaning and conceived. Also around 75% of the total population had a weaning to oestrus period of 38 days.

3.5 Services per conception and litter index

Large white breed needed the least number of services (1.10) compared to others. This parameter is mainly a sow character reflecting its reproductive efficiency. Litter index was highest in Landrace breeds (2.01). However all breeds studied attained the stipulated standard for female selection (1.7). Litter index is also a prerequisite to produce a 'ton of meat on four hooves'.

4. Conclusion

The sow and litter characteristics investigated in this study are necessary technological constraints which should be overcome for profit optimisation in the swine industry. All parameters studied are comparable to western standards except the weaning weight which was well below the values reported. This can be attributed to the nutrition of the sow and piglings during the suckling period. Further, in most of the farms and in small holdings, the porker weight and baconer weights are reached much later than what was reported in the literature. Therefore in order to get a 'ton of meat' every year, from exotic sows, the nutritional problem must be looked into.

This study recommends the use of large white breed for future expansion of our pig industry. In addition to the favourable parameters observed in this study, others too have recommended this breed for future expansion.[3] The Landrace breed is not preferred by most of the pig breeders in Sri Lanka, due to their weakness on hind legs.[3] The large black and their crosses are not liked by the consumers because of seedy bacon.[3] This study also sheds some information on culling of sows for profit optimisation. According to this study, the sows productive performance decreased after the fourth farrowing. Therefore sows should be culled for meat after their fourth or fifth farrowing.

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