Reproductive Performance of Swine Under Artificial Insemination and Natural Service

S. Jaishankar\textsuperscript{1}, M. Murugan and H. Gopi
Post Graduate Research Institute in Animal Sciences, TANUVAS, Kattupakkam – 603 203.

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Abstract
A research was conducted in Large White Yorkshire and Landrace pigs maintained at Post Graduate Research Institute in Animal Sciences, Kattupakkam to compare the performance of pig between artificial insemination and natural service; between breeds and between seasons. Their productive and reproductive performance is reported.

Key words: Insemination procedure, reproductive performance, swine.

There are no authenticated report on the performance of swine under natural service and artificial insemination. Though the advantages of artificial insemination was known the published reports on this are scanty. The advantage of artificial insemination is the genetic gains with the use of the genetically superior males. Hence, this study is undertaken to compare the performance of pig between artificial insemination and natural service; between breeds and between different seasons.

Materials and Methods
Twelve sows of Large White Yorkshire and Twelve (LWY) sows of Landrace of same age group were selected and were randomly divided into two groups each containing 6 animals for Natural Service and Artificial Insemination. The sows were monitored for the presence of standing heat symptoms. The pigs in heat were bred during south-west monsoon according to the group to which it is allotted. Artificial insemination was done using foam catheter with 90 ml of liquid semen at a concentration of 30 million live sperm/ml. Following farrowing during north-east monsoon. The weaning of piglets was done at 42 days of age. The sows that came to post-weaning heat were again bred during winter which farrowed during summer. The litter size at birth, litter size at weaning, litter weight at birth, litter weight at weaning, post-weaning oestrus, conception rate and farrowing rate were recorded. The effect of breed, season and treatment (natural service vs artificial insemination) on reproductive performance of the sows were studied and compared.

The data was analysed using the least squares mean and Duncan Multiple Range Test (DMRT, 1965). Conception rate and farrowing rate were analysed using Fisher’s Exact Test.

Result and Discussion
In Large White Yorkshire and Landrace pigs conception rate was 100 per cent under natural service during monsoon and winter season. In Landrace sows conception rate was 83.33 per cent under artificial insemination in both mating season. In Large White Yorkshire sows of AI group the conception rate was 100 per cent during monsoon and 83.33 per cent during winter. The overall conception rate in Large White Yorkshire and Landrace pigs were 91.67 and 83.33 per cent, respectively. The breed, season and type of breeding had no influence on conception rate.

The mean farrowing rate in Large White Yorkshire pigs under natural service and artificial insemination were 100 and 91.67 per cent and in Landrace pigs were 100 and 83.33 per cent, respectively. Significant difference was not found between natural service and artificial insemination for farrowing rate. The breed and season had no influence on farrowing rate. In contrary, Chokoe and Siebrits (2009) reported significant difference in farrowing rates between...
winter (91.0 per cent) and summer (81.3 per cent).

The overall litter size at birth was 10.13 ± 0.21 (Table I). The litter size at birth had no significant difference between natural service (10.54 ± 0.29) and artificial insemination (9.71 ± 0.29) which coincides with the findings of Rajamahendran and Marasinghe, (1980). Season had no significant effect on litter size at birth. Similar findings were reported by Chhabra et al. (1990) and Singh et al. (2002). Breed had a non-significant influence on litter size at birth.

The litter size at weaning under natural service and artificial insemination was 9.38 ± 0.28 and 8.79 ± 0.28, respectively. The breed, farrowing season and treatment had no influence on litter size at weaning (Table I). Singh et al. (loc. cit) reported litter size at weaning of 8.13 ± 0.12 and 7.48 ± 0.08 in Landrace and Large White Yorkshire breed, respectively which is lower than the present findings. They also reported that season had non-significant effect on litter size at weaning in Large White Yorkshire pigs which is in concurrence with the present study.

The overall mean weaning to estrus interval was 4.44 ± 0.09 days. Season, breed and treatment had no influence on post-weaning estrus. Rita Narayanan et al. (2008) reported that all the sows weaned at 28 days returned to estrus by 4-5 days post weaning whereas, sows weaned at 56 days the interval varied between 10-20 days.

The breed, season and treatment had no significant influence on birth weight and litter weight at birth of piglets which concurs that of Sai Prasanna et al. (2010) who has observed non significant influence on birth weight of the piglets. In contrary, Pandey and Singh (2010) reported that the birth weight of piglets born during winter and rainy season were significantly lower than those born during summer.

The overall mean weaning weight at 42 days of age was 8.54 ± 0.07 kg and litter weight at weaning was 77.20 ± 2.05 kg. The weaning weight of Large White Yorkshire piglets and Large White Yorkshire x Landrace piglets were 8.28 ± 0.09 and 8.80 ± 0.10 kg, respectively. The breed had a significant influence on weaning weight (P<0.01) but not on litter weight at weaning. Season and treatment had no significant effect on weaning weight and litter weight at weaning. Chhabra et al. (loc. cit) reported that the year or season of farrowing did not have

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<th>Table I. Effect of breed, farrowing season and type of breeding on litter size at birth and weaning in swine</th>
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<td><strong>Effect</strong></td>
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significant effect on litter size which is in agreement with the present study. In contrary, Sai Prasanna et al. (loc. cit) reported that the piglets born in rainy season recorded significantly higher body weights, followed by those born in winter and summer seasons.

The average pre-weaning weight gain (up to 42 days of age) was 172.06 ± 1.63 g/day. The difference in pre-weaning weight gain was found to be highly significant between the breeds with highest gain in Large White Yorkshire x Landrace piglets (177.92 ± 2.33 g/day), followed by Large White Yorkshire piglets (166.21 ± 2.28 g/day). The season and treatment had no effect on pre-weaning. In contrary, Sai Prasanna et al. (loc. cit) reported significant effect of season of farrowing on body weights at different pre-weaning ages.

Summary

A study was conducted in Large White Yorkshire and Landrace pigs to compare the performance of pig between artificial insemination and natural service; between breeds and between seasons. The breed, season and type of breeding had no influence on conception rate. Significant difference was not found between natural service and artificial insemination for farrowing rate. The overall mean weaning to estrus interval was 4.44 ± 0.09 days. Season, breed and treatment had no influence on post-weaning estrus. The breed, season and type of breeding had no significant influence on birth weight and litter weight at birth of piglets. The breed had a significant influence on weaning weight (P<0.01) but not on litter weight at weaning. Significantly higher pre-weaning weight gain was found in Large White Yorkshire x Landrace piglets (177.92 ± 2.33 g/day), compared to Large White Yorkshire piglets (166.21 ± 2.28 g/day).

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