

Studies on genetic and non-genetic factors affecting reproductive traits in landrace desi and their crossbred pigs



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Abstract- Existence of piggery industries depends mainly reduction losses due to mortality of piglets with better pre-weaning litter traits and higher growth rate. Therefore the present investigation was undertaken with an objective to study the effect of various factors affecting different economic traits in 3 genetic groups of piglets. Genetic group and parity had significant effect on all the 5 economic traits, viz, litter size at birth, litter size at weaning, litter weight at birth, litter weight at weaning and farrowing interval. The period of farrowing had significant effect on litter size at birth at litter size at birth and farrowing interval, whereas season had non-significant effect on all the five traits. The litter traits were superior in exotic followed by crossbreds and desi pigs. In general, litter traits showed increasing trend from 1st to 6th Parity.

Key Words:- Genetic and non-genetic factors, reproductive traits.

Introduction, Materials and Methods

The data on 1301 pigs spread over a period of 20 years from 1982 to 2001 belonging to three genetic groups viz. Landrace(378), Desi (288) and their half breeds (625) maintained at pig breeding farm Ranchi veterinary college (Jharkhand). The pre-weaning and post-weaning body weight were recorded at 4weekly interval from birth to 24th week of age. The weaning was done at the age of 8weeks. The year was divided in to 4 season on the basis of climatological data viz., winter (December to February-cold),summer (March to May-hot dry),Rainy(Jun to August-hot humid) and autumn (September to November-moderate). The whole data were grouped in to 4 periods comprising of 5 years in each period viz., P₁(1982 to1986)P₂ (1987 to1991), P₃(1992 to1996) and P₄(1997 to2001).The suckling piglets were provided with creep feed in creep box after 2 weeks of ages. Least squares – analysis was done to see the effect of genetic and non-genetic factors on weight at different ages and Duncan Multiple Range Test (DMRT) as modified by Kramer(1957) was used for pair wise comparison of different effects.

Results and Discussion

Reproductive Traits

The overall AFF was to be 396.00±4.94 days. However, Kumar (1999) noticed the over all AFF to be 406.93±5.96days in Landrace, desi Tamworth and their crossbred. Genetic group had significant

(P<0.01) effect on AFF in desi pigs was observed than Landrace where Landrace half-bred were in between two genetic groups and did not differ significantly neither from Landrace nor from desi. Similar results were observed by Kumar (1999) who reported lowest AFF in desi than LR X D were in between to genetic groups. The effect of season of birth was non-significant on AFF of gilts. Kumar (1999) also observed non-significant effect of season of farrowing on AFF. Period had significant (P<0.01) effect on the age at first farrowing. Significantly shortest AFF was observed in gilts born during P₂ (1987-1991) than other three periods but it did not differ significantly. The significant effect of period was also reported by Khalkho(2004) in various genetic group in pigs. Significant effect of genetic group on litter size at birth are in conformity with the finding of Kumar *et al.*(1990), Mukhopadhyay *et al.*(1992),Sharma and Singh(1995),Pandey *et al.*(1996),Singh and Devi(1997) and Lakhani and Jogi (2001)in various exotic desi and their cross-bred pigs. On the contrary, significantly higher litter size at birth were recorded in Landrace sow which might be due to exotic blood level. Period had significant effect on the litter size at birth. Highest litter size at birth was observed during P₁ and lowest during P₄. Lakhani and Jogi (2000) and Khalkho (2004) also reported significant effect of period on litter size at birth. Season of farrowing

shows non-significant effect on litter size at birth. Similar findings were reported by Pandey *et al* (1996) and Singh and Devi (1997a) in LR, Desi, Tamworth and crossbred pigs. There was progressive increase in litter size at birth with the advancement of parities from 1st to 6th onward. Critical review of data indicated significantly lowest litter size at birth in first parities followed by 2nd and 3rd parities. An increasing trend of litter size at birth with the advancement of parities was reported by Mukhopadhyay *et al* (1992) Sharma and Singh (1993,1995). Singh *et al* (1989) reported significantly lower litter size at birth in first two parities in LWY and Hampshire, respectively. Significantly higher litter size at weaning was observed in Landrace than Landrace half-bred followed by desi. Significantly lower litter size at weaning in desi than exotics and crossbred was reported by Kumar *et al* (1990), Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Kumar (1999) and Khalkho (2004) in various genetic groups belonging to desi, exotic and their crossbreds. Period of farrowing had non-significant influence on the litter size at weaning. On contrary, Singh *et al* (2002) in Landrace and LWY and Khalkho (2004) in Tamworth, desi and their crosses noticed significant effect of period of farrowing on litter size at weaning. Season had non-significant effect on litter size at weaning. Singh *et al* (2002), Mukhopadhyay *et al* (1992), Singh and Devi (1997) and Kumar (1999) also reported non-significant effect of season in different exotic desi and their crossbred pigs. Parity had significant ($P < 0.01$) effect on litter size at weaning. Progressive increase in litter size at weaning was observed with advancement of parities from 1st to 7th. Significantly lowest litter size at weaning in early parities was reported by Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Singh and Devi (1997), Kumar (1999) in various genetic groups. Significantly lowest litter weight at birth was recorded in desi pigs and highest in Landrace sow. The half-breeds were in between these two genetic groups. The present findings are in conformity with Kumar *et al* (1990), Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Singh and Devi (1997), Kumar (1999) and Khalkho (2004). Period had non-significant

effect on litter weight at birth. The same results were observed by Khalkho (2004), who reported progressive decrease of litter weight at birth with the advancement of period. The effect of season of farrowing had non-significant influence on litter weight at birth. The present findings were supported by the work of Mukhopadhyay *et al* (1992) and Pandey *et al* (1996). Parity had significant effect on the litter weight at birth. Progressive increase in litter weight at birth from 1st to 5th parity. Significantly lowest value in first two parities might be due to small body size of sow. Kumar *et al* (1990), Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Kumar (1999) and Khalkho (2004) also had similar findings in different exotic desi and crossbred pigs. Genetic group had significant effect on litter weight at weaning. Lowest litter weight at weaning was observed in desi sow than Landrace and highest in LR X D. Similar findings have also been reported by Singh and Devi (1997), Kumar (1999), Sharma and Singh (1993), Lakhani & Jogi (2000) and Khalkho (2004). Period had significant influence on litter weight at birth. The findings were supported by the results of Lakhani and Jogi (2000) and Khalkho (2004). There was a progressive decrease in litter weight at weaning with the advancement of period. Season of farrowing had non-significant effect on litter weight at weaning. Similar findings were reported by Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Singh and Devi and Pandey *et al* (1996). Least-squares analysis showed significant effect of parity on litter weight at weaning. There was a progressive increase in litter weight at weaning from 1st to 7th parity. The result was in agreement with the findings of Mukhopadhyay *et al* (1992), Sharma and Singh (1993), Singh and Devi (1997), Kumar (1999) and Khalkho (2004). Genetic group had significant effect on farrowing interval. Significantly increasing trend of farrowing interval was recorded in desi and Landrace and LR X D. Significant effect of genetic group was also reported by Mukhopadhyay *et al* (1992), Singh and Devi (1997) and Khalkho (2004) in exotic desi and their crossbreds. Period had significant effect on farrowing interval. Significantly higher farrowing interval in P₁ period than rest three periods was observed. Similar

result was also noticed by Khalkho(2004) in exotic desi and their crossbreds. The effect of season of farrowing on farrowing interval of was found to be non-significant The present finding were in conformity with the Mukhopadhyay *et al.* (1992). Highly significant effect of parity on farrowing interval of sow was observed. Critical study of data indicated progressive decrease in farrowing interval with the advancement of parities from 1st.to 4th. The longest farrowing interval was between 1st.and 2nd.parity was also reported by Kumar(1999) in various exotic, desi and their crossbred pigs.

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Table 1- Least-square analysis of various factors affecting reproductive traits in pigs

Source of variance	Means - squares				
	Farrowing interval	Litter size at birth	Litter size at weaning	Litter weight at birth	Litter weight at weaning
Genetic group	59964.03** (2)	140.97** (2)	188.02** (2)	1570.12** (2)	2607.23** (2)
Period of farrowing	7018.93** (2)	31.60** (3)	8.37 (3)	23.42 (3)	1011.14** (3)
Season	2422.15 (3)	8.75 (3)	4.63 (3)	25.98 (3)	330.00 (3)
Parity	10673.40** (4)	72.65** (3)	42.51** (3)	65.38** (3)	1453.25** (3)
Error	1604.14 (155)	5.50 (206)	4.81 (206)	12.87 (206)	316.18 (205)

Figure in parentheses indicate degree of freedom; ** P < 0.01; * P < 0.05