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## Evaluation of reproductive performance of Jharsuk pig under farm management

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### Abstract

Pig farming is a traditional occupation of tribal population in Jharkhand. Pig farming plays an important role in improving the socio-economic status of pig farmers was tribal population of Jharkhand as compared to other livestock farming. The present investigations were carried out on Jharsuk Pigs maintained at Pig Breeding farm of Ranchi Veterinary College, Birsa Agricultural University, Ranchi (Jharkhand). 161 sows along with their 440 farrowing and 3414 piglets were taken into account in this study. Average age at first oestrus, age at first service, age at first farrowing and farrowing interval was observed to be  $200\pm 6.25$ ,  $216\pm 2.56$ ,  $329\pm 2.1$  and  $202\pm 4.25$  days. Average litter size at birth, litter size at weaning, litter weight at weaning observed to be  $6.74\pm 0.11$ ,  $6.24\pm 0.11$ ,  $7.92\pm 0.14$ ,  $56.88\pm 0.96$  respectively. Season had significant effect on age at first oestrus and farrowing interval.

**Keywords:** reproductive performance, Jharsuk pig, farm management

### Introduction

Reproductive performance is one of the main determinants of productivity of 2wzpig. High reproduction rates are essential for profit in pig production. The level of reproductive performance is dependent on the interaction of genetic and environmental factors and has to be given priority. Reproductive efficiency as such can be measured and expressed as the farrowing rate, weaning rate, farrowing interval, litter size at birth and weaning Jharsuk pig is the popular variety of desi pig a many farmers because of high reproductive efficiency as compared local pig.

### Material and Methods

The present investigations were carried out on Jharsuk Pigs maintained at Pig Breeding farm of Ranchi Veterinary College, Birsa Agricultural University, Ranchi (Jharkhand). The data for the present investigation were collected from the Jharsuk pigs maintained under different AICAR, MSP projects over a period of about five years from 2012 to 2017. The observations pertaining to reproductive performance and season effect were recorded from history cum-pedigree sheet of the farm. 161 sows along with their 3414 piglets were taken into account in this study.

### Results and Discussion

#### Reproductive performance of Jharsuk pigs

Average reproduction performance of Jharsuk pigs *viz.* Age at first oestrus, Age at first service, Age at first farrowing, Farrowing interval, Litter size at birth, Litter size at weaning, Litter weight at birth and Litter weight at weaning were observed to be  $200\pm 6.52$  days,  $216\pm 2.56$  days,  $329\pm 2.1$  days,  $202\pm 4.25$  days,  $6.74\pm 0.11$ ,  $6.24\pm 0.11$ ,  $7.92\pm 0.14$  (kg) and  $56.88\pm 0.96$  kg respectively. The results have been tabulated in Tables no 1.

The results are in conformity with finding of Marksimovic *et al.*, (1984) reported the average Age at first oestrus in Swedish Landrace gilts were 240 days however Kouamo, *et al.* (2015) reported to be age at first oestrus 210 to 230 days respectively.

#### Sow performance under different litter size

Average reproduction performance of Jharsuk pigs belong to different litter size *viz.* litter size 1 to 5, 6 to 8 and more than 8. Were observed result clearly indicated Maximum number of sow farrowed with litter size 6 to 8 (65) followed by 1 to 5 (56) and >8 (40). Farrowing

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interval of sow were observed to be 183±7.48, 202±7.8, and 225±8.2 days for litter size 1 to 5, 6 to 8 and >8 respectively. Significant ( $P<0.05$ ) highest farrowing interval were observed for litter size>8 (225±8.2) days followed by 6 to 8, 202±7.8 (days) and 1 to 5, 183±7.48 (days) However, irrespective of litter size average farrowing interval were observed to be 202±4.25 (days)

Litter size at birth were observed to be 3.87±0.09, 6.99±0.05, and 9.86±0.09 for litter size 1 to 5, 6 to 8 and >8 respectively. Significant different ( $P<0.05$ ) were observed among groups. Litter size at weaning were observed to be 3.72±0.11, 6.38±0.38 and 9.09±0.15 for litter size 1 to 5, 6 to 8 and >8 respectively. However significant difference ( $P<0.05$ ) were observed among group.

Litter weight at birth were observed to be 4.76±0.17, 8.19±0.10 and 11.36±0.15 for litter size 1 to 5, 6 to 8 and >8 respectively. However significant different ( $P<0.05$ ) were observed among group The results have been tabulated in

Tables no 2 The results are corroborated with the finding of Mukhopadhyay *et al.*, (1992) 191.86±4.26 days by Singh and Devi (1997) [4, 5] who reported the average farrowing interval LR x D and desi pigs. Farrowing interval in female pig of Tripura were reported 178±0.9 days.

**Table 1:** Average reproductive performance of Jharsuk pigs

Reproduction parameter	Observation of result
Age at first oestrus (days)	200±6.52 <sup>(161)</sup>
Age at first service (days)	216±2.56 <sup>(161)</sup>
Age at first farrowing (days)	329±2.1 <sup>(161)</sup>
Farrowing interval (days)	202±4.25 <sup>(161)</sup>
Litter size at birth	6.74±0.11 <sup>(3414)</sup>
Litter size at weaning	6.24±0.11 <sup>(3042)</sup>
Litter weight at birth	7.92±0.14 <sup>(3414)</sup>
Litter weight at weaning	56.88±0.96 <sup>(3042)</sup>

**Tables 2:** Effect of litter size on reproductive performance of sow

Source of variance	Litter size			Overall	Sig
	1 to 5	6 to 8	>8		
Average farrowing interval (days)	183±7.48 <sup>a(56)</sup>	202±7.8 <sup>b(65)</sup>	225±8.2 <sup>c(40)</sup>	202±4.25 <sup>(161)</sup>	*
Average litter size at birth	3.87±0.09 <sup>a(133)</sup>	6.99±0.05 <sup>b(202)</sup>	9.86±0.09 <sup>c(105)</sup>	6.74±0.114 <sup>(440)</sup>	*
Average litter size at weaning	3.72±0.11 <sup>a(133)</sup>	6.38±0.38 <sup>b(202)</sup>	9.09±0.15 <sup>c(105)</sup>	6.24±0.114 <sup>(440)</sup>	*
Average litter weight at birth (kg.)	4.76±0.17 <sup>a(133)</sup>	8.19±0.10 <sup>b(202)</sup>	11.36±0.15 <sup>c(105)</sup>	7.92±0.14 <sup>(440)</sup>	*
Average litter weight at weaning (kg.)	38.81±1.13 <sup>a(134)</sup>	59.65±0.09 <sup>ab(202)</sup>	73.43±1.58 <sup>c(105)</sup>	56.88±0.96 <sup>(440)</sup>	*

Fig. () Parentheses indicate number of farrowing \* =  $P<0.05$ , NS = Non – significant, () parentheses indicate number of sow

**Season wise sow performance**

Average age at first oestrus during different season were observed to be 198±2.20, 195±4.46, 219±3.81, and 189±3.13 days during summer, rainy, autumn and winter season respectively. Irrespective of season overall AFE were observed to be 200±6.52 days. Significantly different highest age at first estrus days were observed during winter season (219±3.81) followed by summer season (198±2.20), autumn season (195±4.46) and rainy season (189±3.13) days. However no significant differences were observed among summer, rainy and winter season. Table’s 3. The results are in conformity with finding of Andersson and Einarsson (1980) [2] reported the age at first oestrus in cross bred gilts (Swedish Landrace x Swedish Yorkshire) which were 188.8±13.18 days (Range 166-204 days) where as in Large White were 177.67±3.41 days which range between 160 to 195 days (Babu *et al.*, 2004) [3] reported age at AFE in Large White were 177.63±3.41 days which range between 160 to 195 days. However Marksimovic *et al.*, (1984) reported the average Age at first oestrus in Swedish Landrace gilts were 240 days however Kouamo, *et al.*, (2015) reported to be age at first oestrus 210 to 230 days respectively.

Average age at first service during different season were observed to be 219±2.61, 210±3.28, 222±1.67, and 216±4.42 days during summer, rainy, autumn and winter, season respectively. Slightly highest age at first service were observed during autumn season (222±1.67) followed by summer season (219±2.61), winter season (216±4.42) and rainy season (210±3.28) days. However, no significant differences were observed among winter, summer, rainy and autumn season. Irrespective of season overall average age at first service was observed to be 216±2.56 days. Kouamo *et al.* (2015) reported that the age at first service (days) in Large-white 183.68±5.13, Duroc 184.50±13.13, Landrace 177.75±8.54, Local 149.00±1.01 respectively. Braune and

Schlegal *et al.*, (1981) [4] reported that the average age at first service in female swine were 235 days with a live weight of 114 kg, The current finding were in couronance with Mishra *et al.*, (1985) [23, 41, 46] who reported that the age at first service in Large White Yorkshire, indigenous and cross breed pigs were 388.46±15.90 337.16±29.87 and 255.0±4.81 days respectively.

Average age at first farrowing during different season were observed to be, 332±2.76, 323±3.12 332±1 and 330±4.40,6day during summer, rainy, autumn and winter season respectively. Slightly highest age at first farrowing were observed during summer (332±2.76) and winter (332±1.6), followed by autumn (330±4.40) and rainy season (323±3.12) days. Irrespective of season average AFF was observed to be 329±2.10days however no significant difference were observed among group. The results are in conformity with finding of Singh& Devi *et al.*, (1997) [4, 5] reported who that the age at first farrowing of Desi and crossbred (T&D) were 333.45±9.01 and 376.46±12.86 days, Mukhopadhyay *et al.*, (1992), Sharma *et al.*, (1992) [34-36, 37, 40] and Singh *et al.*, (1995) [3, 35-37, 39-46, 52] Reported in the significant effect of season of farrowing period were observed in exotics, Desi and their cross breeds. They found significant higher farrowing of sows during rainy season than that of autumn. Significant effect of season of farrowing period were also reported by Prasanna *et al.*, (2009) in LWY crossbreeds. On the country, Average farrowing interval were observed to be 214±7.93, 194±6.65, 199±6.2 and 202±7.7, days during summer, rainy, autumn and winter season respectively. Irrespective of season average farrowing interval was observed to be 202±4.25 days Significant ( $P<0.05$ ) highest farrowing interval were observed during summer (214±7.93), followed by autumn (202±7.7), winter (199±6.2), and rainy (194±6.65) season. However no significantly differences were observed among summer, autumn and winter season. The

results are in finding of the average Panday (2004) who reported average farrowing interval in Landrace pigs during winter 197.22±6.25 days, summer 219.04±7.98 days, rainy 198.64±6.75 days and autumn 208.01±6.73 days, LR in sows were 207.02±1.31 days

Average litter size at birth were observed to be 6.90±0.2, 6.68±0.24, 6.41±0.25, and 6.87±0.22 during summer, rainy, autumn, and winter season respectively. Irrespective of season average LSB was observed to be 6.74±0.11. Slightly highest litter size at birth were observed during summer (6.90±0.2), followed by autumn (6.87±0.22), rainy 6.68±0.24, winter season (6.41±0.25). However no significant differences were observed among group. The results are in close agreement with finding of Chhabra *et al.*, (1996) [6, 8-10, 16, 42, 49] who reported that litter size at birth were 7.38 for L x D crossbreds litter size at birth in Lx D pigs were reported as range 7.0-7.60, 7.33±0.843 in Lx D, Large White Yorkshire 7.11±0.43 kg.

Average Litter sizes at weaning during different season were observed to be 6.38±0.20, 5.90±0.48, 6.05±0.25, 6.59±0.2 kg during summer, rainy, autumn and winter season. Irrespective of season average LSW was observed to be 6.24±0.11. Significant highest litter size at weaning were observed during autumn (6.59±0.22) followed by summer (6.38±0.20), winter (6.05±0.25), summer (6.38±0.20) and rainy season (5.90±0.48) respectively. However no significant differences were observed among summer rainy and winter. Singh *et al.* (1995) [3, 35-37, 39-46, 52]. Reported in the significant effect of season on LSB, LSW, LWB, and LWW in exotics, Desi and their crossbreds. They found significant higher LSB during rainy season than autumn. Significant effect of season of LSB, LSW, LWB, and LWW were also reported by Prasanna *et al.* (2009) in LWY crossbreds. On the contrary, Sharma and Singh (1993) [3, 35-37, 39-46, 52] in LWY, LR Desi and their crossbreds and Panday *et al.* (1996) in Hampshire, LWY, Desi and crossbreds recorded Non significant influence of season period. Panday (2004) who reported litter size at birth Landrace pigs that the winter 5.71±0.33, summer 6.41±0.36, rainy 6.20±0.31 and autumn 6.21±0.38 kg respectively

Average Litter weight at birth during different season were

observed to be 7.90±0.23, 7.75±0.28, 7.69±0.32, and 8.28±0.28, during summer, rainy, autumn and winter, season respectively. Irrespective of season average LWB was observed to be 7.92±0.14 kg. Slightly highest litter weight at birth were observed during autumn season (8.28±0.28), followed by summer season (7.90±0.23), and rainy season (7.75±0.28) and winter season (7.69±0.32). However no significant differences were observed among group. The litter weight at birth varies from 3-10 kg in desi pigs. Nath *et al.*, (2013) [11, 55] and Sahoo *et al.*, (2012) [14] reported that the litter weight at birth as 3.00±0.45 kg (non-descript Sikkim local pig), 6.40±1.43 kg, and 9.5± 0.23 kg in Ghungroo pig, 4.23±0.29 kg in Niang-Megha, respectively. However Kaushik *et al.*, (2017) who reported that the Large White Yorkshire piglets in litter weight at birth 8.94±0.46, kg, respectively.

Average Litter weights at weaning during different season were observed to be 57.36±1.88, 53.74±1.90, 54.23±1.90, and 61.45±1.87, during summer, rainy season, autumn, and winter respectively. Irrespective of season average LWW was observed to be 56.88±0.96 kg. Significant highest litter weight at weaning were observed during autumn season (61.45±1.87) followed by summer season (57.36±1.88) winter season (54.23±1.90), and rainy season (53.74±1.90) kg. However ( $P>0.05$ ) significant difference were observed among group. Singh *et al.* (1995) [3, 35-37, 39-46, 52] Reported in the significant effect of season on LSB, LSW, LWB, and LWW in exotics, Desi and their crossbreds. They found significant higher LSB during rainy season than autumn. Significant effect of season of LSB, LSW, LWB, and LWW were also reported by Prasanna *et al.* (2009) in LWY crossbreds. On the contrary, Sharma and Singh (1993) [3, 35-37, 39-46, 52] in LWY, LR Desi and their crossbreds and Panday *et al.* (1996) in Hampshire, LWY, Desi and crossbreds recorded Non significant influence of season period. Panday (2004) who reported litter size at birth Landrace pigs that the winter 5.71±0.33, summer 6.41±0.36, rainy 6.20±0.31 and autumn 6.21±0.38 kg respectively.

**Tables 3:** Effect of different season on reproductive performance of Jharsuk pigs

Parameter	Summer	Rainy	Autumn	Winter	Overall	Sig
Age at first oestrus (days)	198±2.20 <sup>a</sup> (43)	189±3.13 <sup>a</sup> (31)	219±3.81 <sup>b</sup> (49)	195±4.46 <sup>a</sup> (38)	200±6.52 (161)	*
Age at first service (days)	219±2.61 (43)	210±3.28 (31)	222±1.67 (49)	216±4.42 (38)	216±2.56 (161)	NS
Age at first farrowing (days)	332±2.76 (43)	323±3.12 (31)	332±1.6 (49)	330±4.40 (38)	329±2.1 (161)	NS
Farrowing interval (days)	214±7.93 <sup>bc</sup> (43)	194±6.65 <sup>a</sup> (31)	199±6.2 <sup>b</sup> (49)	202±7.7 <sup>ab</sup> (38)	202±4.25 (161)	*
Litter size at birth	6.90±0.2 (131)	6.68±0.24 (107)	6.41±0.25 (90)	6.87±0.22 (112)	6.74±0.11 (440)	NS
Litter size at weaning	6.38±0.20 <sup>ab</sup> (131)	5.90±0.48 <sup>a</sup> (107)	6.05±0.25 <sup>ab</sup> (90)	6.59±0.22 <sup>b</sup> (112)	6.24±0.11 (440)	*
Litter weight at birth (kg)	7.90±0.23 (131)	7.75±0.28 (107)	7.69±0.32 (90)	8.28±0.28 (112)	7.92±0.14 (440)	NS
Litter weight at weaning (kg)	57.36±1.88 <sup>ab</sup> (131)	53.74±1.90 <sup>a</sup> (107)	54.23±1.90 <sup>a</sup> (90)	61.45±1.87 <sup>b</sup> (112)	56.88±0.96 (440)	*

Fig. () Parentheses indicate number of sow (), parentheses indicate number of litter/farrowing

### Summary and Conclusions

1. Average age at first oestrus, age at first service, age at first farrowing and farrowing interval was observed to be 200±6.25, 216±2.56, 329±2.1 and 202±4.25 days.
2. Average litter size at birth, litter size at weaning, litter weight at weaning observed to be 6.74±0.11, 6.24±0.11, 7.92±0.14, 56.88±0.96 respectively.
3. No significant different was observed in reproductive traits
4. Season had significant effect on age at age at first oestrus and farrowing interval.
5. Age at first oestrus was observed to be during rainy season followed by autumn, summer and winter season.

6. Farrowing interval was significantly lowest during rainy season.
7. Season had significant no effect litter size at birth and litter weight at birth LSB, LSW, LWB and LWW was observed during autumn season followed by summer, winter and rainy season.
8. Season had significant effect Litter weight at birth and litter weight at weaning.
9. Maximum number sows farrowed with litter size 6 to 8 followed by 1 to 5 and >8 litter size.
10. Litter size had significant influence on reproductive performance of sows.

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