

Effect of Number of Insemination on Farrowing Rate and Litter Size in Large White Yorkshire Sows*

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ABSTRACT

Semen was collected from Large White Yorkshire (LWY) boars by gloved - hand technique twice weekly and extended in Beltsville Thawing Solution (BTS) keeping 4 billion sperm per insemination dose of 100 ml volume. The diluted semen was packed in cotchette and preserved at 18°C in BOD incubator and was used for insemination within 3 days of storage. Insemination was done using sponge tip 'Golden pig' catheter. Single insemination was done in 14 animals on the 2nd day of oestrus and double insemination was done in 15 animals on the 2nd and 3rd day of oestrus (Day of onset of oestrus was the first day of oestrus). The farrowing rate was 71.43 and 80.00 per cent for single and double inseminations respectively, the difference being not significant. The mean litter size for single and double inseminations was found to be 9.00 ± 0.75 and 9.25 ± 0.81 respectively, the difference being non-significant. From this study, it may be concluded that though not significant, the farrowing rate was higher in double insemination than single insemination and the litter size were also not significant between the number of inseminations.

Key words: No. of insemination, farrowing rate, litter size, sow.

The optimal schedule for Artificial insemination (A.I.) is one that will result in a high farrowing and litter size. In pig high variation has been observed in the duration of oestrus and in the time of ovulation. Successful fertilization depends mainly on the time of insemination or mating relative to ovulation. As the time of ovulation varies considerably within the period of oestrus, fertilization rate will be compromised if the number of mating per sow is restricted (Foxcroft and Vande Wiel, 1982). Many workers reported significantly higher farrowing rate and litter size in double insemination during the same oestrus than that in single insemination (Kim *et al.*, 2003; Kadirvel *et al.*, 2004; Flowers and Esbenshade, 1993). However, Waller and Bilkei (2002), Slijkhuis and Schneijdenberg (1987) and Gooneratne *et al.* (1989) observed that farrowing rate did not differ significantly between

single and double mated sows. Hence, the present study was undertaken to investigate the effect of single versus double insemination during oestrus on farrowing rate and litter size.

MATERIALS AND METHODS

The effect of number of insemination on fertility was studied on 29 oestrous Large White Yorkshire (LWY) sows in Regional Pig Breeding Farm, Selesih. Semen was collected twice a week from seven LWY boars by gloved hand technique (Hancock and Hovell, 1959) using a dummy as mount as per the routine programme of semen collection in Artificial Insemination Centre, Selesih, Aizawl, Mizoram. Semen collections were made in the morning from 6.00 to 7.00 AM. from one or two boars per collection day. The boar was brought to the semen collection site and was allowed to mount over the dummy. Good quality semen was extended in Beltsville Thaw Solution (BTS) keeping 4 billion sperm per insemination dose of 100 ml volume. The diluted semen was packed in cottle and preserved at 18°C in BOD incubator and was used for insemination within 3 days of storage. Insemination was done using sponge tip 'Golden pig' catheter. Single insemination was done in 14 animals on the 2nd day of oestrus (Day of onset of oestrus was the first day of oestrus) and double insemination was done in 15 animals on the 2nd and 3rd day of oestrus (24 hours interval). The farrowing rate and litter size were studied.

Statistical analyses were done as per Snedecor and Cochran (1989).

RESULTS AND DISCUSSION

The farrowing rate and litter size at birth in LWY sows inseminated single or double insemination is given in table 1 and 2.

Table 1: Effect of Number of Insemination of Oestrous Sows on Farrowing Rate in Yorkshire Pigs

No. of A.I.	No. of sows inseminated	No. of sows farrowed	Farrowing rate (%)	Chi-Square value
Single	14	10	71.43	0.29 ^{NS}
Double	15	12	80.00	

^{NS} non-significant

Table 2: Effect Of Number Of Insemination Of Oestrous Sows On Litter Size In Yorkshire Pigs

No. of A.I.	No. of farrowing	Litter size (Mean ± SE)	't' value
Single	10	9.00 ± 0.75	0.22 ^{NS}
Double	12	9.25 ± 0.81	

^{NS} non-significant

The farrowing rate was 71.43 and 80.00 per cent for single and double inseminations respectively. The farrowing rate obtained with single insemination in the present finding was comparable with the report of Konnermann (1974) and Swensson (1976), Kadirvel *et al.* (2004). However, slightly lower farrowing rate after single A.I. was reported by Xue *et al.* (1998) and Peter Best (2007). The farrowing rate recorded in the present study with double inseminations was in agreement with the reports of Kuster and Althouse (1999) and Popwell and Flowers (2004). On the other hand, higher farrowing rate was reported by Watson *et al.*

(2001), Watson and Behan (2002), and Kantharaj and Althman (2007) and lower farrowing rate was reported by Candini *et al.* (2000), Bracken *et al.* (2003) and Jansen *et al.* (2007). This might be due to difference in the breed, age of animals, quality of semen, volume of semen, sperm number per dose, age of semen used and feeding and management. The mean litter size for single and double inseminations was found to be 9.00 ± 0.75 and 9.25 ± 0.81 respectively, the difference being non-significant (Table 2). The non-significant difference in litter size between single and double insemination in the present study was in agreement with the reports of Slijkhuis and Schneijdenberg (1987) and Gooneratne *et al.* (1989). On the contrary, significantly higher litter size with double insemination was reported by earlier workers (Karlberg, 1980; Waller and Bilkei, 2002; Kim *et al.*, 2003; Kadirvel *et al.*, 2004).

The litter size obtained with single insemination in the present finding was comparable with the reports of Konnermann (1974), Karlberg (1980), Johnson *et al.* (1982), Xue *et al.* (1998) and lower litter size was reported by Kadirvel *et al.* (2004). However, higher litter size with single insemination was reported by others (Swensson, 1976; Sohst, 1997; Peter Best, 2007). The litter size obtained with double inseminations in the present finding was comparable with the report of Hernandez and Duverger (1978), Kadirvel *et al.* (2004) and Kantharaj and Athman (2007). However, higher litter size was also reported (Swensson, 1976; Huang *et al.*, 2005; Jansen *et al.*, 2007; Peter Best, 2007 and Pelland *et al.*, 2008). This might be due to difference in the breed, age of animals, quality of semen, volume of semen, sperm number per dose and feeding and management.

From this study, it may be concluded that though not significant, the farrowing rate was higher in double insemination than single insemination and the litter size were also not significant between the number of inseminations.

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