USE OF 'WOODEN DUMMY SOW' FOR TRAINING OF BOAR FOR SEMEN COLLECTION AND THE SEMEN QUALITY OF TRAINED BOAR

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ABSTRACT

The present investigation indicated that boar can be trained through psychological intervention, without any hormonal treatment, using 'wooden dummy sow' for semen collection. Semen characteristics like sperm concentration (165.6 million/ml), sperm motility (76.2%) and live sperm (76.6%) of trained boar were within normal range with minimum morphological sperm abnormalities (9.9%). Also, HOST revealed the presence of quality sperms (70.5%) that was supported by successful conception rate (71.4%). Biochemical tests viz. 'R' test and MBR test as per protocol for bull semen were not fit for the quality assessment of boar semen. In brief, boar can be trained for semen collection using a dummy sow and the semen quality of trained boar was acceptable for AI.

Keywords: AI, Boar, HOST, Semen collection, Semen evaluation

INTRODUCTION

Pig is the most important livestock in North-East Hill region because of the heavy demand of pork by tribal people, however, these pigs have inferior genetic potential with low feed conversion efficiency. The production of genetically superior pig is possible through artificial insemination (AI). Although, the superiority of breeding boar is mainly assessed through its pedigree history and progeny testing, yet there are various laboratory tests that can be used to evaluate the quality of germplasm of a boar for AI purposes. Semen collection is easy when boar mounts over estrus gilt / sow, however, it is difficult to get estrus pig at the required time. This warrants training of boar for collection of semen using a 'wooden dummy sow'. Thus, the present work was carried out with the objective to train the boar for semen collection and the subsequent evaluation of semen.

MATERIALS AND METHODS

A healthy Large White Yorkshire boar (age, 8 month) was selected for training for semen collection using a 'wooden dummy sow'. Initially, the boar was separated and kept in a single pen. After a month, the boar was exposed to 'dummy sow' daily in the morning along with mimicking breeding sound. Semen collection was done by holding protruded erect corkscrew end of the penis firmly with sterilized gloved hand and an intermittent pulsatile pressure was maintained tightly on the penis to obtain complete ejaculation. The semen was allowed to pass through a Buchner funnel to separate the gel mass at the time of semen collection into a pre-warmed (37ºC) thermos flask.

Ten ejaculates were collected, twice a week, for evaluating sperm concentration, motility, live spermatozoa, morphologically abnormal sperm (Chutia *et al.,* 2014), Hyposmotic Sperm Swelling Test (HOST, Jeyendran *et al*., 1984), biochemical tests viz. Millovano's Resistance Test ('R' test) and Methylene Blue Reduction Test (MBR test; Beck and Salisbury, 1943). For the assessment of 'R' test, 20 µl of fresh semen was taken in a pre warmed (37°C) sterilized conical flask and mixed with 10 ml of 1% NaCl solution. A drop of mixture was observed under microscope for progressive motility. The addition of NaCl solution

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was continued until progressive motility was stopped. The 'R' value was calculated by milliliter of 1% NaCl solution required to stop the progressive sperm motility divided by 0.02 ml semen.

Seven females were used for AI with 80 ml extended (BTS @ 1:3) and preserved (0-96 h at 17°C) semen. Golden pig catheters were used to transfer the extended semen transcervically. Animals were inseminated after 4 h from the time of stance reflex and 18 h thereafter for the second insemination. The females were diagnosed for pregnancy on the basis of 40 to 60 days non-return rate and the conception rate was expressed in percentage. The statistical analysis of the data was performed using SPSS-10 (http://www.spss.co.in/).

RESULTS AND DISCUSSION

The method applied for the training of boar, without any hormonal treatment, was simple and effective. Following initial exposure to 'wooden dummy sow', the boar exhibited behavioral characteristics like biting, licking, pushing and mounting over the dummy. On day 9, the boar exhibited innate sexual eagerness, mounted over dummy and semen was collected. This success was due to the fact that sexually mature boar was initially kept in a single pen which prevented pederasty and increased magnetism towards dummy. The libido of boar during training period was enhanced by mimicking breeding sound and striking gently over snout of boar to direct towards the dummy. The massage of penis along with prepuce stimulated erection and protrusion of penis. The long preputial hairs were cut at 2.0-2.5 cm apart from the prepuce to avoid pain to boar while holding of erected penis. However, no data was generated due to insufficient number of boar.

Sperm concentration recorded in the present study (Table 1) was lower than reported earlier in Large White Yorkshire boars (Kantharaj and Athman, 2009). However, sperm motility of boar semen in the present study (Table 1) was in agreement with the same report. Similarly, the recorded live sperm percentage (Table 1) was in agreement with literature on Large White boars (Maldjian *et al.*, 2005). The variations in some of these parameters might be attributed to multiple animal related factors as well as frequency and method of semen collection.

Table 1: Seminal attributes of Large White Yorkshire boar (n=8 ejaculates)

Seminal attributes	**Mean±SE**	**Range**
Sperm concentration, 10^6/ml	165.63±6.71	140-195
Sperm motility, %	76.25±1.57	70-80
Live sperm, %	76.64±1.05	72.76-81.03
Sperm head abnormality, %		
Pear shaped head	1.5	0.6-2.1
Giant head	1.2	0.9-1.5
Round head	0.7	0.6-0.8
Small abnormal head	0.9	0.4-1.5
Detached head	0.5	0.4-0.7
Sperm tail abnormality, %		
Proximal droplet	1.6	0.6-2.7
Folded tail	2.3	1.0-4.9
Terminally coiled tail	1.2	0.5-2.1
HOST-reacted sperm	70.48±1.04	65.7-74.1

Total sperm head and tail abnormality in the present study (Table 1) was recorded as 4.8% and 5.1%, respectively, with total morphological abnormalities recorded as 9.9%. In fact, the overall morphological abnormalities were lower than permissible limit value of 30% (Flowers, 1998).

The percentage of HOST-reacted spermatozoa recorded in the present study (Table 1) was in agreement to a previous observation in Landrace boar (Vazquez *et al.*, 1997). With regard to 'R' test, a good quality bull semen exhibits 'R' value >5000 which was mainly standardized for bull semen. However, the protocol in the present experiment appeared to be not suitable for evaluation of boar semen that may be due to lower sperm concentration and physiological status of boar sperm. In present study, 'R' value for boar semen was 500 that was much lower than bull semen. A good quality semen sample can reduce methylene blue within 3-5 minutes. In the present study, the extended boar semen (1:4) could not reduce methylene blue, however, methylene blue was completely decolorized within 8-10 min at 1:1 dilution. Thus, it may be due to much lower sperm concentration in boar semen compared to bull semen. Out of the inseminated pigs, two returned to estrus at normal interval (21 days) and AI was repeated. Thus, conception rate at first insemination, on non-return basis till day 50 post-AI, was 71.4%.

In brief, the training of boar for semen collection can be done without any hormonal therapy. Semen characteristics of trained boar were within normal range with minimum sperm abnormalities. The HOST also revealed presence of quality sperms that was reflected in the successful conception rate (71.4%) after artificial insemination.

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