



Training and sexual behaviour of boars on portable and fixed dummies for semen collection

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During the present few decades, there has been a dramatic increase in the use of artificial insemination (AI) by commercial swine producers in developed countries. The use of AI has increased the number of boars needed for semen collection on a daily basis. It was realized that a small scale economic technology intervention in the form of superior germplasm and package of practices is required to improve income and viability of the enterprise. One of the key factors in determining the productivity of the pigs is its genetic makeup. Therefore, for production of superior germplasm, one of the strategies will be to undertake genetic improvement of pigs through AI. Boar's training for semen collection is always a challenging job for AI. Patience is required in training boars for semen collection using a mounting dummy (Althouse 2007). Definitely, several factors might influence the sexual behaviour of boars during training such as age of boar, location of the dummy (collection pen vs collection in boar's pen), floor surface of collection pen, height of dummy sow, surrounding environments and technicians collecting semen (Levis and Reicks 2005). The aim of the present study was to compare the success rate of training, sexual behaviour, effect of sow's urine and stress level during training on portable with specific human intervention (training technique) and fixed dummies for semen collection.

The experiment was conducted at the Swine Production Farm, Livestock Production and Management Section, Indian Veterinary Research Institute, Izatnagar during summer season. A total of 22 crossbred (Landrace × *Desi*) boars of same age (180±5 days) were selected randomly and divided into two groups based on use of dummies (portable/fixed) for training. Each boar was housed in equal sized individual pen. Floor was made of concrete with serration to avoid slippage. Animals were fed *ad lib*. concentrate mixture as per standards followed at the farm. The supply of clean, fresh and potable drinking water was ensured always. Regular check-up of sick animals was done

in the morning and was treated by a team of veterinarians daily. Boars were vaccinated for swine fever and FMD. Skilled labourers were engaged in supportive work during boar's training and semen collection. Detail comparison of portable and fixed dummies used for training of boars for semen collection is given in Table 1.

The sexual behavioural traits during training for semen collection were recorded in all the boars in individual pen on portable dummy and collection pen on fixed dummy. The sexual behaviour parameters, viz. number of false mounts, number of times a boar sniffing the dummy, number of times boar shows penile reaction, number of times boar urinate, number of times boar biting, number of times boar rubbing the dummy were recorded. Sexual behaviour score was also recorded as display no interest in the dummy-1, display slight interest in dummy but did not attempt to mount-2, mounted the dummy but did not display an erection-3, mounted the dummy and displayed an erection but did not allow semen collection-4 and mounted the dummy and allowed semen collection-5. Blood samples were collected at every week during training to compare stress level during use of portable and fixed dummies. Comparison of serum cortisol level during training was done by using commercial RIA kit. Experimental data were analyzed using SPSS Version 20.

All boars were trained in two weeks duration on a portable dummy but none could be trained on fixed dummy. The average time taken for successful training on a portable dummy was 8.45 days. The time taken for getting trained varied among the individuals ranging from 1 to 14 days. Patra *et al.* (2014) reported about 63.6% success rate in training on fixed dummy involving different breed like Large black, Ghunghroo, Hampshire and Hampshire—Ghunghroo cross with an 15 days average duration ranging from 4 to 25 days. The failure of response on fixed dummy in this study is however unclear at this point of time. Failure of training on fixed dummy may be due to breed variation between studies, shifting from own pen to collection pen, microclimate of collection pen, absence of liveliness of handling and early age (6 months) for collection. Although, Patra *et al.* (2014) have shown a response of 63% using fixed dummy in which the boars were selected at the age of

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Table 1. Comparison of portable and fixed dummy used for training of boars

	Portable dummy	Fixed dummy
Type of dummy	Farm made wooden dummy with white colour	Same size and colour as portable but it was fixed in collection pen
Location	Dummy was brought in boar's pen	Boars were brought in collection pen
Bio-stimulation	By estrus and non-estrus sow's urine on alternate day	By estrus and non-estrus sow's urine on alternate day
Time for exposure	20 minutes every day in morning hours	20 minutes every day in morning hours
Human assistance	Dummy was rotated according to position of boar Sloping of dummy for easy mount Due to movement of dummy boar feel it as live sow and take more interest	No rotation because it was fixed No sloping as it was fixed No movement
Training schedule	14 days	14 days
Training technique	i. Put up the dummy in boar's pen and boar to accustomed it for approx 4-5 min ii. Enter in the pen and make slop to the dummy iii. By holding sloppy condition make side by side movements iv. Move dummy according to position of boars to develop more interest v. After mounting, another fellow should hold the penis, while one who hold dummy remains in the same position and engage boars with soft sounds vi. After holding tip of penis in hand, make pulsation to ejaculate and semen collection	i. Boar was brought in collection pen and allow for 4-5 min ii. Enter in the pen and make the efforts for stimulate mounting to the dummy iii. After mounting, another fellow should hold the penis, while one who hold dummy remains in the same position and engage boars with soft sounds iv. After holding tip of penis in hand, make pulsation to ejaculate and semen collection

8 months. Age of boars (early) may be another reason for the non-response in the present study. Better results on portable dummy may be due to effect of microclimate (trained in its house only in known area) and human intervention (movement of dummy according to position of boar as well as sloping of dummy for easy mount). Results obtained after training on portable dummy implies that the age of boars and type of portable dummy is optimum for the training.

The mean frequency of sniffing, false mount, penile reaction, urination, biting and rubbing by boars irrespective of type of urine (estrus, non-estrus) during training on portable dummy was 2.96 ± 0.11 , 0.70 ± 0.06 , 0.70 ± 0.06 , 0.85 ± 0.06 , 3.16 ± 0.14 , 2.45 ± 0.12 , respectively and the corresponding values for fixed dummy were 1.89 ± 0.08 , 0.01 ± 0.04 , 0.18 ± 0.05 , 0.56 ± 0.05 , 0.74 ± 0.11 , 1.64 ± 0.09 , respectively. The mean sexual behaviour score showed by the boars irrespective of type of urine (estrus, non-estrus) during training on portable dummy was 2.79 ± 0.09 while, corresponding value on fixed dummy was 1.59 ± 0.07 . Overall, the behavioural traits showed by the boars irrespective of type of urine (estrus, non-estrus) were significantly higher in portable dummy as compared to fixed dummy except urination. Better results on portable dummy may be due to effect of microclimate and human intervention.

The mean frequency of sniffing, false mount, penile reaction, urination, biting and rubbing by boars on portable dummy with estrus urine was 3.10 ± 0.16 , 0.71 ± 0.12 , 0.67 ± 0.11 , 0.90 ± 0.09 , 3.29 ± 0.28 , 2.51 ± 0.19 , respectively and the corresponding values for portable dummy with non-

estrus urine were 2.79 ± 0.17 , 0.70 ± 0.14 , 0.74 ± 0.12 , 0.79 ± 0.10 , 3.00 ± 0.30 , 2.37 ± 0.20 , respectively. The mean sexual behaviour score during training on portable dummy with estrus urine was 2.82 ± 0.17 while, corresponding value for portable dummy with non-estrus urine was 2.74 ± 0.19 . Sexual behaviour for most of the behavioural traits except penile reaction during training was higher when boars were trained on portable dummy using estrus urine. However, the mean behavioural traits and score during training on portable dummy with estrus and non-estrus urine were non-significantly affected. However, Tirindelli *et al.* (2009) reported that pheromones affect the reproduction of many mammals, including domestic animals and humans.

The mean frequency of sniffing, false mount, penile reaction, urination, biting and rubbing on fixed dummy with estrus urine were 2.00 ± 0.11 , 0.00 ± 0.00 , 0.14 ± 0.05 , 0.60 ± 0.06 , 0.81 ± 0.10 , 1.66 ± 0.11 and the corresponding values for fixed dummy with non-estrus urine were 1.78 ± 0.11 , 0.00 ± 0.00 , 0.22 ± 0.05 , 0.52 ± 0.06 , 0.68 ± 0.10 , 1.61 ± 0.11 , respectively. The mean sexual behaviour score during training on fixed dummy with estrus urine was 1.64 ± 0.06 while, corresponding value for fixed dummy with non-estrus urine was 1.53 ± 0.06 . Same as portable dummy, sexual behaviour for most of the behavioural traits except penile reaction during training were higher when boars were trained on portable dummy using estrus urine. However, the mean behavioural traits and score during training on fixed dummy with estrus and non-estrus urine were non-significantly affected.

Average cortisol level (nM/l) in blood serum at 0, 7 and day 14 of training on portable dummy was 109.86 ± 13.51 ,

114.29±8.24, 104.01±16.84 while, corresponding values for fixed dummy were 122.27±22.66, 115.53±10.88, 130.49±17.77, respectively. The difference in mean cortisol level between the groups at each day of training did not differ significantly. Similarly, difference in the mean cortisol level among the days of training within each groups also remained similar. However, stress level elicits more on fixed dummy in all days of measurement as compared to portable dummy.

In conclusion, boars were easily and successfully trained on portable dummy with distinct sexual behaviour while, on fixed dummy, the sexual behaviour was inadequate. Success rate for training using portable dummy was cent-percent, implying that the age of boars and type of dummy is optimum for the training. The average time taken for successful training on a portable dummy was 8.45 days. Overall, the behavioural traits (sniffing, false mount, penile reaction, biting, rubbing, sexual behaviour score) were significantly higher in portable dummy as compared to fixed dummy except urination. On both types of dummies, estrus urine differed non-significantly from non-estrus urine for expression of sexual behaviour. Level of cortisol (stress) also differed non-significantly at all days of measurements. It is suggested that training technique on portable dummy can be used for skill development of AI technician at farm which are engaged in training of boars for semen collection.

SUMMARY

The present study was conducted to compare the success rate of training, sexual behaviour, effect of sow's urine and stress level during training on portable with specific human intervention and fixed dummies for semen collection. A total of 22 crossbred (Landrace × *Desi*) boars of same age (180±5 days) were selected randomly and divided into two groups based on use of dummies (portable/fixed) for training. The sexual behaviour during training for semen collection was recorded in all the boars. Blood samples were collected at every week during training to compare stress. All boars were trained in two weeks duration on a portable dummy but none could be trained on fixed dummy. The average time taken for successful training on a portable dummy was 8.45 days. Overall, behavioural traits showed

by the boars during training irrespective of type of urine (estrus, non-estrus) were significantly higher on portable dummy as compared to on fixed dummy except urination. The mean sexual behaviour score showed by the boars irrespective of type of urine during training on portable dummy was 2.79±0.09 while, corresponding values for fixed dummy was 1.59±0.07. Average cortisol level (nM/l) in blood serum at 0, 7 and 14 day of training using portable and fixed dummy was 109.86±13.51, 114.29±8.24, 104.01±16.84 and 122.27±22.66, 115.53±10.88, 130.49±17.77, respectively. The difference in mean cortisol level between the groups at each day of training did not differ significantly. On both types of dummies, estrus urine was not significantly different from non-estrus urine for expression of sexual behaviour. It can be concluded that boars might be successfully trained on portable dummy with distinct sexual behaviour and semen quality in a average period of 8.45 days.

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