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SEMEN CHARACTERISTICS OF EXOTIC PIG BREEDS

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Abstract: A research was conducted to study the semen characteristics of Large White Yorkshire, Landrace and Duroc boar. The reaction time was 48.51 ± 3.02, 52.18 ± 5.61 and 31.84 ± 1.21 seconds and the ejaculation time was 462.93 ± 5.60, 399.24 ± 7.24 and 349.20 ± 7.40 seconds in Large White Yorkshire, Landrace and Duroc boars, respectively. Large White Yorkshire pigs had significantly (P<0.05) higher ejaculation time and semen volume compared to other two breeds. The sperm concentration was significantly (P<0.05) higher in Duroc breed (359.38 ± 2.94 million/ml) followed by Large White Yorkshire (319.66 ± 2.56) and Landrace (308.71 ± 3.27) breed. Breed had no significant influence on mass activity, progressive motility and abnormal sperm count. The live sperm per cent was significantly (P<0.05) higher in Landrace (90.73 ± 0.27) and Duroc (90.16 ± 0.43) compared to Large White Yorkshire (88.93 ± 0.26).

Keywords: Semen evaluation, **s**emen volume, semen concentration, pig breed.

Introduction

Artificial insemination in pigs is accepted widely and its use is increasing throughout the world for the past three decades. Successful artificial insemination in pigs without affecting the reproductive performance necessitates training the boars for semen collection and to study the quality of the semen before insemination. Hence, a study was conducted to assess the semen characteristics of exotic pig breeds at Pig Breeding Unit, PGRIAS, Kattupakkam, Tamilnadu.

Materials and methods

Six boars from Large White Yorkshire, Landrace (LWY) and Duroc breeds of 12 months age were and trained for semen collection using dummy sow. Semen collection was done twice a week. Immediately after collection the colour was examined macroscopically by visual examination. The gel free portion of the semen was measured using a graduated cylinder of 500 ml capacity. Hemocytometer was used to assess the spermatozoa concentration. The semen was diluted with the semen extenders at 1:5 ratio and then a drop of diluted semen was placed on the slide and viewed under high power objective of the microscope to record the

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percentage of sperms with rapid progressive movement. Live spermatozoa sperm count was done using eosin and nigrosin stain. The sperm abnormality was recorded by using Rose Bengal stain. The data viz. semen volume, progressive motility, spermatozoa concentration, live spermatozoa percentage and abnormal spermatozoa percentage were analysed using the least-squares methods and means were compared using Duncan Multiple Range Test (DMRT).

Result and discussion

The reaction time was significant between the three breeds with the shortest reaction time (31.84 ± 1.21s) recorded in Duroc. Breed had significant influence (P>0.05) on the ejaculation time. The highest ejaculation time was recorded in Large White Yorkshire. The ejaculation time recorded in the present study is higher than that reported by Estienne and Harper (2004) in boars (280.4 ± 43.15 seconds). The mean semen volume in LWY, Landrace and Duroc boar were 222.80 ± 2.19ml, 203.03 ± 2.61 and 200.50 ± 2.55 ml, respectively. The semen volume is significantly higher (p>0.05) in LWY boars compared to Landrace and Duroc but no significance difference observed between Landrace and Duroc. Lee *et al*. (2004) reported that in Duroc and Yorkshire the semen volume was 155 ± 25 and 154 ± 23 ml, respectively. Okere *et al.* (2005) reported that the Yorkshire boar showed overall superiority in quantity of semen produced when compared to Landrace boar (336.05 ± 168.20 vs 144.42 ± 100.00 ml; p<0.01).

Breed had no significant influence on mass activity and progressive motility. The mean progressive motility rate of sperms in Large White Yorkshire, Landrace and Duroc boars were 87.97 ± 0.23, 88.31 ± 0.31 and 88.19 ± 0.33 per cent, respectively. The progressive motility obtained in the present study were in concurrence with Stancic *et al*. (2009a) in Duroc (82 per cent), Hampshire (85 per cent), Large White (84 per cent) and Swedish Landrace (85 per cent) boars. The sperm concentration was significantly higher in Duroc (359.38 ± 2.94 million/ml), followed by Large White Yorkshire (319.66 ± 2.56 million/ml) and Duroc boars (308.71 ± 3.27 million/ml). The overall mean sperm concentration observed in the present study is higher than that reported by Stancic *et al*. (2009b) who observed 224, 174, 190 and 211 million sperms/ml, in Duroc, Hampshire, Large White and Swedish Landrace boars, respectively. In contrary, a higher sperm concentration was reported by Lee *et al*.(2004) in Yorkshire boars (600 ± 1.1 million /ml), Wolf (2010) in Large White and Landrace boars (428 million/ml and 418 million/ml respectively).

Semen Characteristics of Large White Yorkshire, Landrace and Duroc Boar (Mean ± S.E)

Sl. No.	Semen Quality Characteristics	LWY Boar	Landrace Boar	Duroc Boar
1	Reaction time* (Seconds)	$48.51^{b} \pm 3.02$ (59)	$52.18^{b} \pm 5.61$ (33)	$31.84^{a} \pm 1.21$ (32)
2	Ejaculation time* (Seconds)	$462.93^{c} \pm 5.60$ (59)	$399.24^{b} \pm 7.24$ (33)	$349.20^{a} \pm 7.40$ (32)
3	Volume* (ml)	$222.80^{b} \pm 2.19$ (59)	$203.03^{a} \pm 2.61$ (33)	$200.50^{a} \pm 2.55$ (32)
4	Mass activity (0- 5)	3.61 ± 0.06 (59)	3.58± 0.09 (33)	3.50 ± 0.09 (32)
5	Progressive motility (%)	87.97 ± 0.23 (59)	88.31 ± 0.31 (33)	88.19 ± 0.33 (32)
6	Sperm Concentration* (Million/ml)	$319.66^{b} \pm 2.56$ (59)	$308.71^{a} \pm 3.27$ (33)	$359.38^{c} \pm 2.94$ (32)
7	Live Sperm Count (%)	$88.93^{a} \pm 0.26$ (59)	$90.73^{b} \pm 0.27$ (33)	$90.16^{*b} \pm 0.43$ (32)
8	Abnormal Sperm Count (%)	9.32 ± 0.14 (59)	9.79 ± 0.18(33)	9.66 ± 0.17(32)

*- Means bearing different superscript within a row differ significantly ($P<0.05$)

Figures in parentheses indicate the number of observations

Breed had significant influence on live sperm per cent. Significant influence was found between Large White Yorkshire and Landrace; and Large White Yorkshire and Duroc, but not between Landrace and Duroc. Breed had no influence on abnormal sperm count. The mean abnormal sperm count (per cent) in Large White Yorkshire, Landrace and Duroc were 9.32 ± 0.14, 9.79 ± 0.18 and 9.66 ± 0.17 per cent, respectively. In contrary to the present findings, Frydrychova *et al.* (2011) in Czech Republic reported a higher abnormal sperm per cent (14.40 ± 7.81 per cent) in hydrid boars of one to three years of age.

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