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Epididymal sperm reserve in the indigenous pigs (*Sus vittatus*) of Assam*

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ABSTRACT

Twenty-seven indigenous pigs of Assam 4 to 12 months of age were used to study the sperm reserve in the caput, corpus and cauda epididymis. The epididymis after castration was separated from the testes and divided into caput, corpus and cauda regions. The spermatozoa from each region of the epididymis was obtained by homogenizing and filtering the homogenate. The sperm concentration in the filtrate was determined by direct haemocytometer method. The distribution of sperm (x 10^9) in caput, corpus and cauda was 1.02 ± 0.08 (17.20%), 0.71± 0.05 (11.97%) and 4.19 ±0.21 (70.66%), respectively at 4 months of age which increased to 5.63 ± 0.20 (17.09%), 3.37± 0.03 (10.23%) and 23.95± 0.67 (72.69%), respectively at 12 months of age. The epididymal sperm reserve increased significantly (P<0.01) with advancement in age. The sperm reserve differed significantly (P<0.01) between regions of the epididymis, being significantly (P<0.05) higher in cauda than in caput and corpus epididymis. The epididymal sperm reserve had positive significant (P<0.01) correlation with age (0.98), body weight (0.96), and weights of epididymis (0.97) and testis (0.98).

Key words: Indigenous pig, age, caput, corpus and cauda epididymis, sperm reserve, testis

INTRODUCTION

Determination of epididymal sperm reserve helps in the assessment of sexual maturity of male animals which could indicate their potentiality for use in successful breeding programmes. Information regarding the epididymal sperm reserve in the exotic boars are available (Swierstra, 1971, Egbunike *et at* 1975; Egbunike, 1980), however, the same with regard to indigenous pigs particularly of Assam is lacking. Hence, the present study was taken up to put in record the sperm reserve at different regions of the epididymis at different ages in growing indigenous pigs of Assam.

MATERIALS AND METHODS

The study was carried out on 27 young indigenous boars at 4 to 12 months of age. The testis and epididymis were removed from the animals by open method of castration. Prior to castration the live weight of each animal was recorded. Testes and epididymides were brought in ice to the laboratory in pre-chilled polythene bags. They were processed immediately and the testis and epididymis were weighed separately after removal of fascia and other tissues. The epididymis was divided into caput, corpus and cauda regions on the basis of external morphology. Each region of the epididymis was minced thoroughly in a petridish with 10 ml of normal saline and homogenised by using a tissue homogenizer at 1200 rpm, the total volume of saline used being 75ml. The homogenate was filtered through double washed muslin cloth, the filtrate was thoroughly shaken and 1,00,000 I.U. of crystalline penicillin was added into it. One ml of filtrate was diluted with 10ml of eosin solution (0.05%) a kept overnight in a refrigerator at 40C. On the following day the sperm concentration was determined by direct haemocytometer method. For easy sperm counting, the samples obtained from cauda region was further diluted with another 10 ml of eosin solution. The statistical analysis of the data was made as per Snedecor and Cochran (1968).

RESULTS AND DISCUSSION

The sperm reserve at different regions of the epididymis is presented in Table 1.

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Table 1. Epididymal sperm reserve (Mean ± S.E.) at different ages in indigenous pigs of Assam

Age (month)	Sperm Count (X 109)			
	Caput	Corpus	Cauda	Overall
4 (n=3)	1.02± 0.08 (17.20)	0.71± 0.05 (11.97)	4.19 ± 0.21 (70.66)	5.93 ± 0.30^{e}
5 (n=3)	1.37 ± 0.07 (16.55)	0.91 ± 0.04 (10.99)	5.99 ± 0.10 (72.34)	8.28 ± 0.15^{e}
6 (n=3)	2.54± 0.10 (18.01)	2.01 ± 0.13 (14.26)	9.55 ± 0.31 (67.73)	14.10 ± 0.50^{de}
7 (n=3)	5.09 ± 0.26 (24.90)	2.01±0.17 (9.83)	13.32 ± 0.23 (65.17)	20.44 ± 0.16^{cd}
8 (n=3)	4.73 ± 0.06 (22.34)	2.80 ± 0.18 (13.23)	13.63±0.66 (64.38)	21.17 ± 0.67^{cd}
9 (n=3)	4.45 ± 0.12 (19.22)	3.42 ±0.06 (14.77)	15.27 ± 0.54 (65.96)	23.15 ± 0.68^{bcd}
10 (n=3)	4.95 ±0.11 (18.39)	3.58 ± 0.03 (13.30)	18.38 ±0.35 (68.30)	26.91± 0.35^{abc}
11 (n=3)	5.48 ±0.29 (17.40)	3.63 ± 0.18 (11.52)	22.40 ± 0.79 (71.11)	31.50 ±1.21^{ab}
12 (n=3)	5.63 ± 0.20 (17.09)	3.37 ± 0.03 (10.23)	23.95 ± 0.67 (72.69)	32.95 ± 0.86^{a}

Figures bearing at least one superscript in common do not differ significantly, Figures in parentheses indicate percentage

The overall epididymal sperm reserve increased from 4 to 12 month of age. The present estimate of epididymal sperm reserve was much higher than that report by Egbunike (1980) in pubertal and adult indigenous West African boars, and was much lower than that reported in German Landrace boars of 6 to 24 months of age by Egbunike *et al.* (1975) and in young Yorkshire Lecombe boars by Swierstra (1971). The sperm count in the epididymis differed significantly (P<0.01) between regions of the epididymis. It was significantly higher in cauda as compared to caput and corpus, the difference between caput and corpus being non-significant. The per cent distribution of sperm in the caput, corpus and cauda epididymis were found to be comparable to that of Egbunike and Elemo (1978) in crossbred European boars.

The epididymal sperm reserve was significantly (P<0.01) positively correlated with age(0.98), live weight (0.96), epididymal weight (0.97) and testis weight (0.98) of the animal . Egbunike *et al* (1975) recorded similar correlation of the epididymal sperm reserve with age, body weight and epididymal weight in German Landrace boars. Courot and Legault (1977) also recorded significant correlation of epididymal sperm reserve with weight of testis and epididymis in Large White boars.

The sperm reserve in the epididymis was found to vary significantly (P<0.01) between ages of the animals. The critical difference test revealed that the variation in the sperm reserve was not significant amongst 4,5 and 6 months; 6,7,8 and 9 months; 7,8,9 and 10 months; 9,10 and 11 months; and 10,11 and 12 months of age. The gradual increase in epididymal sperm reserve with the increase in age of the animal recorded in the present study is in conformity with the observation of Egbunike *et al* (1975) .The increase in overall epididymal sperm

count between the boars of 11 and 12 months of age was much less when compared with the substantial increment in sperm reserve between the animals of lower age indicating that sperm production in boars become somewhat steady on attaining 11 to 12 months of age. It could be suggested that the growing young indigenous boars of Assam might be considered to be utilized for breeding purposes only after attaining the age of about one-year.

REFERENCES

Courot, M and Legault, C. (1977). Genetic analysis of sperm production in young large white boars; preliminary results. Anim.Breed.Abstr., **46**: 822.

Egbunike, G.N. (1980). Sperm storage capacity of the indigenous West African boar. International J. Androf., **3**: 210-216.

Egbunike, G. N. and Elemo, A. O. (1978). Testicular and epididymal sperm reserves of crossbreed European boars raised and maintained in the humid tropics. J. Reprod.Fert., **54**: 245-248.

Egbunike, G.N. Holtz, W., Endell, W. and Smidt, D. (1975). Reproductive German Landrace boars. Gonadal and extragonadal sperm reserves. Zuchthygiene, **10** (4): 184-187 (Cf., Anim. Breed. Abstr. 44: 3827).

Snedecor, G.W. and Cochran, W.G. (1968). Statistical Methods. 6th edn. Oxford and IBH Publishing Co., Bombay, New Delhi, Calcutta.

Swierstra, E.E. (1971). Sperm production of boars as measured from epididymal sperm reserves and quantitative testicular histology. J. Reprod. Fert., **27**: 91-99.