



Semen Characteristics of Vanaraja and Indigenous Chicken of Assam

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ABSTRACT

A total of 147 ejaculates collected by abdominal massage method from five Indigenous and five Vanaraja chicken were used to study the physical characteristics of semen. The mean P^H of Indigenous chicken (6.95 ± 0.01) was slightly acidic than the Vanaraja chicken (7.13 ± 0.01). The total ejaculate volume, sperm motility, live sperm count, sperm abnormalities, intact acrosome with normal head, intact acrosome with swollen head, head abnormalities, mid piece abnormalities, tail abnormalities, gaint sperm and total sperm abnormalities in Indigenous chicken was 0.13 ± 0.01 ml, 84.38 ± 0.67 per cent, 89.73 ± 0.41 per cent, 5305.50 ± 134.30 million/ml, 88.37 ± 0.53 per cent, 11.63 ± 0.53 per cent, 1.57 ± 0.15 per cent, 8.00 ± 0.71 per cent, 3.34 ± 0.36 per cent, 0.11 ± 0.04 per cent and 12.61 ± 0.95 per cent respectively in fresh semen. The corresponding values for Vanaraja chicken was 0.223 ± 0.01 ml, 84.38 ± 0.59 per cent, 89.47 ± 0.64 per cent, 3700.73 ± 112.48 million/ml, 89.10 ± 0.46 per cent, 10.90 ± 0.46 per cent, 1.70 ± 0.17 per cent, 4.09 ± 0.20 per cent, 2.91 ± 0.19 per cent, 0.45 ± 0.05 per cent and 8.84 ± 0.25 per cent respectively. The volume and morphologically normal sperm was significantly higher in Vanaraja than Indigenous chicken while sperm concentration was significantly higher in Indigenous chicken.

Keywords – Chicken, Semen, Indigenous, Vanaraja

I. INTRODUCTION

The assessment of semen quality characteristics of chicken gives an excellent indicator of their reproductive potential and has been reported to be a major determinant of fertility and subsequent hatchability of eggs [7]. Fertility and hatchability on the other hand are the major determinant of profitability in the hatchery enterprise. It is important to note that many researchers [6],[2] and [7] have worked on semen production and quality on variety of poultry breeds and strains and reported that breed and season, time of collection, body size and age affected the semen quality. Although the results of several studies on semen characteristics of different breed and strain of chicken have been published none has been reported on the Indigenous chicken of Assam and very little has been reported on Vanaraja Chicken. This study therefore has been undertaken on the comparative evaluation of semen characteristics of Vanaraja and Indigenous Chicken of Assam.

II. MATERIALS AND METHODS

A total of 10 (5 from each genetic group) sexually active mature Cockerels of Vanaraja and Indigenous chicken, aged 6 to 7 months, maintained at All India Coordinated Research Project on Poultry at Khanapara in individual cages were used in the present study. The Cockerels were trained to respond to massage technique for ten to fifteen days and semen was collected from each Cockerel twice

a week as per the abdominal massage method of Burrows and Quinn [3].. One hundred and forty seven ejaculates (107 from Vanaraja and 40 from Indigenous) were evaluated to study the semen characteristics.

III. RESULT AND DISCUSSION

The results of characteristics of fresh semen of Vanaraja and Indigenous chicken are given in Table 1. The colour of semen observed in Vanaraja and Indigenous chicken was watery to creamy white. Out of total 153 ejaculates, 147 (96%) ejaculates were creamy white and 6(4%) ejaculates were watery. The overall mean semen P^H of Indigenous chicken (6.95 ± 0.01) was slightly acidic than the Vanaraja chicken (7.13 ± 0.01). There was significant difference (P< 0.01) of overall mean total ejaculate volume and sperm concentration between Indigenous and Vanaraja chicken. The difference of mean total ejaculate volume between Vanaraja birds was significant. The mean intact acrosome with normal head and intact acrosome with swollen head did not differ significantly between the two genetic groups but bird to bird variation within Vanaraja chicken was significant. The mean sperm mid piece and total sperm abnormalities differ significantly (P< 0.01) between two genetic groups and there was significant difference of mean giant sperm within bird of Indigenous chicken. The significantly higher semen volume of Vanaraja in the present study could be due to heavier size in Vanaraja chicken as there is a positive correlation between body size and volume of sperm [7], [4] while the concentration of sperm was significantly lower in Vanaraja chicken as there is a negative correlation between body size and sperm concentration which conforms the earlier findings of [5] in semen of four south African chicken breeds. The highest sperm abnormality recorded in the present study in Indigenous and Vanaraja chicken was found in the sperm mid piece followed by sperm tail. The chicken sperm cells have a relatively long mid piece which was reported to be most sensitive region in chicken sperm and deterioration was quicker in mid piece than the other region [1].

Table 1 Semen characteristics of Indigenous and Vanaraja chicken (Mean ± SE)

Sl.No	Characteristics of semen	Indigenous Chicken	N	Vanaraja Chicken	N
1	Ejaculate volume (ml)	0.130 ± 0.013	40	0.223 ± 0.01	107
2	Colour	Creamy white	40	Creamy white	107
3	P ^H	6.95 ± 0.01	40	7.13 ± 0.01	107
4	Sperm motility (%)	84.38 ± 0.67	40	84.38 ± 0.59	92
5	Sperm concentration (million/ml)	5305.50 ± 134.31	40	3700.72 ± 112.48	55
6	Live sperm count (%)	89.73 ± 0.41	40	89.47 ± 0.64	55
7	Acrosomal integrity (%)		40		40
	a) Intact acrosome with normal head	88.37 ± 0.53		89.10 ± 0.46	

	b) Intact acrosome with swollen head	11.63 ± 0.53		10.90 ± 0.46	
8	Sperm abnormalities (%)		40		40
	a) Head	1.57 ± 0.15		1.70 ± 0.17	
	b) Mid-piece	8.00 ± 0.71		4.09 ± 0.20	
	c) Tail	3.34 ± 0.36		2.91 ± 0.19	
	d) Giant sperm	0.11 ± 0.04		0.45 ± 0.05	
	e) Total sperm abnormalities	12.61 ± 0.95		8.84 ± 0.25	

IV. CONCLUSION

Semen characteristics of Indigenous and Vanaraja chicken were within the normal range required for a fertile chicken. Semen characteristics are variable parameter and influenced by many factors and should be monitored before and during use of chicken in breeding programme.

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