

INFLUENCE OF TEASER HENS ON SASSO SEMEN COLLECTION, QUALITY AND SPERMATOZOA CHARACTERISTICS

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ABSTRACT

In poultry, body weight is an important trait when selecting for breeding flock performance, hence Sasso cock could be notable in any breeding program. But the size may not be convenient for massage technique during semen collection. As a result, this study was aimed at using teaser hens to ease semen collection in Sasso cocks without massaging. Twelve Sasso cocks with 4 each in Control (T1): massage technique, use of Sasso hen as a teaser (T2) and use of local hen as a teaser (T3). Another set of 4 each of Sasso hens and local hens were used as teasers in T2 and T3, respectively. In T1, gentle massage on the back and the abdominal regions of the cocks was done to collect semen. While in T2 and T3, Sasso and local hens were used as teasers for semen collection (without massage). Capillary tubes were used in the collection of semen that was promptly processed for semen quality and spermatozoa characteristics determinations. It was observed that only a cock (representing 25%) responded to semen collection when local hen was used as a teaser, whereas all the cocks (100%) responded to massage technique and use of Sasso hen as a teaser. The semen volume ranged from 0.12ml (T3) to 0.22ml (Control) and the total spermatozoa count was similar ($405 - 459 \times 10^6/\text{ml}$) across the treatments. Since the Sasso cocks responded to use of teaser hens in semen collection and the semen quality as well as spermatozoa characteristics were apparently not compromised, use of teasers in semen collection could be an alternative technique in poultry.

Keywords: ACGG-Nigeria, artificial insemination, poultry species, spermatozoa quality

INTRODUCTION

It has been established that assessment of semen quality in poultry species, gives an excellent indication of the reproductive potential and it was stated to be a major determinant of fertility and hatchability of eggs, which in turn determines hatchery enterprise profitability (Islam *et al.*, 2002). Poultry semen quality as reported by Tarif *et al.* (2013) includes semen volume, glucose level and pH as well as spermatozoa concentration and motility.

According to Ganpule (2018), Sasso is the premium quality coloured broiler breeder that was exclusively bred from original parent breeding stocks in France. It was stated that it has been proven to be hardy, easy to manage and was regarded to as a multipurpose bird, hence its international popularity. These attributes make Sasso cock a reputable strain and may be a suitable research bird for demonstration of artificial insemination technique in breeding programs.

Unfortunately, the weight may not be convenient for the usual massage method of semen collection, as a result of possible injuries and discomfort during massage for semen collection in large poultry species. This has often times resulted in frequent administration of antibiotics and anti-stress medications, which could be detrimental. Therefore, use of teasers as being practiced to collect semen in rabbits, swine and ruminants (Barszcz *et al.*, 2012; Dominiek *et al.*, 2011; Naughton *et al.*, 2003), could be a veritable alternative to the usual massage technique in poultry species.

MATERIALS AND METHODS

Experimental birds and welfare

From a large stock of Sasso birds reared in deep litter system, by African Chicken Genetic Gains Research Group at the Teaching and Research Farm, Nasarawa State University, Keffi, Shabu-Lafia Campus. Twelve cocks at 24 weeks old were randomly selected, weighed, housed individually and acclimatized for two weeks. Breeders' mash as well as cool clean drinking water was offered *ad libitum*. The twelve Sasso cocks were distributed 4 each to Control (T1): massage technique, use of Sasso hen as a teaser (T2) and use of local hen as a teaser (T3). Another set of 4 each of Sasso hens and local hens were kept separately and used as teasers to arouse the Sasso cocks in T2 and T3, to ease semen collection without massage. During the acclimatization period, teasers were introduced only to the cocks in T2 and T3 twice daily, but were not allowed to mount.

Semen collection techniques

Massage technique

Gentle “to and fro” stroke on the back feather using one hand accompanied with abdominal massage toward the tail with the other hand to stimulate the copulatory appendage was done to cause the ejaculatory papillae to swell. Upon eventual secretion of semen on the swollen ejaculatory papillae, capillary tube was used in the semen collection as described by Burrows and Quinn (1937).

Use of teaser technique

A teaser hen was introduced one at a time to the Sasso cocks individually. Immediately the cock advances to mount the teaser, it was allowed a short time and then picked up at the point of ejaculation. Without any massage, semen was secreted on the swollen ejaculatory papillae and capillary tube was used in the collection as described by Burrows and Quinn (1937).

Data collection and statistical analysis

Body weight of the Sasso cocks, number of cocks that responded to semen collection technique, response time to semen collection, semen volume and pH were recorded. Also, semen glucose, motile spermatozoa, sluggish spermatozoa, alive spermatozoa, dead spermatozoa and total spermatozoa count were determined, following the guide of Bakst and Long (2010). Data were subjected to analysis of variance at $\alpha_{0.05}$ using SPSS (2010).

RESULTS AND DISCUSSION

Table 1 shows the influence of teaser hens on Sasso cocks' semen collection, quality and spermatozoa characteristics. There were no statistical variations ($P < 0.05$) in all the parameters measured, except in response time to semen collection and semen volume.

Table 1: Influence of teaser hens on Sasso cocks' semen collection, quality and spermatozoa characteristics

Parameters	Semen collection techniques ($\pm$ STD)		
	Control T1	T2	Teaser T3
Number of cocks	4	4	4
Body weight (kg)	4.19 $\pm$ 0.17	3.77 $\pm$ 0.56	3.82 $\pm$ 0.33
NCRSC	4 (100%)	4 (100%)	1 (25%)
Response time (minutes)	5.25 $\pm$ 1.26 ^c	9.75 $\pm$ 3.86 ^b	30.0 $\pm$ 0.00 ^a
Semen volume (mL)	0.22 $\pm$ 0.03 ^a	0.17 $\pm$ 0.03 ^b	0.12 $\pm$ 0.00 ^c
Semen pH	7.50 $\pm$ 1.0	7.25 $\pm$ 0.96	7.80 $\pm$ 0.00
Semen glucose (mol/L)	5.28 $\pm$ 0.26	5.20 $\pm$ 0.22	5.0 $\pm$ 0.00
Motile spermatozoa (%)	68.75 $\pm$ 12.48	64.25 $\pm$ 13.68	62.00 $\pm$ 14.88
Sluggish spermatozoa (%)	31.25 $\pm$ 13.20	35.75 $\pm$ 13.68	38.00 $\pm$ 14.06
Alive spermatozoa (%)	50.00 $\pm$ 33.66	63.75 $\pm$ 29.26	40.00 $\pm$ 0.00
Dead spermatozoa (%)	50.00 $\pm$ 33.66	36.25 $\pm$ 29.26	60.00 $\pm$ 0.00
Total spermatozoa count ($\times 10^6$ /mL)	459.10 $\pm$ 231.5	455.50 $\pm$ 266.08	405.48 $\pm$ 235.8

a,b,c: Mean values on the same row with different superscript differ statistically at 5% probability test; NCRSC: Number of cocks that responded to semen collection technique; STD: Standard deviation; T1 (Control): Massage technique; T2: Use of Sasso hen as a teaser; T3: Use of local hen as a teaser.

This observation probably indicated that irrespective of collection technique, semen quality and spermatozoa characteristics may not be compromised. It was observed that only a cock (25%) responded to semen collection when local hen was used as a teaser. This probably suggested that Sasso cocks were reluctant to mate with the local hens, resulting in delay response time of 30 minutes compared to massage technique and use of Sasso hen as a teaser, where all the cocks (100%) responded between 5 and 10 minutes. This could be largely due to the size of the local hen that was relatively very small compared to that of a Sasso hen. The observed Sasso cocks' responses to teaser hens perhaps, suggested that a teaser could be used in poultry breeder semen collection as established in cattle (Barszcz *et al.*, 2012), pigs (Dominiek *et al.*, 2011) and rabbits (Naughton *et al.*, 2003).

The superiority ($P < 0.05$) of semen volume recorded in T1 over T2 and T3, may be a mere coincidence and probably due to only a cock that gave 0.12ml in T3, unlike in T1 and T2 where the values were obtained from 4 hens. However, it possibly indicated that massage technique may be better than the use of teasers. Generally, it has been reported that semen volume of poultry species are low but very high in spermatozoa concentration (Hafez and Hafez, 2000). Meanwhile, the semen volume, pH and glucose values were similar to what was reported in poultry species (García-Herreros, 2016; AL Mahdi *et al.*, 2014). Therefore, collecting semen from Sasso cocks using teasers without massaging, may not down grade semen quality.

There were more dead spermatozoa (60%) in semen collected with a local hen as a teaser, slightly followed by massage technique (50%) compared to 36% recorded when Sasso hen was used as a teaser. This observation could be a mere coincidence and not possibly due to the treatment. The quantum of motile spermatozoa recorded was similar to a range reported in birds by Froman (2007).

The spermatozoa concentration was within the values given as normal in poultry breeder cocks (Latif *et al.*, 2005; Nwagu *et al.*, 1996). Therefore, use of teasers in Sasso cocks' semen collection may not influence semen quality and spermatozoa characteristics.

CONCLUSION AND RECOMMENDATION

Sasso cocks apparently responded to teaser hens in semen collection yet, the semen quality and spermatozoa characteristics were seemingly not affected. Thus, use of teasers in collecting semen in poultry species could be adopted, as already being practiced in some mammals. However, in depth research investigations, on the use of different teasers in order to develop avian research and improve poultry production may be required.

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