

SEASONAL VARIATIONS ON SEMEN QUALITY TRAITS OF AMO COCKS IN NORTHERN GUINEA SAVANNAH OF NIGERIA

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ABSTRACT

This study evaluated the effect of seasonal variation on semen quality characteristics of Amo cocks. Sixty sexually matured cocks aged 40–45 weeks and weighing 1.8–2.0 kg were used. The experiment was conducted at the Teaching and Research Farm of Modibbo Adama University, Yola, across four seasonal periods: early and late dry seasons, and early and late rainy seasons. Semen was collected using the abdominal massage technique and analyzed following standard procedures. Results revealed that semen motility, viability, morphology, count, and density were significantly ($p < 0.05$) higher during the early and late rainy seasons compared to the dry seasons. However, semen pH was not significantly ($p > 0.05$) affected by season. The findings suggest that rainy seasons offer optimal conditions for improved semen quality and potential fertility in Amo cocks.

Keywords: Seasonal, Variations, Semen, Traits, Amo cock

DESCRIPTION OF PROBLEM

Male reproductive performance is a vital trait of economic importance in managing breeder stock and the semen evaluation is an essential aspect of male animals' reproductive status determination (4). Poultry birds have many advantages over other livestock because of its popularity faster rate of achieving genetic improvement due to their shorter generation interval (7). Males can produce semen as early as 12 weeks of age, depending upon the size, however sperm from such roosters is rarely viable and effective maturity does not develop until birds are around a minimum of 18 weeks of age (3). Reproductive performance is usually expressed in terms of semen yield and quality in cocks. Assisted reproduction technologies (ART's) contribute to increased poultry production, as it allows a wider use of genetically superior cock. In a breeder flock,

fertility rates are often related to the male performance, in order to select cock of high fertility and for the purpose of using ejaculate that can be relied upon to give a high conception rate for artificial insemination program and increased productivity. Conventional semen analysis includes the measurement of particular aspect of spermatozoa. According to (5), this includes viability, morphology, motility, volume, concentration, density and pH. Normal values of semen concentration (200×10^6), semen motility (50%) or more with rapid forward progression and semen pH (6.87.0). The assessment of the seminal characteristics of the fowl gives an excellent indication of reproductive capacity of an animal.

MATERIALS AND METHODS

The experiment was conducted at the Teaching and Research Farm of the Department of Animal Science, Faculty of Agriculture, Modibbo

Adama University Yola, Adamawa State. It lies between latitude 9°N and 140N and longitude 12°E and 380E and it covers an area of about 3420 hectares. Sixty sexually matured cocks were used for the study. The ages of the birds ranged between 40 to 45 weeks and weighing between 1.8 - 2.0kg. The cocks were purchased from good sources within Jigawa state. They were acclimatize for two weeks prior to the commencement of the study. The cocks were placed on commercial feed 110-160gram daily, water was provided *ad libitum* throughout the experiment, similarly they were also treated against ecto and endo parasites and oral Newcastle Disease Vaccine (NCDV) was administered. The study was conducted during the rainy and dry seasons, which were further subdivided into early dry season (October-December), late dry season (January–March) and early rainy season (April–June) and late rainy season (July–September).

Abdominal massage method were used in collecting the semen. The method involved massaging the cloacal region to achieve phallic tumescence, this is followed by a ‘cloacal stroke’, and squeezing of the region surrounding the sides of the cloaca to express the semen as described by (2). Immediately after collection, the ejaculates were placed in lacted ringer solution at temperature of 29-300c to the laboratory for semen evaluation. The semen samples were evaluated using standard procedure of semen evaluation. The data generated was analysed using one - way analysis of variance (ANOVA) and means separation was carried out using DUNCAN Multiple Range Test where significant difference exists.

RESULTS AND DISCUSSION

Table 1 below, present the effects of season of the year on semen quality characteristics of Amo cock. According to the results of the study,

active motile semen is significantly higher ($p<0.05$) in early raining season in comparison with other seasons but statistically similar ($p>0.05$) to that of the late raining season. The highest mean value ($p<0.05$) of non-motile semen was recorded during the early dry season. The seasonal variations in percent non motile sperm as observed in the present study agrees with the findings of (1) and (6) who showed that the hot dry season affected semen characteristics. The relative higher percentage value of motile semen observed during the early raining season relative to the early and late dry season might be contributed to the differences in the ambient temperatures among the different seasons. The highest figure ($p<0.05$) of viable semen was recorded during the late raining season but statistically similar ($p>0.05$) with the semen recorded during early raining season. The morphological structure of the semen collected during early raining season showed a higher ($p<0.05$) significant value when compared with those collected during the other seasons but statistically similar with one collected during late raining season. Based on the values recorded from this study, seasonal variation has no significant effects ($p>0.05$) on the semen pH. The highest ($p<0.05$) sperm count was recorded during the late raining season where as semen density showed a significantly ($p<0.05$) higher values during early raining season though statistically similar ($p>0.05$) to that of the late raining season. The variation in semen concentrations with seasons in the Amo cocks may be due to the meteorological conditions prevailing during the various seasons rather than management technique. This submission was earlier made by (6) and (1) who recorded highest semen concentration during the rainy seasons. The results further indicate that maximum fertility in indigenous cocks for breeding should be obtained during rainy season of the year when semen concentration is high.

Table 1: Seasonal effect on semen quality traits of Amo cock

Seasons	Semen quality characteristics			
	Motility Active motile	Viability (%)	Morphology (%) pH	Sperm Count (10 ⁶)

Early dry	47.66±6.45 ^c	55.33±5.08 ^c	64.33±4.43 ^b	6.63±0.10	1.70±0.18 ^c
Late dry	60.33±4.53 ^b	58.33±3.89 ^b	65.33±4.15 ^b	6.72±0.09	2.18±0.31 ^b
Early raining	75.16±4.07 ^a	69.33±3.98 ^a	78.33±3.76 ^a	6.80±0.06	3.23±0.27 ^a
Late raining	72.66±3.83 ^a	69.66±3.28 ^a	76.33±4.00 ^a	6.80±0.06	3.28±0.22 ^a
Overall Mean	63.95±3.05	63.16±2.70	74.50±2.11	6.73±0.04	2.60±0.15

CONCLUSION AND APPLICATION

It can be concluded that seasonal variation have a significant effects on the semen quality parameters of the Amo cock breed as the quality parameters recorded was better during early and late raining seasons, respectfully.

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