

SCRUTINIZING COURTSHIP ETHOGRAM OF RED SOKOTO BUCK EXPOSED TO TWO OESTRUS NULLIPAROUS DOES

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ABSTRACT

Raising goat requires more than knowledge of feeding, medication, breeding and various other routine management. Having a clearer understanding of buck mating behavior in the flock is necessary to ensure a good breeding program. One apparently healthy mature red Sokoto buck of 4 years old was exposed to two oestrus nulliparous does of 1 year-old to evaluate courtship behavior for 60 minutes in breeding pen. One hour video-tapping was copied into computer system and visualized to record frequencies and durations of reproductive behavioral events. Courtship behavior frequencies and durations were presented in figure 1 and 2 respectively. The result showed that foreleg kicks (12 times repeated) was the highest frequent courtship behavior displayed by the buck followed by snorts, nuzzling, chin resting and vocalization. Buck spent higher time (10.52 mins) without displaying courtship behaviors while nuzzling (6.36mins) and self-enurination (6.26 mins) was the highest courtship duration spent by buck while mounting without ejaculation (2.10 min) was the lowest time spent. The results showed that red Sokoto buck can be used to evaluate courtship ethograms and serve as a tool that will provide holistic ideas of modern reproductive behaviors for better and clear understanding of courtship behavior causes, its mechanism and complex interaction between the animals to both internal and external environments that influence such behaviors.

Key Words: Courtship, Ethogram, Buck, and Nulliparous Does

INTRODUCTION

The sexual behavior of goats is an important factor for flock breeding efficiency and productivity of goat farming. Many researchers have derived different ways and means to evaluate the breeding quality of the buck. The potential fertility of breeding males can be evaluated in the field by assessment of physical examination and genital tract examination, mating ability and semen quality evaluation (Kerketta *et al.*, 2013).

The “Ethology” is the observation and description of behavior that leads to improved understanding of its mechanism, function, development and evolution, while an “Ethogram” is a detailed description of the behavioral features of a particular species and collected behaviors that are distinguished according to their duration in “events” and “states” (McGreevy, 2004). The events are behaviors of instantaneous duration (e.g. vocalizations), which are best described by their frequency, while the states are behaviors of relatively long duration (e.g. feeding), which can be best described by their total or average duration. Therefore, a correct ethogram should include the frequency of events and the duration of states (McDonned, 2003).

OBJECTIVES OF THE STUDY

The objective of this study is to evaluate reproductive behaviors of buck exposed to two oestrus nulliparous does for 1 hour indoor breeding confinement.

MATERIAL AND METHODS

Experimental Site

The experiment was carried out in the small ruminant unit, Livestock Teaching and Research Farm, Department of Animal Science, Federal University Dutsin-ma. The site lies between latitude 12°27'18" North and 7°29'29" East and 605 meters above sea level with an average rainfall of 700mm within the Northern guinea Savannah zone (Gaddafi *et al.*, 2019)

Experimental Animal

A total number of three apparently healthy red Sokoto goats comprise of 1 buck and 2 oestrus nulliparous does of about 4 years old buck and 1 year old does respectively, was used in this study. The animals was housed in mating pen of about 7 x 5 mm² made up of blocks wells, concretized floor, metallic gate and windows with galvanized roofing sheet. Two oestrus does was identified by their behavioral displayed and introduced to the breeding pen for this trail.

Observations and Recordings

Two cameras were mounted in the well to enable 1 hour (60 minutes) video-taping. The video records was then transferred into computer and visualized for scoring frequency and durations of behavioral events of red Sokoto buck.

Sexual Ethogram for Red Sokoto Buck

Houpt, (2011) state that as the major stimulus for expressing sexual behavior is the presence of the partner, it is therefore very essential to bring a doe in estrus, near the mating pen for a limited time. Since the sampling rule is a behavioral sampling, therefore two estrus does were brought to the breeding pen and occurrence of the following mating behaviors were recorded: vocalization, self-enurination, flehmen, anogenital sniffing, foreleg kicks, tongue flicking, chin resting, snorts, mounting without ejaculation and mounting and ejaculation. The choice for video camera was to enable the animal to exhibit mating behavior naturally without observer distractions.

Table 1: Definition of Buck reproductive behaviors

Behaviors	Definition
Vocalization	Characterized by frequent louder bleating.
Self-enurination	Downward turning of the head and shoulders towards the hindquarters and the emission of urine from the erect penis onto the face, beard and front legs.
Anogenital sniffs	Buck sniffs and licks the anal, vulva and other external genitalia.
Flehmen	When buck raise his head, curl his lip and wrinkled his nose.
Snorts	When buck forcibly produce exhalation sound/huffing.
Foreleg kicks	When buck kicked a doe's back and shoulders with foreleg.
Nuzzling	When buck rub his nose to move the doe in cozy position.
Chin resting	Buck rises his forelegs and hanging his chest on the doe's back.
Mounting without ejaculation	When buck chin resting properly, extrusion of penis without inserting into doe's vagina.
Mounting with ejaculation	When resting, penis into vagina and ejaculation take place.
Non courtship behaviors	Walking, laying, feeding e.t.c.

RESULT

The courtship behavioral frequencies of red Sokoto buck exposed to two oestrus nulliparous does were presented in figure 1. The results revealed that foreleg kicks highest courtship behavior followed by snorts, nuzzling, chin resting, and vocalizations with a repetition frequencies of 12, 11, 10, 8 and 8 respectively. While anogenital sniffing (5), flehmen (4), mounting without ejaculation (4), self-enurination (3) and mounting with ejaculation (3) was the less frequent displayed behaviors observed during this study. 10 times were the frequency scores of other (non-courtship) behavior which characterized by standing without displaying any courtship behavior, lying down or walking away from the does.

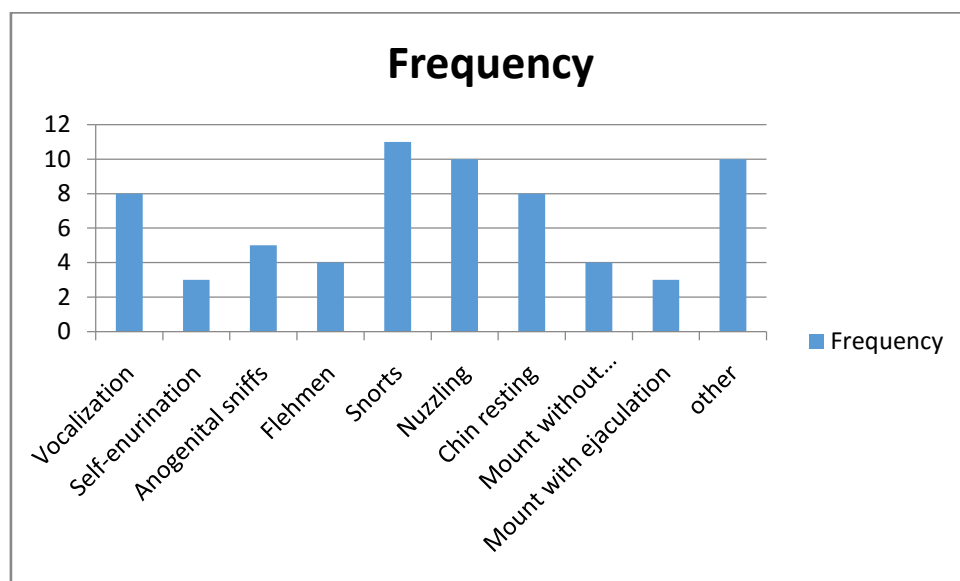


Fig. 1: Courtship Behavioral Frequencies of Red Sokoto Bucks Exposed to Two Oestrus Nulliparous Does

The time spent by buck on courtship behavior exposed to two oestrus nulliparous does were presented in figure 2. Non-courtship (other) behaviors was the highest times (10.52 minutes) by buck while the from the video recording, buck spent 6.36 minutes nuzzling, 6.26 minutes self-enurination, 4.50 minutes foreleg kicks, 4.19 minutes vocalization, 3.56 minutes chin resting, 3.15 minutes mounting with ejaculation, and 3.7 minutes anogenital sniffing. Buck spent less time displaying snorts (2.18 minutes), flehmen (2.17 minutes) and mounting without ejaculation (2.10 minutes).

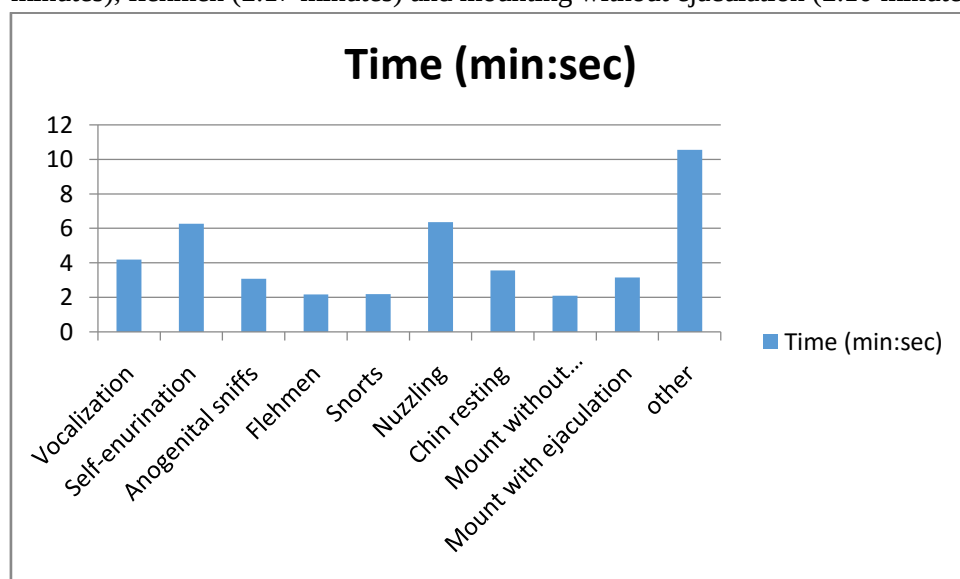


Fig. 2: Duration of Courtship behavior of Red Sokoto Buck Exposed to Two Estrous Nulliparous Does

DISCUSSION

The male domesticated goat (buck; *Capra hircus*) is popularly noted for his high libido and sexual vigor. Before mating, the male goat engages in several distinct behaviors that, as a whole, make up the courtship display (Longpre *et al.*, 2011). These behaviors include latency courting (vocalization, anogenital sniffing, nudging and flehmen) and copulatory (mounting and ejaculation) behaviors (Darwish and Mahboub, 2011). Vocalization, snorts, anogenital sniffing and flehmen are the first pre-

copulatory behaviors recorded in this study, were the buck begin by sniffing the doe's vulva and urine. He then raises his head, extends his neck and raises his upper lip while moving his head from side to side. This is called the "Flehmen reaction". Snort and vocalization was probably a stimulator that will arouse the attention and likely induce oestrus of female goat. This agrees with the statement made by Vielma *et al.*, (2005) that buck vocalization may stimulate estrus in local anovulatory female goats during the anestrus period. From the research carried out by Delgachillo *et al.*, (2006) were one group of goats was joined with two sexually active bucks (SA groups, n= 6), the second group was exposed to buck vocalization (VOC group, n= 6) reproduced through a microphone-amplifier-loudspeaker system, the third group was isolated from any male stimulus (C group, n= 6). He concluded that those submitted to male vocalization displayed higher estrus than isolated group and similar estrus behavior with those exposed to sexually active male. He further suggests that male goat vocalization may induce estrus activity in anestrus female goats even though they do not seem to influence ovulation itself (Delgachillo *et al.*, 2006).

Flehmen and anogenital sniffing was the less pre-mating activity observed in this study which contradict Mondal *et al.*, (2005) study who reported that flehmen was the longest pre-mating activity in experienced buck. However, the flehmen and anogenital sniffings duration in this study are almost similar those reported by Kerketta *et al.*, (2013) who reported 2.18 minutes flehmen reaction and bucks treated groups with a sniffing time spent ranging from 3.44-3.58 minutes. Self-enurination behavior was observed both at the first introducing does to the breeding pen before and after copulation, this support the suggesting made by Price *et al.*, (1986) that the self-enurination behavior is more likely to occur when the buck can view, but not breed an estrous. This may occur when the buck is separated from a female by a fence, or when the male is in the post-ejaculatory refractory period. It was also found that first contact and distance from the stimulus or the presence of another buck (especially when that buck is tending the female) increase the likelihood of self-enurination.

Buck displayed nuzzling behavior and spent more time to move and arrange the does in a comfortable and cozy position for mounting and these may be attributed to the mating inexperience nature of the does since they are nulliparous does. Similarly chin resting and mounting without ejaculation may be as a result of inexperienced nature of the does or complex interaction of buck's internal and external environment. Because, Katz, (1987) reported that the sexual behavior of the male goat are dependent upon highly complex interaction between his internal and external environment. The buck's external environment is comprised of his physical surroundings and social interactions. His physical environment is his surroundings, humidity, temperature, housing, topography *et.c.* His social environment is comprised of sexual, competitive, aggressive and communicative interactions with parents, siblings, other conspecifics, or animals of different species, including humans (Katz, 1987). The buck's endocrine and nervous systems make up of his internal environment and also play a critical role in the activation of his sexual behaviors. It is, of course, both the buck's internal and external environments that influence behaviors via highly complex interactions.

The result of this study revealed that high amount of time was spent by buck without displaying any courtship behavior, similar kerketta *et al.*, (2013) reported that the amount of time spent in standing without any activities was highest in a study with local Rottinkh goat bucks on mating behavior, libido score and semen biology.

CONCLUSION

The results showed that red Sokoto buck can be used intensively to evaluate courtship ethograms and serve as a tool that will provide holistic ideas and modern reproductive behaviors for better and clear understanding of the causes, its mechanism and complex interaction between the animals to both internal and external environments that influence such behaviors.

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