

**NSAP****47th Annual Conference**
(JOS 2022)**CONFERENCE PROCEEDINGS**THEME
SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES**EFFECT OF FERMENTED CINNAMON JUICE EXTRACT ON RED SOKOTO BUCKS
SEXUAL ETHOGRAM****Garba, M.G., Gaddafi, S., Salisu, U.S., and Yakubu, G.***Department of Animal Science Federal University Dutsin-Ma Katsina State*

Corresponding author: Email: alghazali8067@gmail.com phone: 08034655789 sanigaddafi4@gmail.com

ABSTRACT

This study was designed to evaluate the reproductive ethograms of red sokoto bucks supplemented with fermented cinnamon juice extract (FCJE). A total number of 24 apparently healthy pubertal red Sokoto buck were allotted into four treatments comprising 0, 15, 30 and 45 mls of FCJE in a completely randomized design (CRD). The animals were drenched for three weeks daily followed by individually exposed to oestrus doe for video tapping to records reproductive behaviour for 30 minutes. The results in frequencies and durations of each reproductive behaviours were presented in a histogram in figure 1 and 2 respectively. The result revealed that reproductive behaviour frequencies and duration of bucks were independent to supplementation of FCJE. However, considerable increase in frequencies and duration of some reproductive behaviour such as anogenital sniffing, flehmen reaction and mount with ejaculation were observed in red sokoto bucks supplemented 45 mls FCJE. Therefore, further studies are however, recommended to fully explore the effect of fermented cinnamon extract on reproductive performance of Red Sokoto Bucks.

Key Words: Cinnamon, Fermented, Extract, Buck and Reproductive Ethogram

INTRODUCTION

Reproduction is central to the continued existence of animals on earth. In sexual animals, reproduction is important for both males and females for life to continue. Efficient reproduction is key to the success of any livestock enterprise (Ukaret *al.*, 2021). Several research efforts have been made, , targeted towards enhancing the reproductive performance of farm animals through scientific approaches involving some kind of genetic, nutritional and physiological manipulations or interventions (Herbert and Ukar, 2008; El-Azim and El-Kamash, 2011). The sexual behavior of goat 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 through genital tract examination, mating ability and semen quality evaluation (Kerkettaet *al.*, 2013).

The male domesticated goat (buck; *Capra hircus*) is popularly known 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 (Longpreet *al.*, 2011). These behaviors include latency courting (vocalization, anogenital sniffing, nudging and flehmen) and copulatory (mounting and ejaculation), (Darwish and Mahboub, 2011).

MATERIALS AND METHODS

Experimental site: The experiment was conducted at Small Ruminant Animal Unit of Prof. Lawal Abdu Saulawa Livestock Teaching and Research Farm, Department of Animal Science, Federal University Dutsin-Ma, Katsina State, Nigeria.

Experimental Animals: A total of twenty four (24) pubertal Red Sokoto bucks were procured from Dutsin-Ma Wednesday market. The animals were given a prophylactic treatment (Broad spectrum Antibiotic and Albendazole as dewormer against possible infection and parasites infestation) prior to the commencement of the experiment within 14 days period of acclimatization.

Experimental Design: A total of twenty four (24) apparently healthy pubertal Red Sokoto bucks were allotted into four treatments (6 bucks per treatment) comprises of four dosage levels of fermented cinnomum juice extract with three replicates havig two bucks each in a completely randomized design (CRD). The animals were drenched orally with 0, 15, 30 and 45 mls of FCJE daily for a period of 3 weeks followed by reproductive behaviour trails of each buck exposed to estrus doe for a period of 30 minutes



NSAP

47th Annual Conference
(JOS 2022)

CONFERENCE PROCEEDINGS

THEME
SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES

Preparation of Fermented Juice Extract: Dry Cinnamomum stem was obtained from Katsina central market. The stem was identified, sorted to remove inert materials and grinded using mortar and pestle. The powdered material obtained was further grinded using electric grinding machine to obtain final finer particles. One (1 kg) of grinded powder was put in a bow, 1 Litre of molasses and 5 litres of water mixed together thoroughly using paddle. The mixture was poured into a plastic pail and tightly covered to assist anaerobic fermentation thereby preventing some air to get inside the plastic and was allowed to ferment for a period of one week (7 days). Fermented juice was obtained by straining mix through fine cheese cloth. The fermented extract was stored in plastic bottle under normal room temperature.

Sexual Ethogram: The video camera was mounted in the mating pen to identified copulatory behaviours. The sexual behaviour of Red Sokoto Buck was determined according to procedure outlined by Gaddafi *et al.*, (2020) with the presence of the partner, where a doe in estrus was identified, and brought near the mating pen for a limited time. Since the sampling rule is a behavioural sampling, therefore, estrus doe was 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 behaviors 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.

Source: (Gaddafi *et al.*, 2020)

RESULT

The results of reproductive behavioural frequencies and durations of Red Sokoto bucks were presented in figure 1 and 2. The frequency (number of times exhibited)of reproductive behaviours of bucks supplemented with fermented cinnamon juice extract were presented in figure 1. The result revealed that treatment 2 (15 Ml FCJE) has the highest repeated number of vocalization (8 times), 2 times occurrence of self-urination were recorded in treatment 1 while zero self-urination behaviour was observed in T3 and T4. Flehmen reaction/lip curling, snorts, nuzzling and mount with ejaculation behaviours were the highest repeated behaviours observed in Red Sokoto buck supplemented 45Ml of FCJE while Foreleg kicking and nuzzling were the highest frequent behaviours observed in T3. Longpre *et al.* (2011) state that before mating, the male goat engages in several distinct behaviours that, as a whole, make up the courtship display.



NSAP

47th Annual Conference
(JOS 2022)

CONFERENCE PROCEEDINGS

THEME
SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES

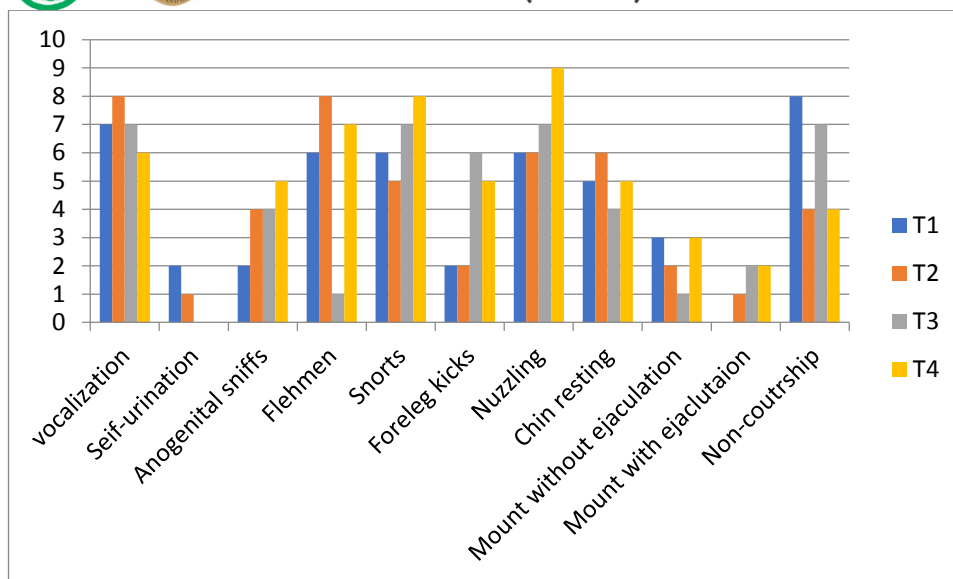


Figure 1:

Figure 2: Present s the duration (Min: Sec) of Red Sokoto bucks supplemented Fermented cinnamon juice extract. From the figure, treatment 2 shows the highest (5:21min) duration taken in exhibiting vocalization behaviour, this vocalization may serve as a stimulator for estrus. Vielma et al. (2005) states that buck vocalization may stimulate estrus in local anovulatory female goats during the anestrus period. while treatment 4 (3:59 min) was the lowest duration. Highest self-urination (3:5 min) was recorded in treatment 1 and self-enuration is more likely to occur when the buck van view, but not breed an estrous. Price et al. (1986) reported that self-enuration may occur when buck is separated from a female by a fence, or when the male is in the post-ejaculatory refractor period. while no self-urination behaviour was observed in both treatment 2 and 4.

Bucks supplemented 45 mls of FCJE spend long durations exhibiting Anogenital sniffing, flehmen reaction, nuzzling, chin resting and mount with ejaculation. Highest duration in snorts, foreleg kicks and non-courtship were observed in bucks supplemented 30 mls of fermented cinnamon juice extract.

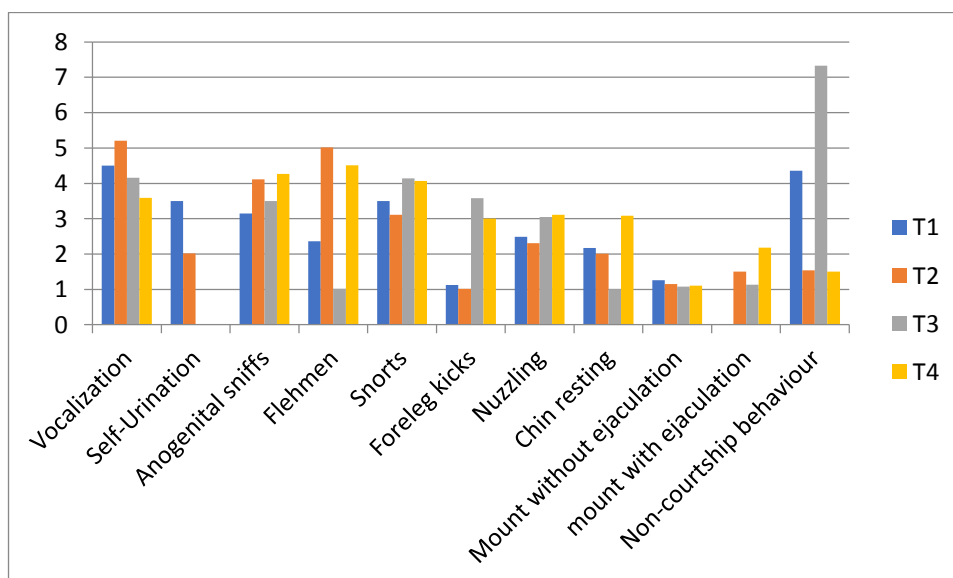


Figure 2: Duration (Min:Sec) of Reproductive behaviours of Red Sokoto bucks supplemented FCJE

Nuzzling the behaviour that assist buck to arranged does in a cozy corner this support the statement made by gaddafi et al. (2020) that buck displayed nuzzling behaviour and spent more time to move and arrange the does in a comfortable and cozy position for mating and these may be attributed to mating inexperience nature of the does.

CONCLUSION

This study suggested that supplementing bucks with fermented cinnamon juice extract increases frequencies and duration of some reproductive behaviour such as anogenital sniffing, flehman reaction, mount with ejaculation.

REFERENCES

- Darwish, R.A. and Mahboub, H.D.H. 2011. Breed and experience effect on the sexual behaviours of Damascus and Egyptian-Nubian goat bucks. *Theriogenology*, 76:1386-1392.
- El-Azim, A.A. and El-Kamash, E.M. (2011). Evaluation of semen quality and its relation to mating system for some breeds of rabbits under environmental conditions in the middle of Egypt. *Egyptian Poultry Science Journal*, 31:467-480
- Gaddafi, S., Usman, H.U., Aliyu, A.M. and Abdulrashid, M. (2020). Scrutinizing courtship ethogram of Red sokoto Buck exposed to two oestrus nulliparous Does. *Book of proceedings of Nigerian Society for Animal Production 45th Annual Conference-Bauchi*, 2020, 352-356.
- Herbert, U. and Ukar, I.A. (2008). Sexual behaviour and semen quality of rabbits fed diets containing *Myristicafragrans* (Houtt) (Nutmeg). *Proceedings of 15th International Congress on Animal Reproduction*, Budapest, Hungary. *Reproductive Domestic Animals*, 43(3):137
- Kerketta, S., Singh, M., Patel, B.H.M., Verma, M., Prasad, J.K., Upadhyay, D. and Bhushan, B. (2013). Study on buck's mating matingbehavior, libido score and semen biology in local goat of Rottinkh and Region, India. *Indian Journal of Animal Research*, 48(5):491-495.
- Longpre, K.M., Koepfinger, M.E., and Katz, L.S. 2011. Female goats use courtship display as an honest indicator of male quality. *Hormones and Behaviour*, 60, 505-511.
- Mondal, S.K 2005. Ph.D Thesis, Indian Veterinary Research Institutes, Izatnagar; Bareilly (U.P); India.
- Price, E.O., Smith, V.M. and Katz, L.S. 1986. Stimulus conditions influencing self-enurination, genital grooming and flehmen in male goats. *Applied Animal Behaviour Science*, 16, 371-381.
- Ukar, .I.A., Odaa, E.J. and Herbert, U. (2021). Sexual receptivity and reproductive performance of rabbit does administered exogenous GNRH, Ovaprim. *Nigerian Journal of Animal Science*, 23 (2):60-65
- Vielma, J., Hernandez, H., Veliz, F.G., Flores, J.A., Duarte, G., Malpaux, B., Dalgadillo, J.A. 2005. Buck vocalizations stimulate estrous behavior in seasonal anovulatory female goats. *Reproduction of Domestic Animal*, 40:360-367