

ASSESSMENT OF MILKING PROFILE OF RED SOKOTO DOES ADMINISTERED VARYING DOSAGE OF ETHANOLIC EXTRACT OF TIGER NUT (*Cyperus esculentus*)

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ABSTRACT

Tiger nut (*Cyperus esculentus*) is consumed by humans and livestock. It also has many medicinal uses such as aphrodisiac properties. There is an incidence of milking incompetence or deficiencies and dryness in does in the study area. Hence, this study intends to assess or evaluate the effect of ethanolic extract of tiger nut on milking profiles of red Sokoto does. Consequently, the effect of ethanolic extract of tiger nut on milking profiles to determine the milking performance in female Red Sokoto does were investigated. Twelve (12) healthy Red Sokoto does were divided into four treatments with three replicates in each treatment in a completely randomized design. The does were treated with ethanolic extract of tiger nut (EETN) at 0ml, 5ml and 10ml respectively for a period of 60 days (8wks). After which the does were allowed to feed their kids and milking parameters were observed for the milking traits. The milking parameters either decreased or increased in a EETN dose dependent manner; without traces of weaknesses or reduced milking reflexes and a higher significant difference ($p < 0.05$) was observed in treatment two and three. In conclusion EETN has a strong lasting potential on milking profile in female Red Sokoto goats (Does) can be used as a milking inducement.

KEY WORDS: Average daily yield, *Cyperus esculentus*, Does, initial yield, Peak yield, Lactation length

Materials and Methods

The study was carried out at National Agricultural Extension Research and Liaison Services, North Central Zonal Office, Baddegi, Niger State from April to June 2021. The State falls within the northern guinea savanna zone of Nigeria and is about 430m above the sea level. It is located between latitude $9^{\circ} 31'$ and $9^{\circ} 42'$ North and longitudes $6^{\circ} 29'$ and $6^{\circ} 41'$ East of the equator. Niger State has two distinct climates, the dry season from (November to March). And the rainy season from (April – October) with mean annual rainfall between 1,000mm to 1,500 mm, with an average highest temperature in the month of March and lowest temperature in the month of August. The mean annual temperature is between 21 to 36.5°C . The relative humidity observed in the State varied from 15-65% - 26.39% (NSADP, 2020).

Collection of Plants Materials:

Fresh tiger nut (*Cyperus esculentus*) were purchased from Kure Ultra –modern market, Minna, Niger State, Nigeria. The fresh tiger nut were screened and washed to remove sand and debris, sun dried and pulverized into fine powder using pestle and mortar in line with (Ekalou *et al.*, 2015). The tiger nut powder was soaked in 85% ethanol solution for 48 hours, mixed every 6 hours and then filtered using the muslin cloth. The filtrate was evaporated using rotary evaporator. This was also to remove excess alcohol from the extract before finally kept in refrigerator for use throughout the experiment.

Source and Management of Experimental Animals

Twelve (12) red Sokoto does within the age range of 5-6 months were used for this experiment. The does were purchased from within Niger State principally from goat market at Izom. The goats were allowed to acclimatize for a period of two (2) weeks. During acclimatization, the goats were administered with Ivomectin®; a broad spectrum anti-parasitic drug, to remove both ecto and endo parasites. Broad spectrum anti-biotic (20 % Oxytetracycline manufactured by Heibei huarun pharmacy Co Ltd, China), Penstrep (manufactured by Kepro, Holland), other drugs such as albendazole and Terramycin G were administered when necessary to keep the animals in good health. Feed and water were provided ad libitum at 4% body weight.

Experimental Design and Procedure

Twelve (12) does were randomly divided into four treatments in a completely randomized design. The animals were allowed to acclimatize for the period of two weeks before the commencement of the research. The does

in control and treatment groups were treated with 0ml, 5ml, 10ml and 15ml of tiger nut extract per kilogram body weight thrice (3) in a week respectively through oral gavage throughout the experiment. After 4 weeks (30 days) of experiment after kidding, the following milking and udder characteristics were observed. Anisa *et al.*, (2019) method for determining milking characteristics in animals were adopted for milking profile in this present study.

Data analysis.

Data collected were subjected to the analysis of Variance (ANOVA) Using SAS statistical package (SAS, 2006). Duncan Multiple Range Test was employed to separate the treatment means.

RESULTS

The milking characteristics presented in Table 1.1 showed existence of significant differences ($p < 0.05$) among the treated and control group in most of the parameters assessed. Among the parameters measured are average daily yield, initial yield, peak yield, total yield, last test day yield and lactation length. Ethanolic extract of tiger nut significantly ($p < 0.01$) affected ADY, IY, PY, TY, PD and LTDY. However, there was no significant ($p > 0.05$) effect of EETN on LL observed. Treatment four (T) had higher ADY, IY, PY and PD. Treatment 1 had the least ADY, IY, and PY.

1.1 Milk characteristic of Red Sokoto Does Administered Varying Dosages of Ethanolic Extract of Tiger nut

Treatments	ADY (g)	IY (g)	PY (g)	TY (days)	PD (days)	LTDY(g)	LL (days)
1	321.86 ^o	301.79 ^o	440.36 ^o	50.73 ^b	33.64 ^a	78.48 ^{ab}	113.64
2	37.78 ^b	416.11 ^o	557.78 ^b	49.86 ^b	32.00 ^a	60.11 ^b	112.78
3	437.78 ^b	475.00 ^b	588.33 ^b	66.95 ^a	33.60 ^b	96.67 ^a	111.33
4	577.00 ^a	581.50 ^a	717.50 ^a	63.66 ^{ab}	35.40 ^a	90.00 ^{ab}	113.40
P-value	0.03	0.01	0.02	0.04	0.01	0.00	0.06
SEM	9.11	9.80	1.11	0.70	1.96	0.52	9.30

abc = means with different superscripts within the same column differs significantly.

ADY = Average daily yield, IY = Initial yield, PY = Peak yield, TY = Total yield, LTDY = Last test day yield and LL = lactation length.

Mean Values of Lactation Performance of Treated and Non-treated Red Sokoto does

4.18a: The mean lactation performance of treated and non-treated Red Sokoto does are presented in Table 1.2. In this study, the ethanolic extract of tiger nut had highly significant ($p < 0.05$) effect on average daily yield (ADY), initial yield (IY), peak yield (PY) and total yield (TY). There was also significant ($p < 0.05$) difference of ethanolic extract of tiger nut last test day yield (LTDY), peak days (PD) and lactation length (LH). The performance was in favour of administered or treated does.

Table 1.2: Mean Values of Lactating Performance of Treated and Non-treated Red Sokoto does

parameter	Non-treated	Treated	P-Value	SEM
ADY(g)	339.07 ^b	402.38 ^a	0.01	9.30
IY(g)	328.33 ^b	503.10 ^a	0.03	9.11
PY(g)	457.67 ^b	681.43 ^a	0.03	9.80
TY(g)	48.08 ^b	59.80 ^a	0.05	1.11
LDY (days)	77.33 ^b	80.95 ^a	0.04	1.96

PD (days)	31.09 ^b	33.40 ^a	0.02	0.70
LL	113.17	117.07	0.04	0.52

abc=means within the same row with different superscripts differ significantly, ADY=average daily yield, IY=Initial yield, PY= peak yield, TY=total yield, LDY=last day yield, PD=peak days, LL= lactation length, SEM= Standard error of mean.

DISCUSSION:

In this study, each milking parameters were observed to enable the understanding of the terms that constitutes milking traits of Red Sokoto does used in the experiment (Anisa *et al.* 2020). These Observations were significantly ($p < 0.05$) demonstrated by the ethanolic extract of tiger nut especially on the 30 day of administration as compared to the control (1-4). This proved that ethanolic extract of tiger nut has a milking-let down potentials (Anisa *et al.*, 2020), which emphasized the need for the use of ethanolic extract of tiger nut.

This also support the findings of Anisa *et al.*, (2020) who opined that methanolic extract of tiger nut has a highly significant ($p < 0.01$) increase in initial yield (IY) of Nubian does. This finding is further buttressed by the report of Anisa *et al.* (2019) who stated that ethanolic extract of tiger nut has is an important inducement agent for the milking -let down in ruminant animals and man. While there is an affirmation that elevated milking yield is believed to be an important index of milking stimulus or efficacy (Fouche *et al.* , 2020) while average daily milking yield (ADY) relates to the recorded time from when a kid is introduced in to the dam before daily collection (Anderson, 2011).

A delayed milking yield is an indication of poor milking performance, viability and reduced quality. This findings revealed a dosages dependent milking characteristics from the ethanolic extract and a reduction in last day yield (LDY) in a similar manner as reported by Anisa *et al.* , (2020). This research agrees with an earlier report by Anisa *et al.*, (2020) who opined that medicinal crops with possible potentials to improve stimulus ought to result in a significant increase in total yield (TY) which are both indicative of milking activities. This agrees with Allouh *et al.*, (2015) who reported that a significant rise in the sum of peak day yield (PDY) is an indication of efficiencies of milking let- down and the perfect manner at which milking reflexes are coordinated after activation. The improvement observed in milking reflexes, vigour, strength and let-down viability was further corroborated by increase average daily yield (ADY) across all the treatment groups compared to control. This supported the findings of Allouh *et al.*, (2015) Who also opined that the quantity and quality of milk produce were significantly ($p < 0.05$) affected by ethanolic extract of tiger nut. In this study treatment T4 has the most significant ($p < 0.05$) milking characteristics

CONCLUSION

From the results of this research study, it can be concluded that ethanolic extract of tiger nut (EETN) has a potential for the reactivation of milking potency in a dosage dependent manner. EETN can be used to induce more milk production. It is a promising milking -let down with health benefits for small ruminants. Thus, it could be used to safely replace synthetic drugs or hormones and about 15mg daily is recommended

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