

ETHANOLIC EXTRACT OF TIGER NUT (CYPERUS ESCULENTUS) ON GROWTH PERFORMANCE, HEAMATOLOGY AND SERUM BIOCHEMISTRY OF RED SOKOTO GOATS

APRIL 025

Sakpe Y.Y, J. Y Adama, Y.S Kudu, A. Usman

ABSTRACT

Tiger nut is consumed by humans and animals. It possesses some medicinal uses. There is growing evidence of decline in human sperm count and quality. Hence, these studies seek to evaluate the effect of ethanolic extract of tiger nut on reproductive performance, hematology and biochemical indices of red Sokoto goat. The goats were divided into four treatment groups of three replicates with two animals per replicates. The goats were treated with ethanolic extract (ET) of Tiger nut at 0ml, 5ml, 10ml and 15ml respectively for thirteen (13) weeks. After which the goats were examined for the growth, reproductive performance and hematology. In conclusion ethanolic extract has the capability of influencing growth, hematology and serum chemistry of red Sokoto goat. Hence, it could be used as a possible fertility booster (Ekaluoet al., 2015). The results reveal a significant difference ($p < 0.05$) in haemoglobin, Does in T² and T³ has the highest Hemoglobin and PCV values, this was followed by Does in T¹ and T⁴ respectively.

Keyword: Hematology, Cyperusesculentus, Ethanolic Extract, Red Sokoto Does

INTRODUCTION

Tiger nut (*Cyperusesculentus*) is cultivated for human consumption and as well as livestock feed. It is one of the underutilized and widely distributed plants in subtropical and tropical regions. In Nigeria it is cultivated mainly in the northern Nigeria especially middle belt regions (Gambo et al., 2014). Tiger nut is a tuber that belongs to the family cyperaceae, with a slightly sweet flavour (Shaikher et al., 2013).

Tiger nut has been historically used in herbal medicines and in the cosmetic industry in the production of soap and oil (Aremuet et al., 2016).

MATERIALS AND METHOD

Collection of plant materials:

10 grammes (10g) Fresh tiger nuts (*Cyperusesculentus*) were purchased from Kure Ultra-modern market, Minna, Niger State, Nigeria. The fresh tiger nut were screened and washed to remove sand and other debris, sun dried and pulverized into fine powder using pestle and mortar in line with (Ekaluo et al., 2015). The tiger nut powder was soaked in ethanol solution for 48 hours mixed every 6 hours then filtered using the muslin cloth. The filtrate was evaporated using rotary evaporator. This also was to remove the sand and finally extract was kept in refrigerator for use throughout the experiment.

EXPERIMENTAL ANIMALS

A total of twenty four (24) healthy red Sokoto goats about 5-6 months of ages between 10-12 kg were used in the study. The goats were purchased from Izom market Gurara Local government, Niger state, Nigeria. They were allowed free access to water and fed with cowpea husk basal diets throughout the period of experiment.

EXPERIMENTAL DESIGN AND PROCEDURE

The twenty four red Sokoto goats were randomly divided into four treatments of three replicates and two (2) animals per replicate in a completely randomized design. The animals were acclimatized for two weeks before the commencement of the research. The goats in control and treatment groups were treated with 0ml, 5ml, 10ml and 15ml of tiger nut ethanolic extract per kilogram body weight thrice (3 times) a week respectively. The tiger nut ethanolic extract was administered in 0ml, 5ml, 10ml, and 15ml through oral gavage throughout the experiment.

After thirteen week (13) of treatment, blood samples were collected and analysed.



Result and Discussion

Effect of ethanolic extract of Red Sokoto does on the Haematological parameters of does.

The result reveal a significant difference ($p < 0.05$) in the Haemoglobin, pack cell volume, eosinophil, MCV and MCH but showed no significant difference ($p > 0.05$) in the white blood cell, red blood cell, neutrophil, lymphocytes, monophile, basophile and MCHC. Does in treatment four and three had the highest haemoglobin and PCV values, this was followed by does in T_2 while does in T_1 had

lowest values ($p > 0.05$). in blood haemoglobin content. Does in T_3 had the highest ($p < 0.05$) EOS values, but does in treatments two, three and four were statistically similar in Eos values ($p > 0.05$). Does in T_1 were not significantly different ($p > 0.05$) from T_2 . The two treatments were however higher ($p < 0.05$) than T_3 and T_4 which was statistically equal ($p > 0.05$) from each other in the MCV values. Does in T_2 had significantly higher ($p < 0.05$) MCH values than does in T_1 , T_3 , and T_4 . However, the table showed lymphocyte and monocyte were not statistical different ($P < 0.05$)

Effect of ethanolic extract of Tiger nut on the Haematological parameters of red sokoto does

Parameters	Range	T_1	T_2	T_3	T_4	SEM
RBC ($\times 10^9$ /dl)	9.2 - 13.5	10.64	12.37	11.74	10.86	0.17
Hb (g/dl)	7 - 15	6.56 ^b	8.21 ^a	8.53 ^a	10.11 ^a	0.39
PCV (%)	21 - 35	18.42 ^b	24.71 ^a	24.05 ^a	29.10 ^a	1.32
MCV (fl)	16 - 25	33.44 ^b	38.44 ^a	36.44 ^a	36.44 ^a	0.32
MCH (pg)	5.2 - 8.0	6.10 ^b	8.16 ^a	7.56 ^a	6.14 ^b	0.40
MCHC (g/dl)	30 - 36	37.96	38.59	35.48	35.01	0.80
WBC ($\times 10^3$ /l)	6.8 - 20.1	12.31 ^a	11.53 ^b	12.84 ^a	10.25 ^b	0.75
WBC Differentials						
Lymphocytes (%)	47 - 82	65.27	65.52	69.15	68.54	1.31
Neutrophils (%)	17 - 52	29.68	34.81	26.99	32.62	0.98
Eosinophils (%)	1 - 7	1.00 ^b	1.92 ^a	1.61 ^b	0.00 ^b	0.41
Monocytes (%)	0 - 4	0.82	0.00	1.25	1.31	1.14
Basophils (%)	0 - 1	0.24	0.00	0.00	0.00	0.15

Means within a row having different superscripts differed significantly ($P < 0.05$).

T_1 = 0ml

T_2 = 5ml

T_3 = 10ml

T_4 = 15ml

SEM = Standard Error of Mean

Effect of ethanolic extract of Tiger nut on the Serum Biochemistry of the Red Sokoto Does

The result reveals a significant difference ($p < 0.05$) in the sodium, potassium, calcium, chloride, phosphorus, cholesterol, and Total bilirubin components of the blood serum of the does used after parturition. The urea, total protein, creatinine, glucose, HDL, LDL, albumin, triglyceride, conjugated bilirubin, SGOT, SGPT and ALP showed no significant difference ($p > 0.05$).

Does in T_2 , T_3 and T_4 showed statistical equal ($p > 0.05$) while T_1 happen to have the least values of Serum Sodium

Does in T_4 have the highest serum potassium followed by the Does in T_3 while Does in T_2 are similar to T_1 (the least) in the serum potassium. The does in treatment three (3) had higher calcium blood serum ($p < 0.05$) followed by T_2 and T_1 while T_4 had the least calcium blood serum. The table showed treatment (T_1) had the highest ($p > 0.05$) chlorides blood serum across all the treatment while treatment T_3 , T_4 and T_2 are statistical similar ($p > 0.05$). Does in T_2 had the highest phosphorus content while the least content was found in T_4 , T_3 and T_1 respectively and all the treatments are statistical equal in creatine blood serum ($p > 0.05$).



Finally the table showed that T₄ had the highest total protein (p<0.05) while T₁, T₂ and T₃ had the least values of total protein.

Effect of ethanolic extract of Tiger nut on the Serum Biochemistry of the red sokoto Does

Parameters	Range	T ₁	T ₂	T ₃	T ₄	SEM
Sodium (mmol/L)	124 - 155	143.40 ^b	154.65 ^c	155.35 ^c	160.00 ^d	3.02
Potassium (mmol/L)	3.0 - 6.0	4.97 ^a	4.97 ^{ab}	5.57 ^b	5.58 ^{ab}	0.34
Calcium (mmol/L)	1.15 - 3	2.37 ^a	2.49 ^b	2.52 ^b	3.61 ^c	0.22
Chloride (mmol/L)	99 - 120	74.68 ^a	68.68 ^a	55.26 ^b	52.39 ^b	1.11
Phosphorus (mmol/L)	0.58 - 4.5	1.40 ^b	1.83 ^a	1.55 ^b	1.10 ^c	0.20
Urea (mmol/L)	0.8 - 9.7	6.49	6.05	4.20	4.63	0.71
Creatinine (mg/dl)	0.9 - 1.8	0.64	0.82	0.45	0.59	0.22
Cholesterol (mmol/L)	2.07-3.37	2.10 ^c	3.55 ^b	3.35 ^b	4.69 ^a	0.72
Glucose (mmol/L)	2.78-4.16	2.32	1.31	1.66	1.53	0.61
Total Protein (g/100ml)	6.3 - 8.5	3.86	4.67	5.10	5.70	0.35
HDL (mmol/L)		1.79	1.87	1.21	1.01	0.22
LDL (mmol/L)		1.32	1.40	2.15	2.30	0.24
Albumin (g/100ml)	2.8 - 4.3	1.270	1.712	2.261	2.05	0.31
Triglyceride (mmol/litre)	0.16 - 1.6	0.47	1.13	0.71	0.45	0.24
Total Bilirubin (mg/dL)	0 - 0.9	3.11 ^a	2.76 ^b	2.74 ^b	4.73 ^a	0.35
Conjugated Bilirubin (mg/dl)		2.26	2.02	1.88	1.54	0.12
SGOT (IU/L)	12-38	12.30	13.75	12.70	12.80	0.18
SGPT (IU/L)	2 - 22	6.94	16.95	11.70	5.34	0.80
ALP (IU/L)	1.4-25.7	23.55	24.54	31.49	41.37	2.14

abc Means within a row having different superscripts differed significantly (P<0.05).

T₁= 0ml

T₂= 5ml

T₃= 10ml

T₄= 15ml

SEM= Standard Error of Mean

REFERENCES

- Aremu M.O, Ibrahim H. and Aremu S.O. Lipid composition of black variety of raw and boiled tiger nut (*Cyperus esculentus*)
- Ekaluo, U.B, Ikpeeme, S.E. and Ekpo, P.B. Effect of Aqueous Extract of Tiger nut (*Cyperus esculentus*) on sperm parameters and testosterone levels of Male Albino Rats. *Asian Journal of Biotechnology*, 7: 39-45
- Gambo, A. and Da'u, A. Tigernut (*Cyperus esculentus*): Composition, products, uses and health benefits- A review *Bayero Journal of pure and Applied Sciences* 7: 56-61 (2014)
- Jagdish, P. Goat, Sheep and Pig Production and Management, 5th Edition 2014 Kayam Publishers, New Delhi-110002