



**BAUCHI
2022**



**ANIMAL SCIENCE ASSOCIATION
OF NIGERIA & NIGERIAN INSTITUTE
OF ANIMAL SCIENCE**



PROCEEDINGS

of the



**ASAN -NIAS
JOINT ANNUAL MEETING**

AND



**ASAN
ANNUAL CONFERENCE**

Theme:

**SUSTAINABLE ANIMAL PRODUCTION:
CURRENT STATUS AND WAY FORWARD**

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**K. M. Bello, M. Abubakar, D. J. U. Kalla,
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EFFECT OF DIETARY ORANGE FLESH SWEET POTATO VINE AND *Calopogonium mucunoides* ON WEIGHT GAIN AND HEAMATOLOGY OF RABBIT BUCKS RAISED IN THE DERIVED SAVANNAH**¹*Ajao, B.H., **Babaniyi, G.G. and ***Hameed, K.O.**^{*}Department of Animal Production, University of Ilorin, Nigeria^{**}Department of Agricultural Development and Management, Agricultural and Rural Management Training Institute (ARMTI), Nigeria.^{***}Agriculture and Natural Resources Department, Ilorin West Local Government Secretariat, Warrah, Ilorin, Nigeria¹**Corresponding Author:** ajao.bh@unilorin.edu.ng; 08035000745

ABSTRACT

The study investigated the effect of Orangeflesh Sweet Potato (PV) vine on growth and hematology of rabbits raised in the derived Savannah. Twenty-four growing male rabbits were allocated to four treatment diets made up of pure concentrate (C), Calopogonium mucunoides (CM) (positive control), PV and a combination of CM and PV (PVCV) with the last 3 supplemented with 25grams of concentrate each. A thermohygrometer was used to measure the ambient temperature (AT) and relative humidity (RH) of the rabbit pen daily and THI was calculated using the recorded AT and RH. The animals' weight was measured once a week. The study lasted for eight weeks. AT (26.15°C - 35.07°C), RH (10.00% - 47.57%) and THI (23.05 - 38.05) differed significantly ($p < 0.05$) across the weeks with the highest value on the 8th week. Animals fed C had the highest weight gain which was similar to those allocated to PV and PVCV but statistically different ($p < 0.05$) from CM with the lowest weight gain. Treatment had significant effect ($p < 0.05$) on the red blood cell count and packed cell volume of experimental animals with the exception of the control. This study concludes that Orangeflesh Sweet Potato vines (PV), alone or in combination with CM sustained the weight of the experimental animals with no adverse effect on their hematological parameters while THI indicated absence of heat stress.

Keywords: *Calopogonium mucunoides*, Orangeflesh Sweet Potato, Hematology, Derived Savannah, Temperature-Humidity Index

INTRODUCTION

Uncultivated forage crops which are indispensable to rabbit nutrition (1 and 2) are becoming sparse because of human activities and relatively longer dry season of the derived Savannah (3). Hence there is a formidable challenge to the welfare and nutrition of the rabbit in the zone due to heat stress and scantier forages. Crop residues have been reported to substitute common uncultivated forages and as an alternative feed source (4) thereby ensuring adequate nutrition for the rabbit which thrives on fibrous materials due to the unique feature of its gastrointestinal tract. This study compared the weight gain and hematology of rabbits fed orange flesh sweet potato vine (OFSP), a crop residue and *Calopogonium mucunoides*, an uncultivated

forage with those fed formulated concentrate. The ambient temperature and relative humidity of the rabbit housing were also monitored to determine the intensity of the heat stress prevalent in the ecological zone and determine its effect on weight gain and hematology of the animal.

High ambient temperature coupled with sparse population of uncultivated forages may negatively impact rabbit welfare and production in the Savannah. Orange flesh sweet potato vine which is discarded after harvest of the potato tuber can be a replacement for common forages if it sustains weight without impairing the animal's health as reported in other crop residues.

MATERIAL AND METHOD

The experiment took place in a backyard rabbit farm in Ganmo, Ifelodun Local Government Area, Kwara State, at latitude 8.41900N and longitude 4.60360E. The study lasted for 8 weeks between the months of December 2021 and January 2022. Twenty-four, 4-month-old rabbit bucks with average weight of 1.25kg were allocated to 4 experimental diets comprising of whole formulated concentrate (150 gram/animal), *Calopogonium muconoides* (CM), Orange Flesh Sweet Potato vine (PV) and a combination of CM and PV with the last 3 treatments supplemented with 25grams of concentrate each. Before starting the trial, the animals were given two weeks to acclimate. At 3 days intervals, a thermohygrometer was used to monitor the rabbit pen's ambient temperature (AT) and relative humidity (RH). Readings were taken at the morning (7am – 9am), afternoon (12 noon – 3pm), and evening (5pm – 7pm) hours for the entire 8-week research period. Temperature - humidity index (THI) was calculated and categorized based on the equation of (5) (shown below) from the

recorded ambient temperature and relative-humidity.

$$THI = t - [(0.31 - 0.31 \times RH) (t - 14.4)]$$

RH = relative humidity (%), t = temperature (Degree Celsius).

THI values obtained in the experiment were classified for the tropics as follows :< 27.8 = absence of heat stress, 27.8-28.9 = moderate heat stress, 28.9-30 = severe heat stress and above 30 = very severe heat stress.

Weight of the animals was measured once a week using a weighing balance. Blood sample was collected at the beginning and the end of the study to determine the hematology of the experimental animals using the methodology of (11).

Data Analysis

The collected data was analysed and subjected to the general linear model of the SPSS version 21. Statistically different means was separated by Duncan Multiple Range Test with α equals 0.05.

RESULTS AND DISCUSSION

Table 1: Relative - humidity, ambient temperature, temperature - humidity index, and weight gain of experimental animals monitored during the experiment.

Week	RH(%)	AT(°C)	THI	Weight(KG)
1	22.5 ^a	29.75 ^d	25.96 ^c	1.25 ^a
2	17.83 ^a	28.68 ^{cd}	24.95 ^{ab}	2.05 ^b
3	40.50 ^{bc}	27.82 ^{bc}	25.15 ^c	2.09 ^{bcd}
4	16.67 ^a	26.15 ^a	23.05 ^a	2.08 ^{bcd}
5	18.33 ^a	27.53 ^b	24.04 ^{ab}	2.07 ^{bc}
6	10.00 ^a	27.22 ^{ab}	23.64 ^a	2.16 ^{bcd}
7	24.17 ^{ab}	28.97 ^d	25.46 ^c	2.21 ^d
8	47.67 ^c	35.07 ^e	38.05 ^d	2.20 ^{cd}
SE±	5.78	0.37	0.35	0.04

^{abcd} Means with different subscripts within the column are significant different (p<0.05).

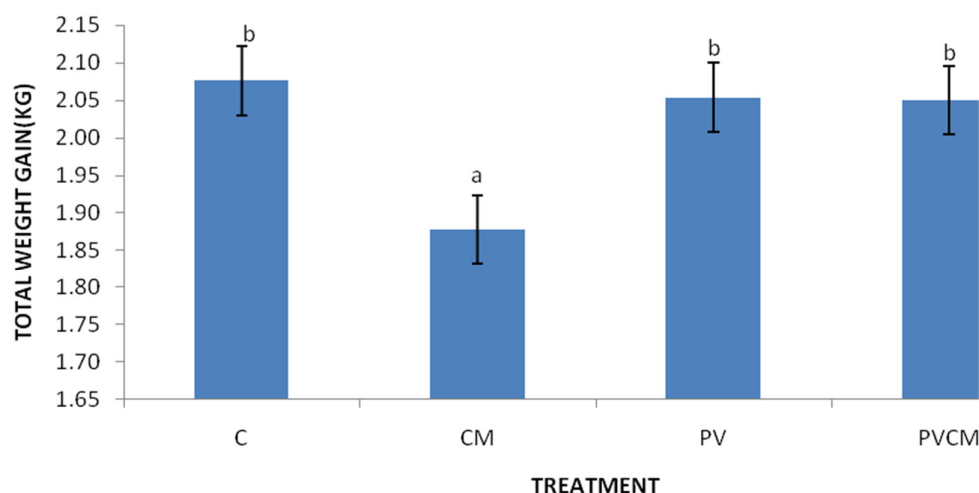
AT= Ambient Temperature, RH= Relative Humidity, THI= Temperature-Humidity Index, SE= standard Error

Ambient temperature (AT), Relative - humidity (RH), Temperature humidity index (THI) and the weight of the experimental animals were depicted in Table 1. AT ranged between 26.15°C and 35.07°C with significantly different (p<0.05) weekly means similar to the findings of (6) but with lower values.

Relative - humidity prevalence though significantly different across the weeks but lower compared to the values recorded by (6) which may be due to difference in season. THI (23.05 - 38.05) values though significant among the weeks was lower than the observation of (7) contrary to expectation and indicated absence of heat stress according to (5) with the exception of the 8th week. The

weight of the animals (1.25kg - 2.21kg) increased sharply in week 2 gaining 750 grams but remain stable till the end of the experiment. This implies that the experimental diets sustained the animals' weight similar to the report of (8). At the same time, the prevalent THI had no adverse effect on the weight of the animal because of the absence of heat stress. Total weight gain of the

experimental animal (Figure 1) was similar in all studied animals with the exception of those fed *Calopogonium mucunoides* which have a significantly lower ($p < 0.05$) weight. This report is different from the conclusion of (9) and implies Orange Flesh Sweet Potato (PV) vine alone or in combination with other forages is suitable just like concentrates in rabbit nutrition.



C=Concentrate, CM=Calopogonium mucunoides, PV=Orange Flesh Sweet Potatoe

Figure 1: Total weight gain of rabbit bucks fed orange flesh sweet potato vine and *Calopogonium mucunoides*.

Table 2: Hematology of rabbit bucks fed orange flesh sweet potato vine and *Calopogonium mucunoides*.

Parameters	Period	Treatments				SE±
		C	CM	PV	PVCM	
WBC($\times 10^6/\text{mm}^3$)	Beginning	8.97	9.60 ^b	7.23	7.43	1.32
	End	6.67	5.07 ^a	6.30	8.43	1.32
RBC ($\times 10^6/\text{mm}^3$)	Beginning	5.53	5.13 ^b	5.20 ^b	5.64 ^b	0.37
	End	4.43	3.70 ^a	3.97 ^a	4.27 ^a	0.37
HGB(g/dl)	Beginning	9.13	8.60	5.20	8.90	0.71
	End	8.90	7.70	5.20	8.53	0.71
PCV (%)	Beginning	41.20 ^b	39.07 ^b	39.50 ^b	40.40 ^b	2.29
	End	26.67 ^a	23.00 ^a	24.30 ^a	25.67 ^a	2.29

^{abcd} Means with different superscript within the column are significantly different ($\alpha = 0.05$). C = Concentrate, CM = *Calopogonium mucunoides*, PV = Orange Flesh Sweet Potato, WBC = White Blood Cell, RBC = Red Blood Cell, HGB = Haemoglobin, PCV = Packed Cell Volume, SE = Standard Error

The hematology of the experimental rabbits is presented in Table 2. Rabbit fed experimental diets with the exception of the control had significantly lower packed cell volume and red blood cell count at the end of the experiment

different from the findings of (10). Though these values were reduced, they were still within the normal ranges reported for rabbits (12).



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CONCLUSION

RECOMMENDATIONS

The current study discovered that heat stress was absent during the period of the experiment in the derived Savannah. The experimental diets had no adverse effects on the growth and hematology of the experimental rabbit bucks. This study concludes that though both Orange Flesh Sweet Potato vine (PV) and *Calopogonium mucunoides* (CM) can be fed to rabbits individually or in combination, PV seem to benefit rabbit bucks more than CM and can be fed with little amount of concentrate in replacement of a whole concentrate diet.

REFERENCES

1. Abu, O. A. and Turner, L. S. (2017). Chemical composition of tropical forages and their acceptability by the domestic rabbit (*Oryctolagus cuniculus*). *Nigerian Journal of Animal Production*, 44(5): 141 - 147.
2. Safwat, M. A., Sarmiento-Francoa, L. and Santos- Ricaldea, R. H. (2014). Rabbit production using local resources as feedstuffs in the tropics. *Tropical and Subtropical Agroecosystems*, 17, 161-17.
3. Oluwatimilehin, I. A. and Ayanlade, A. (2021). Agricultural community-based impact assessment and farmers' perception of climate change in selected Ecological Zones in Nigeria. *Agriculture and Food Security*, 10(3), 3 - 17. <https://doi.org/10.1186/s40066-020-00275-5>.
4. Omer, H.A.A., El Karamany, M.F, Ahmed, S.M., Abdel-Magid, S.S., El-Naggar, S. and Bakry, B.A. (2018). Incorporation field crop residues in rabbit rations. *Bulletin of the National Research Centre*, 42 (27), 1 - 8. <https://doi.org/10.1186/s42269-018-0025-2>.
5. Marai, I.F., Habeeb, A. and Gad, A.E. (2008). Performance of New Zealand White and Californian male weaned rabbits in the subtropical environment of Egypt. *Animal Science Journal*, 79: 472- 480.
6. Ajao B. H. and Ola S. I. (2021). Impact of varying temperature-humidity index on the thermo-physiological, libidinal and seminal characteristics of male rabbits raised in the wet humid tropics. *Nigerian Journal of Animal Science*, 23 (2), 83-92.
7. Asemota, O.D., Aduba, P., Bello-Onaghise, G, Orheruata, A.M. (2016). Effect of temperature-humidity index (THI) on the performance of rabbits (*Oryctolagus cuniculus*) in the humid tropics. *Archivos de Zootecnia*, 1 – 6.
8. Adeyemo, A.A., Taiwo, O.S. and Adeyemi, O.A. (2014). Performance and carcass characteristics of growing rabbits fed concentrate to forage ratio. *International Journal of Modern Plant and Animal Sciences*, 2, 33-41.
9. Abejeshi, I. M., Okwori, A. I., Shaahu, D. T. and Enaku, O. O. (2018). Effect of feeding some evergreen tropical browse plant leaves on performance, digestibility and economic analysis of growing rabbits. *Nigerian Journal of Animal Science*, 20 (1), 200 - 211.
10. Bawa, G. S., Abia, E.E., Oimage, J. J. Hassan M. R. and Abdu S. B. (2013). Nutritive value of Dolichos Lablab (*Lablab purpureus* CV. Rongai) forage cut at different stages of growth on performance of weaned rabbits. *Nigerian Journal of Animal Science*, 15, 3-36.
11. Ewuola, E. O. and Egbunike, G. N. (2008). Haematological and serum biochemical response of growing rabbit bucks fed dietary fumonisin B1. *African Journal of Biotechnology*, 7 (23): 4304-4309.
12. Ekine, O.A., George, O.S. and Eboh, T. (2018). Hematological profile of weaner rabbits fed graded levels of sweet potato. *Nigerian Journal of Animal Science*, 20 (3): 124-129.