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Effects of Supplementing Concentrate with Amaranthus Hybridus Stem and Ficus Thoningii Foliage on Haematological and Serum Indices of Weaner Rabbits

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Abstract

Studies were carried out to determine the effects of feeding rabbits with concentrate diet supplemented with *Amaranthus* stem and *Ficus thoningii* foliage on haematological and serum indices in a ten (10) weeks experiment. A total of 18 crossbred weaner rabbits with average initial weight of 630 ± 10 gm were used for feeding trial in a completely randomized design experiment. The animals were divided into three groups of six animals per treatment and each treatment had triplicates of two animals per replicate. Treatment T1 was fed with concentrate only. Treatment T2 was fed with concentrate and *A. hybridus* stem while treatment T3 was fed with concentrate and *F. thoningii* foliage. The results have shown that haematological and serum biochemical indices differed significant (P<0.05) between treatments 1 and 2 and treatment 3. It was concluded that A. hybridus is better in feeding rabbit than *F. thoningii* foliage.

Keywords: Amaranthus stem, *Ficus thoningii*, Weaner rabbits, Haematology, Serum indices.

Introduction

Feed makes up at least 60 % of the cost of production for all animal species and sometimes as much as 80% [1]. High cost of conventional feed ingredients has necessitated the need to look for alternative, non-conventional feed ingredients that are available, cheaper and nutritionally adequate and safe for feeding animals. Utilization of locally available cheap and less competitive feedstuff in feeding rabbits will minimize the incorporation of the highly cost feed sources while maximizing output at least cost of production [2]. Rabbit can thrive on a number of tropical forages supplemented with concentrate [3] but concentrate rations are expensive and can be a constraint to exploitation of the potentials of rabbits. Therefore, a feeding strategy that will engage sparing use of concentrate and dependence on forages will be of immense benefits [4]. *Amaranthus hybridus* stem and *Ficus thoningii* are available and are not competed for by man and can be used in feeding rabbit. However, some of these forages have high fiber content and anti-nutritional factors that have effects on performance and health status of animals. This experiment was conducted to evaluate the effects of supplementing these forages on hematological and serum indices of rabbits.

Materials and Methods

This research work was conducted at the Teaching and Research Farm of Federal College of Wildlife Management, New Bussa, Niger State, Nigeria. Concentrate diet was compounded as shown in Table 1. Eighteen crossbred weaner rabbits with average initial weight of 630±10 gm were used. The animals were divided into three treatment

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Table 1: Composition of the experimental diets.

Ingredient	Percentage (%)
Maize bran	64.61
Groundnut cake	18.39
Blood meal	3.0
Rice husk	10.00
Bone meal	3.00
Salt	0.50
Premix	0.50
Total	100.00
Calculated composition	
Crude protein (%)	18.00
Crude fiber (%)	11.70
Metabolizable Energy (Kcal/Kg	2580.00

Table 2: Proximate Composition of the experimental concentrate, *A. hybridus* stem and *Ficus thoningii* foliage.

Nutrient (%)	Concentrate	*A. hybridus* stem	*F. thoningii*
Dry matter	91.70	50.48	64.32
Crude protein	17.89	10.05	9.73
Crude fiber	12.20	15.31	18.56
Ether extract	6.52	3.20	5.92
Ash	8.34	4.68	7.32
Nitrogen free extract	55.05	66.76	58.47

groups of six animals with each group having triplicate of two animals per replicate in a completely randomized design experiment. They were given prophylactic treatment and allowed for two weeks adjustment period followed by 10 weeks experimental period. Treatment 1 (T1) were fed with concentrate diet only while Treatment 2 (T2) were fed with concentrate and *A. hybridus* stem. Treatment 3 (T3) were fed with concentrate and *F. thoningii* foliage. Feed and water were served ad-libitum. After the feeding trial, blood samples were collected into sterile universal bottles containing anti-coagulant, Ethylene Diamine Tetra Acetic acid (EDTA), for haematological parameters evaluation while blood samples were also collected into sterile bottles without anti-coagulant for serum biochemical indices. Packed cell volume (PCV), hemoglobin (Hb), red blood cells (RBC) and white blood cells (WBC) were determined while their differentials that include mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC) were calculated according to Jain (1986). Serum biochemical indices determined include total protein, albumin, urea, serum glutamate oxalotransaminate, serum glutamate pyruvate transaminate, total bilirubin and conjugate bilirubin. Proximate analyses of the concentrate diet, *A. hybridus* stem and *F. thoningii* foliage were carried out according to AOAC (1990). All data collected were subjected to analysis variance (ANOVA) according to the procedure of Steel and Torrie [5] while significant means were separated using Duncan's Multiple Range Test [6].

Results and Discussion

The results of proximate analyses of the concentrate, *A. hybridus* stem and *F. thoningii* is presented in Table 2. Haematological indices of the experimental rabbits are represented in Table 3. The hemoglobin (Hb), packed cell volume (PCV), white blood cells (WBC), red blood cells (RBC) and mean corpuscular hemoglobin concentration (MCHC) were higher (15.60 g/dl, 35.00%, 6.35,7.02 x 10^9l and 39.50% respectively) in control (diet1) than diets 2 and 3 with the lowest in diet 3. The values for hemoglobin were all within the normal range (9.9-19.3 g/dl) [7] for healthy rabbits. PCV values were also within the normal range of 31-50% [8]. The similar trend for Hb and PCV could be ascribed to the relationship between Hb and PCV [9]. White blood cells (WBC) were higher (10.50) in treatment 3 than treatments 1 and 2 (6.35 and 6.32 respectively) while red blood cells (RBC) were lower in treatment 3 (4.20) than in treatments 1 (7.20) and 2 (7.15). This might be due to presence of some anti-nutritional factors. MCV, MCH and MCHC values also followed the same trend with Hb and PCV, MCV, MCH and MCHC of animals in diets 1 and 2 were similar (P>0.05) but different (P<0.05) from animals on diet 3.The values for animals on diets 1 and 2 were within the normal ranges of (MCV, 57.8-65.4 and MCH, 17.1-23.5) but higher in animals on diet 3 [8]. The normal MCV and MCH values indicate that the animals were free from anemia. Higher MCHC suggests presence of hyperchromasia. Serum biochemistry indices are presented in Table 4. The result had indicated total protein to be between 4.50 g/dl and 6.25 g/dl with the highest value in animals on diet 3. The values for diets 1 and 2 were similar (P>0.05).

Low level of total protein is an indication of adequacy of protein in the diets. This is in line with Fasuyi and Ibiayo [10] who stated that total protein is indirect indices for measuring the nutritional protein adequacy. Albumin values were between 2.80 g/dl and 3.85 g/dl with highest in diet 1 and lowest in diet 3. This could be due to anti-nutritional factors in *F. thoningii*. Ewuola *et al.* [11] stated that high albumin is an indication that the rabbit did not suffer from any infection. Urea values were lower in diets 1 and 2 than in 3. This may be an indication of amino acid imbalance which resulted in increased blood urea as reported [12]. Serum glutamate

Table 3: Hematological indices of the experimental rabbits.

	Treatment			
Parameters	1	2	3	SEM
Hemoglobin (g/dl)	14.60^{a}	13.85^{a}	11.72^{b}	0.98
Packed cell volume (%)	32.50^{a}	35.87^{b}	32.43^{c}	1.46
White blood cells (x10^4/mm^3)	6.24^{c}	6.63^{c}	8.56^{b}	0.53
Red blood cells (x10^{22}/mm^3)	7.06^{a}	6.92^{a}	5.30^{b}	0.37
Mean Corpuscular Volume (μ^3)	53.12^{c}	57.84^{c}	61.19^{b}	2.68
Mean Corpuscular Hemoglobin (µg)	20.68^{c}	20.01^{c}	22.11^{b}	1.36
Mean Corpuscular Hemoglobin Conc.(%)	38.93^{a}	38.61^{a}	36.14^{b}	1.51

$^{a.b.c.d}$Means in the same row with different superscripts differ significantly (P<0.05)
SEM=Standard Error of Mean

Table 4: Serum biochemical indices of the experimental rabbits.

	Treatment			
Parameters	1	2	3	SEM
Total Protein (g/dl)	4.30 [c]	4.80 [c]	5.70 [b]	0.34
Albumin (g/dl)	3.75 [a]	3.68 [a]	3.50 [a]	0.10
Urea (mg/dl)	4.10 [d]	4.63 [c]	5.82 [b]	0.26
Serum glutamate oxalotransaminase (µ /l)	10.15 [c]	10.75 [c]	12.43 [b]	1.58
Serum glutamate pyruvate transaminase (µ /l)	9.86[c]	10.07 [c]	11.68 [b]	1.43
Total Bilirubin(mg/dl)	3.45[c]	3.87 [c]	5.21 [b]	0.87
Conjugate Bilirubin (mg/dl)	1.80[c]	2.42[bc]	2.86 [b]	0.09

[a.b.c.d]Means in the same row with different superscripts differ significantly (P<0.05)
SEM=Standard Error of Mean.

oxalotransaminate (SGOT) and serum glutamate pyruvate transaminase (SGPT) followed the same trend with urea. This could also be as a result of anti-nutritional components. This agreed with [12] (2010) who reported that an increase in serum SGOT and SGPT signify necrosis and myocardial infection or response to the presence of a number of toxic factors. Total bilirubin and conjugate bilirubin were similar in diets 1 and 2 and were within the normal ranges of 0-6 mg/dl and 0-3 mg/dl respectively [12-13] but were higher in diet 3. All the values for haematological and serum biochemical parameters were significantly (P<0.05) different between treatments 1 and 2 and treatment 3.

Conclusion

The results of this study had shown that supplementing concentrate diet with *A. hybridus* stem is better than *F. thoningii* as indicated by the haematological and serum indices. There is therefore need for phytochemical screening of *F. thoningii* foliage to ensure safety of use in feeding rabbit.

References:

1. Gill C (2003) Feed ingredients versus pollution. Feed International 24: 4.
2. Onyekwere MU, Olabode AD, Okechukwu SO, Iheukwumere FC (2010) Effect of feeding boiled Bambra nut (*Voandzeia subterranae)* waste on performance, haematology and serum biochemistry of weaned rabbits. Proceedings of 25th Annual Conference of Nigerian Society for Animal Production (NSAP), 14th-17th March, University of Ibadan, Ibadan, Nigeria pp: 203-206.
3. Shiawoya EL, Musa JAO (2003) Evaluation of the feeding potentials of mango (*Mangifera indica*) leaves, Banana (*Musa spp*) leaves and Tridax (*Tridax procumbens*) as supplements to conventional feeds for growing rabbits. Proceedings of the 8th Annual Conference of Animal Science Association of Nigeria (ASAN) pp: 90-92.
4. Yusuf AM, Olafadehan OA, Garba MH (2010) Evaluation of feeding potentials of Vitellaria paradoxa, Nauclea latifolia and Terminalia macroetre foliages as supplements to concentrate feed for grower rabbits. Australian Journal of Basic and Applied Sciences 4: 429-433.
5. Steel RGD, Torrie JH (1980) Principles and procedures of statistics: A biometrical Approach, 2nd ed. McGraw-Hill Book Co. Inc, New York.
6. Duncan DB (1995) Multiple Range and Multiple F-Test. Biometrics 11: 1-42.
7. Tuffery AA (1995) Laboratory Animals: An Introduction for Experimenters. John Wiley and Sons Ltd, England.
8. Mitruka BM, Rawnsley HM (1977) Clinical, Biochemical and Haematological Reference values in Normal Experimental Animals. Masson, New York, pp: 272.
9. Jain NC (1986) Schlams Veterinary Haematology, 4th ed. Lea and Febiger, Philadelphia, USA.
10. Fasuyi AO, Ibiayo FI (2010) Hematological indices and serum metabolites of experimental pigs fed varying levels of wild sunflower (*Tithonia diversifolia*) leaf meal based diets. Proceedings of 36th Annual Conference of Nigerian Society for Animal Production (NSAP), 14th-17th March, Ibadan, Nigeria. pp: 495-498.
11. Ewuola EO, Chinwe AU, Imam TK (2010) Testicular and epididymal sperm reserves and sperm production of rabbits fed prebiotics and probiotics diets. Proceedings of 36th Annual Conference of Nigerian Society for Animal Production (NSAP), 14th-17th March, Ibadan, Nigeria. pp: 185-188.
12. Olafadehan OA, Obun CO, Yusuf AM, Adewum MK, Olafadehan OO, et al. (2010) Effect of residual cyanide in processed cassava peel meals on haematological and biochemical indices of growing rabbits. Proceedings of 36th Annual Conference of Nigerian Society for Animal Production (NSAP), 14th-17th March, Ibadan, Nigeria, pp: 212-215.
13. Sirios M (1995) Veterinary Clinical Laboratory Procedure. Mosby Year Book, Inc. St. Louis, Missouri, USA.

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