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PERFORMANCE OF WEANER RABBITS FED WITH VARYING LEVELS OF *TRIDAX PROCUMBENS* (L) FORAGE

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Target Audience: Rabbit producers, animal nutritionists

ABSTRACT

Twenty four weaner rabbits (mongrel breed) of both sexes with average weight of 350g were fed formulated diet comprising 0, 15, 30 and 45% Tridax procumbens (TRP). The parameters evaluated were nutrient intake, daily weight gain, feed, conversion ratio, incidences of diarrhoea and mortality. At the end of the study, internal organ weight and dressing percentages were determined. Analysis indicated a significant ($P < 0.05$) dietary effect on nutrient intake, daily weight gain, and final body weight. However, organ weights and dressing percentages were not significantly ($P > 0.05$) affected by the dietary treatments. As the level of TRP increased in the diet, there was significant ($P < 0.05$) increase in dry matter intake and feed conversion ratio among the dietary treatment, while the daily weight gain decreased with increase in TRP inclusion level. It was concluded that weaner rabbits can tolerate up to 45% level of TRP in their diet without any adverse effect on their performance.

Key Words: Tridax Procumbens, weaner rabbits, performance

DESCRIPTION OF PROBLEM

The problem of rising cost of feed stuffs due to the competition of domestic animals with man for grains has raised the need for continued investigation on alternative readily available sources of high quality feed that are not consumed by man. There are different weed species (green feeds) that grows in association with field crops that can be exploited. In addition to being protein sources, some of these green feeds have been found to be sources of potassium, calcium, phosphorus and indigestible fibre (1).

Rabbits can be raised on high fibre feeds and materials not utilized by man. Among local rabbit keepers there is the observation that access of animals to green feeds allows for a faster rate of growth when compared to animals which do not have access to green feed. Also, Harris et al (2) observed higher weight gain and feed efficiency in a mixed feeding regime

of free choice forage and concentrate than on sole concentrate feeding.

Many of the green feed traditionally used in Nigeria in rabbit feeding are annual in growth habit which dies off during the dry season. A very common exception is TRP. Tridax probumbens is a very common tropical weed that is well adapted to a wide range of environmental conditions, it is a very common forage among rabbit raisers because it is highly relished by localrabbits. In a feed preference, study on tropical forages Aduku et al (3) found that more of TRP leaves were consumed than any other greens. They also reported crude protein value of 25.5% and crude fibre of 45.4% for TRP. Kalu et al (4) however, reported crude protein of 14-28% and crude fibre of 26-59% depending on the harvesting stage. Similarly, Ekpeyong (5) reported 12.47% crude protein, 17.04% ash and 36% crude fibre. Aduku (6) in his table of tropical feed stuff analysis showed 15.31% crude protein, 4.33 ether extract 20.57 crude fibre, 14.8% ash and 38.69%nitrogen free extract. Although TRP is a weed of cultivated crops, it can be converted into high quality animal protein by feeding it to rabbits. The present study was aimed at evaluating the performance of weaner rabbits fed diets with varied levels of Tridax procumbens forage. The result of such a study would be useful towards improving performance of our local rabbits especially during the dry seasons when there is shortage of feed stuffs.

MATERIALS AND METHODS

Diet and plan of experiment:

The four experimental diets contained 0,15,30 and 45% levels of Tridax procumbens. The TRP was collected and.dried under the shade for 3-4 days and ground in a hammer mill of 2.3mm sieve. The milled forage was stored in bags until when needed for the experiment. The remaining portion of the diet was made up of maize, wheat offal, groundnut cake, bone meal, vitamin premix and oyster shell. The four (4) treatment diets were formulated such that TRP was included at 0, 15, 30 and 45% respectively replacing wheat offal on weight to weight basis. The level of other ingredients remained the same in the four treatment diets (Table 1).

The chemical composition of the tested forage (TRP) and diets are as shown in Table 2.

Experimental animals and their management:-

Twenty four (24) weaner rabbits of mongrel breed with an average weight of 355g were used. They were 4-7 weeks old and were randomly allocated

Table 1: Composition of Experimental Diets.

(g kg^{-1} of diet) Ingredients	1 0% TRP	2 15% TRP	3 30% TRP	4 45% TRP
Maize	200.0	200.0	200.0	200.0
Wheat offal	600.0	450.0	300.0	150.0
TRP	0.0	150.0	300.0	450.0
Groundnut cake	160.0	160.0	160.0	160.0
Bone meal	20.0	20.0	20.0	20.0
Vitamin premix*	5.0	5.0	5.0	5.0
Oyster shell	10.0	10.0	10.0	10.0
Salt	5.0	5.0	5.0	5.0

*Supplied per kg of diet: Vit A 15,000 IU; Vit D. 1,500 I.U. Vit E 3,000 IU, K 3.0g; B_6 0.3g; B_{12} 8.00mg; Nicotinic acid 8.0g, Ca-Pantothenate 3.0g; Fe 5.0mg; Mn 10.00g; Cu 0.2g; Zn 4.5mg; I_2 0.15mg;; C0 0.02g; Se 0.01g.
TRP = *Tridax Procumbens*

Table 2: Proximate composition of Experimental diet and Tridax procumbens.

Nutrients (% of DM)	TRP1	2 0%	3 15%	4 30%	45%
Dry matter	94.4 89.64	88.49	87.70	88.86	
Crude protein	16.32	19.88	17.50	17.31	17.19
Acid detergent fibre	40.62	8.36	11.07	16.91	22.16
Ash	16.72	8.38	9.28	11.79	12.38
Calculated analysis:					
Crude protein	18.55	18.30	18.25	18.21	18.17
Ether extract	5.35 5.23	5.11	4.89	4.97	
Crude fibre	7.15 9.80	1.45	15.10	17.75	
Calcium	0.98 1.16	1.33	1.50	1.68	
Phosphorous	0.57 0.57	0.55	0.54	0.52	

to four dietary treatments at six rabbits (3 male and 3 female) per treatment in a completely randomized design experiment. The rabbits were placed in individual metabolism cages and were then subjected to the treatment diets. The trial lasted seven (7) weeks during which the rabbits were fed appropriate diet ad-libitum once daily in order to allow for maximum voluntary feed intake determination. Left over feeds of the previous day from individual cages were collected, weighed and discarded daily before the daily feeding was initiated. Body weight measurement were recorded daily, records of mortality were also kept.

Determination of dressing percentage and organ weight:-
At the end of the feeding period, feed was withheld overnight and three rabbits per treatment were randomly selected and slaughtered for carcass evaluation.

Chemical Analysis:-
Proximate analysis of feed was done by the AOAC (7) methods for the estimation of crude protein dry matter, ash and organic matter. The acid detergent fibre (ADF) was determined by the methods of Goering and Van Soest (8).

Statistical Analysis:-
Results were subjected to statistical analysis using an analysis of variance technique (9) and significance of difference of mean assessed by applying standard error of mean.

RESULTS AND DISCUSSION

The composition of the diets is given in Table 1. Results of the treatment diets and TRP are presented in Table 2. The crude protein content of the diets containing TRP were slightly lower than that of the control, but they all met the protein requirement of weaner rabbits (10).

Data in Table 3 summarized the performance of rabbits fed diets containing different levels of TRP.

Table 3: Performance and economic analysis of rabbits on varying levels of Tridax procumbens

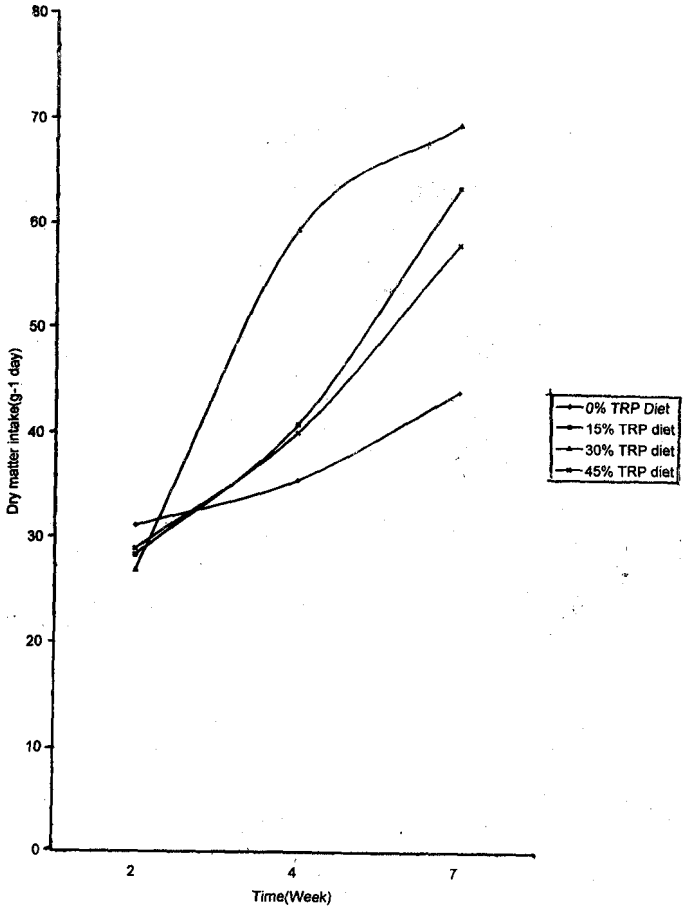
	Dietary Treatments				
Parameters	**0% TRP**	**15% TRP**	**30% TRP**	**40% TRP**	**S.E.**
Dry matter intake	37.35^{a}	40.49^{ab}	52.50^{c}	42.13^{b}	±4.14
Initial weight	357.0	358.0	355.0	352.0	-
Final weight	1037.19^{c}	992.17^{b}	957.63^{b}	867.25^{a}	±10.02
Daily weight gain	13.84^{b}	12.94^{b}	12.98^{b}	9.38^{a}	±2.05
Organic matter intake	33.39^{a}	35.98^{a}	40.47^{b}	36.83^{a}	±3.32
Crude protein intake	7.06	7.06	6.93	7.23	1.99
Acid detergent fibre intake	3.20^{a}	5.45^{b}	6.90^{b}	9.32^{c}	±2.30
Feed conversion ratio	2.70^{a}	3.12^{a}	4.05^{b}	4.49^{b}	±1.06
Mortality	0	0	0	16.67	
Cost analysis					
Cost of Feed/kg (=N=)	17.34	16.29	15.24	14.19	
Cost/kg weight gain (=N=)	46.82	54.08	61.72	63.71	

^{bc} mean values with different superscripts within the row, are significantly ($P < 0.05$) different.

Dry matter intake (DMI) of the rabbits increases with increase in dietary level of TRP, this might be attributed to acceptability of TRP (3). At 30%TRP inclusion level the dry matter intake was significantly ($P < 0.05$) higher than for the other treatments. The increase in DMI with increase in TRP inclusion level corresponds with increasing level of crude fibre and decreasing energy level. The finding is in agreement with that of (11)

who reported that dry matter intake increases as dietary fibre level was increase in growing rabbits. The DMI was in the range of 4-9% of their body weight. This is similarly close to 4-7% of body weight consumed by rabbits on pasture and barley (12). The DMI also shows increase with increase in ages of the rabbits (Fig. 1). The organic matter intake, crude protein intake and acid detergent fibre intake followed the same trend (Table 3) as the DMI.

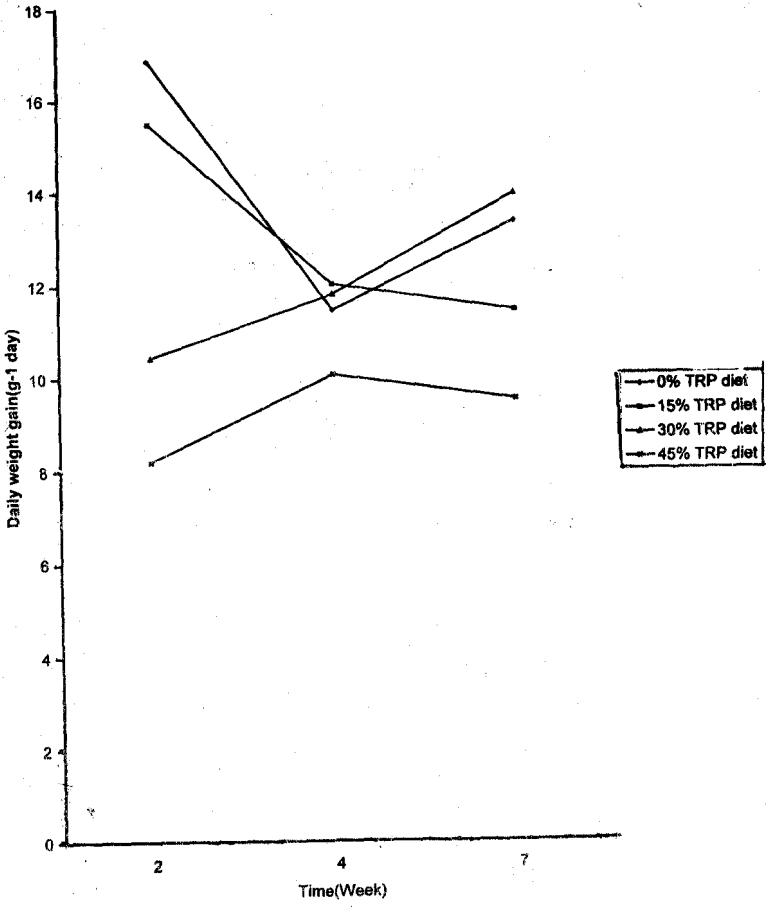
Fig 1



Final body weight and average daily weight gain decreased significantly ($P < 0.05$) with increasing level of TRP. The 45% TRP diet was significantly ($P < 0.05$) lower in daily weight gain and final weight compared to the other treatments. This trend in daily weight gain was in agreement with

the report of (13) that rabbits perform better on a lower fibre diet than those on a higher one. Throughout the experimental period, daily weight gain showed a significant dietary effect (Fig. 2) for the rabbits on the 30% TRP diet the daily weight gain showed steady rise throughout the experimental period.The rabbits on the control (0% TRP) diet recorded the best FCR value (2.70) which is similar (P>0.05) to 15% TRP level (3.12). The FCR value obtained in this study were similar to values of 2.84 and

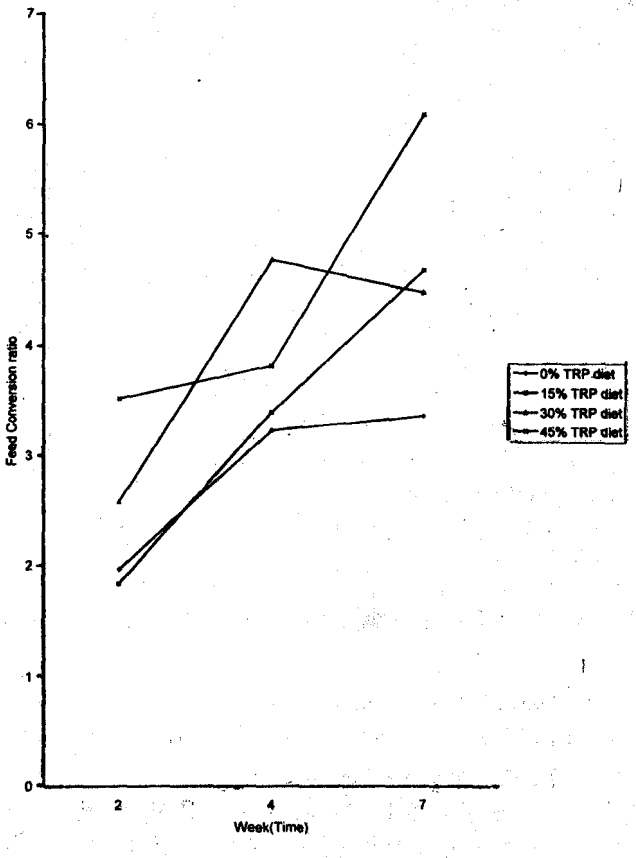
fig 2



3.45 reported (14), who investigated effect of protein sources (soya bean meal, cotton seed cake, sun flower seed and flax seed) on rabbit performance. Similarly, (15) in their trial with tropical forage at 40% level inclusion and 34% maize in rabbit diets obtained FCR values of 2.39-3.62.

This showed that high level of TRP in the diet of rabbits compared favourable well with protein concentrates and other tropical forages with high level of maize inclusion in terms of feed efficiency. The FCR showed similar trend with the DMI, it increases (Fig. 3) with increase inages of the rabbits. Mortality of 16.67% was recorded on the 45% TRP diet only, even though there was no incidence of diarrhoea throughout the experimental

fig 3



period.The cost/benefit effects of the diets are as outlined in Table 3. As at the time of the trial the cost per kilogram of the four (4) experimental diets are=N=17.34, =N=16.29, =N=15.24 and =N=14.19 respectively. The cost of feed per unit weight gained increased with increase in TRP inclusion level, which may be attributed to higher feed conversion ratios. Inspite of these increases in feed cost, the use of TRP up to 45% level appears economical compared to a kilogram of beef that costs =N=250.00 at thetime

of the trial, while a 2 kg broiler is sold for between =N=400.00 –=N=450.00.

The warm dressing percentage of rabbit (Table 4) did not differ significantly among the treatments. Likewise kidney, heart, liver and lung weights, which could be used to assess TRP inclusion at 45% in weaner rabbit diet as save.

Table 4: Dressing percentage and relative organ weight (%/ of body weight) of rabbits fed varying levels of TRP:

Organs	0% TRP	15%TRP	30% TRP	40% TRP	NS
Heart	0.42	0.39	0.50	0.37	0.34NS
Liver	3.37	3.13	3.54	3.14	0.86NS
Kidney	0.89	1.01	0.82	0.82	0.39NS
Lungs	1.79	1.83	1.42	1.74	0.44NS
Dressing %	60.44	61.49	66.43	61.27	2.15NS

CONCLUSION

The result of this research indicated that TRP can be fed to weaner rabbits up to 45% level with just 20% maize inclusion in semi arid zone without weight loss especially during the dry season when there is acute shortage and scarcity of feed stuffs. However, further investigation is desirable on the feasibility of increasing the level of TRP beyond 45% and decreasing maize level below 20% which would be most suitable and acceptable to local farmers, that is the group which the research targeted. This is because of the high cost of maize in this part of the world. Presence of anti-nutrition factors and TRPdiet pelleting are areas open to further in-depth investigation to obtain better and higher performance.

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