

REPLACEMENT VALUE OF COWPEA SHELL WITH FAIDHERBIA ALBIDA PODS IN THE DIET OF WEANER RABBITS

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Abstract

The effect of Replacing Cowpea Shell (CPS) with *faidherbia albida* pods (FAP) in the diets of weaner rabbits based on the performance characteristics and Economics of Production were examined for Eight weeks (8 wks). Thirty two (32) mongrel rabbits were randomly allotted to four diets in which F.A.P replaced C.P.S at 0, 33, 66 and 100% levels designated as diets 1, 2, 3 and 4 respectively. The result showed that feed intake (68.70 – 72.55g) was significantly different at ($P < 0.05$) but depressed on diet 4 (100% FAP level). However, Daily weight gain of (9.25 – 12.01g) and feed conversion ratio of (6.02 – 7.65) were not affected by the dietary treatments. The feed cost in Naira/kg gain was highest on diet 4 (100% FAP level) and lowest on diet 3 (33% FAP level) having 229.94 and N120.81 respectively. The result indicated that *Faidherbia albida* pods can replace Cowpea shell at 66% level in the diet of weaner rabbits without adverse effect on their performance with subsequent reduction in the cost of feed used.

The present increase in human population and the current economic situation have severely reduced the animal protein intake of an average Nigerian. Consequently, there is the need to improve our livestock production through the use of non-conventional feed source and highly prolific animals. Olubanjo (2008) suggested the use of highly prolific animals like pigs, poultry and rabbits. However, pigs and poultry have the disadvantage of competing with humans for the staples feed ingredients like cereals, grains, pulses and tubers. Rabbits, however can be raised on high fibre diets not utilized by man. Salepov (2008) and Perez (2000) reported that rabbits can be maintained on all forage diets with encouraging weight gain.

Rabbit is a herbivorous, monogastric and pseudo-ruminant animal that can effectively and efficiently convert fodders to food (Lebas,1997). Rabbit is blessed with a unique digestive tract that can convert fibrous materials to animal protein. Other advantages of rabbit include high fecundity, short generation interval, and high feed conversion efficiency. The ability of rabbit to thrive on roughage (high fibre) and non conventional feed make them outstanding among all mono gastric. The challenge now is for animal researchers and nutritionist to provide the feeding strategies for mono-gastric animals. This should be able to minimize the cost of production and reduce competition in human nutrition (Biobaku, 2002).

Faidhesbia aibida pods is one of such non-conventional feed-stuff.It is a leguminous pod which is readily consumed by sheep, cattle and goats. The tree is widely distributed in the arid and semi arid region of Nigeria where the rainfall is inadequate and erratic. The pods are normally available during the dry season i.e. from March – June when feed resources are scare and costly.

Gohl (2003) believed that the pods are moderately nutritious, containing 14-18% crude protein, and 24-26% crude fibre. Because of the abundance of the pods during the dry season and the ability of rabbits to handle high fibre feed, arose the interest of the researchers into investigating the effects of these pods on rabbits.

Processing of the *Faidherbia Albida* Pods

Sundried *faidherbia albida* pods obtained from the market were chopped into pieces and later-soaked in water for 24 hrs to remove the anti-nutritive factor from the pods. These are mostly Tannins and phenolics. They cause increased salivation and decrease the palatability of the feed. They also impair feed conversion efficiency in growing animals with reduction in weight gain. (Mole, 2000).

After this period, the pods were removed from the water, sundried and grounded with the seeds to obtain a uniform product. This product is then incorporated into the diets at the specified levels. The proximate composition of the pods can be seen in table 1 below.

Table 1: Proximate Composition (%) of Faidherbia Albida Pods and Cowpea Shell

Component	Faidherbia albida pods	Cowpea shell
Protein	11.80	5.70
Ether extract	2.50	1.31
Crude fibre	10.40	33.40
Nitrogen free extract	70.40	50.90
Ash	4.90	8.30

Material and Methods

Thirty two mongrel rabbits were bought from the Rabbitory at the National Veterinary Research Institute Vom (N.V.R.I) Plateau State. The rabbits were then conveyed to the Teaching and Research Farm of Animal Science Department of Federal University of Technology Yola, Adamawa State, Nigeria.

Four diets were formulated and compounded in which grounded *faidhebia albida* pods replaces cowpea shell at 0, 33, 66 and 100% levels designated as diet 1, 2, 3 and 4 respectively as shown in table 2 below.

Table 2: The Composition of the Diets Fed to Rabbits

Ingredient	1 0%	2 33%	3 66%	4 100%
Maize	32.46	29.71	26.85	23.98
Soybean	14.54	17.29	20.15	23.02
Cowpea Shell	40.00	26.80	13.6	00
F. aibida pod	00	13.2	26.6	40.0
Maize offal	10.0	10.0	10.0	10.0
Bone meal	2.0	2.0	2.0	2.0
Salt	0.5	0.5	0.5	0.5
Vitamin premix	0.5	0.5	0.5	0.5
Total	100.00	100.00	100.00	100.00

Replacement Value of Cowpea Shell with *Faidherbia Albida* Pods in the Diet of Weaner Rabbits

At the beginning of the experiment, the rabbits were individually weighed using a weighing balance scale.

The experimental design used was a completely randomized design (CRD). Each treatment was replicated four times with eight rabbits. i.e. two rabbits of the same sex were housed in the same cage unit. 160 grams of feed was offered to two rabbits in replications and the left over were recorded daily using a weighing balance scale. Water was supplied *ad libitum*. The weekly weight gain were taken at regular interval and recorded. The feed consumption was also determined by the intake and left over of feed recorded.

The sample of diets and faeces from each replication were analyzed in the laboratory using proximate analysis as described by Association of Analytical Chemist (A.O.A.C,1980). The cost of each ingredient used in compounding the feed were recorded and calculated to determine the economics of utilizing the albida pods in the experiment. All the data collected were subjected to analysis of variance (ANOVA) as described by Steel and Torrie (1984). Significant difference mean were compared using the Duncan Multiple Range Test (D.M.R.T).

Result

The effect of replacing C.P.S. with F.A.P in the diets of rabbits is shown in Table 3.

Table 3: Economic Performance of Rabbit Fed Different Dietary Levels of Processed *Faidherbia Albida* Pods

Parameters	1	2	3	4
Total feed intake/rabbit (g)	2340.00	2368.50	2011.04	2660.09
Feed cost/kg of feed (N)	122.58	121.69	120.81	229.94
Total feed cost/rabbit (N)	252.86 ^a	251.36 ^b	251.40 ^{ab}	253.54
Total weight gain/rabbit (g)	496.72 ^a	509.04 ^{ab}	552.72 ^a	550.60
Total feed cost/gain/rabbit (N/kg)	305.70	310.10	290.80	301.60

Means in the same row bearing the same superscript are not significantly different $p > 0.05$

* Significant ns not significant.

Calculated Analysis of Different Dietary Levels of Processed *Faidherbia Albida* Pods

Parameters	1	2	3	4
Crude protein (%)	16.0	16.0	16.0	16.0
Crude fibre (%)	15.52	15.84	16.19	16.53
Ether Extract (%)	2.34	2.42	2.41	2.56
Melabolisable energy Kcal/kg	27.34	28.16	28.89	29.61

The result showed that there was significant difference ($p < 0.05$) in diet 2 and 3. However, the daily weight gain and feed conversion ratio of the rabbit fed with diet 4 showed no significant difference ($p > 0.05$). The highest weight gain was obtained on diet 3 (66% FAP level) and lowest value on diet 4 (100% FAP level) having 552.72g and 406.80g respectively.

The feed conversion ratio was found to be highest in diet 4 (100% FAP level) and lowest in diet 3(66% FAP level) having 8.62g and 6.85g respectively. This shows that diet 3(66% FAP) is the best. The total weight gain and feed cost were not significantly affected by the dietary treatment. The result showed that the highest total weight gain per kilogram was highest in diet 3 (66% FAP level) and the lowest in diet 4(100 FAP) having 0.58kg and 0.43kg respectively. However, the feed cost in naira per kilogram gain was found highest in diet 4 having (N410.00) and lowest in diet 3(N220.20). This shows that the cost of feeds increases per kilogram body gain with increased level of *faidhebia albida* pods to replace cowpea shell beyond 66% level.

Conclusion

The study has shown that *faidhelbia albida* pods can substitute cowpea shell in the diet of rabbits up to 66% level of replacement without any adverse effect on the performance with significant reduction in the feed cost.

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