

EFFECT OF FEEDING *Faidherbia albida* POD MEAL ON GROWTH PERFORMANCE OF BROILER CHICKENS

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Abstract

The study was conducted to determine the effect of feeding *Faidherbia albida* on growth performance of broiler chickens. A total of one hundred and sixty (160) broiler chickens were assigned to five treatments diets containing 0, 2.5, 5.0, 7.5, and 10.0% *Faidherbia albida* pod meal in a completely randomized design. Each treatment was replicated 4 times with 8 chicks per replicate. Data were collected for body weight gain, feed intake. Feed conversion ratio and feed cost were determined. The result of the proximate composition of the FAPM shows that it contains 9.51% crude protein, 25.91% crude fiber, 13.61% ether extract, 47.9% nitrogen free extract and 91.57% dry matter. The proximate composition of the experimental diets shows that crude protein ranges from 21.56 to 26.56% while ash content ranges from 6.46 to 10.47%. The final weight with the control diet was higher ($P < 0.05$) than that of 7.5%FAPM diet. Those fed 2.5, 5.0 and 10% FAPM had similar final live weights with the control. Weight gain was also higher ($P < 0.05$) in the control group compared to the 5%FAPM. The feeding of FAPM increased ($P < 0.05$) feed intake of the experimental diets. Feed conversion ratio of broiler chickens fed 5.0%FAPM was higher ($P < 0.05$) than the control. The result shows that total feed cost of birds fed 2.5%FAPM was statistically higher ($P < 0.05$) than the control. Feed cost per kg gain of birds fed 5%FAPM was higher ($P < 0.05$) than that of the control. It can be concluded that FAPM can be used up to 10% in the diets of broiler chickens.

Keywords: *Faidherbia albida*, Pod meal, growth, chicken, feed intake

Introduction

Poultry meat is probably the most palatable of all meat and is easily digested (Olorede and Ajayi, 2005). The meat can be served in a variety of ways such as fried, roasted, stewed or combined with other foods as in salad, sandwich, sauces and soup. The high cost also as well as scarcity coupled with inadequate knowledge of possible alternative and cheap ingredients as a result of our dependence on importation of certain feed items have contributed towards militating increased commercial poultry production in Nigeria. One of the possible options advocated to solve the present high cost of animal protein and protein intake deficit due to lack of adequate supply of feedstuffs at economic prices is the substitution of nonconventional feeds for conventional ones in animal rations (Olorede and Ajayi, 2005). Studies have indicated that seeds of many plants contain protein in high concentration e.g. seed of kernel of desert dates *Balanites aegyptica*, *Hyphaena thebacea*, *Moringa oleifera*. Some of these alternatives are known to have better feeding quality (Hassan and Umar, 2004).

Faidherbia albida also called *Acacia albida* fruits usually available in dry season in semi-arid areas are good example of such nonconventional feedstuffs. (Igwebuike, *et al.* 1999), also reported that 20% of *Acacia albida* pod could be included in the diet of growing rabbit without adverse effect on nutrients digestibility and mineral availability. This study is aimed at revealing the effect of feeding *Faidherbia albida* pod meal (FAPM) on growth performance and carcass characteristics of broiler birds.

Materials and methods

Study area

The experiment was conducted at the Livestock Teaching and Research farm, Department of Animal Science, Federal University, Dutsin-Ma. Dutsin-ma town is located at latitude 12°26'N and longitude 07°29'E (Shamsuddeen, 2018).

Feed preparation

The *Faidherbia albida* pods were obtained from Katsina town. The pods were sun-dried for 6 hours daily for 4 days. The pods were thinly spread. So as to allow pods still wet to dry properly. The dried pods were then grounded to get the pod meal.

Experimental design, birds and their Management

Two hundred (200) day-old broiler chicks were sourced from a reputable hatchery. At two weeks of age, the birds were assigned to five different diets serving as treatments in a completely randomized design. The diets contained FAPM at 0% (control diet), 2.5%, 7.5% and 10%. Each treatment has 32 birds replicated 4 times with 8 birds per replicate. The experiment lasted for a period of six weeks. Throughout the period of experiment, feed and water were supplied *ad-libitum* to the birds and all routine management practices were strictly adhered to.

Table 1 Composition of the experimental diets

Ingredient	FAPM inclusion level (%)				
	0	2.5	5.0	7.5	10
Maize	58.55	57.05	55.55	54.05	52.55
<i>Faidherbia albida</i>	0	2.5	5	7.5	10
Soyabean meal	18.5	17.5	16.5	15.5	14.5
GNC	18.5	18.5	18.5	18.5	18.5
Bone meal	3.00	3.00	3.00	3.00	3.00
Limestone	0.50	0.50	0.50	0.50	0.50
Salt	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Premix	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100

Data collection

Proximate composition of FAPM and that of the treatment diets were carried according to the procedures of AOAC (2000).

The initial live weight of the chicks was measured, after which weekly body weight of each treatment was measured using a weighing scale. A given quantity of feed was measured and fed to the birds daily. Feed leftover is also measured. Feed intake was calculated as difference between feed given and leftover. Weight gain and feed intake were used to determine the feed conversion ratio of the chickens

Statistical analysis

The data generated from the experiment was subjected to analysis of variance (ANOVA) using the SAS package. Those with significant difference existing between the means were subjected to Duncan's multiple range test (DMRT) to separate them (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Proximate composition of FAPM

The result of the proximate composition of the FAPM shows that it contains 9.51% crude protein, 25.91% crude fiber, 13.61% ether extract, 47.9% nitrogen free extract and 91.57% dry matter. High dry matter content indicate that FAPM constitute important, useful and dependable sources of dry matter for feeding livestock. Protein content is sufficiently high to affirm their use as plant protein sources as it will favor live weight gain and good animal performance. This result is in consonance with Hassan *et al.* (2007) who worked on the nutritional evaluation of *Faidherbia albida* seeds and pulp as sources of feed for livestock.

Table 2: Proximate composition of *Faidherbia albida* (%)

Parameter	<i>Faidherbia albida</i>
Dry matter	91.57
Ash	3.07
Ether extract	13.61
Crude fiber	25.91
Crude protein	9.51
Nitrogen free extract	39.47

Proximate composition of experimental diets

The results of the proximate composition of the experimental diets are shown in table 3. From the table it can be observed that the crude protein ranges from 21.56 to 26.56% which did not follow a particular pattern as the lowest value was obtained in 0%FAPM and highest in 5%FAPM. The dry matter is relatively high. The ash content of the feed ingredient ranges from 6.46 to 10.47%. The findings of this study are in line with the work of Hassan and Umar (2007) who worked on the nutritional evaluation of *Faidherbia albida*.

Table 3: Proximate composition of experimental diets (%)

Parameter	FAPM inclusion level (%)				
	0	2.5	5.0	7.5	10.0
Dry matter	92.30	91.45	90.26	90.81	92.16
Ash	10.19	7.72	6.46	7.01	10.47
Ether extract	19.47	13.53	14.38	15.41	13.90
Crude fiber	2.76	2.59	3.62	4.23	4.46
Crude protein	21.56	23.69	26.56	25.31	23.38
Nitrogen free extract	38.32	47.53	39.24	38.85	39.95

Growth performance of broiler birds fed FAPM

The result in table 4 shows that the initial weight of the broiler bird is homogenous among the treatment diets. The results show that feeding FAPM had significant effect ($P<0.05$) on the final weight with the control diet having the higher ($P<0.05$) final weight than those fed 7.5%FAPM diet. Those fed 2.5, 5.0 and 10% FAPM had similar final live weights with the control. Weight gain was also higher ($P<0.05$) in the control group compared to the 5%FAPM. Broiler chickens fed 2.5, 7.5 and 10% FAPM had similar weight gain with the control diet. There is significant difference ($P<0.05$) in the feed intake of the experimental birds. The feeding of FAPM increased ($P<0.05$) feed intake of the experimental diets. Birds fed the FAPM had similar ($P>0.05$) feed intake amongst themselves. There is significant difference ($P<0.05$) in the feed conversion ratio per kilogram amongst the treatments. Feed conversion ratio of broiler chickens fed 5.0%FAPM was higher ($P<0.05$) than the control. Those fed 2.5, 7.5 and 10% FAPM had similar ($P>0.05$) feed conversion ratio to the control. The result shows that total feed cost of birds fed 2.5%FAPM was statistically higher ($P<0.05$) than the control. Feeding 5, 7.5 and 10% FAPM had similar ($P>0.05$) total feed cost with both the control and those fed 2.5%FAPM. Feed cost per kg gain of birds fed 5%FAPM was higher ($P<0.05$) than that of the control. The broiler fed 2.5, 7.5 and 10% FAPM had similar ($P>0.05$) feed cost per kg gain to the control.

The results obtained in this study disagree with findings of Muhammad (2019) who studied the effect of processed *Faidherbia albida* on the performance and carcass characteristics of broiler birds. He observed no difference in performance parameters of the broiler birds. Also contrary to the observations of this study, Abbator, (1996) observed increased level of *Faidherbia albida* pods above 20 kg in the diet of broiler birds decreased feed intake. The results of this study confirmed the inference of Hassan *et al.* (2007) that the seed and pulp of *Faidherbia albida* could be an important source of feed ingredient for livestock.

Table 4: Growth performance of broiler birds fed FAPM

Parameter	FAPM inclusion level (%)					SEM
	0	2.5	5.0	7.5	10	
Initial weight	0.675	0.725	0.750	0.650	0.675	0.032
Final weight kg/bird	1.625 ^a	1.55 ^{ab}	1.425 ^{ab}	1.375 ^b	1.550 ^{ab}	0.071
Weight gain kg/bird	0.950 ^a	0.825 ^{ab}	0.675 ^b	0.725 ^{ab}	0.875 ^{ab}	0.077
Total feed intake kg/bird	2.083 ^b	2.342 ^a	2.255 ^a	2.367 ^a	2.302 ^a	0.050
Feed conversion ratio	2.298 ^b	2.867 ^{ab}	3.684 ^a	3.277 ^{ab}	2.638 ^{ab}	0.361
Total feed cost	509.3 ^b	562.7 ^a	532.4 ^{ab}	549.0 ^{ab}	524.2 ^{ab}	12.42
Feed cost per kg gain	562.0 ^b	689.1 ^{ab}	869.8 ^a	760.0 ^{ab}	600.6 ^{ab}	85.74

Conclusion and recommendations

On the basis of results obtained from the study, it can be concluded that FAPM can be used up to 10% in the diets of broiler chickens.

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