



Dietary Effects of Feeding Graded Levels of Lablab Purpureus Soaked in Pap Water Filtrate and Ash Solution on Growth Performance of Broiler Finisher

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Abstract

Two different experiments were conducted and a total of 90 day old broiler were used for each of the study to determine the growth performance of broiler finisher fed graded levels of Lablab purpureus seed soaked in pap water filtrate and wood ash solution. The experiment was carried out at the Teaching and Research Farm of Oyo State College of Agriculture and Technology, Igboora. The seeds used were purchased from Bodija Market in Ibadan. The raw seeds were first soaked at the rate of 1kg/3L of water for 12 hours, after which the pre-soaked seed were soaked at the rate of 1kg/3L of pap water filtrate for 24 hours and in 0.5% wood ash solution for 24 hours separately. Initial and final pH were taken, samples were sundried for 3days, milled and included in the diet accordingly. Birds were randomly assigned into 3 dietary treatments of 30 birds consisting of 3 replicates of (10) birds per replicates in a completely randomized design experiment. Birds on T₁ received the control diet, T₂ and T₃ received 5% and 10% level of lablab treated with pap water filtrate and wood ash solution separately. The experiment lasted for eight (8) weeks. Results showed that there was significant ($P<0.05$) differences in all the growth performance parameters measured for birds fed lablab soaked in pap water filtrate. Birds on T₃ had the highest value of final live weight (2128.50g), weight gain (1816.56g) feed intake (5780g) and a better feed conversion ratio of (3.18). However, birds on T₁ had the lowest value of final live weight (19800.50g), weight gain (1634.09g) and feed intake (5680g). For birds fed ash treated lablab, results showed that birds on T₁ recorded the highest value of Live Weight (2290.00g), weight gain (1956g) and feed conversion ratio (2.90g), followed by birds on T₃ with final live weight of (1966.00g), weight gain of (1621.24g), feed intake of (5780g). However lowest value in terms of Live weight (1955.50g) weight gain (1612.56g) and feed intake (5740g) was recorded for birds on T₂. It can be concluded that birds fed pap water-soaked lablab seed performed better than those fed ash treated lablab and can be fed to birds for up to 10% level of inclusion without having any negative effect on the birds.

Keywords: Broiler, *Lablab purpureus*, treatment, replicate, performance

Introduction

The use of legumes as source of protein and energy in animal production has greatly contributed to the survival of livestock industry in developing countries. However, with the increasing importance of conventional grain legumes such as soya bean and groundnut in human diets, their use has almost disappeared as source of supplementary protein in cereal-based diet for livestock animals. Improved nutrition in animals is subject to either the possibility of increasing the local production of soya bean and groundnut, or encouraging the use of other lesser-known grain legumes. An example of the lesser-known grain legumes in the tropics is pigeon pea (*Lablab purpureus*). *Lablab purpureus* is a tropical leguminous plant with high seeds and foliage yield. The legume

is potentially suitable for feeding with a protein content ranging between 25% was reported for lablab by (Eneche, 2003). Lablab is cultivated for their edible parts (bean) which are contain hard and tough, 20-30 long pods it is mainly used as food but can be used to feed animal. However, the nutritive value of lablab is masked by the occurrence of anti-nutritional factors such as tannins trypsin inhibitors hydrogen cyanide, saponins and phytic acid (Akinmutimi *et al.*, 2006). Processing method such as heating, fermentation, boiling, toasting and soaking are some of the processing methods which had been used to inactive these anti nutritional factors and improve the nutritional value of *Lablab purpureus* products and its by (Ani and Adiegwu, 2005).



Materials and methods

Experimental site

The experiment was carried out at the Teaching and Research Farm, Oyo State College of Agriculture Igboora, Nigeria. The experimental area lies in savannah forest zone on latitude 7°15'N and longitude 3°30'E, with an elevation 140m above sea level. The average minimum temperature is about 20.5°C and maximum average temperature of about 32.50°C. The average humidity in the study area is 58.0%. The double maximum rainfall is about 314.3mm in June and 165.2mm in September. (Sanusi, 2011).

Procurement of Sample: *Lablab purpureus* seed was purchased from Bodija market, Ibadan. The pap water filtrate and wood ash used for the study were prepared

Pre-treatment of seed: The lablab seeds were soaked at the rate of 1kg/3L of water for 12 hours after which the water was decanted

Treatment of sample: The soaked seeds were soaked at the rate of 1kg/3L of raw pap water filtrate for 24 hours and 0.5% wood ash solution. Initial and final pH was taken. The samples were sundried for 3 days, milled and then included in the diet accordingly

Experimental diets

Two different experiments were conducted separately and a total number of 90 birds were used for each of the study, they were randomly assigned into 3 dietary treatments of 30 birds consisting of 3 replicates of 10 birds per replicates in a completely randomized design experiment. Birds on T₁ received the control diet, T₂ and T₃ received 5% and 10% level of lablab treated with pap water filtrate and wood ash solution separately. The experiment lasted for eight weeks.

Table 1: Gross composition of experimental diets (Pap water soaked)

Ingredient	T1 (0%)	T2 (5%)	T3 (10%)
Maize	58.00	56.24	54.50
SBM	27.00	25.64	24.29
Lablab	0.00	3.12	6.21
Wheat offal	10.00	10.00	10.00
Limestone	2.00	2.00	2.00
Bonemeal	2.00	2.00	2.00
Lysine	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Salt	0.25	0.25	0.25
Broiler Premix	0.25	0.25	0.25
TOTAL	100.00	100.00	100.00

Calculated Analysis			
Crude protein (%)	19.65	19.47	19.29
ME (kcal/kg)	2908.22	2904.50	2901.99

ME: Metabolizable Energy, SBM: Soyabean meal

T₁= Control, T₂= 5% level of inclusion, T₃= 10% level of inclusion

Table 2: Gross composition of experimental diets of Broiler Finishers (Ash treated)

Ingredient	T1 (0%)	T2 (5%)	T3 (10%)
Maize	58.00	56.24	54.50
SBM	27.00	25.64	24.29
LABLAB	0.00	3.12	6.21
Wheat offal	10.00	10.00	10.00
Limestone	2.00	2.00	2.00
Bonemeal	2.00	2.00	2.00
Lysine	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Salt	0.25	0.25	0.25
Broiler Premix	0.25	0.25	0.25
TOTAL	100.00	100.00	100.00
Calculated Analysis			
Crude protein (%)	19.65	19.47	19.29
ME (kcal/kg)	2908.22	2904.50	2901.99

ME: Metabolizable Energy, SBM – Soya bean meal

T₁= Control, T₂= 5% level of inclusion, T₃= 10% level of inclusion

Data collection: Data were collected on Feed intake, final weight, Weight gain, Feed conversion ratio

Statistical analysis

Following the experimental design, all data collected were subjected to statistical analysis of variance (ANOVA) using SPSS 2003 version and means separated by Duncan Multiple Range Test.

Result and discussion

Result

Table 3 showed the proximate composition of experimental diet acidic medium. Diet 1 had the highest value of dry matter (95.19%), crude protein (5.30%), crude fibre (5.30%) and ash (5.60%) while diet 2 had the highest value of ether extract (3.00%).

Table 4 also showed the proximate composition of experimental diet alkaline medium. Diet 1 had the highest value of dry matter (94.85%),



crude fibre (5.50%, while diet 3 had the highest value of ash (6.80%) and ether extract 7.30%

Table 5 showed the effects of feeding graded levels of pap water-soaked *Lablab purpureus* seed on growth performance of broiler finisher. Results showed that there were significant ($P<0.05$) differences in all the growth performance parameters measured for birds fed acid soaked *Lablab purpureus*. Birds on T3 had the highest value of final live weight (2128.50g), weight gain (1816.56g) feed intake (5780g) and a better feed conversion ratio of (3.18g). However, birds on T1 had the lowest value of final live weight (1980.50g), weight gain (1634.09g) and feed intake (5680g)

Table 6 showed the effects of feeding graded levels of ash-soaked *Lablab purpureus* seed on growth performance of broiler finisher. Results showed that birds on T1 recorded the highest value of live weight (2290.00g), weight gain (1956g), followed by birds on T3 with final live weight of (1966.00g), weight gain of (1621.24g), feed intake of (5780g). However lowest value in terms of live weight (1955.50g), weight gain (1612.56g) and feed intake (5740g) were recorded for birds on T2. Birds on T1 recorded the lowest value of FRC (2.90g)

Table 7 showed the anti-nutritional factor content of both raw and processed *lablab purpureus* seed. Analysis showed that the raw seed had the highest value of oxalate (3.96mg/100g) and saponin (250.72mg/100g) followed by lablab seeds soaked in ash solution. The least value of oxalate (2.53mg/100g) and saponin (141.39mg/100g) was obtained for lablab seeds soaked in pap water filtrate. However, there was 37.45% and 37.30% reduction in oxalate and saponin respectively for lablab seed soaked in ash solution, and there was about 36.1% and 43.63% reduction in oxalate and saponin for lablab seeds soaked in pap water filtrate.

Table 3: Proximate composition of experimental diet (pap water soaked)

Treatments	T1	T2	T3
Dry matter	95.19	94.10	95.25
Ash	5.60	5.10	5.00
Ether extract	6.65	7.00	6.80
Crude fibre	5.30	4.10	4.60
Crude protein	5.30	4.10	4.60

Table 4: Proximate composition of experimental diet (ash treated)

Treatment	T1	T2	T3
Dry matter	94.85	94.35	94.60

Ash	4.45	5.75	6.80
Ether extract	7.00	6.60	7.30
Crude fibre	5.50	3.90	5.45
Crude protein	21.00	20.93	21.19

Table 5: Effect of feeding graded levels of *Lablab purpureus* seed soaked in pap water filtrate on growth performance of broiler finisher.

Parameters	T1(0%)	T2(5%)	T3(10%)	SEM+/-
Final Weight (g/b)	1980.50 ^c	2070.50 ^b	2128.50 ^a	35.15
Initial Weight(g/b)	346.41 ^a	346.35 ^{ab}	311.94 ^c	9.37
Weight Gain(g/b)	1634.09 ^c	1724.15 ^b	1816.56 ^a	43.01
Feed intake (g/b)	5680 ^c	5740 ^b	5780 ^a	23.73
Feed conversion ratio	3.48 ^c	3.33 ^b	3.18 ^a	0.18

^{abc}-means on the same rows having superscripts are significantly different ($P<0.05$)
SEM +/-: Standard Error of Mean

Table 6: Effect of feeding graded levels of ash treated *Lablab purpureus* seed on growth performance of broiler finisher.

Parameters	T1(0%)	T2(5%)	T3(10%)	SEM+/-
Final Live Weight (g)	2290.00 ^a	1955.50 ^{bc}	1966.00 ^b	89.64
Initial Weight (g)	334 ^c	242.94 ^{ab}	344.76 ^a	2.71
Weight Gain (g)	1956 ^a	1612.56 ^{bc}	1621.24 ^b	92.31
Feed intake (g)	5680 ^c	5740 ^b	5780 ^a	23.73
Feed conversion ratio(g)	2.90 ^a	3.56 ^b	3.57 ^c	0.18
Mortality	0.00	0.00	0.00	0.00

^{abc}-means on the same rows having the same superscripts are significantly different ($P<0.05$)

Table 7: Antinutritional factor content of raw and processed *Lablab purpureus* seed

Parameters	RAW	ASLLP	PWSLLP
Oxalate (mg/100g)	3.96	2.67	2.53
Saponin (mg/100g)	250.72	157.18	141.31
Phenols (g/100mg)	0.91	0.84	0.68
Tannin (g/100mg)	0.29	0.20	0.17

ASLLP- Ash-soaked *lablab purpureus*, PWSLLP- Pap water-soaked *lablab purpureus*

Discussion

It was observed that birds on T2 and T3 had higher value of final weight, weight gain and feed conversion ratio when compared with the control birds fed graded levels of *Lablab purpureus* soaked in pap water filtrate, this could be attributed to the fact that the processing methods employed was effective in reducing the anti-nutritional factors. However, birds on control diets for ash treated *Lablab purpureus* performed better in terms of final weight and weight gain compared to birds fed



test ingredients. When comparing the results from the two experiments, it could be seen that there was greater extractability of anti-nutritional factors in pap water filtrate than in wood ash solution, which could be seen in table. The reduction in anti-nutritional factor content of the test diet for birds fed *lablab purpureus* resulted in improved final weight and weight gain as the feed was palatable to the birds resulting in high feed intake, well-balanced amino acid and availability of nutrients to the diets. Akinmutimi *et al.* (2006) observed that most processing methods do not completely reduce or inactivate anti-nutritional factors, but only reduce them to tolerable level.

Conclusion

It can be concluded that feeding of *Lablab purpureus* soaked in pap water filtrate was effective in reducing the ANFs as birds perform better as growth performances was improved at 10% levels of inclusion when compared to those on ash treated *lablab purpureus*

Recommendation

Feeding of lablab seeds soaked in pap water filtrate to birds shows good results at both 5% and 10% level of inclusion. However further research needs to be done and the level of inclusion increased

References

- Ahamefule F.O, Ejiofor C.A, Ibeawuchi J.A, 2000. A comparative study of the constituents of cattle, sheep and goat milk in a hot humid environment. *Disc and Innov.15 (1/2): 64-68*
- Akinmutimi, A.H, Aligwara O.A and Abasiokong S.F 2006. The effect of qualitative replacement of soya bean meal with cooked and toasted lima bean meal on growth performance and carcass quality value of broiler finisher birds. *J. Agric. Biotech Environment 4:(1/2)*
- Ani, A. O. and Adiegwu, L. I. 2005. The Feeding Value of Velvet beans (*Mucuna pruriens*) to weaker rabbits. Proceeding of 30th Annual Conf. of Nig Soc. of Anim. Prod. (NSAP) 20th-24th March at University of Nigeria Nsukka, Nigeria, pp: 186-189
- Eneche, E.H 2003. Preparation and physiological properties of flours and protein concentrates from raw and

germinated pigeon pea (*Cajanus cajan*). Proceedings of Annual Conference and Scientific meeting of Nutritional Society of Nigeria. 158-161.

- Olasupo N.A, Olukoya D.K, and Odunfa S. A.1997. Assessment of a bacteriocin producing
- Onyeike, E.O., Ayalogu, S.G.,1995. Influence of heat processing African yam bean seed (*Sphenostylisstenocarpa*) flour on the growth weight of rats. *Plant Foods for Animal Nutrition*
- Sanusi, W.A (2011) Effect of poverty on participation in non-farm activity in Ibarapa Local Government Area of oyo state Nigeria. *International Journal of Agriculture and Apiculture Research (1/2)*. 86:95.