

SUBSEQUENT EFFECT OF LOCUST BEAN PULP FED DURING THE GROWER PHASE ON THE LAYING PERFORMANCE OF PULLET (20-42 weeks)

*M. AFOLAYAN,¹ G.S. BAWA,² A.A. SEKONI³, F.O. ABEKE³, AND I.A. ADEYINKA³.

¹Samaru College of Agriculture, Ahmadu Bello University, Zaria, ²Department of Animal Science, Ahmadu Bello University, Zaria, ³National Animal Production Research Institute, Ahmadu Bello University, Zaria,

*Corresponding author's E-mail: moji_afolayan@yahoo.com

ABSTRACT

Effects of graded dietary levels of locust bean pulp (LBP) fed during the growing phase (9-20 weeks) on subsequent laying performance of the birds from 20-42 weeks of age were investigated. A total of three hundred and thirty (330) birds fed diets containing LBP at 0.00, 0.75, 15.00, 22.50 and 30.00% during the growing phase were used for the study. These same set of birds were fed a common layer diet containing 17% CP and 2727 ME kcal /kg for 22 weeks. Feed intake, water intake, average weight of eggs, hen-day egg production and hen- housed egg production at peak of lay and feed cost per crate of eggs were computed. Results revealed significant ($P < 0.05$) differences in first egg weight and egg weight at peak production across dietary levels. Feed and water intake increased with increase in the level of LBP in the previous grower diets. Feed cost per crate of egg, income above feed cost, hen day egg production (HDP) and hen housed egg production (HHP) were also significantly ($P < 0.05$) affected by LBP in the previous diets. It was therefore concluded that LBP fed to growing pullets had a carryover effect on the performance of laying hens.

Key words: locust bean pulp, subsequent laying effect, pullets

INTRODUCTION

The high cost of feedstuff for poultry feed formulation is one of the major constraints militating against poultry production in Nigeria. A lot of research had been conducted on possible ways of cutting down production cost by using agro- industrial by- products and locally available feedstuffs. Locust bean pulp is obtained from the locust bean seed (*Parkia biglobosa*). It belongs to the family Leguminosae, sub-family Mimosoidae and genus *Parkia*. The LBP is higher in carbohydrate (Oyenuga, 1968 and Fetuga *et al.*, 1974). Aduku (2004) also indicated that the metabolizable energy content of the LBP was 2420kcal/kg. The yellow colour of the pulp may be an indication of the presence of beta carotene which is a precursor of vitamin A, which is known to improves appetite and consequently growth and laying performance in poultry. The sour taste of the locust bean-pulp is an indication of high value of ascorbic acid (vitamin C) which has beneficial effects on poultry during stressful conditions. Afolayan *et al.* (2014a) reported that LBP contained 542.40mg/100g of vitamin C, 1.046mg/g of Beta Carotene and 22.177mg/g of Calcium. This study evaluated the effect of LBP diets fed to growers on the subsequent egg laying performance of pullets.

MATERIALS AND METHODS

A total of three hundred and thirty 20 weeks old pullets fed graded dietary levels of LBP between 9-20weeks were used for this study.

The previous grower diets contained LBP at levels 0.00, 0.75, 15.00, 22.50 and 30.00% respectively. All the birds were then fed a common layer diet (Table 1) which was without LBP containing 17% CP and 2727 ME kcal /kg from 20-42 weeks to determine the carryover effect of LBP on the laying performance of the birds. Water and feed were given *ad libitum*. The initial weights of the birds were recorded at the commencement of the experiment. The final weights of the birds were taken at the end of 42 weeks to determine percent change in body weight. Other parameters such as feed intake, water intake, average weight of eggs, hen-day eggs production and hen- housed % egg production at peak of lay and feed cost per crate of eggs were computed for each treatment.

RESULTS AND DISCUSSION

Results of this study indicated that LBP fed during the growing phase of the study had significant ($P < 0.05$) effects on all the parameters recorded except for the final weight. There were no significant ($P > 0.05$) difference in final weight of the hen across the dietary treatments. From the contrast analysis, the LBP had no negative effect on the age of the bird at first egg neither on the age which the birds reached peak of egg production. The egg weight was observed to increased with the age of the birds. This observation is in agreement with the findings of Ezieshi, *et al.* (2003). These authors reported that egg weight increases with hen day egg production. The result obtained in this study also

agreed with the findings of Udeh (2010) who reported that a high correlation existed between egg weight and the age of the birds. The feed intake increased with increase in the level of LBP in the grower diets and birds on the control (0%LBP) diet had the least feed intake. The observed increase feed intake with increased in the level of LBP may be due to the low metabolizable energy value of LBP compared to maize (3432 kcal ME/kg diet). Afolayan, *et al.* (2014b) had reported that LBP has low metabolizable energy (2344 kcal ME/kg diet). Olomu and Offiong (1983) had earlier reported that low metabolizable energy diet resulted in increase feed intake. Feed cost per crate of egg and income above feed cost, hen day egg production (HDP) and hen housed egg production (HHP) were also significantly ($P<0.05$) affected by LBP diets. The linear increased observed for water intake and water to feed ratio of the birds may be due to the powdery nature of LBP. This observation agreed with the report of Aduku (2004) who gave a report that poultry consumes two to three times amount of water per unit of dry feed consumed. It was also possible that the LBP fed during the growing phase had carry over effect on the water intake pattern. The observed low cost in the feed cost per crate of egg at 22.5 and 30% LBP is an indication of reduction in the cost of feed required to produce a crate of egg. It was more costly to produce a crate of egg with the control diet than when 7.5, 22.5 and 30% LBP were used during the growing phase. The significant ($P<0.05$) increased in income above feed cost per crate of egg observed when 7.5, 22.5 and 30% LBP were included in the grower ration is an indication of cost savings.

Conclusion

It was concluded from the findings of this study that LBP diets fed to the growing pullets between 9-20weeks had a carryover effects on the subsequent performance of the birds. It also improved the appetite of the birds. Additional advantages are reduced feed cost and increased in the returns from egg sales.

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Table 1 Composition of common layer diet (20-42 weeks)

Feed Ingredients	Quantity (%)
Maize	45.00
Groundnut cake	11.00
Soya cake	15.40
LBP	0.00
Maize offal	16.50
Fishmeal	2.00
Limestone	5.00
Bone meal	4.00
Common Salt	0.30
Methionine	0.25
Lysine	0.25
Premix **	0.30
Total	100
Calculated Analysis	
ME kcals/kg	2727
Crude Protein (%)	17.06
Crude Fibre (%)	3.80
Calcium (%)	3.48
Available Phosphorus(%)	0.57
Methionine. (%)	0.59
Lysine (%)	1.13
Cost/ kg (₦)	51

**Biomix layer premix supplied the following per kg of diet: Vit. A 8,500 I.U, Vit D₃1,500 I.U, Vit. E 10,000mg, Vit. K₃ 1,000mg, Vit B₁ 1,500mg, Vit B₂ 4,500mg, Niacin 15,000mg, pantothenic acid 4,500mg, Vit. B₆ 3,000mg, Vit B₁₂ 15mg, folic acid 600mg, Biotin H₂ 500, choline chloride 175,000mg, cobalt 200mg, copper 3,000mg, iodine 1,000mg, iron 20,000mg, manganese 40,000mg, selenium 200mg, zinc 30,000mg, Antioxidant 1250mg.

Table 2. Effect of locust bean pulp fed during the grower phase on subsequent performance of pullets (20-42 weeks)

Parameters	Dietary Inclusion Levels (%)					SEM	contrast
	0	7.5	15	22.5	30		
Initial Weight (g/bird)	1444.06	1441.91	1435.02	1436.96	1439.97	8.34	-
Final Weight (g/bird)	1546.3	1559.94	1548.45	1593.68	1586.87	19.51	-
Age at 1 st egg (day)	160 ^b	157 ^a	166 ^d	163 ^c	160 ^b	1.29	-
Age at Peak lay (day)	194 ^{ab}	201 ^a	195 ^{ab}	197 ^{ab}	199 ^a	1.31	-
1 st egg weight (g)	46	52	49	50.67	49.67	0.74	-
Egg weight at peak (g)	54.67 ^b	54.00 ^b	56.33 ^a	56.33 ^a	56.00 ^a	0.49	linear
Daily Feed Intake (g)/ bird	91.38 ^d	97.33 ^c	103.55 ^{ab}	105.39 ^a	108.21 ^a	1.93	linear
Daily water intake (ml) / bird	164.20 ^b	172.15 ^{ab}	176.59 ^{ab}	178.34 ^{ab}	183.49 ^a	3.88	linear
Water / feed ratio	3.29 ^a	3.24 ^a	3.13 ^b	3.10 ^b	3.11 ^b	0.03	-
Feed Cost/crate of eggs(₦)	435 ^b	405 ^c	440 ^a	383 ^c	397 ^d	0.27	-
Income above feed cost (₦) per crate of eggs	165 ^c	195 ^b	160 ^c	217 ^a	203 ^b	4.57	-
%HDP at Peak Lay	88.57 ^b	98.25 ^a	85.40 ^b	89.32 ^{ab}	98.49 ^a	1.16	quartic
%HHP at Peak Lay	81.82 ^c	89.39 ^{ab}	80.30 ^c	87.88 ^b	90.91 ^a	1.39	-

^{abc} Means within the same row with different letter superscripts are significantly different ($P < 0.05$), LOS = Level Of Significance, NS= Not Significant, SEM = Standard error of the means, * = Significant ($P > 0.01 < 0.05$), ** very significant ($P < 0.01 < 0.001$), *** highly significant ($P < 0.001$) FCR = Feed conversion ratio, Cost per crate of egg = ₦600; HDP = Hen Day Egg Production; HHP = Hen Housed Egg Production