

GROWTH PERFORMANCE OF BROILERS FED WITH VARYING LEVELS OF BANANA MEAL

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INTRODUCTION

Poultry raising is one of the most popular and most profitable commercial enterprises in the country today. If managed properly, it can generate large incomes because poultry products, such as meat and eggs, are on top of the consumers' list.

However, poultry raisers suffer from a major drawback as the cost of commercial feeds continues to soar. This problem had opened up avenues for a number of investigators to find some locally-available materials as possible supplements to commercial feeds.

Most of the possible feed supplements so far studied were taken from plant sources. Rick and Gail Luttman (1976) used homegrains as a dietary supplement while peanut oil meal was tried by Edem (1977). Compared to brewer's yeast as another supplement, peanut oil meal was inferior in terms of egg production and meat. It was further reported that copra meal was not recommended by many poultry authorities because of its high oil content which has a laxative effect on the young chicks. Rice and sorghum were used to replace the corn component of the commercial feeds. Arnas and Chicco (1970) reported that birds fed with all-rice and all-corn diets had similar body weight and feed conversion efficiency. Replacing the corn component of the feeds with broken rice, Caceres and Aragon (1974) reported that no significant difference was observed in terms of feed intake and body weight among the birds compared with those fed with commercial feeds. With sorghum used as a substitute for corn, Borstein and Bartov (1967) reported similar efficiency and growth performance in all dietary treatments. This was confirmed by Singh and Barsaul (1977) who worked on the substitution value of sorghum with corn.

Other plant materials investigated as possible feed supplement to broilers include azolla meal (Cambel, 1984) and *Sargassum* sp. (Pineda, 1986).

So far no studies have been reported to have been conducted on the feeding value of banana. Since banana is widely cultivated in the farmlands of the country and is available throughout the year, it is but appropriate to investigate its possibility as a supplement to commercial feeds. This study, therefore, aims to determine the effects of varying levels of banana meal and starter mash combination on the growth performance of broilers.

MATERIALS AND METHODS

The banana fruit variety 'sab-a' was used in the study. Mature fruits were skinned, thinly-sliced sun-dried for three to four days and later pulverized. Preparation of the different levels of banana meal and starter mash combination was made with the following proportions (percentage by weight):

<u>Treatment</u>	<u>% banana meal</u>	<u>% starter mash</u>
I (control)	0	100
II	10	90
III	20	80
IV	30	70
V	40	60
VI	50	50

These different feed rations were given to a total of 72 straight-run-day-old broiler chicks which were kept in a battery cage with 12 chicks per treatment for the entire six-week experimental period. Proper management and sanitation practices were observed during the study including brooding of the chicks for two weeks and provision of antibiotic. Feeding was on *ad libitum* basis. Pre-weighed feeds were given thrice a day to ensure that the chicks had a 24-hour supply of feeds. Refused feeds were collected regularly once every 24 hours and weighed.

The following parameters were used to assess the effect of the different treatments on the growth performance of the broilers:

1. Weekly Weight Gain

Initial weights of the birds were determined at the start of the study, and the birds were weighed regularly once every week for six weeks. Computation for the average weekly weight gain of the birds (gm/bird) was done using:

$$\text{Weekly weight gain} = W_n - W_{n-1}$$

where: W_n - the mean weight of the birds during the n^{th} week of observation

W_{n-1} - the mean weight of the birds a week before the n^{th} week of observation

2. Weekly Feed Intake

This parameter determined the palatability of the feed rations. Computation for the weekly feed intake was determined by:

$$\text{Weekly feed intake} = \frac{\text{Total weight of ration given for one week} - \text{Total weight of ration refused for one week}}{\text{No. of birds}}$$

(gm/bird/week)

3. Feed Conversion Ratio

This determined the amount of feeds consumed by the birds used up to produce their liveweight and was given by:

$$\text{Feed conversion ratio} = \frac{\text{Total weight of feeds consumed per bird}}{\text{Final weight of the broiler}}$$

RESULTS AND DISCUSSION

A. Weekly Weight Gain of the Birds

The mean weekly weight gain of the broilers fed with different banana meal-starter mash combinations is presented in Table 1. As shown, Treatment I (control) yielded the highest weekly weight gain while Treatment VI consistently yielded the lowest. That there is a significant difference in the mean total weight gain of the birds at the end of the experimental study is shown in the analysis of variance (Table 2). To determine which specific treatment significantly differed from the control, Duncan's Multiple Range Test (DMRT) was employed and it revealed that Treatments III to VI differed from the control while Treatment II yielded statistically similar total weights gain compared with the control.

From this result, it can be inferred that banana meal can be considered as a feed supplement for commercial feeds but the quantity to be mixed with the commercial feeds must not exceed 10 percent. This indicates that the protein and other nutritional needs of the broilers fed with 10% banana meal were not at all significantly altered with the addition of banana to the ration as evidenced by their more or less same growth performance compared with those fed with commercial feeds. However, the reduction in the weight gain of the birds fed with increasing quantities of banana meal in the feeds may be attributed to the decreasing amounts of proteins and other nutrients in their diets. Adequate supply of proteins should be given to the birds as it has been widely accepted that protein is one of the principal components of the organs, muscles and other parts of the birds. Rick and Gail Luttman (1976) stated that birds raised for meat should be provided with feeds having higher protein content.

B. Weekly Feed Intake

Table 3 summarizes the mean weekly feed intake of the broilers fed with varying combinations of banana meal and starter mash. Birds fed with commercial ration had the highest feed intake, and a decreasing trend was shown with an increase in the amount of banana meal in the ration. As shown further in Table 3, unlike in the other treatments, the intake of the birds fed with 10% banana meal differed only slightly from the control.

The feed intake of the broilers is one of the qualitative measures of palatability of the feed rations. And based on this result, palatability is greatly affected with the addition of banana meal to the feed ration.

C. Feed Conversion Ratio

The feed conversion ratio among the birds fed with varying levels of banana meal and starter mash combinations is presented in Table 4. The commercial feeds gave the best conversion as it required only about 2.31 kg of feeds to be taken in by the bird to produce a kg of liveweight. Among the other different treatments, broilers fed with 10 percent banana meal gave the best conversion although it was slightly higher than the control. On the other hand, a further increasing ratio was observed with increasing banana meal content in the ration so that broilers fed with 50 percent banana meal gave the poorest feed conversion.

Feed conversion is one of the efficiency indicators used in poultry farm operations as it expresses the efficiency among the broilers to convert feeds taken in into meat. This is directly related to the protein and nutritional contents on the diet. Thus the increasing ratio observed among the birds fed with increasing amounts of banana meal in the ration can be ascribed to the lowering of the protein content in their diet.

SUMMARY AND CONCLUSION

This study was conducted to explore the possibility of using banana as a supplement to commercial feeds. Varying levels of banana meal-starter mash combination from 10 percent to 50 percent were used, and the growth performance of the broilers fed with these rations were assessed based on the weekly weight gain of the birds. Other related parameters such as feed intake and feed conversion ratio were likewise considered.

Results of the study showed no significant difference on the total weight gain and possibly on the weekly weight gain of the birds fed with 10 percent banana meal compared with the control. However, the weight of the birds fed with increasing banana content in their diets differed significantly from the control. On feed intake, birds fed with wholly commercial feeds had the highest intake compared with other treatments. It was also observed that the intake of the birds fed with 10 percent banana meal differed only slightly from the control while those fed with increasing

amounts of banana meal in their diets differed significantly. This observation can be attributed to the loss of palatability of the rations containing higher banana content. Among the birds fed with varying levels of banana meal-starter mash combinations, Treatment II showed the best conversion although it was slightly higher than the control.

Based on the results of the present study, it can be concluded that banana meal can be a possible supplement to commercial feeds. However, it is recommended that the quantity of the banana meal to be mixed with the commercial feeds should not exceed 10 percent.

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TABLE 1. Mean weekly weight gain (gm/bird) of the broilers fed with varying levels of banana meal and starter mash combinations.

Week of observation	COMBINATIONS					
	Control	10% BM	20% BM	30% BM	40% BM	50%BM
1st	76.83	66.615	68.73	66.69	55.43	38.98
2nd	160.73	159.62	119.90	119.90	124.74	76.56
3rd	283.75	263.79	231.17	199.52	191.66	160.8
4th	272.92	225.375	170.83	177.10	184.20	125.33
5th	201.75	207.50	187.50	191.66	161.66	179.16
6th	171.16	173.75	172.50	156.25	162.50	125.33
Mean total weight gain* (g/bird)	1,167.14a	1,096.65a	944.31b	911.0b	880.2bc	776.5b

* Mean values with similar letters show no significant difference as determined by Duncan's Multiple Range Test (DMRT).

TABLE 2. Analysis of variance of the mean total weight gain of the broilers fed with varying levels of banana meal-starter mash combinations

Sources of variation	df	Sum of Squares	Mean Square	F-value
Treatment	5	312,730.48	62,546.1	30.68**
Experimental Error	12	24,320.75	2,026.73	
Total	17	337,051.23		

**highly significant

TABLE 3. Mean weekly feed intake of the broilers (in gram/bird) fed with varying levels of banana meal-starter mash combinations.

Week of observation	Control	10% BM	20% BM	30% BM	40% BM	50% BM
1st	125	120.83	117.57	120.83	116.66	114.28
2nd	264.42	262.50	267.86	266.66	248.50	257.14
3rd	453.00	433.30	432.14	400.00	425.00	421.43
4th	558.33	550.00	478.57	479.20	475.00	467.85
5th	595.83	587.50	532.14	529.20	529.16	535.71
6th	700.00	683.33	678.57	675.00	670.00	667.86
Total feed intake (g/bird)	2,696.58	2,637.46	2,506.85	2,470.89	2,465.10	2,464.27

TABLE 4. Feed conversion efficiency among broilers fed with varying levels of banana meal-starter mash combinations

Combinations (Treatment)	Mean total feed intake (g/bird)	Mean total weight gain (g/bird)	Feed conversion ratio
Control	2,696.58	1,167.14	2.31
10% BM	2,637.46	1,096.65	2.41
20% BM	2,506.85	944.31	2.65
30% BM	2,470.89	911.00	2.71
40% BM	2,465.10	880.20	2.8
50% BM	2,464.27	776.50	3.04