

Research Article

Performance of broilers fed premix prepared from locally sourced materials

*Oyewole B O, Olarenwaju G and Dafwang II

Department of Animal Production, Kogi State University, Anyigba. Nigeria

*Corresponding author E-mail: benjowole@yahoo.com

Accepted 24 March 2013

Abstract

One hundred and eighty 7-day old broilers were used in a 28 days feeding trial to determine the effect of premixes prepared from locally sourced ingredients on the performance and economics of production of broiler starters. Five (5) broiler starter diets were formulated such that Diet 1 was the control and contained the commercial premix. Diets 2 and 3 contained 2.3% and 4.6% of premix 1 respectively. Premix 1 was formulated with blood meal, fish meal, wood ash and *Moringaoleifera* leaf meal. Diets 4 and 5 had 2.3% and 4.6% of premix 2 respectively, prepared from blood meal, fish meal and poultry litter ash. The birds were randomly allotted to the five diets in a Completely Randomized Design. Each treatment comprised of three replicates of 12 birds per replicate. The results showed that final weight (551.00 - 682.00g), daily feed consumed (43.67 - 50.07g), daily weight gain (14.03 - 19.00g) and feed: gain ratio (2.44 - 3.11) were significantly ($P < 0.05$) affected by the treatments. Cost of feed/kg and cost of feed consumed per bird were affected ($P < 0.05$) by the type of premix. The use of commercial premix resulted in the cheapest feed (control) per kg. Cost of feed consumed per bird was lowest with the control birds, followed by Diet 3 while birds on Diets 2 and 5 had the highest. Feed cost /kg gain was not significantly ($P > 0.05$) influenced but numerically the controlled (Diet1) was the least economical in terms of economy of utilization. This may indicate that production of premix from locally sourced could result in higher profit margin for poultry farmers.

Keywords: Performance, premix, broiler

INTRODUCTION

Broiler chickens remain one of the fastest sources of readily available animal protein for human consumption because of their rapid growth, when given good nutrition and management. Therefore, productivity of broiler chickens need not be compromised despite increasing cost of conventional feedstuffs. According to Udedibie (2003), prices of concentrates in Nigeria rose by nearly 400% and commercial feeds by about 2000% within the last 20 years. However, this trend does not have affect on the demand for chicken (Onwurahet al., 2012). The authors maintained that demand for broiler chickens were rising as meat consumers' interest were gradually shifting from red to white meat. To match this demand as well as produce broiler at reduced cost than what is currently obtainable, evaluation of cheaper, locally available and unconventional feed resources might be the answer. The search for these feedstuffs has remain central to research efforts of animal nutritionists (Dafwang and Damang, 1995), all aimed at reducing the cost of livestock production through the use of cheaper feeds. One of the ways of reducing the cost of poultry feed is by preparing vitamin-mineral premix from materials sourced locally. Premixes are homogenous mixtures required in small amounts in rations containing one or several micronutrients with diluents and or carriers.

As critical as the presence of premix is in the ration of monogastric animals in enhancing their performance and well being, information on how to assemble premix is limited because such is the manufacturer's trade secret (Aduku, 1993). Hence the need to evaluate a number of premixes compounded from locally available ingredients relative to commercial premix.

Objective of the study

The study was to determine the effect of premixes prepared from locally sourced ingredients on the performance and economics of production of broiler starters.

MATERIALS AND METHODS

The experiment was conducted at the Poultry Unit of the Department of Animal Production Teaching and Research Farm, Kogi State University Anyigba. Anyigba is located between latitudes $7^{\circ} 15' - 7^{\circ} 29'$ N of the equator and longitudes $7^{\circ} 11' - 7^{\circ} 32'E$ of the Greenwich meridian (Ifatimehin *et al.*, 2009).

Experimental diets

Poultry litter ash, *Moringaoleifera* leaf meal, wood ash, blood meal and scrap fish meal were used to prepare two different premixes. Five (5) broiler starter diets (Table 1) were formulated such that Diet 1 was the control containing the commercial premix. Diets 2 and 3 contained premix formulated with blood meal, fish meal, wood ash and *Moringaoleifera* leaf meal (premix 1), containing 2.3% and 4.6% of premix 1. Diets 4 and 5 had premix 2 prepared from blood meal, fish meal, poultry litter ash and contained 2.3% and 4.6% of premix 2.

Table1. Experimental Diets for Broiler Chickens

Ingredients	(%)	Diet1	Diet2	Diet3	Diet4	Diet5
Maize		40.00	41.55	41.55	41.55	42.00
FFSB		40.00	40.00	40.00	40.00	40.00
Maize offal		3.90	0	0	0	0
Cassava peel meal		10.00	10.30	8.00	10.30	7.55
Blood meal		2.00	2.00	2.00	2.00	2.00
Bone meal		3.50	3.50	3.50	3.50	3.50
Methionine		0.10	0.10	0.10	0.10	0.10
Common salt		0.25	0.25	0.25	0.25	0.25
Commercial premix		0.25	0	0	0	0
Premix 1		0	2.30	4.60	0	0
Premix 2		0	0	0	2.30	4.60
Total		100.00	100.00	100.00	100.00	100.00
Calculated analysis						
Crude protein		21.14	20.87	20.74	20.87	20.74
Crude fibre		3.47	4.13	3.91	4.13	3.14
Energy (Kcal/kgME)		3043.85	2999.31	2952.48	2999.31	2958.62

FFSB – FullFatSoyabean, Premix 1(blood meal, fish meal, wood ash and *Moringaoleifera* leaf meal), Premix 2 (blood meal, fish meal and poultry litter ash)

Experimental birds and management

The day old broiler chicks were purchased from a reputable hatchery and were brooded for one week on deep litter. At 7-day old one hundred and eighty of the birds were randomly allocated to the five (5) treatment groups each having three (3) Replicates of twelve (12) birds. Experimental diets and water were supplied *ad libitum*. Birds in each treatment were weighed at the beginning of the study and on a weekly basis.

Feed consumption was determined by obtaining the difference between quantity of feed offered and the left over every week. The duration for the study was twenty eight days. Performance indices that were computed include average daily feed intake per bird. The average daily intake per bird was obtained by dividing the weekly intake by 7 days and the number of birds. Average weight gain was obtained by subtracting initial weight from final weight and then dividing by the product of the number of birds and the number of days of the feeding trial. Feed gain ratio or feed conversion ratio was computed by dividing the average daily intake by the average daily weight gain.

Economic analysis

The considered economic parameter was determined using the prevailing market prices of the feedstuff at the time the experimental diets were formulated, costs of medication and that of broilers on live weight basis.

Data analysis

All data collected were analyzed using the SPSS version 16 statistical software package for completely randomized design.

RESULTS AND DISCUSSION

The performance of broiler starters is shown in Table 2. The results showed that final weight, daily feed consumed (DFC), daily weight gain (DWG) and feed: gain ratio were significantly ($P<0.05$) affected by the treatments. Observed final weight is above 516 –572.2g and 434.52 – 590.76g reported by Olabode *et al.* (2011) and Onuh *et al.* (2011) for broiler starters. The observed DWG range of 14.03 – 19.00g is above the range of 12.84 – 18.42g reported by Onuh *et al.* (2011) but below 29.28 – 35.82g (Ndelekwute *et al.*, 2011). The observed feed gain ratio is superior to the range 3.01 – 4.00 (Onuh *et al.*, 2011) but inferior to the range of 1.73 – 2.42 (Olabode *et al.*, 2011). The observed final weight, DWG and feed gain ratio indicated that locally prepared premixes promoted better utilization and weight gains than commercial premix. One of the possible reasons for this might be that the minerals and vitamins in them were more active due to their freshness. Some commercial premixes may have been long on the shelf before being sold; hence this may affect their potency. Observed mortality was not significantly ($P>0.05$) influenced by the dietary treatments.

Table 3 shows the economics of production of the experimental broiler starters. Cost of feed/kg and cost of feed consumed per bird were affected ($P<0.05$) by the type of premix. The use of commercial premix resulted in the cheapest feed (control) per kg. Diet 2 was the costliest. Cost of feed consumed per bird was lowest with the control birds, followed by Diet 3 while birds on Diets 2 and 5 had the highest. Although, feed cost /kg gain was not significantly ($P>0.05$) influenced, numerically the control (Diet1) was the least economical in terms of economy of utilization. This may indicate that production of premix from locally sourced could result in higher profit margin for poultry farmers.

Table2. Performance of Broiler Starters Fed Locally Prepared and Commercial Premixes

Parameters	Diet 1	Diet 2	Diet 3	Diet 4	Diet 5	SEM
Initial body weight(g)	150.00	150.00	150.00	150.00	150.00	0.00
Final body weight	551.00 ^b	678.66 ^a	672.33 ^a	661.00 ^a	682.00 ^a	28.18
Daily weight gain(g)	14.03 ^b	19.00 ^a	18.70 ^a	18.30 ^a	18.93 ^a	1.07
Daily feed consumed(g)	43.67 ^b	47.23 ^{ab}	45.70 ^b	45.73 ^b	50.07 ^a	1.25
Feed/gain ratio	3.11 ^b	2.49 ^a	2.44 ^a	2.52 ^a	2.65 ^a	0.15
Mortality (%)	0	2.66	0	0	5.33	1.48

ab= means on the same row followed by different superscripts differ significantly ($P<0.05$)

SEM=Standard error of mean

Table3. Economics of Production of Broiler Starters Fed Locally Prepared and Commercial Premixes

Parameters	Diet 1	Diet 2	Diet 3	Diet 4	Diet 5	SEM
Cost of feed/kg(\$)	0.43 ^b	0.51 ^a	0.48 ^a	0.50 ^a	0.48 ^a	0.01
Cost consumed feed/bird(\$)	0.53 ^b	0.67 ^a	0.62 ^a	0.63 ^a	0.67 ^a	0.03
Feed cost/kg gain(\$)	1.99	1.57	1.58	1.68	1.59	0.53

ab= means on the same row followed by different superscripts differ significantly ($P<0.05$)

SEM=Standard error of mean

CONCLUSION

It is obvious from the results obtained from this experiment that the use of locally available materials to prepare vitamin-mineral premix may lead to some reduction in the cost of poultry production thereby improving profit margin in poultry enterprise.

RECOMMENDATIONS

From the results of this study, it is recommended that poultry farmers prepare their own vitamin-mineral premix, using materials that are available in their area. This should also guarantee the freshness of the premix as well as the potency of its nutrients.

References

- Aduku A O (1993). Tropical Feed stuff Analysis Table. Ahmadu Bello University, Zaria, Nigeria. Pp. 4
- Dafwang I I, Damang P (1995). Rice Offal in Finishing Diets of Broilers. *J. Animal Prod. Res.* 15 and 16 (182): 131-139.
- Ifatimehin O O, Musa S D, Adeyemi J O (2009). An analysis of the changing land use and its impacts on the environment of Anyigba town, Nig. *J. Sustainable Dev. Afr.* 10 (4): 357-365.
- Ndelekwute E K, Amaefule K U, Anigbogu N M (2011). Effect of Water Acidified with Organic Acid on the Growth Performance of Starter Broiler Chicks. In: *Research and Value-Addition: Key to Transformation of the Nigerian Livestock Industry*. Eds (Aduku A O, Oluwagbemi T, Aribido S O, Daikwo S I, Saliu O J). Proceedings 16th Annual Conference of Animal Science Association of Nigeria (ASAN) September 12th-15th 2011 Kogi State University Anyigba, Anyigba, Nigeria. Pp. 377-380.
- Olabode A D, Onyimonyi A E, Ilo S U (2011). Replacement of Synthetic Methionine with Naturally Compounded Materials in Broiler Starter Birds. In: *Research and Value-Addition: Key to Transformation of the Nigerian Livestock Industry*. Eds (Aduku A O, Oluwagbemi T, Aribido S O, Daikwo S I, Saliu O J). Proceedings 16th Annual Conference of Animal Science Association of Nigeria (ASAN) September 12th-15th 2011 Kogi State University Anyigba, Anyigba, Nigeria. Pp. 299-302.
- Onu S O, Orsterga D D, Adeka L A (2011). Response of Broiler Chickens to Graded Levels of Palm Kernel Cake. In: *Research and Value-Addition: Key to Transformation of the Nigerian Livestock Industry*. Eds (Aduku A O, Oluwagbemi T, Aribido S O, Daikwo S I, Saliu O J). Proceedings 16th Annual Conference of Animal Science Association of Nigeria (ASAN) September 12th-15th 2011 Kogi State University Anyigba, Anyigba, Nigeria. Pp. 402-405.
- Onwurah F B, Ifeanacho M O, Amaefule K U, Ndelekwute E K (2012). Effect of Yeast on Cholesterol Content in Broiler Chicken. *Indian J. Innovations Dev.* 1(1): 45-46.
- Udedibie A B I (2003). In Search of Food: FUTO and Nutritional Challenge of Canavalia Seeds. 6th Inaugural Lecture, Federal University of Technology Owerri-Nigeria.