PERFORMANCE OF BROILER CHICKENS FED VARYING LEVELS OF LOCAL FISH MEAL AS REPLACEMENT FOR IMPORTED FISH MEAL

By

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ABSTRACT

A fourty nine days experiment was carried out at poultry unit of Bauchi State College of Agriculture to evaluate the performance of broiler chickens fed varying levels of local fish meal (LFM) diets. Five experimental diets were formulated for both starter and finisher phases. Coded as diets 1 (0%), 2(25%), 3(50%), 4(75%) and 5(100%). Two hundred and ten (210) broiler chickens were randomly allotted to five dietary treatments in completely randomized design. Each treatment was replicated three times with fourteen birds per replicate. The result of this study indicated most of the performance attributes at both starter and finisher phases as well as the overall performance were not significantly influenced by the dietary levels of LFM. However starter phase final weight (575.09-779.65g) were significantly (P<0.05) influenced by the dietary levels of local fish meal. It can be concluded that LFM can completely replace imported one with no adverse effect on the performance attributes.

Key Words: Broiler Chicken, Imported Fish Meal, Local Fish Meal, Varying levels

INTRODUCTION

Poultry production forms an important component of livestock subsector as a provider of employment and income (Eduvie, 2002). Ogundipe and Sanni (2002) reported that, the primary purpose of keeping poultry in all parts of Nigeria is for both dietary and economic reasons. Kekeocha (1994) defined poultry as those species of birds that render economic services to man and produce freely under his care. Animal protein requirement in the developing countries including Nigeria has become critical due to rapid population growth (FAO/WHO, 1973), Yusuf *et al.* (2008) reported that the population in Nigeria is increasing at a rate much higher than that of food production especially with regards to the production of animal protein. The development of poultry industry has been described as the fastest way of ameliorating the animal protein deficiency in the 3rdworld countries due to the short generation interval of domestic fowl, their high feed utilization efficiency, ease of management and small space requirement (Depeolu *et al.*, 2004). Nworgu *et al*. (2000) and Rultu (2004) reported that the current acute shortage of animal protein in Nigeria and the rapidly increasing demand for livestock products could be alleviated through broiler production. Broiler chicken are fast growing strain of birds that are specifically produced for

their meat (Onibi and Bamigboye, 2000). Kosden (2010) described the term broiler as fast growing birds which reach market weight of 1.6 to 2.50kg at 8 weeks. High cost of inputs, most especially feeds and day old chicks limit opportunity and advantages of poultry production in Nigeria as feed utilization accounts for over 70% of the total cost of broiler production (Afolayan *et al*., 2002). The high cost of feed could be attributed partly to animal protein source of which imported fish meal (IFM) is the most common (NSA *et al.*, 2016). The importance of fish meal as feed ingredient, in poultry production is quite enormous. Among the animal protein sources fish meal is particularly suited to meet all the nutrients requirement of animals (Ijaiya and Eko, 2009). The conventional animal protein source (imported fish meal) is expensive and sometimes is unavailable. There is little or no information on the status of performance of broiler chickens fed with local fish meal diets. Therefore, there is needs towards looking for other unconventional animal protein source that could meet the nutritional requirement of the birds, with similar or better performance like local fish meal (LFM).

MATERIALS AND METHODS

Study area

The experiment was conducted at Bauchi state college of agriculture, poultry research unit of the Department of Animal Production Technology, Bauchi. Five (5) experimental diets were formulated for both starter and finisher phases respectively. Local fish meal was included at 0, 25, 50, 75 and 100% replacement levels coded as diets 1,2,3,4 and 5 respectively to substitute the conventional animal protein source (imported fish meal).

Experimental birds

Two hundred and ten (210) day-old broiler chickens were procured from Zartech Company, Ibadan Nigeria. The birds were randomly assigned to five dietary treatments. Each treatment was replicated three (3) times with fourteen (14) birds per replicate in completely randomize design (CRD). Feed and water were given *ad libitum.* All vaccination schedules for broiler chickens were given at appropriate time.

Data collection

Parameters measured were feed intake, weight gain and mortality. Feed conversion ratio was also computed. All the data generated for both starter and the finisher phases were subjected to analysis of variance (ANOVA) as outline by (Steel and Torrie, 1984). Where significant difference was observed, Duncan Multiple Range Test (DMRT) was used to separate the means. Table 1 and 2 shows the percentage and calculated proximate composition of the experimental diets at starter and finisher phases respectively.

Results and Discussion

The performance of broiler chickens at the starter phase presented in table 3 shows that birds on diet 5 (100%LFM) recorded significantly (P>0.05) higher final live weight. Daily feed intake, daily weight gain and feed conversion ratio were not affected by the dietary

treatments similar trend was observed at the finisher phase (Table 4). The results of this study are in agreement with the reports of Ojewola *et al*. (2005) who reported that, there was no significant influence among broiler chickens fed locally processed and imported fish meal diets in relation to performance attributes. The overall performance indicate significant ($P<0.05$) difference in relation to initial weight. This could be due to the significant influence observed at the starter final weight. Overall daily weight gain, feed intake and feed conversion ratio were not affected by the graded levels of local fishmeal in the diets. This findings also agreed with the reports of Ojewole *et al.* (2005) reported no significant difference was observed among broiler chickens fed with locally processed and imported fish meal. Similar results were also obtained by (Akpodiete and Inoni 2000; Ijaiya and Eko, 2009).

Conclusion and Recommendation

This result conclude that local fish meal can replace imported fishmeal up to 100% with better effect on performance attributes. Therefore, it is recommended that farmers should include LMF in formulating their diets to reduce cost of production.

Table 1: Ingredients percentage composition of local fish meal based diets fed to broiler chickens at the starter phase. (1-4 weeks)

	Diets				
Ingredients	**1 (0%)**	**2 (25%)**	**3 (50%)**	**4 (75%)**	**5 (100%)**
Maize	45.35	45.35	45.35	45.35	45.35
Soyabean	33.25	33.25	33.25	33.25	32.25
Wheat offal	12.00	12.00	12.00	12.00	12.00
Imported fish meal	5.00	3.75	2.50	1.25	0.00
Local fish meal	0.00	1.25	2.50	3.75	5.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Limestone	1.50	1.50	1.50	1.50	1.50
Salt	0.25	0.25	0.25	0.25	0.25
Vitamin premix	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Total	100	100	100	100	100
Calculated analysis					
Crude protein	23.01	22.83	22.64	22.45	22.26
ME (Kcal/kg)	2949.39	2949.38	2949.39	2949.39	2949.39
Crude fibre	4.32	4.31	4.32	4.32	4.32
Ether extract (%)	7.78	7.77	7.75	7.77	7.78
Calcium (%)	1.71	1.71	1.71	1.71	1.71
Phosphorus	0.76	0.79	0.95	0.89	0.96
Methionine (%)	0.65	0.45	0.63	0.62	0.63
Lysine (%)	1.56	4.49	1.57	1.58	1.56

Table 2: Ingredients percentage composition of local fish meal based diets fed to broiler chickens at the starter phase. (4-8 weeks)

	Diets				
Ingredients	**1 (0%)**	**2 (25%)**	**3 (50%)**	**4 (75%)**	**5 (100%)**
Maize	50.46	50.46	50.46	50.14	50.14
Soyabean	28.14	28.14	28.14	28.14	28.14
Imported fish meal	2.00	1.50	1.00	0.50	0.00
Local fish meal	0.00	0.50	1.00	1.50	2.00
Wheat offal	15.00	15.00	15.00	15.00	15.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Limestone	1.50	1.50	1.50	1.50	1.50
Salt	0.25	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Total	100	100	100	100	100
Calculated analysis					
Crude protein	20.00	19.92	19.85	19.78	19.70
ME (Kcal/kg)	2907.45	2987.65	2907.65	2907.65	2907.45
Crude fibre (%)	4.44	4.44	4.45	4.44	4.44
Ether extract (%)	7.14	7.14	7.13	7.14	7.14
Calcium (%)	1.55	1.54	1.53	1.54	1.55
Phosphorus	0.88	0.90	0.87	0.90	0.88
Methionine (%)	0.56	0.55	0.54	0.55	0.56
Lysine (%)	1.31	1.32	1.32	1.31	1.31

Table 3: Performance of broiler chickens fed different replacement levels of local fish meal based diets at the starter phase.

	Diets					
Parameters	**1 (0%)**	**2 (25%)**	**3 (50%)**	**4 (75%)**	**5 (100%)**	**SEM**
Initial weight (g)	124.39	128.05	129.90	120.97	126.50	5.09NS
Starter final weight(g)	575.09^{c}	694.60^{ab}	649.38^{bc}	684.14^{abc}	779.65	34.90*
Feed intake (g)	57.43	65.55	63.17	70.10	64.32	2.73NS
Daily weight gain (g)	16.09	20.23	19.27	20.12	23.32	1.49NS
Feed conversion ratio	3.61	3.26	3.36	3.23	2.77	0.27NS

abc = Means within the same row with different superscripts were significantly different (P<0.05)
NS = Not significant
SEM = Standard Error of the mean

Table 4: **Performance of broiler chickens fed different replacement levels of local fish meal based diets at the finisher phase.**

	Diets					
Parameters	**1 (0%)**	**2 (25%)**	**3 (50%)**	**4 (75%)**	**5 (100%)**	**SEM**
Initial weight (g)	575.09[c]	694.60[bc]	649.38[bc]	684.14[abc]	779.65 [c]	86.58*
Final weight (g)	1133.4	1329.40	1235.60	1418.40	1552.20	91.96NS
Daily feed intake (g)	98.54	100.65	100.36	103.07	99.76	1.32NS
Daily weight gain (g)	27.92	32.33	32.81	37.21	38.63	4.72NS
Feed conversion ratio	3.54	3.46	3.32	2.83	2.64	0.49NS

abc = Means within the same row with different superscripts were significantly different (P<0.05)
NS = Not significant
SEM = Standard Error of the mean

Table 5: Overall performance of broiler chickens fed graded levels of local fish meal diets. (1-8 weeks)

	Diets					
Parameters	**1 (0%)**	**2 (25%)**	**3 (50%)**	**4 (75%)**	**5 (100%)**	**SEM**
Initial weight (g)	349.75[c]	411.33[ab]	399.14[b]	402.56[abc]	453.08[a]	18.94*
Overall final weight (g)	1025.80	1012.00	997.50	1051.30	1165.90	74.52NS
Daily feed intake (g)	79.32	83.10	81.76	86.59	82.04	1.67NS
Daily weight gain(g)	22.01	26.28	26.04	28.66	30.98	2.28NS
Feed conversion ratio	3.57	3.36	3.34	3.03	2.70	02.2NS

abc = Means within the same row with different superscripts were significantly difference (P<0.05)
NS = Not significant
SEM = Standard Error of the mean

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