

COST-BENEFIT ANALYSIS OF FEEDING BROILER CHICKENS WITH TWO DIFFERENT MILLING WASTES (MAIZE OFFAL AND WHEAT OFFAL) WITH AND WITHOUT NUTRIZYME

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ABSTRACT

The study was carried to evaluate the cost-benefit analysis of feeding broiler chickens with two different milling wastes supplemented with and without nutrizyme. A total of one hundred and thirty-five (135) day old Ross white strain unsexed broiler chicks were randomly allocated to five (5) dietary treatments and replicated three (3) times with nine (9) birds per replicate in a Completely Randomized Design (CRD). Maize offal and wheat offal were included at 17% and 22% in the starter and finisher phase with and without nutrizyme respectively. The starter phase result shows that the cost of total feed intake ₦374.17 was least in T4 and feed cost per kg gain also least in T4. The cost saving was better in T4 (₦13.40). While the finisher phase result shows that T4 recorded the least cost of total feed intake of ₦732.12. The cost saving was better in T4 (₦14.72). Broiler chickens fed 17% and 22% maize offal with 0.4% nutrizyme at both starter and finisher phases reduced the cost of total feed intake and feed cost per kg gain respectively. There was a cost saving of ₦13.70 and ₦14.72 at both starter and finisher phases respectively, resulting to a gain in kg of feed formulated. Therefore, it is recommended that broiler chickens should be fed 17% and 22% maize offal with 0.4%/100kg diet inclusion of nutrizyme at starter and finisher phases respectively for reduced cost of total feed intake and feed cost per kg gain, resulting to higher saving cost.

Keywords: Broiler chickens, Maize offal, Wheat offal, Feed cost per kg gain, Saving cost

INTRODUCTION

The use of alternative feed ingredients like the milling wastes in poultry diets has been suggested as a means of alleviating feed scarcity and providing adequate animal protein (Amaefule *et al.*, 2006). Poultry production relies mainly on maize as the main energy source but it suffers intense competition as food for humans resulting in higher demand than supply (Olaiya *et al.*, 2015). The escalating cost of conventional feedstuff has stimulated research into alternative feedstuff with the aim of reducing the cost of poultry production (Tuleun *et al.*, 2009). Therefore, the objective of this study is to determine the cost of total feed intake, feed cost per kg gain and saving cost of feeding broiler chickens with maize offal and wheat offal with and without nutrizyme at starter and finisher phase.

MATERIALS AND METHODS

Location of the Experiment

The research was carried out at the poultry unit of the Department of Animal Science Teaching and Research Farm, Faculty of Agriculture, Kaduna State University, Kafanchan Campus, Kaduna State.

Sources of Materials

Major ingredients (maize and full fat soya) used in this study was purchased at Kafanchan market, Jema'a local government. Wheat offal, Soya cake, nutrizyme and all micro ingredients used were purchased at Dignity feeds Enterprise, Kaduna. Maize offal was bought at Kafanchan.

Source of Experimental Birds

Day old Ross chicks were purchased from a reputable hatchery at Ibadan.

Experimental Diet

Five experimental diets were formulated and coded as T1, T2, T3, T4 and T5. T1 (control diet) contained none of the milling waste products while T2 contained of maize offal without enzyme, T3 contained wheat offal without enzyme, T4 contained maize offal with enzyme and T5 contained wheat offal with enzyme while 17% of the wheat offal and maize offal was included in the starter phase, while 22% of maize offal and wheat offal were included in the finisher phase.

Table 1: Percentage composition of broiler starter diets

Ingredients	T1 (control)	T2 17%M.O	T3 17%W.O	T4 17%M.O + Enzyme	T5 17%W.O + Enzyme
Maize offal	0.00	17.00	0.00	17.00	0.00
Wheat offal	0.00	0.00	17.00	0.00	17.00
Maize	52.10	35.10	35.10	35.10	35.10
Full fat soya	12.50	22.30	22.30	22.30	22.30
Soya cake	31.00	21.20	21.20	21.20	21.20
Limestone	0.50	0.50	0.50	0.50	0.50
Bone meal	3.00	3.00	3.00	3.00	3.00
Salt	0.25	0.25	0.25	0.25	0.25
Vitamin premix	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Methionine	0.3	0.3	0.3	0.3	0.3
Nutrzyme	0.00	0.00	0.00	0.4	0.4
TOTAL	100	100	100	100	100
Calculated Analysis%					
Crude protein (%)	23.35	23.01	23.19	23.01	23.18
ME (Kcal/kg) (%)	2958.59	2900.84	2982.44	2900.84	2982.44
Ether extract (%)	6.31	7.45	7.09	7.45	7.09
Crude fibre (%)	4.41	5.54	4.18	5.54	4.18
Ca (%)	1.06	1.07	1.07	1.07	1.07
Available protein (%)	0.52	0.54	0.53	0.54	0.53
Lysine (%)	1.41	1.39	1.39	1.39	1.39
Methionine+cys (%)	0.99	0.96	0.98	0.96	0.98

M.O= maize offal; W.O= wheat offal; ME= Metabolizable energy; cys= cysteine

Table 2: Percentage composition of broiler finisher diets

Ingredients	T1 Control	T2 22%M.O	T3 22%W.O	T4 22%M.O + Enzyme	T5 22%W.O+ Enzyme
Maize offal	0.00	22.00	0.00	22.00	0.00
Wheat offal	0.00	0.00	22.00	0.00	22.00
Maize	61.60	39.50	39.50	39.50	39.50
Full fat soya	9.00	19.70	19.70	19.70	19.70
Soya cake	25.00	14.40	14.40	14.40	14.40
Limestone	0.50	0.50	0.50	0.50	0.50
Bone meal	3.00	3.00	3.00	3.00	3.00
Salt	0.25	0.25	0.25	0.25	0.25
Vit premix	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Di methionine	0.30	0.30	0.30	0.30	0.30
Nutrzyme	0.00	0.00	0.00	0.40	0.40
TOTAL	100	100	100	100	100

Calculate Analysis%

Crude protein (%)	20.27	20.00	20.22	20.00	20.22
ME (kcal/kg) (%)	3025.35	2922.15	3037.75	2922.15	3037.75
Ether extract (%)	5.64	6.89	6.43	6.89	6.43
Crude fibre (%)	3.93	5.46	3.67	5.46	3.70

Calcium (%)	1.039	1.06	1.05	1.06	1.05
Lysine (%)	0.51	0.53	0.52	0.53	0.52
Met + cyst (%)	1.18	1.16	1.16	1.16	1.16

M.O= maize offal; W.O= wheat offal; ME= Metabolizable energy; met=methionine cyst= cysteine

Experimental Design and Management of Experimental Birds

One hundred and thirty-five (135) day old Ross strain broiler chicks were used for the study. The chicks were randomly allotted to five (5) treatment groups of 27 birds each in a completely randomized design (CRD). Each treatment group was replicated three (3) times with nine (9) birds per replicate and housed in a deep liter system. Birds were manually brooded with a charcoal stove for one week during which they were fed with their various corresponding diet and was provided with fresh water ad-libitum throughout the experimental period.

Statistical Analysis

All data collected were subjected to one-way analysis of variance (ANOVA) as outlined by Daniel (1995) and the significant means separated by Duncan's multiple range test (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Starter Phase

Table 3: Cost-benefit Analysis of Feeding Broiler Chicks with diets containing Maize offal and Wheat offal with and without Nutrizyme (0-4 Weeks)

Parameters	T1Control	T2(MO)	T3 (WO)	T4 (MO+Enzyme)	T5 (WO+Enzyme)
Total feed intake (kg/bird)	1.51	1.52	1.56	1.46	1.49
Feed cost/kg (₦)	274.55	258.08	259.10	265.28	266.30
Cost of total feed intake (₦/kg consumed)	414.57	392.28	404.20	374.17	396.79
Total weight gain (kg)	1.11	1.07	0.94	1.04	0.92
Feed cost/kg gain (₦)	373.48	366.61	430.00	359.78	431.29
Cost saving (₦/kg gain)	-	6.87	-56.52	13.70	-57.81

MO: Maize offal, WO: Wheat offal, Kg: Kilogram

Table 3 Result obtained shows that T5 had the least weight gain (0.92kg). Also T4 has the least in both total feed intake (1.46kg/bird) and cost of total feed intake ₦374.17 per bird/kg. The feed cost (₦/kg) was highest in T1 and least in T2. T4 has the least feed cost per kg gain (₦359.78) and T5 has the highest feed cost per kg gain (₦431.29). The cost saving was better in T4 (₦13.40) and least in T5 (- ₦57.81).

Finisher Phase

Table 4: Cost-benefit Analysis of Feeding Broiler Chickens with diets containing Maize offal and Wheat offal with and without Nutrizyme (4-8 Weeks)

Parameters	T1Control	T2(MO)	T3(WO)	T4(MO+Enzyme)	T5(WO+Enzyme)
Total feed intake (kg/bird)	3.05	3.15	3.70	3.01	3.34
Feed cost/kg (₦)	257.06	236.03	237.35	243.23	244.55
Cost of total feed intake (₦/kg consumed)	784.03	743.49	878.20	732.12	816.80
Total weight gain (kg)	1.65	1.56	1.46	1.59	1.49
Feed cost/kg gain (₦)	475.17	476.60	601.51	460.45	548.19
Cost saving (₦/kg gain)	-	-1.43	-126.34	14.72	-73.02

MO: Maize offal, WO: Wheat offal, Kg: Kilogram

Table 4 Results obtained shows that T4 recorded the least cost of total feed intake of ₦732.12 per bird/kg and the highest in T3 (₦878.20) per bird/kg. It was noted that T4 has the highest weight gain (1.59kg), least total feed intake and also has the least cost of feed intake which is of huge economic advantage over the rest, which agree with the report of Nnenna *et al.* (2006) that it is more profitable and economical to supplement maize offal with enzyme. The feed cost (₦/kg) was least in T2 and highest in T1. T3 has the highest feed cost per kg gain (₦601.51) and T4 has the least feed cost per kg gain

(~~₦~~460.45). The cost saving (~~₦~~/kg gain) was also better in T4 (~~₦~~14.72) which also agree with the findings of Nnenna *et al.* (2006) that maize offal supplemented with enzyme reduces the cost of production.

CONCLUSION AND RECOMMENDATION

The results of this study shows that the inclusion level of 17% maize offal as supplement with nutrizyme in the diet of broiler chickens at the starter phase, reduced the cost of total feed intake (~~₦~~374.17) and feed cost per kg gain (~~₦~~359.78) likewise cost saving (~~₦~~13.70). Broiler chickens fed 22% maize offal as supplement with nutrizyme at the finisher phase, reduced the cost of total feed intake (~~₦~~732.12) and feed cost per kg gain (~~₦~~460.32) likewise cost saving (~~₦~~14.72). Therefore, it is recommended that broiler chickens at both starter and finisher phases should be fed 17% and 22% maize offal as supplement with 0.4% inclusion of nutrizyme respectively.

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