

RESPONSE OF BROILER CHICKENS TO DIETARY LEVELS OF QUALITY PROTEIN MAIZE

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ABSTRACT

The study was conducted to evaluate the effect of replacing maize (M) with Quality Protein Maize (QPM) on the performance of broiler chicken. Five experimental diets were formulated in which QPM replaced maize at 0, 25, 50, 75 and 100 % levels coded as T₁, T₂, T₃, T₄ and T₅, respectively. A total of 240 broilers chicks were used for the study. The birds were randomly allotted to the dietary treatments (48 birds per each) in a completely randomized design. Data generated were subjected to one-way analysis of variance (ANOVA) of MINITAB (Version, 17). The results obtained showed that replacement of maize with QPM in broiler diets had no significant effect on growth performance; DFI (53.34-57.81g), DWG (15.09-17.26g) and FCR (3.21-3.60g), and finisher phase DFI (71.60-79.66g), DWG (34.96-44.68g) and FCR (1.72-2.30g) as well as overall phase DFI (58.66-68.03g), DWG (25.53-30.68g) and FCR (2.47-2.95g). Therefore, it is recommended that QPM can be used in place of conventional maize in broiler chicken diets without compromising the overall performance and economic advantage. Further studies should be conducted using QPM in other species of monogastric animals, to determine suitability.

Key Word: Broiler, Performance, QPM, Maize

Introduction

Animal production industry is generally geared towards converting cheap and available feedstuffs into more balanced animal protein. Feed accounts for over 75 – 80 % of the total cost of production (Agbede and Aletor, 2003). Poultry production in the humid is therefore constrained by seasonal feed deficits, high costs and erratic supply of feeds ingredients and competition between human and animals for available feed resources (Halamani *et al.*, 2007).

Maize is a well-accepted as the king of feed ingredients (Haiqi *et al.*, 2003). It is a primary source of energy supplement and can contribute up to 30 % protein, 60 % energy and 90 % starch in animal diets (Hai *et al.*, 2010).). About 70 -80 % of maize production is used as feed ingredient (FAO, 2004). The maize (M) varieties are however deficient in lysine and tryptophan contents (NRC, 1998; FAO, 2004).

Broiler chicken's production and breeding using improved protein quality maize is an area where researchers pay more attention. Broilers are raised specifically, for meat production. They are most efficient converters of feed into animal protein in comparison to other domestic animals (Tirwari *et al.*, 2013). Maize (*Zea mays L.*) is a staple food for millions of people all over the world. Breeding for improved protein quality in maize began in the mid-1960s with the discovery of mutants, such as opaque-2., (Devensho *et al.*, 2018).

MATERIALS AND METHODS

Experimental Site

The study was carried out at Abubakar Tafawa Balewa University Bauchi, teaching and research farm Yelwa campus. The university is located at Yelwa along Tafawa Balewa road, Bauchi. Bauchi lies between latitude of 10⁰, 17⁰N, longitude 9⁰ 49⁰E and at attitude of 902 meters above the sea level.

There are two distinct season in the area. A rainy season, which usually starts in May and end in October, and dry season which starts from November to April. The mean annual rainfall is 1091mm (World Atlas, 2015).

Experimental Diets

The feed was formulated at the Abubakar Tafawa Balewa University farm feed mill. Five different diets were formulated; the feeds were designed as diets 1,2,3,4 and 5. The diets were formulated in the ratio of QPM to Maize in the following order, Diet 1(100% M), Diet 2 (75 M: 25 QPM), Diet 3 (50 M: 50 QPM), Diet 4(75 QPM: 25 M) and Diet 5(100% QPM).

Data Collection

Growth performance

Feed consumption, weight gain, feed conversion ratio and mortality were the performance parameters monitored during the study period. Initial live weights of chicken were taken at the beginning of the experiment, thereafter, weekly weights were determined. These were in-turn used to calculate the daily weight gain (DWG). Daily mean feed intakes were also determined by subtracting the weight of left – over feed from the quantity offered the previous day. Feed conversion ratio on the other hand,

Ingredients	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5(100%)	
Maize	45.73	34.29	22.87	11.43	0.00	
QPM	0.00	11.43	22.87	34.29	45.73	ement
FFSB	33.57	33.57	33.57	33.57	33.57	ecorded
Wheat offal	10	10	10	10	10	
Fish meal	5	5	5	5	5	
Bone meal	2.5	2.5	2.5	2.5	2.5	
Lime stone	2.5	2.5	2.5	2.5	2.5	
Premix	0.25	0.25	0.25	0.25	0.25	
Salt	0.25	0.25	0.25	0.25	0.25	
Lysine	0.10	0.10	0.10	0.10	0.10	
Methionine	0.10	0.10	0.10	0.10	0.10	
Total	100	100	100	100	100	
Calculated analysis						
ME (kcal/kg)	3007.26	3006.92	3006.23	3006.92	3007.26	
Crude protein (%)	22.95	22.95	22.95	22.95	22.95	
Maize	52.10	39.07	26.05	13.03	0.00	

QPM	0.00	13.03	26.05	39.05	52.10
FFSB	27.00	27.00	27.00	27.00	27.00
Wheat Offal	12	12	12	12	12
Fish Meal	3	3	3	3	3
Borne Meal	3	3	3	3	3
Lysine	2	2	2	2	2
Premix	0.25	0.25	0.25	0.25	0.25
Salt	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

ME (kcal/kg)	2989.27	3009.27	2989.27	2989.27	2989.27
Crude protein (%)	20	20	20	20	20

Table 3: Performance of broiler chickens fed quality protein maize as replacement for maize (Starter Phase)

PARAMETER	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5(100%)
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IW (g)	160.83	163.33	162.50	162.50	174.17
BW (g)	608.33	668.53	637.50	601.51	623.10
FBW (g)	2094.4	1974.2	1950.5	2050.0	2080.6
DFI (g)	56.40	57.81	53.34	54.45	56.16
DWG (g)	15.70	17.26	16.66	15.09	15.70
FCR	3.59	3.34	3.21	3.64	3.58
MORT (number) (g)	0	1	1	1	0

CONCLUSIONS

The study revealed as follows:

Replacing maize with QPM in broiler diets had no significant influence on the productive performance and carcass characteristics.

The study showed that treatment three (T₃) had the lowest cost of feed per kg body weight gain.

RECOMMENDATIONS

From the findings of the research it is recommended that:

QPM can be used in place of the conventional maize (Normal Maize) in broiler chicken diets without compromising the over roll performance and economic advantage.

Further studies should be conducted using QPM in other species of monogastric animals, to determine its suitability.

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