

AMM -10

Carcass Characteristics of Broiler Chickens Raised on Dual and Triple Phase Feeding Regimes

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Abstract

Dual phase and triple phase feeding regimes were assessed with respect to carcass and organ parameters of broilers, as well as proximate analysis of its meat. The dual phase feeding regimes T1 (28 days starter mash, 28 days finisher mash), T2 (35 days starter mash, 21 days finisher mash), T3 (21 days starter mash, 35 days finisher mash) and two triple phase feeding regimes T4 (7 days starter mash, 14 days grower mash, 35 days finisher mash), T5 (21 days starter mash, 14 days grower mash, 21 days finisher mash) were adopted. A total of 120 broilers were allocated to these five treatments at the rate of 24 birds per treatment which were subdivided into 3 replicates with 8 birds per replicate. Analysis of carcass parts after 56 days trial shows weight of breast part in T1, T2, T3, T4 and T5 were 518.87g, 526.05g, 499.44g, 491.29g and 482.69g respectively. Breast part in T2 was significantly higher ($p < 0.05$) than that in the two triple phase regimes. Thigh weight varied significantly ($p < 0.05$), but with no specific trend. However, there was no significant difference ($p > 0.05$) that could be attributed to feeding regimes used in this trial in terms of liver weight, abdominal fat weight, wing weight, drumstick weight and heart weight. But the head weight, gizzard weight and intestine weight differed significantly ($p < 0.05$) amongst treatments.

Keywords: Phase feeding, carcass, broilers

Introduction

Energy intake in excess of the requirements for maintenance and production in broiler chickens is converted into fat with probable adverse effect on human health. Several qualitative and quantitative feeding regimes have therefore been employed in attempts to restrict feed intake of broilers in order to reduce feeding cost and fat deposition, improve feed efficiency, lessen the frequency of occurrence of metabolic diseases in the birds and reduce the unfavorable effects of fat on human health. For sustained growth and efficient meat production in the country, better feeding and management strategies need to be employed. Among these, phase feeding and provision of proper stocking density can help in managing the nutrient and space requirement of broilers needed to maximize their productivity. Phase feeding is performed to take advantage from the changes in nutrient requirements of broilers at various stages of growth. The NRC (1994) recommends a single set of feeding both for male and female broilers, with dietary amino acid requirements segregated into three fixed periods including the starter (0 to 3 weeks), grower (3 to 6 weeks), and finisher phases (6 to 8 weeks). Phase feeding is a good means of reducing feed costs during the grower and finisher phases (Pope and Emmert, 2001) without influencing performance and having environmental benefits.

The most common feeding system in practice by Nigerian farmers currently depends on the available commercial feed in the country. For instance, commercial millers now produce two sets of feeds for broilers; broiler starter (high protein, lower energy) and broiler finisher (high energy, lower protein) diets. On experimental basis, broilers are given pre starter diets from 1-14 days, starter diet 15-21 days and finisher diet from 21 days till maturity. But the common practice does not portend this because the pre starter diet is not often available on commercial basis. Shariatmadari (2009) noted however, that shortcomings in the traditional feeding systems have made way for introduction of different approaches; alternate (subsequent), dual phase/choice feeding as some of the feeding presentation and phasing.

The aim of this study was to compare the carcass and organ parameters of broilers raised on the dual and triple phase feeding regimes.

Materials and Methods

This research was carried out in the Teaching and Research Farm of Federal University of Technology, Owerri. The experimental design was Completely Randomized Design (CRD) and 120 unsexed broilers were used. Five treatments sub divided into three replicates of 8 birds were designed as follows (Table 1):

Table 1: Experimental plan and arrangement of treatments

Feed	T1	T2	T3	T4	T5
Starter broiler mash	0-28	0-35	0-21	0-7	0-21
Broiler grower mash	—	—	—	8-21	22-35
Finisher broiler mash	29-56	36-56	22-56	22-56	36-56

Birds were fed for eight weeks with the experimental diet (Table 2) under deep litter management system in an open-sided poultry house. Management practices including *ad libitum* feeding, provision of drinking water, vaccination and medication as well as proper sanitation were adopted. Randomly picked birds were picked and slaughtered at the end and carcasses were assessed.

Table 2: Ingredient composition of experimental broiler diets

Ingredients (%)	Starter Broiler	Broiler Grower	Finisher Broiler
Maize	51.00	55.00	60.00
Soybean	31.45	20.00	22.00
PKC	10.00	18.20	11.95
Fish meal	4.00	3.50	2.50
Bone meal	2.50	2.25	2.50
Salt	0.30	0.30	0.30
Premix (Vit/Min)*	0.25	0.25	0.25
Lysine	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Total	100.00	100.00	100.00
Calculated Composition of diet			
Crude Protein (%)	23.14	20.14	18.80
ME (kcal/kg)	2974.82	2923.55	2984.60
Calcium	1.27	1.13	1.16
Phosphorus	0.75	0.64	0.66
Lysine	1.24	0.96	0.94
Methionine	0.40	0.35	0.36

*Premix (Vit/Minerals) contains per kg of diet: 7714iuVit. A; 2204iuVit. D3; 16.53iuVit. E; 0.013 mg Vit. B12; 6.6mg riboflavin; 39mg niacin; 10mg pantothenic acid; 495mg Choline; 1.5mg Vit. K; 0.9mg folic acid; 1.54mg thiamin; 2.76mg pyridoxine; 0.066mg D-biotin; 125mg ethoxyquin; 0.1mg Se. Source: Manufacturers label (Hi-Nutrient premix)

Results and Discussion

Carcass characteristics of the experimental broilers are presented in tables 3. Dressed weight of broiler chickens under T2 (1691.48 g) was significantly higher than the mean of those from T4 and T5 which were respectively 1592.52 and 1568.70 g.

Table 3: Carcass characteristics of broilers raised on dual and triple phase feeding regimes.

Parameters (g)	T1	T2	T3	T4	T5	±SEM
Dressed Wt.	1643.04 ^{ab}	1691.48 ^a	1599.74 ^b	1592.52 ^b	1568.70 ^b	21.68
Wt. of liver	35.48	36.97	33.62	33.33	34.94	0.92
Wt. of intestine	105.10 ^a	76.22 ^b	118.77 ^a	97.21 ^{ab}	99.52 ^{ab}	6.90
Wt. of head	39.95 ^b	47.71 ^a	48.55 ^a	37.57 ^b	42.99 ^a	1.70
Wt. of gizzard	74.88 ^{ab}	62.25 ^b	77.55 ^a	58.78 ^b	78.22 ^a	3.73
Wt. of *abd fat	2.88	2.48	2.33	2.43	2.70	0.18
Wt. of wings	180.58	179.55	180.48	163.91	187.89	6.13
Wt. of drumstick	204.89	238.45	240.69	232.42	251.15	12.28
Wt. of heart	6.70	7.26	7.43	7.68	7.98	0.38

Wt. of breast	518.87 ^{ab}	526.05 ^a	499.44 ^{ab}	491.29 ^b	482.69 ^b	8.18
Wt. of thigh	535.96 ^{ab}	554.81 ^a	510.04 ^{ab}	519.96 ^b	503.08 ^b	9.31

^{ab} Means on the same row with different superscript are significantly different (P<0.05).

±SEM: Standard Error of Means, *abd = Abdominal. *Wt = Weight.

However, there were no significant differences (p>0.05) between T1 and T2, as well as between T1, T3, T4 and T5 with respect to dressed weight. There were significant differences (p<0.05) in weights of head, gizzard, and intestine of broiler chickens in this trial without particular preference to feeding phase adopted here. Breast weight in T2 was the highest at 526.05g which was significantly (p<0.05) higher than those in T4 and T5. Similarly, thigh muscle weight in T2 was on average 554.81g which was also significantly higher than those of T4 and T5. But Watkins (1993) reported that feeding broilers at a stage with grower mash did not affect performance. Pope and Emmert (2001) multiple phase feeding is better because of improve feed efficiency and reduced cost of feeding.

It follows from the data that the weights of major carcass parts (breast and thigh) in dual phase feeding regimes were higher than those in triple feeding phases adopted in this study. Dressed carcass weight tended to be higher in dual phase feeding regimes than in triple phase feeding phases too.

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