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THE EFFECT OF VARIOUS COMMERCIAL FEEDS ON THE PERFORMANCE AND MEAT QUALITY OF NOILER CHICKENS

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Abstract

This study was conducted to evaluate the growth performance, carcass characteristics, meat quality and cost effectiveness in Noiler chickens fed five commercial diets coded as T1, T2, T3, T4 and T5. A total of 240 Noiler chicks were allotted to five dietary treatments with 45 birds per diet and 15 birds per replicate in a completely randomized design. Feed and water were supplied *ad libitum*, the experiment lasted for 16 weeks. The daily feed intake at starter phase 5-8 weeks (55.15 – 16.19g), daily weight gain (20.03 – 21.41g), feed conversion ratio (2.70 – 3.05). 9-16 weeks at grower's phase, daily feed intake (3.74 – 3.80g), daily weight gain (73.22 – 74.29g), total weight gain (1092.63-1097.63), were significantly affected by the dietary treatments ($P < 0.05$). Most of the carcass parameters measured were significantly different ($P < 0.05$) by the treatments. However, non significant variations were observed in live and neck weight. The sharp practice of feed companies and high cost of commercial feed made it difficult for noiler production less profitable despite the fast growing and low mortality rate of noiler chickens. The different commercial feeds did not have any detrimental effect on carcass yields, internal organs and meat quality of the experimental animals.

Key words: Commercial, feeds, performance, meat, noiler chickens

Introduction

Poultry feeds is the most expensive singular input in poultry production business, it accounts for 60-70% of the total cost in poultry production business (Abel, *et al.* 2014). Global consumption of poultry meat in Nigeria has consistently increased to over the years and this trend is expected to continue (FAO, 2011). Broiler chickens are species of *Gallus domesticus* that are mainly reared for the purpose of meat. In Nigeria the poultry industry has gone through many policy changes from 1960 to date. Poultry feed is one of the most important factor that determine poultry production and the success of the poultry business. Feed constitute about 60-70% of the total cost of production (Nwosu *et al.*, 1999) and this has led to the quest for least cost dietary formulation. According to FAO (2017), the prevalence of hunger is on the in Africa, with central and West Africa faring the worst. The report further disclosed that not less than 20% of the population in these regions is undernourished. The deterioration of the food security situation and the lack of progress towards the WHO global nutrition targets makes it imperative for countries to step up their efforts. The development of the poultry industry has been identified as the fastest way of bringing the animal protein deficiency gap. The World Data Atlas (2017) revealed that in 2006, Nigeria produced 232,100mt of poultry meat. However, this quantity decreased to 201,493mt in 2017. A number of factors might be responsible for this decline. Notable among them is the increasing cost of poultry feed ingredients and that of finished commercial feeds that often contain sub-standard nutrient levels. In a similar way, the need to overhaul the quality control agencies of the country in order to check-mate sharp practices in feed manufacturing industries cannot be underscored. Furthermore, research work to determine the efficiency of different commercial feeds available in the markets would go a long way in ensuring that feed companies live up their responsibility of producing quality feeds.



Materials and Methods

The project was conducted at the Teaching and Research Farm of the Federal College of Land Resources Technology, Kuru-Jos, Plateau State. A total of 240 day-old Noiler (local x exotic hybrid) straight run chicks were used for the study. The day-old chicks were purchased from a reputable hatchery (Amo Nigeria Ltd) distributor in Jos, Plateau State. Five commercially available poultry feed within Jos environs were randomly selected to be used for this study. The five different feeds represent the five treatments designated T₁, T₂, T₃, T₄ and T₅, respectively. Each treatment is replicated three times with 15 birds per replicate. This culminates in 45 birds per treatment. The birds were grouped using a completely randomized design. Daily Weight Gain (DWG), Daily Feed Intake (DFI), Feed Conversion Ratio (FCR) and mortality were the performance parameters monitored during the study.

At the end of the experiment, two (2) birds per replicate were randomly selected to evaluate their carcass parameters. The standard analytical methods AOAC (1990) was used to determine dry matter (DM), crude protein (CP), Ether Extract (EE), whereas Nitrogen Free Extract (NFE) and metabolizable energy (ME) was calculated.

Results and Discussion

Table 1: Performance of Noilers fed different commercial diets at starter phase (5 -8weeks)

Parameters	Commercial diets					SEM
	T1	T2	T3	T4	T5	
Initial weight (g)	291.01	291.36	290.99	292.02	291.30	0.22 ^{NS}
Final weight (g)	859.30 ^d	865.46 ^c	877.26 ^b	852.90 ^a	890.80 ^a	3.96 [*]
Weight gain (g)	568.29 ^d	574.11 ^c	586.28 ^b	560.88 ^a	599.50 ^a	4.02 [*]
Feed consumed (g)	1656.67 ^c	1549.97 ^d	1544.43 ^a	1713.57 ^a	1657.43 ^b	17.97 [*]
Feed to Gain (FCR)	2.91 ^b	2.70 ^d	2.63 ^a	3.05 ^a	2.77 ^c	0.04 [*]
Mortality	1	0	0	1	0	

abcde: means within rows with different superscripts differ significantly (P<0.05).

Table 2: Performance of Noilers fed different commercial diets at grower phase (9-16 weeks)

Parameters	Commercial diets					SEM
	T1	T2	T3	T4	T5	
Initial weight of Noilers (g)	859.30 ^d	865.46 ^c	877.26 ^b	852.90 ^e	890.80 ^a	3.96 [*]
Final weight of Noilers(g)	1952.55 ^d	1960.44 ^c	1969.90 ^b	1948.63 ^e	1988.43 ^a	4.04 [*]
Weight gain of Noilers (g)	1093.25	1094.98	1092.63	1095.73	1097.63	1.96 ^{NS}
Feed consumed(g)	4111.48 ^c	4160.60 ^a	4101.23 ^d	4117.60 ^b	4100.87 ^e	7.69 [*]
Feed to Gain (FCR)	3.76	3.80	3.75	3.76	3.74	0.01 ^{NS}
Mortality	2	1	0	2	1	

abcde: means within rows with different superscripts differ significantly (P<0.05).



Table 3: Performance of Noilers fed different commercial diets for overall phase (5-16wks)

Parameters	Commercial diets					SEM
	T1	T2	T3	T4	T5	
Initial weight(g)	291.01	291.36	290.99	292.02	291.30	0.22 ^{NS}
Final weight(g)	1952.55 ^d	1960.44 ^e	1969.90 ^b	1948.63 ^a	1988.43 ^a	4.04 [*]
Weight gain(g)	1661.54 ^a	1669.08 ^b	1678.91 ^c	1656.61 ^d	1697.13 ^a	1.96 [*]
Feed consumed (g)	5768.15 ^b	5710.57 ^c	5645.66 ^a	5831.17 ^a	5758.30 ^d	7.68 [*]
Feed to Gain (FCR)	3.47	3.42	3.36	3.52	3.39	0.01 ^{NS}

abcde: means within rows with different superscripts differ significantly (P<0.05).

Table 4: Carcass characteristics of Noilers fed different commercial feed

Parameters	Commercial diets					SEM
	T1	T2	T3	T4	T5	
Live (g)	1927.22	1928.11	1926.90	1926.63	1927.76	0.27 ^{NS}
Carcass (g)	1358.52 ^a	1346.52 ^d	1358.30 ^b	1344.60 ^e	1354.11 ^c	1.61 [*]
Dressing %	69.61	68.81	69.53	68.94	69.18	0.44 [*]
Breast (g)	369.22 ^a	368.85 ^c	365.94 ^d	348.14 ^e	344.62 ^b	2.83 [*]
Thigh (g)	226.92 ^c	224.91 ^a	234.27 ^a	231.95 ^b	226.20 ^d	1.06 [*]
Drumstick (g)	217.67 ^c	215.77 ^a	223.30 ^a	221.09 ^b	216.96 ^d	0.87 [*]
Back weight(g)	283.09 ^c	280.45 ^a	283.76 ^b	284.95 ^a	282.03 ^d	0.49 [*]
Wing (g)	177.75 ^a	176.05 ^c	173.94 ^d	172.89 ^e	177.04 ^b	0.55 [*]
Neck weight(g)	87.30	86.40	88.57	88.38	86.88	0.36 ^{NS}

abcde: means within rows with different superscripts differ significantly (P<0.05).

Table 5: Non-Carcass characteristics of Noilers fed different commercial feed

Parameters (g)	Commercial diets					SEM
	T1	T2	T3	T4	T5	
Head	47.56	47.23	46.31	47.90	47.32	0.32 ^{NS}
Shank	60.21	59.82	57.80	59.50	60.06	0.37 ^{NS}
Gizzard	39.33	38.99	39.59	41.08	39.18	0.35 ^{NS}
Liver	29.94	29.68	29.57	30.06	29.72	0.13 ^{NS}
Heart	6.68	6.46	7.44	6.58	6.85	0.30 ^{NS}
Spleen	2.09	2.15	2.14	2.17	2.09	0.02 ^{NS}
Intestine	91.13 ^c	90.78 ^e	91.83 ^b	93.62 ^a	91.11 ^d	0.27 [*]
Blood	49.51 ^a	49.31 ^c	43.82 ^e	47.70 ^d	49.47 ^b	0.58 [*]
Feather	154.29 ^a	153.58 ^c	152.21 ^e	153.09 ^d	154.17 ^b	0.21 [*]

abcde: means within rows with different superscripts differ significantly (P<0.05).



Table 6: Proximate analysis of selected portions of carcass of noilers fed different commercial diets

Parameters	Commercial diets					SEM
	T1	T2	T3	T4	T5	
DM breast	26.27 ^b	25.29 ^d	26.51 ^a	25.18 ^a	25.44 ^c	0.15*
DM thigh	25.51 ^b	25.73 ^a	24.43 ^d	24.16 ^a	25.09 ^c	0.17*
DM drumstick	24.55 ^a	24.42 ^c	24.21 ^a	24.24 ^d	24.43 ^b	0.05*
CP breast	23.85+0.06 ^a	23.20 ^b	22.55 ^d	23.14 ^c	22.24 ^a	0.15*
CP thigh	21.66+0.06 ^b	21.69 ^a	21.46 ^c	21.08 ^a	21.12 ^d	0.08*
CP drumstick	21.04+0.12 ^b	21.11+0.10 ^a	20.89 ^d	20.79 ^a	20.95 ^c	0.04*
Ash breast	5.09+0.03 ^a	4.89 ^b	3.84 ^a	3.89 ^d	4.33 ^c	0.14*
Ash thigh	5.46+0.02 ^b	5.50 ^a	4.30	5.21 ^c	4.36 ^d	0.14*
Ash drumstick	5.24 ^a	5.23 ^b	4.40 ^a	4.62 ^d	4.67 ^c	0.09*
EE breast	3.40 ^a	3.29 ^c	3.15 ^a	3.39 ^b	3.26 ^d	0.03*
EE thigh	3.91 ^a	3.87 ^c	3.74 ^a	3.81 ^d	3.87 ^b	0.02*
EE drumstick	3.60 ^a	3.49 ^c	3.21 ^a	3.42 ^d	3.54 ^b	0.04*

abcde: means within rows with different superscripts differ significantly ($P < 0.05$), DM = dry matter, CP = crude protein, EE = ether extract.

Table 7: Economic Analysis of commercial feeds used in feeding noilers

Parameters	Commercial diets				
	T1	T2	T3	T4	T5
Total feed intake (g)	5768.15	5710.57	5645.66	5831.17	5758.3
Price/25kg bag (₦)	5750.00	5800.00	6000.00	5900.00	5800.00
Feed cost/g (₦)	0.230	0.232	0.240	0.236	0.232
Total feed cost (₦)	1322.50	1345.60	1440.00	1392.40	1345.60
Total weight gained (g)	1661.54	1669.08	1678.91	1656.61	1697.13
Feed cost per gram gain (₦)	0.80	0.81	0.86	0.84	0.79

The nutritional composition of the diets were inadequate to meet the requirements of broiler starter and finisher irrespective of the breed. The basis for compounding commercial feed for poultry feed is to meet up with the nutritional requirement of poultry birds (Cerrate and Waldroup, 2009). Most commercially produced poultry feed is produced in granular form for easy and fast conversion of flesh (Cultipet *al.*, 2006) and nutritive value of most commercially produced feed affects the growth performance of broiler chicken either negatively or positively the proximate composition of the commercial feed use in this study meet the nutritional requirement of broiler chicken recommended by NRC (1994).

Traditionally, the salient criteria for appraising the performance of the broiler strain have been the growth rate and feed conversion efficiency, and less frequently carcass composition, (Cahaneret *al.*, 1987; Cabel and Waldroup, 1991; Rezaei *al.*; 2004).

Conclusion and Recommendations

The study indicates that using commercial feeds did not result in lower cost of feeding Noilers despite the high feed conversion ratio. The result did not show any detrimental effect of the different commercial feeds used on carcass yield, internal organs parameters. Proximate analysis also revealed that none of the feeds has the recommended crude protein percentage of 23% for starter diet and 16CP% of growers. It was therefore recommended that, there is need to overhaul the quality control agencies of the country in order to check-mate sharp practices in feed manufacturing industries cannot be underscored. Furthermore,



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research work were recommended to determine the efficiency of different commercial feeds available in the market.

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