

CARCASS CHARACTERISTICS OF BROILERS FED PERIWINKLE FLESH AND PALM KERNEL CAKE

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Received 2 May, 1994; Accepted 5 August, 1995

ABSTRACT

Feeding 180 hyperco broiler chicks varying levels of palm kernel cake (PKC), fishmeal and periwinkle flesh, showed that 25% PKC fed along with either 2% fishmeal or 6% periwinkle flesh significantly ($P < 0.05$) improved carcass traits while the experimental feeds had no significant effect on the abdominal fat pad level, but the birds had smaller heads and intestines. Key words: Broiler, Periwinkle, carcass traits; flesh

INTRODUCTION

Animals require calorie and protein for energy, growth and body repairs. It is however, getting more difficult to meet even the basal nutritional maintenance requirements of human beings and livestock especially in the third world countries. This is due to lack of properly compounded rations and the high cost of feeds. Inexpensive feeding-stuffs, coupled with a proper knowledge of the nutrient requirements of broilers, will therefore be necessary. Mba *et al.* (1974), Babatunde and Fetuga (1976) and Olumu (1976) have studied the protein and energy requirements of broilers. Olomu (1978) reviewed the nutrient requirements, sources, and contents of feed ingredients in Nigeria. Ogunmode (1978, 1980 a, b) investigated the mineral and vitamin requirements of birds in the tropics. This study therefore, is an attempt to monitor the carcass characteristics of eight weeks old broilers fed relatively inexpensive and locally available feeding stuffs, namely palm kernel cake and periwinkle flesh.

MATERIALS AND METHODS

One hundred and eighty day old Hyperco strain broiler chicks randomly assigned to five pens with three replicates having 12 chicks each were raised on deep litter for 8 weeks. Five isocaloric and iso-nitrogenous rations were formulated with the control ration designated Diet A without PKC and periwinkle flesh. Diet B with low level of PKC and no periwinkle; Diet C with high level of PKC and no periwinkle; Diet D with high level of PKC and low level of periwinkle Diet E with High level of PKC and high level of periwinkle. The four experimental rations contained either 15% or 25% Palm Kernel Cake in addition to a gradual replacement of fishmeal by periwinkle flesh (Table 1). Feed and water were supplied *ad Libitum*.

At the end of eight weeks of study, 3 birds were randomly selected per replicate using the method of Adams *et al* (1986). The birds were starved for 12 hours, weighed and killed by severing their carotid arteries. The slaughtered birds were bled by turning them upside down after which they were weighed and then steeped in hot water at 80°C for 5 minutes. They were then defeathered, weighed and dressed. The following measurements were taken thereafter: dressed weight, weight of abdominal fat pad, weights of gizzard, liver, heart, neck, shank and feet and intestines.

RESULTS

Mean values of the carcass performance traits are presented in Table 2. Mean values of the traits studied for birds fed Diet C or Diet E were not significantly different from each other. The values were however higher than those from birds fed Diet A or B. Mean values for the carcass traits studied for these two groups (Diet A or B) were not

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TABLE 1: PERCENTAGE COMPOSITION OF EXPERIMENTAL DIETS FED BROILERS.

INGREDIENTS	DIETS				
	A	B	C	D	E
Maize	50.00	43.68	40.20	40.95	42.39
Groundnut Cake	18.62	15.07	11.95	12.30	10.78
Fish Meal	2.00	2.00	2.00	1.00	0.00
Blood Meal	5.00	5.00	5.50	5.00	5.00
Palm Kernel Cake	0.00	15.00	25.00	25.00	25.00
Periwinkle Flesh	0.00	0.00	0.00	2.47	6.00
Dried Brewer's Grain	8.98	8.00	8.00	7.83	6.00
Wheat Offal	11.55	8.30	4.40	2.47	1.88
Bone Meal	3.00	2.10	2.10	2.10	1.70
*Vit-Min Premix	0.25	0.25	0.25	0.25	0.25
DL - Methionine	0.20	0.20	0.20	0.20	0.20
L - Lysine	0.00	0.00	0.00	0.03	0.04
Salt	0.40	0.40	0.40	0.40	0.40
TOTAL	100.00	100.00	100.00	100.00	100.00

Calculated Analysis

M.E. Kcals/Kg	2800.06	2800.13	2800.22	2799.81	2800.28
Crude Protein	23.09	23.02	22.97	23.01	22.99
Crude Fibre	4.30	5.38	6.02	6.11	4.73
Ether Extract	4.23	4.49	4.64	4.52	4.37
L - Lysine	1.05	1.05	1.04	0.98	1.26
DL - Methionine	0.52	0.53	0.54	0.50	0.49
Ca	1.34	1.02	1.03	1.18	1.27
P	0.66	0.53	0.52	0.46	0.43
Protein: Energy ratio	121.27	121.64	121.91	121.68	121.80

*The following were present per kg: Vit. A, 9,000,000 I.U., Vit. D, 1,280,000 I.U., Vit. E, 7,000 I.U., Riboflavinm 6,000 Mg, Vit B₃, 2,200 mg, Vit. B₅, 14,000 Mg, Lysine, 120,000 Mg, Methionine, 65,000 mg, Choline chloride, 240,000 Mg, Mn, 60,000 mg, Fe, 35,000 mg, Cu, 5,000 mg, I₂, 1,100 mg, Se, 100 mg, Anti oxidant, 125,000 mg.

(Source: Okon and Ogunmodede (In Press))

significantly different from each other ($P > 0.05$). However, Diets A, B and D were significantly different from Diets C and E for all the traits ($P < 0.05$). When these carcass traits were expressed as a percentage of live weight (Table 2), mean values for birds fed Diet C or Diet E while being consistently similar, were among the groups with comparatively higher values for the various traits considered. The birds fed diet A or B had values that were significantly different in respect of their slaughtered weight and total edible meat. ($P < 0.05$).

Apart from the drum-sticks, weights of cut-up parts were not statistically different

from each other for birds fed Diet C or Diet E. Mean values for birds fed either Diet B or Diet D were also similar. The results show that periwinkle flesh fed along with palm kernel cake improved performance of the broilers if the cut-up parts of the control group serve as the reference point. There was no significant difference between the mean values obtained from the different dietary groups for all parameters examined when the cut-up parts were expressed as a percentage of live-weight (Table 3). Non-significant treatment differences ($P > 0.05$) were observed for the weights of abdominal fat pad, gizzard, heart and liver (Table 4). Birds fed Diets B, C and E

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TABLE 2: CARCASS PERFORMANCE TRAITS* OF BROILERS

Carcass Traits	DIETARY TREATMENTS				
	A	B	C	D	E
Pre-slaughter wt (kg)	1.42±0.10 _b	1.45±0.05 _b	1.57±0.08 _a	1.32±0.13 _b	1.52±0.10 _b
Slaughter wt. (kg)	1.36±0.09 _b	1.35±0.06 _b	1.51±0.08 _a	1.25±0.13 _c	1.44±0.13 _b
Plucked wt. (kg)	1.25±0.09 _b	1.30±0.05 _b	1.43±0.05 _a	1.20±0.13 _b	1.41±0.14 _a
Dressed wt. (kg)	0.89±0.04 _b	0.89±0.06 _b	1.02±0.06 _a	0.84±0.08 _b	1.04±0.14 _a
Total edible meat (g)	491.11±19.89 _b	492.95±30.39	564.68±30.39 _a	465.36±44.26 _b	572.04±74.51 _a
Total bone wt. (g)	328.49±13.31 _b	329.70±20.33	377.70±20.33	311.27±29.60 _b	382.63±49.84 _a

* Values denoted by different subscripts for a given parameter were significantly different (P < 0.05)

Carcass traits as % of live wt

Slaughtered wt.	95.81±0.97 _a	93.31±1.87 _b	96.59±0.43	95.18±2.48 _a	95.07±2.04 _a
Plucked wt.	88.36±4.98 _a	89.65±0.36 _b	91.12±1.84 _a	91.08±2.38 _a	91.12±2.04 _a
Dressed wt.	62.93±2.16 _b	61.57±1.67 _b	65.3±0.58 _a	64.05±1.15 _{ab}	68.17±2.47 _a
Total edible meat	34.72±1.19 _b	33.97±0.62 _b	24.11±0.32 _a	35.35±1.64 _b	37.65±2.47 _a
Total bone wt.	23.23±0.79 _b	22.73±0.62 _b	24.11±0.22 _{ac}	23.64±0.42 _{ab}	25.16±1.67 _a

had heavier heads although there was no significant difference between the mean weight of the heads of birds fed Diets A D & E. Birds fed Diet C had significantly heavier shanks and feet followed by birds fed diets B, D and E; while birds fed diet A had the heaviest shanks and feet. (73.96±18.67). For the intestines, birds fed Diets A,B and C had heavier intestines than other diet although there was no significant differences between the mean weight of intestines from birds fed diets C,D,E. When the absolute weights presented in Table 4 were expressed as a percentage of liveweight (Table 4), dietary treatment appeared to have affected only the weight of the head.

DISCUSSION

The mean carcass weights in this study were higher than those reported by Benoff (1981) but lower than those reported by Hause and Marion (1973) Kiker (1976) Lesson And Summers (1983). The percentage mean dressed weights were comparable to those of Moron *et al* (1970) and higher than those of Tarrago and Puchal (1977), but they were lower than those reported by Kiker (1976), Lesson and Summers (1983). The percentage total edible meat and total bone weight were

higher than those of Tarrago and Puchal (1977) but compable with those reported by Hause and Marion (1973). The differences in results observed in respect of carcass traits may be due to the types of experimental diets, strains of birds and the nature of the routine management techniques employed. The better performance of broiler chicks fed Diet C or Diet E is contrary to the findings of Yeong (1980) who did not observe any significant difference in the dressing percentage of broilers fed different levels of PKC. The difference here could be due to the strains of birds fed and the stage at which the experiment was terminated. Except for the drum sticks, there was no significant differences between weights of the cut-up parts of birds fed Diet C, or E. The improved performance of broiler chicks fed Diet C or E again buttresses the fact that birds can actually tolerate high levels of fibre and that PKC could be a far more nutritive feed ingredient than hitherto believed.

Feeding Diet C or E to the birds did not significantly increase their abdominal fat level of birds. Also, either of these diets resulted in birds having smaller heads and intestines. This may have accounted for their high percentage dressed weight and total edible meat. Further

TABLE 3: WEIGHT OF CUT-UP PARTS (g) * OF BROILERS

Cut-Up Parts	DIETARY TREATMENTS				
	A	B	C	D	E
Breast	190.02±3.00 _b	180.01±2.11 _{bc}	230.09±2.00 _a	170.11±2.33	210.03±6.67 _a
Back	180.00±1.00 _a	200.02±6.13 _{ab}	230.00±300 _a	170.01±1.50 _{bc}	220.13±3.00 _a
Thigh	120.11±0.06	140.00±2.00	150.13±2.17	130.00±2.97 _{bc}	150.03±0.97 _a
Drum-Sticks	130.00±1.01 _c	140.03±0.96 _b	140.01±1.00 _b	130.04±0.98 _c	150.00±0.03 _a
Wings	110.00±0.97 _b	110.01±1.00	130.11±2.00 _a	110.00±1.00 _b	120.03±2.06 _a
Neck	59.95±1.63 _b	61.45±2.92 _{ab}	69.07±6.30 _a	54.27±14.51 _b	67.99±10.12 _a

* Values denoted by different subscripts for a given parameter were significantly different (P < 0.05)

Cut-Up Parts as % of Live wt.

Breast	13.66±0.28	12.39±0.95	14.87±1.42	13.18±1.25	14.00±1.95
Back	12.54±1.66	13.80±1.27	14.67±0.48	12.87±0.81	14.49±1.05
Thigh	8.50±0.64	9.43±0.20	9.79±0.18	9.60±1.00	9.92±0.70
Drum-Sticks	9.18±0.19	9.41±0.75	9.15±0.51	10.19±1.30	9.69±0.31
Wings	7.53±0.57	7.57±0.96	8.48±1.00	8.68±1.22	8.10±0.95
Neck	4.24±0.22	4.24±0.27	4.41±0.33	4.11±0.90	4.47±0.42

There was no statistical difference between means (P > 0.05)

TABLE 4: WEIGHTS OF ABDOMINAL FAT PAD, HEAD, SHANKS AND FEET AND SOME SELECTED ORGANS (g)*

Parameters	DIETARY TREATMENTS				
	A	B	C	D	E
Abdominal Fat Pad	19.15±2.58	30.63±2.94	27.26±2.64	24.02±1.45	28.49±1.63
Head	57.88±5.30	62.92±2.97 _a	62.21±2.79	58.39±1.39 _b	60.18±3.02 _{ab}
Shanks and Feet	73.96±18.67 _a	82.22±11.79 _b	91.29±6.66	83.87±3.51 _a	80.84±9.34 _b
Gizzard	33.61±3.46 _a	34.83±2.96 _b	38.84±2.81 _a	37.42±5.00 _b	36.07±7.83
Heart	5.78±0.60	7.07±0.29	6.74±0.18	6.71±1.15	7.25±0.85
Liver	32.18±6.02	28.05±3.22	29.20±5.65	25.45±2.95	32.52±1.82
Intestines	104.40±22.74 _a	110.82±12.79	99.49±11.53 _{ab}	94.72±19.62 _b	97.24±14.67 _b

* Values denoted by different subscripts for a given parameter were significantly different (P < 0.05)

CUT-UP PARTS EXPRESSED AS A PERCENTAGE OF LIVE WEIGHT

Cut-up Parts as % of Live wt.	DIETARY TREATMENTS				
	A	B	C	D	E
Breast	13.66±0.28	12.39±0.95	14.87±1.42	13.18±1.25	14.00±1.95
Back	12.54±1.66	13.80±1.27	14.67±0.48	12.87±0.81	14.49±1.05
Thigh	8.50±0.64	9.43±0.20	9.79±0.18	9.60±1.00	9.92±0.70
Drum- Sticks	9.18±0.19	9.41±0.75	9.15±0.51	10.19±1.30	9.69±0.31
Wings	7.53±0.57	7.57±0.96	8.48±1.00	8.68±1.22	8.10±0.95
Neck	4.24±0.22	4.24±0.27	4.41±0.33	4.11±0.90	4.47±0.42

There was no stastical difference between means (P < 0.05)

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research into this would be enlightening, for if diet affects the weight of intestines, it may then be possible to compound rations that would yield the least possible weight of offals, thereby, increasing the percentage dressed weight, thus providing more edible meat for the table and as such increase the profit margin of broiler farmers.

In Conclusion The edible meat yield is about the best indicator of the efficient utilization of feed ingredients by broilers. Feeding broilers 25% PKC along with either 2% fishmeal or 6% periwinkle flesh did not only improve mean dressing percentage, but also improved the weight of the cut-up parts and the total edible meat yield. It also resulted in birds with smaller heads and intestines. There exists therefore, the possibility that diet may affect the weight of the head and intestines. Further research into this, is necessary. Also, 6% periwinkle flesh would conveniently replace 2% fishmeal where the latter is not easily available when compounding broiler ration.

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