EFFECT OF SLAUGHTER WEIGHT ON PERFORMANCE AND CARCASE CHARACTERISTICS OF COCKEREIS

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SUMMARY

Finishing copkerels of Brown Hisex (egg laying strain) to 1.5 kg liveweight produced a carcase weighing about 1. 0 kg at a feed conversion ratio of 4.70. Cuts as breast, thigh and drum stick as well as muscle yield were significantly‘ (P < 001) greater in cockerels slaughtered at heavier than at lighter weight. Sales revenue was greater when cockerels were finished to 1. 5 kg liveweight than to a lighter weight of 1.0 kg. Selling on livewight base saved the costs of processing and gave more return than selling on carcase weigh! bases.

INTRODUCTION

In developing countries the production oi‘ meat especially that of poultry is low. FAO U987) estimates of poultry meat production in developing countries was 12000 Meteric Tonnes in the year i986 while that of Sudan was l6 Meteric Tonnes only. ln the year 1986 per capita meat consumption was l3.2 kg while that of poultry meat was 0. 72 kg (Min. of Anim. Resources Sudan, l986) which represented 5 % of the meat consumed.

In the Sudan poultry meat is obtained from specialized broiler strains, spent hens and cockerels. The latter are reared under different managlement conditions and slaughtered at different weights. Recently, Babiker and Nasir (I984) indicated that cocketels from egg laying strains finished on broiler mash. performed better and yielded heavier caicases than those finished on chick mash. Egg laying strains slaughtered at older age of 14 weeks produced heavier carcases than those slaughtered at 7 and X weeks of aget Mikoltiscdk and Pour, 5980). Joint weight an-.1 carease yield were also found to increase

an birds slaughtered at older than at younger age (Letihe, I984). The eileet of slaughter \\€lgl1l on pesforinanee car- case characteristics, meat chemical composition and production economics 0t eockerels from red I-Iisex laying strains were evaluated in this study.

MATERLALS AND METHODS

180 one - day old male chicks (_B_l_'OWn ffiisept egg laying strains)lwere used. Chicks were distributed into I2 pens =5cn'mt2:iritrig'equs1 weight and number. The pens were then randomly allocated to two slaughterweights which were l.0 and l.5 kg. Each slaughter weight'(treatment) comprised or sixipens. ‘ The two treatments were fed adlibiium on and the same ration (Table 1) thro- ughout the experiment. Water was available all the times. Food intake was recorded daily and liveweight gain of each pen was taken weekly.

Table 1: Experimental Ration Formula and Their Calculated Nutrient Content.

Ingredients	%
Sorghum grains	74.09
Wheat bran	2.25
Ground nut cake	10.00
Sesame cake	5.00
Super concentrate (*)	6.25
Oyster shell	2.25
Common śalt	0.25
Calculated composition (as DM) DCP 18.95 %	
ME 12.61 (MJ/Kg)	

* Super concentrate supplied 9. 63 MJ kg ME, 50% CP;
8 % Ca; 5% P; 3.5% lysince ; 1.5% Methionine, 2% .
methionine Cysteine, 25000 Iu/kg vitamin A and trace of all other vitamins.

When the specific target weight was attained birds wereindividually weighted after an overnight fast t‘ except for water l and slaughtered without stunning. Following scalding, plucking, washing and evisceration internal organs and head and shanks were weighed individually and expressed as percentage of slaughter weights. Eviscerated cai-cases were weighed, chilled for l2 h. at 4 c‘ and cold car- case weights were recorded. Five carcases wererandomly selected from each pen for cutting and dissection- The breast, drumsticlt and thigh joints were removed and weighed. Each joint was then dissected into meat (including skin, tendons and sub- cutaneous fat) and bone. Meat and bone were weighed individually and expresed as precentage of joint weight. The dissected joints meat was minced twice, thoroughly hand mixed and analysed for moisture, protein and fat contents according to the AOAC 1975). Data were subjected to student-t-test according to Snedeccr and Cochran (1961). ' .

RESULTS

Chick Performance : Cockerels performance data are given in Table 2. Although birds slaughtered at heavierweights (Treatment ll) ate significantly ($P < 0.001$) more food, they gained significantly ($P < 0.001$) more than those slaughtered at lighter wights (Treatment 1). Slight significant ($P< 0.05$) decrease in Feed conversion eflieiency with weight increase was observed. Mortality was low and similar in the two slaughter weights.

Table 2 : Performance of Cockerels .

	Treatment 1	Treatment 11	Level of Significance
Preiod (days)	90	120	—
Number of chicks	90	90	—
Initial chicks weight (kg)	0.04 ± 0.15	0.04 ± 0.14	N.S.
Final weight (kg)	1.07 ± 0.04	1.42 ± 0.04	P(0.001)
Liveweight gain (kg.)	1.03. ± 0.04	1.38 ± 0.04	P(0.001)
Food intake(kg. bird)	4.20 ± 0.20	5.50 ± 0.40	P(0.001)
Food conversion ratio (kg. feed /kg liveweight gain)	4.10 ± 0.30	4.70 ± 0.30	P(0.05)
Mortality (%)	1.85	1.85	N.S.

Carcase Characteristics: :

As seen in Table 3 keeping cockerels for 120 days (Treatment 11) will result in significantly ($P < 0.001$) heavier carcase weights and improved dressing percentage than slaughtering them at an early age and lighter weight (Treatment 1).

Significantly ($P < 0.001$) more muscles were dissected out from carcases obtained from Treatment ll than those obtained from Treatment l. Muscle to bone ration and chilling loss were similar in the two treatments.

Table 3: Organ Proportion of Cockerels : (% of body weight)

	Treatment I	Treatment II	Level of significance
Head and shanks	10.80 ± 0.69	9.30 ± 0.10	P(0.001)
Total viscera	12.20 ± 0.50	15.40 ± 0.20	P(0.001)
Liver	2.20 ± 0.30	2.10 ± 0.10	N.S.
Heart	0.50 ± 0.60	0.50 ± 0.00	P(0.001)
Gizzard	3.30 ± 0.20	2.60 ± 0.20	P(0.001)
Non - edible visceral components*	6.20 ± 0.05	10.30 ± 1.00	P(0.001)

* Non - edible visceral components / Total viscera weight (liver + heart + gizzard).

The weight and composition of breast, thigh and drumstick are given in Table 4. Birds in treatment II had significantly ($P < 0.001$) heavier joint weightc which yield significantly more muscles and less bone than birds in Treatment I.

Tabl e 4: Carcase Characteristics

	Treatment I	Treatment II	Level of significance
Hot eviscerated carcase Weight (kg.)	0.68 ± 0.16	0.93 ± 0.80	P(0.001)
Cold eviscerated carcase weight (kg.)	0.65 ± 0.16	0.87 ± 0.60	P(0.001)
Dressing percentage (hot)	60.30 ± 0.90	63 ± 2.90	N.S.
Dressing percentage (cold)	57.30 ± 0.90	61.10 ± 3.10	P(0.05)
Total muscle weight (kg).	0.48 ± 0.04	0.65 ± 0.05	P(0.05)
Total bone weight (kg.)	0.16 ± 0.02	0.22 ± 0.02	P(0.05)
Muscle : bone ratio	3.00 ± 0.70	2.90 ± 0.60	N.S.
Chilling loss (%)	4.90 ± 0.60	4.80 ± 0.40	N.S.

Organ Proportion of Cockeris : _ Birds slaughtered at heavier weights (Treatment 11) had significantly (P 0. 001) lighter heads and shanks, heart, gizzard and liver than those slaughtered at lighter weights (Treatment 1). Total viscera weight was significantly heaver (P 0.001) in cockerels from Treatment ll than those from Treatment 1.

Table 5: Joint Weight and Composition

	Treatment 1	Treatment 11	Level of significance
Breast weight (kg)	0.16 ± 0.01	0.22 ± 0.01	P(0.001)
Muscle (%)	75.00 ± 1.10	77.10 ± 1.00	P(0.05)
Bone (%)	25.00 ± 1.20	22.7 ± 0.80	P(0.05)
Drumstick weight (kg),	0.12 ± 0.00	0.16 ± 0.00	P(0.001)
Muscle (%)	66.70 ± 0.50	68.10 ± 1.30	P(0.05)
Bone (%)	38.30 ± 1.10	31.90 ± 0.90	P(0.001)
Thigh weight (kg)	0.11 ± 0.01	0.14 ± 0.00	P(0.001)
Mucsle(%)	76.50 ± 0.90	78.30 ± 1.30	P(0.05)
Bone(%)	23.50 ± 0.90	21.70 ± 1.00	P(0.001)

Table 6: Meat Chemical Composition. *

	Treatment 1	Treatment 11	Level of rignificance
Moisture content (%)	72.50 ± 3.10	65.90 ± 0.90	P(0.001)
Ash (%)	0.72 ± 0.20	0.88 ± 0.10	N.S.
Crude protein % (Nx6.25)	20.78 ± 1.70	20.80 ± 1.30	N.S.
Ether extract (%)	3.50 ± 0.40	4.70 ± 0.60	P(0.01)

* Composite sample from breast, drumstick and thigh.

Meat Chemical Composition :

Table 5 demonstrates the chemical composition of meat obtained from Treatments 1 and 11. A significant ($P < 0.001$) decrease in moisture and increase

in fat found in meat from Treatment 11 than in Treatment 1. Protein and ash were similar in the two treatment groups. _ V I Balance of Cost and Revenue : ‘ ‘ As Seen in Table 6 birds in Treatment 11 gained rnore revenue than those in Treatment 1. The amount of gain was greater when selling was on liveweight base than on carcase weight.

Table 7: Balance of Cost and Revener (In Sudanese Prounds) .

	Treatment 1	Treatment 11
No. of chicks (intially)	90	90
No. of chicks at point of slaughter	87	87
Feed cost (kg intake X price) *	310.3	480.7
Chick cost	135	135
Labour	100	140
Vaccine	6	6
Total cost	551.6	761.7
Other expenses	27.6	38.1
Grand total cost	579.2	799.8
Sales (10 pound /kg liveweight) **	870	1305
Sales (15 pound /kg dressed carcase) ***	848.2	1135.3
Total revenue (liveweight base)	290.8	505.2
Total revenue (dressed carcase base)	269.0	335.5

* Feed price 850 pound/ton.

** Chick cost 1. 5 pound /chick.

*** Prices quoted were market prices at the time of sale.

DISCUSSION

Birds in treatment H took 120 days to attain a slaughter weight of about 1.5 kg than those in Treatment 1 which were slaughtered at an age of 90 days and a liveweight of 1.0 kg. This explains the significant increaee in food in take observed in the former group. Age difference also explains the decrease in food conversion efiiciency observed in Treaiment 11 (Ki-ishnappa et ai, 1976 and Gonzalez,1986). Heavier liveweight effect was clearly seen in the increase in carcase weight, dressing precentage and muscle yield which agreed, with the findings of Mikola- sek and Pour (I980) , Najib et al, (1985) lkhlas Nour (I985) and Babiker and Nasir (l-984). l The jointyield in Treatment ll was greater than in Treatment 1 due to differences in carcase weight (Table3). The increase in weight of head and shanks, heart and gizzard in Treatment I , with age, was in accord with findings of Haseler (I968) and Crawly et al (1980) and can be attributed to the growth diffcerential of tissues; with progress of age, the liveweight, increases and consequently the proportions of early maturing tissues and organs decrease. , The increase in fat deposition, with age and weight increase , could explain the significant increase in extractable fat in Treatment lland the decrease in muscle moisture.

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