RESPONSE OF RED JUNGLE FOWL TO CHOICE FEEDING OF COMPLETE DIET, CORN AND SOYBEAN

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ABSTRACT

The objective of this study was to evaluate the performance of intensively reared Red Jungle Fowl (*Gallus gallus spaedicus)* when provided: (1) a standard broiler finisher diet (20.23 % CP ; 3151 kcal ME/kg) (C), (2) lower energy and lower protein diet (18.08 % CP ; 2926 kcal ME/kg) (L), (3) a choice of diet C, corn and soybean (CSC), and (4) a choice of diet L, corn and soybean (LSC). Experimental diets were fed from Days 21 to 132. Except for feed conversion ratios and daily protein intake, traits measured were not affected by feeding regimen. Corn and soybean intakes for CSC and LSC were 39.4 % and 7.6 %, and 32. 9 % and 7. 9 %, respectively. Energy and protein levels of 2998 kcal/ kg and 17. 15 %, respectively, are adequate to maximize growth.

Key words: Red Jungle Fowl, Choice feeding, Performance

INTRODUCTION

There is substantial evidence (as reviewed by Hughes, 1984) to indicate that broilers, turkeys, pullets and laying hens possess an effective dietary self-selection mechanism. However, information on the response of the Red Jungle Fowl (RJF), the ancestor of the modern poultry breeds (Crawford, 1990) to choice feeding is lacking. There is a possibility that RJF which have not undergone selection for rapid growth or high egg productions are able to maintain maximum production performance under a self-selection regimen.

The objective of this experiment was to evaluate the performance of intensively reared RJF *(Gallus gallus spaedicus)* when provided choice feeding of complete diet, corn and soybean.

MATERIALS AND METHODS

At hatch 160 day-old RJF chicks were wing-banded and assigned at random in-groups of 8 to 20 battery cages with wire floors. Starter diet (crumble form; 21 % CP and 2900 kcal ME/kg) was provided *ad libitum* from Days 0 to 20. On Day 21, chicks were assigned to one of four feeding regimens with five cages per treatment group. The feeding regimens were (1) a standard broiler finisher diet (20.23 % CP; 3151 kcal ME/kg) (C), (2) lower energy and lower protein diet (18.08 % CP; 2926 kcal ME/kg) (L), (3) a choice of diet C, corn and soybean (CSC) and (4) a choice of diet L, corn and soybean (LSC). The compositions of the experimental diets are shown in Table 1. Experimental diets, corn and soybean were in mash form. Individual body weight and shank length, and

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Table 1. The compositions of the experimental diets

Ingredient & analyses	C (%)	L (%)
Corn (9.65 % CP; 3132 kcal)	46. 55	50. 55
Soybean (41.6 % CP; 2971 kcal)	25	9
Rice bran	11	15.50
Wheat bran	5	13
Fish meal	8	9.10
Palm oil	2.50	0.40
Sodium chloride	0.25	0.25
DCP	0.30	0.20
Limestone	1	1
DL-methionine	0.10	0.20
L-lysine	0.10	0.60
Premix	0.20	0.20
Analyzed nutrient content :		
ME, kcal/kg	3151	2926
CP, %	20.23	18.08

C= standard broiler finisher diet; L=lower energy and lower protein diet.

feed consumption were recorded weekly. Mortality was recorded daily. All ANOVA's were conducted with the aid of the General Linear Models (GLM) of SAS software (SAS Institute, 1985). When significant ($P<0.05$) effects were found, comparisons among multiple means were made by Duncan's Multiple Range Test.

RESULTS

The performance of RJF under various feeding regimens from Days 21 to 132 is shown in Table 2. Except for feed conversion ratios (FCR) and daily protein intake, feeding regimen had no significant effect on traits measured. Birds fed C

Table 2. Effect of choice feeding on the RJF performance from Days 21 to 132 (Mean ± SE)

Parameters	Feeding regimens*			
	C	L	CSC	LSC
Final body weight (g/b)	644.22 ± 26.14	714.75 ± 28.34	708.60 ± 28.67	694.41 ± 25.90
Final shank length (cm)	8.41± 0.16	8.59 ± 0.17	8.56 ± 0.15	8.57 ± 0.13
Total gain (g/b)	550.84 ± 25.60	616.31 ± 26.92	608.34 ± 28.07	598.47 ± 26.09
Total feed intake (g/b)	3,459 ± 55.19	3,527 ± 59.75	3,469 ± 54.25	3,340 ± 54.40
Daily feed intake (g/b)	30.88 ± 0.79	31.49 ± 0.85	30.97 ± 0.76	29.82 ± 0.78
Daily protein intake (g/b)	6.25^{b} ± 0.59	5.67^{a} ± 0.53	5.50^{a} ± 0.45	5.11^{a} ± 0.47
Daily energy intake (kcal ME/b)	97.32 ± 2.48	92.13 ± 2.50	96.92 ± 2.37	89.50 ± 2.37
FCR (feed/gain)	6.25^{b} ± 0.21	5.72^{a} ± 0.19	5.70^{a} ± 0.17	5.58^{a} ± 0.14
Mortality (%)	20	20	6.25	20

*C= standard broiler finisher diet; L= lower energy and lower protein diet; CSC= a choice of diet C and soybean and corn; LSC= a choice of diet L and soybean and corn.

Table 3. Feed and nutrient intakes of RJF given choices of feeds.

Intakes	Feeding regimen *					
	CSC			LSC		
	R1	S	C	R1	S	C
Daily feed intake (g/b)	16.41	2.35	12.21	17.65	2.34	9.83
% of feed intakes	53	7.6	39.4	59.2	7.9	32.9
Daily protein intake (g/b)	3.32	0.98	1.18	3.19	0.97	0.95
% of protein intakes	60.6	17.9	21.5	62.4	19	18.6
Daily energy intake (kcal/b)	51.71	6.98	38.24	51.64	6.95	30.79
% of energy intakes	53.3	7.2	39.5	57.8	7.8	34.4

*R1= experimental diet (C); R2= experimental diet (L); S= soybean; C= corn.

consumed more protein and had poorer FCR than those on other regimens. Feed and nutrient intakes of choice fed birds are shown in Table 3.

DISCUSSION

Earlier studies (Munt *et al.* 1995; Siegel *et al.*, 1997) on choice feeding in broiler chickens indicated that birds were unable to select sufficient protein and energy to support maximum growth.

Siegel *et al.* (1997) suggested that self-selection of nutrients in meat type chickens was governed by maintaining a status to enhance well being rather than economic benefits to market age. On the contrary, in the present study, final live-weight and live-weight gain of choice-fed RJF were similar to those provided single diet. Their discrepancies could be attributed to the natural environment of RJF where they are faced with an array of feedstuffs, most of that are nutritionally incomplete. Thus, there is a possibility that RJF are better able to select suitable amount of each food for optimum growth. The present findings add to the growing body of evidence that genetic may have profound impact on dietary choices by chickens (Forbes and Shariatmadari, 1996; Noble *et al.*, 1993).

Based on the present findings, it appears those energy and protein levels of 2998 kcal ME/kg and 17. 15 %, respectively are adequate to support maximum growth in RJF. The authors are not aware of any reports on energy and protein requirements of RJF.

Although birds fed C consumed more protein than their L, CSC and LSC counterparts, there was no difference in body weight among feeding regimens. The poor feed conversion of C birds may have accounted for the phenomenon. The reason for the inferior FCR is not clear. In the choice-feeding regimen, corn intakes of CSC and LSC birds were 39. 42 % and 32. 95 % of total feed intake, respectively, which were higher than that as reported by Ramlah and Halim (1994), and Cowan and Michie (1978) for broiler chickens. There is no clear explanation for the phenomenon although it may be associated with genetic differences in metabolic and nutritional requirements.

CONCLUSION

In conclusion, our data suggest that the Red Jungle Fowl are able to maintain maximum growth rate under a self selection regimen corn and soybean. Energy and protein levels of 2998 kcal/kg and 17. 15 %, respectively, are adequate to maximize growth.

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