Utilization of some local protein supplement mixes in starter layer chick's diet.

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SUMMARY

The experiment was designed to evaluate the nutritive value of some local animal and plant protein supplement mixes in starter chick's diet for six weeks.

Chicks given vegetable protein (V), fish meal (F) and blood meal (B) diets showed no significant difference ($P>0.05$) in feed intake, weight gain and feed conversion ratio when compared with the control diet (C) that contained imported rearing concentrate.

Cost of feed / kg for diets C, V, F, and B were 40.5, 35.7, 39.2 and 39.3 Sudanese dinnar respectively.

It is concluded that under the conditions of the present experiment, the diets V, F and B can be used as alternative sources for the imported superconcentrate

INTRODUCTION

In the Sudan the animal protein sources as blood meal and fish meals are often produced in limited amounts despite of huge animal resources. However, vegetable protein concentrates are available in local market.

In the present experiment various animal and plant by-products are included in starter chick's diet for six weeks post hatching. The main objective for the present experiment was to find local alternative sources of protein supplement to replace the expensive imported superconcentrate. Another objective of the experiment was to compare the economic of using these protein supplements.

MATERIALS AND METHODS

In this experiment, 200 one day old commercial layer strains (Bovans strain) were selected on basis of uniform live body weight and distributed randomly into 20 units on deep litter inside an open-side house. Chicks in this experiment are debeaked, vaccinated against infectious Bursities disease and Newcastle disease. The house average temperatures ranged between 22.3-29.5 °C.

Three experimental diets composed of vegetable protein (V), fish meal (F) blood meal (B) were utilized and compared with control diet (C) that contained an imported rearing concentrate. Details of the diets are given in Table 1. All diets were formulated to be isonitrogenous and isoenergetic. Proximate and amino acids analysis of feed ingredients were carried out by Provimi Company at the Netherlands. The analytical results were used for calculation of chemical and amino acids composition of experimental diets. The experimental design in this study was based on Completely Randomized Design (CRD). All the data generated were subjected to the analysis of variance.

RESULTS

The performance of the four tested groups is presented in Table 2. which indicates no significant difference ($P>0.05$) for the feed intake, live body weight, weight gain and feed conversion ratio (FCR).

Data given in Table 3. indicate that protein intake and protein efficiency ratio (PER) among four groups was approximately similar.

Despite of high lysine and methionine intake as shown in Table 3. the performance of four groups was not statistically different.

The costs of diets (C), (V), (F) and (B) were found to be 40.5, 35.7, 39.2 and 39.3 dinnar respectively.

Table 1. Composition of experimental diets (%).

Ingredients (C)	Control	Vegetable Protein (V)	Fish meal (F)	Blood meal	(B)
Sorghum	54	50.22	51.73		54.67
Groundnut meal	9	4.2	6		9
Sesame meal	7	3.5	7		6.0
Sunflower meal	-	16.5	-	-	
Wheat bran	13.8	9.49	17.1		17.1
Dried Alfa Alfa	6.8	10.7	8.99	2.5	
Imported concentrate	5		-		
Fish meal		-	4		
Blood meal	-	-		4	
L. lysine Hcl		0.48	0.41	0.43	
DL-methionine		0.17	0.11	0.15	
Lime stone (27%)	1.50	2.00	2.27	2.02	
Bone meal	2.65	2.43	2.00	3.63	
Salt	0.25	0.06	0.14	0.25	
Vitamins+minerals*	-	0.25	0.25	0.25	
Total	100	100	100	100	
Calculated chemical analysis					
ME kcal / kg**	2883	2819	2879	2873	
Crude protein (%)	20.5	20.3	20.2	19.9	
Fat (%)	3.56	3.50	4.29	3.53	
Crude fiber (%)	4.43	5.45	4.24		3.80
Lysine (%)	0.70	0.99	0.99	0.99	
Methionine (%)	0.36	0.40	0.40		0.40
Meth. + cystine (%)	0.68		0.50.66		0.63
Calcium (%)	1.60		1.601.30		1.50
Phosphorus(available)	0.60		0.400.40	0.40	

** Vitamins + minerals : composition per 1000 gm.*
tit A: 7,500,000 IU, D: 1,500,000 IU, B_1 : 2,750 IU, : 5mg, D-calcium pentothenate: 5,000mg, E: 2,500mg, K: 1,500mg, Niacin: 12,500mg, Choline chloride: 60,000rng, Ethoxyguin: 5,000mg, Manganese oxide: 16,130mg, Potassium iodide: 353mg, Cobalt sulphate: 286mg, Zinc oxide: 12,500mg, Copper oxide: 1,283mg. Ferrocarbonate: 20,323mg.
*** Metabolizable energy is calculated according to the equation of Lodhi et al., (1976).*

DISCUSSION

It was observed in this study the performance of groups (F), (B) and (V) was approximately similar to the control group (C) which did not exhibit significant difference at 5% level of probability in term of feed consumption, live body weight, weight gain and feed conversion ratio (Table 2).

It was noticed here inspite of deficient lysine intake for group (C) (Table 3) when compared with NRC (1984) for essential amino acids, the growth rate for control group (C) was approximately similar to the group (F) and (B) and slightly higher than group (V).

The possible explanation for the results obtained may be due to protein quality source between imported feed concentrate and locals byproduct and may be due to difference in digestibility and availability of protein and essential amino acids

In this study the measurement of protein quality is determined through growth of performance diet, (Table 2 and 3) FCR and PER. The possible explanations for the results obtained for tested groups (F), (B) and (V) despite of high intake of lysine and methionine may be due to reduced availability of essential amino acid. The results obtained here for tested groups supported the hypothesis that reduced availability of amino acids reflected on weight gain (Simon, 1992). Also it is important to note here the calculated levels of essential amino acids of various feed ingredients can not be considered 100% available as calculated in the diet and may due to unknown factors (Yomazaki and Kamatso, 1986; Quin *et al.,* 1988 and Hus *et al.,* 1992).

The cost of kg feed of group C was higher due to inclusion of imported superconcentrate in the diet. It is important to point that birds fed on the diet without animal protein source had the lowest out feed cost. These finding agreed with reports obtained by Branchaert and Vallerand in 1973.

In Summary, the results obtained from the present experiment would be of value to poultry producers. It showed that the quality of the raw materials is an important criterion in feed formulation prior to added premixes and amino acids.

Table 2. Performance of starter layer chicks.

Experimental Diets				
	C	V		
Feed intake (g/bird/6weeks)	1073	1063	1117	1094 NS
Live body weight(g/bird/6weeks)	339	305	347	336 NS
Weight gain(g/bird/6weeks)	297	265	305	295 NS
FCR(Feed kg/weight gain kg)	3.61	4	3.66	3.77 NS
Mortality (%)	-	6	8	4

NS = Values are statistically non significant at 5% level of probability (P>0.05).

Table 3. Protein intake, protein efficiency ratio **(PER),** lysine intake, methionine intake and energy intake of starter layer chicks.

	Experimental Diets		
	Control (C)	Vegetable protein(V)	Fish meal(F)	Blood meal(B)
Protein intake (g/bird/6 weeks)	220	216	224	217
PER	1.34	1.20	1.35	1.36
Lysine intake (g/bird/6 weeks)	7.515	10.530	11.060	10.839
Methionine intake (g/bird/6 weeks)	3.86	4.25	4.46	4.37
Energy intake (kcal/bird/ 6 weeks)	3093	2996	3215	3143

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