PERFORMANCE OF BROILER CHICKS AS INFLUENCED BY VARYING LEVELS OF CRUDE PROTEIN AND PESTICIDE

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Two basal (broiler starter and finisher) rations were prepared containing crude protein 23 or 20% with metabolized energy 3000 Kcal/kg during starter phase and crude protein 19 or 20% with metabolizable energy of 3200 Kcal/kg for finisher phase. Each of the basal ration was then supplemented with 50, 100 or 150 ppm of pesticide. These rations were fed to 240, day-old broiler chicks for periods of 4 and 3 weeks, respectively, in a completely randomized design. The chicks showed no adverse effect on feed consumption. The only difference in weight gain, feed conversion efficiency and mortality was due to the addition of pesticide in the ration.

INTRODUCTION

To improve the efficiency of broiler production the trend has been shifted toward increased protein and energy level in the ration which is usually achieved through the addition of ingredients from vegetable origin. Most of the commercial rations are fortified with low grade feed ingredients which may become detrimental to most of the feed nutrients instead of having beneficial effect. At the same time a huge quantity of insecticide/pesticide is sprayed on the crops for the control of insects/pests. Pesticides influence the metabolism of water in the chicks causing thereby hydropsy in various parts of body of chicks. A recent study of Shane (1989) on hydropericardium concluded that the disease is identified by a toxic factor. Poultry rations comprised largely of ingredients from vegetable origin known for their low quality protein due to lack of critical amino acids, reduced the growth rate of broiler and increased susceptibility of the birds to diseases and consequently led to early mortality (Jamroz *et al.*, 1983). The present experiment was conducted to see the performance of broiler chicks as influenced by varying levels of crude protein and pesticide residue.

MATERIALS AND METHODS

The experiment was conducted in two phases, based on completely randomized design, using 240 day-old broiler chicks of mixed sexes. The chicks were randomly distributed into 24 experimental units of ten chicks each and assigned to floor pens (120 x 90 cm) which were maintained under standard managemental conditions.

Two basal broiler starter and finisher rations, A, B and A', B' were prepared containing 23 or 20% crude protein with 3000 Kcal/kg metabolizable energy for starter phase and crude protein 19 or 20% with 3200 Kcal/kg metabolizable energy for finisher phase, respectively. These rations served as control. Each of the basal rations was then supplemented with 50, 100 or 150 ppm of pesticide to constitute experimental rations A1, A2, A3 and B1, B2, B3, respectively.

All the birds were weighed individually at the start of the study and at weekly intervals thereafter. Feed consumption was re-

corded for each replicate at weekly intervals and feed to gain ratio was computed. The data, thus collected were subjected to statistical analysis to determine difference among treatment means (Steel and Torrie, 1981).

Table 1. Experimental rations

Rations	Starter phase		Finisher phase		Pesticide level
	Crude protein (%)	Metaboli-zable energy (Kcal/kg)	Crude protein (%)	Metaboli-zable energy (Kcal/kg)	(ppm)
A_0 (control)	23	3000	19	3200	-
A_1	"	"	"	"	50
A_2	"	"	"	"	100
A_3	"	"	"	"	150
B_0	20	3000	20	3200	-
B_1	"	"	"	"	50
B_2	"	"	"	"	100
B_3	"	"	"	"	150

RESULTS AND DISCUSSION

As shown in Table 2, the chicks fed on starter rations gained 493.82, 231.05, 349.53, 411.35, 421.85, 352.54, 304.85 and 369.45 g body weight, respectively. The birds fed on ration A_0 containing crude protein 23% and metabolizable energy 3000 Kcal/kg, gained the maximum weight. Statistical analysis revealed highly significant difference between levels of pesticide and interaction of protein with pesticide, while protein levels had non-significant affect. During the finisher phase the birds fed on ration B_0 having crude protein 20% and metabolizable energy 3200 Kcal/kg gained the maximum weight. Statistical analysis of data, however, revealed significant difference due to levels of pesticide and interaction between pesticide and protein, while it was non-significant due to levels of protein.

The results indicated that the control ration without supplementation of each protein level led to maximum weight gain that was significantly different from those of the rations containing any level of pesticide. However, there was less difference in weight gain due to protein level in the rations. High protein level in ration A_0 during starter phase when fed to another group of chicks (A1) with the initial dose (50 ppm) of pesticide reduced the growth rate to a minimum level. It showed that the beneficial protein effect on weight gain was minimised by the initial level of pesticide. Similarly, when the pesticide level was increased from 50 to 100 ppm, the weight gain reduced. It was thus concluded that the effect of higher or lower protein contents in the rations were counteracted by pesticide. The results of the present study are in accordance with Lopez *et al.* (1978).

Table 2. Average weight gain, feed consumption and feed efficiency of birds fed on various starter (0-4 weeks = Phase-I) and finisher (5-7 weeks = Phase-II) rations

Rations	Weight gain (g)		Feed consumption (g)		Feed efficiency (feed/gain)	
	Phase		Phase		Phase	
	I	II	I	II	I	II
A_0	493.82	918.39	1076.29	2448.42	2.17	2.66
A_1	231.05	623.33	886.52	2285.68	3.85	3.67
A_2	349.53	780.70	921.69	2345.51	2.62	3.00
A_3	411.35	838.67	972.86	2273.06	2.36	2.70
B_0	421.85	1401.4	981.72	2298.62	2.32	2.72
B_1	352.54	781.37	815.75	2333.07	2.28	3.00
B_2	304.85	790.15	935.16	3023.41	3.11	3.80
B_3	369.45	815.29	840.32	2675.61	2.27	3.32

Feed consumption: Average consumption per chick of different starter rations was 1076.29, 886.52, 921.69, 972.86, 981.72, 815.75, 935.16 and 840.32 g, respectively. The data revealed non-significant difference among all the groups. Neither pesticide levels nor protein level had any effect on feed consumption. During finisher phase, the consumption of different rations was 2448.42, 2285.68, 2345.51, 2273.06, 2298.62, 2333.07, 3023.41 and 2675.51 g, respectively. The results revealed non-significant difference between pesticide levels, protein levels and their interactions. It was observed that increased feed intake was accomplished by chicks fed rations containing pesticide at of 100 and 150 ppm levels particularly under the scheme of low protein feeding throughout starter and finisher phases. Such a tendency of chicks to consume more feed was constant throughout the experiment showing thereby some change in the taste, texture or anything that did not make the protein uniformly available to the chicks as in the case of controlled rations. It is a common belief that shortage of some amino acids changes the structure of protein to some degree which causes the bird to consume more as a compensation for the deficiency of quantity or quality of protein. The results of present study are supported by the findings of Yeong *et al.* (1979).

Feed efficiency: During the starter phase, the feed to gain ratio on different rations was calculated to be 2.17, 3.85, 2.62, 2.36, 2.32, 2.28, 3.11 and 2.27, respectively. The results revealed significant effect due to pesticide, protein and their interaction. Feed conversion ratio was significantly higher in birds fed on ration A_1 containing 23% crude protein and 3000 Kcal/kg metabolizable energy with a pesticide level of 50 ppm.

For the rations containing lower protein concentration, the feed efficiency was

the best when the initial dose of pesticide was given. The lowering down of protein levels in the rations had some beneficial effect on feed conversion ratio because of absence of effect of pesticide on chicks fed on high protein level.

During the finisher phase the feed to gain ratio on different rations was calculated to be 2.66, 3.67, 3.00, 2.70, 2.72, 3.00, 3.80 and 3.32. Feed to gain ratio was maximum for chicks fed rations containing 3200 Kcal/kg metabolizable energy and 20% crude protein with the pesticide level of 100 ppm. The observation on feed consumption of chicks placed on ration containing pesticide are reflected in feed of chicks as indicated by values such as 3.80, 3.32, 3.67 and 3.00. This showed that pesticide containing rations were not fully utilized by chicks for the growth. The results of present study conform to those of Combs and Scott (1977).

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