

Short Communication

Performance and Economics of Broiler Chicks Fed on Rations Supplemented with Different Levels of Sodium Bentonite

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ABSTRACT

Hubbard broiler chicks were used to determine the effect of different levels of Sodium Bentonite on their performance and economics. The birds were fed commercial broiler ration without or with supplementation of Sodium Bentonite @ 1, 2, 3 and 4% of the diet. Sodium Bentonite significantly ($p<0.01$) improved weight gain at 1, 2 and 3% levels. There was significant ($p<0.01$) improvement in feed consumption and efficiency in birds raised on rations having 1% Sodium Bentonite. The performance of the birds was depressed when fed on rations having Sodium Bentonite at 4% level. The ration supplemented with Sodium Bentonite @ 1% was found economical keeping in view the performance of birds.

Key Words: Broiler; Economics of rations; Sodium Bentonite

INTRODUCTION

The escalating rates of poultry feeds and medicines, high prices of day-old chicks and high mortality rate have increased the cost of inputs thus lowering the profit margins of poultry farmers. This situation calls for the use of non-nutritive feed additives to lower the cost of production. Bentonite, a feed additive have been used successfully in poultry feeds without any harmful effect (Olver, 1988; Southern *et al.*, 1994). Bentonite is composed mainly of 75% or more clay minerals and is a complex material with SiO_2 53.788%, Al_2O_3 22.378%, Fe_2O_3 3.90%, CaO 1.65%, MgO 2.123%, Na_2O 1.96%, K_2O 0.693% and organic matter 13.43% (Butt *et al.*, 1984; Anonymous, 1992). Although the exact mode of action is yet unknown, however it is hypothesized that due to high swelling nature, it decreases the flow rate of digesta thus allowing greater absorption of digested nutrients in the intestines (Artamonova *et al.*, 1989). Therefore, less feed will be required to achieve a required gain in weight thus increasing profit margin.

This paper describes the effect of Sodium Bentonite on the performance of commercial broiler chicks and its economic feasibility of inclusion in rations.

MATERIALS AND METHODS

The study involved 150 day-old broiler chicks of mixed sexes for a period of six weeks at Livestock Production Extension Nucleus Depalpur, District Okara. The birds were divided into five groups. Each group consisted of three replicates of 10 birds each. The birds were maintained in 15 separate pens each measuring 4 x 3 x 2.5 feet on littered floor under optimal management conditions. The birds were fed a balanced commercial broiler ration *ad libitum* with out and with Sodium

Bentonite (Himax BS-7) @ 1, 2, 3 and 4%. The data was collected for average feed consumption, weight gain and dressing percentage. Feed conversion ratio was calculated from this data. The study was conducted according to completely randomized design. The data, thus evolved, was subjected to statistical analysis using analysis of variance technique (Steel & Torrie, 1984).

RESULTS AND DISCUSSION

The data on average weight gain, feed consumption, feed efficiency and dressing percentage have been presented in Table I.

Table I. The performance of broiler chicks

Rations	BT	AIW (g)	AFW (g)	AWG (g)	AFC (g)	FE	DP
A	0%	42.90	1170.10	1213	3338	2.75	59.99
B	1%	42.52	1161.48	1604**	3770**	2.35*	61.15
C	2%	42.80	1332.20	1375*	3387	2.46	61.02
D	3%	42.65	1304.35	1347*	3305	2.45	59.87
E	4%	42.60	1104.4	1147	3068	2.67	58.33

BT= Levels of bentonite; AIW= Average initial weight; AFW= Average final weight; AFC= Average feed consumption; FE= Feed efficiency; DP= Dressing percentage; * = ($P<0.05$); ** = ($P<0.01$)

The results showed that Sodium Bentonite supplementation at 1% level significantly improved ($p<0.01$) weight gain in the broiler chicks. The same level also improved ($p<0.05$) feed consumption and efficiency. Although there was an improvement ($p<0.05$) in weight gain at 2 and 3% levels, but with an increase in Bentonite level, there was proportional depression in weight gain. The feed efficiency and dressing percentage at these levels revealed non-significant difference. Bentonite at 4% level rather depressed the performance of chicks. It was, therefore, concluded that Bentonite at 1% level has

certainly positive effect on the growth performance of broiler chicks.

The results of weight gain and feed consumption are in agreement with the findings of Van'ke (1976), Blair *et al.* (1986) and Hebert *et al.* (1986) who used different levels of Bentonite i.e. 0.33, 0.66, 0.99, 1.0, 1.5, 2. and 2.5% of the diet and reported better weight gain and higher feed consumption in chicks. The better weight gain by addition of Bentonite at low levels may be due to the decreased flow rate of digesta and ultimately greater absorption. The other possible explanation for better weight gain may be due to higher energy level as described by Artamonova *et al.* (1989). The depressing trend in the weight gain and feed consumption at higher levels of Sodium Bentonite is in accordance with the results of Sellers *et al.* (1980), and Petkova and Ivonov (1982). It may be due to the highly adhesive nature of the Bentonite which absorbs more moisture and resist the flow of digesta through GIT, which can affect the feed intake negatively (Van Olphen 1963).

Increased feed efficiency in birds fed on rations supplemented with Sodium Bentonite has also been reported previously (Almquist *et al.*, 1967; Van' ke, 1976). It has been reported that weight gain in chicks given low energy diets was not affected by Bentonite (Sellers *et al.* 1980; Petkova & Ivonov, 1982; Eslmeralda & Gonzales, 1991; Southern *et al.*, 1994). This was attributed to the interaction of Bentonite with low energy.

Economics. The inclusion of Bentonite to rations @ 1% make them profitable than the rations without Bentonite (Table II).

Table II. Economics of different experimental rations

Description	Experimental Rations				
	A	B	C	D	E
Rations →					
Bentonite levels (%)→	0	1	2	3	4
ALW per broiler (kg)	1.259	1.650	1.421	1.393	1.193
FC per broiler (kg)	3.338	3.770	3.387	3.305	3.068
Feed cost/ kg of ration (Rs.)	5.502	5.652	5.802	5.952	6.102
Feed cost / broiler (Rs.)	18.37	21.308	19.65	19.67	18.721
Cost of day old chick (Rs.)	12	12	12	12	12
Total cost per chick (Rs.)	30.37	33.308	31.65	31.67	30.721
Value per live broiler (Rs.)	37.77	49.5	42.63	41.79	35.79
Gross profit (Rs.)	7.4	16.192	10.98	10.12	5.069

ALW= Average live weight; FC= Feed consumption; Selling price per kg of live weight of chick = Rs. 30

CONCLUSIONS

The use of bentonite in the poultry rations at low levels can improve performance of chicks. Moreover it does not increase the cost of feed and hence economical.

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