EVALUATION OF MEAT BYPRODUCT – SLUDGE ON COMMERCIAL BROILER CHICKEN PERFORMANCE

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Received 15-7-2015 **Accepted 14-11-2015**

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ABSTRACT

A study was conducted for a period of six weeks to evaluate the effect of meat by-product sludge on commercial broiler performance in a total of 270 unsexed Vencobb chicks. The experimental feeds were prepared by including sludge at zero per cent (control- T1), 2 per cent (T2) and 4 per cent (T3) level in the feed. Addition of two per cent inclusion of sludge in broiler chicken diet showed significant difference in growth performance at 6 weeks of age and did not alter the serum cholesterol, triglycerides and creatinine level of broilers. Further, the profit also more in 2% inclusion of sludge.

KEY WORDS : Meat by Product, Sludge, Broiler

INTRODUCTION

Meat by-products are rendered for use in livestock and poultry diets to reduce the feed cost (Caires *et al.*, 2010.) The most common animal by-products used in broiler chicken diets are meat meal, meat and bone meal, blood meal, feather meal and poultry offal meal. These by-products contain high protein and minerals and may partially replace other nutrient rich feed sources like soya bean or fish meal. Sludge is an organic content of the bone consisting of collagen, produced by degreasing and demineralization of bones received from slaughter house waste. However, the available information on using sludge in broiler feed is limited. Hence, this study was carried out to determine the effect of dietary inclusion of sludge on the performance of commercial broiler chicken.

MATERIALS AND METHODS

A study was conducted to evaluate the effect of dietary meat by-product sludge on day old commercial broiler performance (Vencobb 400) at Poultry Research Station (PRS) Nandanam, Tamilndau Veterinary and Animal Sciences University (TANUVAS), Chennai. Sludge obtained from M/s.Nitta Gelatin India Ltd., Cochin, Kerala, was analysed for its proximal composition and toxins, if any, at animal feed analytical and quality control lab, Namakkal. Then it was checked for microbial load at Central University Lab at Madhavaram. A total of 270 unsexed Vencobb 400 day old broiler chicks were randomly divided into three treatment groups with 3 replicates of 30 birds each and reared in flat deck cage. Isonitrogenous and isocaloric experimental feeds were prepared by including sludge at zero per cent (control- T1), 2 per cent (T2) and 4 per cent (T3) level in the feed. All the birds were given *ad libitum* feed and water under standard managemental conditions. The parameters such as hatch weight, bi-weekly body weight, feed conversion ratio (FCR), livability etc. were recorded. On 30th day, serum samples per treatment were collected and cholesterol, triglycerides and creatinine levels were estimated. The relative economics based on prevailing market prices of the ingredients were worked out. The data were analysed as per standard statistical procedure described by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Proximate composition of sludge and the experimental feed used were analysed as per AOAC (1994). The effect of inclusion of meat by-product sludge on production performance and serum profile of commercial broiler chicken are presented in Table 1.

Table 1. Effect of inclusion of meat by product sludge on the production performance and serum profile of commercial broiler chicken (Mean±SE).

Sl.No	Parameters	*Control-T1 (0%Sludge)*	*T2 (2%Sludge)*	*T3 (4%Sludge)*
I	**Production performance**			
1	Hatch weight(g)^{NS}	40.91 ±0.35	41.07 ±0.35	40.51 ±0.30
2	2nd week body weight (g)**	268.59^{a} ±3.81	259.50^{b} ±3.72	250.70^{b} ±5.21
3	4th week body weight (g)**	963.74^{a} ±11.6	908.98^{b} ±12.21	868.13^{b} ±13.87
4	6th week body weight (g)**	1669.86^{a} ±15.19	1701.41^{a} ±15.98	1601.28^{b} ±17.65
5	Feed conversion ratio (FCR)	1.72	1.73	1.69
6	Livability (%)	99.00	99.00	99.00
II	**Serum Profile**			
1	Serum cholesterol (mg/dl) ^{NS}	124.41 ±7.03	134.65 ±8.61	158.65 ±6.48
2	Serum triglycerides (mg/dl) ^{NS}	440.09 ±24.20	407.00 ±20.71	397.30 ±12.82
3	Serum creatinine (mg/dl)^{NS}	0.64 ±0.02	0.68 ±0.01	0.66 ±0.02

Means bearing different superscript in the same row differs significantly (P<0.01),

Highly significant (P<0.01) difference were found in body weight in broiler fed with Sludge. The highest body weight observed in 6th week of age at 2% inclusion level (1701.61g). This is in agreement with Orban and Roland (1992) who recorded better body weight at 3rd week in broiler fed with 1.25 % chicken bone meal but Waldroup and Adams (1994) noticed better body weight in broilers fed diet with 8% poultry by-product meal. However, many authors (Sartorelli, 1998 ; Bellaver *et al.*, 2005; Caires *et al.* 2010 and Martosiswoyao and Jenson 1988) did not observed significant difference in performance, body weight gain and FCR in commercial broilers.

Increased level of sludge in broiler chicken diet resulted in better FCR, which is in agreement with Waldroup and Adams (1994), they noticed better FCR in broilers fed with 8% poultry by-product meal than meat and bone meal. Livability did not affected by addition of increased level of sludge in broiler diet.

The serum profile (cholesterol, triglycerides and creatinine levels) were not found to be affected by the inclusion of sludge in broiler chicken, however Calislar and Ayidin (2006) found high level of serum lipoprotein in broilers fed with higher per cent (8%) of animal bone fat. The economics of inclusion of sludge is presented in Table 2. The cost of production per broiler chicken from 0 to 6 weeks of age is less in sludge included group at 2% level compared to other two groups. The profit per bird is higher in 2% level of sludge in feed than control and 4% sludge level, which is partly agreed with Caires *et.al.* (2010) who tried meat and bone meal, feather meal, blood meal

and poultry offal meal in commercial broiler and found no significant difference in performance, except it reduced the feed cost.

Table 2. Economics of broiler chicken fed diet supplemented with Sludge

Treatment	*Cost of production – Rs./bird*				*Returns Rs./bird*	*Profit Rs./bird*
	Chick	*Feed*	*Misc.cost*	*Total*		
Control	23.00	61.47	10.00	94.47	133.60	39.13
2% Sludge	23.00	59.86	10.00	92.86	136.16	43.30
4% Sludge	23.00	61.72	10.00	94.72	128.08	33.36

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