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Performance of broilers fed water-soluble blood meal during growing and finishing period

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Abstract

The effect of water-soluble blood meal was tested on the performance of broilers. Forty broiler chickens aged 21 days were reared on slatted floor and the dietary treatments were T_0, T_1, T_2 and T_3 where 0, 0.25, 0.50 and 0.75 g blood meal was given/L drinking water, respectively. The blood meal significantly enhanced the growth and feed conversion efficiency. The weight gain and net profit was significantly ($p<0.001$) higher in chickens with 0.25g/L blood meal in water. It is suggested that blood meal at 0.25g/L may be used in drinking water during growing and finishing period of broilers for better performance. (*Bangl. vet.* 2009. Vol. 26, No. 1, 8-12)

Introduction

Commercial poultry production started from 1980 in Bangladesh and now the industry involves US $ 1-5 billion investment and employs 3-5 million people. There are 3 million broiler parent stock producing 260 million day-old broiler chicks every year (Kabir, 2005).

Many private breeder and commercial poultry farms have been established, but in recent years many of them have stopped growing due to high price of feed and chicks. Generally, feed cost accounts for 60-70% of the total running costs of a poultry farm. Many unconventional feed ingredients are available in Bangladesh. Blood meal is one. It contains more than 80% crude protein (Sanger, 1981). It is one of the richest sources of lysine, a rich source of arginine, methionine, cystine, and leucine, but is very poor in isoleucine and contains less glycine than fish meal or bone meal (NRC, 1994). Compared with vegetable protein in poultry diet it is quite high in biological value. Generally vegetable protein is deficient in lysine and methionine (McDonald *et al*., 1992). Blood meal contains certain minerals particularly iron and copper. Blood meal can be incorporated at 1- 4% in the poultry diet for better growth (Petkov *et al*., 1980; Nuarautelli *et al*., 1987; Ikram *et al*., 1989). Slinger *et al.* (1955) stated that a combination of blood meal and keratin meal did not promote better growth than blood meal alone. Batterham *et al.* (1986) stated that the addition of lysine in the diet containing blood meal promoted growth. Dafwang *et al.* (1986) stated that the

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inclusion of both fish meal and blood meal tended to improve performance. The absence of these ingredients increased cannibalism and mortality. But in contrast Toor and Fahimullah (1972); Hassan *et al*. (1974); Onwudike (1981) obtained good growth of chickens with higher level of blood meal. Water-soluble blood meal is now available, but no comprehensive report is available about the effect of water-soluble blood meal on broiler performance. This study was undertaken to investigate the effect of different levels of blood meal on the performance of broilers.

Materials and Methods

The experiment was conducted at a private farm, Agricultural research and development farm (ARDF), Sutiakhali, Mymensingh. The experimental house was cleaned, washed with tap water and disinfected with gluteraldehyde+cocobenzyl dimethyl ammonium chloride (Omnicide®, Vetcare, India) solution. The house was left empty for two weeks before placing the experimental birds. A total of 500 one-day-old "Hubbard classic" chicks were purchased from the Pacific Hatchery, Valuka, Mymensingh. The birds were brooded with electric brooder for three weeks. Light was given for 23 hours/day to acclimatise to the environment. The birds were reared on slatted floor. In order to prevent stress and bacterial infection Dextrose monohydrate-100% (Glucose®, Glaxosmithkline, Chittagong, Bangladesh) administered @ 50g/litre of water for few hours before supplying feed and Oxytetracycline (Renamycin®, Renata Animal Health, New DOHS, Mohakhali, Dhaka, Bangladesh) @ 0.25 g/litre of water was given in first three days and again at 20-22 days of age. Water-soluble multivitamins (Megavit® WS, Novartis Animal Health, Bangladesh Ltd, Dhaka, Bangladesh) @ 0.2 g/litre of water were given for three consecutive days in every weeks. The birds were vaccinated with Baby Chick Ranikhet Disease Vaccine (BCRDV®, Livestock Research Institute, Mohakhali, Dhaka, Bangladesh) against Newcastle disease (ND) @ one eye drop per bird at four days of age and a booster dose was given at 14 days of age and Infectious Bursal Disease (IBD) vaccine (Gumboro BAU 404®, Livestock Research Institute, Mohakhali, Dhaka, Bangladesh) @ one eye drop was given per bird at seven days of age and a booster at 18 days of age.

The feeds manufactured by Nourish Poultry Feeds Ltd. Dhaka, Bangladesh were provided *ad libitum* throughout the experiment. The broiler starter diet in the form of crumble was supplied from 1 to 28 days of age and finisher diet in the form of pelleted from 29 to 35 days of age. Fresh drinking water was available all the time.
At 21 days of age, 40 male birds of uniform size were selected and wing-banded for the experiment. The birds were distributed to four dietary groups: T_0, T_1, T_2 and T_3 having ten birds in each group. The birds were reared on slatted floor with an area of 3.0 × 2.5 feet in each group. Processed water-soluble blood meal was collected from the local market and mixed into the drinking water. T_0 was control where no blood meal was provided; T_1, T_2 and T_3 were supplied blood meal at 0.25, 0.50 and 0.75 g/litre of water from 22 to 35 days of age.

The body weight was recorded at 21 and 35 days of age. Group feed intake was recorded weekly. The feed efficiency was calculated. No mortality was observed during experimental period. The cost-benefit was calculated by deducting the cost of chick, feed, vaccine, medicine and others from the gross income.

The parameters were analyzed by Completely Randomized Design (CRD). Significant differences were identified by least significance difference (LSD) using SPSS-11.50 programme.

Results and Discussion

Growth of broilers was significantly ($p<0.001$) improved by the addition of blood meal (Table 1). The weight gain (22-35 days) of broilers was significantly higher in T_1 than T_0 and T_3 (Table 1). The result is consistent with Petkov *et al*. (1980), Nuarautelli *et al*. (1987), Ikram *et al*. (1989) and Khawaja *et al* (2007) who reported that blood meal can be effectively used at up to 3% of the diet of broilers for optimum growth. However, weight gain can be reduced with higher levels of blood meal and this might be due to low levels of the sulphur-containing amino acids and isoleucine (Onwudike, 1981). Hassan *et al*. (1974) used 6% blood meal with 15% meat meal in broiler diet without adverse effect on growth rate, because meat meal is a good source of B vitamins, with other unidentified beneficial factors. Rahman (1995) studied the growth performance of broilers with different levels of blood meal in the diet and found significant ($p<0.05$) differences in growth at 35 days of age. He suggested that 2% blood meal may be included in the broiler diet for optimum performance. Squibb and Braham (1955) stated that blood meal was most effective when fed at 2 to 4% of the diet. Slinger *et al.* (1955) reported that 3% blood meal with crystalline lysine produced better growth in poultry. T_1 group showed better feed conversion efficiency than other groups (Table 1). The feed conversion efficiency with 2.5% blood meal was best. This might be due to the fact that blood meal is rich in lysine, arginine, methionine, cystine, and leucine. The result is consistent with Friedhelm *et al*. (2002), Subhadra *et al*. (2006) and Khawaja *et al.* (2007), but differs from the observation of Rahman (1995) who found insignificant ($p>0.05$) difference of FCR with different levels of blood meal.

The highest net profit was obtained in T_1 with 2.5 % blood meal (Table 2). The total return from sale of birds ranged from Taka 112.0-129.5 as against the total expenditure of Taka 102.1 - 114.7. The net return per bird ranged from Taka 7.8 - 22.9. The cost-benefit analysis indicated that 2.5 % blood meal gave maximum profit. Petkov *et al.* (1980) reported that chicks fed diet containing 3% blood meal showed most economic benefit. The result is similar to the observation of Khawaja *et al.* (2007). Low prices of blood meal, better feed efficiency and weight gain with 2.5% blood meal (T_1) were responsible for better net profit.

Table 1. Performance (Mean ± SE) of broilers fed different levels of blood meal in drinking water

Treatment group	Day-old weight (g)	Performance parameter (mean ± SE)						
		21 day weight (g)	35 day weight (g)	Weight gain (4-5 weeks) (g)	Feed intake (g)			FCE (4-5 weeks)
					0-3 weeks	4-5 weeks	Total	
T_0 (0%)	43	1020 ± 8.2	1600^{a} ± 25.8	580^{a} ± 27.1	2010	1110	3120	1.9
T_1 (2.5%)	42	1025 ± 13.4	1850^{b} ± 34.2	825^{b} ± 37.5	1850	1390	3240	1.7
T_2 (5.0%)	43	1020 ± 8.2	1800^{bc} ± 25.8	780^{bc} ± 27.1	1880	1360	3240	1.7
T_3 (7.5%)	43	1015 ± 10.7	1750^{cd} ± 26.9	725^{cd} ± 25.0	1925	1315	3240	1.8

^{abc} mean values having different superscripts in the same column differed; significantly ($p<0.05$)

Table 2. Economic analysis of broilers fed different level of blood meal (0-35days)

Parameters	Treatment group			
	T_0	T_1	T_2	T_3
Feed consumed from 0-3 weeks (kg/bird)	2.0	1.9	1.9	1.9
Feed consumed from 4-5 weeks (kg/bird)	1.1	1.4	1.4	1.3
Total feed consumed (kg/bird)	3.1	3.2	3.2	3.2
Cost of feed @ 23.8 *Taka/kg (*Taka/bird)	73.0	74.3	74.4	75.6
Chick cost (*Taka/chick)	24.0	24.0	24.0	24.0
Cost of blood meal (*Taka/bird)	00.0	3.3	6.8	10.0
Vaccine, medicine, electricity (*Taka/bird)	5.1	5.1	5.1	5.1
Total cost (*Taka/bird)	102.1	106.6	110.2	114.7
Average live weight at 35 days (kg/bird)	1.6	1.9	1.8	1.8
Return on sale of live broiler @ *Taka 70 per kg	112.0	129.5	126.0	122.5
Net profit per bird (*Taka)	9.9	22.9	15.8	7.8

* 1 Taka = 0.01435 US $ (or 1 US $ = 69.66 Taka) as on 10th November, 2007

It may be concluded that blood meal at a level of 2.5% may be incorporated in drinking water of broilers for optimum performance with greatest economic benefit.

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