ISSN 1682-8356
ansinet.org/ijps

INTERNATIONAL JOURNAL OF

POULTRY SCIENCE

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

International Journal of Poultry Science 5 (7): 651-655, 2006
ISSN 1682-8356

Effect of Yoghurt and Protexin Boost on Broiler Performance

A. Aftahi[1], T. Munim[2], M.A. Hoque[2] and M.A. Ashraf[*]
[1]Department of Poultry Science, [2]Department of Animal Breeding and Genetics,
Bangladesh Agricultural University, Mymensingh 2002, Bangladesh

Abstract: The influence of yoghurt and protexin boost on broiler growth, feed intake, feed conversion ratio, livability and profitability production was studied from 1 to 35 days of age. A total of 120 day-old Arbor Acres commercial broiler chicks were distributed randomly into five dietary treatments. Each treatment had 3 replications each of 8 birds. The experimental treatments T_1 considered as control and T_2, T_3, T_4 received 3.0g, 4.0g, 5.0g sour yoghurt, respectively per liter of drinking water and T_5 received 1.0g protexin boost per 10 liter of drinking water throughout the experimental period. Improvement was observed in body weight gain and feed conversion ratio of broiler of T_5 group at 35 days of age compared to other groups. Satisfactory improvement was observed in birds of T_4 treatment group. Diet of different treatments had no significant ($p>0.05$) effect on livability of broiler. It was concluded that yoghurt and protexin boost could show beneficial effect on broiler performance at the level tested and the inclusion of yoghurt at a level of 5 g per liter of drinking water could be economized broiler production.

Key words: Probiotic, broiler, livability, profitability

Introduction

The demand by the consumers for the improved quality of poultry products continues a momentum but equally pressing in the requirement to offer products which have received no antibiotics, chemotherapy or growth promoters harmful for human. There is some evidence which suggests that antibiotics may also counteract the adverse consequences of stress. There is growing concern regarding the residual effect of antibiotics and the development of drug resistant bacteria attributed to continuous feeding of antibiotics at sub - therapeutic levels. The adverse effect of feeding antibiotic has encouraged in flavor of feeding probiotics or yoghurt to boost up productive performance of chickens.

Probiotics are live microbial feed supplements which beneficially affect the host animal by improving its intestinal microbial balance. They also prevent contamination of carcass by intestinal pathogens during processing and promote growth rate and feed efficiency in growing chickens (Juven *et al*., 1991). The probiotics include enzymes, yeast and live bacteria, which contribute to maintain balance in intestinal micro flora (Tortuero, 1973). Yoghurt is also a kind of probiotic, which mainly contains *Streptococcus lactis* and *Lactobacillus acidophilus* (Perdigon *et al*., 2002). When it is applied to animals or men it affects the host beneficially by improving the properties to the indigenous microflora.

Various probiotics preparations are available in the market at present and there indiscriminate uses are in practice without much scientific information about it. Protexin is one of the commercial probiotics preparations containing a unique mixture of micro organs, which is marketed by Novertis (Bangladesh) limited. The manufactures of the product (Probiotics internationals limited, UK) claims that it exerts its beneficial effects on the performance of broilers. Keeping those in mind, present study was undertaken to investigate the effects of protexin and yoghurt on the performance of broilers and to asses economic viability of feeding yoghurt and protexin to broilers.

Materials and Methods

Experimental birds: This study was conducted at the Bangladesh Agricultural University Poultry Farm, Mymensingh during the period from 26 March to 1 May, 2005 to see the effects of yoghurt and protexin boost on broiler performance. Day-old Arbor Acres commercial broiler chicks were collected from Aftab Bahumukhi Farms Limited, Bajitpur, Kishorejong, Bangladesh.

Preparation of house: An open house was partitioned to 15 pens of equal size by using expanded wire net and bamboo materials with 8 pens in one side and 7 pens in another side of a service area running along the middle of the house. Each pen was 95 cm × 85 cm for eight birds. Therefore, the space given for each bird was 1009 sq cm. The pens were thoroughly brushed, swiped and washed by water. After washing with clean water, the pens were disinfected by virkon solution. Then the rooms were left vacant for 10 days. During this time, all feeders, waterers and other necessary equipment were properly cleaned, washed and disinfected with virkon solution, subsequently dried and left for 3 days before use.

Collection of probiotic and yoghurt: A commercial probiotic "Protexin boost" was collected from local market which was denoted by Novertis (Bangladesh) Limited for the study purpose. Yoghurt was also purchased from local market.

Layout of the experiment: There were 5 treatments i.e. control (T_1), 3.0g yoghurt per liter of water (T_2), 4.0g yoghurt per liter of water (T_3), 5.0g yoghurt per liter of water (T_4) and 0.1g protexin per liter of water (T_5) in this experiment. Each treatment had 3 replications each of 8 birds. The chicks were randomly picked up from a large population and distributed to replicate pens. Initial body weight was adjusted in all replicates and treatment groups and the initial (day-old) body weight ranged from 48-50 grams.

Experimental feeds: The commercial broiler starter and finisher diets were purchased from an agent at Mymensingh town of Aftab Bahumukhi Farms Limited.

Litter management: Fresh rice husk at a depth of 3 cm was used as a litter material and was placed in the pens 2 days earlier before arrival of the baby chicks. The litter has disinfected with virkon solution. Litter material when found damp was replaced by new litter.

Brooding and lighting: The birds were brooded with one 60 watt electric bulb from day-old to 10 days. The bulb was hanged just above the bird's level at the center of each pen. Brooding temperature was kept 34°C at the beginning of the first week of age and decreased gradually in each subsequent week until adjusted to normal environmental temperature. Increasing or decreasing of temperature was done by lowering or raising the bulbs according to the condition of birds observed. After that only one 100 watt bulb were provided up to end of the experiment at the levels of human's head.

Feeder and waterer management: For the first week, feeds were given on newspaper and water was supplied in a round waterer. After first week one trough feeder and one round waterer were provided for each replication (8 birds). Each waterer was placed on two flat bricks.

Feeding and drinking: Immediately after distribution of the chicks in the pens, 5% glucose solution was provided to the chicks for 3 hrs. Then yoghurt was provided with drinking water to T_2, T_3 and T_4 treatments and protexin boost was provided with to T_5 treatment group of chicks. For the first 7 days feed was given on paper and thereafter trough feeder was used for feeding the birds. Leftover feed were mixed with fresh feed into the feeder in each time. In case of cake formation or spoiled condition, it was excluded by taking weight of the waste feed. Feed and water was supplied at *ad libitum*.

Vaccination, sanitation and bio-security: The experimental birds were vaccinated against Newcastle disease and Infectious Bursal Disease. The vaccination schedule followed during the experimental period is given in the Table 1. Adequate hygiene and sanitation were maintained during the study period. Drinkers were washed with clean tap water every morning. The room ally was swiped once daily. A gunny bag was placed at the entrance of the room soaked with bleaching powder solution at all times. All equipment of the house was kept clean. Before entrance, hand and feet were properly washed during working.

Data collection and record keeping: The following records were kept throughout the study period:

Body weight and weight gain: Body weights of chicks were recorded initially and then weekly for each replication in each treatment. Birds were weighed early in the morning prior to feeding. The average body weight gain of birds in each replication was calculated by deducting initial body weight from the final body weight.

Feed consumption and feed conversion ratio: Feed intake was calculated as the total feed consumed in each replication divided by the number of live birds in that particular week. Feed conversion ratio was calculated as the total feed consumed divided by body weight gain.

Mortality: Mortality was recorded as and when occurred. Mortality was calculated from the records of dead birds up to the end of the study against total number of birds and was expressed as percentage.

Performance index: Performance index was measured by using the following formula:

$$PI\ (\%) = \frac{\text{Live weight (kg)}}{\text{Feed conversion ratio}} \times 100$$

Production cost: The production cost of broilers was estimated by considering the expenses involved to purchase chicks, feed, vaccine, protexin boost, yoghurt and miscellaneous items.

Statistical analysis: All the recorded and calculated data were analyzed for analysis of variance (ANOVA) using a completely randomized design (CRD) with the help of MSTAT computer program. The meat yield parameters were analyzed by using a 2 (sex) x 5 (diets) factorial design in CRD. Least significant differences were calculated to compare variation among treatments when ANOVA showed significant differences ($P< 0.05$).

Table 1: Vaccination schedule

Age	Name of the vaccine	Name of the disease	Manufacturer	Route of administration
4th day	BCRDV	Newcastle disease	Live stock Research Institute, Mohakhali, Dhaka	One drop in one eye
14th day	IBD-Blen	Gumboro	Merial, USA	One drop in one eye

Results

Performance of broiler: The effects of probiotic and different levels of yoghurt on the performance of broilers are summarized in Table 2.

Body weight gain: The body weight gain significantly ($p<0.05$) improved in T_4 and T_5 treatment groups than other groups. However, there was no significant difference in weight gain among the treatments of T_1, T_2 and T_3 groups during the period from 1-21 days of age and from 1-35 days of age. During 22 to 35 days of age the highest weight gain was in T_5 followed by T_4, T_2, T_1 and T_3 and the difference were significant between the treatments.

Feed consumption: The significantly ($p<0.05$) highest amount of feed was consumed by birds in T_3 treatment group and lowest in T_2 group during 1-21days, while the difference in feed consumption in T_1, T_4 and T_5 groups was non-significant. During 22-35 days of age the significantly ($p<0.05$) higher amount of feed was consumed by birds in treatment T_5, T_4 and T_2 groups than other treatments. The overall feed consumption during the period from 1-35 days was significantly ($p<0.01$) highest in T_5 and T_4 than the other groups. However, there was no significant difference among birds of T_1, T_2 and T_3 treatment groups.

Feed conversion ratio: During the period from 1-21 days of age feed conversion ratio did not differ significantly among T_1, T_2 and T_4, while significantly improved in birds of T_5 group but significantly reduced in T_3 group. However, during 22-35 days of age feed conversion ratio differs significantly among different treatments. During 1-35 days of age feed conversion ratios significantly ($p<0.01$) improved in birds of T_4 and T_5 treatment groups than the other treatments, while significantly reduced in T_1 and T_2 groups The poorest feed conversion ratio was found in birds T_3 group during 1-35 days of age.

Livability: The livability was almost similar in all dietary treatments (Table 2) and the differences were non significant ($p<0.05$) among treatments. Postmortem report of dead birds indicated that birds were infected with infectious bursal disease.

Performance index: The best performance was obtained in birds of T_5 treatment group followed by T_4, T_2, T_1, and T_3 and the difference were significant ($p<0.05$) among treatments. However there was no significant difference in performance index between birds of T_1 and T_3 treatment groups.

Profitability of broilers: The cost of production and live weight of broilers are shown in Table 3. It was evident that the production costs per kg broiler were Tk. 63.64, 66.25, 69.81, 64.00 and 65.05 for birds of T_1, T_2, T_3, T_4, and T_5 treatments groups. The profit of broiler was highest in T_4 treatment group; however, there was no significant difference in profit of broilers among different treatment groups.

Discussion

Body weight gain: The significantly better performance on body weight gain of probiotic groups than the control group is consistent with the report by Mohan *et al.* (1996). They found 9 to 10.8% more weight gain in probiotic group than control group. The higher and improved body weight gain in probiotic group might be due to better digestive or microbial enzymatic activity (Jin et *al.*, 1998), while the results contradict with the observations of Hossain (2004), Kwon *et al.* (2002) and Priyankarage *et al.* (2003). They found no significant effect of probiotic on live weight gain of broiler. The possible variation might be due to sex effect, weather condition, infectious diseases, etc.

Feed consumption: The effect of probiotics on feed intake was significant, and birds of T_3 group consumed more feed than other groups. The higher feed intake might be due to the increased rate of appetite and enzymatic activity in the digestive tract in those treatments. The significant effects of probiotic on feed intake were observed by Kim *et al.* (1988); Erdogan (1999) and Haq *et al.* (1997). However, Hossain (2004) found non-significant effect of probiotic on feed consumption of broiler.

Feed conversion ratio: Feed conversion ratio was not significantly affected ($p>0.05$) during starter period (1-21 days of age) except birds in T_3 group, which significantly ($p<0.05$) higher than other groups. The feed conversion ratio was the best in protexin group (T_5) in the overall period (1-35 days of age).The results are similar with the findings by Mohan *et al.*, (1996) and Hamid *et al.* (1994). They reported that broiler fed different level of *L. acidophilus* culture (probiotic) up to 35 days of age and found improved feed conversion ratio in birds fed 5.0g probiotic per liter of water, while Hossain *et al.* (2004) found no significant effect of probiotic groups on feed conversion ratio.

Table 2: Effects of different levels of yoghurt and protexin boost on performance of broilers

Variable	Dietary treatments					LSD value
	T_1	T_2	T_3	T_4	T_5	
Body weight gain (g/broiler)						
1-21 days of age	589.85^{c}	586.73^{c}	590.33^{c}	604.48^{b}	617.85^{a}	13.36**
22-35 days of age	717.18^{d}	740.33^{c}	669.50^{e}	819.33^{b}	908.81^{a}	17.21*
1-35 days of age	1307.37^{c}	1327.07^{c}	1259.83^{c}	1423.82^{b}	1526.66^{a}	67.67**
Feed consumption (g/broiler)						
1-21 days of age	784.00^{b}	755.00^{c}	831.00^{a}	785.66^{b}	790.00^{b}	23.41**
22-35 days of age	1469.33^{b}	1510.66^{a}	1408.33^{c}	1530.50^{a}	1530.66^{a}	22.92*
1-35 days of age	2253.00^{b}	2265.66^{b}	2239.33^{b}	2316.16^{a}	2320.66^{a}	67.07**
Feed conversion ratio						
1-21 days of age	1.32^{a}	1.28^{a}	1.40^{b}	1.30^{a}	1.27^{a}	0.057**
22-35 days of age	2.06^{a}	2.03^{c}	2.11^{a}	1.76^{c}	1.64^{d}	0.057**
1-35 days of age	1.71^{c}	1.70^{c}	1.77^{d}	1.53^{b}	1.51^{a}	0.057**
Livability (%)						
1-35 days of age	96.66	95.00	96.66	96.66	96.66	3.5
NSPerformance index value						
1-35 days	78.63^{d}	80.56^{c}	73.66^{d}	90.63^{b}	103.84^{a}	6.23**

The experimental treatment T_1 considered as control and T_2, T_3, T_4 received 3.0g, 4.0g, 5.0g sour yoghurt, respectively per liter of drinking water and T_5 received 1.0g protexin boost per 10 liter of drinking water throughout the study period.

Table 3: Profitability of broilers feed on different level of protexin and yoghurt treatments

Cost item	Dietary treatment				
	T_1	T_2	T_3	T_4	T_5
Chick (Tk./chick)	25.25	25.25	25.25	25.25	25.25
Feed (Tk./chick)	45.91	46.55	47.28	17.40	46.98
Liter	2.08	2.08	2.08	2.08	2.08
Labor	11.00	11.00	11.00	11.00	11.00
Vaccine	0.84	0.84	0.84	0.84	0.84
Disinfectant	0.52	0.52	0.52	0.52	0.52
Electricity	0.60	0.60	0.60	0.60	0.60
Yoghurt	-	0.60	1.62	1.83	-
Protexin boost	-	-	-	-	10.62
Miscellaneous	1	1	1	1	1
Total Production cost (Tk./Broiler)	87.20	88.50	89.23	90.19	98.89
Live weight (kg/broiler at 35 days)	1.37	1.32	1.26	1.42	1.52
Production cost (Tk./kg Broiler)	63.64	66.25	69.81	64.00	65.05
Sale (Tk./kg Broiler)	80	80	80	80	80
Profit† (Tk./kg Broiler)	13.95^{c}	13.75^{c}	10.19^{b}	16.00^{a}	14.95^{a}

The experimental treatment T_1 considered as control and T_2, T_3, T_4 received 3.0 g, 4.0 g, 5.0 g sour yoghurt, respectively per liter of drinking water and T_5 received 1.0 g protexin boost per 10 liter of drinking water throughout the experimental period Miscellaneous cost included newspaper, kerosene oil, polythene bag, candle, register book. Pen, sandal etc. †means with different superscript differ significantly ($p<0.05$)

Livability: The non-significant effect of probiotic on livability of broilers in the present study was inconsistent with the report by Samanta and Biswas (1995). They found significant effect ($p<0.05$) of probiotic on livability of broilers.

Performance index: All yoghurt treated groups and protexin group had higher performance index than that of control group. The superior performance index in protexin (T_5) and in 5.0g yoghurt per liter of water (T_4) was due to the higher body weight and better feed conversion ratio compared to other treatment groups.

Profitability of broilers: The observation of the present study with regard to the profitability of broiler raising was consistent with the findings of Khan *et al.* (1992); Singh and Sharma (1999). They received more profit for broiler fed probiotics. In the present study it was observed that T_4 treatment group had the highest profitability for per kg live weight. The results contradict with the observation by Hossain (2004), who observed maximum profit was in protexin group. It might be due to disease condition, feed consumption and other factors.

Conclusions: The birds supplied 5.0g yoghurt per liter of water or 0.1g protexin per liter of water gained significantly ($p< 0.05$) higher weight than other dietary treatments, which indicate that supplementation of higher level of yoghurt or probiotic might be effective to improve body weight gain and feed conversion ratio. The

differences in livability in all dietary treatments were non significant ($p<0.05$). The significantly higher performance index value was observed in 5.0g yoghurt per liter of water and 0.1g protexin per liter of water groups than the other dietary groups. Production cost was higher in 0.1g protexin per liter of water treatment group and the profit per kg live broiler was highest in 5.0g yoghurt per liter of water group. It may be concluded that feeding yoghurt in drinking water might be effective for better performance in broiler. However, further investigation with more different levels of yoghurt and protexin boost is needed to confirm the results.

References

Erdogan, Z., 1999. The use of antibiotics and probiotics in broiler diets. Lalaham-Hayvancilik-Arastirma enstitusu-Dergisi, 39: 37-69.

Hamid, A., F.Z. Khan, A. Munid and M.A. Qadeer, 1994. Probiotics in poultry production. Bang. J. Sci. Ind., Res., 29: 1-10.

Haq, A., A.S. Khan, M.Z. Siddiqui, A.B. Haq and S. Rasool, 1997. Effect of feeding Biofeed on the performance of broiler chicks. Pak. J. Agri. Sci., 34: 50-52.

Hossain, M.A., 2004. Effect of yoghurt and protexin boost on gut microflora and broiler performance. M. S. Thesis, Department of Poultry Science, Bangladesh Agricultural University, Mymensingh 2202.

Jin, L.Z., Y.W. Ho, N. Abdullah and S. Jalaludin, 1998. Growth performance, intestinal microbial populations and serum cholesterol of broilers diets containing lactobacillus cultures. Poult. Sci., 77: 1259-1265.

Juven, B.J., R.J. Meinersmann and N.J. Stern, 1991. A review Antagonistic effects of *Lactobacilli* and *Pediococci* to control intestinal colonization by human enteropathogens in live poultry. J. Appl. Bacteriol., 70: 95-103.

Khan, M.L., I. Ullah and M.T. Javed, 1992. Comparative study of probiotics, T. M. 50, Biovin 40 and Alback on the performance of broiler chicks. Pak. Vet. J., 12: 145-147.

Kim, C.J., H.A. Namkung and I.K. Paik, 1988. Supplementation of probiotics to the broiler diets containing moldy corn. Kor. J. Anim. Sci., 30: 342-548.

Kwon, O.S., I.H. Kim, J.W. Hong, Y.K. Han, S.H. Lee and J.M. Lee, 2002. Effects of probiotics supplementation on growth performance, blood composition and fecal noxious gas of broiler chickens. Kor. J. Poult. Sci., 29: 1-6.

Mohan, B., R. Kadirevel, A. Natarajan and M. Bhaskaram, 1996. Effect of probiotic supplementation on growth, nitrogen utilization and serum cholesterol in broilers. Br. Poult. Sci., 37: 395-401.

Perdigon, G., A. Moreno, J. Valdez and M. Rachid, 2002. Role of yoghurt in the prevention of colon cancer. European J. Clinical Nutrition. 56 (supplement): 65-68.

Priyankarage, N., S. Silva, S.P. Gunaratne, H. Kothalawala, M.W.C.D. Palliyaguru and G.A. Gunawardana, 2003. Efficacy of probiotics and their effects on performance, carcass characteristics, intestinal microflora and salmonella incidence in broilers. Br. Poult. Sci., 44 (Suppliment): 26-27.

Samanta, M. and P. Biswas, 1995. Effect of feeding probiotic and lactic acid on the performance of broiler. Indian J. Poult. Sci., 30: 145-147.

Singh, S. and V.P. Sharma, 1999. Performance of broiler chicks under different energy and probiotics levels. Poult. Sci., 34: 34-37.

Tortuero, F., 1973. Influence of implantation of *Lactobacillus acidophilus* in chicks on the growth, feed conversion, malabsorption of fats syndrome and intestinal flora. Poult. Sci., 52: 197-203.