

# Effect of Feeding Probiotic and Antibiotic on Productive Performance of Nandanam Broiler - 3

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**Abstract** – A biological trial of eight weeks duration was conducted to assess the effects of feeding probiotic (*Lactobacillus* and *Saccharomyces* species) and antibiotic (Co-Trimazine) on productive performance of Nandanam 3 colour broiler chicken. Day old Nandanam 3 broiler chicks (n = 72) were distributed into 3 groups of 24 chicks each with two replicates. Three dietary treatments were T1 (basal diet), T2 (basal diet with probiotics) T3 (basal diet with antibiotic) at a level of 500gm per ton of feed. The average body weight (g) at 8th week was 934.22 ± 43.95, 1013.48 ± 32.16 and 1174.67 ± 50.22 in T1, T2 and T3 respectively. The feed efficiency was 2.45 ± 0.15, 2.35 ± 0.07 and 2.21 ± 0.14 in T1, T2 and T3 respectively. Slaughter studies was conducted at the end of 8<sup>th</sup> week and the per cent eviscerated, giblet and ready-to-cook weight were 58.92 ± 2.73, 60.52 ± 3.71, 64.11 ± 2.96; 5.80 ± 0.19, 5.38 ± 0.20, 5.04 ± 0.20 and 64.72 ± 2.75, 65.89 ± 3.88, 69.16 ± 3.09 respectively for T1, T2 and T3 groups. The results indicated that the dietary supplementation of antibiotic at the level of 500 gm per ton feed significantly (P<0.01) higher body weight and livability was significantly (P<0.01) higher in control than probiotic and antibiotic groups. The slaughter studies of the above result indicated percent giblet was significantly (P<0.05) higher in control than probiotic and antibiotic groups.

**Keywords** – Broiler, Probiotic, Antibiotic, Production performance.

## I. INTRODUCTION

Poultry production during last few decades has received great impetus in India. Feed amounts to one of major input in broiler production with approximately two third of input costs. Attempts have been made to minimize this factor by incorporation of feed additives (Swain and Johri, 2000) and probiotics (Jain *et al.*, 2002). Supplementation of these agents is aimed to improve digestibility and bioavailability of various nutrients thereby enhancing economic gain by cutting down the input costs. Probiotics have beneficial effect on broiler performance, improvement in feed conversion, reduction in mortality and reduction of serum cholesterol (Gil, *et al.*, 2005). A peptolide antibiotic (Virginiamycin) has reversible bacteriostatic action on gut micro flora and improves nutrient availability in monogastric animals (Jerry and Jim, 1995). In this present study, an attempt has been made to evaluate the performance of Nandanam broiler 3 Chickens fed with diets supplemented with probiotic and antibiotics.

## II. MATERIALS AND METHODS

### *Birds and Experimental Design:*

Total of 72 day old Nandanam broiler 3 day old chicks were used for experiment and reared under deep litter system at poultry Research station, Chennai - 50. The chicks were randomly distributed into three dietary treatments viz. T1- control (basal diet only), T2- Probiotic (*Lactobacillus* and *Saccharomyces* species 500gm/ton of feed) and T3 - Antibiotic (Co - Trimazine 500gm ton of feed). Each treatment contained 2 replicates with 12 birds in each treatment. The birds were reared in deep litter system in well ventilated shed. The floor was thoroughly cleaned and dried before spreading the dry rice husk as bedding materials. Electric bulbs were placed in each pen at the rate of one watt per chick for first 3 weeks of age then it will be reduced.

### *Vaccination:*

All the birds were vaccinated against Ranikhet disease (F1- strain) at 5 to 7 days by intra ocular or intera-nasal, Lasota at 14<sup>th</sup> days of age by drinking water.

### *Feeding Management:*

The birds were offered weighed quantity of the broiler feed from 0-8 weeks of age. For the first three days of brooding, feed was provided on the news paper spread on floor and thereafter, linear chick feeders were used. Feed residues were collected and weighed at weekly interval. During the finishing stage large linear feeders were used. Fresh and clean drinking water was made available throughout the day. The record of feed offered and residual amount left was maintained for each replicate to calculate the feed intake up to 8 weeks. Body weight of the birds was also recorded. Feed intake to weight gain ratio was calculated to determine feed efficiency and livability were recorded.

### *Carcass Traits:*

At the end 56 days of age, 3 birds from each replicate were randomly chosen slaughtered and abdominal fat, liver, pancreas, gizzard, heart, proventriculus, small intestine and caecum were collected, weighed and calculated as a percentage of eviscerated weight, giblet weight and ready-to cook weight.

### *Statistical Analysis:*

Performance data were analyzed by using simple ANOVA (Snedecor and Cochran, 1994).

### III. RESULTS AND DISCUSSION

The data on growth performance and carcass traits of the birds were presented in the Table1.

#### *Impact of Probiotics and Antibiotic on Growth Performance*

The body weight at the end of 8<sup>th</sup> week among the treatments, Antibiotic supplemented group (T3) was highly significant ( $P < 0.01$ ) compared to the control group and probiotic supplemented group (T2) was significantly ( $P < 0.05$ ) higher compared to control group. Shalini Srinivastava *et al.*, (2011) reported that the supplementation of antibiotic (Zinc bacitracin at level of 35mg/kg feed) improved the growth performance significantly ( $P < 0.05$ ) in finisher phase. Similar response on body weight after 7 weeks was significantly ( $P < 0.05$ ) higher in antibiotic (virginiamycin) supplemented broiler chicken compared to control birds (Pnadey *et al.*, 2005). Singh *et al.*, (2009) who have reported that the body weight gain of the birds fed probiotic supplemented diets for 0-6 weeks period was higher ( $P < 0.05$ ) than those fed with basal diet only. Sangilimadan *et al.* (2011) reported that the supplementation of probiotics at a level of 500gm per ton of feed to Nandanam broiler 2 at 8<sup>th</sup> week body weight lower than that of present study. Similar findings were observed by Vinayasree *et al.*, (2011) who reported that there was a significant ( $P < 0.05$ ) increase in the average body weight gain by probiotics compared to control. Kumar *et al.*, (2010) conducted an experiment in which they fed probiotic at 1gm per 10kg and supplemented Virginiamycin about 1gm per 1kg along with feed up to 42 days of age and reported that 6<sup>th</sup> week of age revealed highest mean body weight in antibiotic fed group ( $1625.26 \pm 46.98$ g) and the same trend was also observed in this study.

#### *Impact of Probiotics and Antibiotic on Feed Efficiency*

Feed efficiency was significantly ( $P < 0.01$ ) improved in the birds of antibiotic and probiotic treated when compared with those of control at 0-8 weeks period. The similar responses on feed efficiency was significantly ( $P < 0.01$ ) improved for the birds of probiotic treated compared with those control for 0-6 weeks period (Singh, *et al.*, 2009). Similar experimental results were also observed in Nandanam broiler 2 by Sangilimadan, *et al.*, (2011). In present study the feed conversion ratio was also superior ( $P < 0.05$ ) in antibiotic fed groups ( $2.21 \pm 0.14$ ) than other group. This same trend was observed by Pandey *et al.*, (2005) in commercial broiler chicks at 7 weeks of age. Chicks in probiotic supplemented group feed efficiency improved on comparison to control birds (Mehdi Toghyani *et al.*, (2011). The same trends were observed in the present study. (Mehdi Toghyani *et al.*, (2011) reported that significant benefits of antibiotic supplementation observed on chick growth and improved FCR. The same results were observed in the present study on antibiotic fed group (T3).

#### *Impact of Probiotics and Antibiotic on Livability Rate (%)*

Percent livability up to 8<sup>th</sup> week of age was presented in Table1. The results of present study suggested that poor

livability was found in T3 as compared to other groups. The same trend was also noticed in antibiotic fed broilers upto 6 weeks (Kumar, *et al.* 2010). Mortality rate was not influenced by probiotics and prebiotics as substitution with antibiotic experimental treatments upto 42 days of Ross broilers (Mehdi Toghyani *et al.*, (2011). The same results were observed as the present study.

#### *Impact of Probiotics and Antibiotic on Carcass Traits*

In the present study per cent eviscerated, giblet and ready – to – cook weight was higher in antibiotic and probiotic compared to control. The same trend was observed by Swain, *et al.* (2011).

### IV. CONCLUSION

Thus, the present study confirmed that the performance of Nandanam broiler 3 chicken fed with chicks supplemented with probiotic and antibiotic at the level of 500g per ton feed attained significantly ( $P < 0.01$ ) higher body weight and livability was significantly ( $P < 0.01$ ) higher in control than probiotic and antibiotic supplied groups. The slaughter studies of the above result indicated percent giblet was significantly ( $P < 0.05$ ) higher in control than probiotic and antibiotic groups.

### REFERENCES

- [1] Gil de los Santos (Gil of the Saints), J.R., Storch, O.B. and Gil-Tur nes, C. 2005. Bacillus Cereus var. toyoi and Saccharomyces boulardii increased feed efficiency in broilers infected with Salmonella enteritidis. *Brit. Poult. Sci.* 46 (4) : 494 - 97.
- [2] Jain Archana, Goel, V.D and Mohsin, M. 2002. Effect of dietary supplementation with bacitracins on production performance and carcass quality in broilers. *Indian J. Poult. Sci.*, 37 (1) : 78-82.
- [3] Jerry, W.S. and Jim, E.R. 1995. In: Veterinary Pharmacology and Therapeutics. pp845, (Ed.) Adams H.R, 7<sup>th</sup> ed. Ames, Iowa state University press.
- [4] Kumar, S., Choudhary, R.S, Gujrathi, P.G. and Vaishnav, A.K. 2010. Effect of feeding probiotics and Virginiamycin on body weight gain of broiler chicks. XXVII- Annual Conference and National Symposium of Indian Poultry Science Association, Madras Veterinary College, Chennai-7, September 16-18.
- [5] Mehdi Toghyani., Majid Toghyani and Sayed Ali Tabeidian. 2011. Effect of probiotic and prebiotic as antibiotic growth promoter substitutions on productive and carcass traits of broiler chicks. International conference on Food Engineering and Biotechnology (IFCBEE) : 9: 82-86.
- [6] Pandey, H., Rastogi, S.K and Mohsin, M. 2005. Response of feed supplementation of Virginiamycin on feed utilization and organ growth of broiler. *Indian. J.Poult.Sci.*40 (3): 230-234.
- [7] Sangilimadan, K., Omprakash, A.V., Pandian, C., Premavalli, K and Babu, M. 2011. Effect of feeding probiotic on growth performance of Nandanam broiler 2. Xxviii- Annual conference and International symposium of Indian Poultry Science Association - IPSACON-2011, 22-24 December-2011, Bihar Veterinary College, Sabour, Patna. p-65.
- [8] Shalini Srivastava, Vishal Mudgal, R.S. Gupta and R.P.S. Baghel. 2011. Effect of antibiotic supplementation on the growth performance of commercial broiler chicken. Xxviii- Annual Conference and International symposium of Indian Poultry Science Association – IPSACON – December – 22 - 24, Bihar Veterinary College, Sabour, Patna. p-65.
- [9] Singh, S.K., Niranjana, P.S and Udeybir 2009. Effect of dietary probiotics supplementation on growth performance and nutrient utilization in broilers. *Indian J. Vet. Sci.*, 86(8) :813-15. Snedecor, G.W. and Cochran, W.G.1994. Statistical methods. 8<sup>th</sup> ed. Oxford and IBH Publishing Company, New Delhi, India.

- [10] Swain, B.K and Johri, T.S. 2000. Effect of supplementation of combination of different level of selenium and vitamin- E on relative weight of some organs and serum enzyme level in broilers. *Indian J. Poult. Sci.*, 35 (1) : 66-69.
- [11] Swain, B.K., Naik, P.K., Chakurkar, E.B and Singh, N.P.2011. Effect of combined supplementation of probiotic and Yeast on growth, carcass Characteristics and economics of production in broiler chicken. Xxviii- Annual conference and International symposium of Indian Poultry Science Association-IPSACON, December-22-24, Bihar Veterinary College, Sabour, Patna. p-65.
- [12] Vinayaree, C., Kondal Reddy, K., Gupta, P.S.P., Reddy, P.V.M., Gopala Reddy, A and Nagalakshmi, D.2012. Evaluation of probiotic organisms on performance of broilers. *Indian Vet. J.* 89 (7): 16-19.

Table 1. Effects of feeding Probiotic and Antibiotic on productive performance of Nandanam broiler - 3.

Production parameters	Treatment I (Control)	Treatment II (Probiotic 500g/ton of feed)	Treatment III (Antibiotic 500g /ton of feed)
Hatch weight (g) <sup>NS</sup>	40.10 ± 0.64	40.39 ± 0.84	40.32 ± 0.56
8 <sup>th</sup> week weight(g)**	934.22 ± 43.95 <sup>c</sup>	1013.48 ± 32.16 <sup>b</sup>	1174.67 ± 50.22 <sup>a</sup>
Feed efficiency*	2.45 ± 0.15 <sup>b</sup>	2.35 ± 0.07 <sup>b</sup>	2.21 ± 0.14 <sup>a</sup>
Livability	95.83	95.83	87.50
Per cent eviscerated** weight	58.92 ± 2.73 <sup>c</sup>	60.52 ± 3.71 <sup>b</sup>	64.11 ± 2.96 <sup>a</sup>
Per cent giblet weight <sup>NS</sup>	5.80 ± 0.19	5.38 ± 0.20	5.04 ± 0.20
Per cent ready - to - cook weight*	64.72 ± 2.75 <sup>b</sup>	65.89 ± 3.88 <sup>b</sup>	69.16 ± 3.09 <sup>a</sup>

Mean bearing different superscripts within the columns under a parameter differ significantly (\*\* - P (0.01); \* - P (0.05), NS - Non significant.

## AUTHOR'S PROFILE



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Working as Professor and Head in the Department of Livestock Production Management, Veterinary College and Research Institute, Tiuunelveli, Tamil Nadu Veterinary and Animal Sciences University, Tamil Nadu, India since 1999, has published 30 research articles in National Journals, Published 35 popular articles.

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