



## Response of Probiotic and Gut Acidifier on Performance of Broiler

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### ABSTRACT

An experiment was conducted to study the comparative efficacy of *Lactobacillus sporogenes* and gut acidifier on the performance of broiler for 0-6 wk. One hundred and fifty day old broiler chicks were randomly divided into three equal groups viz., T1, T2 and T3 having 50 chicks each. The group T1 was control receiving standard broiler diet, group T2 received standard broiler diet supplemented with probiotic (*Lactobacillus sporogenes*) at the rate of 0.1% and 0.05% in starter mash and finisher mash, respectively, and similarly group T3 received standard broiler diet with acidifier at the rate of 0.1% and 0.05% in starter mash and finisher mash, respectively. Further each group was subdivided into five replicates of 10 birds each. The average weekly live weights at the end of six weeks were 1700, 1805 and 1809g for groups T1 T2 and T3, respectively. Total feed consumption at the end of six weeks for groups T1, T2 and T3 were 3228g, 3270g and 3249g, respectively.

**Key Words:** Broiler, Gut acidifier, Performance, Probiotic, Weight gain.

### INTRODUCTION

The broiler chickens are succumbed to various kinds of stress due to the intensive production pressure in the present farming system, which adversely affect their performance. Under such circumstances antibiotics and synthetic antimicrobial agents are often used for alleviating stress and to improve growth and feed efficiency. However, continuous use of sub-therapeutic levels of antibiotics in animal feed resulted in the presence of antibiotic residues in animal products and development of drug resistant micro-organisms in human. Dietary use of probiotics is thus preferred to antibiotics to enhance nutrient utilization, improve feed efficiency and maintain health status because of their non-harmful effects on the consumers. Probiotics are live microbial feed supplements,

which beneficially affects the host by improving its intestinal microbial balance, resulting in improved performance of chicks.

The word probiotic is derived from the Greek word “probios” meaning “for life” (is the converse of “antibiotic” which means against life.) The probiotic in fact is “a live microbial feed supplement, which beneficially affects the host animal by improving the intestinal microbial balance”. Acidifiers / organic acids include short chain fatty acids, volatile fatty acids and weak carboxylic acids that are only partly disassociated. They may play a role in maintaining gut integrity in the way that they reduce the colonization of pathogen (like *Salmonella* and *E.coli*) in intestinal wall by lowering the intestinal pH below 6.0 and promoting the normal microflora growth. This condition also

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increases the efficiency of all digestive enzymes. Daily application of short chain fatty acids such as butyric acids increases epithelial cell proliferation, quick repairing of the intestine, increased villous height and in turn increased absorptive capacity.

Therefore, present study was conducted to ascertain the effect of dietary supplementation of *Lactobacillus sporogenes* and gut acidifier on the growth performance of broiler chicken during 0 to 6 wk of age.

## MATERIALS AND METHODS

In the present study, total 150 day old broiler chicks were purchased from M/s. Phoenix Hatcheries Pvt. Ltd., Jabalpur were randomly divided into three equal groups viz., T1, T2 and T3 having 50 chicks each. Group T1 was control receiving standard broiler diet, group T2 received standard broiler diet supplemented with probiotic *Lactobacillus sporogenes* at the rate of 0.1% and 0.05% in starter mash and finisher mash respectively, and similarly group T3 received standard broiler diet with acidifier at the rate of 0.1% and 0.05% in starter mash and finisher mash, respectively.

### Percent ingredient composition of broiler diet

Sr. No.	Ingredient	Starter Mash	Finisher Mash
1.	Maize	51.80	57.20
2.	Soyabean meal	33.70	28.30
3.	Vegetable oil	2.5	2.5
4.	Mustered meal	5	5
5.	Meat cum bone meal	5	5
6.	DCP	1.5	1.5
7.	Trace minerals	0.2	0.2
8.	Salt	0.3	0.3
A	Supplement added in broiler diet (g/100kg)		
9.	Vitamin premix	25	25
10.	Methionine	170	140
11.	Lysine	40	-
12.	Choline chloride	60	60
13.	Maduramycin	50	50
14.	Toxin binder	100	100

### Feed Treatment

Group T1	Control
Group T2	Control + <i>Lactobacillus sporogenes</i> @ 0.1% of feed from 0-3 wk Control + <i>Lactobacillus sporogenes</i> @ 0.05% of feed from 4-6 wk
Group T3	Control + Gut acidifier @ 0.1% of feed from 0-3 weeks Control + Gut acidifier @ 0.05% of feed from 4-6 weeks

The birds were reared on deep litter system housing with rice husk as litter material. An adequate and identical floor, feeding and watering space was allotted to all the birds as per standard requirements. Individual body weight of chicks and replicate wise feed intake were recorded at weekly interval throughout the experimental period. The parameters were studied in each group viz., live body weight, weekly feed consumption and feed efficiency ratio. The data were subjected to statistical analysis by using randomized block design for growth parameters.

## RESULTS AND DISCUSSION

### Average weekly live body weight of broilers

It was observed (Table 1) that the average live body weights of day old chicks from the group T1, T2 and T3 were 38.2, 38.8 and 38.1g, respectively. Both the treatment groups (T2 and T3) receiving probiotics and acidifiers supplementation in the diet showed higher body weights than control. Further comparison of treatment means revealed that the average live body weight of T2 and T3 groups were significantly higher ( $P < 0.01$ ) as compared to control. Among the treatment groups (T2 and T3) the group supplemented with acidifier was significantly superior ( $P < 0.01$ ) compared to group supplemented with probiotic. The results indicated that the same trend of significance was noticed from 3rd week onwards, in average weekly live body weights of birds. The growth pattern obtained in present study suggested that use of probiotic and acidifier in

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the broiler ration is quite useful to improve body weights substantially than the control group.

**Table 1. Average weekly live body weight of broilers (g).**

Parameter	Treatment		
	T1	T2	T3
Age			
Day old	38.2	38.8	38.1
1st	155.18a	156.21b	156.28 b
2nd	393.5a	388.26 b	400.8c
3rd	720.8 a	728.8 b	736.42 c
4th	1054.32 a	1083.5 b	1090.89 c
5th	1344.99 a	1472.6 b	1479.2 c
6th	1700.01 a	1805.2 b	1809.99 c

Values with different superscripts in a column differ significantly

### Effect of Gut acidifier and probiotic on the performance of broilers

It was observed (Table 2) that average cumulative gain in body weight (g) of broiler at the end of 6th week was 1700, 1805 and 1809 g for group T1, T2 and T3, respectively. The results of the present study were in agreement with the result of Sheikh et al (2011) and Ghazalah *et al* (2011) who reported that the supplementation of organic acids in broiler chicken improve the body weight gain when compared with the unsupplemented group. The average total feed consumption was 3228, 3270 and 3249g in T1, T2 and T3 groups, respectively during experimental period of 6 wk. The average weekly feed consumption during 6th week was significantly different between control and T2 group but non-significant in probiotic and

acidifier supplement group. The improvement in the feed conversion ratio could be possibly due to better utilization of nutrients resulting in increased body weight gain. Zhang and Kim (2014) reported that dietary supplementation with multistrain probiotic significantly improved body weight gain and reduced feed conversion ratio FCR in broiler chickens compared with chickens from the control group.

### CONCLUSION

The feed intake increased by adding probiotic and gut acidifier into broiler diet. The supplementation of probiotic and gut acidifiers to the diet significantly improved the live weight. The inclusion of probiotic and acidifier in broiler diet at the rate of 0.1% and 0.05 % in starter mash and finisher mash was significantly beneficial in improving feed conversion ratio.

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Received on 25/7/2018

Accepted on 15/8/2018

Particular	Treatment Group		
	T1	T2	T3
Total live body weight at the end of 6th week (g)	1700a	1805b	1809c
Weekly body weight gain (g)	355a	332b	330c
Feed intake (g)	3228	3270	3249
Weekly Feed consumption (g)	841a	842b	841a
Feed conversion ratio	2.369a	2.531b	2.542c

The means having different superscripts differ significantly(P<0.05)