



RESEARCH ARTICLE

Study on Synergistic Effects of Non Starch Polysaccharides NSP Degrading Enzyme, Probiotic and Prebiotics Supplementation on Broiler Performance

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ABSTRACT

A total of sixty one day old commercial broiler chicks (Vencobb strain) were included in current investigation to study the effect of Biomark EPPA[®] containing Enzyme, Prebiotics and Probiotics @ 2.0 kg/ton diet on body weight gain, feed intake and mortality. The birds were randomly divided into two groups namely control and treatment with three replicates of 10 birds each. The birds were reared under uniform management conditions during the experimental period for six weeks. The experimental diets were similar for both the groups except the product Biomark EPPA, a feed additive containing enzymes, synbiotics and acidifiers was added in the treatment group @3.0 kg/ton of feed. The final body weight gain (0-6) in control and treatment groups were 1901 ± 43.6 g and 2007 ± 50.1 g, respectively. There was 100 g additional weight gain per bird due to the addition of Biomark EPPA. The feed intakes in control and treatment groups were 3151 ± 20.8 and 3004 ± 17.5 g. The feed efficiency in control and treatment groups was 1.62 and 1.50 respectively. The feed efficiency was significantly ($P < 0.05$) better in treatment group (1.50) as compared with control group (1.62). Hence supplementation of Biomark EPPA feed additive resulted in increased body weight gain with better FCR in broilers.

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INTRODUCTION

Certain feed additives incorporated in poultry feeds can create favorable conditions in the intestine for the efficient digestion of feed. Feed additives viz. NSP degrading enzymes, probiotic and prebiotic helps in maintaining gut health either directly or indirectly. Sufficient work of testing prebiotics, probiotics and NSP degrading enzymes in broiler production has been investigated (Lokhande *et al.*, 2005). However, in most of the experiments these additives have been used singly and information about their synergistic effect is scanty. If two or more such additives are used in combination, possibly their effects may complement and may have symbiotic effect. Hence, the present study was undertaken to test the efficacy of Biomark EPPA (combination of NSP degrading enzyme, probiotics, prebiotics and acidifier) on growth performance of broilers.

MATERIALS AND METHODS

Birds and housing

The experiment was conducted on 60 Vencobb straight run broilers chicks of day-old for a period of six

weeks. The chicks were weighed individually; wing banded and distributed randomly in to two groups namely control, and Biomark EPPA[®] group with three replicates of 10 birds in each group. Broiler pre- starter, starter and finisher rations were fed from 0-14, 15-28 and 29-42 days of age respectively. The experimental rations were formulated to contain the same level of protein, energy, lysine, methionine, calcium and phosphorus (Table 1) in both control and product group except Biomark EPPA was added @ 2.0 kg/ton of feed in product group.

The chicks were housed in deep litter pens and reared from one day old to six weeks of age following uniform vaccination and standard management practices. The feed and water were provided *ad libitum* throughout the experimental period.

Data collection and cost effective ness

The daily feed intake, mortality (if any), weekly body weight gain and feed efficiency were recorded throughout the experimental period. At the end of the trial, litter samples (approximately 500 g) were collected from each replicate at random locations and moisture was estimated at 100 ± 5 °C for 8 h using hot air oven. The cost of

different experimental rations was worked out based on the actual cost of the feed ingredients, supplements and additives. The cost of feed per unit gain in weight in different groups was calculated and compared. The data collected on various parameters were statistically analyzed as per the method of Snedecor and Cochran (1989).

Table 1: Ingredient composition of broiler pre starter, starter and finisher diet (%DM)

Ingredients	Pre starter	Starter	Finisher
Maize	45.85	46.87	54.63
Broken rice	10.00	10.00	10.00
Soya	40.11	37.42	29.13
Rice bran oil	0.33	1.73	2.23
Dicalcium phosphate	1.00	1.04	1.18
Calcite	1.59	1.58	1.55
Lysine (g/100kg)	160.00	212.00	211.00
DL-Methionine (g/100kg)	261.00	296.00	223.00
Threonine (g/100kg)	7.00	33.00	23.00
Salt (g/100kg)	400.00	330.00	220.00
Sodium bicarbonate (g/100kg)	0.00	134.00	197.00
Additives and supplements (g/100 kg)	532.00	532.00	532.00
CP (%)*	23.00	22.00	19.00
Metabolizable Energy (kcal/kg)*	2850	2950	3050

* Calculated value; Biomark EPPA® was added 2.0 kg/ ton of feed in product group

RESULTS AND DISCUSSION

The body weight gain, feed intake and feed conversion ratio are presented in Table 2. The body weight gain did not differ significantly at 2nd week where as at 4th and 6th, the week body weight gain in product group was significantly ($P<0.05$) higher than the control group. The final body weight gain (0-6 week) in control and product groups were 2075 ± 42.1 g and 2210 ± 35.1 g, respectively and inferred that product group had significantly ($P<0.05$) higher body weight gain. The feed intake in control and product groups did not differ significantly during 2nd and 4th week, whereas at 6th week, the feed intake was significantly ($P<0.05$) lower in product group (1444 ± 33.26 g) than the control group (1654 ± 27.69 g). The over all feed intake (0-6 week) was significantly ($P<0.05$) lower in product group (3005 ± 17.5 g) than the control group (3151 ± 20.8 g). The feed conversion ratio (FCR) in prestarter phase was poor in both the groups and this may be due to feed wastage (paper feeding) in this stage. However, the over all FCR was significantly ($P<0.05$) lower in product group (1.50) than the control group (1.62). Khaksefidi and Rahimi (2005) observed that the body weight and feed conversion ratio of probiotic fed groups were superior compare to the control group. In the study of Sabiha *et al.* (2005) the probiotic and prebiotic supplemented (0.025 %) quails had a significantly higher body weight gain. However, Pelicano *et al.* (2004) observed that probiotic and enzyme supplementation had no beneficial effects on the growth performance of broiler chicken.

Throughout the experiment, there was no mortality in both the groups and the litter moisture percentage was

significantly lower in the product group (31.51 ± 1.39) than the control group (38.55 ± 1.04). The lower litter moisture percentage in product group indicated the efficient utilization of NSPs in the feed stuff and reduces the problem of gut viscosity and loose droppings.

The feed cost for per kg live weight gain in control and product group was ` 26.78 and 24.35, respectively. Results of the present study indicated that addition of Biomark EPPA®, a feed additive in broiler diet resulted in 2.43 low feed cost per kg weight gain. (Table 3).

Table 2: The body weight gain, feed intake and FCR in control and Bio mark EPPA® product groups

Particulars	week	Control		
		Product Biomark EPPA®	NS	
Body weight gain (g)	0-2 week	308±8.1	316± 6.3	NS
	3-4 week	772±18.3 ^a	838±16.9 ^b	$P<0.05$
	5-6 week	907±28.7 ^a	1029±33.6 ^b	$P<0.01$
	0-6 week	2075±42.1 ^a	2210±35.1 ^b	$P<0.05$
Feed intake(g)	0-2 week	477±16.3	493±18.1	NS
	3-4 week	1020±30.8	1068±17.3	NS
	5-6 week	1654±27.7 ^a	1444±33.3 ^b	$P<0.05$
	0-6 week	3151±20.8 ^a	3005±17.5 ^b	$P<0.05$
FCR	0-2 week	1.56	1.61	NS
	3-4 week	1.35	1.39	NS
	5-6 week	1.76 ^a	1.54 ^b	$P<0.05$
	0-6 week	1.62 ^a	1.50 ^b	$P<0.05$
Mortality	0-6 week	Nil	Nil	
Litter moisture %		38.55±1.04 ^a	31.51±1.39 ^b	$P<0.05$

Values bearing different superscript in a row differ significantly at ($P<0.05$)

Table 3: Effect of Bio mark EPPA® addition on cost effectiveness of rations in broilers

Treatment Groups	Feed cost (₹/kg)			Feed cost / kg weight gain (₹)
	Pre starter	Starter	Finisher	
Control	17.73	18.08	17.33	26.78
Biomark EPPA	17.98	18.33	17.58	24.35

Conclusion

From the present study, it can be concluded that supplementation of Biomark EPPA® containing Enzyme, Prebiotics and Probiotics @ 2.0 kg/ton of broiler diet resulted in higher body weight gain with better feed conversion ratio. The feed cost per kg live weight gain was lower to the tune of 2.43 as compared to the control group.

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