

EFFECT OF DIETARY SUPPLEMENTATION OF PROBIOTICS ON JUVENILE GROWTH AND ECONOMICS OF GOAT PRODUCTION

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(Received on Date: 7th October 2014

Date of Acceptance : 10th January 2015)

ABSTRACT

The experimental data on growth performance and economics were collected from the goat kids to find out determine effect of dietary supplementation of probiotics on the juvenile growth and economics of goat production. The average daily gain was significantly ($P < 0.05$) higher in group-III (76.54 ± 2.11) as compared to group-II (69.90 ± 2.29 gm) and control group-I (41.51 ± 2.43 gm).and also economic analysis of cost benefit ratio was highest in the group III and followed by group II and group I. It was concluded that supplementation of microbial feed additives in diet of kids had positive influence on growth rate. Therefore better management to improved growth performance of kids and economized goat production.

Keywords: Probiotic, Goat, Kids and growth performance

No. of Tables: 1

No. of References: 10

INTRODUCTION

Probiotics are living microorganism providing beneficial effect for the host when administered in adequate amounts (FAO/WHO 2001). Pankey, et al., (2014) reported that the feeding supplement of probiotics due to significantly ($P < 0.01$) highly body weight gain in registered group as compared to control group in Marwari lamb. In this study an attempt has been made to generate data on impact of probiotics supplement in diet of growing kids at farmers flock under on farm trial programmes. (OFT) animal probiotics is a live microbial feed supplement, which beneficially affects the host animal by improving its intestinal microbial balance (Fuller, 1999) and has been extracts, enzyme preparation or variation combinations of the above *Saccharomyces cerevisia* (SC) and *Aspergillus oryza* (AO) are the most widely used probiotics for enhancing the animal productivity (Newbold et al. 1996). The development and growth during this period has important bearing on its future productive and reproductive performance. The purpose behind the use of probiotics has primarily to establish normal intestinal flora to prevent or minimize the disturbances caused by enteric pathogens and secondarily to serve as a shield against the use of antibiotic feed additives in diet of animals. Probiotics especially the lactobacilli and *Bacillus cereus* are important in the development of immune competence against enteric infections. *Saccharomyces cerevisia* release essential enzymes, vitamins and

amino acids during digestion, all of which are thought to have positive effect on performance of ruminants (Waziry and Ibrahim, 2007). The low growth rate of growing goats is primarily due to poor genetic make-up, inadequate supply of nutrients or unscientific approach for feeding. In order to improve growth performance in goat there is a need to adopt scientific feeding strategies; however, limited reports of on farm trial are available to illustrate the beneficial effect of probiotic supplementation in small ruminants under Indian condition. Thus, present study was undertaken to assess the beneficial effect of commercial probiotic supplementation on the performance of growing kids on growth at farmers flock under the on farm trial programme (OFT).

MATERIAL AND METHODS

A farm trial was conducted on farmers goat flock maintained at Jaisinghpura village during November 2010 to May 2011, in the semi humid environment, district in Chittorgarh of Rajasthan. Forty five growing kids, aged three months, average weighing 13.33 ± 0.70 kg each were randomly assigned and distributed equally in to three groups and fifteen kids each. Kids are group-I (control group) was maintained solely on grazing for 6-8 hrs. on community grazing land, kids of group-II (Experimental group) were fed concentrate mixture at 1.5% of body weight along with grazing while kids of group-III (Experimental group) were supplemented microbial feed

additives(Bio-Bloom) at 3g/day/animal along with group-II treatment with containing *Saccharomyces cerevisia* 1.5×10^{11} colony forming unit (CFU), *Lactobacillus sporogenes* 5×10^{10} CFU, and rich in calcium, phosphorus, protein, carbohydrate, vitamins and unknown growth factors (UGF). All the kids were sent for grazing (8hrs) in the morning and after their return, were offered concentrate in the pellet form (DM 89%, CP 20% and TDN 62%) at defined rate individually. Concentrate mixture was fortified with mineral mixture @ 2% and salt 1%. DM, CP, EE and total ash (AOAC, 2003) of feed samples were estimated. Fresh and clean drinking water was provided *ad lib* daily throughout the experiment period. The trial was conducted for 180 days and the traits recorded for growth performance were initial weight, final weight, total body weight gain and average daily gain (ADG) at fortnightly intervals. The cost and returns of kids under different groups was worked out at prevailing market price. The additional cost per weight gain was calculated. The data were statistically analyzed as per Snedecor and Cochran. (1994).

RESULTS AND DISCUSSION

After 120 days feeding trial of concentrate and supplemented feed additives resulted in a significant ($P < 0.05$) improvement in the growth rate of the kids of group in Table 1. Group-2 and Group-3 as comparison to Group 1. Initial body weights of kids before start of the study were 13.42 ± 0.54 , 13.22 ± 0.83 and 13.34 ± 0.72 kg in G-1, G-2 and G-3, respectively. The final body weight of

kids at the end of demonstration trial was more in G-3 followed by G-2 and G-1. The respective values were 27.12 ± 0.89 kg, 25.80 ± 0.78 and 20.89 ± 0.89 in G-3, G-2 and G-1 and was significantly ($P < 0.05$) different. Therefore the total body weight gain and average daily weight gain were also higher significantly ($P < 0.05$) in G-3 (13.78 ± 0.38 kg and 76.54 ± 2.11 g) as comparison G-2 (12.58 ± 0.05 kg and 69.90 ± 0.29 g) and G-1 (7.47 ± 0.44 kg and 41.51 ± 2.43 g) Group -3 and group-2 achieved significantly higher ($P < 0.05$) body weight gain may be due to the optimum PH, Stabilization for optimum activity of microbial flora, degrading crude fiber and finally better assimilation of digested nutrients and feed utilization by the group 3 and group-2 kids. The kids in group 3 and group-2 progressively gained higher live body weight than control group 1. Multi strain probiotic when supplemented in diet 3`g/d improved overall mean daily body weight gain by 31.71g more than group 1 kid. The average body weight gain at the end of experiment was higher ($P < 0.05$) in both the concentrate-supplemented kids than kids raised on grazing only indicating the beneficial effect of feeding. Similar observation has been reported by Yadav and Khan, (2011) and Chopadeet *al.*, (2010). The lower body weight gain in the present study might be attributed to variability in experimental protocol and the quality and quantity of pasture available in the grazing area. Total body weight gain and average daily gain during this period increased with increase in concentrate offered up to 1.5 % of their body weight. The feeding of concentrate was

economical and a cost benefit could be generated on concentrate supplementation contrary to the general belief that feeding of concentrate increases cost of production. Morales *et al.* (2000) also observed similar diminished production costs on account of concentrate supplementation in dairy goats. The cost per kg live weight was taken as Rs. 200/-. The weight difference for the group III and I of animals was 6.35 kg and III and II was 1.2 marginally different.

The net profit and benefit cost ratio in G-3 (Rs.15240.00 and 1.68) and (Rs.18840.00 and 1.84) in present in Table 1.

SUMMARY

An on farm trial was conducted in an adopted KVK Village of Chittorgarh district of Rajasthan, to investigate the impact of probiotics on body weight gain in kids, aged three months. Analysis of fortnightly date revealed that animals in group3 fed with probiotics significantly gained higher live-weight.

Table 1: Growth performance of Kids

Attributes	Group I (Control)	Group II (Treatment)	Group III (Treatment)
No. of kids	15	15	15
Initial body weight (kg)	13.42±0.54	13.22±0.83	13.34±0.72
Final body weight (kg)	20.89±0.89 ^a	25.80±0.78 ^b	27.12±1.10 ^b
Average daily gain (g/d)	41.51±2.43 ^a	69.90±0.29 ^b	76.54±2.11 ^c
Body weight gain (kg)	7.47±0.44	12.58±0.05	13.78±0.38
Probiotic fed to kids in 180 days (kg)	-	-	8.1kg
Cost of probiotic @ 250/kg and concentrates	-	-	2025.00
Additional cost of feed (Rs)	-	7594.00	7594.00
Additional weight gain /kid (kg)	7.47	12.58	13.78
Total Live weight gain from 15 kids (kg)	112.50	188.70	206.70
Cost of live weight @ 200/kg	22500.00	37740.00	41340.00
Net profit (Rs.)	-	15240.00	18840.00
Benefit (̀/̀spent)	-	1.68	1.84

Means with different superscripts a, b differ significantly ($P < 0.05$) in a row. The cost of pelleted ration and bio bloom was Rs. 11.25/kg and Rs.250/kg.

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