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SHORT COMMUNICATION

Supplementation of Microbial Feed on Performance of Growing Goats

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ABSTRACT

Thirty growing goats of similar age and body weight were selected from adopted village by Krishi Vigyan Kendra, Bhilwara, Rajasthan and divided into three groups of 10 animals each. One group (T_1) as control was maintained on farmer's practices. While T_2 was fed concentrate mixture @1.5% of the body weight and T_3 was fed same as in T_2 + microbial feed supplement @ 3 g/day/head for 120 days. The average body weight gain /day/head (g) was significantly ($P < 0.05$) higher in T_3 (82.3±0.1) as compared to T_2 (74.3±0.14) and T_1 (42.0±0.24) groups. The growth rate of growing goats improved significantly ($P < 0.05$) in microbial feed supplement fed group over control. Hence, it was concluded that feeding of microbial feed supplement along with balanced diet would improve growth performance in growing goats.

Key words: Daily weight gain, Growing goat, Microbial, Supplement

Microbial feed supplementations have shown promising results in a variety of animal production areas. The multispecies probiotic feeding increased average daily gain and feed efficiency in lambs (Lema *et al.,* 2001) and direct feed microbial supplementation also increased feed efficiency during the growing-finishing and finishing stages in pigs (Davis *et al.,* 2008). The use of microbial feed supplements containing *Saccharomyces cerevisiae*, has been found to improve the performance of lactating animals (Dobicki *et al.,* 2006). Supplementation with direct-fed microbials (DFM) has a beneficial effect on subsequent milk yields, fat and protein content of milk (Kritas *et al.,* 2006). Live microbial feed supplement, which beneficially affects the host animal by improving its intestinal microbial balance (Fuller, 1999) has been used to describe viable microbial cultures, culture extracts, enzyme preparations or various combinations of the above. The development and growth during this period has important bearing on its future productive and reproductive performance. The purpose behind the use of microbial feed supplement has been primarily to establish normal intestinal flora to prevent or minimize the disturbances caused by enteric pathogens and secondarily to serve the function of antibiotic feed additives because there has been so called public mood against the use of antibiotic feed additives in diet of animals. *S. cerevisiae* releases essential enzymes, vitamins and amino acids during digestion, all of which are thought to have a positive effect on the performance of ruminants (Waziry and Ibrahim, 2007). In ruminants the uses of microbial feed supplement have beneficial effect as growth promoter (Yirga, 2015). However, little research has been conducted on the use of microbial feed supplement on growth performance in goats under Indian conditions. Thus, an attempt was made to ascertain the effect of feeding microbial feed supplement in the ration on the performance of growing goats.

A feeding trial of 120 days was conducted on thirty growing goats of similar age and body weight (October, 2014 to February, 2015). All the experimental animals were maintained under loose housing and group management systems. The experimental animals were randomly divided into three groups of equal size (n=10) viz, T_1 farmers practices, natural grazing practice (6-8 hours), T_2 recommended practices as in T_1+ concentrate mixture @ 1.5 % of body weight and T_3 fed as in T_2 + microbial feed supplement containing *S. cerevisiae* 1.5 X 10^{11} colony forming unit (CFU), *Lactobacillus sporogenes* 50,000 million CFU and rich in calcium, phosphorus, protein, carbohydrates, vitamins

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Table 1. Chemical composition of concentrate mixture (% DM basis)

Particular	Concentrate mixture
Dry Matter	90.83
Crude protein	18.22
Ether extract	2.03
Crude fibre	11.92
Nitrogen free extract	62.16
Acid insoluble ash.	5.67

*Chemical composition of concentrate mixture procured by Rajasthan Cooperative Dairy Federation Ltd., (Saras Dairy Bhilwara)

(@3gm/head/day). All the animals were fed individually. Clean and fresh drinking water was available throughout the experimental period. The body weight of animals was recorded fortnightly. Representative samples of feeds and fodders used for feeding of animals were collected at weekly interval throughout the experimental period and the samples were analysed for proximate principles (AOAC, 2005). The data were statistically analyzed by the procedures for completely randomized design (Snedecor and Cochran, 1994).

The chemical composition of concentrate mixture is given in Table 1. The animals in group T_3 were fed microbial feed supplementation containing *S. cerevisiae* 1.5 X 10^{11} CFU, *Lactobacillus sporogenes* 50000 million CFU (@ 3 g/head/day) along with T_2 diet. The average body weight gain /day/head (g) was significantly ($P < 0.05$) higher in T_3 (82.30±0.1) as compared to T_2 (74.26±0.14) and T_1 (42.00±0.24) (Table 2). The higher body weight gain in growing goat with combined microbial feeding may be due to maintenance of rumen pH and high buffering ability of *Lactobacillus* bacteria. The average weight gain and body weight gain in 120 days of growing goats in group receiving microbial feed supplement was significantly ($P<0.05$) higher in T_3 than the control (T_1) and group T_2. Similar results were reported in cattle (Rust *et al.,* 2000) and lamb (Lema *et al.,* 2001). Further incorporation of yeast (*S. cerevisiae*) tends to increase the number of cellulolytic bacteria in the rumen of animals fed high fibre diet with enhanced microbial crude protein synthesis (Tripathi and Karim, 2010). Therefore, prior animal health status and the timeline of administration may influence the effect of microbial supplementation.

Supplementation of microbial feed supplement resulted in increase in net return over control group (₹ 1680). The benefit cost ratio was higher (1.42) on feeding microbial feed supplement in group (T_3) as compared to1.30 in T_2 and 1.10 in control group (T_1). Net returns (Rs/animal/day) were higher in group T_3, T_2 and T_1 groups, respectively (Sharma Deka 2009).

Hence, it can be concluded that the feeding of microbial feed supplement in ration was found to be beneficial in terms of improvement in growth rate and higher net return in experimental growing goats as compared to farmer's practices.

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Table 2. Average body weight gain and daily weight gain in growing goats

Parameter	T_1	T_2	T_3
Initial body weight (kg)	11.45±0.36	11.36±0.46	11.28±0.58
Final body weight (kg)	16.49^{b}±0.18	20.27^{a}±0.14	21.15^{a}±0.21
Body weight gain /day/head (g)	42.00^{b}±0.24	74.26^{a}±0.14	82.30^{a}±0.18
Total body weight gain in 120 day/head (kg)	5.04^{b}±0.16	8.91^{a}±0.24	9.87^{a}±0.26
Net Return (Profit) in ₹ / unit	1680/-	2530/-	2760/-
BC Ratio	1.10	1.30	1.42

^{a,b} Means in a row bearing different superscripts differed significantly ($P<0.05$)

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