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GROWTH PERFORMANCE AND ECONOMICS OF RAISING BUFFALO CALVES BY USING PROBIOTICS

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ABSTRACT

An experiment was conducted at Livestock Farm, Adhartal, College of Veterinary Science and A. H., Jabalpur, N.D.V.S.U., Jabalpur (M.P.). Eighteen Murrah buffalo calves were selected and were divided into 3 groups having 6 calves in each gruop. Group 1 (Control) was fed with the basal ration, group 2 (T1) was fed with the basal ration with probiotic (*Saccharomyces cerevisiae*) @5g/animal/day and the group 3 and (T_2) was fed with the basal ration with probiotic (*Saccharomyces cerevisiae*+ *Lactobacillus sporogenes*) @ 5g/animal/day. Calf starter (22% DCP and 72% TDN) was provided to all the calves. Besides this, *adlib* green chaffed fodder was provided to the animals. It was found that calves of the T2 group showed significantly ($p<0.05$) higher measurements than control and T1 group. The daily body weight gain (kg) through entire period of three months were 0.11±0.01 ,0.19±0.01 and 0.16± 0.01 in C, T1 and T2 group, respectively. The mean of fortnightly dry matter intake (kg) of buffalo calves were 17.05±1.37, 16.66±1.26 and 16.95±1.25 kg in C, T_1 and T_2 group respectively and these values are significantly ($P<0.05$) varied. Overall feed efficiency were 0.14±0.02, 0.24±0.03 and 0.18±0.02 in control, T_1 and T_2 group and the values differed significantly ($p<0.05$). Overall expenditure (Rs.) per kg body weight gain was calculated as 111.06, 66.02 and 70.34 in C, T_1 and T_2 groups, respectively. From the findings of the present study it can be concluded that probiotic supplementation alone *Saccharomyces cerevisiae* or combination of *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* improve average body weight gain, feed conversion efficiency and various body measurements of Murrah buffalo calves. Overall rearing cost can be reduced to 40.55% in *Saccharomyces cerevisiae* fed group and 36.66% in combination of *Lactobacillus sporogenes* and *Saccharomyces cerevisiae* fed group in comparison to control group.

Key words: Buffalo calf, economic, probiotic, growth.

The low productivity of ruminants in developing countries is characterized by high mortality, poor growth rate of young ones, delay in onset of puberty and long interval between successive parturition all of which are largely attributable to poor feed resource, feeding and management[1]. Against the background of growing public concern on the use of antibiotics in food animals, interest in finding alternative to antibiotics has been increasing like probiotics[2,3]. The term probiotic described as “viable microorganisms that should lead to beneficial effect for the host animal due to an improvement of the intestinal microbial balance, or the properties of the indigenous micro

flora[4]". The present investigation was undertaken to study the growth performance and economics of growth of buffalo calves by using probiotic contains *Saccharomyces cerevisiae* and combination of *Lactobacillus sporogenes* + *Saccharomyces cerevisiae.*

MATERIALS AND METHODS

The study was conducted at Livestock Farm, Adhartal, College of Veterinary Science and A. H., Jabalpur, N.D.V.S.U., Jabalpur (M.P.). Eighteen Murrah buffalo calves of both sexes just after colostrum feeding were selected and were divided into 3 groups and each group contains 6 calves. Group 1 (Control) was fed with the basal ration, group 2 (T1) was fed with the basal ration with probiotic (*Saccharomyces cerevisiae*) @5g/animal/ day and the group 3 and (T_2) was fed with the basal ration with probiotic (*Saccharomyces cerevisiae*+ *Lactobacillus sporogenes*) @ 5g/ animal/day. All the calves had free access to water. Calf starter (22% DCP and 72% TDN) was provided to all the calves. A*dlib* green chaffed fodder was provided to the animals. Daily feed consumption of each animal was recorded on the basis of feed offered and left over and feed efficiency was calculated by the body weight gain and dry matter intake. The standard method of management was adopted in all the treatment groups. Growth parameter like average daily body weight gain (ADG), heart girth, wither height, body length, and paunch girth were taken at fortnightly interval by using measuring tape and were calculated as per standard procedure[5]. The data were analysed by using ANOVA[6].

RESULTS AND DISCUSSION

Effect of probiotic on body measurements are presented in table 1. Various body measurements like heart girth, height at wither, body length and paunch girth were significantly ($p>0.05$) varied among the different groups. It was also found that groups had probiotics (T2) in combination *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* shown significantly higher measurements than control and T1 group. The result of the present study is in accordance with a study[7] where 24 crossbred female calves were fed yeast and reported that significant increase ($p<0.01$) in body weight, body length, heart girth, abdominal girth, height at wither in treatment group in comparison to control group.

Body weight gain, dry matter intake and feed efficiency of the all the groups are presented in table 2. The daily body weight gain (kg) through entire period was 0.11±0.01 ,0.19±0.01 and 0.16± 0.01 (kg) in C, T1 and T2 group, respectively. Significant difference ($p<0.05$) was observed among the groups for all the parameters. The results of the present study are accordance with the researcher[8] in H.F. calves. The study indicated that significant difference between control and treated groups. Similarly, researcher[9] fed *Saccharomyces cerevisiae* @ 5g/head/d to T_1 and @ 7.5g/head/d to Rahmani sheep and found significantly higher average daily body weight gain. Researcher[10] fed *Lactobacillus, Saccharomyces cerevisiae* and *Aspergillus niger* significantly ($p<0.01$) higher daily gain in treatment group. Researcher[11] fed *Saccharomyces cerevisiae* (0.25g/ animal /day) to the murrah buffalo calves (age 11-12 months) and found higher average daily body weight gain (g) than control. However, researcher[12] added *bacillus* based probiotic to milk replacer and starter for 1-4 day old H.F. calves where no significant change in body weight gain was observed. In the present study improved body weight gain in the T2 group might be due to the fact that the Probiotics improved feed efficiency and average daily weight gain in the ruminant because yeast culture increase ruminal cellulose digestion. Consequently, it also improves microbial

growth in the rumen and enhanced microbial protein synthesis.

The mean of fortnightly dry matter intake (kg) of buffalo calves were 17.05±1.37, 16.66±1.26 and 16.95±1.25 kg in C, T_1 and T_2 group respectively and these values are not significantly varied. The result of the present study is an agreement with the researcher where Kankrej calves fed *Saccharomyces cerevisiae* @ 5g/d/head and @10g/d/head and did not find any significant difference. Similarly, researcher[12] added bacillus based probiotic to milk replacer and starter for 1-4 day old H.F. calves and they reported no significant differences in both the groups. In contrast to the present findings, researcher[11] reported that *Saccharomyces cerevisiae* fed group had higher dry matter intake.

Overall feed efficiency were 0.14±0.02, 0.24±0.03 and 0.18±0.02 in control, T_1 and T_2 group and the values differed significantly ($p<0.05$). The results of the present study in accordance with the researcher[11] reported that *Saccharomyces cerevisiae* fed group had improved feed efficiency. Similarly, researchers[14,15,16&17] reported improved feed efficiency with yeast culture in the diet of buffalo calves. The reason of increase feed efficiency in the present study may be yeast cultures are rich source of vitamin, enzyme, and other important nutrients and cofactor which make them attractive as a basic source of nutrient. Yeast culture increase ruminal cellulose digestion and consequently it also increase microbial growth in the rumen and enhanced microbial protein synthesis so ultimately it improves the feed efficiency.

Economics of rearing of buffalo calves

The data of cost of buffalo calves are presented in table 3. The average total milk (kg) consumed per animal during the experiment period were 125.88, 127.68 and 147.06 in C, T_1 and T_2 respectively. Likewise calf starter (kg) consumed per animal during the experiment period were 48.09, 48.41 and 50.9 and berseem (kg) consumed per animal during the experiment period were 207.90, 201.8 and 217.20 in C, T_1 and T_2 group, respectively. The average body weight gain (kg) were 10.27, 17.68 and 18.62 and the expenditure (') per kg weight gain was calculated as 111.06, 66.02 and 70.34 in C, $T_1$and T_2 group respectively. In control group the expenditure for per kg body weight gain was higher as comparison to T_1 and T_2 group. Lowest cost per kg body weight gain was observed in the T2 group. Our finding is an agreement with the researcher[11] who stated that the cost (Rs.) of feed /kg gain during 180 days of experiment in the control and treatment calves was calculated as 33.10 and 32.01, respectively. Similar findings observed by previous researchers[18&7].

Table 1: Effect of probiotc on average body measurement (inches) of buffalo calves under different treatments

Groups	Heart girth	Wither height	Body length	Paunch girth
C	31.79^{b}±0.33	31.07^{b}±0.14	24.93^{b}±0.13	35.24^{b}±0.55
T_1	31.54^{b}±0.29	31.01^{b}±0.25	24.90^{b}±0.14	35.14^{b}±0.54
T_2	33.23^{a}±0.25	32.02^{a}±0.13	25.66^{a}±0. 12	38.32^{a}±0.46

Means bearing different superscripts in a column differ significantly ($p<0.05$)

Table 2: Effect of probiotic on average body weight gain (kg), feed efficiency and dry matter intake of buffalo calves under different treatments

Parameters	C	T_1	T_2
Initial body weight	29.58^{a} ±1.98	28.63^{a}±1.79	30.15^{a}±1.42
Final body weight	39.85^{c}±1.30	46.32^{b}±1.81	48.77^{a}±1.65
Average daily body weight gain	0.11^{c} ±0.01	0.19^{a} ±0.01	0.16^{b} ±0.01
Dry matter intake	17.05±1.37	16.66±1.26	16.95±1.25
Feed efficiency	0.14^{c}±0.02	0.24^{a}±0.03	0.18^{b}±0.02

Means bearing different superscripts in a row differ significantly ($p<0.05$)

Table 3 Effect of probiotic on cost of rearing of buffalo calves up to 3 month of age

Particulars	C	T_1	T_2
1.Total feed consumed (kg) during the experiment			
Milk	755.28	766.08	882.37
Calf starter	288.58	290.05	305.40
Green chaffed (berseem)	1247.85	1211.00	1303.70
2.Total feed consumed (kg) /animal			
Milk	125.88	127.68	147.06
Calf starter	48.09	48.41	50.90
Green chaffed (berseem)	207.90	201.8	217.20
3. Cost (Rs.) of feed consumed			
Milk @ Rs. 40 /kg	5035.20	5107.20	5882.40
Calf starter @ Rs. 19.62 /kg	943.52	949.80	998.65
Green chaffed (berseem) @ Rs. 2/kg	415.80	403.6	434.40
4. Cost (Rs.) of total feed consumed	6393.72	6460.60	7315.45
5. Probiotic consumed /animal (kg)	0.00	0.43	0.43
6. Cost of probiotic (Rs.) @ 220/kg	0.00	93.50	93.50
7. Labour charge/calf for 3 month experiment @ 1 labour/20 calves and Rs. 3000/ month	450.00	450.00	450.00
8. Total (Feed+Probiotic +Labour) cost (Rs.)/animal	1140.62	1167.35	1309.825
9. Average body weight gain (kg)	10.27	17.68	18.62
10. Cost (Rs.) feed including probiotic/kg gain	111.06	66.02	70.34

CONCLUSION

From the findings of the present study it can be concluded that probiotic supplementation alone *Saccharomyces cerevisiae* or combination of *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* improve average body weight gain, feed conversion efficiency and various body measurements of murrah buffalo calves. Overall rearing cost can be reduced 40.55% in *Saccharomyces cerevisiae* fed group and 36.66% in combination of *Lactobacillus sporogenes* and *Saccharomyces cerevisiae* fed group in comparison to control group.

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