To assess the effect of probiotic (having *Lactobacillus acidophilus*) supplementation on pre-ruminant (0-3 months age) buffalo calves, total eight buffalo calves were divided into two groups of four calves in each with completely randomized design (CRD) according to their body weight. One group was the control while the other group was supplemented with bacteria *Lactobacillus- acidophilus*-containing probiotics 100 mg/calf/day in milk for a period of two months. Weekly growth rate of calves represents that the effect of *Lactobacillus acidophilus* was more effective (*P*<0.01) in the first month of supplementation but the effect was not sustained in the second month. Never the less, probiotic supplementation led to an overall improvement (*P*<0.05) in the growth rate of buffalo calves. The results indicate that supplementation of *Lactobacillus acidophilus* in the diet of buffalo calves had a positive effect in the early stage of life, and the effect subsides with advancement of time due to rumen development.

**Keywords:** *Lactobacillus acidophilus*, probiotics, buffalo calves, growth performance

**ABSTRACT**

**INTRODUCTION**

Young animals are subject to various kinds of stresses due to intensive production pressure in the present farming system, which adversely affects their performance. Under such circumstances antibiotics and synthetic antimicrobial agents are often used to alleviate stress and to improve growth and feed efficiency. However continuous use of sub-therapeutic levels of antibiotics in animal feed results in the presence of antibiotic residues in animal products and development of drug-resistant microorganisms in human beings (Jin et al., 1997). Public disapproval of the use of antibiotics and growth hormones in livestock production necessitates the use of probiotics in the feeding of farm animals. The main objectives of application of probiotics in the rearing of young animals are improved survival, inhibition of diarrhea, superior growth and better feed conversion efficiency (Jin et al., 1996). Dietary use of probiotics is thus preferred to that of antibiotics to enhance nutrient utilization, improve feed efficiency and maintain health status because of their non-harmful effect on consumers (Onifade et al., 1999).

Probiotics are defined as live microbial feed supplements that improve the health of livestock, or in other words, organisms or substances that contribute to intestinal microbial balance referred as probiotics (Parker, 1974). A wide range of microbial...
feed additives for ruminants has been described, including bacterial cultures and mixtures of bacteria and fungi. Beneficial bacterial concentrates, i.e., probiotics used in feed, have been reported to enhance growth rate (Alder and Domassa, 1980; Pollman et al., 1980) and metabolic activities by stimulating digestion and immunity and also to act as prophylactic and therapeutic medium (Fuller, 1992; Rolef, 2000).

*Lactobacilli* is one of the major species of beneficial micro-organism in the gut of monogastric animals (Blaut, 2002); the fore-stomach of ruminants in very early life is similar to that of monogastric animals and hence supplementation with *Lactobacillus* improves digestibility of nutrients (El Adawy et al., 2000; Soliman et al., 2000) and ultimately growth in pre-ruminant calves.

### MATERIALS AND METHODS

This experiment was conducted on growing pre-ruminant (0-3 month’s age) buffalo calves. A total of eight buffalo calves were used and divided into two groups of four calves each with completely randomized design (CRD) according to their body weight.

Calves were maintained individually in concrete-floored, well-ventilated pens in a properly managed shed. The body weight of the calves was recorded with an electronic weighing balance at the start of experimental feeding and thereafter regularly at weekly intervals. Weighing was done before feeding and watering in the early morning. One group served as the control, while the other was supplemented with probiotics. Supplementation of probiotics (having *Lactobacillus acidophilus*) was done 100 mg/animal/day with milk. Milk was fed according to the age of calves. The amount was 1/10th of the body weight from 0-20 days of age, thereafter up to one month of age, it was 1/15 of their body weight, from 1-2 months, it was 1/20th of their body weight, and thereafter till three months of age, it was 1/25th of body weight. Milk feeding was done in the morning at 7.00 a.m. and in the evening at 5.00 p.m. in divided doses, calves had access *ad-lib* to water for two hours in the morning as well as in the evening, and all calves has access *ad-lib* to calf starter and green chaffed maize fodder. The probiotic supplement was given daily for a period of two months, and the average daily gain (ADG) was recorded.

The growth record data were analyzed according to the standard procedure of Snedecor and Cochran (1994).

### Table. Effect of probiotic supplementation on average body weight gain (kg) of buffalo calves.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Initial</th>
<th>1st fortnight</th>
<th>2nd fortnight</th>
<th>$ADG$ at 1 month</th>
<th>3rd fortnight</th>
<th>4th fortnight</th>
<th>Overall $ADG$ at 2 month</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>39.38</td>
<td>41.63</td>
<td>43.63</td>
<td>142g/d</td>
<td>48.10</td>
<td>52.65</td>
<td>221g/d</td>
</tr>
<tr>
<td>T2 (Probiotics)</td>
<td>38.33</td>
<td>40.88</td>
<td>44.52</td>
<td>207**g/d</td>
<td>48.62</td>
<td>52.50</td>
<td>232**g/d</td>
</tr>
</tbody>
</table>

* (P<0.05) and ** (P<0.01)
RESULTS AND DISCUSSION

The data pertaining to average body weight gain, which has been presented in the table, indicate that out of the total period, in the initial one month, body weight gain was significantly (P<0.01) improved in the supplemented group, while the effect was non-significant in the second month leading to a reduced overall (P<0.05) effect on the growth performance of the buffalo calves.

When we compare our results with previous findings, Saijpaul et al. (2005) observed that supplementation of Lactobacillus acidophilus 0.1% of body weight in rabbits diet had no effect on either body weight gain or on digestibility of different nutrients when supplemented for a period of one month. Likewise, no effect on body weight gain was observed when Rao and Dutta (2005) supplemented Lactobacilli in male Muzaffarnagar lambs (age 10 days to six month). In the last two experiments, the age of the animals chosen for the study long enough for the rumen get develop completely, and that might be the reason the improvement in growth rate was not significant. In the present experiment also, the effect of Lactobacilli supplementation on body weight gain was reduced in second month of experiment as compared to the first month of study.

In contrast to the above findings but similar to our findings, Malik and Sharma (1998); Pandey and Agrawal (2001) and Prahalada et al. (2001) also reported higher growth rate and feed conversion efficiency in C.B. Calves supplemented with probiotics.

Similarly, when Pashupathy et al. (2002) added Lactobacillus acidophilus to the diet of growing mongrel pups, they observed improved growth rate in the early stage of life, while in later stages when there was higher fiber in the diet, reduction in the growth rate was observed, so that ultimately the growth what at the level of the control group.

On the basis of the literature available and findings of the present experiment, it may be concluded that supplementation with Lactobacilli acidophilus is more beneficial in initial stages of calves’ lives when the fiber level in the diet is low and that the effect is reduced when the rumen develops, for then fiber intake may increase and utilization of crude fiber is not improved by the bacteria Lactobacillus acidophilus.

REFERENCES


