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EFFECT OF BIOVET AND PROBIOTIC (BM-TECHNOLOGY) ON MILK PRODUCTION IN LACTATING BUFFALOES

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ABSTRACT

This trial was conducted for a period of 90 days at the Livestock Experiment Station, Bahadurnagar, Okara, Pakistan during September - November, 2002. Eighteen lactating buffaloes were divided into three groups A, B and C, with six animals in each group. Animals of Group A were fed a concentrate ration with 2 ml of Biovet per kg of feed, while those of Group B were fed an experimental ration having probiotic 500 gms in 100 kg of concentrate mixture. The Group C animals served as control group. The average daily milk yield was 7.60, 7.39 and 6.15 litres in groups A, B and C, respectively. The corresponding values for milk fat were 7.60, 7.39 and 6.15 percent. The daily feed intakes for concentrate mixture were 4.36, 4.38 and 4.41 kg, while fodder intakes were 35.28, 35.29 and 37.46 kg in respective groups. The values for feed efficiency per kg were 1.70, 1.75 and 2.14 on dry matter basis, 0.197, 0.203 and 0.251 on crude protein basis, while 1.05, 1.08 and 1.35 on TDN basis in Groups A, B and C, respectively. It was also observed that under same feeding and management conditions, the lactating buffaloes supplemented with Biovet (Group A) produced more milk @ 1.45 litres per day, while Group B buffaloes supplemented with probiotic produced 1.22 litres more milk per day than Group C. There was a significant ($P<0.05$) difference in milk yield between groups A and C, and B and C, while these differences were not significant for average daily feed intake and feed efficiency on crude protein basis. The Biovet (BM-Technology) has favourable effect on milk yield and feed efficiency due to beneficial micro-organisms (BM) and combined function for increased digestibility of concentrate mixture and fodder in lactating buffaloes.

Key words: BM-Technology, probiotic, buffaloes, milk yield, milk fat, feed efficiency.

INTRODUCTION

The present socio-economic situation of commercial dairy farming demands better utilization of livestock feed resources through enhancing their nutrient digestibility for profitable enterprise. The use of probiotics in animal ration has recently attracted more attention due to their role in increasing digestibility of ration under present feeding regime. The BM-Technology (Biovet) consists of lactic acid bacteria, yeast, actinomycetes and fermenting fungi, while probiotic consists of culture of lactic acid producing bacteria i.e. Lactobacilli, which enhance the digestibility due to favourable bacteria present in both products and make the intestinal environment free of pathogens resulting in minimum internal stress. The use of Biovet/probiotic in livestock feeding showed favourable physiological effect as it enhanced cellulolytic activity by increasing the number of bacteria for the production of amino acids, fatty acids and vitamins (Shafaqat *et al*., 2002).

The objective of this study was to observe the effect of Biovet and probiotic feeding on milk production of lactating buffaloes.

MATERIALS AND METHODS

The trial was conducted for a period of 90 days on 18 lactating buffaloes divided into three groups at the Livestock Experiment Station, Bahadurnagar, Okara, Pakistan. The buffaloes were at about same stage of lactations i.e. freshly calved in second lactations. They were divided into three groups A, B and C, with six buffaloes in each group. Animals of Group A were fed a concentrate ration with 2 ml of Biovet per kg of feed, while those of Group B were fed an experimental ration having probiotic 500 gms in 100 kg of concentrate mixture. The Group C animals served as control group. Their feeding requirements were fulfilled from concentrate and fodder (Tables 1 and 2) for milk production according to Nutrient Requirement of Cattle Feeding Standard (NRC, 1971). A concentrate mixture (ration) having 17% CP and 70% TDN was prepared (Table 1) and fed to all the groups in the morning and evening at milking time. The green fodder of the season consisted of K-94 Jowar and multi-cut Sadabahar (Table 2). The data on daily feed intake, daily milk production and fat percentage were maintained. All rations/fodders available were analyzed and their nutritive values were estimated (AOAC, 1970). The data were subjected to analysis of variance. The multiple means were compared by Statistical Analysis System (SAS, 1998) programme.

RESULTS AND DISCUSSION

The logic of adding probiotics in animal feeding is that these ingredients control the beneficial bacteria, yeast and fungi in the rumen which are responsible for increasing number of rumen bacteria. As a result, the

digestibility of edible nutrients in the rumen is increased. In the intestine, they change the PH somewhat toward acidic which kills pathogens present in the intestine. This enhances the absorption of nutrients, resulting in better body metabolism.

Feed intake

The average daily fodder intakes by lactating buffaloes of groups A, B and C were 35.28, 35.29 and 37.46 kg, respectively. The average daily intakes of concentrate mixture in three groups of buffaloes were 4.36, 4.38 and 4.41 kg, respectively (Table 3). The daily fodder and concentrate intakes among all the three groups were similar.

Table 1: Composition of concentrate ration

Sr. No.	Ingredients	Percentage
1.	Maize (ground)	15
2.	Canola meal	12
3.	Wheat bran	38
4.	Maize gluten 30%	14
5.	Molasses	18
6.	Mineral mixture	2
7.	Common salt	1
	Total	100

Table 2: Chemical composition (%) of concentrate ration and fodder

Feed stuff	DM	CP	TDN
Concentrate ration	89.10	17.00	70.45
Fodder			
Jowar K-94	28.10	2.00	14.00
S. S. Hybrid (3rd cut)	23.30	2.30	14.00
Average	25.70	2.15	14.00

The average daily intakes of Biovet and probiotic in buffaloes of groups A and B were 22.0 ml and 24.16 gm, respectively (Table 3). The average daily dry matter intake in groups A, B and C buffaloes were 12.94, 12.95 and 13.19 kg, respectively. Statistically significant ($P<0.05$) variation was observed among Groups A and C and Groups B and C. The average daily crude protein intakes were 1.499, 1.502 and 1.549 kg for the three groups, respectively (Table 3). Shafaqat *et al*. (2002) observed that by using BM-Biovet in livestock feeding, better feed intake and better FCR with favourable physiological effects and enhancement of cellulolytic activity were attained. Zhaho *et al*. (1998) concluded that yeast culture and lactic acid bacteria have beneficial effect on the digestibility of nutrients. Gujjar *et al*. (2003) reported that feed intake could be successfully collaborated by adding Biovet and probiotic in the ration of lactating buffaloes. Gujjar (2002) also observed that 50 ml additional allowance of Biovet increased 1.0 to 2.0 litres of milk. It means that an investment of Rs.2.75 can fetch Rs.7/- to Rs.8/-.

The average daily total digestible nutrients intakes were 8.00, 8.04 and 8.34 kg for three groups, respectively (Table 3). Significant ($P<0.05$) variation was observed among Groups A and C and Groups B and C. The feed efficiency per litre of milk production on dry matter basis was observed as 1.70, 1.75 and 2.14 kg and on crude protein basis it was 0.197, 0.203 and 0.251 kg, while on total digestible nutrients basis these values were 1.05, 1.08 and 1.35 kg in groups A, B and C, respectively (Table 3). Significant difference ($P<0.01$) in feed efficiency on dry matter and TDN basis and non-significant difference on crude protein basis were observed (Table 3). Gujjar *et al*. (2003) reported that with Biovet and probiotic, 70 and 81 gm crude protein and 407 and 471 gm TDN were required for the production of one litre of milk.

Milk yield

The average daily milk yield in buffaloes of groups A, B and C was 7.60, 7.39 and 6.15 litres, respectively (Table 2). The maximum daily milk yield was recorded in group A buffaloes supplemented with Biovat and lowest in Group C buffaloes without any supplementation of Biovet/probiotic. The average daily milk production in Group B buffaloes fed probiotic was also more ($p<0.05$) than those in Group C (Table-3). There was significant variation ($P<0.05$) for milk yield among the Groups A and C and Groups B and C, while it was non-significant for the Groups A and B. Gujjar *et al*. (2003) observed that BM-Biovet fed buffaloes produced 1.34 – 2.0 litres of more milk as compared to probiotic and control group buffaloes. They also observed significant difference in feed conversion ratio on TDN basis and daily milk yield. Williams *et al*. (1991) and Al-Shaikh et *al*. (2002) reported that under same feeding and management conditions, cows produced more milk and fat when fed on diet containing yeast and lactic acid bacteria. Boland (1986) observed that the yeast culture fed to dairy cows produced 3 to 4 litres more milk per day as compared to controls. McGilliard and Stallings (1998) and Holden (1999) also reported an increase in milk yield by feeding probiotic in dairy ration.

Conclusion

This study showed that under same feeding and management conditions, supplementation of Biovet increased feed efficiency and resulted in more milk in Groups A and B as compared to group C buffaloes. It was observed that under present availability and price of feed ingredients (especially bran, cake, meal and grain) their feed efficiency could be enhanced upto 8.09% in terms of milk production simply by supplementation of Biovet/probiotic (BM-Technology).

Table 3: Performance of lactating buffaloes fed on feeding regimes based on Biovet/probiotic

Particulars	Observations		
	Group-A	**Group-B**	**Group-C**
No. of lactating animals	6	6	6
Days on trial	90	90	90
Average body weight (Kg)	484	497	477
Average daily fodder intake (Kg)	35.28	35.29	37.46
Average daily concentrate intake (Kg)	4.36	4.38	4.41
Average daily Biovet intake (ml)	22.0	Nil	Nil
Average daily probiotic intake (gm)	Nil	24.16	Nil
Average daily milk yield per head (Litres)	7.60a	7.39a	6.15b
Average daily per group milk yield (Litres)	45.63	44.27	36.90
Total milk per group during 90 days of trial (Litres)	4107	3985	3322
Avg. daily more milk produced as compared to control group (Litres)	1.45	1.21	---
Average daily milk fat (%)	6.62	6.66	6.55
Average solids not fat (SNF) (%)	9.32	9.45	9.35
Average total solids (TS) (%)	15.94	16.11	16.13
Average daily dry matter intake (Kg)	12.94a	12.95a	13.19b
Average daily crude protein intake (Kg)	1.499	1.502	1.549
Average daily TDN intake (Kg)	8.00a	8.04a	8.34b
Feed efficiency on concentrate intake basis (Kg)	0.573a	0.593a	0.717b
Feed efficiency on fodder basis (Kg)	4.64a	4.77a	6.09b
Feed efficiency on dry matter basis (Kg)	1.70a	1.75a	2.14b
Feed efficiency on crude protein basis (Kg)	0.197	0.203	0.251
Feed efficiency on TDN basis (Kg)	1.05a	1.08a	1.35b

Values with different letters within a row differ significantly ($p<0.05$).

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