



## Effect of Supplementation of Milk Dhara on Milk Yield and Milk Composition in Graded Murrah Buffaloes

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### Abstract

The experiment was carried out to study the effect of feeding Milk Dhara supplement on milk yield and composition in lactating buffaloes. Twelve multiparous (2nd/3rd lactation) graded Murrah buffaloes ( $450 \pm 25$  kg) in mid lactation (3-4 months) were divided into two groups of six animals each (control and treatment). Animals in both the groups received a basal diet comprising of Hybrid Napier, paddy straw and concentrates while the buffaloes in the treatment group were fed same basal diet plus Milk Dhara (M/S Zydus AHL, Ahmedabad) containing rumen stable bypass fat and protein at 100 g/buffalo/day. Results revealed that milk yield (kg/d), 6% FCM yield (kg/d) and all milk constituents except SNF % increased significantly with addition of supplement containing rumen bypass fat and protein in the diet. Thus, it can be concluded that supplementation of Milk Dhara at 100g/buffalo/day improved milk yield and milk composition in graded Murrah buffaloes.

**Keywords:** Fat; 6% FCM yield; Milk Dhara; Protein; SNF; Total Solids

### Introduction

In India, the diets commonly fed to milk animals mostly comprises of crop residues that are generally low in energy and protein. The impact of feeding these low energy and protein diets is more significantly reflected in lactating and high producing animals leading to reduced milk production. Feeding bypass fat to lactating animals enhances the energy intake in early lactation, which sequentially reduces deleterious effect of acute negative energy balance on lactation (Tyagi *et al.*, 2010). Further, feeding of bypass fat and protein in the diet of cows and buffaloes resulted in increased milk yield and milk composition (Garg *et al.*, 2003; Thakur and Shelke, 2010; Shelke and Thakur, 2011). Hence, the present experiment was carried out to study the effect of feeding Milk Dhara con-

taining rumen stable bypass fat and protein on milk yield and milk composition in graded Murrah buffaloes.

### Materials and methods

The study was carried out for 9 weeks duration in a dairy farm located at Nidamanuru village nearby Gannavaram. Twelve multiparous (2nd/3rd lactation) graded Murrah buffaloes ( $450 \pm 25$  kg) in mid lactation (3-4 months) were randomly divided into two groups of six animals each (control and treatment) taking into consideration daily average milk yield, butter fat content, and 6% FCM yield. Animals in both the groups received a basal diet comprising of Hybrid Napier, paddy straw and concentrates separately to meet the maintenance and production requirements (ICAR, 1998). The ingredient composition of concentrate mixture is presented in Table 1. The data represented in Table (2) showed the chemical composition of Hybrid

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Napier (APBN-1) fodder and concentrate mixture fed to graded Murrah buffaloes during the trial. The buffaloes in the treatment group were fed Milk Dhara mixed in concentrate mixture at 100 g/buffalo/day. Milk Dhara (manufactured by M/S Zyodus Animal Health Limited, Ahmedabad) is a commercial product containing rumen stable by-pass fat and protein enriched with carbohydrate, chelated chromium and probiotics. Rumen stable nutrients are stable irrespective of the rumen pH. Rumen stability of Milk Dhara is achieved by physical fractionation. It passes into the intestine almost 100% unchanged.

Table 1. Percent of ingredient composition of concentrate mixture

Ingredient	Parts (%)
Maize	10.0
De-oiled rice bran	20.0
Broken rice	20.0
Sunflower cake	10.0
Gingilly cake	14.0
Tapioca tippi	11.0
Molasses	10.0
Urea	2.0
Mineral mixture	2.0
Salt	1.0

The buffaloes were milked by stripping, and the yields were recorded twice daily at 5.00 A.M and 5 P.M. The milk yields were standardized to 6% FCM (Rice *et al.*, 1970). The milk samples from

individual buffaloes were analyzed for Fat (ISI 1977 IS: 1224 part-1), solids-not-fat (SNF) (ISI 1982 IS: 10083), total solids, and protein contents (AOAC, 2005) at weekly intervals.

Data were statistically analyzed by Students 't' test as per Snedecor and Cochran (1994) using SPSS package programme version 17.0.

## Results

The effect of supplementation of Milk Dhara on milk yield and composition in graded Murrah buffaloes was presented in Table (3). The average daily milk yield was higher ( $P<0.05$ ) in the treatment group of buffaloes (9.33 kg) as compared to the control (9.02 kg). The daily average 6% FCM yield increased ( $P<0.01$ ) in buffaloes fed Milk Dhara supplemented diet compared to those in the control group (9.12 vs. 8.61 kg/d).

The daily average fat content of milk in graded Murrah buffaloes was higher ( $P<0.01$ ) in Milk Dhara supplemented group (5.78%) when compared to the control group (5.59%). Similarly, % Total solids ( $P<0.05$ ) and % Protein ( $P<0.01$ ) content of milk were higher in Milk Dhara supplemented group of buffaloes compared to control. The average SNF % was 10.3 and 10.5% in control and treatment groups, respectively (Table 3). Though, there was an increase in SNF% with Milk Dhara supplementation in the diet compared with the control, the difference was not statistically significant.

Table 2. Chemical composition (on % DMB except for DM) of Hybrid Napier (APBN-1) and concentrate mixture fed to graded Murrah buffaloes.

Nutrient	Hybrid Napier (APBN-1)	Concentrate mixture
Dry Matter	24.2	90.9
Organic Matter	91.0	87.2
Crude Protein	8.50	20.4
Ether Extract	2.19	1.84
Crude Fibre	36.8	14.2
Nitrogen Free Extract	43.5	49.8
Total Ash	8.98	13.8
Neutral Detergent Fibre	75.1	49.0
Acid Detergent Fibre	47.8	24.1
Acid Detergent Lignin	7.40	5.61
Cellulose	37.9	16.3
Hemi-cellulose	27.3	24.9
Calcium	1.60	1.12
Phosphorous	0.62	0.40

Table 3. Effect of supplementation of Milk Dhara on milk yield and composition in graded Murrah buffaloes

Parameter	Control Group	Treatment Group	SEM	P
Milk Yield (kg/d)*	9.02 <sup>a</sup>	9.33 <sup>b</sup>	0.15	0.011
Milk fat (%) **	5.59 <sup>a</sup>	5.78 <sup>b</sup>	0.05	0.000
6% FCM (kg/d)**	8.61 <sup>a</sup>	9.12 <sup>b</sup>	0.20	0.004
SNF (%)	10.3	10.5	0.09	0.303
Total Solids (%)*	15.9 <sup>a</sup>	16.3 <sup>b</sup>	0.10	0.045
Protein (%) **	3.47 <sup>a</sup>	3.66 <sup>b</sup>	0.05	0.000

Values in same row with different superscripts differ significantly

\*(P<0.05) \*\* (P<0.01)

## Discussion

The milk yield and composition of graded Murrah buffaloes fed Milk Dhara supplement is presented in Table 3. The average daily milk yield was 3.44% higher in treatment group than that of control group. Average 6% FCM yield was enhanced by 5.92% in treatment group as compared to the control group (Table 3). Higher milk production in the treatment group may be attributed to enrichment of ration with rumen stable bypass fat and protein that increased the energy density of the ration thereby preventing negative energy balance as well as improving the availability of amino acids for absorption in the lower gut. Furthermore, addition of bypass protein increases feed intake thus leading to increased milk production (Preston and Leng, 1987). The present results are in line with the findings of Shelke and Thakur (2011), who reported significant increase in milk yield (P<0.05) and 6% FCM yield (P<0.01) in lactating Murrah buffaloes fed rumen protected fat and protein. Similar findings were also reported by Mishra *et al.* (2006), Chandrasekharaiah *et al.* (2008), Barley and Baghel (2009), Tyagi *et al.* (2010), Thakur and Shelke (2010) and Vahora *et al.* (2012). In contrast, Lounglawan *et al.* (2007) reported no improvement in milk yield of lactating dairy cows fed rumen bypass fat.

The overall average milk fat % was higher (P<0.01) in treatment group than that of control (Table 3). The increase in milk fat % in the treatment group when compared to the control may be due to correction of energy balance of the animal by feeding rumen bypass fat that previously was in negative energy balance. Similar results were re-

ported by Gulati *et al.* (2003), Chandrasekharaiah *et al.* (2008), Barley and Baghel (2009), Thakur and Shelke (2010) and Vahora *et al.* (2012). The average protein content was enhanced by 5.48% in treatment group as compared to the control group (Table 3). Similar observations were reported by Bharadwaj and Sengupta (1999) in buffaloes and Garg *et al.* (2002) in crossbred cows. On the other hand, some workers reported no effect of rumen bypass fat or protein supplementation on protein content of milk in lactating animals (Lounglawan *et al.*, 2007; Purushothaman *et al.*, 2008; Thakur and Shelke, 2010). Concerning the total solids (%) content was 2.39% higher in the treatment group as compared to the control Chandrasekharaiah *et al.* (2008) reported increased (P<0.05) total solids in milk while Thakur and Shelke (2010) observed no effect upon feeding rumen bypass nutrients in the diet. Moreover, supplementation of bypass nutrients in the diet increased the % SNF by 1.84 % but the difference was not significant.

## Conclusion

It can be concluded that supplementation of Milk Dhara at 100 g/buffalo/day improved milk yield and milk composition in graded Murrah buffaloes.

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