



# Supplementation Effect of Bypass Fat on Production Performance of Lactating Crossbred Cows

S M Soni and M V Patel

Krishi Vigyan Kendra, Ganpat Vidyanagar  
District: Mehsana- 384 012 (Gujarat)

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## ABSTRACT

An on farm trial was conducted on 20 lactating crossbred cows randomly divided into two groups on the basis of milk yield (10 to 13 kg/d) and day of calving less than 60 d to note the effect of supplementing bypass fat on milk yield and fat percentage for a period of three years (2012 to 2015). Cross bred cows were fed concentrate, green and dry fodder and wheat straw in control group and addition of 100 g of bypass fat was given in treatment group. Experimental feeding was continued up to 90 d. The average milk production and fat percentage was significantly higher in treatment group. Milk production efficiency was also significantly higher in bypass fat supplemented group in comparison to control group. It was, thus concluded that bypass fat supplementation @ 100 g per day per animal in cows significantly increased the milk production and fat percentage over the control group.

**Key Words:** Bypass Fat, Cows, Milk Production, Fat Percentage.

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## INTRODUCTION

Role of bypass fat in diet of the high producing crossbred cows is very crucial for enhancing the energy density of the diet. Dietary fat, that resist lipolysis and bio hydrogenation in rumen by rumen micro-organism, but gets digested in lower digestive track, is known as bypass fat. The technology of bypass fat protects the nutrient from degradation and bio hydrogenation in rumen with increase in the energy density of the diet enabling the animals to meet their energy and essential fatty acid requirement expressing their milk production potential to the fullest extent (Krishna Mohan and Reddy 2009). Additional fat fed as bypass fat does not interfere with rumen fermentation process, but supply more energy to animal for more milk synthesis after being digested in abomasums and small intestine with absorption from the small intestine this helps in increased unsaturated fatty acid in milk which can produce softer butter and safer milk for human consumption especially for heart patient (Bobe *et al*, 2007, Garg *et al*, 2008). The present study was undertaken to evaluate feeding of bypass fat on milk yield and fat percentage performance in cross bred dairy cows.

## MATERIALS AND METHODS

Twenty lactating crossbred cows were selected from villages of Mehsana District with average milk yield of 10 to 12 kg and lactation stage below 60 days. The study was conducted during winter month of November to January for 90 days after the adoption period of two weeks for consecutive three years (2012-2015). The control animal were given concentrate, green and dry fodder and wheat straw whereas experimental group fed additional 100 grams bypass fat (Commercial product). The animals were kept in well-ventilated byres with access to fresh water and having separate mangers for fodder and concentrate. The animals were milked twice a day morning and evening and the concentrate was given at each milking time. Bypass fat was added and mixed in concentrate uniformly in morning and fed individually to each animal. Milk sample from each animal in both groups were collected daily and analyzed for milk production and fat percentage at their village cooperative dairy regularly for 90 days.

## Supplementation Effect of Bypass Fat on Production

**Table 1. Effect of feeding bypass fat on milk yield in crossbred cows.**

Year	Parameter	Control	Treatment group	Significance
2012-13	Average milk yield per animal	10.50 ± 0.96	10.90 ± 1.02	< 0.01
2013-14	Average milk yield per animal	12.30 ± 0.59	12.91 ± 0.63	< 0.01
2014-15	Average milk yield per animal	12.10 ± 0.48	12.80 ± 0.40	< 0.01
Pooled of three years	Average milk yield per animal	11.63 ± 0.59	12.20 ± 0.62	< 0.01

Values in rows are significance at P < 0.01

**Table 2. Effect of feeding bypass fat on milk fat in crossbred cows.**

Year	Parameter	control	Treatment group	Significance
2012-13	Average fat percentage per animal	3.91 ± 0.43	4.31 ± 0.36	< 0.01
2013-14	Average fat percentage per animal	4.01 ± 0.24	4.33 ± 0.26	< 0.01
2014-15	Average fat percentage per animal	3.81 ± 0.34	4.10 ± 0.30	< 0.01
Pooled of three years	Average fat percentage per animal	3.91 ± 0.25	4.23 ± 0.21	< 0.01

Values in rows are significance at P < 0.01

**Table 3. Effect of supplementation of bypass fat on milk yield (kg).**

Particulars	Bypass fat		Increase in MY		References
	Control	Treatment	Kg	(%)	
Milk yield	15.51	18.88	3.37	21.7	Naik <i>et al.</i> (2009)
Milk yield	17.57	18.65	1.08	6.2	Tyagi <i>et al.</i> (2009)
Milk yield	9.49	10.68	1.19	12.5	Thakur and Shelke (2010)
Milk yield	11.40	13.18	1.78	15.6	Sirohi <i>et al.</i> (2010)
Milk yield	17.80	19.00	1.20	6.8	Gowda <i>et al.</i> (2011)
Milk yield	11.17	12.04	0.87	7.8	Parnerkar <i>et al.</i> (2011)
Milk yield	20.42	21.55	1.13	5.5	Wadhwa <i>et al.</i> (2012)

## RESULTS AND DISCUSSION

### Effect of feeding bypass fat on milk yield and milk fat

Feeding of bypass fat resulted in significant (P<0.01) increase in milk yield and fat percentage (Table 1 and 2). Milk yield and fat percentage increased by 5 and 9 per cent in bypass fat fed group over the control group.

Similarly, Naik *et al.*, 2009; Tyagi *et al.*, 2009; Thakur and Shelke 2010, Sirohi *et al.*, 2010; Gowda *et al.*, 2013; Parnerkar *et al.*, 2011; and Wadhwa *et al.*, 2012 also reported significant improvement in milk yield from 5.5 to 24 per cent (Table 3).

Mishra *et al.*, 2004; Skalan *et al.*, 1991; Thakur and Shelke 2010; Sirohi *et al.*, 2010 and Parnerkar *et al.*, 2011; also reported a clear cut rise in milk fat percentage with bypass fat supplementation.

## CONCLUSION

Results obtained under on farm testing of technology showed that supplementation of

bypass fat to high yielding crossbred cows was beneficial in terms of increased milk yield and fat percentage. Further research is necessary to find out the supplemental effect of the bypass fat on dairy animals fed various types of basal rations at different production levels and stage of lactation.

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