

## Effects of Probiotics Supplementation on Production Performance and Economics of Feeding of Lactating Kankrej Cows

Raval AP, Bhagwat SR, Pawar MM, Makwana RB, Sadrasenia DA, Gami YM, Patel AP, Patel G, Joshi S and Chaudhary V

Department of Animal Nutrition,  
College of Veterinary Science and Animal Husbandary  
Sardarkrushinagar Dantiwada Agricultural University  
Sardarkrushinagar - 385 506

(Received on 16.01.2013; Accepted on 24.02.2013)

---

### Abstract

To study the effects of probiotics supplementation in lactating kankrej cows, a farm trial of 90 days was conducted in Kushkal village, Palanpur taluka of Banaskantha district of North Gujarat. The parameters studied were production performance and economics of feeding. Fourteen lactating Kankrej cows were divided in to two dietary treatments T1 (control) and T2 (probiotics). The results revealed that supplementing probiotics to lactating Kankrej cows significantly improved fat percent, 4% FCM while milk production and return as percent of feed cost were increased but remained statistically similar as compared to control.

**Keywords:** Probiotics; Supplementation, Productivity; Kankej cow; Economics.

---

**Corresponding author: Dr. S.R. Bhagwat**, Professor & Head, Dept. of Animal Nutrition, College of Veterinary Science and Animal Husbandry, SDAU, Sardarkrushinagar – 385 506, Gujarat. Email: shekhar.bhagwat@gmail.com. Mo: 09824315464

## Introduction

The productivity potential of our livestock has not been fully exploited because of deficit feed resources and under utilization of available technologies to fill the deficiency of nutrients in their ration. For achieving the economic productivity in livestock, it is essential to enhance the feeding value of available feed resources. Successful strategies for increasing the efficiency of utilization of poor quality roughages include pretreatment of crop residues and dietary supplementation and manipulation of rumen ecosystem (Baghel *et al.*, 2005). The rumen harbors a dense and complex microbial population responsible for 60-70 % of total digestion therefor, the potential prospective benefits of probiotics are greater with ruminants than with monogastrics (Fuller, 1992).

The use of probiotics culture in large and small ruminants has been appreciated for the improvement in feed intake and nutrient utilization (Nocek and Kautz, 2006). Probiotics has potential to improve the milk production in dairy cows, increase milk fat, milk protein and lactose content in milk (Williams, 1989, Adams *et al.* 1995). Further the large majority of descript cattle belongs to draught and dual-purpose breeds among which Kankrej is a well established dual-purpose breed of cattle, giving sustainability to the marginal farmers and contributing to agriculture based economy of the nation. (Singh, 2006). Hence present study was carried out to study the effects of probiotics supplementation on production performance and economics of lactating Kankrej cows.

## Material and methods

An on-farm trial of 15 days preliminary feeding and 90 days experimental period was conducted in village Kushkal, Palanpur taluka of Banaskantha district during October to December 2011. Fourteen lactating Kankrej cows of uniform body weight, milk yield and with 2<sup>nd</sup> and/or 3<sup>rd</sup> lactation number in the initial stages of lactation were selected for the

experiment to observe the effect of probiotics supplementation. Seven healthy animals, each allotted to two dietary treatments in completely randomized design. Two dietary treatments i) T1 (control concentrate mixture + Green fodder + Dry fodder) and ii) T2 (T1+15 g/d/animal probiotics containing *Saccharomyces cerevisiae*;  $1.5 \times 10^8$  cfu/g and bacteria, *Lactobacillus sporogens*;  $5 \times 10^7$ cfu/g) were given. All the animals were individually fed and their nutrient requirements were met as per ICAR feeding standards (1998). Milk yield of morning and evening was recorded daily and was compiled for six periods of 15 days each. The milk fat percent and 4% FCM were recorded at fortnight interval by procedure described by ISI (1961). At the end of experiment, digestion trial of 7 days was undertaken. The samples of feeds and fodder were analyzed for proximate constituents by AOAC (1999) method.

## Results and discussion

The results are represented in **Table 1**. Average daily milk production, average fortnightly yield of whole milk and whole milk production for 90 days of were statistically ( $P>0.05$ ) similar. In corroboration to finding of present study Bhageri *et al.* (2009) and Schingoethe *et al.* (2004) found no effect of probiotics on milk production. However Dutta and Kundu (2008) observed that probiotics supplementation increased milk production significantly.

The average daily milk fat percent and 4% FCM of T2 were significantly ( $P<0.05$ ) higher than T1 group. Similarly, fortnightly 4% FCM and cumulative FCM of T2 were significantly ( $P<0.01$ ) higher than T1 group. However, total FCM production of treatment groups was statistically ( $P>0.05$ ) similar. The findings of present experiment corroborate with Bhageri *et al.* (2009) while Raeth-Knight *et al.* (2007) reported that probiotics supplementation did not have any adverse effect on milk fat percent and 4% FCM.

Average return as percent of feed cost remained statistically ( $P>0.05$ ) similar. However, the Kankrej cattle fed with probiotics

**Table 1: Effect of Probiotics on production performance and economics of feeding of lactating Kankrej cows**

Parameters		T1	T2	P value
Milk yield	Kg/d	8.56±0.57	9.11±0.53	NS
	Kg/15d	127.63± 1.37	134.83±50.96	NS
	Kg/90d	770.33±51.60	819.71±47.99	NS
4%FCM	Kg/d	9.32±0.59 <sup>a</sup>	10.82±0.55 <sup>b</sup>	(P<0.05)
	Kg/15d	139.25±3.07 <sup>a</sup>	160.71±5.25 <sup>b</sup>	(P<0.01)
	Kg/90d	838.94±53.27	973.91±49.06	NS
Fat (%)		4.61±0.16 <sup>a</sup>	5.59±0.21 <sup>b</sup>	(P<0.05)
Total Selling price (Rs)		15216.50±977.76 <sup>a</sup>	18519.26±949.34 <sup>b</sup>	(P<0.05)
Total feed cost (Rs)		6431.40±40.86 <sup>a</sup>	6966.00±33.86 <sup>b</sup>	(P<0.05)
Return as Percent of feed cost (%)		236.80±15.62	265.62±12.70	NS

culture recorded 28.25% higher return over feed cost than the control group. Thus, supplementation of probiotics culture in concentrate mixture has economic advantage in lactating Kankrej cows.

### Conclusion

It was concluded that supplementing probiotics to lactating Kankrej cows significantly improved fat percent, 4% FCM while daily milk production and return as percent of feed cost were increased but remained statistically similar as compared to control. Thus supplementation of probiotics to lactating Kankrej cows has economic advantages compared to control.

### References

1. Adams AL, Harris Jr B, Van Horn HH and Wilcox CJ. Effects of varying forage types on milk production responses to whole cottonseed, tallow and yeast. *Journal of Dairy Science*. 1995; 78: 573-581.
2. AOAC (1999). Official method of analysis, 18<sup>th</sup> ed., Association of Official Analytical Chemist, Wahington DC. 160-165.

3. Baghel RPS, Tiwari RK and Nayak S. Feeding strategies for sustainable milk production in dairy cow. *The Indian Cow*. 2005; 2(5): 48-54.
4. Bhageri M, Ghorbani GR, Rahmani HR, Khorvash M, Nili N and Sudekum KH. Effect of live yeast and mannan-oligosaccharides on performance of early-lactation Holstein dairy cows. *Asian-Aust J Anim Sci*. 2009; 22(6): 812-818.
5. Dutta TK and Kundu SS. Response of mixed viable probiotics culture on milk production and nutrient availability in crossbred mid-lactating cows. *Indian Journal of Animal Science*. 2008; 78: 531-535.
6. Fuller R. Probiotics for ruminants. *Probiotics the scientific approach*. 1992: 317-353.
7. ISI (1961). Indian Standards Institution. Methods of Tests for dairy Industry. *Chemical Analysis of Milk*. (IS: 1479, Part II).
8. Nocek JE and Kautz WP. Direct-fed microbial supplementation on ruminal digestion, health and performance of pre and postpartum dairy cattle. *Journal of Dairy Science*. 2006; 89: 260-266.
9. Raeth-Knight ML, Linn JG and Jung HG. Effect of direct-fed microbials on performance, diet digestibility and rumen characteristics of Holstein dairy cows. *Journal of Dairy Science*. 2007; 90: 1802-1809.

10. Schingoethe DJ, Linke KN, Kalscheur KF, Hippen AR, Rennich DR and Yoon I. Feed efficiency of mid-lactation dairy cows fed yeast culture during summer. *Journal of Dairy Science*. 2004; 87: 4178-4181.
11. Singh B, Singhal L and Chauhan RS. Biodiversity of indigenous cattle and its utility. *The Indian Cow*. 2006; 8: 8-11.
12. Williams PEV. (1989). Understanding the biochemical mode of action of yeast culture. *Biotechnology in the Feed Industry*. (Ed.) Lyons T P. Alltech Technical Publications, Nicholasville, U.S.A.

**STATEMENT ABOUT OWNERSHIP AND OTHER PARTICULARS ABOUT  
"Journal of Animal Feed Science and Technology" (See Rule 8)**

- |  |   |  |
|--|---|--|
| 1. Place of Publication  | : | Delhi  |
| 2. Periodicity of Publication  | : | Quarterly  |
| 3. Printer's Name  | : | <b>Asharfi Lal</b>   |
| Nationality  | : | Indian   |
| Address  | : | 3/259, Trilok Puri, Delhi-91   |
| 4. Publisher's Name  | : | <b>Asharfi Lal</b>   |
| Nationality  | : | Indian   |
| Address  | : | 3/259, Trilok Puri, Delhi-91   |
| 5. Editor's Name   | : | <b>Asharfi Lal</b> (Editor-in-Chief)   |
| Nationality  | : | Indian   |
| Address  | : | 3/259, Trilok Puri, Delhi-91   |
| 6. Name & Address of Individuals<br>who own the newspaper and particulars of<br>shareholders holding more than one percent<br>of the total capital | : | <b>Red Flower Publication Pvt. Ltd.</b><br>41/48, DSIDC, Pocket-II, Mayur<br>Vihar Phase-I, Delhi-91 |

I Asharfi Lal, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-

**(Asharfi Lal)**