Int.J.Curr.Microbiol.App.Sci (2021) *10*(04): 773-777

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 10 Number 04 (2021)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2021.1004.079

Effect of Probiotics on Milk Yield and its Production Economics in Crossbred Cows

Ravindra Korake[1] and Saurabh Sharma[2*]

Deendayal Research Institute, Krishi Vigyan Kendra, Ambajogai, Beed-1, Maharashtra, India

**Corresponding author*

Keywords

Probiotics, Crossbreed, Milk and Economics

Article Info

Accepted:
18 March 2021
Available Online:
10 April 2021

A B S T R A C T

The on farm trial was conducted during two consecutive years 2018-19 and 2019-20 at two adopted villages of Deendayal Research Institutes Krishi Vigyan Kendra, Ambajogai District Beed (Maharashtra). The trials were conducted for 60 days to study the effect of probiotics on milk yield and its production economics. The trials were laid out in a randomized block design consisting of three treatments with four replications of each. Twelve lactating crossbred cows were selected on the basis of parity, average daily milk yield and stage of lactation. Cows were divided into three groups (four cows in each group). The crossbred cow (T_1) were fed with basal diet, T_2 with basal diet plus 10 gm probiotics and T_3 with basal diet plus 20 gm probiotics per day. The basal diet comprising of concentrate mixture, green maize and sorghum straw. The probiotic was containing four strains consist of bacteria and fungi *namely., Lactobacillus acidophilus*, *Saccharomyces cerevisiae*, *Saccharomyces boulardii* and *Propionibacterium frendenreichii* along with sea weed powder. It was found that, feeding of 20 gm probiotics proved to be effective in increasing milk production as well as milk fat and SNF content. Therefore, it may be concluded that per day supplementation of 20 gm probiotics with basal diet in crossbred lactating cow is profitable for dairy farming business.

Introduction

Milk has highest value in Indian agriculture and food sector, more than combined value of wheat and rice. Milk contributes close to the 1/3rd of gross income of rural households. The livestock sector contributes to 4% of India's GDP and the dairy sector comprises majority of share (Anonymous, 2018). Dairy farming is means of subsistence for millions of dairy farmers in country. It provides livelihood support to millions of small marginal farmers and land less labours. The dairy sector today provides approximately 70 million families the triple benefits of nutritious food, supplementary income and productive employment (Tajpara *et al.*, 2016).

The environmental and stochastic factors, such as diet composition, feeding practices, and

farm management have been shown to strongly affect the composition and functions of the microbiota in livestock which leading to impaired health and productive performance livestock animals (Dehority, 2003).

In such condition, feeding of probiotics to livestock is better option to overcome these problems.

The term "probiotics" has been amended by the FAO/ WHO to "Live micro-organisms, which, when administered in adequate amounts, confer a health benefit on the host" (Fuller, 1989).

Probiotics have the ability to enhance intestinal health by stimulating the development of a healthy microbiota (predominated by beneficial bacteria), preventing enteric pathogens from colonizing the intestine, increasing digestive capacity, lowering the pH, and improving mucosal immunity (Uyeno *et al.,* 2015). In addition, probiotics are able to enhance nutrient absorption (Sheridan *et al.*, 2014).

Most of the recent studies suggest that utilization of probiotics as feed supplement for ruminants improves growth performance, production, and enhance health and overall wellbeing of the animals. With view of these benefits, on farm trial (OFT) was conducted on 'Assessment the effect of probiotic feeding on milk production' during 2018-19 and 2019-20 at two adopted villages of DRI Krishi Vigyan Kendra, Ambajogai District Beed (Maharashtra).

Materials and Methods

The on farm trial was conducted during two consecutive years 2018-19 and 2019-20 at two adopted villages viz. (Sugaon Tq. Ambajogai & Bhatumba Tq. Kaij) of Krishi Vigyan Kendra, Ambajogai District Beed (Maharashtra). Twelve multi-purpose (parity number 2 and 3) crossbred cows were selected on the basis of average daily milk yield and stage of lactation (early to mid lactation). Cows were divided into three groups (four cows in each group).

All experimental crossbred cows were fed with basal diet comprising of green fodder, dry fodder and concentrates individually to meet maintenance and production requirement as per NRC feeding standard (Anonymous 2001). The each experimental cow were fed with basal diet of 5 kg Sorghum straw, 20 kg green maize fodder, 1 kg concentrate for maintenance and 1 kg concentrate for each 3 liters milk production per day. The crossbred cows (T_1 – Control group) fed with only basal diet, T_2 with basal diet plus 10 gm probiotics and T_3 with basal diet plus 20 gm probiotics per day. The probiotic used were containing four strains consist of bacteria and fungi namely., *Lactobacillus acidophilus*, *Saccharomyces cerevisiae*, *Saccharomyces boulardii* and *Propionibacterium frendenreichii* along with sea weed powder. The trials were laid out in a randomized block design consisting of three treatments with four replications of each. The trial was conducted for 60 days to study the effect of probiotics feeding on milk yield and economics of feeding.

Analytical procedure of milk

Milk obtained by different treatment combinations were chemically analyzed for fat by Gerber's method described in ISI: 1224 Part II (Anonymous, 1977).

Total solids % was calculated by the formula AOAC (Anonymous 1990) as Total solid % = Weight of dried sample/Weight of milk sample x 100 and Solid not fat was determined by the formula (Harding, 1995) as Solid Not Fat (%) = Total Solid (%) – Fat (%)

Statistical analysis

Data of milk yield, fat and SNF content obtained were analyzed statistically as per Snedecor and Cochran (1967).

Results and Discussion

The effect of probiotics feeding on milk fat, SNF and milk yield is presented in table No. 1. It showed that mean values of daily average milk fat (4.3% & 4.4%) were significantly ($P < 0.05$) higher in treatment group T_3 than rest of the treatment groups. The mean values of daily average solid not fat (8.7 % & 8.9 %) were significantly ($P < 0.05$) higher recorded in treatment group T_3 than rest of the treatment groups. Moreover, mean values of average daily milk yield per animal per day (13.42 lit & 13.32 lit) were significantly ($P< 0.05$) higher noted in treatment group T_3 than treatment groups T_1 and T_2. The present results agreements with Yasuda and Fukata (2004), Vibhute *et al.,* 2011, Srinivas *et al.,* 2011, Hussain *et al.,* 2014 and Shreedhar *et al.,* 2016.

The effect of probiotics feeding on cost of production is presented in table No. 2. It revealed that milk obtained from T_3 group fed with 20 gm probiotics per animal per day gets highest average selling price (Rs. 27 & Rs. 29) than rest of the treatment groups T_1 and T_2 due to higher fat and SNF present in milk. The treatment group T_3 has obtained highest net profit per animal per day (203.74 and 224.32) than rest of treatment groups.

Moreover, higher B: C ratio observed in the T_3 treatment group than rest of treatment group T_1 and T_2. Present results were in accordance with Vibhute *et al.,* 2011 and Kumar Satendra and Kumar B (2017).

From two years study, it was observed that supplementation of 20 gm probiotics powder with basic diet to crossbred cows significantly improved daily milk production, milk fat and milk SNF content. Therefore, it may be concluded that per day supplementation of 20 gm probiotics with basal diet in crossbred lactating cow is profitable for dairy farming business.

Table.1 Effect of probiotics feeding on milk fat, SNF and milk yield during 2018-19 and 2019-20.

Treatments	Average milk fat (per cent)		Average solid not fat (per cent)		Average daily milk yield per animal (lit.)	
	18-19	19-20	18-19	19-20	18-19	19-20
T_1	2.6^c	2.6^c	8.2^c	8.2^c	12.30^c	11.40^c
T_2	3.3^b	3.3^b	8.5^b	8.7^b	12.85^b	12.30^b
T_3	4.3^a	4.4^a	8.7^a	8.9^a	13.42^a	13.32^a
CD (P < 5 per cent)	0.135	0.144	0.194	0.222	0.342	0.372
C V per cent	2.553	2.703	1.470	1.644	1.683	1.887

Values with different superscript are significantly differed at P< 0.05

Table.2 Effect of probiotics feeding on cost of production during 2018-19 and 2019-20

Parameter	Treatments					
	T_1		T_2		T_3	
	18-19	19-20	18-19	19-20	18-19	19-20
Average total feed cost (Rs. per cow per day)	147	152	151	154	155	158
Average feeding cost of probiotics (Rs. per cow per day)	0	0	1.80	1.98	3.60	3.96
Average total expenses of feeding (Rs. per cow per day)	147	147	152.80	155.98	158.60	161.96
Average daily milk yield (kg per)	12.30	11.40	12.85	12.30	13.42	13.32
Average selling price of milk (Rs. per kg)	17	19	22	24	27	29
Average daily income (Rs. per animal per day)	209.1	216.6	282.7	295.2	362.34	386.28
Average net profit (Rs. per animal per day)	62.1	69.6	129.9	139.22	203.74	224.32
B:C ratio	**1.42**	**1.47**	**1.85**	**1.89**	**2.28**	**2.38**

References

Anonymous, 1977. Determination of fat by Gerber's method. ISI; (1224 (Part-I) Indian Standard Institute, Manak Bhavan, New Delhi.

Anonymous 1990. Official Methods of Analysis. Association of Official Analytical Chemists Inc., Virginia, USA.

Anonymous, 2001. National Research Council. Nutrient Requirement of Dairy Cattle. 7th rev. Ed. Natl. Acad. Sci., Washington, D.C.2001.

Anonymous, 2018. Things to know about agri, dairy sector and their expectations. www.business-standard.com/budget/article/budget-2018-things-to-know-about-agri-dairy-sector-and-their-expectations-118013101113_1.html

Dehority B A. 2003. Numbers, factors affecting the population and distribution of rumen bacteria. In: Dehority BA, editor. Rumen Microbiology. Nottingham Univ Press; Nottingham: 265–294.

Fuller R. 1989. Probiotics in man and animals: A review. J Appl Bacteriol; 66:365–378.

Harding, F. 1995. Milk quality. Blackie Academic and Professionals, an imprint of Chapman and Hall, Glasgow, UK: 157-158.

Hussain F M A, Islam M M. Ara A and Iliyas N. 2014. Supplementing probiotics (*Saccharomyces cerevisiae*) in multiparous crossbred cows ration provoke milk yield and composition. Online journal of animal and feed research; 4(2):18-24.

Kumar Satendra and Kumar Brajendu. 2017. Effect of Supplementation of probiotics on the performance of milk

yield and economics of dairy cattle. Journal of Animal Feed Science and Technology, 5:55-60.

Sheridan P O, Bindels L B, Saulnier D M, 2014 Can prebiotics and probiotics improve therapeutic outcomes for undernourished individuals?. Gut Microbes.; 5(1):74-82. doi:10.4161/gmic.27252

Shreedhar J N, Patil M and Pradeep Kumar 2016. Effect of probiotics supplementation on milk yield and its composition in lactating Holstein Fresien and Deoni crossbred cows. Journal of medical and bioengineering, 5(1):19-23.

Snedecor G W. and Cochran W G. 1967. Statistical methods, 6thed. Ames. Lowa State University Press.

Sriniwas D K, Rama Prasad J and Raghava Rao E 2011. Effect of supplementation of yeast culture in the diet of milk yield and composition in graded murrah buffaloes. Buffalo Bulletin; 30(1):100-104.

Tajpara M M, Chandawat M S., Bhorniya M F., Bochalya B C and Kalsariya B N. 2016. Knowledge level of beneficiaries dairy farmers about recommendations of SAUs on improved animal husbandry practices. International Journal of Agriculture Sciences ;8(21):1396-1398.

Uyeno Y, Shigemori S, Shimosato T. 2015 Effect of Probiotics/Prebiotics on Cattle Health and Productivity. Microbes Environ; 30 (2):126-132. doi:10.1264/jsme2.ME14176

Vibhute V M, Shelke R R, Chavan S D and Nage S P. 2011. Effect of probiotics Supplementation on the performance of lactating crossbred cows. Veterinary World, 4(12): 557-561.

Yasuda, K. and T. Fukata, 2004. Mixed feed containing dextran improves milk production of Holstein Frisian Dairy cows. J. Vet. Med. Sci. 66(10):1287-1288.

How to cite this article:

Ravindra Korake and Saurabh Sharma. 2021. Effect of Probiotics on Milk Yield and its Production Economics in Crossbred Cows. *Int.J.Curr.Microbiol.App.Sci.* 10(04): 773-777. doi: https://doi.org/10.20546/ijcmas.2021.1004.079