Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2582-2845.8374

ISSN: 2582 – 2845

Ind. J. Pure App. Biosci. (2020) *8*(5), 487-492

Indian Journal of Pure & Applied Biosciences

Peer-Reviewed, Refereed, Open Access Journal

Research Article

Effects of Feed Additives and Supplement on Production Performance on Cross Breed Lactating Cows

Rajendra Kumar[1], R.K. Pandey[1], Dheeraj Kumar[1*], Vinod Kumar[2], Shankar Lal[3] and Suman Chopra[4]

[1]Department of Animal Husbandry & Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India

[2]Dept. of Agronomy, MJRP University, Jaipur

[3]Assistant Professor KVK, Jaisalmer

[4]Dept. of Plant Pathology, College of Agriculture, RVSKVV, Gwalior, Madya Pradesh, India

*Corresponding Author E-mail: dheerumaal@gmail.com

Received: 6.09.2020 | Revised: 11.10.2020 | Accepted: 17.10.2020

ABSTRACT

The experiment was carried out for a period of 45 days (November, 2016 to December, 2016) split into 1 phase or 45 days i.e. winter season on crossbred cows at the Dairy Farm, Department of Animal Husbandry and Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. This experiment was conducted comprising three feed additive groups, with 18 crossbred cows in each group. The animals was randomly divided into 3 groups with 6 animals in each group. Cows group was selected according to their milk production, three lactation period and body weight to maintain the similarity in the trial. 6 cattle of group T_1 was feeding only concentrate farm feed "A"roughages without mineral mixture supplements. (Table 1) ,6 cattle of group T_2 was feeding mineral mixture(vitamin D_3 ,vit.B_{12},Phosphorus,Calcium) supplement fed concentrate farm feed, roughages "B" as per recommendation which is 50gm/cattle/day (Table 2) and 6 cattle of group T_3 was feeding mineral mixture (Vit.A,Vit.D_3,Vit.E,Biotin,Niacin,Ferrous,Copper,Manganese,Zinc,Mg,Co,Iodine,Selenium,Chro mium and Potassium) supplement fed concentrate farm feed, roughages "C" as per instruction which is 50gm/cattle/day (Table 3). Milk yield was recorded at pretreatment (0 day) and post treatment (45 day).After complete experiment in three group of milk production T_3(Treatment) group was increase total milk production.

Keywords: *Concentrate farm feed, Roughages, Mineral mixture, Cross bred cow, Milk yield.*

INTRODUCTION

In India, about 66 per cent population of country is engaged in agriculture and allied sector such as dairy plant and poultry farm etc. But mainly in cattle and buffaloes rearing which is complementary to agriculture. India is endowed with the largest livestock population in the world although livestock production in India is of backward type.

Cite this article: Kumar, R., Pandey, R. K., Kumar, D., Kumar, V., Lal, S., & Chopra, S. (2020). Effects of Feed Additives and Supplement on Production Performance on Cross Breed Lactating Cows, *Ind. J. Pure App. Biosci. 8*(5), 487-492. doi: http://dx.doi.org/10.18782/2582-2845.8374

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Moreover, the gap between achievable and achieved productivity in livestock enterprises with existing resources and infrastructure is wider than any other enterprise. India ranks first in milk production accounting for 18.5% of world production. India has attained the position of the largest milk producer in the world leaving behind the USA in 2014-15 by producing 146.3 million tones. In the present, the country projected human population is about more than 1 billion, while India ranks first among the world's milk producing nations, achieving an annual output of about 155.5 million tons of milk during 2015-16. In India Utter Pradesh ranks first in milk production 26.4 million tonnes followed by Rajasthan, is 18.5 million tons (2015-16 Statistics, NDDB), making a per capita availability of 337 gm (2015-16 Statistics, NDDB) per day against 285 g per day per capita recommended by the Indian Council of Medical Research (ICMR). It is more than the world average of 294 gm per day during 2013.The results of the December 2015 Livestock. For increasing milk production Supplements play a very important role in enhancing the performance of dairy animals and poultry sector. Present time they are very important for the feed to maintain the health and yield of the livestock. Mainly enzymes, growth promoters, antibiotics, toxin reducer, supplements, flavours, antioxidants etc. are the most important components of the mineral mixture. A number of these products are imported from developed countries. Supplementation of minerals is helpful in improving the growth of the livestock and their yield capacity viz. reproduction efficiency, milk production etc. helps in efficient utilization of absorbed nutrients and in so many other ways, for improving growth, milk production and reproduction efficiency. There is a standardized formulation, plant and process for production of mineral mixture which has setup by the National Dairy Development Board. Dairy cattle and buffaloes require a number of dietary mineral elements for normal body maintenance, growth and reproduction. Minerals that are required in relatively large amounts are called major or macro elements. Those needed in small amounts are classified as micro, minor or trace minerals. The major minerals include calcium, phosphorus, magnesium, potassium, sodium, chlorine and sulphur etc.

MATERIALS AND METHODS

This investigation was undertaken to study the milk production in lactating crossbred cows on diet containing different feed supplements. The trial was conducted lactating cows maintained at dairy farm, Department of Animal Husbandry and Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. The city of Varanasi is located in eastern part of Uttar Pradesh, which extends from $80^0$45' E to $84^0$30' E and $23^0$45' N to $28^0$30' N. It is situated approximately in the center of North Gangetic alluvial plain on the left bank of river Ganga at an altitude of 128.93 meters from sea level. It comes under subtropical climate and is often subjected to extremes of weather condition, with an average rainfall of about 110 cm per annum. A total of 18 crossbred cows was selected. The animals were quite healthy and all the 18 cross bred cows was randomly divided into 3 groups with 6 animals in each group. Cows group was selected according to their milk production, three lactation period and body weight to maintain the similarity in the trial. The animal was housed in well ventilated cemented sheds which was washed and cleaned daily. The animal was maintained in experimental sheds with arrangement for individual feeding and watering. Proper attention was paid to cleanliness and other related hygienic conditions. The cross bred cows were dewormed and vaccinated against Foot and Mouth disease, Black quarter and Haemorrhagic septicaemia disease. Milking was done by hand milking twice daily from individual animal i.e. early morning at 4.00 A.M. and again at 4.00 P.M. during the experimental period and Daily milk yield was recorded for individual animals at each milking time by using a circular. Data was

analysed using the model of the Two Factorial CRD Statistical analysis and simple calculation for mean is done by formula given below:-

Grouping of experimental animals:

(1) 6 cattle of group T_1 was feeding only concentrate farm feed "A" roughages without mineral mixture supplements. (Table 1)

(2) 6 cattle of group T_2 was feeding mineral mixture supplement (macronutrients), feed concentrate farm feed, roughages "B" as per recommendation which is 50gm/cattle/day. (Table 2)

(3) 6 cattle of group T_3 was feeding mineral mixture supplement (micronutrients), feed concentrate farm feed, roughages "C" as per instruction which is 50gm/cattle/day. (Table 3)

Table 1: Concentrate farm feed

	Heifer	**Cow**
Constraint mixture (maize + rice + mustard + cotton cake + Gram Chuni)	8 kg	12 kg
Green fodder (oat+Berseem+ Sorghum)	10 kg	15 kg
Dry fodder	6 kg	8 kg
Salt	50 gm	50 gm
Calcium	-	100 ml

Table 2: Composition of Mineral Mixture Supplements "B"

Each 100 gm Contain

Vitamin D_3	16000 IU
Vitamin B_{12}	400 MCG
Phosphorus	14.25 GM
Calcium	26.000 GM

Table 3: Composition of Mineral Mixture Supplements "C"

Each Kg contains:

Minerals	**Quantities**
Vitamin A	2.500 MIU
Vitamin D_3	0.260 MIU
Vitamin E	14.00 MIU
Biotin	0.400 gm
Niacin	100 gm
Ferrous	25 gm
Copper	5 gm
Manganese	14 gm
Zinc	18 gm
Magnesium	30 gm
Cobalt	0.360 gm
Iodine	0.800 gm
Selenium	0.140 gm
Chromium	0.180 gm
Potassium	60 gm

RESULT AND DISCUSSION

Milk yield was recorded at pre treatment (0 day) and post treatment (45 day). The average milk yield (per day) pre experiment of all six cows was 8.2, 8.3, 9.5, 9.9, 11.3, and 11.6 (lit) with an overall average 9.57 (lit) respectively in T_1 (control) group; 11.2, 11.3, 11.4, 11.7, 9.3 and 9.5 (lit) with an overall 10.06 (lit)

respectively in T_2 (Treatment) group and 9.6, 9.8, 9.5, 9.9, 11.2 and 11.5 (lit) with an overall 10.35 (lit) respectively in T_3 (Treatment) group. Average milk yield was post treatment of all six cows was 9.5, 9.5, 10.5, 10.9, 9.3 and 9.7 (lit) with an overall average 9.67 (lit) respectively in T_1 (control) group; 8.6, 8.7, 10.3, 10.7, 10.2 and 10.5 with an overall 10.47 (lit) respectively in T_2 (Treatment) group and 10.3, 10.4, 9.2, 9.7, 10.8 and 11.1 (lit) with an overall 10.65 (lit) respectively in T_3 (Treatment) group. To see the effect of various mineral mixtures on milk yield in litter different types of variances were analyzed. The milk yield in various groups differ significantly ($P< 0.05$).

Impact of various feed supplement on total milk yield during experimental period (in Litre/day)

	T1		T2		T3	
Cow Numbers	**0 Day**	**45 Days**	**0 Day**	**45 Days**	**0 Day**	**45 Days**
1	8.2	9.5	11.2	8.6	9.6	10.3
2	8.3	9.5	11.3	8.7	9.8	10.4
3	9.5	10.5	11.4	10.3	9.5	9.2
4	9.9	10.9	11.7	10.7	9.9	9.7
5	11.3	9.3	9.3	10.2	11.2	10.8
6	11.6	9.7	9.5	10.5	11.5	11.1
Total	57.4	58	60.4	62.8	62.1	63.9
Mean	9.57	9.67	10.06	10.47	10.35	10.65

Milk yield mean:

	Milk Yield	
	0 Day	**45 Days**
T_1	9.57	9.67
T_2	10.06	10.47
T_3	10.35	10.65

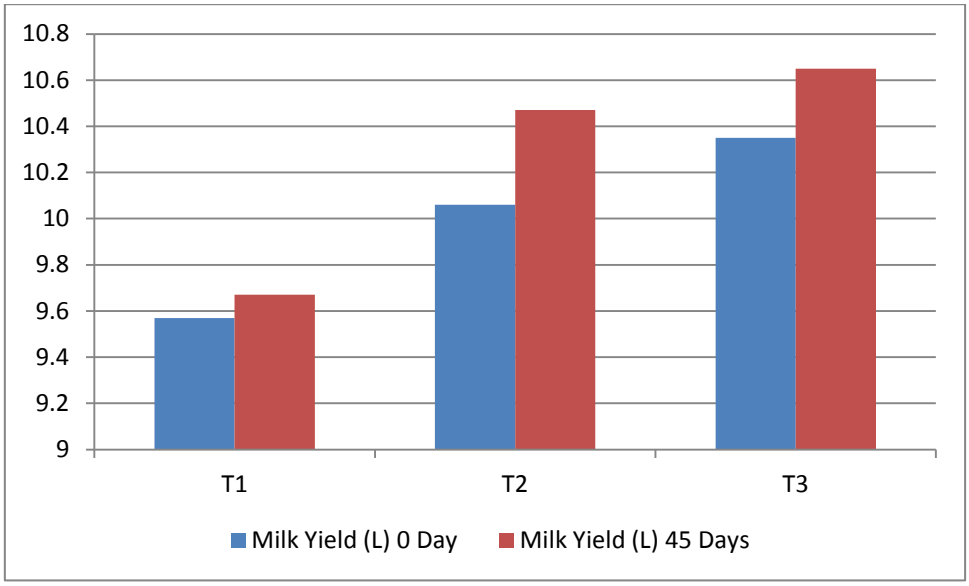

Fig: Total milk yield weight on starting day (0^{th}) of feeding and end day (45^{th}) of feeding.

Table: Milk yield analysis of variance table

Source of Variation	DF	Sum of Squares	Mean Squares	F-Calculated	Significance
Treatment	2	5.029	2.515	2.836	0.07448
Days	1	0.641	0.641	0.723	0.40197
Treatment × Days	2	0.139	0.070	0.079	0.92465
Error	30	26.603	0.887		
Total	35	32.413			

(P<0.05)

Two Way Mean Table

	Day 0	Day 45	Mean T
T_1	9.567	9.667	9.617
T_2	10.067	10.467	10.267
T_3	10.350	10.650	10.500
Mean Day	9.994	10.261	

CONCLUSION

In investigation of total milk production highest was record in T_3 (Treatment group) 10.65 lit. Followed by T_2 (Treatment group) 10.47 lit. And lowest in T_1 (control group) 9.67 lit. In study analysis of variance days and treatment are non-significant it can be concluded that the maximum milk production was obtained by mineral mixture type C is more profitable than control treatment .The supplementation of mineral blended vitamins to cow promoted efficient feed utilization and improving milk production.

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