Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 5021-5026

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 5021-5026**
Journal homepage: http://www.ijcmas.com

Original Research Article

Supplementation of Protein and Minerals to Enhanced the Reproductive and Productive Performance of Crossbred Dairy Cattle under Field Condition in Ambedkar Nagar District of Uttar Pradesh

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A B S T R A C T

In dairy animals, deficiency of protein, macro and micro nutrients adversely affect the haematological, vitamin and hormonal profile, resulting into poor reproductive and productive efficiency, on the other hand endo-parasitic infection make the susceptible to an infestation and weakness due sucking nutrients from their stomach. A survey was conducted in five blocks-Katehari, Jalalpur, Bhiti, Tanda, and Buskhari blocks in Ambedkar district of Uttar Pradesh. Study was carried out to find out the existing crop- livestock production system, macro and micro nutrients status in feed and fodder and feeding practices, reproductive and productive status of dairy animals. Average age of first calving 3.71 year in local desi cows, whereas in H.F. cross bred cattle 15.4 months. and average calving interval 15.4 months in desi cattle and in cross bred H.F. 18.4 months. Anoestrus problems of study area were found with average 15.42% in desi cattle, whereas in H.F. cross bred cattle average 19.81%. Repeat breeding problems were found 19.18% in desi local cattle and with average 33.35% in H.F. cross bred cattle. Dairy animals of study area mostly high yielding Holestein Friesian and their cross bred cattle were found more anoestrus, repeat breeding reproductive, productive problems. Animals of surveyed area exhibited a deficiency in dry matter, protein and total digetible nutrient intake. On Farm Trails conducted on Holestein Friesian croos bred cattle of fifteen farmers, three from each block on balance feeding with minerals mixture and for one year with de-worming 1st day and 30th day and after 4 month regular interval. Supplementation of mineral mixer with balance concentrate with de-worming in treatment group 14 (93.33%) cattle come into oestrus comparison to7(46.67%) cattle in farmers practice group (Feeding of paddy /wheat straw with limited green fodder and imbalance concentrate mixture, no reglar de-worming). Out of 15 H.F. crossbred cattle in treatment group 13(86.67%) conceived within 4-5 months, however only 3 (20%) animals conceived in farmers practice group. Average milk yield increase 18.40 in treatment group against 12.27 liters/day/ animals farmers practice group. From the study it was concluded that supplementation of balance concentrate with protein and minerals supplements and common salt with available dry and green fodder with regular de-worming improve the fertility and productivity of dairy animals and there is a further scope for improvement in productivity and fertility of dairy animals can be get production up to their genetic potential.

Keywords

Protein, minerals supplementation, reproduction, dairy cattle

Introduction

District Ambedkar Nagar is agriculture based district. Vast of majority of its population (80%) were engaged in agriculture and allied activities for their

livelihood. About 85% farmers came under small and marginal category. The average land holding below1.0 ha. and productivity of crops grown in district is near but below the average productivity of state. Nearly two third of farm family in district are associated with livestock farming and 80% of them are small land holders. More than75 per cent of the farmers keeping 2-3dairy animals for subsistence of their livelihood. The most of dairy animals found to performing poor reproductive and productive problems in district and below on their genetic potential. Severe deficiency of micro nutrients adversely affects haematological, vitamins and hormonal profile, resulting into poor reproductive and productive efficiency of dairy animals (Sharma *et.al.*2009). Further, the availability of nutrients depends on feeds and fodder consumed by animals which is again affected by season, cropping pattern, land holding capacity of farmers etc. (Pantgne *et al.*, 2002). but it was always prudent to feed milch animals with optimum quantities of different macro as well as micro nutrients to exploit their maximum production potentials. Therefore, an attempt has been made to induce the timely oestrus, conception and production through balance feeding with protein and minerals supplementation to improve the reproductive and productive efficiency of dairy animals in Ambedkar Nagar district of Utter Pradesh.

Materials and Methods

To find out the existing crop, livestock production system, micro nutrients status in feeds and fodders and existing feeding practices, a field survey in five blocks- Katehari, Jalalpur, Bhiti, Tanda, and Buskhari blocks in Ambedkar district and data were collected from selected farmers through a common questionnaire on farmers, family size, land holding as well as livestock population, milk yield, feeding pattern along with usage of green foders, mineral mixture and salt and reproductive and productive status of animals. Samples of feed and fodder offered to animals were collected from each village and calculated for proximate principles as per AOAC (1995). In field survey, observation were found that most of dairy animals specially Holstein Frisian and H.F. crossbred cattle suffered from severe deficiency of protein,macro and micronutrients, which adversely affect the haematological, vitamin and hormonal profile resulting in anoestrus and poor productivity (Ranjhan, 2001). On Farm Trails conducted in surveyed area of 15 farmers, three in each block on their H.F. cross bred dairy animals. De-worming done on 1st day, 30th day and after 4 month regular interval. Animals under trail fed with balance concentrate mixture (30% grinded grains, rice bran, 20% mustard cake 20% pulse chunni, 25% rice bran, wheat choker along with 2% minerals mixture, 2% chalk powder and 1% common salt) with available dry and green fodder according to thumb rule method of feeding. Feed intake, approximate body weight and number of animals sowing oestrus, number of animals conceived and milk yield during milking period were recorded for individual milch animal during trail period for one year. The body weight of animals was measured by using the formula as suggested by Sharma (1987). Animals under feeding balanced concentrate with minerals with available dry and green fodder showed the improve in milk yield, oestrus and conception rate.

Results and Discussion

Livestock population was high with increased land holding as well as feed resource capacity of the farmers. Cultivated area was mostly irrigated, about 54.47% farmers irrigated their field through their own bore-well in all the selected villages

and owned by small and large farmers. Main crops cultivated during Kharif season are paddy, pigeon pea, maize, multicut chari, sorghum, sugarcane etc. and during Rabi season wheat, chick pea, lentil, mustard, berseem etc. The chemical composition of feed and fodders is presented in Table-1.

The DM content was lowest in green berseem (16.24%) among all green fodders, it might be due to succulent nature. The CP content in roughages was highest in berseem (16.47%) fallowed by multicut chari (11.52%) and sorghum (11.52%), while it was least in paddy straw (2.10%). The value is close agreement with those reported by Mudgal *et al.,* (2003). The concentrate mixture were mainly prepared incorporating locally available ingredients like rice bran, mustard cake, pigeon pea and gram chunni, wheat bran, wheat grain etc. Most of farmers used these concentrate ingredients inadequate amount, generally added energy rich ingredients more and protein and minerals supplements in less amount. Some farmers were also aware to feed commercial concentrate like complete feed pullet to animals. Mustard cake contained high CP (37.12%) as compared to other concentrate ingredients, whereas EE content was highest in rice bran (12.78%). The ash content was found to be highest in rice bran (22.16%) fallowed by berseem green (20.22%), wheat straw (16.81%), paddy straw (16.39%) and incomplete feed pullet (15.76%). However content of ash in paddy and wheat straw is partially available to animal body because these contain high level of acid in salable ash which mainly the silica. Dairy cattle and buffaloes in this region were generally stall fed and allowed to grazing some times. Most of the farmers use to prepare homemade concentrate mixture by blending available concentrate ingredients such as rice bran, mustard cake, pigeon pea and gram chunni, wheat bran, wheat grain etc. provided to their animals in the form of sani (blend of concentrate and wheat or paddy straw sprinkled with water) but not in required and approximate ratio with reported by Tiwary *et al.,* (2003). Some farmers of targeted area were found to fortify the basal diet with to supplement mineral mixture and common salt with ration of cattle and buffaloes.

Age of first calving (Table-2) range different blocks from 3.20 to 3.90 year and average 3.71 year in local desi cows, whereas in H.F. cross bred cattle age of first calving 2.70 to 3.5 with averge 2.98 years and calving interval ranged from14to 17 with average 15.4 months indesi cattle however in cross bred H.F. cows ranged from17 to 21 with average 18.4 months. Anoestrus problems of study area were found 12.00 % to18.20 % in desi cows with average 15.42%, whereas in H.F. cross bred cattle range from 18.50% to22.65% with average 19.81%. Repeat breeding problems were found 15.40% to 20.80% with average 19.18% in desi local cattle and 25.20% to 40.20 % with average 33.35% in H.F. cross bred cattle. Delayed first calving and calving interval, anoestrus and repeat breeding failure in maturation of ovarian follicles, to be more than the normal value Benerjee, 1998). This might be due to late attainment of the matured body weight, delay in onset oestrus and failure of ovulation because animal of different categories were not getting nutrients intake through different feed ingredients was not enough to fulfill the requirement of the animals as per the standard.

On Farm Trail conducted on Assessment of protein and minerals supplementation for improved milk production and conception rate in dairy H.F. cross bred cattle (Table-.T-1-(Farmers practices) Feeding of paddy /wheat straw with limited green fodder and imbalance concentrate mixture, no regular de-worming.

Table.1 Chemical composition of feeds and fodders (% on DM basis)

S.N.	Feeds/ fodders	DM	CP	CF	NFE	EE	Total Ash
1.	Rice bran	92.42	12.30	14.58	38.90	12.78	22.16
2.	Mustard cake	91.87	37.12	9.35	37.16	9.81	08.59
3..	Pigeon pea chunni	92.64	18.70	17.20	53.55	2.30	08.02
4.	Gram chunni	92.25	12.47	38.62	42.10	1.62	04.86
5.	Wheat bran	93.31	16.29	7.76	67.81	3.35	04.78
6.	Wheat grain	92.28	10.34	4.69	80.52	2.45	02.46
7.	Complete feed pullets	88.23	13.76	14.60	52.35	3.34	15.76
8.	Paddy straw	92.20	2.10	37.59	42.97	0.85	16.39
9.	Wheat straw	93.67	3.04	38.18	48.19	1.02	16..81
10.	Sorghum green	18.27	9.42	26.88	48.82	2.34	11.86
11.	Berseem green	16.24	16.47	25.96	35.78	2.64	20.22
12.	Multicut chari	17.86	11.52	27.20	47.49	4.37	10.15

Table.2 Reproductive status of cattle in different blocks of Ambedkar Nagar district

Block	Age of first calving (Years)		Calving interval (months)		Reproductive problems in dairy anmals			
	Local Desi Cattle	H.F./H.F. Cross bred	Desi Cattle	H.F./H.F. Cross bred	Anoestrus in cattle (%)		Repeat breeding (%) in cattle	
					Desi	H.F.cross bred	Desi	H.F.cross bred
Katehari	3.80	2.70	17	17	18.20	20.48	18.00	25.20
Jalalpur	3.60	2.80	15	18	16.30	19.30	20.80	31.84
Bhiti	3.90	3.20	16	21	12.00	20.10	19.20	40.20
Tanda	3.20	2.70	14	17	14.50	18.50	22.50	32.00
Baskhari	4.05	3.50	15	19	16.10	22.65	15.40	37.50
Overall mean	**3.71**	**2.98**	**15.4**	**18.4**	**15.42**	**19.81**	**19.18**	**33.35**

Table.3 Effect of balance feeding with minerals mixture and de-worming in different blocks

No. of trials - 15, No of animals -30 (30 H.F of 2nd calving)

Block Name	Animals under trial		No. of animals sowing oestrus		No. of animals conceived within 4-5 months after calving		Average Milk yields (Lit./day/animal)	
	T1- Farmers Practice	T2- Balance Feeding	T1-F.P.	T2-B.F.	T1-F.P.	T2-B.F.	T1-F.P.	T2-B.F.
Katehari	3	3	2(66.6%)	3(100%)	1(33.3%)	3(100%)	13.66	17.80
Jalalpur	3	3	1(33.3%)	3(100%)	-(0%)	3(100%)	11.67	19.50
Bhiti	3	3	1(33.3%)	2(66.6%)	-(0%)	2(66.6%)	12.33	18.33
Tanda	3	3	2(66.6%)	3(100%)	1(33.3%)	3(100%)	13.00	19.00
Baskhari	3	3	1(33.3%)	3(100%)	1(33.3%)	2(66.6%)	10.67	17.35
Total	15	15	7(46.67%)	14(93.33%)	3(20.00%)	13(86.67%)	61.33 (Av.12.27)	91.98 (Av.18.40)

T-2- Balance feeding according to thumb rule method of feeding – Feeding balance concentrate mixture (30% grinded grains, rice bran, 20% mustard cake 20% pulse chunni, 25% rice bran, wheat choker along with 2% minerals mixture, 2% chalk powder and 1% common salt with available dry and green fodder for one year with de-worming 1st day and 30th day and after 4 month regular interval.

Supplementation of mineral mixer with balance concentrate with de-worming in treatment group 14 (93.33%) cattle come into oestrus comparison to 7(46.67%) cattle in farmers practice.

Out of 15 H.F. crossbred cattle in treatment group 13(86.67%) conceived within 4-5 months, however only 3 (20%) animals conceived in farmers practice group.

Average milk yield increase 18.40 in treatment group against 12.27 liters/day/animals farmers practice group. I (Table-4) that supplementation of balance concentrate with protein and minerals supplements and common salt with available dry and green fodder with regular de-worming improve the fertility and productivity of dairy animals was reported by Lall *et al.*, (2001), who observed that high plane of nutrition with proper minerals supplementation improves production and estrus condition as well as need based de-worming, induced the ovarian activity and conception in dairy animals.

Similar improvement 70 % in reproductive efficiency of anoestrus buffaloes was reported by Kumar *et al.*, (2012).

From the study it can be concluded that by feeding the animals as per the feeding standards, there is a further scope for improvement in productivity and fertility of dairy animals can be get production up to their genetic potential.

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