Journal of AgriSearch **4**(4):290-293
An Open Access International Peer Reviewed Quarterly
ISSN : 2348-8808 (Print), 2348-8867 (Online)
http://dx.doi.org/10.21921/jas.v4i04.10212

Nutrient availability and strategy to enhance the productivity of animals in Ambedkar Nagar District of Uttar Pradesh

VIDYA SAGAR*, HEMANT KUMAR SINGH[1] AND SK SINGH[2]

KVK, Ambedkar Nagar, ND University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

ARTICLE INFO

Received on	:	14.08.2017
Accepted on	:	15.11.2017
Published online	:	30.11.2017

ABSTRACT

A benchmark survey was conducted through common questionnaires in order to collect the information pertaining to the existing crop-livestock production system, macro and micro nutrients status in feed and fodder and feeding practices of cattle and buffaloes, farmers, family size, land holding, cropping pattern and irrigation facilities as well as livestock population, milk yield, feeding pattern and reproductive status of the animals. Landholding, livestock holding and family size were the main factors influencing the nutritional status of animals. Fifteen farmers under three major categories on land holding basis i.e. landless small (2-3 acres) and large (above 5 acres) from each village were selected. Cattle and buffaloes of the study area were found 17.89% anestrus and 28.52%, repeat breeding reproductive problems. Animals of surveyed area exhibited a deficiency in DM, DCP and TDN intake. Main crops cultivated during Kharif season are paddy, sorghum pigeon pea, maize, cowpea, etc. while during Rabi wheat, sugarcane, lentil chickpea, mustard berseem, etc. are the major crops. On-farm trails conducted on farmer's dairy animals in the surveyed area on balance feeding with minerals mixture and regular de-worming. It was found that conception rate increased from 75 to 97.67%, milk yield increased 51.03%, benefit-cost ratio was found 1:1.46 and 1:1.71 in farmers practice and experimental balance feeding dairy animals.

Keywords: Animals, Nutrient Availability, Productive, Reproductive Status and Strategy

INTRODUCTION

Livestock makes a huge contribution to rural development though it is by a large underestimated, Now it's official that in the agriculture sector, livestock and dairy sector contribute more than the crop production. They produce food, enhance soil health and crop production and provide additional income goods and services as well as cash income (Singh *et al.*, 2009). District Ambedkar Nagar is an agriculture-based district. Vast of the majority of its population (80%) were engaged in agriculture and allied activities for their livelihood. About 85% farmers came under the small and marginal category. The average land holding below 1.0 ha and productivity of crops grown in the district are near but below the average productivity of state. Nearly two-third of a farm family in the district is associated with livestock farming and 80% of them are small landholders.

More than 75% of the farmers usually keep 2-3 dairy animals for their livelihood. Though the productivity of animals depends on their genetic potential it is always prudent to feed milch animals with optimum quantities of different macro as well as micro nutrients to exploit their maximum production potentials. Under typical Indian condition due to under feeding and non-availability of balanced diet and also a deficiency of specific nutrients. Sinha (1982) reported that farmers, in general, do not feed their animals with the required amount of nutrients. Further, the availability of nutrients depends on feeds and fodder consumed by animals which are again affected by season, cropping pattern, land holding capacity of farmers etc. (Pantgne *et al.*, 2002). The present investigation was, therefore, carried out to assess the existing feeding pattern, production and reproductive status of cattle and buffaloes, nutrient availability from different feed resources and present nutritional status and strategy to improve the productivity of dairy animals in Ambedkar Nagar district of Utter Pradesh.

MATERIALS AND METHODS

A field survey was conducted in four villages, two each from Katehari and Jalalpur blocks of district Ambedkar Nagar of Uttar Pradesh, to find out the existing crop, livestock production system, micro nutrients status in feeds and fodders and existing feeding practices. Fifteen farmers under three major categories on land holding basis i.e. landless (0 acres), small (2-5acres) and large (>5acres) from each village were randomly selected. Data were collected from selected farmers through a common questionnaire on farmers, family size, landholding as well as livestock population, milk yield, feeding pattern along with usage of the mineral mixture and salt and reproductive 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). After collection of data, the amount of daily DM (Dry matter), DCP (Digestible crude protein) and TDN (Total digestible nutrients) intakes were calculated from the feed intake on the basis of average nutritive values of the feed and fodders (Ranjhan, 2001). Feed intake, approximate body weight and

[1] *Department of Plant Pathology, ND University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India*
[2] *Crop Research Station Tissuhi, Mirzapur, Uttar Pradesh, India*
*Corresponding Author Email: vsnduat72@gmail.com

milk yield were recorded for the individual milch animal during the survey. The body weight of animals was measured by using the formula as suggested by Ranjan (2001). The data obtained were analyzed for overall mean and other parameters as per procedure (Snaedecor and Cochran, 1994). Based on survey an On-Farm Trail was conducted in the surveyed area involving 12 farmers, six in each block on balance feeding with balance concentrate mixture along with 2% minerals mixture and 1% common salt with available dry and green fodder according to thumb rule method of feeding. It was found that supplementation with concentrate with protein and minerals with available dry and green fodder improve the fertility and productivity of dairy animals.

RESULTS AND DISCUSSION

Socio-economic and milk production status of dairy farmers

The average land holding, livestock holding and family size were 3.30 and 4.10 acre/family; 3.5 and 38.45 number/family, 6.30 and 7.00 members/family, respectively in Katehari and Jalalpur block (Table1). Livestock population was high with increased landholding 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, respectively. Main crops cultivated during Kharif season are paddy, pigeon pea, maize, multi cut chari, sorghum, sugarcane etc. and during Rabi season wheat, chick pea, lentil, mustard, berseem etc. (Singh *et al*., 2010). Cattle and buffaloes population reared by landless, small and large farmers, particularly for milk production was an important source of income for small as well as large farmers (Singh *et al*., 2009). Average and holding of the farmers in Karehari block were 3.30 and in Jalalpur block it was 4.10 acre/ family. Average Milk (l/d/f) production was higher (7.40 liters) in farmers families of Jalalpur block in comparison to Katehari block (6.70 liters) which was due to the fact of rearing some good milk producing breeds of cattle and buffaloes (Table 1), production per animal was found 5.20 in Katehari block and 6.10 l/d/animal in Jalalpur block with an overall mean value of 5.15 l/d/animal. This might due to imbalance feeding in some cases low productive breed cattle and buffaloes with reported by Tiwary *et al.* (2003).

Table 1: Existing cattle and buffaloes farming system in Katekari and Jalalpur block.

Attributes	Katehari	Jalalpur	Average
Family size (members)	6.30	7.00	6.65
Farmer's category (%)			
Landless	10.30	15.54	12.92
Small	51.25	46.30	48.77
Large	27.60	18.25	22.93
Average Land holding (acre/family)	3.30	4.10	3.7
Bore-well irrigation	48.28	52.65	50.47
Average Livestock holding (number/family)	3.50	3.45	3.38
Average Milk production (liters/day/family)	6.70	7.40	7.05
Average Milk production (liters/animal)	5.20	6.10	5.15
Farmers fed minerals mixture and common salt to dairy animals	1.27	2.15	1.71

Dairy cattle and buffaloes in this region were generally stall fed and allowed to grazing sometimes. 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. and 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). Paddy and wheat straw was the sole roughage used during all seasons along with available green fodders. The quality of green fodder in the basal diet was more during rainy season as compared to another season. It may due to abundant availability of green fodder during the rainy season. Farmers grew seasonal green fodder like sorghum, multi cut chari, berseem fodder crops. Only 1.71% of farmers of the targeted area were found to fortify the basal diet with to supplement mineral mixture and common salt with a ration of cattle and buffaloes.

Reproductive status of cattle and buffaloes

Age of first calving (3.35 and 3.96 years for cattle and buffaloes, respectively) and calving interval (14.85 and 16.50 months for cattle and buffaloes, respectively) were found (Table 2) to be more than the normal value (Benerjee, 1998). This might be due to the late attainment of the matured body weight, delay in onset oestrus and failure of ovulation because animal of different categories was not getting balanced ration as per their requirement (Table 4). Cattle and buffaloes of the study area were found 117.89% anoestrus and 28.52% repeat breeding reproductive problems due to lack of minerals and also energy and protein leading to delayed anoestrus and failure in the maturation of ovarian follicles.

Chemical composition and nutritive evaluation of feed and fodders

The chemical composition of feed and fodders is presented in Table 3. 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%) followed 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 was mainly prepared to incorporate locally available ingredients like rice bran, mustard cake, pigeon pea and gram chunni, wheat bran, wheat grain etc., but most of the farmers used these concentrate ingredients inadequate amount, some more or less. 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%) followed by berseem green (20.22%), wheat straw (16.81%), paddy straw (16.39%) and incomplete feed pullet (15.76%). However the content of ash in paddy and wheat straw is partially available to the animal body because these contain a high level of acid in

Table 2: Reproductive status of cattle and buffaloes in Katehari and Jalalpur blocks

Block	Age of first calving (Years)		Calving interval (months)		Reproductive problems	
	Cattle	Buffaloes	Cattle	Buffaloes	Anoestrus (%)	Repeat breeding (%)
Katehari	3.55	3.72	14.85	16.50	16.48	25.20
Jalalpur	3.80	4.25	14.80	17.40	19.3 0	31.84
mean	3.35	3.96	14.8	16.95	17. 89	28.52

salable ash which mainly the silica. Most of the commercial concentrate mixture also contains a fairly high level of crude protein but it might be due to the fortification of urea or other non-protein nitrogenous compounds. As such it is quite difficult to assess the source of such protein.

Table 3: Chemical composition of feeds and fodders (% on DM basis)

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

Nutritional status of livestock

Nutrients intake (DM, DCP and TDN) and their adequacy in terms of the requirement are presented in Table 4. The body weight of the most adult cattle and buffaloes ranged between 360-580 kg in the surveyed area. The average daily intake of DM for an adult cattle and buffalo was observed as 8.65 kg which indicated that the animals got less DM than the requirement in this region. There was 20.69% deficit in DM intake per day.

Daily average DCP intake through different ingredients was observed 247.58 g./ALU/day lead to the deficit by 21.40% per day. A similar observation was recorded by Sinha (1982), who reported that farmers were not feeding concentrates to the animals as per requirements. DCP availability in different categories of animals was less as compared to standard requirements. The average TDN intake in adult cattle and buffaloes was 3.61 kg/ALU/day which was short to the extent of 13.01 per cent.

Table 4: Nutritional status and plane of nutrition in lactating buffaloes

Feed/Fodder	DM intake (kg/ALU+/day)			DCP intake (g/ALU/day)			TDN intake (kg/ALU/day)		
	Jalalpur	Ktehari	Averagr	Jalalpur	Ktehari	Average	Jalalpur	Katehari	Average
Grazing*	0.94	0.62	0.78	35.63	22.15	28.80	0.52	0.39	0.41
Green fodder	1.30	1.20	1.25	67.04	42.33	54.69	0.55	0.46	0.51
Dry fodder	3.75	3.33	3.54	0.04	0.02	0.03	1.63	1.41	1.52
Concentrate	1.37	1.20	1.29	185.10	142.83	163.97	1.24	1.10	1.17
Total nutrient intake	7.36	6.35	6.26	287.81	207.33	247.58	3.94	3.26	3.61
Requirement**	8.65	8.65	8.65	315.00	315.00	315.00	4.15	4.15	4.15
Difference	1.29	2.30	1.79	27.19	107.67	67.42	0.21	0.89	0.54
Deficit /day (%)	14.91	26.59	20.69	34.18	8.63	21.40	5.06	21.45	13.01

*Anonymous (1980); **Ranjhan (2001)

DM- Dry matter, ALU-Average livestock unit, DCP-Digestible crude protein, TDN- Total digestible nutrients.

Animals of Katehari block had a lover intake of DM, DCP, and TDN as compared to Jalalpur block. This shows that cattle and buffaloes were underfed in the study area. Further, the economic condition of farmers of Jalalpur was comparatively better as compared to Katehari block which might have also influenced the feeding of animals in this block as the cattle and buffaloes of Jalalpur block were better nourished. It can be concluded that the nutrients intake through different feed ingredients was not enough to fulfil the requirement of the animals as per the standard. On-farm trials conducted on farmers dairy animals (6 farmers in each block) in the surveyed area on balance feeding with minerals mixture and regular de-worming.

Effect of feed supplementation on improvement in milk production conception rate

Results of On-Farm Trail on Assessment of protein and minerals supplementation for improved milk production and conception rate in dairy buffaloes presented in (Table 5) that supplementation of concentrate with protein and minerals and common salt with available dry and green fodder and regular de-worming improve the fertility and productivity of dairy animals. A similar finding was reported by Lall *et al.* (2001), who observed that high plane of nutrition with proper

minerals supplementation improves production and estrus condition in animals. In the present situation of scarcity of greens and the high cost of concentrates, improvement of the quality of existing feed resources and the use of unconventional feed with supplementation of mineral mixture might be the solution to improve the plane of nutrition of the animals. 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. It is better to prepare homemade concentrate mixture provided it is scientifically blended in proper proportions with all type of feed ingredients with the mineral mixture and common salt for dairy animals to enhance the productivity.

Table 5: Results of On-Farm Trail on Assessment of protein and minerals supplementation for improved milk production and conception rate in dairy buffaloes

Technology Option	Conception rate: No. of animals conceived timely within 4 month	Conception rate: Present conception	Avg. Milk yield/ day (lit)	Increase in milk yield (%)	Gross cost milk production (Rs/anima)	Gross income from milk/day (Rs) @ Rs. 30/liter	Net Return (Rs)	B:C Ratio
T_1 Farmers practice	9	75	6.88	-	141.25	206.4	65.15	1:1.46
T_2 Balance Feeding with de-worming	11	91.67	10.39	51.02	182.00	311.70	149.7	1:1.71

Note: T_1 (Farmers practices) Feeding of paddy /wheat straw with limited green fodder and imbalance concentrate mixture., **T_2** Balance feeding according to thumb rule method of feeding –Feeding balance concentrate mixture (mixed 35% grinded grain, 20% oil cake, 20% pulse crop cunni,22% wheat, rice bran, 2% miners mixture and 1% common salt with available dry and green fodder with de-worming 1st day and 30th day and after 4 month regular interval., No. of trials -12., No of animals -24 (24 Murrah buffaloes of 3rd calving)

CONCLUSION

It was concluded that most farmers did not use minerals mixture and common salt with concentrate. Feeding concentrates with supplementation of protein, mineral is beneficial to improve the nutritional status and productivity of the dairy animals.

REFERENCES

Anonymous.1980. Integrated Natural and Human Resource Planning and Management in Hills of UP Progress Report of Foundation Funded Project. GBPUAT, Pantnagar, India.

AOAC 1995. Official Methods of Analysis, 15th ed. Association of Official Analytical Chemist, Washington, DC.

Lall D, Sikka P, Arora U and Chauhan TR. 2001. Effect of high plane of nutrition and mineral supplementation on blood mineral profile, T_3-T_4 levels and infertility status of anoestrus buffaloes. Proceeding of 5th Animal Nutrition Conference, November 9-11, 2001. National Dairy Research Institute, Karnal, India. Pp. 190.

Mudgal V, Mehta MK, Rana AS and Nanavati S. 2003. A survey on feeding practices and nutritional status of dairy animals in Madhya Pradesh. *Indian J. Animal Nutrition* **20**: 217-220.

Pantgne DD, Kulkarni AN, Gujar BV and Lalyankar SD. 2002. Nutrient availability of milch Marathwari buffaloes in their home tract. *Indian J. Animal Nutrition* **19**:41-46.

Ranjan SK. 2001. Animal Nutrition in Tropics. 5th Rev. ed. Vikash Publishing House Private Ltd., New Delhi., India, pp. 491-555.

Singh AK, Singh Lal, Kumar C, Kumar P and Dimree SK. 2010. Para grass hybrid (*Brachiaria* sp.) – A potential forage *for India. Envi. & Ecol.* **28** (3): 1715-1721.

Singh AK, Verma Nidhi, Yadav SK, Mohanty Aparajita, Singh SP and Singh Surender. 2009. Indian Forage Genetic Resources: Perspectives and Strategies. *Prog. Agri.* **9** (2): 250-256.

Sinha MN. 1982. Gap analysis of relation to feeding recommendation. Annual Report of National Dairy Research Institute, Karnal, India. pp. 168-169.

Tiwary MK, Tiwari DP, Kumar A and Mondal BC. 2007. Existing feeding practices, nutrient availability and reproductive status of dairy cattle and buffaloes in Haridwar district of Uttarakhand. *J. Animal Nutrition and Feed Tech.* **35**: 177-185.

Citation:

Sagar V, Singh HK and Singh SK.2017. Nutrient availability, productive, reproductive status and strategy to Enhance the Productivity of Animals in Ambedkar Nagar District of Uttar Pradesh. *Journal of AgriSearch* **4** (4): 290-293