



## NUTRITIONAL STATUS AND REPRODUCTIVE PERFORMANCE OF DAIRY CATTLE AND BUFFALOES IN SONBHADRA DISTRICT OF UTTAR PRADESH

Vidya Sagar, R. K. Anand & S. V. Dwivedi

Krishi Vigyan Kendra, Sonbhadra, At: CRS. Tissuhi, P.O. Marihan, Distt. Mirzapur, UP-231310

N. D. University of Agriculture & Technology, Faizabad

### ABSTRACT

A survey was conducted in four villages, two each from Ghorawal and Chopan blocks of district Sonbhadra, to find out the nutritional status and reproductive performance of dairy cattle of the area. Fifteen farmers from each village were selected under three major categories on land holding basis *i.e.* landless, small and large. A benchmark survey was conducted through common questionnaires in order to collect the information to the farmers, family size, land holding, cropping pattern and irrigation facilities, livestock population, milk yield, feeding pattern along with mineral mixture and salt supplementation and reproductive status of the animals. Land holding, livestock holding and family size were the main factors influencing the nutritional status of animals. Main crops cultivated during Kharif season are paddy, sorghum, pigeon pea, maize, sesamum, cowpea *etc.* while during Rabi crops are wheat, lentil chickpea, mustard berseem, *etc.* Some of farmers use home made locally available concentrate ingredients such as mustered cake, lentil, gram, pigeon pea chunni, wheat, rice bran and wheat, sorghum, barley grain *etc.* and provided it to their animals in the form of Sani (blend of concentrate with wheat or paddy straw sprinkled with water). Few farmers of Ghorawal block procured cattle feed (pullet) from the market and fed it to the dairy animals. Paddy and wheat straw was the sole roughage used during all season along with available green fodder. Use of minerals mixture and common salt with concentrate is generally not practiced by most of the farmers. Cattle and buffaloes of study area were found 17.93% anostrus and 28.53% repeat breeding reproductive problems. Animals of surveyed area exhibited a deficiency in DM, DCP and TDN intake. In view of the scarcity of green fodder and high cost of concentrates, use of unconventional feeds with supplementation of mineral may be beneficial to improve the nutritional status of the dairy animals. There is further scope for improvement in production by feeding the dairy animals as per recommended feeding standards.

**KEY WORDS:** Livestock feeding, Feed concentrate, Reproductive problems, Crude protein.

### INTRODUCTION

India has the highest livestock population in the world, which emerged as a largest milk producing country with an annual milk production of 127.3 million ton. Uttar Pradesh is one of the major contributors of higher milk production of the country. Annual milk production of Uttar Pradesh is about 21.03 million tones which contributes 17.26 % of total milk production of country (Anonymous, 2013). Although state has rich in milch animals population with first rank in the country, but milch animal production is mainly contributed by a large population rather than higher productivity per animals. This is mainly due to unbalanced feeding practices, because, feeding has a critical role in any livestock production system. 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 conditions, under feeding and non availability of balanced diet and deficiency of specific nutrients are very common in the case of milch animals. Pantgne *et al.* (2002) reported that farmers, in general do not feed their animals with required amount of nutrients. 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.* (Patel *et al.*, 2007). District Sonbhadra is one of the backward districts in the state where, the milk production is very poor but livestock population is very high. It may be because of very low productivity and poor breeds of cattle and buffaloes. The present investigation was, therefore, carried out to assess the existing feeding pattern, reproductive status of cattle and buffaloes, nutrient availability from different feed resources and present nutritional status in Sonbhadra district of Vindhyan region of Uttar Pradesh.

### MATERIALS AND METHODS

Study was conducted in four villages, two each from Ghorawal and Chopan blocks of district Sonbhadra of Uttar Pradesh. Fifteen farmers under three major categories on land holding basis *i.e.* landless, small (2-5 acres) and large (>5 acres) from each village were randomly selected. Data were collected from selected farmers through a common questionnaire on farmer's family size, land holding as well as livestock population, milk yield, feeding pattern along with usage of mineral mixture and salt and reproductive status of animals. Samples of feed and fodder offered to animals were collected from each village and analyzed for proximate

principles as per AOAC (1995). After collection of data, the amount of daily DM, DCP and TDN 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 milk yield were recorded for individual milch animal during survey. The body weight of animals was measured by using the formula as suggested by Sharma (1987). The data obtained were analyzed for overall mean and other parameters as per procedure (Snaedecor and Cochran, 1994).

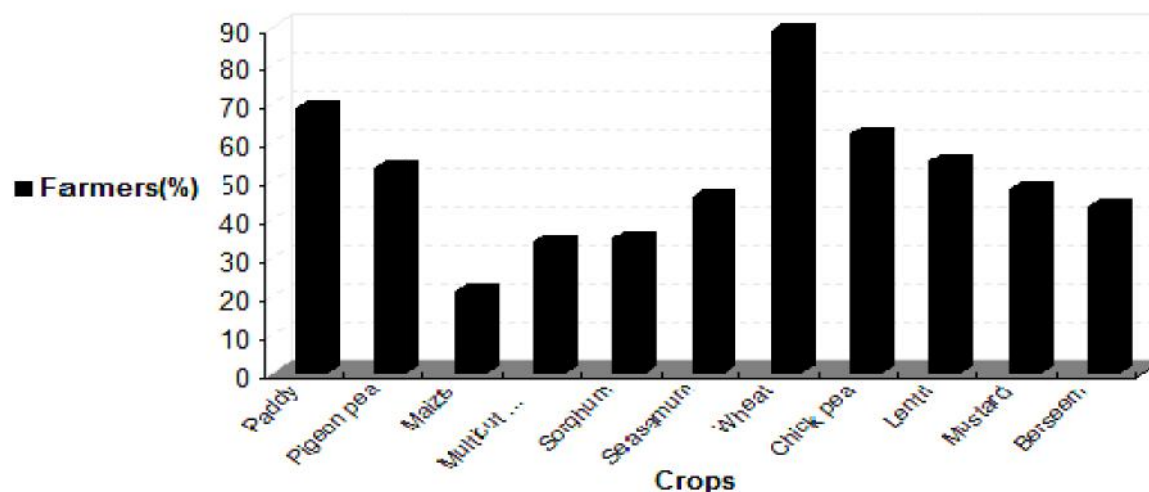
## RESULT AND DISCUSSION

The average land holding, livestock holding and family size were 6.00 and 7.30 acre/family; 6.50 and 8.30 number/family; 7.80 and 8.30 numbers/family, respectively in Ghorawal and Chopan blocks (Table 1). Livestock population was high with increased land holding as well as feed resource capacity of the farmers.

Agriculture farming was mostly rain fed, only 3% farmers irrigated their field through bore-well in all the selected villages. Main crops cultivated during Kharif season are paddy, pigeon pea, maize, multicut Chari, sorghum, sesamum etc. and main crops during Rabi season are wheat, chick pea, lentil, mustard, Berseem etc. (Fig.1) Total cattle and buffalo 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. It is evident from the table 1 that land holding of the farmers in Ghorawal and Chopan blocks were 6.00 and 7.30 acre/ family. Milk (liter/day/family) production was higher (11.70 liters) in farmer families of Ghorawal block in comparison to Chopan block (7.40liters), whereas the production per animal was found 4.60 in Ghorawal block and 3.80 liter/day/animal in Chopan block with an overall mean value of 4.2 liter/day/animal.

**TABLE -1** Existing cattle and buffaloes farming system in Ghorawal and Copan blocks

S.N.	Attributes	Ghorawal Block	Chopan Block	Average
1.	Family size (numbers)	7.80	8.30	7.95
2.	Farmer's category			
	Landless	10.10	17.34	13.72
	Small	27.60	18.25	22.13
	Large	62.25	47.30	54.76
3.	Land holding(acre/family)	6.00	7.30	6.65
4.	Livestock holding(number/family)	6.50	8.30	7.40
5.	Milk production(liters/day/family)	11.70	7.40	9.55
6.	Milk production (liters/animal)	4.60	3.80	4.2



**FIGURE 1:** Agricultural and fodder crops grown by farmers of Sonbhadra district of Uttar Pradesh

### Feeding pattern and reproductive status of different categories of animals

Most of the dairy cattle and buffaloes in this region were generally stall fed and allowed to graze for some times. Goats, sheep, ideal bullocks and non producing cattle were mostly grazed on ranged land. Most of the farmers use to prepare home made 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 it to their animals in the form of sani (blend of concentrate and wheat or paddy straw sprinkled with water) in imbalance ratio. Some farmers of Ghorawal block (3.4%) fed their milch animals with market purchased complete feed pullets (Table- 2). Paddy and wheat straw were 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 other season. It may due to

abundant availability of green fodder during rainy season. Seasonal green fodder like sorghum, multicut Chari, Berseem fodder crops were generally grown by farmers having irrigation facility. Only 1.6% of farmers of targeted

area were found to fortify the basal diet with common salt however, only 3.7 % farmers (Table 2) were reported to supplement mineral mixture with ration of cattle and buffaloes.

**TABLE 2:** Feeds for cattle and buffaloes and feeding pattern adopted by farmers

S. No	Feed ingredients	Percentage of farmers using ingredients to prepare concentrate
1	Rice Bran	45
2	Mustard cake	65
3	Pigeon Pea Chundi	36
4	Gram chundi	42
5	Wheat Bran	83
6	Wheat grain	16
7	Paddy straw	95
8	Wheat straw	68
9	Sorghum green	37
10	Berseem Green	32
11	Common salt	1.6
12	Mineral Mixture	3.7
13	Complete feed pellets	3.4

Table 3 reveals that the age of first calving (3.78 and 4.04 years for cattle and buffaloes, respectively) and calving interval (13.8 and 17.15 months for cattle and buffaloes,

respectively) were found to be more than the normal value (Benerjee, 1998). Cattle and buffaloes of study area were found 17.93% anoestrus and 28.53% repeat breeding reproductive problems

**TABLE -3.** Reproductive status of cattle and buffaloes in Ghorawal and Chopan blocks

Block	Age of first calving (Years)		Calving interval (months)		Reproductive problems	
	Cattle	Buffaloes	Cattle	Buffaloes	Anoestrus (%)	Repeat breeding(%)
Ghorawal	3.65	3.82	13.70	16.50	16.48	25.24
Copan	3.90	4.25	13.90	17.80	19.37	31.82
Overall mean	3.78	4.04	13.8	17.15	17.93	28.53

### Chemical composition and nutritive evaluation of feed and fodders

The chemical composition of feed and fodders is presented in Table-4. The dry matter content was lowest in Berseem (16.24%) among all green fodders which may be due to the succulent nature of species. The crude protein 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%). These values are in close agreement with those reported by Mudgal et al. (2003). The concentrate mixture were mainly prepared by incorporating locally available ingredients like rice bran, mustard cake, pigeon pea and gram *Chundi*, wheat bran, wheat grain etc., but most of farmers used these concentrate ingredients in inadequate amount with higher or lower dose. Some farmers were also aware to feed commercial concentrate like complete feed pullet to their animals. Mustard cake contained high crude protein

(37.12%) as compared to other concentrate ingredients, where as ether extract 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 content of ash in paddy and wheat straw is partially available to animal body because this material contains high level of acid insoluble ash which are mainly the silica. Most of commercial concentrate mixture also contains a fairly high level of crude protein but it might be due to fortification of urea or other non-protein nitrogenous compounds. As such, it is quite difficult to assess the source of such protein. It is better to prepare home made concentrate mixture which is scientifically blended in proper proportions with all type of feed ingredients with mineral mixture and common salt for dairy animals.

**TABLE -4** Chemical composition of feeds and fodders (on percentage 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

**Nutritional status of livestock**

Nutrients intake (DM, DCP and TDN) and their adequacy in terms of the requirement is presented in Table-5 The body weight of the most adult cattle and buffaloes ranged between 300-500 kg in surveyed area. The average daily intake of dry matter (DM) for an adult cattle and buffalo was observed as 8.65 kg which indicated that the animals got less dry matter than the requirement in this region. There was 20.69 % deficit in dry matter intake per day. Daily average digestible crude protein (DCP) intake through different ingredients was observed 247.58

g./ALU/day lead to deficit by 21.40% per day. Similar observation was recorded by Sohal *et al.* (1982) who reported that farmers were not feeding concentrates to the animals as per requirements. This was also the agreement with the observations of Jawale *et al.*(2007) that digestible crude protein availability in different categories of animals was less as compared to standard requirements. The average total digestible nutrient intake in adult cattle and buffaloes was 3.61 kg/ALU/day which was short to the extent of 13.01 per cent (Table-5) .

**TABLE -5** Present nutritional status and deficit in nutrition of lactating buffaloes

Feed/Fodder	DM intake			DCP intake			TDN intake		
	(kg/ALU+/day)			(g/ALU/day)			(kg/ALU/day)		
	Ghorawal	Chopan	Average	Ghorawal	Chopan	Average	Ghorawal	Chopan	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.

**DISCUSSION**

The livestock and average land holding was higher in the case of Chopan blocks but milk production was found very poor in comparison to Ghorawal block. It may be because of rearing of some good milk producing breeds of cattle and buffaloes in Ghorawal block. Whereas, farmers of Chopan blocks depends on indigenous and low milk producing cattle and buffaloes. Most of the milk producing animals of the study area is generally stall fed and allowed to graze for very few hours during a day. Due to less awareness, poor financial condition and age old tradition locally available materials were used to prepare concentrate mixture which has less nutritive value. The paddy and wheat straw were the sole roughage used to feed the cattle and buffaloes during most of the period in a year, which may be because of poor availability of green fodder. The reason behind this was rainfed condition of

the cropping system, which discourages farmers to grow green fodder. The age of first calving and calving interval in the cattle and buffaloes were more in comparison to normal value which might be because of late attainment of the matured body weight, delay in onset oestrus and failure of ovulation. These problems may be because of getting lack of balanced ration to the as per their requirement (Ranjhan, 2001). Lack of minerals, energy and protein in the animals leads to delayed anoestrus and failure in maturation of ovarian follicles resulting in to repeat breeding. Similar finding was also reported by Lall *et al.* (2001), who reported that high nutrition, with proper minerals supplementation can reduce anoestrus and repeat breeding in animals. The daily average intake of dry matter, digestible crude protein and total digestible nutrient by the animals of study area were observed lesser in comparison to daily requirement (Ranjhan, 2001),

which might be due to poor quality of feed and concentrate. Similar observation was also recorded by Sohal *et al.* (1982) who reported that farmers were not feeding concentrates to the animals as per requirements. This was also the agreement with the observations of Jawale *et al.* (2007) that digestible crude protein availability in different categories of animals was less as compared to standard requirements. Chaturvedi *et al.* (2009) also reported deficit in the total digestible nutrient intake. Animals of Chopan block had a lower intake of DM, DCP, and TDN as compared to Ghorawal block. This shows that cattle and buffaloes were underfed in the study area. Further the economic condition of farmers of Ghorawal block was comparatively better as compared to Chopan block which might have also influenced the feeding of animals in this block as the cattle and buffaloes of Ghorawal block were better nourished.

### CONCLUSION

It can be concluded from the present study that the nutrients intake through different feed ingredients was not enough to fulfill the requirement of the animals as per the standard. In the present situation of scarcity of green fodder and high cost of concentrates, improvement of quality of existing feed resources and the use of unconventional feed with supplementation of mineral mixture might be the solution to improve the plan of nutrition of the animals. Feeding of animals with low cost concentrate prepared by locally available material and supplementation with mineral mixture may fulfill the feeding standards which can improve the nutritional status and reproductive performance resulting in to higher milk production in the district.

### REFERENCES

- Anonymous (1980) Integrated Natural and Human Resource Planning and Management in Hills of U.P. Progress Report of Foundation Funded Project. G.B.P.U.A.T., Pantnagar, India.
- Anonymous (2013) Annual report 2012-13, part –I. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India. pp. 1-14.
- AOAC (1995) Official Methods of Analysis, 15th ed. Association of Official Analytical Chemist, Washington, DC.
- Banerjee, G.C. (1998) A Textbook of Animal Husbandry, 8<sup>th</sup> ed. Oxford and IBH Publishing Company Private Limited, Delhi, India, pp. 194-195.
- Chaturvedi, O. H., Mann, J. S. and Verma, D. L. (2009) Feeding practices and nutritional status of Lactating buffaloes at farmer's field in semi arid region- A case study. *Indian Journal of Animal Nutrition*, 26 (3): 265-268.
- Jawale, M. R., Kank, V. D., Patil, M. B., Chopde, S.V., Jagadale, Chavanand Karambele, N. R. (2007) Nutritional status of dairy animals from Pune district of Maharashtra. *Proceeding of International Tropical Animal Nutrition Conference*, October 4-7, 2007. National Dairy Research Institute, Karnal, India. 69 p.. (Abstract)
- Lall, D., Sikka, P., Arora, U. and Chauhan, T.R. (2001) Effect of high plane of nutrition and mineral supplementation on blood mineral profile, T3-T4 levels and infertility status of anoestrus buffaloes. *Proceeding of 5<sup>th</sup> Animal Nutrition Conference*, November 9-11, 2001. National Dairy Research Institute, Karnal, India.. 190 p. (Abstract)
- Mudgal, V., Mehata, M. K., Rana, A.S. and Nanavati, S. (2003) A survey on feeding practices and nutritional status of dairy animals in Madhya Pradesh. *Indian Journal of Animal Nutrition*, 20: 217-220.
- Pantgne, D. D., Kulkarni, A. N., Gujar, B.V. and Lalyankar, S. D. (2002) Nutrient availability of milch Marathwari buffaloes in their home tract. *Indian Journal of Animal Nutrition*. 19:41-46.
- Patel, D. C., Patel, G. R., Devailia, B. R., Vahora, S. G. and Subhash Parnerkar (2007) Feeding practices and composition of feeds and fodder in Surat district of South Gujarat. *Proceeding of International Tropical Animal nutrition conference*, October 4-7, 2007. National Dairy Research Institute, Karnal, India. Pp. 68. (Abstract)
- Ranjan, S. K. (2001) Animal Nutrition in Tropics. 5<sup>th</sup> Rev. ed. Vikash Publishing House Private Limited., New Delhi., India, pp. 491-555.
- Sohal, T.S. and Singh, J.N. & Singh, J.P. (1982) Impact of intrusive extension education, the adoption of scientific dairy farming by landless rural families around Karnal. *Indian Journal of Dairy Science*, 35: 447-453
- Sharma, R.J. (1987) Pashu Dhan Prabandhan. 1<sup>st</sup> ed. Director Communication, University Press, G.B.P.U.A.T., Pantnagar, India. pp. 478-480.
- Snedekar, G.W. and Cochran, W.G. (1994) Statistical Methods. 8<sup>th</sup> ed. Iowa State University Press, Ames, Iowa, USA.