

NUTRITIONAL STATUS OF GROWING CALVES IN DISTRICT KUPWARA OF KASHMIR VALLEY

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Received: 17-05-2011

Accepted: 08-02-2012

ABSTRACT

A field study was conducted in nine villages, three each from Kupwara, Handwara and Karnah tehsils of Kupwara district to find out the nutritional (DM, DCP, TDN) value of feeds and fodders, existing feeding practices and nutritional status of dairy growing calves. For this purpose fifteen farm families from each of nine villages were randomly selected for the study. Data was collected from the selected farmers through a common questionnaire. The average body weight (kg) of calves was 40.91 ± 2.07 , 37.76 ± 1.08 and 37.87 ± 1.23 kg in Kupwara, Handwara and Karnah tehsils respectively. The daily intake of concentrate (kg) for calves was 0.95 ± 0.15 , 0.78 ± 0.08 and 0.27 ± 0.04 in Kupwara, Handwara and Karnah tehsils respectively. The daily intake of roughage for calves were 1.83 ± 0.16 , 1.81 ± 0.11 and 1.37 ± 0.14 in Kupwara, Handwara and Karnah tehsil respectively. The ration of the surveyed calves was excess in DM by 30.6, 30.0 and 29.4 per cent for the respective tehsils. The daily intake of DCP for calves was deficit by 29.5, 29.6 and 78.4 per cent for the respective tehsils. The daily intake of TDN of calves was 2.70, 14.7 and 11.7 per cent excess than that of their nutrient requirements for the respective tehsils. All the farmers were found to add the basal diet with common salt and none of the farmers supplement mineral mixture with the ration of the calves.

Key words: Growing calf, nutrient requirement, Kashmir valley

INTRODUCTION

The state of Jammu and Kashmir has three distinct climatic zones viz. subtropical, temperate and cold arid. The livestock rearing practices in these zones exhibit wide diversity. Jammu and Kashmir has potential grazing resources in the form of forests, green meadows and pastures, yet nutritional status of majority of animals is far from satisfaction. The health and productivity of the animals further worsens during winter when greenery perishes from the scenario (November-December). There is tremendous pressure of livestock on available feed and fodder, as land available for fodder production is limited and far below the national average of 4 per cent.

The available feeds and fodders in Kashmir valley most of which are crop residues and byproducts are not only insufficient but also poor in nutritive value, low in digestibility; as a result the livestock productivity in general is very low. Adequate supply of feed and fodder is critical factor affecting

the performance of animals (Mudgal *et al.*, 2003). Poor productivity of dairy cows in hilly areas in general is attributed to their imbalanced feeding as these animals are largely maintained on dry fodder like straw and grass hay, which are deficient in critical nutrients especially proteins and minerals (Singh *et al.*, 2003). Due to land constraints availability of nutritious fodder is the biggest hurdle in the way of profitable livestock husbandry practiced in the state. An in-depth understanding of existing feeding practices and nutritional status of dairy animals would help not only in getting a comprehensive account of the level of dairy farming development in the study area, but also in planning and taking of any developmental programme. Scanty information is available regarding nutrient supply to livestock in rural areas (Singh *et al.*, 1998). Moreover, no work has been done to evaluate the nutritional status of calves in Kashmir valley especially in disadvantaged district of Kupwara as it is northern most district of Kashmir valley being

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educationally and economically backward. Livestock rearing being the major source of income. Therefore, present study was an attempt to assess the nutritional status and existing feeding practices of growing calves in Kupwara district of Kashmir valley.

MATERIALS AND METHODS

The present study was conducted in the district Kupwara, the northern most district of the Kashmir valley situated at an altitude of 5,300 feet above sea level. The district has three tehsils namely Kupwara, Handwara and Karnah. Climatologically the winters are very cold (-2 to 10°C) with heavy snow fall and the summers are pleasant (33°C). Although the district is considered deficient in natural irrigation, about 90 per cent of the population depends in one way or other way on agriculture for their livelihood. Rearing livestock is the main source of income. Kupwara is the backward frontier district of Kashmir Valley. For the present study an investigation was conducted in 9 villages, 3 each from Kupwara, Handwara and Karnah tehsils of the district to find out the macronutrient (DM, DCP, TDN) status of feeds and fodders, existing feeding practices and nutritional status of growing calves. Fifteen farmers from each village were randomly selected for the study. Sample of feeds and fodders offered to animals collected from each village were oven dried at $80\pm 5^{\circ}\text{C}$ for 24 hours till a constant weight was obtained and were subsequently grinded (1 mm) and analyzed for proximate principles as per methods described by Association of Official Analytical Chemists (1995) and fibre fraction as per VanSoest *et al.* (1991).

DCP value of the available feeds and fodders was calculated by digestibility coefficient value given by Ranjhan (2001).

TDN value of the samples was estimated using the following equations reported by Martin (1985) and Chandler (1990).

$$\begin{aligned}\text{TDN (\%)} \text{ in straw} &= 96.4 - 1.15 \times \text{ADF (\%)} \\ \text{TDN (\%)} \text{ in native grass} &= 105 - 0.68 \times \text{NDF (\%)} \\ \text{TDN (\%)} \text{ in concentrates} &= 81.4 - 0.48 \times \text{NDF (\%)}\end{aligned}$$

Body weight was calculated using Shaffer's formula (Sastry *et al.*, 1982).

The daily intake of DM, DCP and TDN was calculated from the feed intake on the basis of average nutritive values of feeds and fodders (Ranjhan, 2001). The estimated supply of nutrients

(DM, DCP, TDN) to calves was compared with the nutrient requirement given in feeding standards (Ranjhan, 1998) to determine their nutritional status. The data obtained in this experiment were analysed using conventional statistical procedure as suggested by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The chemical composition (%) of various feed resources of overall district is presented in Table-1. The DM content of feed resources ranged from 85.0 ± 0.6 to 90.6 ± 0.3 , with highest DM% recorded for concentrates and lowest for dry roughages. The OM ranged from 84.8 ± 0.7 to 93.7 ± 0.6 , the highest being in the MOC and lowest in maize straw. The CP content was highest in MOC (35.7 ± 1.5) and lowest in wheat straw (3.3 ± 0.1). The EE content ranged between 1.7 ± 0.2 to 10.2 ± 2.3 being highest in MOC and lowest in maize and paddy straw. The CF content was highest in maize straw (39.0 ± 1.3) and lowest in MOC (7.70 ± 1.3). The NFE content of feed resources ranged from 39.8 ± 1.2 to 64.8 ± 0.8 , indicating highest for wheat bran and lowest for maize straw. The ADF and NDF content ranged from 10.6 ± 1.2 to 53.0 ± 1.1 and 24.5 ± 0.5 to 78.0 ± 0.5 respectively. The ADF content was found lowest in wheat bran and highest in paddy straw and NDF content was found lowest in MOC and highest in maize straw. The total ash content was highest in maize straw (15.2 ± 0.6) and lowest in MOC (6.3 ± 0.5). Results of proximate analysis indicated normal chemical composition of various feeding resources as reported by Ganai *et al.* (2006) and Misra *et al.* (2009).

The most commonly available feeds and fodders for feeding dairy cattle include wheat bran, rice bran, pelleted feed, mustard, linseed cake, paddy straw, maize stover, oat hay and grass hay in all the three tehsils while in tehsil, Handwara and Karnah wheat straw is also fed to the animals. However paddy straw, rice bran and wheat bran were the most commonly used feed ingredients fed to the calves. Due to the fact that paddy and wheat were the main cereal crops grown in tehsil Handwara and Karnah. Therefore, local availability of straw and bran favours their use as animal feed. Similar to the present observation, Singh *et al.* (2003) reported that paddy straw constituted the basal dry roughage fed to the animals. Where, Bakshi *et al.* (2009) observed that bajra and sorghum were the predominant

TABLE1: Chemical composition (%) of feeds and fodders of District Kupwara.

Feed sample	Chemical composition								
	DM	OM	CP	EE	CF	NFE	ADF	NDF	Total Ash
Wheat bran	90.6 ±0.3	92.7 ±1.1	13.1 ±0.2	3.1 ±0.3	11.5 ±1.1	64.8 ±0.8	10.6 ±1.2	41.3 ±1.4	7.2 ±0.6
Rice bran	88.6 ±0.6	86.0 ±1.2	11.2 ±0.1	2.1 ±0.3	20.5 ±1.3	52.3 ±0.6	36.9 ±5.0	62.6 ±1.2	13.9 ±0.9
MOC	90.5 ±0.5	93.7 ±0.6	35.7 ±1.5	10.2 ±2.3	7.7 ±1.3	40.1 ±0.4	13.5 ±1.5	24.5 ±0.5	6.3 ±0.5
Linseed	89.0 ±0.5	91.7 ±0.4	31.3 ±0.4	8.8 ±1.2	9.5 ±0.9	42.03 ±0.9	12.6 ±0.3	26.3 ±0.3	8.3 ±0.3
Pelleted feed	89 ±0.5	86.3 ±0.4	11.6 ±0.2	2.5 ±0.5	19.9 ±1.4	52.9 ±0.8	27.3 ±1.8	41.6 ±0.8	13.6 ±0.3
Local grass	85.6 ±0.6	90.5 ±1.1	8.6 ±0.1	2.5 ±0.2	28.8 ±1.7	50.6 ±1.1	38.0 ±2.6	58.6 ±1.7	9.4 ±0.5
Oat hay	85.6 ±0.3	91.4 ±0.4	10.2 ±0.3	2.3 ±0.1	26.5 ±0.7	52.4 ±0.9	44.0 ±5.0	53.0 ±5.0	8.5 ±0.4
Paddy straw	85.0 ±0.5	86.2 ±0.2	3.53 ±0.1	1.8 ±0.3	38.8 ±1.8	42.0 ±0.5	53.0 ±1.1	75.0 ±1.5	13.7 ±0.6
Maize stover	85.6 ±0.3	84.8 ±0.7	4.4 ±0.1	1.7 ±0.3	39.0 ±1.3	39.8 ±1.2	49.3 ±0.8	78.0 ±0.5	15.2 ±0.6
Wheat straw	85.5 ±0.5	88.0 ±0.5	3.3 ±0.1	1.7 ±0.2	36.4 ±0.8	46.5 ±0.3	37.0 ±1.0	73.0 ±1.0	12.0 ±0.5

fodders fed to the animals. All the farmers were found to fortify the basal diet of the animals with common salt. In tehsil Handwara and Karnah common salt was mixed with concentrate mixture @ 20g and fed to calves while in tehsil Kupwara common salt was mixed with drinking water. Similar to the present observation Meena *et al.* (2008) and Tiwary *et al.* (2007) reported that there was a common practice of feeding common salt to different categories of animals. None of the farmers were reported to supplement mineral mixture with the ration of the animals. There was lack of knowledge among farmers with regard to importance of minerals in the livestock productivity. The findings of Mudghal *et al.* (2003) that none of the farmer was found using mineral mixture in the ration of their animals are in agreement with the current findings. Contrary, Bakshi *et al.* (2009) reported that 2.5 per cent of the farmers in Ferozpur and 9.52 per cent in Moga district were feeding mineral mixture to the animals. Moreover,

Tiwary *et al.* (2007) reported that 50 per cent of the farmers were reported to supplement mineral mixture with the ration of the animals. Feed additives were also not used by the farmers.

The daily intake of concentrate for calves was 0.95 ± 0.15 , 0.78 ± 0.08 , and 0.27 ± 0.04 kg per day for the respective tehsils. This was significantly higher ($P < 0.05$) for Kupwara tehsil followed by Handwara and Karnah tehsils. The average daily intake of concentrate in overall district for calves was 0.69 ± 0.08 kg. The above observations were different from that of Meena *et al.* (2008) who reported that the amount of concentrate fed to calves was 0.21 kg per day. The daily intake of roughage for calves were 1.83 ± 0.16 , 1.81 ± 0.11 and 1.37 ± 0.14 kg. This was non-significantly ($P > 0.05$) higher for Kupwara tehsil followed by Handwara and Karnah tehsil. In the whole district the daily intake of roughage for calves was 1.67 ± 0.09 kg. However these observations are in agreement with the findings of Meena *et al.* (2008).

TABLE 2: Nutritional status and plan of nutrition of calves.

Parameters	DM intake (kg/day)				DCP intake (g/day)				TDN intake (kg/day)			
	Ku	H	Ka	Overall	Ku	H	Ka	Overall	Ku	H	Ka	Overall
Total	1.45	1.34	1.32	1.37	81.63	76.76	23.33	60.54	1.14	1.09	0.95	1.05
Nutrient Intake	$\pm 0.08^a$	$\pm 0.04^a$	$\pm 0.03^a$	± 0.05	$\pm 6.3^b$	$\pm 2.7^b$	$\pm 1.5^a$	± 3.9	$\pm 0.05^b$	$\pm 0.05^a$	$\pm 0.04^b$	± 0.04
Requirement	1.11	1.03	1.02	1.05	115.8	109.1	108.1	111.0	1.11	0.95	0.85	0.97
t	$\pm 0.05^b$	$\pm 0.03^b$	$\pm 0.02^a$	± 0.02	$\pm 5.3^a$	$\pm 5.2^a$	$\pm 5.0^a$	± 3.0	$\pm 0.04^b$	$\pm 0.03^a$	$\pm 0.04^b$	± 0.04
Difference	0.34	0.31	0.30	0.32	-34.17	-32.34	-84.7	-50.4	0.03	0.14	0.10	0.08
Surplus/deficit (%)	+30.6	+30.0	+29.4	+30.4	-29.5	-29.6	-78.4	-45.4	+2.70	+14.7	+11.7	+8.24

abc = Means within the same row with different superscripts differ significantly ($P < 0.05$)

Ku=Kupwara, H=Handwara, Ka=Karnah

The daily intake of DM of calves was 1.45 ± 0.08 , 1.34 ± 0.04 and 1.32 ± 0.03 kg for the respective tehsils. The DM intake was non-significantly ($p > 0.05$) higher for calves in Kupwara tehsil followed by Handwara and Karnah tehsils. The ration of the surveyed calves was excess in DM by 30.6, 30.0 and 29.4 per cent for the respective tehsils. In overall district the daily intake of DM for calves was 1.37 ± 0.03 kg and was 30.4 per cent excess than their requirements given in the feeding standards (Ranjhan, 1998). Similar to the present observation, Fadel Elseed *et al.* (2008), Bishoni and Singh (2009) reported that the daily intake of DM was higher than their requirements.. Contrary, Tiwary *et al.* (2007) reported that different categories of dairy cattle were 13.8 per cent deficit in DM intake per day. Similarly, Mudghal *et al.* (2003) observed that daily intake of DM was less as compared to the standard requirements. The excess of DM intake was because of higher intake of roughages and concentrates and less body weight of the animals.

The daily intake of DCP for calves in Kupwara (81.63 ± 6.35 g) and Handwara (76.76 ± 2.76 g) tehsils was significantly ($p > 0.05$) higher than Karnah tehsil (23.33 ± 1.55 g) and was deficit by 29.5, 29.6 and 78.4 per cent for the respective tehsils. In the whole district the daily DCP

intake for calves was 60.54 ± 3.90 g and DCP intake, was deficit by 45.4 per cent. This was also in agreement with the observations of Mudghal *et al.* (2003) and Chaturvedi *et al.* (2009) who reported that DCP intake was less as found in calves during the present study.

The daily intake of TDN of calves was 1.14 ± 0.05 , 1.09 ± 0.05 and 0.95 ± 0.04 kg for the respective tehsils. The intake was significantly ($p > 0.05$) higher for Kupwara and Handwara tehsils than that of Karnah tehsil. The TDN intake was excess to the tone of 2.7, 14.7 and 11.7 in the respective tehsils. In the whole district the daily intake of TDN was 1.05 ± 0.04 kg and was surplus by 8.24 per cent. The present observations were comparable to the findings of Bishoni and Singh (2009). However, the observations were different from that of Mudghal *et al.* (2003), Singh *et al.* (2003) and Chaturvedi *et al.* (2009) reported that the TDN intake was less than their requirements. The excess of TDN in the study area may be due to their low requirements because of less body weight and sufficient supply of straws.

ACKNOWLEDGEMENT

The authors are gladly thankful to NAIP-3, SRLS (ICAR) for their help and financial support for the work.

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