



Influence of two levels of feeding and management systems on feed intake and growth performance of female Murrah buffalo calves

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Received: 16 August 2011; Accepted: 2 November 2011

ABSTRACT

A study was conducted up to 6 months on 20 female Murrah buffalo calves (with average initial age of 10.50 months and body weight of 87.4 kg) at the animal farm of CCSHAU, Hisar during winter and summer to find out the effect of enhanced feeding and modified management on growth performance of female buffalo calves. Each group of 5 calves was allotted to 1 of the 4 treatments, viz. routine management and routine feeding (T₁), routine management and enhanced feeding (T₂), modified management and routine feeding (T₃), modified management and enhanced feeding (T₄). The analysis of variance revealed that there is no significant difference in average daily body weight gain between treatments. However, it was slightly higher in T₂ and T₄ as compared to T₁ and T₃ revealing that even higher protein intake supported growth equivalent to normal feeding levels under improved management practices in different seasons.

Key words: Enhanced feeding, Microclimate, Modified management

One of the reasons for a smaller productive life in buffaloes is its delayed age at first calving which is generally due to improper management of calves. Feeding and management of calves/heifers is less expensive in the period from weaning to first calving than during any other period in the life of buffalo. Since the growing heifers are unproductive, they are often most neglected from feeding point of view. Keeping in view that underfeeding slows down the rate of growth and thereby puberty is delayed in buffalo calves. Feeding accounts for about 78 to 80% of the total cost of rearing of the animals. Also very little information is available regarding relative merits of different type of houses for animals under different agro-climatic conditions in general and for buffaloes in particular. However, it has been observed that the buffalo calves suffer a setback in their growth performance especially during peak summer and peak winter.

MATERIALS AND METHODS

An experiment was conducted on 20 female Murrah buffalo calves of 8 to 12 month age group to compare their performance under routine versus improved feeding and better management systems. The experiment was conducted

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at the animal farm of CCS Haryana Agricultural University, Hisar. The calves were divided into 4 groups of 5 animals each and were subjected to following 4 treatments:

T₁ – Routine management + routine feeding (100% of ICAR, 1985 feeding standards)

T₂ – Routine management + enhanced feeding (120% of ICAR, 1985 feeding standards) + 20 g Calphos AD₃ per animal per day

T₃ – Modified management + routine feeding (100% of ICAR, 1985 feeding standards)

T₄ – Modified management + enhanced feeding (120% of ICAR, 1985 feeding standards) + 20 g Calphos AD₃ per animal per day.

– Routine management implies that there was no provision of bedding and curtaining in winter under loose housing system and only one time body washing in summer.

– Modified/improved management implies that the calves were provided with proper bedding and curtaining in winter under loose housing system and three times body washing in summer.

The DCP values of feed and forages offered to the calves were taken as per book value. The concentrate mixture containing 15.41% crude protein and 75% total digestible nutrient comprising mixture of barley, 30 parts; de-oiled rice polish, 20 parts; mustard cake, 30 parts; wheat bran, 19 parts; and common salt, 1 part was used to feed the calves as per ICAR (1985) feeding standards according to body weight of

Table 1. Average daily DM, DCP, TDN intake per 100 kg body weight gain and average daily body weight gain (gm) in female buffalo calves during the experiment under different treatments

Treatment	Dry matter intake (kg)	DCP intake (g)	TDN intake (kg)	Average daily gain in body weight (g)	Final body weight (kg)
T ₁	2.24 ±0.07	296.66 ±12.02	1.23 ±0.41	387.36 ±10.67	157.30 ±6.22
T ₂	2.60 ±0.10	389.52 ±14.46	1.69 ±0.12	394.12 ±09.45	161.70 ±7.25
T ₃	2.27 ±0.04	351.99 ±18.75	1.40 ±0.13	408.23 ±08.37	158.80 ±8.75
T ₄	2.56 ±0.04	412.72 ±14.81	1.60 ±0.07	468.60 ±10.40	171.90 ±8.45

the animals taken at stipulated intervals. The calves were tied up for 2h daily for feeding the concentrate mixture according to the body weights. However the roughages and wheat *bhoosa* were offered in group to meet the desired requirement of total digestible nutrients. Feed and water intake of individual calf was determined weekly on 2 consecutive days in a week. The experiment lasted for 6 months. The calves were weighed at the beginning of the experiment and thereafter at fortnightly intervals. The body weight of calves was recorded in the morning before providing water and feed to the animals. These weights were used to calculate the quantity of ration required to be fed to each animal to meet their requirement as per ICAR, 1985 standards and the treatment they were subjected. The body weights recorded during the experiment was also used to study the change in body weights taking place during the experimental period. Temperature humidity index (THI) was calculated using formula $THI=0.72$ (dry bulb temp °C+wet bulb temp °C + 40.6°C). Efficiency of body weight gain was estimated in terms of dry matter intake, digestible crude protein intake and total digestible nutrients intake per kg live weight gain.

RESULTS AND DISCUSSION

Nutrients intake and growth performance

Concentrate mixture was fed to the calves to meet the nutritional requirement of calves as per ICAR (1985) feeding standards. The average intake of dry matter, DCP and TDN were significantly influenced by the above 4 treatments (Table 1). The average initial body weights of calves of 4 treatments were almost similar. The calves under modified management gained more body weight than those reared under routine management. However, feeding with higher level of digestible crude protein did not reflect significant increase in body weight. The analysis of variance revealed that there is no significant difference for average daily gain between treatments, however it was slightly higher in T₂ and T₄ (enhanced feeding group) as compare to T₁ and T₃ (normal feeding group). This revealed that even higher protein intake

supported growth equivalent to normal feeding levels if improved management practices for different seasons is adopted for rearing the calves. Similar results were reported earlier by Tomer *et al.* (1986) and Malik *et al.* (1977).

Microclimate: Changes in climate during the experimental period of 6 months, that is in the loose house system were recorded. Micro climate and THI values indicate that the animals under routine management were under more stressful condition than their counterparts kept under modified management system (Table 2). THI value inside the barn of modified management was similar to that in the loose house routine in all seasons (ranging from 50.83 to 63.28, 63.28 to 71.25, 49.72 to 64.78, 60.45 to 72.84 in winter which is higher in the loose house by about 1 to 2% than the modified management and similar trend was also observed in summer (Table 2). Failure of direct sunshine to reach inside the modified house management resulted in higher THI values in the evening whereas the reflected radiation in addition to direct sunshine caused higher THI value in routine management house in the morning indicating that micro – climate in the routine loose house can be further improved

Table 2. Fortnightly temperature humidity index (THI) of the loose-house under two types of management systems

Fortnights	Routine management		Modified management	
	Morning	Evening	Morning	Evening
First	50.83	63.28	49.72	64.78
Second	51.88	64.27	50.45	65.30
Third	52.54	65.61	51.01	66.53
Fourth	56.83	66.75	54.52	67.65
Fifth	59.55	67.96	55.13	68.69
Sixth	63.28	71.25	60.45	72.84
Seventh	68.56	74.48	66.32	76.04
Eighth	71.84	78.42	70.67	79.07
Ninth	73.35	81.40	71.43	84.53
Tenth	76.87	83.89	74.78	85.57
Eleventh	77.03	85.70	75.87	87.72
Twelveth	79.20	86.27	77.09	88.45

upon by making additional alterations of the shelter management. Similar results were also reported by Sharma (1991).

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