Influence of practice on performance of camel in various rearing condition of an organized farm

CHAMPAK BHAKAT¹, N SAINI² and K M L PATHAK³

National Research Centre on Camel, Jorbeer, Bikaner, Rajasthan 334 001 India

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In the changing scenario, due to shift in cropping pattern, camel keepers are forced to rear their camels in intensive and semi-intensive practices. The present study was conducted with the major objective to investigate the influence of rearing practice on growth performance, morpho-metric conformation, macro and micro minerals, biochemical attributes and economics of package of practices of camel calves rearing.

Two rearing practices were provided to two groups of camel calves. The first rearing practice was intensive condition (RIC). The second rearing practice was semi-intensive condition (RSIC) with provision of grazing / browsing daily for about 7 to 8 h and fodder offered in the evening. A mixture of *guar phalgati* (*Cyamopsis tetragonoloba*) and *mungfali chara* (*Arachis hypogaea*) were provided in 50:50 ratios to both rearing practices as manger feeding. Daily, one time watering was done for all camels in both group of rearing. The observations were carried out for 180 days. Eighteen camel (*Camelus dromedarius*) calves, around 15 to 20-month-old, belonging to the farm of the centre were taken. Animals were allotted randomly into 2 groups of rearing practices. The average body weight of 2 groups was more or less similar at initial stage. As per the prevailing field practice, the hetero breed and sex combination were kept in 2 groups of rearing practice. Each group contained 4 Bikaneri, 3 Jaisalmeri and 2 Kutchi breed animals. Sex wise each group contained 4 males and 5 females. The body weight formed the basis of determining growth rate of camels. The body weight of camel calves were recorded first before shifting calves to the respective rearing practice and thereafter all experimental animals were weighed at fortnightly intervals by using electronic balance. The average weight of two consecutive days was taken to represent fortnightly body weight. The weighing was always done in the morning before offering feed and water. The morpho-metric parameters (Higgins and Kock 1984) were

recorded by measuring tape at fortnightly intervals before morning feeding. The height was measured with the help of height measuring stand. The measurements were recorded when camel was standing evenly on foot pad with neck elevated to a normal position on plain ground level for the maximum precision and due care was taken to avoid any kind of error. The blood samples were collected from all camel calves of both groups of rearing practice at the end of experiment. Repeat sampling was also done after one week from all animals. The serum samples were analyzed for biochemical attributes like total protein, albumin, globulin, urea and glucose by kit method. The estimation of important macro and micro minerals like calcium, magnesium, phosphorus, copper, zinc, iron and manganese were done by using AAS. The economic analysis of rearing practices of camel calves in different management conditions were carried out by considering the feed cost. The tabular analysis was carried out. The paired - t test (Snedecor and Cochran 1989) was applied between 2 rearing practices for all parameters.

The average initial body weight was almost similar in 2 groups of rearing practices. After 180 days of experimental period, mean body weight was significantly ($P < 0.01$) increased in RSIC as compared to RIC group. The average total gain was higher in RSIC than RIC group after end of experiment. The average growth rate was significantly ($P < 0.01$) higher in RSIC as compared to RIC group. The average fodder mixture intake (from manger) was on slightly higher side in RIC as compared to RSIC group with a nonsignificant variation. Sahani *et al.* (1992) observed that the average daily gains in 2 month-old Bikaneri and Jaisalmeri calves were 553.3 and 546.6 g, respectively. The present data is consistent with the earlier reports. Bhakat and Nagpaul (2005) had reported that despite similar dry matter content of fodder the intake in all groups were different which is due to the difference in the types of management provided to animals. The performance data under RIC group revealed that total dry matter intake (DMI) was 5.29 ± 0.48 kg/calf/day. The ratio between water intake and DMI was 1.98 ± 0.72 . The feed conversion efficiency was 12.86 ± 0.71 . The total

Present address: ^{1,2}Senior Scientist (e mail: ¹bhakat@scientist.com) ³Ex-Director and D D G (Animal Sciences).

DMI per 100 kg body weight was 2.26 ± 0.31 kg/calf. Total intake per day per kg metabolic body size was 0.088 ± 0.007 kg. The average water intake (from trough) was slightly higher in case of RIC as compared to RSIC group and variation was nonsignificant. Tandon *et al.* (1993) found that dry fodder intake and water intake were positively correlated. Singh *et al.* (2000) reported that the relationship between dry matter intake and growth of weaned calves seems positively correlated.

The average initial values of all morphometric parameters were similar in two rearing practices. After experimental period of 180 days, difference were found in various parameters. The body length, heart girth, height at wither, neck length, hump circumference (horizontal) and leg length (fore and hind) were significantly ($P < 0.01$) increased in RSIC as compared to RIC group after end of experiment. The hump circumference (vertical), foot pad length (fore) and width (hind) were varied significantly ($P < 0.05$) between groups of rearing practices. The foot pad width (fore) and length (hind) varied nonsignificantly between two group of rearing practices. The growth achievement of camel calf was due to development of skeletal structure and muscular tissues mainly. Development of hump circumferences (horizontal and vertical) was due to deposition of adipose tissue. Khanna *et al.* (1990) reported that significant correlation coefficients existed between body weight and heart girth, heart girth and leg length in Bikaneri, Jaisalmeri, Kutchi and Mewari breed of camels.

The average level of serum calcium significantly ($P < 0.05$) increased in RSIC group (10.10 ± 0.34 mg%) than in RIC group (8.94 ± 0.26 mg%). The average level of serum magnesium, copper and iron were high in RSIC as compared to RIC group but the difference were nonsignificant. The phosphorus level was significantly ($P < 0.05$) increased in RSIC (5.59 ± 0.49 mg%) than RIC group (4.85 ± 0.53 mg%). The average level of zinc was significantly ($P < 0.05$) increased in RSIC (1.31 ± 0.08 ppm) than in RIC group (0.96 ± 0.05 ppm). Similarly manganese concentration was significantly ($P < 0.05$) increased in RSIC (0.39 ± 0.04 ppm) than RIC group (0.28 ± 0.03 ppm). Kuria *et al.* (2006) found that camel plasma concentration of calcium decreased and phosphorus increased from dry to wet season. Jakhmola and Nagpal (1992) reported that calcium and phosphorus level in calf (1 year aged) with barley supplementation were 9.95 ± 1.39 mg/dl and 5.73 ± 0.09 mg/dl, respectively.

The level of total protein significantly ($P < 0.05$) increased in RSIC group (6.12 ± 0.39 gm%) as compared to RIC (4.97 ± 0.21 gm%). The albumin level varied nonsignificantly between 2 groups of rearing practices. But globulin level significantly ($P < 0.05$) increased in RSIC (3.07 ± 0.28 g%) as compared to RIC group (1.80 ± 0.14 gm%). In case of level of blood urea the variation was be nonsignificant between 2 groups of rearing practices, although comparatively higher average level of urea was found in RIC (23.46 ± 1.25 mg%)

as compared to RSIC group (22.18 ± 1.99 mg%). The level of glucose significantly ($P < 0.05$) increased in RSIC (140.02 ± 13.26 mg%) as compared to RIC group (116.09 ± 12.38 mg%). The increased level of total protein, globulin, glucose indicates that rearing practices in RSIC fared better as compared to RIC group.

Almost all kind of cost for 2 groups of rearing practices of camel calves were more or less similar except feeding cost. The total feeding cost per calf was more in RIC group (₹2249) as compared to RSIC group (₹1667). The total feeding cost for 180 days for RIC group is on higher side (₹20241) as compared to RSIC group (₹15003). Total feeding cost per day per calf was less in RSIC (₹9.26) than RIC (Rs12.50) group. The cost invested for one kg body weight gain was quite less in RSIC (₹29.65) as compared to RIC (₹48.31) group. Since total body weight gain and average growth rate were quite high, in RSIC group it was more economical than RIC group. From the data in this study it is concluded out that practice for camel calf rearing in the semi-intensive condition is better as compare to practice in the intensive condition.

SUMMARY

The different rearing practice was provided to 18 camel calves of NRCC in 2 group for 180 days. First group was reared under intensive condition (RIC) and second group was reared under semi-intensive condition (RSIC). The average growth rate and body weight were significantly increased in RSIC as compared to RIC group at the end of experiment. The average total gain was higher in RSIC than RIC group. The feed conversion efficiency was 12.86 ± 0.71 . Morphometric parameters, viz. body length, heart girth, height at wither, neck length, hump circumference (horizontal) and leg length (fore and hind) were significantly increased in RSIC as compared to RIC group. The hump circumference (vertical), foot pad length (fore) and width (hind) were varied significantly between groups of rearing practices. The availability and intake of higher plane of nutrients could be attributed to overall better performance of RSIC as compared to RIC group. The average levels of serum calcium, phosphorus, zinc and manganese were significantly increased in RSIC than RIC group. The average levels of serum magnesium, copper and iron were high in RSIC as compared to RIC group. The levels of total protein, globulin, glucose significantly varied between 2 groups of rearing practices. The increased levels of total protein, globulin and glucose indicate that rearing practices in RSIC fared better as compared to RIC group. The total feeding cost per calf for 180 days and for whole group were high in RIC as compared to RSIC. The cost invested for 1 kg body weight gain was quite less and economical in RSIC than RIC group. It was concluded that the practice for camel calf rearing in the semi-intensive condition was better as compared to practice in the intensive condition.

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