Studies on behavioural pattern of camel calf in different systems of management

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ABSTARCT

Seven camel calves (Bikaneri breed) were selected just after birth and kept in two different systems of management like Loose Housing (L.H)/ Intensive (I) system and Semi-intensive system (S.I.) for two months. Different behavioural patterns exhibited by camel calves were recorded throughout the 24 hours period for seven complete days in a month in each group at 15 minutes interval in a special type of score card developed for this purpose. The analysis of data revealed that total average time involved in feed intake/milk suckling was more (174.92 ± 1.85 min.) in S.I than L.H condition. The total average time involved in rumination was in S.I (123.20 min.) system. The nocturnal rumination time is maximum as compared to day time rumination. The total average time involved in sleeping is more in LH than S.I. system. The total average time for idling was less in S.I. than L.H. condition. The total average frequency of defecation and urination of camel calves were more in night than day time in all systems of management. The total average frequency of agonistic behaviour of camel calves were less in S.I. than L.H. condition. The average attempt for drinking was almost similar type in L.H (1.32 ± 0.11) and S.I conditions (2.86 ± 0.17). The study concludes that due to higher time involvement in feeding and other related activities and less time involvement in idling like activity semi-intensive system is better than intensive system for camel calf management.

INTRODUCTION

The Thar desert region is prone to frequent droughts, the small and marginal farmers of this area rely heavily on livestock enterprise for their sustenance. The livestock should be compatible with crop cultivation instead of competing with it for land water resources. Camel rearing enterprise fits well with such conditions. Heifer project International, a private non-profit development agency is assisting tribal minorities who seek gainful employment using camel (Robert *et al.*, 1997). Evaluation of IRDP in the arid lands has indicated that average increase in the income of the beneficiaries

was one of the highest among people who has given loan for the purchase of camel (Khanna, 1994). Singh (1999) reported that animals continue to be a major source of motive power (tractive and rotary) in India and used by the small farmers. The camel has unique adaptive characteristics for survivability in the harsh conditions. It has been estimated that a well-fed camel could carry some six months energy on its back while cattle are unlikely to have more than 2-3 months, if run out of food (Khanna, 1986). Therefore camel can tolerate high temperature, solar

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radiation, water deprivation and subsists on poor quality thorny vegetation. Since 85% of the gross cultivated area of Bikaner district is non-irrigated, camel carts hold a significant potential for financing (Amresh Kumar 1999).

The total world camel population is estimated to be 19.32 million of which India has 1.03 million (FAO 2002). As socio-economic development taking place in the rural areas of dry and cultivable land, the camel management systems are also changing. The present trend of camel husbandry is moving from their traditional extensive mode to more restricted feeding grounds. These changes are more exhibited in rural areas near cities and irrigated areas. Camel keeping depends upon the economic and social aspects of land use management. The camel calf rearing varies to a great extent depending upon the systems of management. In order to obtain optimum profit from camel, it is essential to adopt scientific management practices for calf to reduce mortality in early age. It is therefore necessary to investigate the behavioural pattern of camel calf under different management systems to introduce ideal management practices appropriate to ecosystems and traditions applicable to specific region for economic up keep of camels.

MATERIALS AND METHODS

Seven camel calves (Bikaneri breeds) were selected just after birth from the NRCC herd. They were kept in two different systems of management like Loose Housing (L.H)/Intensive (I) system and Semi-intensive system (SI) for two months, Viz :

(1) Loose Housing/Intensive system: In this system all camel calves were kept in the open type of shed which was provided with 1.5 metre high wire

fencing. The fence was supported by iron angle. Some Kikar trees (*Prosopis Juliflora*) were there to provide the shed. Each camel was provided with 40 – 45 metre square spaces and a common feeding manger with 75cm breadth and 40 cm depth (internal dimension). The floor was kachcha with loose sand dune. The soiled sand of the floor was replaced with new sand as and when required.

(2) Semi-intensive system : In this system all the camel calves were daily sent to range land area for grazing/ browsing for about 6 hr (10.00 am to 4.00 pm) and offered dry fodder in evening after return from field. Ad-labium water was provided to each group once in a day. The DM of feed samples was determined by drying the sample in a hot air oven at $99\pm1^{\circ}\text{C}$ temperature for overnight.

Behavioural Patterns: Different behavioural patterns exhibited by camel calves were observed throughout the 24 hours period. The observation on the feeding behaviour started at 6.00 a.m. and completed at 6.00 a.m. on the subsequent days. Thus, a day was considered from 6.00 a.m. to 5.59 p.m. and a night from 6.00 p.m. to 5.59 a.m. of next day. The observations were recorded for seven complete days in a month in each group. Different behavioural patterns of calves were recorded at 15 minutes interval in a special type of score card developed for this purpose. The hour-wise observations were decoded with the help of decoding sheet. Total time spent for every activity in each hour was cumulated and frequency of defecation, urination, drinking and fighting were counted. The suitable statistical methods (Snedecor and Cochran, 1989) were applied to analyse data.

Table 1. Meant SE of different behavioural pattern of camel calf in 24 hours.

	Time	N	TF	Standing	Posture	RU	CMM	RO	ID	RU	Lying	Posture	SP	Total	RU	ID
LH/I	Min/24Hr	49	MS=65.72 ±0.89 (4.56)	NF	NF	54.55 ±0.76 (3.79)	15.45 00.61 (1.00)	504.63 ±3.79 (35.04)		NF	549.66 ±3.28 (38.17)	250.71 ±2.63 (17.41)		NF	1054.29 (73.91)	
	Min/day	49	MS=52.30 ±0.70 (3.63)	NF	NF	44.28 ±0.52 (3.08)	14.21 ±0.52 (0.99)	253.17 ±2.88 (17.58)		NF	280.76 ±2.53 (19.50)	75.28 ±0.79 (5.23)		NF	533.93 (37.77)	
	Min/Night	49	MS=13.42 ±0.15 (0.93)	NF	NF	10.27 ±0.29 (0.71)	1.24 ±0.36 (0.10)	251.46 ±1.73 (17.46)		NF	268.90 ±1.95 (18.67)	175.43 ±2.00 (12.18)		NF	520.36 (36.14)	
	(%)															
	Min/24Hr	49	MS=40.23 GR=38.11 BR=70.25 IF=26.33 Total=174.92±1.85 (12.15)	35.68 ±0.47 (2.48)	83.33 ±1.56 (5.89)	433.96 ±2.84 (30.14)				87.52 ±0.93 (6.08)	427.92 ±2.75 (29.72)	175.00 ±1.85 (12.15)		123.20 (8.56)	861.88 (59.16)	
	Min/day	49	MS=30.13 GR=38.11 BR=70.25 IF=21.00 Total=159.49±1.26 (11.07)	3.92 ±0.38 (0.27)	65.49 ±1.23 (4.55)	220.03 ±1.29 (15.29)				24.88 ±0.34 (1.73)	211.99 ±1.32 (14.72)	15.75 ±0.39 (1.09)		28.80 (2.00)	432.02 (29.31)	
	Min/night	49	MS=10.10 IF=5.33 Total=15.43±0.32 (1.08)	31.76 ±0.41 (2.21)	17.84 ±0.39 (1.34)	213.93 ±1.75 (14.84)				62.64 ±0.75 (4.35)	215.93 ±1.57 (15.00)	159.25 ±1.63 (11.06)		94.40 (6.56)	429.86 (29.85)	
	(%)															

MS-Milk suckling, IF-Intake fodder from Manger, GR- Grazing, BR-Browsing, NF-Not found, (Figure in parenthesis is indicated % Value)

Table 2. Frequency distribution of eliminative and other behaviour of camel calf in 24 hours.

System	Time	N	Eliminative DE	Eliminative UR	Attempt for drinking	Playing	Agonistic
Loose housing/ Intensive	Total/ 24Hr.	49	5.16±0.21	5.98±0.23	1.32±0.11	5.38±0.12	4.32±0.12
	Day (%)	49	1.31±0.13 (25.39)	1.55±0.12 (25.92)	1.32±0.11	3.51±0.11 (62.24)	3.49±0.09 (80.79)
	Night (%)	49	3.85±0.12 (74.61)	4.43±0.14 (74.08)		1.87±0.10 (34.76)	0.83±0.07 (19.21)
Semi Intensive	Total/ 24Hr.	49	6.74±0.23	6.52±0.25	2.86±0.17	5.95±0.13	3.56±0.11
	Day (%)	49	1.66±0.12 (24.63)	1.57±0.14 (24.08)	2.86±0.17	4.05±0.12 (68.07)	2.64±0.08 (74.16)
	Night (%)	49	5.08±0.13 (75.37)	4.95±0.19 (75.92)		1.90±0.10 (31.93)	0.92±0.05 (25.84)

(Figures in parenthesis indicates % value)

RESULT AND DISCUSSIONS

The mean $\pm$ SE of different behavioural pattern of camel calf in 24 hours is presented in Table 1. The total average time involved in milk suckling (MS) was reduced in S.I. (40.23 min.) than L.H (65.72 min.) condition because according to the advancement of age of calf, Grazing (GR), Browsing (BR), feed intake from manger (I F) behaviours were developed which ultimately leads to more time involvement in feeding activity in SI system. The average percent time involved in feed intake/MS was 4.56% in L.H and 12.15% in S.I system. The time taken for feed intake was maximum during day as compared to night in both system of management. During day total average time involved in feed intake/MS was 3.63% in L.H and 11.07% in S.I condition whereas values were 0.93% in L.H and 1.08% in S.I system during night. It was suggested that in loose housing system the fodder supplied at

10.00 a.m. in sufficient quantity is enough for the daily requirements of camel calf. There is no need to employ any labour after 11.00 a.m. for looking after the feeding job. Bhakat *et al.*, (1997) found that housing management systems significantly ($P < 0.01$) affect the average fodder and concentrate intake in female goats. Rumination (RU) behaviour in calf was developed after the age of 30 days and average RU time in 24hr was 123.20 min. Nocturnal rumination was more than day time. During night total average rumination time was 6.56% and during day it was 2.00% in S.I condition. The rumination activity was more in lying than standing posture during day and night. The average time involved in rumination in S.I condition were 35.68 ± 0.47 and 87.52 ± 0.93 in standing and lying posture, respectively. The rumination time gradually increased with advancement of age of the camels. This may be due to advancement of age, rumen became well developed, the body

weight of camel calf gradually increased and with that the feed requirement was also increased. To fulfil more feed requirement, camel calf consumed more DM which lead to increment of rumination time. The total average time involved in sleeping (SP) is more in LH condition (250.71 ± 2.63 min.) than SI (175.00 ± 1.85 min.) because mainly due to increment of age of calf. The nocturnal sleeping is maximum as compared to day time in both system of management. It was during night 11.06% and 12.18% in S.I and L.H conditions, respectively. Whereas, during day it was 1.09% and 5.23% in S.I and L.H system, respectively. The posture of sleep was that of lateral recumbence. Camel calf was polyphasic in their sleep. A brief naps, then period of activity followed by sleep was the common feature (Tandon *et al.*, 1988). The calf movement with mother (CMM) was reduced in S.I. than L.H. condition but Roaming (RO) / independent individual movement time of calf increased in S.I. than L.H. condition. The total average time involved in CMM in S.I system was 21.67 ± 0.21 min. and in L.H condition was 54.55 ± 0.76 min. Whereas the total average time involved in RO in SI was 83.33 ± 1.56 min and in LH condition was 15.45 ± 0.61 min. Because calf were getting much more open place in S.I. system. The CMM and RO were maximum during day than night time in each system of management. During day average time involved in CMM and RO were 3.08%, 0.99% and 1.37%, 4.55% in LH and SI system, respectively. During night average time involved in CMM and RO were 0.71%, 0.10% and 0.13%, 1.34% in LH and SI system, respectively. Camel calves have a frequent feeding habit which also might have contributed to more movement during the day. During extreme

season camel calf prefer less movement in order to minimise the disturbance in body temperature. The idling means when calf involved in no other activities. The total average time for idling (ID) was less in S.I. system (861.88 min.) than L H condition (1054.29 min) because camels were devoting much more time in feed intake, rumination and other related activities in S.I. systems. Nocturnal idling was maximum as compared to day time in both systems of management. It was 36.14% and 29.85% in L.H. and S.I. conditions, respectively. During day ID was 37.77% and 29.31% in L.H and S.I. conditions, respectively. Almost same pattern of idling was found in standing and lying posture in all systems of management.

In L.H. and S.I. conditions camel calf involved much time (%) in standing posture (SP) than Lying posture (LP) during day (6 a.m. to 6 p.m.) but this situation was almost reverse during night (6 pm to 6 am). It indicates that as the day light /sunlight disappears, camel calves has a tendency to go in lying posture.

The frequency distribution of eliminative and other behaviour of camel calf in 24 hours are given in Table 2. The data indicates that total average frequency of defecation (DE) and Urination (UR) of camel calf were more in night than day time in L.H and S.I systems. During night time average defecation frequency was 74.61% and 75.37% in L.H and S.I systems, respectively. Whereas, average urination frequency was 74.08% and 75.92% in L.H and S.I condition, respectively. During day DE frequency was 25.39% and 24.63% in L.H and S.I conditions, respectively. Whereas, UR frequency was 25.92% and 24.08% in L.H and S.I conditions, respectively. The DE and UR frequency was more in S.I than L.H

condition. This might be due to more DM intake in S.I system. Highest frequency of defecation was found between 4.00 to 6.00 a.m. and the lowest was found between 6.00 to 8.00 a.m. This results provide information about management practices i.e the camel keeping place should be cleaned after 8.00 a.m. so that it may remain clean and hygienic for a longer duration of a day. Bhakat *et al.* (2001) reported that the average time taken for excretion of muconium was 32.00 ± 5.64 min. and first urination was 61.50 ± 2.11 min in camel under loose housing system. The total average frequency of agonistic behaviour was less in S.I. (3.56 ± 0.11) than L.H. condition (4.32 ± 0.12) because camels were getting much more open space in S.I. condition. According to the advancement of age, among troop of camel a hierarchy was formed which leads to reduction of the frequency of agonistic behaviour in S.I. condition. In L.H. condition this frequency was maximum during group feeding when camel calves were competing with each other for taking feed for same manger at the same time. The average frequency of agonistic behaviour was maximum during day as compared to night time. The average attempt for drinking was less in L.H. (1.32 ± 0.11) system than S.I. conditions (2.86 ± 0.17). The camel calf mostly attempt for drinking during day in both system of management. A similar pattern of average playing/interaction activity was found in both system of management. This frequency was maximum during day as compared to night.

CONCLUSION

The study concludes that due to higher time involvement in feeding and other related activities and less time involvement in idling like activity semi-intensive system is better than intensive system for camel

calf management.

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