

# VOLUNTARY FEED INTAKE, SERUM PROFILE, GROWTH PERFORMANCE AND ECONOMICS OF WEANED CAMEL CALVES

A.K. Nagpal, G.P. Singh, U.K. Bissa and N. Sharma

National Research Centre on Camel, P.B. 07, Bikaner, India

## ABSTRACT

Six camel calves (3 Jaisalmeri and 3 Kutchchi) were weaned at 4.5 months of age. The calves had average body weight of 132.4 kg at 4.5 months of age and were raised on dry chaffed *Cyamopsis tetragonoloba adlib* and weighed quantity of *Cynodon dactylon* grass and concentrate mixture till 9 months of age. Average voluntary dry matter intake was 3.60 kg/d or 2.31 kg/100kg DMI. Significant ( $P<0.05$ ) lower serum total protein, urea and triglycerides levels but higher levels of phosphorus and chloride at 6<sup>th</sup> month of age than at 9<sup>th</sup> month of age were observed. The calves gained 56 kg over 139 days or 402.83 g/d with feed efficiency (DMI kg/kg body weight gain) of 8.78. The results indicated that weaning was more economical and resulted in saving of Rs. 10162.06.

**Key words:** Blood parameters, camel calves, economics, feed efficiency, weaning

Early weaning of calves, not only increases the availability of milk for ever increasing human population but also encourages the early development of rumen as a result of increased solid feed intake. Since such information about weaning of camel calves is not available in the literature, this study was undertaken.

## Materials and Methods

Six camel calves (3 Jaisalmeri and 3 Kutchchi) born during mid-February, 1999 were weaned at 3 months of age. Initially there was difficulty in separation of camel calves from their dams due to mother instinct. Eventually camel calves could be separated and actual data recording was started at the age of 4.5 months. The calves were raised in a group under stall-fed conditions upto 9.0 months of age. These were offered dry chaffed guar (*Cyamopsis tetragonoloba*) phalgati *ad.lib.* and weighed quantity of fresh green doob (*Cynodon dactylo*) grass and concentrate mixture. The concentrate mixture comprised of broken rice 41.8%, groundnut cake 29.26%, rice bran 15.67%, de-oiled rice bran 10.45%, mineral mixture 0.94% and common salt 1.88%. The calculated DCP and TDN contents of the concentrate mixture were 16.49 and 74.77%, respectively. Refusals of guar phalgati were recorded daily whereas Doob grass and concentrate mixture was fully consumed by the camel calves. The calves had free access to fresh drinking water all the time. Body weights of the

calves were recorded fortnightly. The blood samples of camel calves were taken at 6 and 9 months of age and analysed for glucose, total protein, albumin, urea, cholesterol, triglyceride, calcium, phosphorus and chloride using Ranbaxy diagnostic kits on ECIL digital spectrophotometer. The data were subjected to statistical analysis (Snedecor and Cochran, 1968).

## Results and Discussion

Weaned camel calves attained body weight of 189.50 kg at 9 months of age with growth rate of 402.83 g/d over 139 days. Average consumption of concentrate mixture, guar phalgati and doob grass was 0.77, 0.086 and 2.76 kg/d, respectively with total dry matter intake varying between 1.65 to 3.68 kg/day. The dry matter intake kg/100 kg body weight varied from 1.77 and 2.54 over 9 fortnights of growth period (Table 1). It is quite clear from Table 1 that growth of animals and DMI has positive correlation indicating similar digestion and feed utilisation efficiency throughout the experimental period. Obviously DMI is directly related to productivity subject to digestibility and nutrient utilisation efficiency. This hypothesis was true in this experiment.

Significantly ( $P<0.05$ ) lower serum urea and triglycerides levels but higher levels of total protein, phosphorus and chloride levels at 6<sup>th</sup> month of age than at 9<sup>th</sup> month of age were observed. Blood

SEND REPRINT REQUEST TO A.K. NAGPAL [email: aknagpal@scientist.com](mailto:aknagpal@scientist.com)

Table 1. Growth and feed intake of weaned camel calves.

Age (months)	Body Wt. kg.	Dry matter intake (kg)					
		Conc.	Guar phalgati	Doob grass	Total	Per 100 kg body wt.	g/kg W0.75
4.5	132.14	–	–	–	–	–	–
5.0	136.14	0.69	2.03	–	2.72	2.03	68.26
5.5	140.00	0.80	1.65	–	2.45	1.77	60.20
6.0	150.33	0.78	2.10	0.06	2.96	2.04	68.96
6.5	160.33	0.78	2.43	0.09	3.30	2.06	73.23
7.0	168.33	0.78	2.93	0.09	3.80	2.31	81.32
7.5	171.67	0.78	3.11	0.09	3.98	2.34	83.90
8.0	186.00	0.78	3.68	0.09	4.55	2.54	90.33
8.5	189.33	0.78	3.55	0.09	4.42	2.36	86.60
9.0	189.50	0.78	3.35	0.09	4.22	2.23	82.63
Average		0.77	2.76	0.086	3.60	2.31	77.27

Table 2. Serum biochemical values of weaned camel calves.

Parameters	6 months age	9 months age
Glucose g/dl	110.45 ± 3.67	105.54 ± 0.80
Total protein g/dl *	5.71 <sup>b</sup> ± 0.21	5.10 <sup>a</sup> ± 0.15
Albumin g/dl	3.74 ± 0.06	3.71 ± 0.12
Urea mg/dl**	20.08 <sup>a</sup> ± 1.14	25.37 <sup>b</sup> ± 0.74
Cholesterol mg/dl	35.75 ± 3.41	28.05 ± 1.45
Triglyceride mg/dl**	28.27 <sup>a</sup> ± 1.32	48.44 <sup>b</sup> ± 2.75
Calcium mg/dl	10.94 ± 0.26	11.11 ± 0.48
Phosphorus mg/dl*	8.66 <sup>b</sup> ± 0.41	6.95 <sup>a</sup> ± 0.58
Chloride mmol/L**	114.46 <sup>b</sup> ± 1.20	101.98 <sup>a</sup> ± 3.56

\*P <0.05, \*\*P <0.01

Table 3. Growth, feed efficiency and economics of rearing weaned camel calves.

Parameters	Values
<b>A. Growth</b>	
Initial body weight kg.	132.14±5.28
Final body weight kg.	189.58±7.25
Body weight gain kg.	56.00±6.09
Average daily gain g/d	402.83±43.72
<b>B. Feed efficiency</b>	
a. Total DMI kg.	491.75
b. Body weight gain kg.	56.00
Feed efficiency (a / b)	8.78
<b>C. Economics (In INR)</b>	
i. Cost of concentrate @10.0 /kg	113.06 × 10.00=1130.60
ii. Cost of Guar phalgati @Rs.7.25 /kg	406.30 × 7.25=2945.68
iii. Doob grass cost @Rs.2.0/kg	25.83 × 2.00= 51.66
Total feed cost ( i + ii + iii)	4127.94
Milk saved @ 5.50 kg/d over 139days	5.5 × 139=764.50
Milk cost @Rs. 20/kg milk	764.5 × 20.0=14290.0
Saving (milk cost-feed cost)	14290-4127.94=10162.06

parameters of camel calves such as glucose and total protein were observed to be lower in our studies (Table 2) as compared to those observed by Bissa (1993) at 6 months of age which decreased with advancement of age and these values are influenced by nutritional status, excretory pattern and kidney functions. Serum electrolytes viz. calcium and phosphorus were observed to be higher than those observed by Nagpal and Sahani (1999) in older camel calves which might be due to age factor. These observations are further supported by Al-Busadah (2004) of significant ( $P < 0.5$ ) higher concentrations of Ca, Mg and P at 3 months of age than at age of 6, 9 and 12 months due to decreasing efficiency of utilisation of minerals as the calves get older.

The calves gained total body weight of 56.00 kg over 139 days with average daily gain of  $402.83 \pm 43.72$  g/d indicating moderate and normal growth of weaned calves (Table 3). The body weights as well as dry matter intake of calves was better than those calves raised on dry moth chara and milk under stall-fed conditions (Nagpal *et al*, 1998) at 9 months of age indicating the advantage of weaning camel calves at an early age. Shreha (1985) had also reported earlier that the daily growth rate of camel calves was not affected by milking half the udder twice a day. Improved management system was found to result in growth rate of 552-722 g/d in young calves upto the age of 12 months (Ismail and Al-Mutairy, 1990). Feed/gain ratio was similar to our earlier values of 7.5-8.4 in 1.5 years old growing camel calves weighing 186-196 kg given guar phalgati and concentrate mixture confirm our results (Nagpal and Sahani, 1999). Taking the average milk yield of lactating camel as 5.5 kg/d (Nagpal *et al*, 1998) and prevailing prices of milk and feeds, the early weaning resulted in saving of Rs. 10162.06 indicating the better economy of weaning system. These observations are supported by the findings of Fehr *et al* (1976) who have reported 20% lower cost through weaning at early age.

The results indicated that weaning does not affect the growth performance of the camel calves adversely and is more economical.

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