

EFFECTS OF FEEDING MILK REPLACER ON SELECTED HAEMATO- BIOCHEMICAL PROFILE IN YAK (*Bos grunniens*) CALVES.

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ABSTRACT

An experiment was conducted to find out the effect of feeding milk and milk replacer on selected haemato-biochemical constituents of Yak calves up to 3 months of age. The calves were subjected to three feeding regimes viz. natural suckling (T_1), milk replacer (T_2) and bottle whole milk feeding (T_3). No significant difference in the levels of blood serum haemoglobin, glucose, cholesterol, calcium, phosphorus, magnesium and albumin were observed among the three treatments indicate that feeding milk replacer has no effect on these blood components.

KEY WORDS: Yak, Haemato-biochemical, Milk replacer, Feeding regimes, Suckling.

INTRODUCTION

Yak (*Bos grunniens*) is a multiuse ruminant of high altitude. The sparse nutritional availability and harsh climatic condition make the mothers of this species unable to support required nutrients to the calves. Under such situation, feeding a suitable milk replacer can provide good support to the yak calves. Considering the paucity of literature in Yak, this study was undertaken to determine the effect of different types of ingested food (milk or milk replacer) on concentrations of selected blood biochemical components in yak calves during the three months of life.

MATERIALS AND METHODS

The experiment was carried out on 18 calves of either sex of National Research Centre on Yak, Dirang, Arunachal Pradesh. The calves were allowed to suckle mother's milk for a period of 8 days. On the 8th day animals were divided into three groups viz. T_1 - (natural suckling of mother's milk), T_2 - (Milk replacer feeding) and T_3 - (Whole yak milk with bottle feeding). A milk replacer containing 22.42 per cent crude protein as suggested by Arora (1979) was prepared with Wheat (35%), Fish meal (10%), Soya bean meal (20%), Skim milk (13.50%), Coconut oil (8.40%), Molasses (8%), Citric acid (1.50%), Butyric acid (0.30%), Mineral mixture (3%), Antibiotic mixture (0.3%), and Rovimix (0.015%) and was offered to the calves under T_2 . The calves under T_1 were allowed to suckled mother's milk and calved under T_3 were fed yak's milk with bottle. A concentrate mixture (Maize 35%, Wheat bran 15%, Rice bran 12%, Soya bean meal 10%, GNC 10%, MOC 15%, Min. mixture 2% and common salt 1%) containing 16.52 per cent crude protein and maize fodder containing 8.20 per cent crude protein were offered to the calves of all the three treatment groups throughout the experimental periods. Milk, milk replacer, concentrate mixture and maize fodder were offered to the calves *ad libitum* two times a day. Blood sample was collected from the jugular vein once a day at birth and thereafter at fortnight interval till 3 months of age. Serum was separated and stored at -20°C until processing. Serum biochemical constituents (serum albumin, calcium, phosphorus, magnesium, glucose and cholesterol) were estimated following standard methods in use. Blood haemoglobin was estimated by Acid haematin method using Haemoglobinometer. The statistical analysis of the data was carried out using ANOVA as per standard procedure given by Snedecor and Cochran (1994).

TABLE : Haemato- biochemical parameters of the calves fed with the milk replacer.

Parameters	Age	T ₁	T ₂	T ₃
Haemoglobin(g/dl)	At birth	10.36±0.38	10.40±0.37	11.37±0.55
	At 3months	12.48±0.52	12.03±0.27	11.67±0.41
Glucose(mg/dl)	At birth	73.94+5.35	60.73+6.40	81.87+1.12
	At 3months	41.19±5.56	48.67+4.84	51.08±1.84
Cholesterol(mg/dl)	At birth	76.47+5.17	81.59+7.43	75.94+2.56
	At 3months	89.18±4.11	90.39±2.24	98.52±5.00
Calcium(mg/dl)	At birth	10.34+1.38	10.79+4.40	10.64+0.72
	At 3months	8.79+0.83	9.02+0.37	8.63+0.53
Phosphorus(mg/dl)	At birth	8.69±0.60	8.46±0.18	8.71±0.40
	At 3months	5.08+0.23	4.69+0.37	4.80+0.35
Magnesium(mg/dl)	At birth	2.03+0.82	2.18±0.05	2.29±4.14
	At 3months	2.00+0.03	2.13+0.04	2.03+0.03
Albumin(g/dl)	At birth	2.85±0.08	2.70±0.28	2.28±0-10
	At 3months	2.89±0.12	2.83±0.29	2.88±0.13

RESULTS AND DISCUSSION

The result of present study showed that all the haemato-biochemical data did not differ significantly among the treatments (Table). The haemoglobin level in blood of the calves was apparently higher at 3 months of age. However, no significant difference was found among the treatments indicating that the calves were not affected with the feeding schedule. Since, yak lives at high altitude, the

haemoglobin level were found high. The results of the present study are in agreement with Sarkar *et al.* (1999).

The glucose, calcium, phosphorous and magnesium concentration in blood serum showed decreasing trend along with the advancement of age of the calves, indicating that the calves were more dependent on the volatile fatty acid during this period rather than glucose for energy. This also suggests the development and functional status of the rumen in the growing calves. Stanley *et al.* (2002) reported that feeding calves with milk replacer once daily did not deleteriously affect performance of the calves or glucose metabolism regardless of breed. Glucose levels recorded in the study are in agreement with Shaffer *et al.* (1981) who reported that blood glucose level decreases with increasing age of the growing calf. Stanley *et al.* (2002) observed differences in calcium concentrations in milk replacer fed calves. Lepczynski *et al.* (2011) observed that the magnesium concentration in blood plasma in both milk and milk replacer groups of calves was stable during the entire experimental period. The blood calcium, phosphorous and magnesium levels in the three treatments decreased with the advancement of age may be primarily due to more intake of concentrate and fodder along with the advancement of age. In early age, the calves were more dependent on milk or milk replacer which is a good source of calcium and phosphorous. As age advances, the calves consume more concentrate and fodder for energy. At the same time calcium and phosphorous may not be readily available from the feeds and fodder as these are bound with the phytic acid. The present values of calcium and phosphorous and their decreasing trend around maturity are in agreement with Devraj *et al.* (1985). Shrikhande and Saode (1999) reported higher serum calcium level in younger age as compared to aged cows.

Stanley *et al.* (2002) observed differences in cholesterol concentrations in milk replacer fed dairy calves which was not in agreement with the present study. High cholesterol levels along with the advancement of age reflect the pattern of metabolic changes in the growing calves. The present findings corroborate with the findings of Terri *et al.* (1946) who reported that the blood cholesterol level increases with the advancement of age in dairy calves.

Non significance difference in albumin levels in blood due to feeding schedule or age of the calves of the present study was not in agreement with Stanley *et al.* (2002) who reported that albumin concentrations were greater in the conventionally fed group than milk replacer fed group.

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