

## EFFECT OF FEEDING MILK REPLACER ON GROWTH PERFORMANCE OF YAK CALVES

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Received : 23.11.2012

Accepted : 06.12.2013

### ABSTRACT

*An investigation was carried out on 18 numbers of new born Yak calves of both sexes to study the cost of raising the calves under three feeding systems. The calves were placed under three feeding systems: T<sub>1</sub> - (natural suckling), T<sub>2</sub>- (milk replacer) and T<sub>3</sub>- (whole milk with bottle feeding like foster mother). Each group had 3 male and 3 female calves. A milk replacer was prepared with the conventional feed ingredients containing 22.42 per cent CP and was offered as per recommendation of Arora (1979) on dairy calf. The calves under T<sub>1</sub> were allowed to suckle ad lib mothers' milk two times a day and calves under T<sub>3</sub> were offered yak whole milk as per body weight requirement. During three months of experimental period, no significant body weight gain was observed in all three groups. Feed conversion efficiency was significantly higher in T<sub>2</sub> group. The cost incurred on feed, fodder, concentrate mixture, milk and milk replacer were recorded to calculate the cost of raising calves under different treatments. The total cost of feeding of calves during the experiment period was Rs.7812.00, 6468.46 and 5884.00 for T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> respectively. The cost of raising calves with milk replacer seems to be marginally higher than whole milk feeding. It is concluded that the yak calves can be raised under milk replacer feeding from birth to three months of age without affecting the growth.*

**Key words:** Yak, Milk replacer, Feed conversion efficiency, Foster mother, Concentrate mixture, Suckling.

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## INTRODUCTION

Yak (*Bos grunniens*) is a multiuse animal and its utility as pack animal for higher altitude, milk, meat, hair, hide is well known. However, calf mortality is one of the most important contributing factors of reducing the yak population. It is due to the poor health condition of the mothers surviving on sparse nutritional availability and harsh climate for which mothers are unable to support required nutrients to the calves or some time death of the mother yak cow. In this context, it is an utmost important to formulate a suitable milk replacer for well being of the yak calves. Milk replacer is an excellent source of nutrition for calves that are fed prior to weaning which is very popular in dairy calves development programmes in India and abroad as it ensure better economic gain. Considering the paucity of literature about the artificial rearing of yak calves with milk replacer, the present investigation was undertaken at National Research Centre (NRC) on yak, Dirang, Arunachal Pradesh.

## MATERIALS AND METHODS

Eighteen numbers of new born yak calves of both sexes were procured from the farm of NRC on Yak. They were divided in three groups of 3 males and 3 females calves in each group and were placed under three management system: T<sub>1</sub>- (natural suckling), T<sub>2</sub>- (milk replacer with bottle feeding) and T<sub>3</sub>- (whole yak milk with bottle like foster mother). The calves were allowed to suckle mother's milk for a period of 8 days. A milk replacer was prepared (Table.1) with the conventional feed ingredients containing 22.42

per cent crude protein and was offered to the calves under T<sub>2</sub> as per recommendation of Arora (1979) for dairy calf. The calves under T<sub>1</sub> were allowed to suckle *ad lib* mother's milk (Table.2) two times a day and the calves under T<sub>3</sub> were offered whole yak milk with bottle feeding as per body weight requirement. The concentrate mixture (Table.3) containing 16.52 per cent crude protein and maize fodder containing 8.20 per cent crude protein were offered from the beginning of the experiment. During three months experiment period, weekly body weight, feed consumption was recorded to study their gain in body weight, DM consumption and feed conversion efficiency. At the end of the experiment cost of feeding the calves were calculated. The statistical analysis of the data was carried out using ANOVA as per standard procedure given by Snedecor and Cochran (1994).

## RESULTS AND DISCUSSION

Milk replacer can play a pivotal role in raising healthy calves' population. The research findings (Heinrichs and Jones, 2003) revealed that an ideal milk replacer should contained 20 to 28 per cent crude protein, 10 to 22 per cent fat, 1 to 2 per cent crude fibre and 95 per cent TDN which was similar with the composition of the present study. Such a composition is essential for optimum growth and minimum health problems.

The average initial, final and overall average body weights of different groups are presented in Table 4. The difference in the body weight did not vary significantly among the group. This clearly indicates that probably there was no significant difference in assimilation

of ingested feed in the three different treatment groups. In the present study, the body weight gain of the milk replacer group (T<sub>2</sub>) also indicated the quantity of milk replacer that was offered to the animals was optimum. The present study is in agreement with the finding of Ackerman *et al.* (1969), Galton and Brakel (1976) and Jenny and O' Dell (1981) that there was no significant difference in growth rate while feeding two different milk replacers. The overall mean value of body weight gain has been shown in Table - 4. Although there was a variation in weekly average body weight gain among the group, there was no significant difference in the overall average body weight gain. These values could not be compared due to paucity of literature. However, the result of the present study corroborates with the findings of Olcay Gular *et al.* (2006) and Jakir *et al.* (2009) in dairy calves.

The overall average intake of milk and milk replacer, concentrate and fodder has been shown in Table- 4. There was no significant difference in consumption among the group. Initial consumption of whole milk and milk replacer were less which were again increased and finally decreased. This might be attributed to the fact that beside the whole milk and milk replacer, calves were also supplied with concentrate and fodder. Lower intake of liquid diet and more intakes of solids with advancement of age indicate the functional development of digestive tract particularly the rumen. The dry matter intake from the milk replacer was significantly higher in T<sub>2</sub> than T<sub>1</sub> and T<sub>3</sub> groups. This is primarily because of

the chemical composition and the volume of milk replacer consumed as compared to the intake of whole milk either in T<sub>1</sub> or T<sub>3</sub>. Intake of concentrate and DM was found to be increased along with the advancement of age in all the groups and the calves consuming milk replacer (T<sub>2</sub>) consumed significantly higher than the other two group ( T<sub>1</sub> and T<sub>3</sub>). Supplementation of milk replacer (T<sub>2</sub>) stimulates the intake of more concentrate and DM as compared to the whole milk in T<sub>1</sub> and T<sub>3</sub>. The overall fodder intake was significantly higher in T<sub>2</sub> followed by T<sub>1</sub> and T<sub>3</sub> group. It was increased with advancement of age of the calves which is in agreement with finding of Patel *et al.* (1990). The overall feed conversion efficiency was found to be significantly higher in T<sub>2</sub> than T<sub>1</sub> and T<sub>3</sub> group. The findings could not be compared due to non availability of information. However, Rault *et al.* (1996) found better feed conversion efficiency by feeding milk replacer in cross bred calves which corroborate with the present result.

The cost of feeding calves with milk replacer (T<sub>2</sub>) seems to be marginally higher than the whole milk feeding (T<sub>1</sub> and T<sub>3</sub>) group. Milk replacer feeding is always works costlier. However, in view of saving an orphan yak calf, this cost price can be ignored.

#### ACKNOWLEDGMENT

The authors are grateful to the Director, National Research Centre on Yak, Dirang, Arunachal Pradesh, for the facilities provided.

**Table 1. Composition of milk replacer**

<b>Ingredients</b>	<b>Parts (%)</b>
Wheat	35.00
Fish meal	10.00
Skim milk	13.50
Soya bean meal	20.00
Coconut oil	8.40
Molasses	8.00
Citric acid	1.50
Butyric acid	0.30
Mineral mixture	3.00
Antibiotic mixture	0.30
Rovimix	0.015
Total	100.015

**Table 2. Composition of yak milk**

<b>Milk constituents</b>	<b>Per cent</b>
Protein	4.25
Fat	7.87
Total ash	0.87
Total solid	18.77

**Table 3. Composition of concentrate mixture**

<b>Ingredients</b>	<b>Parts (%)</b>
Maize grain	35.00
Wheat bran	15.00
Rice bran	12.00
Soybean meal	10.00
GNC	10.00
MOC	15.00
Min. mixture	2.00
Common salt	1.00

**Table 4. Body weight changes (Kg), body weight gain (Kg), feed and DM (Kg) intake of the Yak calves.**

Parameters	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Initial body weight (Kg)	18.58±0.86	22.08±0.67	19.92±1.00
Final body weight (Kg)	49.50±1.59	50.83±1.75	47.50±3.53
Overall av. Body weight (Kg)	36.79±5.05 <sup>a</sup>	36.57±2.60 <sup>a</sup>	35.01±2.74 <sup>a</sup>
Overall av. gain in body weight(Kg)	2.58±0.06 <sup>a</sup>	2.44±0.07 <sup>a</sup>	2.58±0.15 <sup>a</sup>
Overall av. intake (Kg)			
Milk and milk replacer	1.89±0.08 <sup>a</sup>	2.25±0.28 <sup>a</sup>	1.91±0.03 <sup>a</sup>
Concentrate mixture	0.93±0.90 <sup>a</sup>	1.08±1.082	0.90±0.16 <sup>a</sup>
Fodder	0.27±0.050	0.34±0.073	0.18±0.04
Overall av. DM intake (Kg)			
Milk and milk replacer	0.43±0.03 <sup>a</sup>	2.05±0.26	0.35±0.01 <sup>a</sup>
Concentrate mixture	0.78±0.78 <sup>a</sup>	0.91±0.40	0.8±0.26 <sup>a</sup>
Fodder	0.17±0.02	0.03±0.01 <sup>a</sup>	0.05±0.01 <sup>a</sup>
Overall av. feed conversion efficiency	0.51±0.11 <sup>a</sup>	1.25±0.17	0.45±0.06 <sup>a</sup>
Cost of raising calves (Rs.)	7832.00	6468.46	5884.00

Similar superscript in row does not differ significantly.

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