

Original Research Article

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Effect of Supplemental Rumen Bypass Lysine and Methionine on Economics of Feeding in Growing Jaffrabadi Heifers

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ABSTRACT

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An experiment was conducted to evaluate incorporation of rumen protected LYS and MET on economics of feeding in Jaffrabadi buffalo heifers. Eighteen buffalo heifers of Cattle Breeding Farm, Junagadh Agricultural University were offered one of the dietary treatments for a period of 180 days: T1-DCP requirement met through concentrate mixture, T2-DCP requirement through cottonseed cake and concentrate mixture (50:50) and T3-In addition to DCP requirement through concentrate mixture with supplementation of rumen bypass LYS and MET @ 5.0 g and 2.5 g/day/animal respectively. Cost of feeding/day (Rs/day) was 48.13±4.18, 45.99±2.01 and 55.19±2.03 in T1, T2 and T3, respectively, cost of feeding significantly ($P<0.05$) higher in T3 than T1 and T2. Cost of feeding (Rs/Kg body weight gain) was 99.81±13.49, 87.66 ±4.06 and 98.63±4.71 for T1, T2 and T3, respectively, the differences being non-significant. Cost of feeding was higher in T3 due to supplementation of the rations with rumen by pass amino acids.

Introduction

Jaffrabadi buffalo heifers, a heavy breed of Saurashtra region of Gujarat state (adult BW 650 kg), are bred at average body weight of 337 kg with age at first calving hovering around 50 to 55 months (Anonymous, 2011).

Manipulation of growth rate to attain an ADG of 500 g per day, can reduce AFC to around 40 months (Bhatti *et al.*, 2007). Nutritional

management, a valuable tool that embodies concentrate feeding coupled with bypass amino acid feeding for making limiting amino acids available in lower gut may provide desirable growth in Jaffrabadi heifers, to attain required body weight for conception.

Besides growth, economics of feeding was also studied to evaluate effect of protected lysine methionine feeding on economics of feeding.

Materials and Methods

Eighteen Jaffrabadi Heifers (15 to 21 months) from Jaffrabadi buffalo herd of the Cattle Breeding Farm, Junagadh Agricultural University, Junagadh, were randomized and blocked into three groups of six each and were offered Protein requirement (ICAR, 1998) through (T1) commercial concentrate, (T2) protein requirement split through commercial concentrate and cottonseed cake (50:50) and (T3) commercial concentrate supplemented with rumen bypass LYS and MET @ 5.0 and 2.5 g/animal/day (commercially procured, brand name *Metipearl* & *Lysipearl* from Kemin Industry Asia Ltd.), respectively, besides receiving 10 kg seasonal green fodder per animal and mature pasture grass hay offered ad.lib. Animals had access to fresh, clean drinking water.

The cost of feeding per animal was calculated from the data of feed intake and prevailing procurement price of individual feed ingredients. The average actual prices of feed on as such basis purchased during the experiment are given in Table 1. The cost of green and dry fodder was as per the rates decided by Junagadh Agricultural University.

Results and Discussion

Experimental duration was divided into thirteen periods. Mean body weight gains of

experimental Jaffrabadi heifers during different phases of growth are given Table 2.

Mean total cost of feeding/day was 48.13 ± 2.07 , 45.99 ± 2.01 and 55.19 ± 2.03 (Rs./day) in T1, T2 and T3 respectively (Table 3). There was significant ($P < 0.05$) difference during all the periods with regard to cost of feeding except during P2. During all these periods and in for the entire period T3 feeding regimen was significantly ($P < 0.05$) higher than T1 and T2, which were at par. Supplementation of bypass amino acids (T3) was 14.67 per cent costlier compared to T1 and 20 per cent compared to T2.

However, with regard to the cost of feeding Rs/Kg body weight gain (table 3) was 99.81 ± 13.49 , 87.66 ± 4.06 and 98.63 ± 4.71 for T1, T2 and T3 respectively. Periodic differences were non-significant, except during P3. During P3, T1 was significantly ($P < 0.05$) higher than T3 and T2, though the cost of feeding /day was significantly ($P < 0.05$) higher in T3.

This might be due to higher growth recorded in T 3 during this period. T3 was at par with T1 and T2 with regard to cost of feeding / kg weight gain. However, cost / kg gain was lower by 12.51per cent in T2 compared to T3. The cost of feeding was higher in T3 due to supplementation of the rations with rumen by pass amino acids.

Table.1 The average actual prices of feeds on as such basis

Feed	Price (Rs./kg)
Concentrate	11.50
Cotton seed cake	14.00
Green Maize	01.00
Pasture hay	02.60
<i>MetiPEARL</i>	478.00
<i>LysiPEARL</i>	292.00

Table.2 Mean body weight (kgs) of growing Jaffrabadi buffalo heifers during different experimental periods (n=6)

	T1	T2	T3	S.Em.	C.D.at 5 %	C.V. %
P0	259.20 ± 3.98	255.32 ± 10.53	257.45 ± 11.41	12.07	NS	11.49
P12	374.67 ± 14.06	382.67 ± 16.35	402.67 ± 11.14	14.02	NS	8.88
Overall	115.47 ± 4.35	127.35 ± 8.01	145.22 ± 3.50	5.64	17.00	10.68

Table.3 Total cost of feeding / day and mean total cost of feeding Rs/Kg body weight gain

	T1	T2	T3	S. Em.	C.D.at 5 %	C.V. %
Mean total cost of feeding (Rs/day)						
P1	39.21±2.11	37.29±1.60	44.47±1.77	1.84	5.54	11.17
P12	56.26±2.24	55.71±2.36	66.03±1.95	2.19	6.61	9.06
OVERALL	48.13±2.07	45.99±2.01	55.19±2.03	2.04	6.15	10.04
Mean total cost of feeding (Rs) / kg body weight gain						
P1	77.81±15.27	73.09±17.48	100.01±37.28	25.36	NS	74.27
P12	161.14±23.85	148.64±14.81	207.60±27.91	22.86	NS	32.47
OVERALL	99.81±13.49	87.66±4.06	98.63±4.71	8.58	NS	22.03

Rode *et al.*, (1997) opined that RPAA supplemented cows produced increased milk at decreased cost. Driver, (2007) employed the strategy of reducing dietary CP and obtained a return on investment (ROI) ranging from 1.1 to 5.5 with an average of 3.35:1. Divya *et al.*, (2009) obtained better growth rate at a lower cost by increased UDP in the ration.

Present experiment was conducted on growing Jaffrabadi heifers and any effort to reduce age at first conception / AFC should be viewed as an economic gain. As these are non-productive animals only growth should be considered as an advantage which was significantly (P<0.05) higher in T3 group of heifers.

Feeding regimen based on supplemental feeding of rumen bypass LYS and MET were costlier but cost was justified in the long run as the heifers conceive at an early age thus reducing AFC and earlier economic returns in the form of milk production to dairy farmers.

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