

Moringa as Economic Feed for Murrah Buffalo Calves: Short Communication

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ARTICLE ID: 23

Abstract

The experiment was conducted to assess the economics of Murrah buffalo calf rearing. The experiment was conducted at Livestock farm, Adhartal, College of Veterinary Science and Animal Husbandry, N.D.V.S.U., Jabalpur (M.P.). A total of 12 Murrah buffalo calves with similar body weight of either sex at the 5th day were selected distributed in two groups (Control and M10) with six calves in each group. Calf starter was replaced by Moringa oleifera leaf meal @ of 10% for M10 group. Economic analysis indicated that the recurring cost of rearing of the buffalo calves was significantly decreased in M10 group in comparison to the control group. Percent decrease of total recurring expenditure in comparison to control group was 14.96 in M10 group. Decrease of recurring expenditure (percent/kg/BW gain) in comparison to control group was 48.23 for M10 group. It can be concluded that Moringa leaves can replace up to 10 percent in the calf starter to reduce the cost of buffalo calf rearing.

Key words: Concentrate Mixture, Calf Starter, DMOL Dry *Moringa Oleifera* Leaf meal, Murrah Buffalo

Introduction

Calves are the future of a dairy farm. Calves at their pre-ruminant stage, solely depend on milk which is indispensable for nourishment and gradually adapt to solid feed (Abbass, 2013). The farmers feel burden to raise calves as it is considered uneconomical, largely due to economic compulsion to sell milk for human consumption and perhaps not realizing the potential values of these animals in their adulthood (Anjorin et al. 2010). Thus, it results in underfeeding or starvation with consequence of stunted growth, heavy mortality, economics losses in livestock production. Smallholder dairy farmers experience high calf mortality which can go up to 50% (Moran 2011). So, it is essential to find out the suitable feeding

strategy to minimize the cost of calf rearing while maintaining desired growth rate with minimum calf mortality.

Moringa oleifera of *Monogeneric family moringaceae* is commonly referred to as ‘drumstick tree’ and is locally known as “Saijhan” or “mungaa” describing the shape of its pod or ‘horseradish tree’. It is a multipurpose tree that is cultivated both for human food and animal feed in India. It is considered as one of the most useful tree (Khalafalla et al., 2010). Moringa leaves have a very high biological value and considerable potential for adoption as feed for ruminant fodder resource (Pradhan, 2016). It is rich in protein, amino acids, fatty acids, minerals, vitamins, calcium, potassium, various phenolic and oxycaroteniod which are the basic building blocks of animal body (Anjorin et al., 2010). Moringa leaves are inexpensive, easily available and provides unconventional source of nutrients. Moringa oleifera plants are readily available in Madhya Pradesh.

Materials and Methods

The experiment was conducted at Livestock farm, Adhartal, College of Veterinary Science & A.H., Nanaji Deshmukh Veterinary Science University, Jabalpur (M.P.). A total 12 Murrah buffalo calves of either sex from 5 days of age selected for experiment. All the calves were permanently separated from dam just after birth. Colostrum and milk was offered as per standard protocol upto 90 days of age. The experimental design shown in table no.1.

Table 1: Grouping of animals and their diet

S. No	Group	No. of calves	Treatment
1	Control	6	Calf starter
2	M10	6	10% calf starter/concentrate mixture replaced by dry Moringa leaves

Economic analysis

During the experimental period the cost of buffalo whole milk and Moringa leaves were Rs.44/kg and Rs.12 per kg, respectively. Total expenditure (Rs./calf) on milk, feed and fodder were 14,179.59 and 13,883.41 in control and M10 group, respectively. Economic analysis of the experiment indicated that total recurring expenditure on buffalo calves upto six months of age were 16,129.59 and 15,833.41 in control and M10 group, respectively. The experiment was also indicated that there was 14.96 per cent reduction of recurring expenditure in M10 group in comparison to control group. On the other hand the feed cost

per kilogram weight gain of buffalo calves was decreased with increasing the levels of DMOL up to 10%. The results clearly indicated that Moringa leaf meal in addition to the diet of calves not only improves the growth rate but also improves the economic efficiency of rearing of Murrah buffalo calves.

Economics of buffalo calves rearing,

The cost (Rs./kg) of milk, feed and fodder offered to the calves during the experimental period i.e., control and M10 are presented in table no.2. The cost (Rs./kg) of milk was 44.00 for both the group. The cost of dry Moringa leaf meal for M10 was 12.00 (Rs./kg). The cost (Rs./kg) of calf starter for control and M10 was 24.88 and 23.59 respectively. The cost (Rs./kg) of concentrate mixture for control, M10 was 23.00 and 21.90 respectively. The cost (Rs./kg) of green fodder and wheat straw were 2.00 and 3.37 for control and M10 group, respectively. The cost of wheat straw was Rs.3.37 per kg for both the group.

Table 2: Cost (Rs./kg) of milk, feed and fodder offered to the different group during the experimental period

Items	C	M10
Milk (Rs./kg)	44.00	44.00
Dry Moringa leaf (Rs./kg)	-	12.00
Calf starter (Rs./kg)	24.88	23.59
Concentrate mixture (Rs./kg)	23.00	21.90
Green fodder (Rs./kg)	2.00	2.00
Wheat straw (Rs./kg)	3.37	3.37

Effect of Moringa leaf meal on economics of rearing of Murrah buffalo calves

The data of economics of rearing of Murrah buffalo calves are presented in table no.3. The experiment was conducted to evaluate effect of Moringa oleifera leaf meal on Murrah buffalo calves rearing upto 6 months of age. The expenditure (Rs./calf) incurred for milk were 11,283.07 and 11,283.07 in control and M10 group, respectively. Expenditure on calf starter were 247.03 and 237.93 in control and M10 group, respectively. Expenditure on concentrate mixture is 1859.01 and 1562.69 in control and M10 group, respectively. The expenditure (Rs./calf) incurred for green fodder was 623.70 and 635.88 in control and M10 group, respectively. The expenditure (Rs./calf) incurred for wheat straw was 100.18 and

99.71 in control and M10 group, respectively. Total expenditure (Rs./calf) on milk, feed and fodder were 13,883.41 in M10 group. Expenditure on labour /calf for 6 months experimental period @ 1 labour/12 calves and wage

Rs.7500/- month was 1,875.00 and same for both the group. Reduction of total recurring expenditure (Rs./kg) in comparison to control group 296.19 for M10 group. Per cent decrease of total recurring expenditure in comparison to whole milk fed group 1.87 for M10 group. Average initial weight of calf (kg) was 32.28 and 32.43, in control and M10 group, respectively. Average final weight of calf was (kg) 82.83.83 and 90.21 in control and M10 group, respectively. Average weight gain of calf was (kg) 50.05 and 57.78 in control and M10 group, respectively. Reduction of recurring expenditure (Rs./kg) per kg body weight gain in comparison to control group was 48.23 in M10 group. Per cent decrease of recurring expenditure per kg body weight gain in comparison to control group was 14.96 M10 group.

Table 3: Effect of Moringa leaf meal on economics of rearing of Murrah buffalo calves

SN	Particulars	C	M10
1	Total milk, feed and fodder consumption per calf during the 6 months experimental Period		
1.1	Milk consumed (kg)	256.43	256.43
1.2	Calf starter consumed (kg) (upto 3 months)	11.41	10.99
1.3	Concentrate mixture consumed (kg) (>3 months to 6 months)	80.83	79.57
1.4	Green fodder consumed (kg)	311.85	317.94
1.5	Wheat straw consumed (kg)	29.73	29.59
2	Expenditure on milk, feed and fodder per calf during the 6 months experimental period		
2.1	Expenditure on milk (@Rs.44/kg)	11,283.07	11,283.07
2.2	Rate of calf starter	24.88	23.59
2.3	Expenditure on calf starter	247.03	237.93
2.4	Rate of concentrate mixture	23.00	21.90
2.5	Expenditure on concentrate mixture	1859.01	1562.69
2.6	Expenditure on green fodder (@Rs.2/kg)	623.70	635.88

2.7	Expenditure on wheat straw (Rs.4/kg)	118.91	118.35
	Total expenditure (Rs./kg) on milk, feed and fodder	14,179.59	13,883.41
3	Expenditure (Rs./kg) on labour /calf for 6 months (@ 1 labour/24 calves and wage Rs.7500/ month)	1,875.00	1,875.00
4	Miscellaneous expenditure (Rs./kg) (medicines, de worming, tagging etc.) (@ Rs.75/ calf)	75.00	75.00
5	Total recurring expenditure (Rs./kg) during the 6 months experimental period (2+3+4)	16,129.59	15,833.41
6	Reduction of total recurring expenditure (Rs./kg) in comparison to control group	-	296.19
7	Per cent decrease of total recurring expenditure in comparison to whole milk fed group		1.87
8	Body weight changes during the experimental period		
8.1	Average initial weight of calf (kg)	32.28	32.43
8.2	Average final weight of calf (kg)	82.83	90.21
8.3	Average weight gain of calf (kg)	50.05	57.78
9	Recurring expenditure (Rs./kg) per kg body weight gain (no.5/ no. 5.3)	322.27	274.05
10	Reduction of recurring expenditure (Rs./kg) per kg body weight gain in comparison to control group	-	48.23
11	Per cent decrease of recurring expenditure per kg body weight gain in comparison to control group	-	14.96

Discussion

The economic analysis was performed to check the recurring expenditure incurred to rear buffalo calves upto six months of age by replacing Moringa leaves in 10% proportions (Ahmad et al., 2017). Information over cost of calf rearing is important for the successful raising of calves as replacement stock (EL-badawai et al., 2014).

Concentrate mixture provide a convenient way to feed pre-ruminant calves for the development of its rumen. Provided the concentrate mixture is formulated correctly from good quality ingredients and fed according to the instructions of preparation. Moringa leaves with concentrate mixture is successfully used in buffalo calves (Ahmad et al., 2017). Moringa leaves have a very high biological value and considerable potential for adoption as feed for ruminant fodder resource (Pradhan, 2016).

Economic analysis of the study indicated that total recurring expenditure (Rs.) to buffalo calves upto six months of age were 16,129.59 and 15,833.41 in control and M10 group, respectively. The study also indicated that there was 14.96 per cent reduction of recurring expenditure in M10 group, in comparison to control group (Aharwal et al, 2018).

Conclusion

Moringa leaves have a very high biological value and considerable potential for adoption as feed for ruminant fodder resource, which is cheaper and economic. Moringa leaves are inexpensive, easily available and provides unconventional source of nutrient. Moringa oleifera plants are readily available in Madhya Pradesh. On the basis of the findings of the present