Economics of milk production in southern transition zone of Karnataka

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ABSTRACT

The present study was aimed at working out the cost of milk production of local cow, crossbred cow and buffalo in southern transition agro-climatic zone of Karnataka covering Hassan and Mysuru districts using primary data collected from dairy farmers. Results revealed that fodder and feed consumption was higher in case of crossbred cow followed by buffalo and local cow. In all the three bovine species in total cost of milk production, share of variable costs was much higher than the fixed costs. Average milk production per day was higher in case of crossbred cattle followed by buffalo and local cow. Cost of milk production of local cow was high and as such the farmers incurred loss. Crossbred cow milk production was much profitable than that of buffalo in the study area. Overall results indicated that profitability was more in case of crossbred milk production followed by buffalo milk production. The policy measures are essential to uplift farmers rearing local cows by providing extra price incentives.

Keywords: Local cow; crossbred cow; buffalo; milk production; profitability

INTRODUCTION

The milk production has increased by 20 per cent from 137.7 to 165.4 MT between 2014 and 2017. The per capita availability of milk has risen by 15.6 per cent from 307 to 355 g/day between 2013-14 and 2016-17. Similarly the income of dairy farmers has increased by 23.77 per cent between 2011-14 and 2014-17 (http://www.pib.nic.in/Pressreleaseshare.aspx?PRID=1523682).

Increasing disposable income, socio-economic and cultural values are leading to increased expenditure on milk and milk products. According to NSS 64th round, monthly per capita expenditure on milk and milk products was found to be Rs 60 and Rs 107 in rural and urban area respectively (Ghule et al 2012).

The objective of the present study was to work out costs and returns of the milk production. It also intended to identify and quantify constraints faced by dairy farmers in the study area.

METHODOLOGY

The study was conducted in Hassan and Mysuru districts of Karnataka. Hassan and Mysuru ranked first and second respectively in cross breed cattle population in the state. These districts held 5th and 6th position respectively in indigenous cattle population. Hassan and Mysuru comprised 6.37 and 5.77 per cent of the state's bovine population respectively. These figures reveal that this area had prominence in milk production. To maintain less variation in climatic and geographic factors, areas falling under southern transition zone were selected in the districts. Through probability proportion sampling 191 farmers were selected comprising 62 farmers in Hassan and 129 in Mysuru district. Primary data were collected for the period 2016-17 through personal interview method in 16 villages covering eight villages in each selected district. Mean and percentage analysis was carried out to show the composition of several costs in estimating costs and returns in milk production.

To check progress of diary sector it is important to know about costs and returns in producing each litre

of milk. It denotes profitability and economic efficiency of milk production. Components involved in estimation of milk production were fixed and variable costs.

Fixed costs

Fixed costs are costs that remain unchanged in a short time period.

Depreciation on fixed assets: It is value of an asset after accounting wear and tear over a time period. Pucca and Kuccha cattle sheds were depreciated at 2 and 5 per cent respectively (Dixit 1999). Depreciation on dairy equipments like water troughs, milking cans and utensils was also taken into consideration. Depreciation rate was also computed for milch local cows (10%), crossbred cows (8%) and buffaloes (10%). Productive or economic life of local cows, crossbred cows and buffaloes was taken as 10, 12.5 and 10 years respectively (Ghule et al 2012). The depreciation cost was apportioned to individual animal as per standard animal units (SAUs).

$$\text{Depreciation} = \frac{\text{Purchase value} - \text{Junk value}}{\text{Life of an asset (years)}}$$

Interest on fixed capital: The interest on fixed assets was worked out at 6.25 per cent per annum based on bank rate fixed by RBI on the assumption that the farmers might have invested their own funds. Had they not invested here, they could have earned the interest income by depositing the capital in a bank.

Variable costs

These are the costs which change with levels of milk production.

Cost of feed and fodder: Animals were fed dry fodder, green fodder and concentrates. Purchased feeds were taken into account. In case of home-grown feed and fodder, prevailing market prices were taken for accounting. When concentrate feeds were homely prepared, it was computed by taking weighted price of ingredients used in the concentrates.

Cost of labour: The actual amount paid in cash and kind to the hired labour was recorded and in the case of family labour, imputed value of family labour was computed based on local wage rates in the study period. Conversion factor used was 1 day of women labour= 0.67 man days (3 women= 2 men) by assuming 8 working hours a day.

Cost of veterinary services and miscellaneous: It included amount paid for veterinary staff for treating animals and breeding bovines. In addition other related expenses were recorded in the study. Miscellaneous costs incurred on fixed assets were repairing charges, water and electricity charges, insurance premium and other related costs. These being joint costs apportionment of the same was done based on SAUs.

Apportionment of joint costs: Among several costs mentioned above certain expenses were incurred on entire herd as a whole. Therefore for apportionment of these costs total number of animals was converted into standard animal units (SAUs).

Other costs

Gross cost: Total cost was obtained by adding variable and fixed costs.

Imputed value of dung: The quantity of dung produced was recorded and its value was computed based on the market value.

Net cost: It was worked out by deducting imputed value of dung from gross cost of milk production.

Net return/litre of milk: It was net return realized from producing each litre of milk.

RESULTS and DISCUSSION

Economics of milk production was worked out and presented as sub-components. Two of the main components were total fixed costs and variable costs.

Table 2 shows the cost of milk production of local cow. Overall maintenance cost of local milch cow was worked out to be Rs 69.62 per milch animal/day. It varied in Hassan and Mysuru districts ranging from Rs 67.50 to 71.72. In overall variable costs, share of feed in milk production was Rs 42.00. It varied from Rs 41.00 to 43.00 per milch animal/day. Its share was highest in total variable cost. Overall share of veterinary and miscellaneous costs accounted for 1.19 per cent of total gross cost. This showed that veterinary and miscellaneous cost contribution towards increased milk production cost was negligible.

Table 1. Standard animal units for southern region of India

Animal	Local cow	Crossbred cow	Buffalo
Adult male (≥3 years)	0.97	1.12	1.04
Adult female (≥3 years)	1.00	1.62	1.24
Young stock (<1 year)	0.22	0.24	0.24
Young stock (<1 year)	0.27	0.3	0.28
Young stock (>1 year)	0.54	0.63	0.6
Young stock (>1 year)	0.47	0.52	0.51
Heifer	0.82	0.86	0.77

Source: Sunil et al (2016)

Table 2. Cost of milk production of milch local cow (Rs/milch animal/day)

	Component	Hassan	Mysuru	Overall
A	Total fixed cost	8.50 (12.59)	9.97 (13.90)	9.24 (13.25)
	Depreciation on fixed assets	5.50 (8.15)	6.47 (9.02)	5.99 (8.58)
	Interest on fixed assets	3.0 (4.44)	3.50 (4.88)	3.25 (4.66)
B	Total variable cost	59.0 (87.41)	61.75 (86.10)	60.38 (86.75)
	Feed cost	41.00 (60.74)	43.00 (59.96)	42.00 (60.35)
	Labour cost	17.10 (25.33)	18 (25.10)	17.75 (25.22)
	Veterinary and miscellaneous costs	0.90 (1.33)	0.75 (1.05)	0.83 (1.19)
C	Gross cost (A + B)	67.50	71.72	69.62
D	Imputed value of dung	2.98	3.10	3.04
E	Net cost (C - D)	64.52	68.62	66.58
F	Average milk yield (litre)	2.19	2.35	2.27
G	Net cost of milk production (E/F)	29.46	29.20	29.33
H	Net return/litre milk	-1.71	-2.20	-1.96

Figures in parentheses indicate per cent to gross cost of milk production

Source: Primary Survey (2016-17)

Overall fixed cost was Rs 9.24 which varied from Rs 8.50 to 9.97 in Hassan and Mysuru districts respectively. The total fixed cost was accounted for about 13.25 per cent of overall gross cost of milk production.

By production of each litre milk of local cow milk, farmers realised loss to an extent of Rs 1.96. Loss ranged from Rs 1.71 to 2.20/litre in Hassan and Mysuru districts respectively. Similar results were reported by Sunil et al (2016).

Table 3 shows the cost of milk production of crossbred cow. Overall districts' net cost of milk production of crossbred cow per litre was Rs 22.29. It ranged from Rs 23.46 to 21.11 in Hassan and Mysuru districts respectively. Overall variable cost accounted for 86.87 per cent of gross cost of milk production. It ranged from Rs 145.55 in Hassan to Rs 142.00 in Mysuru. In overall variable cost, share of feed cost was high with Rs 120.50 per animal. It ranged from Rs 120.00 to 121.00 in the two districts. Next was the labour cost with Rs 24.65 per milch cow/day. Labour cost varied from Rs 24.15 to 25.15 per milch cow/day in two districts. Share of veterinary and miscellaneous costs was minimum. Hence it did not affect the cost of milk production significantly.

The overall share of fixed cost per crossbred animal was Rs 21.73 per milch cow/day. It varied from Rs 22.86 to 20.60 in two districts. Through rearing crossbred cows, farmers realised profit of Rs 4.96 per litre/animal. It varied from Rs 4.04 to 5.89 per litre/animal.

Cost of milk production of buffalo rearing is given in Table 4. The overall net return from buffalo milk production was Rs 3.19/litre. It varied from Rs 2.96 to 3.42/litre. In overall gross cost of milk production, variable costs accounted for 87.19 per cent

Table 3. Cost of milk production of milch crossbred cow (Rs/milch animal/day)

	Component	Hassan	Mysuru	Overall
A	Total Fixed cost	22.86 (13.57)	20.60 (12.67)	21.73 (13.13)
	Depreciation on fixed assets	16.43 (9.76)	15.15 (9.32)	15.79 (9.54)
	Interest on fixed assets	6.43 (3.82)	5.45 (3.35)	5.94 (3.59)
B	Total variable cost	145.55 (86.43)	142.00 (87.33	143.78 (86.87)
	Feed cost	120.00 (71.25)	121.00 (74.42)	120.50 (72.81)
	Labour cost	24.15 (14.34)	25.15 (15.47)	24.65 (14.89)
	Veterinary and miscellaneous costs	1.40 (0.83)	1.35 (0.83)	1.38 (0.83)
C	Gross cost (A + B)	168.41	162.60	165.51
D	Imputed value of dung	4.20	4.25	4.23
E	Net cost (C - D)	164.21	158.35	161.28
F	Average milk yield (litre)	7.00	7.50	7.25
G	Net cost of milk production (E/F)	23.46	21.11	22.29
H	Net return/litre milk	4.04	5.89	4.96

Figures in parentheses indicate per cent to gross cost of milk production

Source: Primary Survey (2016-17)

Table 4. Cost of milk production of milch buffalo (Rs/milch animal/day)

	Component	Hassan	Mysuru	Overall
A	Total Fixed cost	14.25 (13.44)	13.01 (12.18)	13.63 (12.81)
	Depreciation on fixed assets	10.00 (9.43	9.53 (8.92)	9.77 (9.18)
	Interest on fixed assets	4.25 (4.01)	3.48 (3.26)	3.87 (3.63)
B	Total variable cost	91.75 (86.56)	93.83 (87.82)	92.79 (87.19)
	Feed cost	70.45 (66.46)	73.17 (68.49)	71.81 (67.48)
	Labour cost	20.10 (18.96)	19.37 (18.13)	19.74 (18.54)
	veterinary and miscellaneous costs	1.20 (1.13)	1.29 (1.21)	1.25 (1.17)
C	Gross cost (A + B)	106.00	106.84	106.42
D	Imputed value of dung	3.11	2.98	3.05
E	Net cost (C - D)	102.89	103.86	103.38
F	Average milk yield(litre)	4.10	4.15	4.13
G	Net cost of milk production (E/F)	25.05	25.02	25.03
H	Net return/litre milk	2.96	3.42	3.19

Figures in the parentheses indicate per cent to gross cost of milk production

Source: Primary Survey (2016-17)

of production cost followed by fixed costs (12.81%). Variable cost varied from Rs 91.75 to 93.83 per buffalo per day. In variable costs, share of feed cost was high with Rs 71.81. It varied from Rs 70.45 to Rs 73.17 per milch buffalo/day. Among total variable costs share of veterinary and miscellaneous cost varied from Rs 1.20 to 1.29 per animal. Overall veterinary and miscellaneous cost was Rs 1.25 per milch buffalo per day. This indicates that role of veterinary and miscellaneous cost in cost of milk production was negligible.

Overall fixed cost of rearing buffalo was Rs 13.63. It varied from 14.25 in Hassan to Rs 13.01 in Mysuru.

Above figures indicate that reducing variable costs would lead to decrease in the cost of milk production. In turn profitability can be enhanced. But traditionally farmers do not prefer buffalo over crossbred and indigenous cattle. So in this study area profitability in case of buffalo rearing was insignificant from farmers mind set.

CONCLUSION

Cost of milk production was higher in case of local cow. This was due to low productivity of animals. Genetically they are draught breeds meant to work in fields and for milk production to limited extent. In case of crossbred cattle cow, producing milk is cheaper due to its increased productivity level. Cost of production of buffalo milk was higher when compared to crossbred cattle but lower when compared with local cow. Therefore productivity of animals can be improved through improved breeding practices and following scientific animal husbandry practices. It does not mean to go for commercial scale of dairy farming.

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