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Economic Analysis of Indigenous Cow Milk Production in Pune District of Maharashtra

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Abstract

An attempt has been made in present investigation to know the, cost and returns in production of indigenous cow milk in the Pune district of Maharashtra. The simple random sampling method was adopted for selection of 90 indigenous cow rearers. Farmers were divided into three categories based on herd size: small (1 to 2 milch animals), medium (3 to 4 milch animals) and large (more than 5 milch animals). Primary data is collected and data pertains to year 2020-21.The per herd per day maintenance cost was ₹ 1148.60 on an overall basis. In total maintenance cost share of concentrate, green fodder, dry fodder, labour and veterinary expenses were 23.47, 14.82, 13.81, 24.18 and 0.41 per cent respectively. The total variable cost and total fixed costs required to maintain a herd of indigenous cow contributes 75.86 and 24.14 per cent in the total maintenance cost. Whereas at overall level gross returns were calculated to be ₹ 1250.56, of which 96.46 % came from milk and 3.57 % from dung. In the production of milk from herd of indigenous cows, a net profit of ₹ 102.17 per herd per day was made. Benefit: Cost ratio was 1.06, it was profitable for all herd size. It was more profitable in large (1.11) followed by medium (1.05) and small (1.03) herd size.

Introduction

India keeps on being the biggest producer of milk in world. A few measures have been started by the Government to improve the efficiency of animals, which has brought about expanding the milk production altogether from 102.6 million tons till the end of the tenth plan (2006-07) to 127.9 million tons till the end of the eleventh plan (2011-12). Milk production during 2017-18 and 2018-19 is 176.3 million tons and 187.7 million tons respectively, showing a yearly development of 6.47%. The per capita availability of milk is near 394 grams per day in 2018-19 and at present situation it is 400 grams per day. Uttar Pradesh ranks first in total milk production whereas Maharashtra (12.02 million tonnes) ranks seventh in India.

In Maharashtra, more than three-fourth area of the agriculture is rainfed area. Due to uncertainty of precipitation across different areas of the state and furthermore with erratic monsoon patterns, dairying is acquiring important source of livelihood for the small and marginal farmers of the state. Areas of Marathawada and Vidarbha locales are portrayed by successive dry spells, cracked soils, dried wells, dried bore wells, low yielding animals and in like manner, dairying is confined to western parts of the state. The parallel piece of land in western part containing Ahmadnagar, Nasik, Pune, Satara, Sangli, Kolhapur and Solapur areas have more than 33% of bovine population of the state, especially crossbred cows and buffalos.

Materials and Methods

Selection of the Study Area : Pune is one of the leading districts in Maharashtra as far as dairying is concerned. It is the 2nd largest milk producing district in Maharashtra. Therefore, this district was selected purposively. Secondly, three tehsils viz. Baramati, Daund and Mulshi were selected on the basis of population of indigenous cow.

Sampling Technique : The list of indigenous cow milk producers was prepared on the basis of information obtained from Indigenous Cattle Research -cum -Training Center, College of Agriculture, Pune, Maharashtra and Sahiwal Club Pune. From three selected tahsils, 90 indigenous cow rearers were selected and classified into three herd size categories namely, small (1-2 milch animals), medium (3 and 4 milch animals) and large (above 5 milch animals). Simple random technique was used for selection of indigenous cow milk producers. The details regarding selection of indigenous cow milk producers are given in following table, Table-3.1.

Collection of Data : The data was collected by survey method conducting personal interviews using specially designed questionnaire for the study purpose. The information was collected regarding the aspects livestock assets, input use, costs, milk yields and returns, marketing channels and constraints in milk production *etc.*, the data pertained to the agricultural year 2020-2021.

Analytical Techniques

Cost Concepts : The overall cost of milk production is an aggregate of expenditure incurred on feed and fodder, labour, depreciation on animals, interest on fixed capital, depreciation on assets and equipment and miscellaneous recurring expenses.

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Table-1 : Maintenance cost of indigenous cow milk production. (₹/herd/day).

Sr. No.	Particulars	Herd size			
		Small	Medium	Large	Overall
		Cost			
1.	Green fodder	31.50 (14.10)	118.20 (15.50)	365.40 (14.86)	171.70 (14.82)
2.	Dry fodder	29.30 (13.10)	105.20 (13.8)	357.00 (14.52)	163.83 (13.81)
3.	Concentrate	47.80 (21.40)	160.20 (21.0)	627.90 (25.53)	278.63 (23.47)
4.	Total feed and fodder	108.60 (48.60)	383.60 (50.30)	1350.30 (54.91)	614.17 (51.27)
5.	Labor	55.30 (24.70)	190.50 (25.00)	561.40 (22.83)	269.07 (24.18)
6.	Mineral and veterinary charges	0.60 (0.20)	2.70 (0.40)	15.40 (0.63)	6.23 (0.41)
7.	Variable cost	164.50 (73.60)	576.90 (75.60)	1927.10 (78.37)	889.50 (75.86)
8.	Depreciation on fixed capital	42.10 (18.80)	136.50 (17.90)	376.60 (15.31)	185.07 (17.34)
9.	Interest on fixed capital	17.00 (7.60)	49.80 (6.50)	155.40 (6.32)	74.07 (6.81)
10.	Total fixed cost	59.00 (26.40)	186.30 (24.40)	532.00 (21.63)	259.10 (24.14)
11.	Total maintenance cost	223.50	763.20	2459.10	1148.60
12.	Dung	8.95	29.61	95.06	44.54
13.	Net maintenance cost	214.52	733.47	2364.11	1104.03
14.	Cost/lit	33.52	103.02	267.12	134.55

(Figures in parentheses indicate percentage to total)

Table-2 : Cost and returns structure of indigenous cow milk production. (₹/herd /day)

Sr. No.	Particulars	Herd size							
		Small		Medium		Large		Overall	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
1.	Milk	6.40	221.37 (96.12)	21.36	769.44 (96.29)	61.6	2627.87 (96.53)	29.7	1206.23 (96.46)
2.	Dung		8.95 (3.88)		29.61 (3.71)		95.06 (3.49)		44.54 (3.57)
3.	Total return		230.32 (100.0)		799.05 (100.0)		2722.30 (100.0)		1250.56 (100.0)
4.	Total maintenance cost		223.50		763.20		2459.10		1148.60
5.	Net returns		6.82		35.85		263.83		102.17
6.	Returns per liter		1.07		1.68		4.28		3.43
7.	B:C ratio		1.03		1.05		1.11		1.09

(Figures in parentheses indicate percentage to total).

The general estimation procedure for cost of milk production is given below :

I. Gross costs = Total Fixed Cost + Total Variable Costs

II. Fixed Costs = Depreciation on milch animals + Depreciation on cattle sheds and dairy equipment + Interest on fixed capital investment.

III. Variable costs = Feed and fodder cost + Labour cost + Veterinary cost.

IV. Gross return = (Milk yield × Price) + Value of Dung.

V. Net Cost = (Total cost – Value of dung)

VI. Net return = Total return – Total cost

Results and Discussion

Maintenance Cost of Herd of Indigenous Cow Milk Production : The table-1 shows that the per herd maintenance cost was ₹ 1148.60 on an overall basis. Concentrate was the most expensive component of the cost, accounting for ₹ 278.43 (23.47 %) followed by green fodder, with cost ₹ 171.70 (14.82 %), dry fodder with cost of ₹ 161.83 (13.81 %), labour cost which was ₹ 869.07

(24.18%) and veterinary expenses which were ₹ 6.23 (0.41%), respectively. The total variable expense required was ₹ 889.50, reflecting 75.86 per cent of the whole cost. The total fixed costs required to maintain a herd of indigenous cow came to ?259.10 or 24.14 per cent of the overall cost. Depreciation on fixed capital, which was accounted for ₹ 185.07 and 17.34 Per cent of the entire maintenance cost and interest on fixed capital accounted for ₹ 74.07 (6.81%) of the total fixed cost (animal, shed/byre, utensils). The total fixed cost for small herd size was ₹ 59.00 (26.40 %), for medium herd size it was ₹ 186.3 (24.4 %) and for large herd size it was ₹ 532.00 (21.63 %). Contrary to small and medium herd size, the fixed cost was more prominent for the large herd size.

For small, medium and large herd size, the variable expenses per herd was ₹ 164.50 (73.6 %), ₹ 576.9 (75.6%) and ₹1927.10 (78.37%), respectively. Contrary to small and medium herd size, variable costs were more prominent for large herd size. The total cost of maintenance per herd for the small, medium and large herd size was ₹ 223.5, ₹ 763.2 and ₹ 2459.10 respectively. The large herd size had higher total maintenance costs compared to the other two herd size. For the small, medium and large herd, the value of the dung for the overall level was ₹ 8.95, ₹ 29.61 and ₹ 95.06, respectively. In order to calculate the overall level net maintenance cost, the value of the dung was subtracted from the entire maintenance cost, which came to ₹ 1104.03.

Net maintenance cost was higher in large herd size than those of small and medium herd size. Farmers with large herd size paid the highest input costs, followed by those with medium and small herd size.

Cost and Returns Structure of Herd of Indigenous Cow Milk Production : Table-2 gives details about the annual gross profits from milk production for all herd size, selling milk to various agencies.

The process of producing milk is complex. It depends on the environment, management procedures, breeding, fodder and feed and breed type. The earnings from the milk were calculated based on the total amount of milk produced by each cow and the total price paid per liter of milk. Due to its usage as fuel and manure, dung is a beneficial waste. By taking into account the average price at which cow manure was sold in the area of study, the return on investment was calculated.

On the farms of selected herd size, the annual maintenance cost per cow was calculated by adding fixed and variable costs. The value of milk, the value of dung or manure, were all taken into consideration when evaluating per-animal returns and are shown in Table-2.

Overall, the cost of maintaining a herd of indigenous cow was calculated to ₹ 1148.60, whereas gross returns were calculated to ₹ 1250.56, of which 96.46 per cent came from milk and 3.57 per cent from dung. In large herd size it was observed that, mostly sahiwal cows were reared by farmers therefore, returns obtained in large herd size was more due to high milk production of sahiwal breed than small and medium herd size . In the production of milk a herd of indigenous cows, a net profit of ₹ 102.17 was made.

By dividing gross returns by total cost, the output-input ratio (B:C ratio) for indigenous cow milk production was calculated. Table 3.2 shows that at overall level, the output-input ratio for producing indigenous cow milk was 1.06, meaning that selected farmers made a net profit of rupees 0.06 on every rupee they invested in the production of cow milk. For small, medium and large herd size farmers, the output-input ratio (B:C ratio) was 1.03, 1.05 and 1.11 respectively. Therefore, producing indigenous cow milk was a more profitable investment venture for farmers with large herd size, followed by those with medium and small holding size.

Conclusions

The variable resources such as labour, concentrate and green fodder were top contributors in the overall per liter cost of production of indigenous cow milk in the study area.For selected farmers in the study area, the B:C ratio of indigenous cow milk production was discovered to be greater than 1, which shows that the production of indigenous cow milk is profitable from the producer's perspective.

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