

RESEARCH PAPER

An economic analysis of milk production by dairy entrepreneurs of Belagavi milk union

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Abstract: A study to assess the economic analysis of milk production by dairy entrepreneurs of Belagavi Milk union was carried out during 2017-18. Multistage sampling procedure was followed for selection of 40 sample member and non-member dairy farmers. Budgeting technique were used to analyze the data. The per year total variable cost incurred by member of Milk cooperative societies in production of milk from buffalo, crossbred cow and indigenous cow was ₹ 33164, 41069 and 25401, respectively and ₹ 27222, 36638 and 23282 for non-member dairy entrepreneurs. The major fixed cost of dairy farm is depreciation on dairy animals and building. The cost of depreciation on crossbred cow was found more in both member (₹ 5990) and non-member dairy farmers (₹ 5671) compared to depreciation on building and machinery. The total cost incurred on buffalo, crossbred cow and indigenous cow by member dairy farmers was ₹ 39965, 51054 and 29930, respectively and ₹ 33545, 45499 and 26897 by non-member dairy farmer. The gross return obtained by member farmers was ₹ 77060, 99114 and 52261 from buffalo, crossbred cow and indigenous cow, respectively, similarly for non-member farmers the gross returns was ₹ 56396, 80418 and 42972 per animal per year. Maximum share of returns was from sale of milk. The B: C ratio was calculated for both member and non-member dairy farmers and it was found that B: C ratio of buffalo, crossbred cow and indigenous cow was 1.92, 1.94 and 1.74, respectively and it was 1.68, 1.77 and 1.59 for non-member farmers. Since B:C ratio in case of member farmers was higher compared to non-member farmers, the impact of milk union on the dairy entrepreneurs is a profitable venture and has positive influence on the standard of living and economic status of the farming community in the study area.

Key words: Cost and returns, Crossbred, Member farmers, Milk production

Introduction

Dairying in India, in general, is closely interwoven as an integral part of agriculture and it has been recognized as an instrument of economic and social change especially for the weaker sections of the rural community. In dairying, a change that is taking place is shift from the maintenance of dairy animals on home grown feed inputs to purchased feed inputs, due to the decreasing size of land holding and shrinking common property resource base. Cost of milk production plays an important role in portraying economic viability of a dairy enterprise. It is a critical economic indicator for milk producers, consumers and policy makers in order to provide an effective linkage between the milk producers and consumers for fixing the price of milk rationally. Generally, a milk producer can increase his dairy income in two ways either by increasing the milk production or by reducing the cost of milk production. Cost of milk production often becomes a policy issue, when milk producers complain that the price of milk they are getting does not cover cost of milk production. With the galloping growth in human population, the demand for crop and livestock production is ever increasing. Currently, livestock is one of the fastest growing agricultural sub-sectors in developing countries and this sector provides regular employment to 11 million people in principal status and 9 million people in subsidiary status. Its share to total GDP is around 4.11 per cent and is largest segment of the agricultural sector. This growth is driven by rapidly increasing demand for livestock products, driven by population growth, urbanization and increasing incomes.

Dairying definitely offers itself as a prospective farm diversification means with immense commercial potential. Traditionally dairying has been a small holder's enterprise, now it is passing through transition and farmers have taken up dairy farming as a commercial enterprise. The proportion of milk produced on these commercial dairy herds in total milk production of the country may not be very high, yet they influence the economy of the respective area to a greater extent as their number is growing rapidly. These farms can only sustain if they are earning reasonable profit, which is the prime concern of the dairy enterprise. Therefore, it is very pertinent to study the economics of these herds, which demands a detailed analysis of the estimates of cost of milk production and returns of dairy enterprise. The information on the cost and returns from milk production will provide useful insight into the parameters of profitability of dairy enterprise to the owner so that the full genetic potential of the animals can be tapped. Also since investors give high priority to profitable returns, the study attempts to find out whether profitable margins or sufficient returns are likely to emerge from that investment or not? Economic analysis of dairy farming provides the basis for delineating the possibilities of controlling costs of milk production and increasing the returns to make it a potential dairy enterprise (Bhowmik and Sirohi, 2008). The present study focuses on all production and profitability traits of dairy enterprise to answer such issues. Thus, in order to evaluate and explore the possibilities of dairy farming as a potential

enterprise in Belagavi, a study was undertaken in 2017-18 with focus on estimation of the cost and returns of milk production.

Material and methods

The present study was taken up in Karnataka state. Multistage sampling technique was adopted for selection of farmers for the study. Belagavi district under University of Agricultural Sciences Dharwad jurisdiction has the second highest number of dairy cooperatives and is one of the livestock rearing district which has got favourable condition for production of different food and fodder crops. Hence, Belagavi milk union district was selected for the study. There are totally ten taluks in Belagavi district, and taluk with highest milk production was selected for the study. Two villages from each selected taluk, where the Dairy farming is widely practiced and produced highest milk were selected for the study. From each selected village, 20 dairy farmers were selected randomly. Out of 20 randomly selected farmers 10 each from members and non-members of milk cooperative societies. Thus, the total sample size for the study was 40 farmers. The primary data on cost and returns of milk production was collected from the sample farmers through pre tested schedule. The data so collected pertained to the year 2017-18. Budgeting technique was used to estimate the costs and returns in milk production.

Results and discussion

Socio-economic characteristics of the dairy entrepreneurs

The socio-economic characteristics of both member and non-member sample dairy farmers of Belagavi milk union district in the study area have been depicted in Table 1.

With respect to the age of the sample farmers, it is observed that, in both the cases most of the sample member and non-member dairy farmers in Belagavi milk union (50 and 65 %), belonged to middle age group. The reason for the above result may be the fact that dairying is a recurrent income generating programme and it adds significantly to the family income. The income from dairy is assured unlike agriculture which is uncertain one. Therefore, most of middle aged farmers are taking up dairying as a subsidiary occupation. And the middle age farmers were the key generators of income. Further, middle aged farmers are physically strong, more dairy experienced and more sense of family responsibilities than young and old ones. So, they were more interested to earn additional income from dairy management and thereby improving their livelihood status. Similar conclusions were drawn by Maheswari and Patil (2016).

With regard to education level of the both member and non-member sample respondents, it was noticed that 15 and 23.75 per cent of the farmers were illiterates. Among literates, education level of sample respondents ranged from primary to degree level. This indicated that literacy level (85 and 76.25 %) in the study area was higher. Hence, the farmers' receptive capacity eased the process and adoption of new technology. And on the other hand to take care of the illiterates, there is need for the extension workers to educate the farmers regarding

Table 1. Socio-economic profile of member and non-member dairy farmers (N=40)

Sl. No.	Particulars	Member dairy farmers(n=20)		Non-member dairy farmers (n=20)	
		No.	%	No.	%
1	Age (years)	42		51	
	Young age (< 35 years)	06	30.00	04	20.00
	Middle age (35-54 years)	10	50.00	09	65.00
	Old age (> 54 years)	04	20.00	07	15.00
	Total	20	100.00	20	100.00
2	Education				
	Illiterate	03	15.00	04	23.75
	Primary (up to 4 std.)	02	10.00	02	08.75
	Middle (5 to 7 std.)	04	20.00	07	18.75
	High school (8 to 10 std.)	06	30.00	04	25.00
	PUC	04	20.00	01	08.75
	Above 12 std. and Graduate	01	05.00	02	15.00
	Total	20	100.00	20	100.00
3	Type of family				
	Joint family	07	35.00	06	40.00
	Nuclear family	13	65.00	14	60.00
	Total	20	100.00	20	100.00
4	Family size	06		05	
	Small (up to 4 members)	02	10.00	08	28.75
	Medium (5-8 members)	11	55.00	09	50.00
	Large (> 8 members)	07	35.00	03	21.25
	Total	20	100.00	20	100.00
5	Occupation				
	Agriculture + Dairy	15	75.00	14	63.75
	Dairy + Others	03	15.00	04	27.50
	Others + Agriculture + Dairy	02	10.00	02	08.75
	Total	20	100.00	20	100.00
6	Experience in dairy farming	08		09	
	Low (up to 10 years)	11	55.00	13	60.00
	Medium (10 to 20 years)	03	15.00	03	23.75
	High (more than 20 years)	06	30.00	04	16.25
	Total	20	100.00	20	100.00
7	Average income (₹)				
	Low (< 50,000)	02	10.00	07	15.00
	Medium (50,000 - 1 Lakh)	09	45.00	09	66.25
	High (> 1 Lakh)	09	45.00	04	18.75
	Total	20	100.00	20	100.00

recent developments in dairy, agriculture and other enterprises to increase their level of income and productivity on the farm. Priyadarshini and Kunnal (2018) did draw similar conclusions.

It is observed from the Table 1 that, clearly three size groups of sample dairy farmers emerged *i.e.*, small size (up to 4 members), medium size (5-8 members) and large size (> 8 members). In milk union district 5-8 members were commonly found in a family for both member and non-member farmers and majority (65.00 %) of the member farmers and 60 per cent of the non-member farmers belonged to nuclear family. This might be due to their awareness regarding the increased cost of living and difficulties in maintenance of big family and they might have found to have

medium families to lead better and comfortable life. The predominance of nuclear family was due to the realization of advantages of nuclear family in terms of running family, fewer responsibilities, privacy and more freedom of action in taking family decisions. Priyadarshini and Kunnal (2018) also drawn similar conclusions.

The occupational pattern of the member and non-member dairy farmers can be seen that in district 75.00 and 63.75 per cent of the sample farmers had agriculture as a main occupation, 15.00 and 27.50 per cent of the farmers had dairy as a main occupation, and remaining 10.00 and 8.75 per cent farmers had other than agriculture and dairy as a main occupation respectively. With respect to experience in dairying majority of the member and non-membersample respondents low experience in dairy enterprise (55 % and 60 %) followed by medium and high level experience. The reason for this may be due to the fact that in recent decade it is found that majority of the farmers are gradually taking interest in dairying as an enterprise. They also have exposure to various types of training programmes conducted by concerned departments of the government on dairy farming.

From the table it can also be seen that most of the member and non-member dairy farmers had medium level of income followed by high level income in case of member farmers and low level income in case of non-member dairy farmers (45 % and 66.25 %). The probable reasons which could be attributed for varied income levels of member and non-member dairy farmers might be due to their varied levels of land holding and possession of cross breeds cows. Further, it was observed that technical guidance might have favourable impact on member dairy farmers with regards to knowledge gained about improved dairy management practices. Further, putting them in to actual use have certainly contributed in increasing income level with comparatively less spending of money and efforts and thus helped in prospering dairying business of member dairy farmers compared to non-member dairy farmers. The results were in line with the Sowjanya (2014) and Maheshwari (2015).

Milk production cost incurred by member and non-member dairy farmers for different dairy animal breeds in Belagavi milk union

The costs incurred on various inputs in milk production are presented in Tables 2 and 3. Dairy farmers incur cost on inputs such as green fodder, dry fodder, concentrates, veterinary medicines and labour charges.

The per year total variable cost incurred by member of milk cooperative societies in production of milk from buffalo, crossbred cow and indigenous cow was ₹ 33164, 41069 and 25401, respectively and ₹ 27222, 36638 and 23282 for non-member dairy entrepreneurs. The major items of variable costs incurred per animal were feed which includes green fodder, dry fodder and concentrate. The cost incurred by member farmers for green fodder on buffalo, crossbred cow and indigenous cow rearing was ₹ 8565, 9221 and 6287, respectively and that of non-member farmers was ₹ 6999, 8587 and 5800 followed by

Table 2. Cost involved in milk production from different dairy animals of the member farmers of Belagavi milk union (₹/animal/ annum) (n=20)

Sl. No.	Particulars	Buffalo	Crossbred cow	Indigenous cow
I Variable cost				
	Green fodder	8565 (21.43)	9221 (18.06)	6287 (21.00)
	Dry fodder	2396 (05.99)	3125 (06.12)	1885 (06.30)
	Concentrates	6217 (15.56)	10570 (20.70)	4194 (14.01)
	Labour	9125 (22.83)	10220 (20.01)	8303 (27.74)
	Veterinary expanses	782 (01.96)	1003 (01.96)	512 (01.71)
	Electricity	933 (02.33)	1000 (01.96)	533 (01.78)
	Breeding expenses	500 (01.25)	509 (00.99)	225 (00.75)
	Transportation	689 (01.72)	488 (00.95)	428 (01.43)
	Milking equipment	1500 (03.75)	1889 (03.70)	1150 (03.84)
	Interest on working cost (8%)	2456 (06.15)	3042 (05.96)	1881 (06.28)
	Total variable cost	33164 (82.98)	41069 (80.44)	25401 (84.86)
II Fixed cost				
	Depreciation on Buildings	1523 (03.81)	2561 (05.02)	987 (03.29)
	Depreciation on Machinery	317 (00.79)	403 (00.79)	178 (00.59)
	Depreciation on animals	4258 (10.66)	5990 (11.73)	2896 (09.67)
	Interest on fixed cost (11.5%)	701 (01.76)	1029 (02.17)	467 (01.56)
	Total fixed cost	6800 (17.01)	9984 (19.56)	4529 (15.13)
	Total cost (I + II)	39965 (100.00)	51054 (100.00)	29930 (100.00)

Note: Figures in parentheses are percentage to respective total

concentrates cost. It is because the crossbred cow requires more feeds as compared to buffalo and indigenous cows and in this union district due to availability of irrigation facility and good rain fall, availability of green fodder throughout the year were good so farmers dependent on green fodder followed by concentrates and dry fodder. The main objective of dairy farming is to maximize the milk production; this was fulfilled by feeding the animal with the green and dry fodder as well as concentrates. Thus, the cost incurred on feed constituted more than half of the costs incurred in rearing of buffalo, crossbred cow and local cow.

The major fixed cost of dairy farm is depreciation on dairy animals and building. The cost of depreciation on crossbred

Table 3. Cost involved in milk production from different dairy animals of the nonmember dairy entrepreneurs' of Belagavi milk union (₹/animal/annum) (n=20)

Particulars	Buffalo	Crossbred cow	Indigenous cow
I Variable cost			
Green fodder	6999 (20.86)	8587 (18.87)	5800 (21.56)
Dry fodder	2152 (06.41)	3054 (06.71)	1553 (05.77)
Concentrates	4330 (12.90)	8331 (18.31)	3272 (12.16)
Labour	8395 (25.02)	9946 (21.86)	8030 (29.85)
Veterinary expenses	592 (01.76)	635 (01.39)	190 (00.70)
Electricity	500 (01.49)	630 (01.38)	327 (01.21)
Breeding expenses	257 (00.76)	650 (01.42)	120 (00.44)
Transportation	700 (02.08)	703 (01.54)	596 (02.21)
Milking equipment	1278 (03.80)	1385 (03.04)	1666 (06.19)
Interest on working cost (8%)	2016 (06.01)	2713 (05.96)	1724 (06.41)
Total variable cost	27222 (81.15)	36638 (80.52)	23282 (86.56)
II Fixed cost			
Depreciation on Buildings	1276 (03.80)	1999 (04.39)	897 (03.33)
Depreciation on Machinery	272 (00.81)	276 (00.60)	172 (00.64)
Depreciation on animals	4122 (12.28)	5671 (12.46)	2172 (08.07)
Interest on fixed cost (11.5%)	652 (01.94)	913 (02.00)	372 (01.38)
Total fixed cost	6323 (18.84)	8860 (19.47)	3614 (13.43)
Total cost (I + II)	33545 (100.00)	45499 (100.00)	26897 (100.00)

Note: Figures in parentheses are percentage to respective total

cow was found more in both member (₹ 5990) and non-member dairy farmers (₹ 5671) compared to depreciation on building and machinery. The total cost incurred on buffalo, crossbred cow and indigenous cow by member dairy farmers was ₹ 39965, 51054 and 29930, respectively and ₹ 33545, 45499 and 26897 by non-member dairy farmers. The expenditure on various inputs showed that the farmers have less scope to reduce the variable costs by altering the breed of animal, feeding charges and veterinary medicines.

Returns from milk production (per animal per annum)

The details of the returns from the dairy farming by the sample farmers were presented in Tables 4 and 5. It can be seen from the table that the main share of returns was from

Table 4. Returns from different dairy animals of the member farmers of Belagavi milk union (₹/ animal /annum)

Particular	Buffalo	Crossbred cow	Indigenous cow
Sale of Milk	54230 (70.37)	75000 (75.67)	37128 (71.04)
Sale of milk products	8433 (10.94)	4305 (04.34)	2250 (04.31)
Sale of Manure	9503 (12.33)	9888 (09.98)	8256 (15.80)
Sale of animals (1 Milch animal/ Five year)	4893 (06.35)	9920 (10.00)	4627 (08.85)
Total / Gross Returns	77060 (100.00)	99114 (100.00)	52261 (100.00)
Net returns	37094	48060	22330
B:C ratio	1.92	1.94	1.74

Note: Figures in parentheses are percentage to respective total

Table 5. Returns from different dairy animals of the non-member dairy entrepreneurs' of Belagavi milk union (₹/animal/ annum)

Particular	Buffalo	Crossbred cow	Indigenous cow
Sale of Milk	37537 (66.56)	59957 (74.56)	30400 (70.74)
Sale of milk products	3673 (06.51)	2861 (03.56)	1802 (04.19)
Sale of Manure	9352 (16.58)	8600 (10.69)	6450 (15.02)
Sale of animals (1 Milch animal/ Five year)	5833 (10.35)	9000 (11.19)	4320 (10.05)
Total / Gross Returns	56396 (100.00)	80418 (100.00)	42972 (100.00)
Net returns	22850	34918	16075
B:C ratio	01.68	01.77	01.59

Note: Figures in parentheses are percentage to respective total

the sale of milk. The gross return obtained by member farmers was ₹ 77060, 99114 and 52261 from buffalo, crossbred cow and indigenous cow, respectively similarly for non-member farmers the gross returns was ₹ 56396, 80418 and 42972 per animal per year. Returns from sale of milk contributed the maximum share, the return from sale of milk in case of member dairy farmers with respect to buffalo, crossbred cow and indigenous cow was ₹ 54230, 75000 and 37128 and in case of non-member farmers the returns was ₹ 37537, 59957 and 30400 followed by sale of manure, sale of young ones and sale of milk products. The B:C ratio was calculated for both member and non-member dairy farmers and it was found that B: C ratio of buffalo, crossbred cow and indigenous cow was 1.92, 1.94 and 1.74, respectively and it was 1.68, 1.77 and 1.59 for non-member farmers. Since B:C ratio in case of member farmers was higher compared to non-member farmers, the impact of milk union on the dairy entrepreneurs is a profitable venture and has positive influence on the standard of living and economic status of the farming community in the study area.

Conclusion

It can be concluded from above study that the cost of milk production and income measures obtained in the present study suggested that crossbred cow milk production is relatively more profitable than buffalo and local cow in the study area. Thus, sound economic logic exists for persuading both the member and non-member households to continue crossbred cow rearing to enhance their income. Hence, adequate attention should be

paid to promote crossbred cow upgradation programme. The expenditure on feed, fodder and concentrates could be reduced by adopting high yielding varieties of grasses, legumes and fodder crops on farmers' fields, replacing the local milch animals with improved breeds at faster rate. The Government should provide the necessary input supplies at subsidized rates to the dairy farmers so that these breeds can be reared economically and commercially.

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