

ECONOMICS OF MILK PRODUCTION IN DHAKA DISTRICT-A CASE FOR SAVAR THANA

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Summary

This study was conducted to compare the cost of rearing native and cross-bred dairy cows and returns received from them. For this purpose, 144 cows of 132 households from 24 villages were randomly selected. Of them, 96 were native cows and 48 were cross-bred cows. The study revealed that among the structure of cost components, labour charge occupied the major share in the total cost of milk production per litre. The total cost of rearing native and cross-bred cows was Tk. 14,155 and Tk. 19,854 per annum, respectively. The average net cost of milk production per litre was Tk. 14.12 for native cows and Tk. 10.41 for cross-bred cows. Returns over cost of milk per litre for native cows were Tk. 0.52 and for cross-bred cows were Taka 3.40. The benefit-cost ratio of milk per litre was higher (1:1.33) in cross-bred cows than native ones (1:1.04). The study further showed that in comparing with bulk line cost, the price of milk per litre received by the farmers was higher in cross-bred cows than native cows. Therefore, the study recommends dairying with cross-bred cows as encouraging and viable commercial enterprise in Bangladesh.

(Key Words: Native Dairy Cows, Cost of Rearing, Taka, Bulk-Line Cost)

Introduction

Bangladesh is an agrarian country. About 90 percent of its people lives in the rural areas and about 85 percent people depends directly or indirectly on agriculture. The agricultural crop production in Bangladesh, mainly depends on cattle and buffaloes. Cattle and buffaloes supply about 98 percent of total draft power for crop production. The crop production, especially rice production has increased to 1.77 tons per hectare in 1990 from 1.09 tons per hectare in 1960 by the blessings of green revolution technology in the country.

While the agricultural production is increasing, farmers at the same time are diversifying their income through livestock for increasing draft power, meat and milk production in the country. For this purpose, farmers are adopting cross-breeding technology for upgrading their native cows with exotic blood. The Directorate of Livestock Services (DLS) has been playing a pioneer role for qualitative improvement of cattle

through artificial insemination programme in Bangladesh.*

Although Bangladesh has high density of cattle population which is well above the averages of many developing countries of the world, it suffers from an acute shortage of livestock products. This shortage of livestock products is attributed to poor quality of livestock species and their low productivity. The current milk production is about 0.65 litre per cow per day compared to 20 litres in advanced countries. The per capita availability of milk is only 43 ml against a minimum requirement of 250 ml. The low milk yield and increased demand for it for ever increasing population has encouraged farmers to increase milk production in the country.

By this time, many progressive farmers shifted from traditional to modern milk production technology for maximizing their family income. Moreover, there is a great demand for various information on dairying from many other interested quarters. Keeping all those factors in consideration, the present study was undertaken to unveil the economics of milk production in the rural areas of Bangladesh with the following objectives: to compare the cost of rearing native and cross-bred cows by farm size, to calculate the cost and return of milk production of native

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and cross bred cows by farm size, and to examine the bulk-line cost of milk production per litre.

Materials and Methods

The Savar Thana (thana is the local administrative unit) was purposively selected for the study. It is 16 miles north of Dhaka city and is well linked with road communication. Rapid urbanisation and industrialisation is taking place in this area. There is the Central Cattle Breeding Station and Dairy Farm. This station has some villages where the intensive artificial insemination programme is in practice. Moreover, there is a Military Dairy Farm in the vicinity of the Thana. Considering the above factors, two-stage stratified random sampling, villages as the primary and respondents within the village as the ultimate unit of sampling, was followed. All twelve Union Parishads (union is the smallest electoral unit of areas outside municipality comprising several mauzas or villages. It has a Union Parishad council) were selected for the study and two villages were selected randomly from each of the Union Parishad. Thus, 24 villages were selected for the study. A list of households having cows in each selected village was prepared and arranged in ascending orders of their farm sizes. They were classified into 3 groups, viz, small (upto 1.00 ha), medium (1.01-2.00 ha) and large (above 2.00 ha) farms. In all 132 milk-producer households were selected from those villages under study. Of them 72, 40 and 20 were small, medium and large farms, respectively. The herd strength consisted of 144 cows, out of which 96 were native cows exclusively used for milk purposes and 48 were cross-bred cows reared for milk production only. The cows kept with the respondents throughout the year were selected for the study.

The study covered the agricultural year 1990-91 and data were collected by survey method. The study was conducted for one lactation period.

Estimation of input cost

The procedure used to estimate the value of purchased inputs and home-produced resources is given below:

1. Feed cost: The value of purchased feeds was recorded as reported by the milk-producer farmers, whilst the farmer's own feed and fodders were valued at the market rates prevailing in the villages.

2. Labour cost: The value of hired labour was recorded as reported by the farmers, while the family labour was valued at the wage rate of casual labour prevailing in the selected villages.

3. Miscellaneous expenses: The items like veterinary expenses, water charges, electricity bills, amenities provided to the manpower and other routine expenses were included under the head of miscellaneous expenses and were valued at the actual expenses incurred.

4. Fixed cost: The depreciation charges on cows, capital investment and interest on own as well as borrowed capital were included in the fixed cost.

(a) Depreciation of cow: The depreciation charges were worked out according to the straight line method of depreciation, based on the value of the cows. The useful life of the cows was considered eight lactations.

(b) Depreciation of capital investment: It includes the depreciation of the item like cattle-shed and equipment. The depreciation on cattle-shed was calculated 5 years for Kutcha-shed and 10 years for Pucca-sheds.

(c) Interest on fixed capital: The interest on own fixed capital comprising of assets and the value of cows was worked out @ 10 percent per annum, while the interest on capital borrowed for purchasing of fixed assets was taken as per the actual payment made by the respondents. The interest on working capital was not calculated as there was a regular income from the selling of milk which was utilized for the working expenses.

5. Gross cost: Includes all costs of feed, labour, depreciation, interest, miscellaneous expenses etc.

6. Net cost: The net cost was calculated by deducting the income earned through selling of dung from the gross cost.

7. Bulk-line cost: It is the cost of milk production at which 85 percent production of milk is covered.

Besides, ratio, mean and percentages were used for better precision of analysis.

Results and Discussion

Cost of rearing native and cross-bred dairy cows by farm size

The data of various cost components pertain-

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ing to the maintenance of native and a cross-bred cows per annum is presented in tables 1 and 2. It can be seen from the tables that the labour charges had the major share in the total cost of maintenance. It was Tk. 7,908 (55.87%) for native cows and Tk. 9,638 (47.19%) for cross-bred cows. The labour charges was highest (55.9%) followed by dry fodder (17.4%), concentrates (13%), green fodder (8.2%), miscellaneous expenses (2%), fixed cost (1.9%) and veterinary charges (1.7%) in native cows and for cross-bred cows labour charges (47.2%) was followed by concentrates (20.4%), dry fodder (12.1%), green fodder (11.2%), fixed cost (3.9%), miscellaneous (3%) and veterinary charges (2.3%).

It can also be observed that the total cost of rearing native and cross-bred dairy cows per

year worked out to be Tk. 14,155 and Tk. 19,854, while the net cost were Tk. 13,846 and Tk. 19,508, respectively, for native and cross bred cows. The total cost was highest in small farms (Tk. 14,801) while it was lowest in medium farms (Tk. 13,872) for native cows. The total cost for maintenance was highest in large farms (Tk. 20,435) and it was lowest with small farms (Tk. 18,560) for cross-bred cows. For both types of cows, the cost of labour was highest followed by concentrates and dry fodder for large farms, while they were lower with small farms as they could not afford to buy them. The highest labour charges was observed in small farms for both local and cross-bred cows. Because they can not employ their surplus labour elsewhere, they remain engaged with dairy rearing activities.

TABLE 1. COST OF REARING NATIVE DAIRY CCW PER YEAR (1990-91). (Taka 39.00 = US \$ 1.00)

(In Taka)

Item of expenditure	Size of holdings			Overall
	Small	Medium	Large	
Labour charges	9,125.00 (61.65)	7,300.00 (52.62)	7,300.00 (51.59)	7,908.33 (55.87)
Dry fodder	2,190.00 (14.80)	2,555.00 (18.42)	2,602.45 (18.39)	2,456.45 (17.35)
Concentrates	1,600.20 (10.81)	2,047.50 (14.76)	2,085.30 (14.74)	1,830.15 (12.93)
Green fodder	1,168.00 (7.89)	1,076.75 (7.76)	1,277.50 (9.03)	1,155.83 (8.17)
Miscellaneous expenses	238.00 (1.61)	332.90 (2.40)	384.00 (2.71)	293.97 (2.08)
Veterinary medicine	200.00 (1.35)	294.00 (2.12)	250.00 (1.77)	239.67 (1.69)
Fixed cost	280.00 (1.89)	265.75 (1.92)	250.60 (1.77)	270.35 (1.91)
Total cost	14,801.20 (100)	13,871.90 (100)	14,149.85 (100)	14,154.75 (100)
Income from dung	330.00	320.00	220.00	308.33
Net cost	14,471.20	13,551.90	13,929.85	13,846.42

Figures in the parentheses indicate percentages.

The cost and returns of milk production of native and cross bred dairy cows by farm size

The details regarding the cost and returns of native and cross-bred dairy cows are presented

in tables 3 and 4. It revealed from the tables that the average net cost of milk production per litre for native cows was Tk. 14.12, the highest being in small farms (Tk. 16.18) and lowest in

TABLE 2. COST OF REARING CROSS-BRED DAIRY COW PER YEAR (1990-91).

Item of expenditure	Size of holdings			Overall
	Small	Medium	Large	
Labour charges	9,581.25 (51.62)	8,979.00 (48.25)	9,508.25 (46.53)	9,368.33 (47.19)
Dry fodder	1,387.00 (7.47)	2,044.00 (10.93)	2,993.00 (14.65)	2,409.00 (12.13)
Concentrates	3,358.00 (18.09)	3,504.00 (18.83)	4,646.45 (22.74)	4,051.50 (20.41)
Green fodder	2,325.05 (12.53)	2,117.00 (11.38)	1,930.85 (9.45)	2,226.50 (11.21)
Miscellaneous expenses	645.38 (3.48)	652.50 (3.51)	432.00 (2.11)	580.46 (2.92)
Veterinary medicine	452.86 (2.44)	485.00 (2.61)	362.50 (1.77)	448.51 (2.26)
Fixed cost	810.16 (4.37)	826.50 (4.44)	561.60 (2.75)	769.45 (3.88)
Total cost	18,559.70 (100.00)	18,608.00 (100.00)	20,434.65 (100.00)	19,853.75 (100.00)
Income from dung	400.00	300.00	273.00	345.50
Net cost	18,159.70	18,308.00	20,161.65	19,508.25

Figures in the parentheses indicate percentages.

large farms (Tk. 13.54). The average net cost of milk production per litre for cross-bred dairy cows was Tk. 10.41. It was the highest in large farms (Tk. 11.09) and lowest in small farms (Tk. 9.96). The break-up of cost components indicated that labour charges had the major share in the total cost of milk production per litre both for native (Tk. 8.92) and cross-bred (Tk. 5.08) dairy cows. For native cows, farmers spent more family labours while for cross-bred cows the farmers spent more on hired labour causing net cost of milk production per litre higher. The highest labour charges was followed by dry fodder (Tk. 2.52), concentrates (Tk. 2.31), green fodder (Tk. 1.79), fixed cost (Tk. 0.42), miscellaneous (Tk. 0.32) and the lowest veterinary charges (Tk. 0.30) for native cows. But for cross-bred cows the highest labour charges followed by concentrates (Tk. 1.86), dry fodder (Tk. 1.27), green fodder (Tk. 1.17), fixed cost (Tk. 0.57), miscellaneous (Tk. 0.43) and the lowest for veterinary charges (Tk. 0.24).

The average price of milk per litre received

by the farmers was Tk. 14.64 for native cows, while it was Tk. 13.81 for cross-bred cows. It was higher by Tk. 0.52 and Tk. 3.40 for native and crossbred cows, respectively, over the average net cost. The highest margin per litre of milk was observed for large farms (+Tk. 0.71) followed by medium farms (+Tk. 0.43), and the negative margin for small farms (-Tk. 1.18) for native cows, while it was positive for cross-bred cows and highest in small farms (Tk. 4.11), followed by medium (Tk. 3.77) and large farms (Tk. 2.11), respectively.

The benefit-cost ratio of total cost to returns in milk production for native cows was highest in large farms (1:1.05) and lowest in small farms (1:0.93) with an average of 1:1.04. In case of crossbred cows, it was highest for small farms (1:1.41) and lowest for large farms (1:1.19) with an average of 1:1.33. The medium farms in both native and cross-bred cows indicated that the business of their milk production is weighted comparatively better than other two groups of farms.

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TABLE 3. COST AND RETURNS OF MILK PRODUCTION PER LITRE OF NATIVE COW BY FARM SIZE (1990-91)

(In Taka)

Items	Size of holdings			Overall
	Small	Medium	Large	
Labour charges	8.92	6.84	6.02	6.94
Dry fodder	2.50	2.39	2.86	2.52
Concentrates	2.15	2.45	2.49	2.31
Green fodder	1.94	1.60	1.74	1.79
Miscellaneous expenses	0.31	0.31	0.37	0.32
Veterinary medicine	0.25	0.40	0.27	0.30
Fixed cost	0.54	0.39	0.34	0.42
Gross cost	16.61	14.38	14.09	14.60
Income from dung	0.43	0.51	0.55	0.48
Net cost	16.18	13.87	13.54	14.12
Price of milk/litre	15.00	14.30	14.25	14.64
Returns/litre	-1.18	0.43	0.71	0.52
BCR	1:0.93	1:1.03	1:1.05	1:1.04

TABLE 4. COST AND RETURNS OF MILK PRODUCTION PER LITRE OF CROSS BRED COW BY FARM SIZE (1990-91)

(In Taka)

Items	Size of holdings			Overall
	Small	Medium	Large	
Labour charges	5.12	4.96	5.21	5.08
Dry fodder	0.74	1.04	1.64	1.27
Concentrates	1.79	1.78	2.22	1.86
Green fodder	1.24	1.07	1.06	1.17
Miscellaneous expenses	0.47	0.45	0.40	0.43
Veterinary medicine	0.24	0.25	0.20	0.24
Fixed cost	0.59	0.57	0.52	0.57
Gross cost	10.17	10.12	11.25	10.59
Income from dung	0.21	0.14	0.16	0.18
Net cost	9.96	9.98	11.09	10.41
Price of milk/litre	14.07	13.75	13.20	13.81
Returns/litre	4.11	3.77	2.11	3.40
BCR	1:1.41	1:1.37	1:1.19	1:1.33

The Bulk-line cost of milk production

The bulk-line cost of milk production per litre was calculated and the details are shown in tables

5 and 6. The brief summary of the bulk-line cost is given below :

Description	Local cows	Cross-bred cows
Bulk-line cost	Tk. 13.86	Tk. 11.86
Percentage of production covered	85	85
Percentage of cows covered	79	79
Percentage of milk producers covered	77	78

TABLE 5. BULK-LINE COST OF MILK PRODUCTION OF NATIVE COWS (1990-91)

Cost range Taka/litre	No. of		Production covered	Percent of		Percent of		Cumulative percentage of	
	producers covered	cows covered		producers covered	of cows covered	production covered	Producers covered	Cows covered	Production covered
Below Tk. 12.00	3	3	1,870	3.13	3.13	3.12	3.13	3.13	3.12
12.01-13.00	21	21	13,020	21.87	21.87	22.59	25.00	25.00	25.71
13.01-14.00	56	56	34,418	58.33	58.33	59.71	83.33	83.33	85.42
14.01-15.00	6	6	3,570	6.25	6.25	6.19	89.58	89.58	91.61
15.01-16.00	4	4	1,884	4.17	4.17	3.27	93.75	93.75	94.88
16.01-17.00	2	2	1,050	2.08	2.08	1.82	95.83	95.83	96.70
Above Tk. 17.00	4	4	1,903	4.17	4.17	3.30	100.00	100.00	100.00
Total	96	96	57,645	100.00	100.00	100.00			

TABLE 6. BULK-LINE COST OF MILK PRODUCTION OF CROSS-BRED COWS (1990-91)

Cost range Taka/litre	No. of		Production covered	Percent of		Percent of		Cumulative percentage of	
	producers covered	cows covered		producers covered	of cows covered	production covered	Producers covered	Cows covered	Production covered
Below Tk. 7.00	2	2	4,860	5.56	4.17	7.51	5.56	4.17	7.51
7.01-8.00	3	5	8,167	8.33	10.42	12.63	13.89	14.59	20.14
8.01-9.00	2	3	5,940	5.56	6.25	9.18	19.45	20.84	29.32
9.01-10.00	7	8	11,053	19.44	16.67	17.09	28.89	37.51	46.41
10.01-11.00	7	8	1,293	19.44	16.67	17.47	58.33	54.18	63.88
11.01-12.00	9	13	14,040	25.00	27.08	21.71	83.33	81.26	85.59
12.01-13.00	4	6	6,332	11.11	12.50	9.79	94.44	93.75	95.38
Above Tk. 13.00	2	3	2,987	5.56	6.25	4.62	100.00	100.00	100.00
Total	36	48	64,672	100.00	100.00	100.00			

The average price per litre of milk of native cows obtained by the milk producer households reported to have been Tk. 14.64 which was higher than the bulk-line cost (Tk. 13.86/litre). For cross-bred cows, the price obtained per litre of milk was Tk. 13.81, which was also higher than the bulk-line cost (Tk. 11.86). This indicated that dairying with cross bred cows is more profitable than native ones even over bulk-line cost.

Conclusion

The small farmers can generate additional income, employment and can minimize risk of loss of income from crops. Labour and concentrates constitute the major share in the cost components of maintenance of cows. Efficient management practices will help in minimizing cost of milk production. Thus small farmers can maintain milch animals to supplement their family income. Creation of dairy development infrastructure in terms of liberal dairy loans, ensured milk market, better breeding, feeding and management practices and animal health covered with insurance can help in establishing dairying as a viable commercial enterprise in Bangladesh. It is evident that crossbred cows give more returns

than native ones. So, dairying should be encouraged with cross-bred cows in Bangladesh.

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