

Research Article**Profitability assessment of Red Chittagong cattle under different farming practices in Chandanaish upazilla of Chittagong district**Shiblee, A. S.^{1*}, Halim., M. A.² and S. M. M. A. Dipu²¹Department of Animal Sciences and Nutrition, ²Department of Agricultural Economics and Social Sciences, Chittagong Veterinary and Animal Sciences University, Chittagong-4225, Bangladesh.**ARTICLE INFO***Article history :*

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ABSTRACT

The study was designed to analyze the socio-economic characteristics of dairy cow owners and the profitability of rearing Red Chittagong Cattle (RCC) dairy cow in a village named Hazirpara under Chandanaish Upazila of Chittagong District and the study identifies the problems of the dairy owners and provide recommendations. A sample of 30 dairy owners was selected randomly to determine the profitability of RCC. Primary data were collected from the selected farms. Costs and return analysis as well as functional analysis were performed using Benefit Cost Ratio (BCR). The study showed about 20% of RCC farm owners were landless, 40% were small and marginal farmers, 23.33% were medium and 16.67% were large farmers according to their landholding sizes. The average rearing cost of RCC per cow per year was found on the basis of cash cost, non- cash cost and full cost basis at Tk. 34,699, Tk. 12,655 and Tk.47,354 respectively. The average gross return per year per cow of RCC was found at Tk.53,283.33. The average gross return per lactation per cow of RCC rearing over cash cost and full cost basis were found at Tk.19,698 and Tk. 7,043, respectively. The BCR on the basis of cash costs and full costs per year per cow were found 1.58 and 1.15, respectively indicating that the RCC farming is profitable at rural condition in Chittagong. Major identified problems are high prices of feed, scarcity of quality feeds and fodder, low prices of milk, inadequate veterinary care and services, distance of AI center, lack of credit and lack of technology. Ensuring root level veterinary services, cultivating high yielding fodders, arranging training programs on livestock management, health care and marketing and ensuring the extension of easy-to-get credit facilities to the farm owners are the main recommendations for the betterment of the rural RCC dairy owners.

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1. INTRODUCTION

Livestock plays a vital role to provide animal protein, nutrition as well as it create self-employment opportunities to generate income. The crop sector showed an annual growth rate of 0.88% while fisheries, livestock and forestry sub-sectors experienced 6.11%, 3.19% and 5.12% growth rates (in

constant price) respectively (BBS, 2016). The livestock sub-sector is creating full time employment for 20% of the population in Bangladesh (BBS, 2016). These statistics show that livestock plays an important role in the national economy of Bangladesh. In Bangladesh, the cattle population is 23.76 million (BBS, 2016). In another report it says 92% of the milking cows are

indigenous and 8% are crossbred cows (BBS, 2013) and yearly milk production is about 50.67 lakh metric tons (DLS, 2013). The numbers of dairy farms are 1.4 million. The county has cattle population about 1.79%

of the world and 4.97% of Asia and Pacific (FAO, 2004). The supply of the domestically produced livestock products (meat, milk, eggs) are increased by amount 1.2% annually (DLS, 2013).

Table 1: Requirements, production and shortage of livestock products

Products	Demand*	Production	Availability	Deficiency
Milk	146.91 Lakh Metric Ton (250 ml/day/head)	72.75 Lakh Metric Ton	125.59 (ml/day/head)	74.16 Lakh Metric Ton
Meat	70.52 Lakh Metric Ton (120 gm/day/head)	61.52 Lakh Metric Ton	106.21 (gm/day/head)	9.00 Lakh Metric Ton

*Estimated population of the country: 16 crores 10 lakhs (As on July, 2016)

Source: DLS, 2016

Bangladesh has the highest cattle densities which are 145 large ruminants per square kilometer compared to 90 for India, 30 for Ethiopia and 20 for Brazil (Karim, 1997) and by recent time it must be increased to a higher numbers as the cattle population has increased meantime. The best local cattle are available in some selected areas like Pabna, Sirajgonj, Chittagong and Munshigonj areas. Among them some improved varieties such as Red Chittagong Cattle (RCC), Pabna Cattle, Munsiganj Cattle, Manikganj Cattle and North Bengal Grey (NBG) Cattle are potential producers of milk and meat and they are found in different localities of the country. In Chittagong beautiful red cattle with some distinct characteristics are seen and they are known as Red Chittagong Cattle (RCC). It is one of the improved and promising domestic animal genetic resources and is found all over the Chittagong at varying concentrations.

The Red Chittagong Cattle have distinct phenotypic characteristics. They are small in size with red coat color, distinct reddish color of muzzle, horn, hoof, ears, eyeball, eyebrow, vulva and tail switch (Hossain, 2005). The RCC are well adapted to adverse climatic condition, they have developed disease resistance power, service per conception, lactation length, and they give birth to one calf per year etc. (Akhter et al., 2002).

The dairy farming in this country is dependent on crop residues, natural resources and open grazing system as a source of feeds. The profitability of a dairy farm depends on productive and reproductive performance of the animals. Milk production of both local and exotic breed depends not only on the genetics but also on its interaction with the environment, mental factors and good animal health. Rural areas have abundant supply of green fodder which is a good sign for rearing cows in the

villages. Maize silage is the most economic forage which is very common to use in the dairy cattle rearing. The forage is enriched with protein which has an important effect on the milk yield. In Bangladesh, the government, cooperatives, the private sectors and a few non-governmental organizations (NGOs) provide veterinary services and artificial insemination facilities to the rural dairy farmers. Women's involvement in cattle rearing is also very common in rural areas of Bangladesh. All these independent variables are positive to RCC rearing in rural condition. Moreover, Red Chittagong cattle have some distinct characteristics with improved genetics and it produces 2.0 ± 0.65 kg milk in farm condition and 1.80 ± 0.87 kg in rural condition per day (Khan et al., 1989).

The study has been conducted in a RCC populated Upazilla, Chandanaish of Chittagong district with a view to meeting the following objectives:

1. To assess the profitability of RCC farming under available farming practices
2. To identify the problems faced by the RCC farmers
3. To recommend some measures for the development of RCC farmers.

Materials and Methods

The socio economic study was conducted on the basis of field data which was collected from individual RCC rearing household. Farm business survey (FBS) method is one of the recognized methods used in such study.

Selection of study area: One Upazilla of Chittagong district Chandanaish was selected to conduct the study because the density of Red Chittagong Cattle in that particular area was high. Both convenient and random sampling techniques were applied for sample selection.

Duration of study: The study on economic analysis of milk production of different types of farming in Chandanaish Upazilla was conducted actually from September to October 2015.

Sampling techniques: The survey was conducted on 30 RCC farm owners from the selected Upazilla. Thus a total of 30 sample farmers were surveyed by face-to-face interview in a single visit using a designed questionnaire to achieve the objectives of the study.

Selection of sample and sampling procedure: Purposive sampling technique was used for selecting the sample. In total 30 farms were visited for collecting data on the basis of backyard, semi-commercial and commercial farming. The economic analysis was done by using Benefit Cost Ratio (BCR) under different farming practices. The types of farming practices were categorized according to the following conditions:

a. Backyard farming: This farming system is very common in rural areas. The average herd size ranges from 1 to 4 cattle. Farmers practise a cut and carry feeding system and give scanty amount of concentrates only during the peak lactation period.

b. Semi-commercial farming: This farming system comprises farms with 5-15 dairy cows of which 70% are cross-bred. Farm grown crop residues (i.e. rice straw) and purchased concentrates feeds are used for feeding. The milk production per cow per year is higher in this case.

c. Commercial farming: In this farming system, the farmers keep the highest proportion of high yielding breeds. More concentrates and supplementary feeds such as vitamins, minerals and other feed additives etc. are used and owing to this reason the production cost is higher. The provision of veterinary health care, artificial insemination and other support services are also affordable for those farmers.

Methods of data collection: Demographic and socio-economic data were collected by personal interview with the individual farm owners during the farm visits. Farmers are not usually used to keeping records and so it was very difficult to collect actual data.

Data analysis: All the collected data were processed and analyzed in accordance with the objectives of the study. Benefit-Cost Analysis which attempts to identify the relationship between the cost and benefits of a project, was also estimated to find out the profitability of the farm owner. The BCR is calculated by dividing the total benefits (revenues) by the total the costs (expenses) of the business. If the BCR is greater than 1, it indicates that the project benefits outweigh the costs. Therefore, the project should be considered as profitable.

Results and Discussions

Socio Economic Profiles of RCC Farmers

Age

There were 4 age groups e.g. 0-10 years, 11-30 years, 31-50 years and 50 years and above. Among 178 family members, maximum male and female members were 11-30 years age groups and the lowest number of farm family members lies in 50 and above year's age group (Table 2).

Literacy level of family members

Literacy level of RCC farm owners were classified into Illiterate, Primary, Secondary, Higher secondary, Honors and above respectively. Maximum 42.13% of the family member lies in primary level and lowest 3.37% of the family member lies in Honors and above level (Table 2).

Occupation of family members

Occupation of the RCC farm family members was classified into four categories. Among 66 employed family members, highest 34.85% farmers were involved in RCC farming with crop agriculture and lowest 12.12% farmers involved in RCC farming and

Table 2: Distribution and Socio Economic Profiles of RCC farm Families

General Characteristics	Categories	Number	Percent	
Age	0-10 years	Male	20	11.24
		Female	23	12.92
	11-30 years	Male	35	19.66
		Female	30	16.85
	31-50 years	Male	24	13.48
		Female	24	13.48
	50 and above	Male	10	5.62
		Female	12	6.74
Literacy level of farm family members	Total	178	100.00	
	Illiterate	32	17.98	
	Primary	75	42.13	
	Secondary	45	25.28	
	Higher Secondary	20	11.24	
	Honors and Above	6	3.37	
	Total	178	100.00	
Occupation of farm family members	RCC farming with crop agriculture	23	34.85	
	RCC farming with service	15	22.72	
	RCC farming with business	20	30.30	
	RCC farming and others	8	12.12	
	Total	66	100.00	

Land ownership pattern

According to the size of land holdings, the RCC farm owners were classified into 4 groups. Highest 40% of the farm owners were small farmers and the lowest 16.67% farm owners were large farmers (Figure-1).

Yearly income level of the farm owner

Maximum 33.33% of the farmers' yearly income is Tk.150,000 and the lowest 16.67% of the farmers yearly income is below TK. 50,000 (Figure-2).

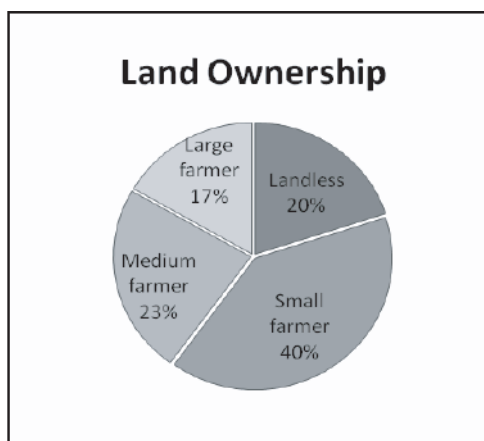


Figure-1: Land ownership patterns of farm owner

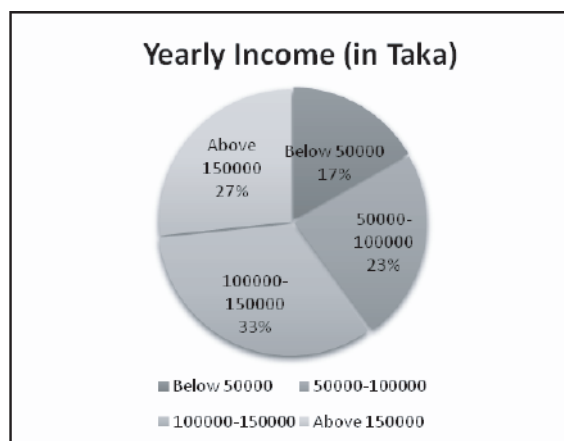


Figure-2: Yearly income level of farm owners

Cost of rearing RCC cows

The cost of rearing RCC cows were classified as cash cost where direct cash expenditure incurred were calculated from available daily records and non-cash costs were fixed and family supplied input costs. Total estimated full costs of rearing RCC per year at Chandanaish in Backyard, Semi-Commercial and

Commercial farming are Tk. 40,691, Tk. 43,540 and Tk. 54,490 respectively. The figures indicate that cost of rearing RCC is higher in Commercial farming because of lack of fodders and high prices of concentrate feed. Major expenditures incurred by concentrate feed which was 62.40% and labor cost which was 10.14% of total cost (Table-3).

Table-3: Costs and Returns of Farming Red Chittagong Cattle in Chandanaish Upazilla

Costs	Per Month Per Cow recurrent Cost							
	Backyard Farm n=20		Semi-commercial Farm n=8		Commercial Farm n= 2		All average (N=30)	
	In taka	%	In taka	%	In taka	%	In taka	%
Cash cost:								
Straw	3240.0	7.96	3420	7.85	3500.0	6.42	3386.67	7.41
Concentrate	27000	66.35	29250	67.18	29250	53.68	28500	62.40
Vet. Care	960.25	2.36	1000	2.30	1000	1.84	986.75	2.17
A.I Cost	150.25	0.37	155	0.36	160	0.29	155.08	0.34
Others	550.5	1.35	560	1.29	560	1.03	1670.5	1.22
Total (cash cost)	31901	78.40	34385	78.97	34470	63.26	34699	73.54
Non-cash cost:								
Straw	4200	10.32	4200	9.65	4210	7.73	4203.33	8.88
Green Grass	3240	7.96	3250	7.46	3250	5.96	3246.67	6.86
Labor cost	1200	2.95	1200	2.76	12000	22.02	4800	10.14
Depreciation on housing	300	0.74	350	0.80	400	0.73	350	0.74
Dairy equipment cost	150	0.37	155	0.36	160	0.29	155	0.38
Total (Non cash cost)	8790	21.60	9155	21.03	20020	36.74	12655	26.72
Total Cost	40691	100	43540	100	54490	100	47354	100
Returns	Per Month Per Cow recurrent Returns							
	Backyard Farm n=20		Semi-commercial Farm n=8		Commercial Farm n= 2		All average (N=30)	
	In taka	%	In taka	%	In taka	%	In taka	%
Income from milk	36000.00	81.82	45000.00	84.75	54450.00	86.77	45150.00	84.74
Income from calf	6200.00	14.09	6300.00	11.86	6500.00	10.36	6333.33	11.89
Income from cow dung and feed sacks	1800	4.09	1800	3.39	1800	2.89	1800	3.38
Total Return	44000.00	100	53100.00	100	62750.00	100	53283.33	100
Return over cash cost	12099	-	18715	-	28280	-	19698	-
Return over full cost	3309	-	9560	-	8260	-	7043	-
BCR over Cash Cost	1.38	-	1.54	-	1.82	-	1.58	-
BCR over Full Cost	1.08	-	1.22	-	1.15	-	1.15	-

Source: Field survey, 2015

Returns of rearing of Red Chittagong Dairy Cows

Total estimated return of rearing cows per lactation in backyard, semi-commercial and commercial farming and all average were Tk. 44,000.00, Tk. 53,100.00, Tk. 62,750.00 and Tk. 53,283.33 respectively (Table-3).

This current study estimated higher income than the study of Khan et al. (2010). Major portion of income comes from milk (81.82%-86.77%) followed by calf (10.36%-11.86%) and cow dung (2.89%-4.09%) in backyard, semi-commercial and commercial farms.

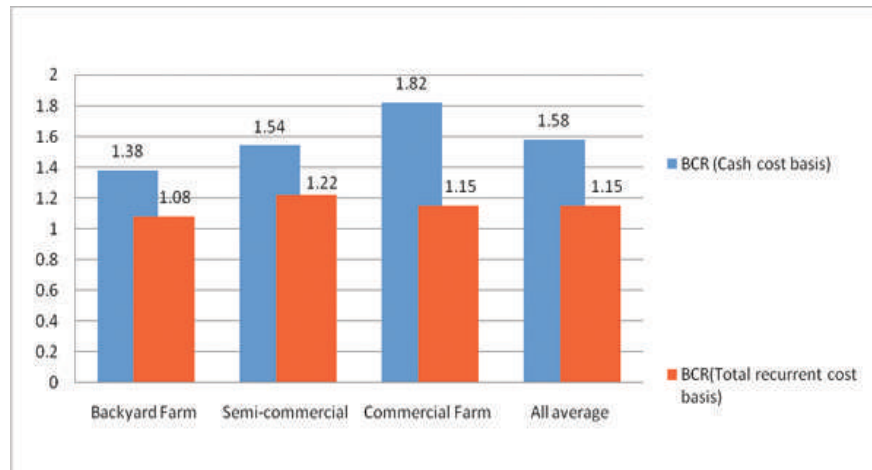


Figure-3: Returns of rearing of Red Chittagong Cattle

Estimated BCR on the basis of cash cost for backyard, semi-commercial and commercial farming and all average were 1.38, 1.54, 1.82 and 1.58 respectively. BCR on the basis of total recurrent cost for back yard, semi-commercial and commercial farming and all average were 1.08, 1.22, 1.15 and 1.15 respectively (Figure-3).

Reasons for preference for rearing RCC farming practices

The Red Chittagong Cattle (RCC) is one of the improved and promising varieties of domestic animals and full of genetic resources found in greater Chittagong District of Bangladesh.

Table 4: Reasons for Preference for Rearing RCC Farming Practices

Particulars of Preference	Number of farmers responds (N=30)	Percent
Nice looking	28	93.33
Comparatively less disease risk	25	83.33
Cost effective farming	20	66.67
Delicious milk	26	86.67
High fat % in milk	29	96.67
Low death rate of calf	22	73.33
Calving every year	24	80.00
High lactation period	26	86.67
High conception rate	22	73.33
High market price of cattle	27	90.00
High milk price	22	73.33
Highly adaptive to local environment	29	96.67
High demand of beef	28	93.33

Source: Field Survey, 2015