**Contents**

|  |  |
| --- | --- |
| **Chapter**  | **Page**  |
| Acknowledgment  | 1 |
| Abstract | 2 |
| Introduction | 3-4 |
| Review of literature | 5-6 |
| Materials and method | 7-8 |
| Result and discussion | 9-15 |
| Conclution | 16 |
| References  | 17-18 |

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The Author

Profitability of small-holder dairy farms and milk product processing shops

**Abstract**

The study was undertaken to know the economics of small-holder dairy farms and sweetmeat shops. Six dairy farm and four sweetmeat shops were surveyed from three areas of Bangladesh. The studied dairy herds consist of 10 to 15 milking cows and the cows produce milk 270day a years. The net annual income for per crossbred cow was ranging from taka 1600 to taka 8000. The sweetmeat shops produce Ghee, Dahi and Rosogolla mainly. They generate income taka 130 from 1 kg Rosogolla, taka 600 from 1kg ghee and taka 130 from 1kg Dahi. The study showed that smallholder dairy farms and sweetmeat shops were profitable.

**Key words:** Economics, Dairy farm, Dairy products, Profitability.

**Introduction**

The dairy farms of Bangladesh generally consist of indigenous breeds and different temperate and tropical breeds and their crossbreds. For example- Holstein-Friesian, Jersey, Sahiwal and Red-Sindhi. The crossbreds cattle, produce 5-10 liters milk per day *(Nahar et al., 1992; Majid et al.,1998; Hossain et al.,2002).* The average milk production of zebu type cattle is 0.5-2.5 liters per day *(Ahmed and Islam, 1987 and Hossain et al., 2002).* The goal of dairy farming in Bangladesh is to make profit from milk production. The farm profitability depends on how many cattle to be run; which genotype/breed are most suitable; what type and level of supplementary feeding is required; the area to be cultivated for fodder; the amount of feed to be conserved to meet up the period of feed shortage; and how to breed the cattle effectively *(Khan, 2009).* The farms contain temperate Crossbreds showed higher profit than tropical crosses and indigenous cows. Studies on theeconomics of small-holder dairy farming under the government support programs in Bangladesh have shown that dairying is a profitable business and the profitability is greater with cross-bred than local cattle *(Kabir and Talukder, 1999).*

Recently, farmers have shown growing interest in rearing cattle exclusively for the milk production. Mini-dairy farms have been developed mostly in urban and semi-urban areas where farmers prefer crossbred cows for producing milk *(Shamsuddin et al. 2006).* About 95% of the produced milk in Bangladesh handled as liquid. The small scale producers sell their milk direct to the end consumers and some are sell their milk to the processing shops (sweetmeat shops). However, middle-man (Farias, and/or Paikers) collects milk from some commercial farmers and some small-scale producers and sell it to the retailers or processing shops (sweetmeat shops) who sell it to the consumers.

Milk has always been valued and often is referred to as nature’s most nearly perfect food because it has remarkable combination of nutrients *(Norman and powell,1999)* milk constitutes the most important source of nourishment for both vegetarians and non-vegetarians, for young and old alike. On the other hand dairy products such as: Dahi, Rosogolla, Chana, Ghee provide the most important amino acid required for body building as well as tissues repairs in human beings. Animal protein equally supplies its own level of energy required for daily activities. It is also essential for the synthesis of certain hormones, enzymes and body products in both man and animals *(Osotimehin et al, 2006).*

The milk product processing shops collects their milk from the commercial and small scale dairy farms and after processing they produces the various milk products such as Dahi, Ghee, Ice-cream, Rosomalai, Ice-bar, Sandesh, Malaikari etc. and they sell these products to the consumers. How much profit were obtain by the dairy farmers and also by the sweetmeat shops is interesting to identify to hold the business. Therefore, the current study was undertaken during the veterinary undergraduate internship tenure with the following objectives.

:

1. To estimate the profitability of dairy farms, whose objective is milk production only.
2. To estimate the profitability of processed milk products shops (sweetmeat shops).

**Review of literature**

Studies on profitability of dairy farms and milk processing industries are very limited in number in Bangladesh. Most of the studies examined the comparative analysis of cross breed and local breed of dairy cows and economic aspect of dairy enterprise. But very few studies are related to the present study. The important studies that have relevant to the present study are discussed here.

kabir and Talukder. 1999. Reported that economics of small/ medium scale dairy farming nunder the govt. upport programmein Bangladesh have shown that dairying is profitable business and the profitability is greater with cross-bred.

Osotimehin K. O., Tijani A. A. and Olukomogbon E. O. 2006. Results showed that milk processing enterprise was profitable and flexible-A net farm income of N18, 011.20 per month was realized by an average processor, while the fixed costs accounted for about 1% of the total costs of processing milk into different products with their utility.

Khan et al.2009. Showed that profitability of a farm depends on the number of cows reared, breed, feeding system and other managemental system of the farm.

Nahar et al., 1992; Majid et al.,1998; Hossain et al.,2002. Reported that the dairy farms of Bangladesh generally consist of indigenous breeds and their crossbreds are Holstein-Friesian, Jersey, Sahiwal and Red-Sindhi. The crossbreds cattle, produce 5-10 liters milk per day.

Ahmed and Islam, 1987 *Hossain et al.,2002).* The average milk production of zebu type cattle is 0.5-2.5 liters per day

Shamsuddin et al. 1995. He reported that milk production in bangladesh is increasing day by day in urban, semi urban and rural area.

Norman and powell,1999 described on the utility of milk and its nutrinents that has been valued as nature’s most nearly perfect food.

Moran, 2005.In his study, showed the sources of income of farm and cost of farm. He also reported that about 70% cost is the feed cost.

Hemme et al.,2004 repoted that the annual net profit of varies from 15000 taka to 17000 taka on a per cow per year basis. Similar ner profits (12000 taka per year per cow) were reorted by

**Materials and method**

This study was carried out in the veterinary undergraduate internship placement three different upozilla (Savar of Dhaka, Pahartoli of Chittagong, Nokla of Sherpur) during October 2011 to April 2012. A total of 6 dairy farms whose farm size was ranging from 5 to 10 milking cows. The dairy farms were interviewed personally and data were collected from farm owners and workers. The studied dairy herd consisted of 43 crossbreds (Holstein-Friesian 50%-75%) and 4 indigenous/local cows.

 A structured questionnaire was designed and used for the study of the farm size, types of animals, length of lactation, milk yield per day per cow, types of fodder used, items and quality of supplied food stuffs, selling price of milk, feed cost, labour cost, and other costs for estimate the net profit of farms were collected. Various proportion of rice police, wheat bran, til oil cake, mustered oil cake, soybean meal etc. as concentrate and jumbo grass, other green grass, rice straw, water hyacinth etc. as roughage were fed to the animals in these farms on the basis of thumb rule. The average daily milk yield per cow was calculated by total quantity of milk per day divided by the total number of cows for each farm for both indigenous and crossbreds’ cows.

**The survey of dairy farm includes:**

1. Total asset value: it includes- possession of land, land for housing, pasture land, farm building, equipments, current animal value, other value, bank loan, Variable cost: it includes- feed cost per month, labor cost, medication, vaccination, artificial insemination, treatment cost , transportation cost, electricity cost, other maintenance cost.
2. Income from farm output: it includes- milk sale (total income per month), live animal sale (replacement stock sale, calf sale, culled cow/bull) and animal by products sale.

The farmers sell their milk, middle-man (Farias, and/or Paikers/ Ghosh). Sweetmeat shops collect milk from the Ghosh. After collecting the milk they process the milk and make various dairy products. The available dairy products are chana, dahi, rasgolla, cheese etc. For the study four (4) sweetmeat shops were chosen and surveyed. A designed structured questionnaire was also used for collecting the information from the sweetmeat shops. The owner or manager of the sweetmeat shops were interviewed for milk used per day, amount of milk used for Chana, Ghee, Dahi, Rosogolla, Rosomalai etc, cost of per liter milk, producing cost, selling price, etc. were collected to estimate the profit per month and was expressed as year etc.

**The survey of sweet shop includes:**

1. Cost: purchase of milk, labor cost, electricity cost, transportation cost, other maintenance cost.
2. Income: selling of dairy products.

The following profit equation was used to estimate the net income from farm and sweetmeat shops.

P= I-C

Where, P= Profit;

 I= income; and

 C=Costs.

**Result and discussion:**

**Feeding and management**

The management of whole dairy farm is a complex operation. The studied farmers rear both crossbreds and indigenous cows. They feed the cattle according to the breed of cows and state of the cow. Farmers supply feed to them regularly. Both roughage (rice straw, green grass, water hyacinth etc.) and concentrate (rice polish, wheat bran, til oil cake, mustered oil cake etc.) are feed to the milch cows. On an average 3-4 kg rice straw/day/cow are provide to the indigenous cows, and 4-6 kg/day/ cow to the crossbreds. Furthermore, about 8-10 kg and 15-20 kg green grasses are feed to the indigenous and crossbred cows in these dairy farms. Reports indicate that improved feeding has a positive effect on productive and reproductive performance in the cattle. The crossbreds are provided more concentrate than indigenous cows because they produce higher milk than indigenous cows. In addition to normal drinking water (6-10 liters) rice gruel and pulse washed water (5-7 liters) are supplied for drinking to the milking cows.

 **TABLE- 1:** Types and number of cows reared in the studied dairy farms

|  |  |  |  |
| --- | --- | --- | --- |
| Farms | Crossbred (HF×L) | Indigenous breed | Total  |
| Farm-1 | 7 | - | 7 |
| Farm-2 | 9 | 2 | 11 |
| Farm-3 | 5 | - | 5 |
| Farm-4 | 9 | 1 | 10 |
| Farm-5 | 7 | 1 | 8 |
| Farm-6 | 6 | - | 6 |

**TABLE-2:** Average per day milk yield and lactation length of cows under different farms

|  |  |  |
| --- | --- | --- |
| Farms  |  Milk yield (liter per cow) | Lactation length |
| Crossbred | Indigenous breed | Crossbred | Indigenous breed |
| Farm-1 | 9.5 | - | 270 | - |
| Farm-2 | 10 | 2 | 270 | 140 |
| Farm-3 | 8.5 | - | 260 | - |
| Farm-4 | 9 | 1.5 | 265 | 130 |
| Farm-5 | 10 | 1.5 | 280 | 130 |
| Farm-6 | 8.5 | - | 260 | - |

**Studied farms and breeds:**

Types and number of cows reared in studied farms are presented in Table-1 and average milk yield and lactation length of different breeds are presented in Table-2.

The milk yield and different expenditures were higher is crossbreda than indigenous cows. The temperate breeds and their crossbreds produce more milk were reported by Syrstad, 1989; khan et al, 2005 and khanet al 2012.

**Table 3:** Price of milk, calf, labour cost and milk products

|  |  |
| --- | --- |
| Price of milk per litre | 40 taka |
| Price of rosogolla per kg | 130 taka |
| Price of dahi per kg | 150 taka |
| Price of ghee per kg | 600 taka |
| Price of calf | 7000 taka |
| Labour cost per person per day | 150 taka |

The annual net incomes of dairy farms are presented in table 4. From the table it was seen that the income varied in between farms. This variation might be due to the variation of milk yield, expenditure of the farms and breed differences. Table 4, indicated that the income from dairy farm was ranging from taka70000 to taka150000.

The variable cost includes feed cost, labour cost, treatmentl cost, artificial insemination cost, electric cost, transport cost and others. Small amount of purchased green roughage were fed to cows and the amount of The maximum green roughage comes from road side, crop field, river side.

The income from a dairy farm includes annual milk sale, live animal sale (heifer/bull, calf, culled cow) and selling of by products (dung).

**Table 4. Annual net income of dairy farms**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Farm-1 | Farm-2 | Farm-3 | Farm-4 | Farm-5 | Farm-6 |
| **Income**  |  |  |  |  |  |  |
| Milk sale | 615600 | 1096000 | 367200 | 912400 | 761200 | 476000 |
| Animal & by product | 50000 | 80000 | 25000 | 60000 | 55000 | 30000 |
| Total income (tk) | 665600 | 1176000 | 392200 | 972400 | 816200 | 506000 |
| **Cost**  |  |  |  |  |  |  |
| Feed cost | 357048 | 696070 | 215000 | 547000 | 463800 | 278800 |
| Labor cost | 150000 | 200000 | 65000 | 168000 | 134500 | 100000 |
| Treatment + A.I. costs | 30500 | 60000 | 25000 | 40500 | 37000 | 20500 |
| Elect. cost | 11470 | 20000 | 9500 | 18900 | 13500 | 11000 |
| Transport cost + others | 10000 | 32730 | 4000 | 30000 | 5660 | 9000 |
| Total var. cost | 559100 | 1008800 | 316200 | 804400 | 672200 | 410000 |
| **Net profit** | 106500 | 167200 | 78300 | 168000 | 144000 | 95000 |

In the study, income derived from milk, selling of calf, selling of manure, while the expenses included: feed cost, labour cost, health cost, reproduction cost and all other operational cost. Feed costs accounted for dairy operation was about 70% in the current study. Similar percentage of feed cost (64%-69%) of total cost was reported by Morans, 2005.

*The annual net profit of varies from 15000 taka to 17000 taka on a per cow per year basis. Similar ner profits (12000 taka per year per cow) were reorted by Rahmann et al., 2003. T*he profitability depends on the herd size, breed and lower operational cost *(Hemme et al.,2004)*

The produced milk supplied to the sweetmeat shops. They extract the fat of milk to produce ghee. For 3-3.5 kg ghee, it requires 100 liter milk. A certain amount of milk used for Dahi, some of milk used for Rosogolla and other sweets. They collect about 900-1200 liters milk daily at 40 taka per liter. About 35 liter milk required for making 15 kg Dahi. To produce 1 kg Chana require 4 liter milk is required. Price of 1 kg Rosogolla is about 130 taka; 1 kg Dahi is about 150 taka and 1kg ghee is about 600 taka. In India, The cost of ghee manufacturing worked out to be Rs 120.97 /kg (*Raina et al.**2006.)*

 **TABLE-5 Annual net income of sweetmeat shops**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Income** | Shop-1 | Shop-2 | Shop-3 | Shop-4 |
| Prod. of ghee (kg) | 1050 | 1200 | 1000 | 1100 |
| Selling of ghee (tk) | 525000 | 630000 | 500000 | 550000 |
| Prod. of dahi (kg) | 46000 | 50000 | 45000 | 48000 |
| Selling of dahi (tk) | 6000000 | 7500000 | 5500000 | 6080000 |
| Prod. of rosogolla (kg) | 80000 | 90000 | 77000 | 80500 |
| Selling of rosogolla (tk) | 10530000 | 11700000 | 9800000 | 10740000 |
| Total income (tk) | 17055000 | 19830000 | 15800000 | 17370000 |
| **Cost**  |  |  |  |  |
| Milk purchased (liter) | 324000 | 360000 | 320000 | 325000 |
| Cost of milk | 12,960,000 | 15,000,000 | 12,800,000 | 13,000,000 |
| Labour cost | 555000 | 650000 | 550000 | 600000 |
| Transport cost | 650000 | 800000 | 600000 | 680000 |
| Electricity cost | 36000 | 40000 | 34000 | 36000 |
| Packaging + Spoilage + others | 800000 | 1050000 | 700000 | 600000 |
| Total cost | 14801000 | 17420000 | 13076400 | 14916000 |
| **Net profit** | 2054000 | 2160000 | 1927000 | 2454000 |

The sweetmeat shops profitability are shown in table 5. Table 5 indicated that the income from sweetmeat shops was ranging from taka 200000 to taka 250000. There was a variation of income between shops were observed. That was depended the quantity of production and price of milk, demand of milk products, availability of milk, production cost, availability of technician etc.

Results showed that milk processing enterprise was profitable and flexible-A net farm income of taka 1125000 per month was realized by an average processor, while the fixed costs accounted for about 1% of the total costs of processing milk into different products (*Osotimehin**et al,*

**Conclusion**

The study has shown that the smallholder dairy farms and the milk processing enterprise (sweetmeat shops) were profitable. It showed that the higher percentage of cross of exotic breeds with local showed higher profit and The annual net profit is very much higher in the processing industries of milk products than dairy farming. Among the different milk products has shown that ghee manufacturing is the most profitable. The study of economics of dairying also showed the linkage between dairy farms and milk processing shops in term of profitability.

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