

Husbandry Practices of Dairy Farming at Chittagong Sub-urban Area

Faruk MSA^{1*}, Islam SKMA¹, Alam M², Deb A³ and Chanda GC⁴

¹Department of Physiology, Biochemistry and Pharmacology; ²Department of Animal Science and Nutrition; Faculty of Veterinary Medicine, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong-4225, Bangladesh

³Department of Youth Development and Research, Chittagong-4216, Bangladesh.

⁴Department of Dairy and Poultry Science, Faculty of Veterinary Medicine, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong-4225, Bangladesh

[Received: November 19, 2015; Accepted: December 08, 2015]

ABSTRACT

The present study was carried out to know the present status including general information, feeding, breeding, housing, milking etc. and costs and returns of small dairy farms, to compare the productive and reproductive performance of crossbred and indigenous cows and to make recommendation for development of small scales dairy farming. With this view, the empirical data were collected by using pretested questionnaire. The study was conducted at preselected 30 dairy farms in Chittagong suburban area, and four months-long survey was diminished on thirty small dairy owners. It appeared that 57% farm owners belong to business class and remaining 43% to different categories. Fifty three percent took dairying as a side-business whereas only 47% took it as a main business enterprise. Major percentage of farm owner education level was Higher Secondary (60%). The dry period, calving interval, services per conception and day's open of crossbred was 98.5 ± 18.9 , 419 ± 11.3 , 1.18 ± 0.82 , 118 ± 25.8 and indigenous was 140 ± 10.4 , 428 ± 24.7 , 1.95 ± 0.44 , 137 ± 7.78 respectively. The study showed that there were significant ($P < 0.01$) differences within the dry period, services per conception, calving to first service, highest and lowest milk production and lactation period of crossbred and indigenous dairy cows. The study also showed non-significant differences within calving interval for crossbred and indigenous. In case of small dairy farming, the farms were facing a lot of problems such as scarcity of feeds and fodder, high price of concentrate and lack of technical knowledge. This type of dairy farming will be a potential sector for economic development of Bangladesh.

Key words: Cost and return, crossbred, dairy farming, indigenous, performance.

INTRODUCTION

The economy of Bangladesh is mainly based on Agriculture. Livestock plays a crucial role in the agricultural economy. About 36% of the total animal protein comes from the livestock products in our everyday life. In our countries 25% peoples are directly engaged in livestock sector and 50% peoples are partly associated in livestock production. Last year, the contribution of livestock sub-sector to the GDP was 2.51%, which was estimated about 7-8% GDP to agriculture [1]. That's why the dairy farm is raising day by day all over the Bangladesh. Development of dairy has generated considerable employment through the production and marketing of dairy and dairy products [2]. The majority of the dairy cattle are in the hands of smallholder dairy producers. Also dairying is part of the mixed farming systems in Bangladesh [3] and a predominant source of income, nutrition and jobs [4, 5]. Dairying is also considered a strong tool to develop a village micro economy of Bangladesh [6] in order to improve rural livelihoods and to alleviate rural poverty. Potentially, therefore, small-scale dairying is a viable tool to spur economic growth and alleviate poverty and malnutrition. Chittagong is now in a very satisfactory position on dairy farming contrast. More or less, majority farms are in beneficial condition and contribute in national economy. The husbandry

practices of these farms are vital issue. For determination the actual condition of this dairy farm various parameters like housing, feeding, breeding, biosecurity & health care management that mean the overall husbandry status need to evaluate.

MATERIALS AND METHODS

Study area and time

The study was conducted at Chittagong district in Bangladesh between September to December, 2013. Its geographical location is 22° 21' 49" N and 91° 48' 12" E in DMS (Degrees Minutes Seconds).

Sources and methods of data collection

In order to collect the more purified data of various farms an organized questionnaire was formatted [7, 8]. Data were collected through face to face interviewing of farmer and personal visits to the randomly selected dairy farming households involved in small scale dairy farming. A questionnaire was designed to capture information related to general characteristics of the household and the household head; farmland ownership and use housing pattern; production, inputs, costs and profits/income from dairy farming and other households activities; income from non-farm activities; expenditure of income from dairy farming;

* Corresponding author: shoheldvm03@gmail.com

assets ownership; perceived benefits and constraints to dairy farming [9].

Sampling methods

Chittagong district and Patiya upazila were selected in bias (Non-random selection). Patiya upazila have 22 unions. From these union five unions were randomly selected and from this five unions six farm was selected randomly (Multi-stage random sampling). The farms which have $3 \leq$ cattle as define as small scale dairy farm are our target population.

Population and sample size

All the dairy farms of the district engaged in production were classified as population of the study. On the basis of-nature of research and analysis; number of variables; resource constraints; and, the importance of decision, a sample size of 30 Dairy farms were selected.

Data Analysis

After collecting all the data of individual dairy farms, we analyze some vital husbandry issues like housing, feeding, breeding, udder health status, biosecurity condition etc. Here we tried to make a comparative deviation on these key issues from a minimum standard that required for a dairy farm operation. Actually percentage (%) of some special important husbandry practice is find out here and graphically represent on some contrast. The obtained data was stored in Excel-2007 and imported to software STATA/IC-11.0 (STATA Corporation, USA) for analysis. Stored data were tabulated and arranged as percent value. Descriptive statistics (i.e. means, frequencies etc) was done to estimate the different variables. Unpaired unequal t-test was used to determine the level of significance ($P < 0.01$) between categorical variables.

RESULTS AND DISCUSSION

General information of small dairy farm owners

The general information of selected dairy farm owners in Chittagong sub-urban areas are presented in Table 1. The results showed that the highest percentage (57%) of the farmers had business as the principal occupation and the rest job seekers, agriculture. It was observed that 53% of the farmers had taken dairying as a main business and the rest as side business. Highest percentage (60%) of the farmers had higher secondary level education and nobody was found illiterate and under secondary education level. This result were not agree with Uddin et al. [9] who reported that highest percentage (65%) of the farm householders had higher primary level of education followed by secondary level education (17.5%). Hossain et al [10] stated that the average literacy rate of farm households in all farm categories was more than 60% which had above primary level of education. Similar observations have also been reported by Mollel et al. [11]. Kabir [12] conducted an economic study and found that the average literacy rate of farm households in all farm

categories was also sufficiently higher than the national average. More than 76% house numbers of family in all the farm categories had above primary level of education. The crossbred farm owners had relatively higher level of education. Farmers were further categorized based on land owner. The highest percentage (57%) of farmers posses 1-2 acres of land and lowest percentage (7%) of farmers posses 0.5-1 acres of land. It was found that 16.7% farmers had training on dairy farms and 83.3% farms had no training on dairy farm management. This result is contraindicated with Sriri et al [13] but agree with Hossain et al [12] who reported that 18% farmers had training on dairy farms and 81% farms had no training on dairy farm management. For establishing dairy farms, 7% of dairy farmers were dependent on bank loan, 10% on their own sources and 83 % on bank loan and own source. The average capital investment was Tk. 45,000 to 2,50,000.

Housing management

Only 10% of the farmers provide half building and rest 90% of the farmers used tin shed and straw shed to house their cattle (Table 2). Highest percentage of farmers (80%) provided open house, 13% provided closed and rest used semi-closed house. This result opposes the findings of Uddin et al [9] who reported that highest percentage of farmers (77.5%) provided open house, 22.5% provided closed and semi-closed house. In another region of the same district, Hossain et al [14] observed that 63% farmers provided closed house and 63% farmers used paved floor.

Feeding management

There were two systems of feeding, which were practiced by the dairy owners to feed their cattle. 63% farmers followed stall feeding and 37% farmers followed both stall and grazing system (Table 2). All calves were fed milk by suckling. No farmers were found using bottle to provide milk to calves. The main livestock feed at the study area was rice straw. Most of the farmers (80%) used untreated straw. It was noted that 20% and 40% farmers cultivated napier and maize, respectively and rest of the farmers did not cultivate fodder. Most important constraints regarding fodder cultivation are scarcity of land, scarcity of seed/cutting and lack of knowledge.

Breeding system

It was observed that 87% cows were inseminated artificially and 13% both naturally and artificially (Table 2) which is similar to the observation by Hossain et al [14] who found 93% cows were inseminated artificially. For artificial insemination, the majority of the farmers preferred Friesian semen.

Overall management system

It was observed that 100% farmers milked their cows manually. Most of the farmers (77%) used traditional equipments and 53% farmers milked their cows hygienically (Table 2). The source of water in most of the farms was direct water supply by local authority and the supply was adequate in 80% farms. Majority of the farmers cleaned their cattle house

regularly with the help of pipe. The same findings were also revealed in a study by Urassa and Raphael [15] in Tanzania.

The average length of calving interval of crossbred and indigenous cows stood at 419 and 428 days, respectively (Table 3). Statistically non-significant variations existed between the length of calving interval between crossbred and indigenous cows.

Productive and reproductive parameters of

Table 1: General information of farm owners (N: 30)

Variables	No. of Farms	Percentage (%)
Owner's Occupation		
Service holder	2	7
Business	17	57
Job seeker	5	17
Agriculture	3	10
Others	3	9
Dairy Farming		
Main business	14	47
Side business	16	53
Education		
Class 6-10	3	10
Secondary school level	5	17
Higher school level	18	60
Above higher secondary level	4	13
Land Size (acre)		
0-0.5	2	7
0.5-1.0	5	17
1-2	17	57
2-5	4	13
Above 5	2	7
Source of fund		
Bank loan	2	7
Own source	3	10
Both	25	83
Herd size (Number)		
0-3	2	7
4-8	9	30
9-15	14	47
16-30	4	13
Above 30	1	3
Monthly income (Thousand)		
0-2	6	20
2-4	14	47
4-6	4	13
Above	6	20

crossbred and indigenous cows

Dry period

The average dry period for crossbred and indigenous cows was 98.5 and 140 days respectively (Table 3). There was a statistically significant variation ($P < 0.01$) in the length of dry period of crossbred and indigenous cows. These results were in agreement with Ali *et al.* [16] and Nahar *et al.* [17] Ali *et al.* [16] observed that average dry period for crossbred and indigenous cows were 97.2 and 141 days, respectively. Nahar *et al.* [17] found that the average dry period for F1 graded Sindhi and Sahiwal as 146 and 127 days, respectively.

Calving interval

Nahar [18] found that under urban conditions, the mean calving interval of Sindhi and Sahiwal cows were 415 and 429 days, respectively. Ali *et al.* [16] stated that average length of calving interval of crossbred and indigenous were 653 and 539 days, respectively which contradict to this study.

Service per conception

The average services per conception of crossbred and indigenous cows were 3.10 and 1.95, respectively (Table 3), which were significantly different ($P < 0.01$). These results were in agreement with Ali *et al.* [16] who reported that the service per conception of crossbred and indigenous cows were 3.33 and 1.98, respectively in Chittagong district.

Calving to first service

Table 3 shows that the average calving to first service for crossbred and indigenous were 118 and 137 days, respectively, which were significantly different ($P<0.01$). This result were in agreement with the information of Ali et al. [16] who observed that average calving to first service for crossbred and indigenous were 124 and 114 days, respectively.

The difference in milk production between crossbred and indigenous cows was highly significant ($P<0.01$). Similar studies were made by Halim [19] who found that total milk production per lactation of crossbred and indigenous cows were 800 and 296 litres, respectively.

Table 2: Housing system, feeding system, fodder cultivation, breeding system and overall management system (N=30)

Information	Percentage	Information	Percentage
Housing system	Type of cow shed	Washing of udder by	
	Half building	Warm water	43
	Tin shed	Normal water	87
	Straw shed	Daily equipment	
Pattern of housing	Open	Traditional	77
	closed	Modern	-
	Semi closed	Semi-modern	23
Feeding System	Types of feeding system	Preventive register	
	Stall	Maintained	7
	Stall + Grazing	Not maintained	93
	Grazing	Storage of milk	
	Others	Freezing	17
	Type of calf handling	Not stored	83
Fodder cultivation	Sucking	Isolation of sick cattle	
	Bottling	Kept isolated	7
	Milk starter	Not kept isolated	93
	Type of grasses	Causes of disposal	
Napier	Unproductive	30	
Maize	Infertility	70	
No grass cultivation	Labor type		
Type of roughage	Skilled	7	
Treated	Non skilled	93	
Untreated	Place of selling		
Breeding system	Breeding method	Broker	17
	AI	Local market	13
	AI and natural	Sweet market	20
	Natural	Home service	20
Overall management system	Milking	Own selling center	30
	Hygienically	Disposal of manure	
	Unhygienically	Sold out	73
	Cleaning	As manure	20
	Regularly	As fuel	7
	Irregularly	Sanitizer used	
	Water source	Phenyl	70
Water supply	Potas	23	
Tube well	Phenyl + Potas	50	
pond	Bleaching powder	30	
Water supply	Treatment by		
Adequate	Veterinary surgeon	90	
Inadequate	Locally trained person	10	
	Cleaning done by		
	Pipe	77	
	bucket	23	

Highest and lowest milk production

It was revealed from table 3, the highest milk production from crossbred and indigenous cows were 10.4 and 2.40 litres/day, respectively, and lowest milk production 2.29 and 0.72 litres/day, respectively.

Milk yield per lactation

Milk yield per lactation for crossbred and indigenous were 1210 and 358 litres, respectively.

The average lactation period for crossbred and indigenous cows was 283 and 207 days, respectively, which differ significantly ($P<0.01$). Another study made by Halim [19] who found the length of lactation period for crossbred and indigenous cows were 259 and 228 days, respectively.

Milking management

Table 3 : Productive and reproductive performances of dairy cows

Parameters	Crossbred	Indigenous	Level of significance
Dry period (days)	98.5±18.9	140±10.4	**
Calving interval (days)	419±11	428±24.7	NS
Service per conception	3.10±0.82	1.95±0.44	**
Calving to first service (days)	118±25.8	137±7.78	**
Highest milk production (lt/day)	10.4±1.79	2.40±0.51	**
Lowest milk production (lt/day)	2.92±0.72	0.72±0.25	**
Milk yield (lt/lactation)	1210±57.8	358±27.1	**
Lactation period (days)	283±14.5	207±13.7	**
Average milk production (Lt/lactation)	4.27±0.52	1.78±0.13	**

**=Significance at 1% level of probability. NS=Non significant.

All of the farmers were using calves for milk letdown (100 %). Majority of the animals were milked by females through folded thumb. Only 70 % respondents were washing the teat / udder of animals before milking (Table 4). On overall basis, farmers

Bilal et al [20] who pointed out that milk letdown with the help of calves, milking by folded thumb, nonwashing of teat udder prior to milking are the predisposing factors responsible for high incidence of mastitis under field conditions.

Table 4: Adoption trend of feeding, milking and health management related practices at farmer's level (N=30).

Practices	Respondents	Frequency (%)
Awareness about high yielding fodder variety	4	13.33
Use of rice polish as concentrate	30	100
Silage making	1	3.33
Urea treated straw	7	23.33
Urea molasses block	0	0
Source of milk letdown		
i) Calf sucking	30	100
ii) Oxytocin injection	0	0
iii) Concentrate feeding	0	0
Milking by		
i) Male	12	40
ii) Female	18	60
Milking method		
i) Full hand	7	23.33
ii) Folded thumb	23	76.67
iii) Mechanical	0	0
Udder/teat washing		
i) Yes	21	70
ii) No	9	30
Vaccination against hemorrhagic septicemia		
i) Yes	11	36.67
ii) No	19	63.33
Vaccination against foot and mouth disease		
i) Yes	18	60
ii) No	12	40
Deworming		
i) Yes	23	76.67
ii) No	7	23.33
Dipping		
i) Yes	9	30
ii) No	21	70
Control of parasites		
i) Yes	13	43.33
ii) no	17	56.67
Mastitis detection and teat dipping	0	0

were highly ignorant about the recommended milking management practices. There was a general response from the respondents that mastitis is the common problem in lactating animals. This might be attributed to frequent injury/ wound on teats due to calf's teeth, skin flora opportunist, and use of milk foam. These survey findings are in line with those of

Health management

Respondents were paying little attention towards the health management of dairy animals. The vaccination against hemorrhagic septicemia and foot and mouth diseases was being done by 36.67 % and 60% farm respectively and only 43.33% were taking measures to control parasites. There was a common

complaint from the farmers that every year so many animals die due to hemorrhagic septicemia even though these animals had been vaccination. The probable reason may be the use of low quality vaccine and use of a small dose than recommended. Yaqub et al [21] pointed out that hemorrhagic septicemia and foot and mouth diseases are the major problems under field conditions and in time vaccination with recommended dose is the only successful preventive measure. Javed and Ahamd [22] reported that parasites are responsible for huge economic losses under field conditions. This might be due to climate factors, poor husbandry practices and lack of knowledge on the part of livestock farmers.

CONCLUSION

Bangladesh is considered one of the most suitable countries in the world for dairy farming. The present management condition of small dairy farms in Patiya at Chittagong district is more or less traditional and the productive and reproductive performance of crossbred cows was better than that of indigenous cows. Most of the farmers believe that dairy farming is a profitable enterprise and can be more profitable if Government gives support on feed cost, marketing, loan and management training.

REFERENCES

1. DLS. 2013. Department of Livestock Services, Bangladesh, Organization's detail.
2. Nedelea A, Grosu V and Shamsuddoha M (2009). Dairy Farming-an Alternative Income Generating Activity. *Bulletin UASVM Horticulture*. 66(2): 352-355.
3. Saadullah M (2001). Smallholder Dairy Production and Marketing in Bangladesh, Paper presented at South-South Workshop on Smallholder Dairy Production and Marketing, NDDDB-ILBS, March. 2001, Ahmedabad, India, 13-16.
4. Miyan HA (1996). Towards sustainable development: The national conservation strategy of Bangladesh, Consultancy report on the livestock sector. Ministry of Environment and Forestry, Dhaka, Bangladesh.
5. Haque SAM (2009). Bangladesh: Social gains from dairy development. In: Animal Production and Health Commission for Asia and the Pacific and Food and Agriculture Organization (APHCA-FAO) publication on smallholder dairy development: Lessons learned in Asia, RAP publication 2009/2.
6. Shamsuddin M, Alam MM, Hossein M S, Goodger WJ, Bari FY, Ahmed TU, Hossain MM and Khan AHMSI (2007). Participatory rural appraisal to identify needs and prospects of market-oriented dairy industries in Bangladesh. *Trop. Anim. Health Prod.* 39:567-581.
7. Nauta WJ, Baars T, Groen AF, Veerkamp RF and Roep D (2001). Animal Breeding in Organic Farming, Discussion paper, Louis Bolk Institute, Driebergen.
8. De Jong H and Van Soest Y (2001). De biologische melkveehouderijsector in kaart gebracht, Productschap Zuivel, Rijswijk.
9. Uddin MN, Uddin MB, Mamun M, Hassan MM and Khan MMH (2012). Small Scale Dairy Farming for Livelihoods of Rural Farmers: Constraint and Prospect in Bangladesh. *J. Anim. Sci. Adv.* 2(6): 543-550.
10. Hossain MM, Alam MM, Rashid MM, Asaduzzaman M and Rahman MM (2005). Small Scale Dairy Farming Practice in a Selective Area of Bangladesh. *Pak. J. Nutr.* 4 (4): 215-221.
11. Mollel EL, Lekule FP, Kurwijila RL, Turuka FM and Petersen PH (1999). A Socioeconomic study on the role of gender in small scale crop-livestock farming in Turiani, Morogoro. Proceedings of the 26th Scientific Conference LITI-TENGERU Arusha, TSAP conferences series. 26: 354-360.
12. Kabir MA 1995. An economic study of subsidized private dairy farming in selected area of Bangladesh, M.Sc. Thesis Department of Agricultural Economic, Bangladesh Agricultural University, Mymensingh, Bangladesh, pp: 129-134.
13. Sriri MT, Jaouhari ME, Saydi A, Kuper M and Gal PY (2011). Supporting small-scale dairy farmers in increasing milk production: evidence from Morocco. *Trop. Anim. Health Prod.* 43:41-49.
14. Hossain ZMA, Hossain SMJ, Rashid MM, Sultana N and Ali MH (2004). Study on the present management condition of private dairy farm at Rangpur Sadar Thana in Bangladesh. *J. Biol. Sci.* 3.
15. Urassa JK and Raphael E (2002). The contribution of small scale dairy farming to community welfare: a case study of Morogoro Municipality. <http://www.fiuc.org/esap/MOROG/MOROG5/General/dairyfarming.pdf>
16. Ali MH, Khan MAS, Islam MN, Khan MKI, Rashid MM and Khatun MJ (2000). Comparative performance study on the crossbreeds and indigenous cows under small holder dairy farming. *Pak. J. Biol. Sciences.* 3: 795-798.
17. Nahar TN, Islam M and Hasnath MA (1992). A comparative study on the performance of F1 crossbred cows under rural conditions. *Asian-Australian Journal of Animal Sciences*, 5: 435-438.
18. Nahar N (1987). A comparative study on the performances of F1 crossbred progenies on Farm an Urban conditions, M.Sc. Thesis, Department of Animal Breeding and Genetics.

- Bangladesh Agricultural University, Mymensingh.
19. Halim MA (1992). A comparative economic analysis of local and crossbred dairy cows in a selected area of Dhaka district. M.Sc. Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh, Bangladesh, 10-23.
 20. Bilal MO, Iqbal MU, Muhammad G, Avais M and Sajid MS (2004). Factors affecting the prevalence of clinical mastitis in buffaloes around Faisalabad district (Pakistan). *Inter. J. Agril. Biol.* 6(1): 185-187.
 21. Yaqub T, Ahmad R and Ahmad A (1997). Isolation and characterization of *Past. multocida* from suspected cases of HS. 18th Annual Report. LPRI Bahadurnagar, Okara-Pakistan.
 22. Javed S and Ahmad R (1988). Identification of endoparasites in buffalo and cattle at livestock experiment station, Bahadurnagar, Oadirabad and around Bahadurnagar Farm. 9th Annual Report, LPRI Bahadurnagar, Okara-Pakistan.