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## **A surveillance study on dairy farmers selected in Baghabari milk pocket area of Bangladesh**

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**Abstract:** This study was carried out to reveal the animal agriculture status of the dairy farmers. The survey was conducted by random sampling on 100 dairy farmers (50 from Shahzadpur upazila and 50 from Bera upazila). A pretested questionnaire was developed and multiplied for data collection. The data collected were brought to the headquarters of Bangladesh Livestock Research Institute, Savar, Dhaka for analysis. After analysis it was found that the education level of the farmers of Shahzadpur upazila was better than that of Bera upazila, where 74% farmers of Shahzadpur and 66% farmers of Bera were engaged in agriculture. The average annual income and expense of the farmers of Shahzadpur were greater than that of Bera. The average total land, cultivable land and total livestock population per farmer were also higher in Shahzadpur upazila than in Bera upazila. In case of diversity of different genotypes of dairy cattle, except Jersey cross the number of Pabna, Sindhi cross, Shahiwal cross and H-F cross was much greater in Shahzadpur than in Bera. Most of the farmers purchase concentrate feeds and produce roughages in both the locations, where feed scarcity was seen mostly during rainy season. About 56% farmers treat their cattle with the help of veterinary surgeon and 44% farmers provide treatment with the help of veterinary field assistant in Shahzadpur, while the scenery was almost opposite in Bera. About 90% farmers of Bera upazila and 95% of Shahzadpur upazila used anthelminitics to deworm their animals. Most of the farmers in both sites dewormed their cattle every three months. About 78% farmers of Shahzadpur and 76% of Bera vaccinated their animals. About 85% farmers of Shahzadpur had been found to properly dispose the carcasses, where as only 48% farmers had been found to do it in Bera. Almost all the farmers washed their hands, equipment and udders of the cows with clean water before milking in both Shahzadpur and Bera. Approximately, all the farmers of both the locations milked their cows twice a day, did not perform milk testing and sold the raw fresh milk to the cooperative societies. All farmers used cow dung as fuel. Overall, it was revealed that Shahzadpur upazila was more advanced than Bera upazila in almost all aspects of animal agriculture.

**Keywords:** baseline survey; dairy farmers; animal agriculture status; dairy cattle; nutrition management; health management

### **1. Introduction**

“Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in concord with nature” (Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 1992). Food security, nowadays, is the top most global issue considering the expected survival of human beings on the earth. “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food

preferences for an active and healthy life” (World Food Summit, 1996). In light of the recent experience in facing food security challenges, Bangladesh requires to enhance agricultural production in order to achieve self-sufficiency in food production. Milk is thought to be a complete food for mankind. On the other hand, dairy cattle rearing can enhance the income of a dairy entrepreneur which improves the livelihood and provide year-round employment of its family labour (Islam *et al.*, 2010). From these points of view, dairy cattle genotypes are important genetic resources to reach the goal. Dairy cattle, one of the most important farm animal genetic resources in Bangladesh, are mainly categorized into two groups- local/native/indigenous and crossbreds of many types (Holstein-Friesian cross, Jersey cross, Shahiwal cross etc). In fact, the population of Bangladesh is growing at alarming rate, whereas the daily requirement of milk per capita is quite greater than its production and supply. Baghabari under Sirajganj district of Bangladesh is highly promising area for the development of dairy industry contributing a lot to the national demand of milk. To set up a profitable dairy industry in this location, selection of a potential genotype of dairy cattle in addition to scientific management of farm is a prerequisite. That is why, emphasis was given to undertake a surveillance study to pick up data on the animal agriculture status of the dairy farmers, the diversity of livestock species, the diversity of different genotypes of dairy cattle, the health and nutritional management practices for the dairy cattle, the milking procedure and cow dung utilization by the farmers.

## 2. Materials and Methods

In this survey study, 100 dairy farmers of two upazilas (50 from Shahzadpur and 50 from Bera) of Sirajganj district were randomly selected. The study was conducted from July/2011 to June/2012.

A standard questionnaire was developed and pretested for which the questionnaires used by Mostari *et al.*, 2008; Uddin *et al.*, 2011; and Islam *et al.*, 2012 were followed partially. The questionnaire included a good number of questions demanding information on education, profession, annual income and expenditure, total land, cultivable land, livestock population, diversity of dairy cattle, feed source, feed scarcity time, treatment process, deworming of cattle, vaccination, carcass disposal, hands and equipment washing, hands and equipment washing material, udder washing, udder washing material, milking frequency, milk testing and milk marketing, use of cow dung by the farmers etc. However, all the questions were made in mother language to best collect the information.

The pretested questionnaire was multiplied through photocopy for data collection. The data were collected by direct interview method. Finally, the data collected were brought to the headquarters of Bangladesh Livestock Research Institute, Savar, Dhaka for analysis with a view to writing a comprehensive report. The descriptive analyses such as sum, average and percentage were performed by using Microsoft Excel computer programme.

## 3. Results and Discussion

The level of education of the farmers of Shahzadpur upazila was better than that of Bera upazila, where 74% farmers of Shahzadpur and 66% farmers of Bera are engaged in agriculture (Table 1). So, agriculture was their main income source. The average annual income and expense of the farmers of Shahzadpur were greater than that of Bera (Table 2). The average total land, cultivable land and total livestock population per farmer were also higher in Shahzadpur upazila than in Bera upazila among the selected farmers of this study (Table 3).

Regarding the diversity of different genotypes of dairy cattle, except Jersey cross the number of Pabna, Sindhi cross, Shahiwal cross and H-F cross was much greater in Shahzadpur than in Bera (Table 4). In respect of nutritional management, most of the farmers purchased concentrate feeds and produced roughages in both the locations, where feed scarcity occurred mostly during rainy season (Table 5). Regarding health management of dairy cattle, 56% farmers treated their cattle with the help of veterinary surgeon and 44% farmers provided treatment with the help of veterinary field assistant in Shahzadpur, while the scenario was almost opposite in Bera (Table 6). 90% farmers of Bera upazila and 95% farmers of Shahzadpur upazila used anthelmintics to deworm their animals (Table 6). Most of the farmers in both sites dewormed their cattle every three months (Table 6). This might be due to their better education level as well as long time cattle rearing experience.

About 78% farmers of Shahzadpur and 76% farmers of Bera vaccinated their animals but still 22% of farmers of Shahzadpur and 24% farmers of Bera did not use vaccines for their animals (Table 7). But immunizations are an integral part of an effective herd health program. Vaccinations help to curtail the emergence of disease and limit its spread from animal to animal (Bovine Immunization Guidelines, 1993). Uddin *et al.* (2012) reported that the dairy farmers who used vaccine and medication earned 14.3% more than those who did not use vaccine and medication. So, an effective vaccination schedule should be designed to be followed by all the farmers.

**Table 1. General information (education, profession) of the dairy farmers.**

Location/ Area	Farmers selected	Level of education					Profession		
		1	2	3	4	5	1	2	3
Shahzadpur	n=50	66%	16%	10%	6%	2%	18%	74%	8%
Bera	n=50	80%	10%	4%	4%	2%	28%	66%	6%

In case of level of education, 1=below SSC, 2=SSC, 3=HSC, 4=degree, 5=masters

In case of profession, 1=business, 2=agriculture, 3=job

**Table 2. General information (annual income and expenditure) of the dairy farmers.**

Location/Area	Farmers selected	Average annual income (lac)	Average annual expense (lac)
Shahzadpur	n=50	3.99	2.29
Bera	n=50	2.26	1.34

**Table 3. General information (total land, cultivable land, livestock population) of the dairy farmers.**

Location/ Area	Farmers selected	Mean total land (decimel)	Mean culti- vable land	Total livestock population per farmer (mean value)						
				Cattle	Buffalo	Goat	Sheep	Chi- cken	Duck	Pigeon
Shah- zadpur	n=50	312.46	281.61	860	0	22	67	89	55	64
Bera	n=50	187.5	177.48	550	0	79	16	209	87	124

**Table 4. Possession of dairy cattle.**

Location/ Area	Farmers selected	Average number of dairy cattle				
		Pabna	Sindhi X	Shahiwal X	H-F X	Jersey X
Shahzadpur	n=50	95	52	101	307	3
Bera	n=50	12	6	18	196	141

**Table 5. Sources of feed resources and feed scarcity period.**

Location/ Area	Farmers selected	Source of concentrate		Source of roughage		Feed scarcity	
		1	2	1	2	1	2
Shahzadpur	n=50	18%	82%	80%	20%	76%	24%
Bera	n=50	8%	92%	64%	36%	92%	8%

In case of source of concentrate, 1=self production, 2=purchase

In case of source of source of roughage, 1=self production, 2=purchase

In case of feed scarcity, 1=rainy season, 2=winter

**Table 6. Health management (treatment process, deworming) of dairy cattle.**

Location/ Area	Farmers selected	Treatment process				Deworming		Deworming frequency			
		1	2	3	4	1	2	1	2	3	4
Shahzadpur	n=50	0%	56%	44%	0%	98%	2%	72%	12%	8%	6%
Bera	n=50	0%	44%	54%	2%	90%	10%	82%	2%	4%	2%

In case of treatment process, 1=self treatment, 2=treatment given by veterinary surgeon, 3=treatment given by compounder, 4=other ways

In case of deworming, 1=yes, 2=no

In case of deworming frequency, 1=every 3 months, 2=every 4 months, 3=every 6 months, 4=every 12 months

**Table 7. Health management (vaccination, carcass disposal) of dairy cattle.**

Location/ Area	Farmers selected	Vaccination		Disposal of carcass		
		1	2	1	2	3
Shahzadpur	n=50	78%	22%	84%	16%	0%
Bera	n=50	76%	24%	48%	46%	6%

In case of vaccination, 1=yes, 2=no

In case of disposal of carcass, 1=disposed by burial, 2= disposed on open field, 3= disposed on open water body

**Table 8. Practices of hygienic milking of dairy cattle.**

Location/ Area	Farmers selected	Hands and equipment washing		Washing material			Udder washing		Washing material		
		1	2	1	2	3	1	2	1	2	3
Shahzadpur	n=50	100%	0%	96%	4%	0%	96%	4%	88%	0%	12%
Bera	n=50	96%	4%	94%	4%	2%	96%	4%	90%	4%	6%

In case of hands and equipment washing, 1=yes , 2=no

In case of hands and equipment washing material, 1=water, 2=soap, 3=potassium permanganate solution

In case of udder washing, 1=yes , 2=no

In case of udder washing material, 1=water, 2=soap, 3=potassium permanganate solution

**Table 9. Milking frequency, milk testing and milk marketing.**

Location/ Area	Farmers selected	Milking frequency		Milk testing		Milk selling		
		1	2	1	2	1	2	3
Shahzadpur	n=50	0%	100%	8%	92%	4%	0%	96%
Bera	n=50	2%	98%	6%	94%	2%	8%	90%

In case of milking frequency, 1=once, 2=twice

In case of milk testing, 1=yes, 2=no

In case of milk selling, 1=local market, 2=local trader, 3=cooperative society

**Table 10. Use of cow dung by the farmers.**

Location/ Area	Farmers selected	Use of cow dung		
		Compost	Fuel	Biogas
Shahzadpur	n=50	0%	100%	0%
Bera	n=50	0%	100%	0%

Nearly 84% farmers of Shahzadpur were found to properly dispose the carcasses, where as only 48% farmers were found to do it in Bera (Table 7). Proper disposal of the carcasses helps to control animal and human disease epidemics. That is why the farmers of both the sites should be more aware of proper disposal of the carcasses which can be obtained through adequate training and mass media propaganda.

Almost all the farmers washed their hands, equipment and udders of the cows solely with clean water before milking in both Shahzadpur and Bera (Table 8). This practice might not significantly reduce the prevalence of mastitis and thus cannot make sure to protect public health. Bacteria in raw milk come from two main sources: organisms transported from the environment into the milking machine and mastitis organisms from within the udder (Taverna *et al.*, 2001; Kelly *et al.*, 2009). Teat skin is a potential reservoir of microbial diversity for milk (Monsallier *et al.*, 2012). Miseikiene *et al.* (2015) found that the use of udder antiseptics for premilking teats preparation reduced the levels of coliforms, coagulase negative staphylococci and *Streptococcus uberis* but with exception of iodine, no effect was found on reducing *Candida* genus yeasts. Therefore, suitable antiseptics should be used by the dairy farmers.

Approximately all the farmers of both the locations milked their cows twice a day, did not perform milk testing and sold the raw fresh milk to the cooperative societies (Table 9). Table 10 shows that 100% farmers of both Shahzadpur and Bera used cow dung as fuel. Bala *et al.* (1992) also reported that in different parts of Bangladesh the utilization pattern of cow dung as organic manure was also not uniform and it was being used most inefficiently without exploiting its biogas potential.

#### 4. Conclusions

The present study discloses that between two cattle concentrated sites under Sirajganj district, Shahzadpur upazila was more advanced than Bera upazila in almost all aspects. Therefore, Shahzadpur is a more suitable site to set up a sustainable dairy industry in Bangladesh. Feed scarcity, in this location, is a matter of intervention especially during the rainy season. This problem may be solved by adopting some scientific knowledge based strategies. On the other hand, bio-gas plants should be set up in this highly potential dairy zone to properly utilize the cow dung.

#### Conflict of interest

None to declare.

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