An Official Journal of Bangladesh Livestock Research Institute (BLRI)
Bangladesh Journal of Livestock Research
Journal Homepage: https://www.banglajol.info/index.php/BJLR
ISSN 1022-3851

A survey on biosecurity measurement of dairy farms at selected upazillas of Gazipur district in Bangladesh

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Abstract

A baseline survey on biosecurity measurement with some background parameters of dairy farms was conducted at Gazipur sadar, Sreepur, Kapasia and Kaligonj upazilla of Gazipur district from January to June 2022. "Data were collected using a structured questionnaire through personal visits to 115 dairy farms, with assistance from a research assistant." The farm size varied from 10 to 150 dairy cattle, the majority of the farms contained between 15 to 40 dairy cattle. "Most (87.83%) of the farmers were male, while 12.17% were female." The farmers had a wide range of educational backgrounds from primary to higher secondary or above. Majority of the farmers were engaged in agriculture (24.35%) and business (31.30%). Almost all of the farmers (100%) heard about biosecurity from different sources. The majority (35.66%) of the farmers had a slight or moderate idea about biosecurity. The highest 70% of farms are located near the road and 65% of farms are located near the market in Gazipur sadar upazilla and the lowest 35% of farms are located near to another animal farms in Sreepur upazilla. The highest 50% of farms had no fencing in Kaligonj upazilla and the lowest 18% of farms had rodent-proof and wild bird-proof facilities in Kapasia upazilla. The majority (75%) of the farms did not have a separate store room in Sreepur and Kapasia upazilla. The majority of the farms had absence of a 'no admittance' sign, gatekeeper, foot bath at the farm gate, hand washing facilities at shed entry, use of protective/dedicated clothing and no visitor registrar maintained. The highest 76% of the farmers followed the scientific/hygienic way of milking and milk handling, and 68% followed the scientific/hygienic way of storage and transportation of milk in Sreepur upazilla. The results of this study provided a clear picture of the level of biosecurity compliance among the dairy farms of Gazipur district which will be useful for farmers and researchers to improve the biosecurity measurement that is an issue of cattle health, animal welfare, and high productivity to sustainable dairy production.

Key words: Biosecurity, dairy farms, Gazipur, Survey

Bang. J. Livs. Res. Vol. 30 (1&2), 2023: P. 11-22. https://doi.org/10.3329/bjlr.v30i1.83121

Introduction

Bangladesh, a developing country, where livestock is a major component of the agricultural economy which plays a vital role of country's food production, particularly highly nutritious foods: milk, meat and eggs. Milk, meat and eggs currently provide 74.50% animal protein in

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the country (DLS, 2023). Milk has been known as nature's almost complete food and its nutritive value depends on its wholesomeness. Quality of milk can be sharply deteriorated due to adulteration, unscientific and unhygienic way of production. Presence of pathogenic bacteria, heavy metals, insecticides, antibiotics, hormones, soda, urea, melamine etc. deteriorates the quality of milk and not suitable for human consumption.

Outbreaks of different infectious and contagious diseases have been a major constraint to the production of dairy industry. Measures to prevent outbreaks of diseases and reduce their spread include preventive vaccination, promotion of biosecurity and hygiene by changing management systems, and controlling or restricting the sale of live animals in market places (FAO, 2013). The productivity of the dairy industry is constrained by diseases, specially, in urban areas (Ahmed, 2018). Ndambi *et al.* (2017) mentioned that, shortage of land, shortage of feed and/or high feed prices, and manure related waste management, water scarcity, shortage of labour and animal disease prevalence were the common constraints to dairy production. Sibley (2014) stated that, in dairy farms, biosecurity, surveillance, resilience / immunity, biocontainment, and control of disease spread within the herd are the pillars that need to be appropriately managed to ensure the healthy herd.

Fasina *et al.* (2012) stated that, biosecurity, defined as a set of management practices or measures to prevent introduction and spread of pathogens within and between farms. Sahlström *et al.* (2014) revealed that, information about the biosecurity level on the farms is important for contingency planning for emerging diseases, when combating endemic diseases in a country, or to see if and where the biosecurity needs to be improved. The observation of a gap between biosecurity recommendations and on-farm practices have been documented. On-farm biosecurity measures are implemented differently depending on the farm (Sahlström *et al.*, 2014). Research suggests that uptake of biosecurity measures on dairy farms is low with certain practices being rarely carried out (Sayer *et al.*, 2013). Other studies also examined the implementation of biosecurity on a variety of farming enterprises, the majority highlighted that awareness of biosecurity may exist but its implementation at farm level is often poor (Mee *et al.*, 2012).

Thus, inadequate attention to the implementation of biosecurity in such circumstances could have a significant negative impact on animal health which causes economic loss. Asma *et al.* (2015) mentioned that, disease outbreak is a leading issue of high production costs of broiler. Rimi *et al.* (2017) stated that biosecurity, which is an integral part of poultry farming, is very weak or absent in most of the small and medium scale poultry farms in Bangladesh.

Importance of biosecurity in the prevention of different diseases is well established. There have been many comprehensive guidelines on biosecurity; a lot of training has been organized in the country, however, the level of biosecurity compliance in individual dairy farms is often very low. It is proved that, biosecurity can reduce and prevent the introduction of diseases or pests of animals on a farm, and also can minimize the spread of diseases or pests within a farm. Biosecurity action plans need to be implemented mainly in large dairy farms where the disease agents can be introduced

by various sources such as farm owner/s, employees, visitors, equipments, vehicles, buildings, replacement cattle, supplies, feedstuffs, manure etc. In Bangladesh, it is fact that the consumption of milk and milk products has been increased over the last two decades. It is also fact that most of the milk producers of the country still unaware about biosecurity measurement and hygienic production of milk and milk products etc.

The information of the literature on the biosecurity measurement of dairy farms at Gazipur district is still unavailable. To develop a sustainable dairy production in Bangladesh at the farmers' level for production and ending at consumers' level for consumption, it is necessary to find out the existing biosecurity compliance and the factors which are directly related with dairy production at Gazipur. Therefore, the present study was undertaken with the following objectives: (i) to investigate the biosecurity measurement of dairy farms at selected upazilla of Gazipur district and (ii) to identify the background profile of the dairy farmers at the same area to take operational decisions to achieve sustainable dairy production.

Materials and Methods

Gazipur district is located at the central part of Bangladesh and near the capital city of Dhaka which consists of six upazillas, namely Gazipur sadar, Kapasia, Tongi, Sreepur, Kaliganj and Kaliakior upazilla where many educational institutions are situated. The present study was conducted to assess the biosecurity measurement of different dairy farms located at Gazipur Sadar, Sreepur, Kapasia and Kaligonj upazilla of Gazipur district. The data was collected through the direct interviews and/or making frequent personal visits by survey questionnaire which was developed in Bengali on different aspects including knowledge, attitude and practices on biosecurity and management practices. The interview schedule was prepared based on the objectives of the study. The selected characteristics included gender, educational qualification, occupation of the farmers, farmers' familiarity to the word biosecurity, farmers' perception on biosecurity, gaps in the practice of biosecurity of dairy farms at different upazillas, milking and milk handling, storage and transportation of milk etc. The secondary data was collected from Bangladesh Bureau of Statistics (BBS), journals, reports and various published articles.

Data Collection and Sampling

In the Gazipur sadar upazilla, Sreepur upazilla, Kaligonj upazilla and Kapasia upazilla, the data was collected with the visit during 07-08 March, 21-22 March, 04-05 April & 18-19 April, 2022 respectively, with the assistance of a Sub-Assistant Livestock Officer (Extension), Gazipur sadar upazilla veterinary hospital, Gazipur sadar, Gazipur. . The information was collected from a total of 115 respondents in four upazillas. The collected data were entered in Excel spreadsheet and analyzed using Excel software.

Results And Discussion

Gender of the farmers

The study showed that, in Gazipur sadar upazilla among a total of 42 respondents, 37 farmers (88.10%) were male with 5 farmers (11.90%) female. On the other hand, in Sreepur upazilla among a total of 25 respondents, 21 farmers (84.00%) were male with 04 farmers (16.00%) female., in

The total sample covered in this study by the following table:

Table 1: Sampling frame of this study

Name of the District	Name of the Upazilla	No. of Respondents
Gazipur	Gazipur sadar upazilla	42
	Sreepur upazilla	25
	Kapasia upazilla	24
	Kaligonj upazilla	24
	Grand Total	115

Kapasia upazilla among a total of 24 respondents, 21 farmers (87.50%) were male with 03 farmers (12.50%) female and in Kaligonj upazilla among a total of 24 respondents, 22 farmers (91.67%) were male with 02 farmers (08.33%) female.

Academic background of the farmers

The study showed that, the farmers had a wide range of educational background from primary to higher secondary or above; in Gazipur sadar upazilla out of total 42 respondents, 04 farmers (9.52%) were illiterate, 07 farmers (16.67%) were Primary, 10 farmers (23.81%) were Junior, 11 farmers (26.19%) were SSC, 10 farmers (23.81%) were HSC or above. On the other hand, in Sreepur upazilla among a total of 25 respondents, 03 farmers (12.00%) were illiterate, 04 farmers (16.00%) were Primary, 05 farmers (20.00%) were Junior, 06 farmers (24.00%) were SSC, 07 farmers (28.00%) were HSC or above, in Kapasia upazilla among a total of 24 respondents, 01

Table 2: Gender of the farmers

Category	Gazipur sadar upazilla		Sreepur upazilla		Kapasia upazilla		Kaligonj upazilla		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	37	88.10	21	84.00	21	87.50	22	91.67	101	87.83
Female	05	11.90	04	16.00	03	12.50	02	08.33	14	12.17
Total	42	100.00	25	100.00	24	100.00	24	100.00	115	100.00

Table 3: Academic background of the farmers

Category	Gazipur sadar upazilla		Sreepur upazilla		Kapasia upazilla		Kaligonj upazilla		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Illiterate	04	9.52	03	12.00	01	4.16	02	8.33	10	8.70
Primary	07	16.67	04	16.00	04	16.67	03	12.50	18	15.65
Junior	10	23.81	05	20.00	06	25.00	06	25.00	27	23.48
SSC	11	26.19	06	24.00	06	25.00	07	29.17	30	26.09
HSC or above	10	23.81	07	28.00	07	29.17	06	25.00	30	26.08
Total	42	100.00	25	100.00	24	100.00	24	100.00	115	100.00

Table 4: Occupation of the farmers

Category	Gazipur sadar upazilla		Sreepur upazilla		Kapasia upazilla		Kaligonj upazilla		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Farmer	10	23.81	06	24.00	05	20.83	07	29.17	28	24.35
Business	15	35.72	08	32.00	07	29.17	06	25.00	36	31.30
Shop keeper	2	4.76	03	12.00	02	08.33	01	04.17	08	06.96
Teacher	2	4.76	02	08.00	01	04.17	02	08.33	07	06.09
Govt., service	4	9.52	03	12.00	03	12.50	04	16.67	14	12.17
Private service	9	21.43	03	12.00	06	25.00	04	16.66	22	19.13
Total	42	100.00	25	100.00	24	100.00	24	100.00	115	100.00

farmers (4.16%) were illiterate, 04 farmers (16.67%) were Primary, 06 farmers (25.00%) were Junior, 06 farmers (25.00%) were SSC, 07 farmers (29.17%) were HSC or above and in Kaligonj upazilla among a total of 24 respondents, 02 farmers (8.33%) were illiterate, 03 farmers (12.50%) were Primary, 06 farmers (25.00%) were Junior, 07 farmers (29.17%) were SSC, 06 farmers (25.00%) were HSC or above. It is stated that, currently, higher educated (graduation) people are attracting towards the livestock business then before (Sharma *et al.*, 2014, Rahman *et al.*, 2012).

Occupation of the farmers

The study showed that, in Gazipur sadar upazilla out of the 42 respondents, 23.81% were involved in agriculture, 35.72% in business, 4.76% in shop keeper, 4.76% in teacher, 9.52% in govt. service and 21.43% in private service. On the other hand, in Sreepur upazilla among a total of 25 respondents, 24.00% were involved in agriculture, 32.00% in business, 12.00% in shop keeper, 08.00% in teacher, 12.00% in govt. service and 12.00% in private service, in Kapasia upazilla among a total of 24 respondents, 20.83% were involved in agriculture, 29.17% in business, 08.33% in shop keeper, 04.17% in teacher, 12.50% in govt. service and 25.00% in private service and in Kaligonj upazilla among a total of 24 respondents, 29.17% were involved in agriculture, 25.00% in business, 04.17% in shop keeper, 08.33% in teacher, 16.67% in govt. service and 16.66% in private service. The total respondents were classified into six categories. On the other hand, Ahmed et al. (2010) revealed that the majority (70.2%) of the respondents had main occupation as agriculture, 11.2% were related in the livestock business.

Farmers' familiarity to the word biosecurity

Villarroel *et al.* (2007) stated that, biosecurity is focused on reducing and prevent the introduction of diseases or pests of animals on a farm, and to minimize the spread of diseases or pests within a farm. Biosecurity action plans need to be implemented mainly in large dairy farms where the disease agents can be introduced

by various sources such as labor, advisers, replacement cattle, supplies, feedstuffs, and vehicles. The study showed that, in Gazipur sadar upazilla, about 0.00% farmers did not hear about biosecurity, 19.05% farmers hear about biosecurity from DLS staff, 21.43% farmers hear about biosecurity from NGO, 16.67% farmers hear about biosecurity from company people, 11.90% farmers hear about biosecurity from traders, 26.19% farmers hear about biosecurity from media and 04.76% farmers hear about biosecurity from others. On the other hand, in Sreepur upazilla, about 0.00% farmers did not hear about biosecurity, 12.00% farmers hear about biosecurity from DLS staff, 12.00% farmers hear about biosecurity from NGO, 28.00% farmers hear about biosecurity from company people, 04.00% farmers hear about biosecurity from traders, 36.00% farmers hear about biosecurity from media and 08.00% farmers hear about biosecurity from others, in Kapasia upazilla, about 0.00% farmers did not hear about biosecurity, 16.67% farmers hear about biosecurity from DLS staff, 16.67% farmers hear about biosecurity from NGO, 25.00% farmers hear about biosecurity from company people, 08.33% farmers hear about biosecurity from traders, 29.17% farmers hear about biosecurity from media and 04.16% farmers hear about biosecurity from others and in Kaligonj upazilla, about 0.00% farmers did not hear about biosecurity, 12.50% farmers hear about biosecurity from DLS staff, 16.67% farmers hear about biosecurity from NGO, 33.33% farmers hear about biosecurity from company people, 04.16% farmers hear about biosecurity from traders, 29.17% farmers hear about biosecurity from media and 04.17% farmers hear about biosecurity from others.

Table 5: Farmer's familiarity to the word biosecurity

Category	Gazipur sadar upazilla		Sreepur upazilla		Kapasia upazilla		Kaligonj upazilla		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Never heard	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Heard from DLS staff	8	19.05	3	12.00	4	16.67	3	12.50	18	15.65
from NGO	9	21.43	3	12.00	4	16.67	4	16.67	20	17.39
from company people	7	16.67	7	28.00	6	25.00	8	33.33	28	24.35
from traders	5	11.90	1	04.00	2	8.33	1	04.16	9	07.83
from media	11	26.19	9	36.00	7	29.17	7	29.17	34	29.57
Others	2	04.76	2	08.00	1	04.16	1	04.17	6	05.21
Total	42	100.00	25	100.00	24	100.00	24	100.00	115	100.00

Farmers' Perception on Biosecurity

Nöremark *et al.* (2013) mentioned that, some infectious agents are specific for dairy cattle and others are zoonotic, affecting both bovine and human health. Employees and visitors can contribute to the spread of all these infectious agents on a dairy farm. The study showed that, in Gazipur sadar upazilla, about 35.71% farmers had slight or moderate idea about biosecurity, 23.81% farmers defined biosecurity as the measures for prevention of diseases of cattle, 21.43% farmers defined biosecurity as the protection of cattle from germs and other wild-animals and 19.05% farmers meant biosecurity as one or another good management practices. On the other hand, in Sreepur upazilla, about 52.00% farmers had slight or moderate idea about biosecurity, 24.00% farmers defined biosecurity as the measures for prevention of diseases of cattle, 12.00% farmers defined biosecurity as the protection of cattle from germs and other wild-animals and 12.00% farmers meant biosecurity as one or another good management practices, in Kapasia upazilla, about 25.00% farmers had slight or moderate idea about biosecurity, 45.83% farmers defined biosecurity as the measures for prevention of diseases of cattle, 16.67% farmers defined biosecurity as the protection of cattle from germs and other wild-animals and 12.50% farmers meant biosecurity as one or another good management practices and in Kaligonj upazilla, about 29.16% farmers had slight or moderate idea about biosecurity, 37.50% farmers defined biosecurity as the measures for prevention

Table 6: Farmers'perception on biosecurity

Category	Gazipur sadar upazilla		Sreepur upazilla		Kapasia upazilla		Kaligonj upazilla		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Had slight or moderate idea	15	35.71	13	52.00	6	25.00	7	29.16	41	35.66
Disease prevention measures	10	23.81	6	24.00	11	45.83	9	37.50	36	31.30
Protection of cattlefrom germs and other wild-animals	9	21.43	3	12.00	4	16.67	4	16.67	20	17.39
Biosecurity means as one or another good management practices	8	19.05	3	12.00	3	12.50	4	16.67	18	15.65
Total	42	100.00	25	100.00	24	100.00	24	100.00	115	100.00

of diseases of cattle, 16.67% farmers defined biosecurity as the protection of cattle from germs and other wild-animals and 16.67% farmers meant biosecurity as one or another good management practices.

Gaps in the practice of biosecurity of dairy farms at Gazipur district

The level of biosecurity compliance among the farms of Gazipur district surveyed was presented in Table 7. The study revealed that, most of the farms would not satisfy the conceptual biosecurity requirements, as 70% farms were located near to road, 50% farms were located near to residential area, 65% farms were located near to market and 40% farms were located near to another animal farm/s.

From structural biosecurity point of view, 30% farms had no fencing, 80% farms were in east-west direction, 90% farms had concrete floor, only 30% farms had rodent-proof and wild bird-proof facilities and majority (70%) of the farms did not have a separate store room.

The study mentioned that, the operational biosecurity of the farms were very poor. Most of the farmers did not care for entrance of the farm (90%). Absence of no admittance sign (80%), gate keeper (90%), foot bath at farm gate (60%), use of protective/dedicated clothing (95%), no practice of shoe changing (80%), absence of hand washing facilities at shed entry (60%) and no visitor registrar maintained (85%) were remarkable. It was found that, 60% farms were disinfectant spray at the farm, vehicles do not enter into farm premises (70%), Vehicles sprayed with disinfectant at entry (50%), feeder and waterer are cleaned daily (70%), sick animals are isolated in separate shed (80%), dead animals and farm wastes are disposed properly (80%), routine control of rodents (70%) and farm premises and surrounding of sheds are kept clean (40%).

Wallace (2003) mentioned that, the access of visitors must be limited and recorded in a logbook; the farm touring must start from younger to older animal groups; barn doors are recommended to be locked and a warning sign must be posted to keep out unauthorized personnel. He also mentioned that, sick and suspicious animals should be isolated in a specific area and always handled at the end. In the control of contagious mastitis, the latter are milked cows suspected of the disease. Guidance (2015) stated that, along the access road of the farm must be displayed signs directing visitors to the administrative area and to the visitor parking, as well as warning signs to limit direct contact of visitors with farm feed and animals. Dehorners, ear taggers, hoof knives, clippers, and all shared and hired equipment will be cleaned and disinfected between uses. Nursing bottles and buckets must be sanitized before each feeding, calves kept indoors must have fresh clean dry bedding, and plastic calf hutches will be cleaned and disinfected after use. The equipment used for manure disposal will not be used for transporting or delivering feed. Disposable clothing and used veterinary equipment must be removed safely. Troutt (2008) mentioned that, a high biosecurity risk is associated with carcasses (dead stock) collectors because they are usually in contact with diseased animals. To reduce the risk of pathogens spreading in farm animals, dead animals should be disposed of in the shortest time. Depending on the national regulations and farm's possibilities, the disposal of carcasses can be done by a licensed dead stock collector, burial, or composting. To prevent the introduction of

Table 7: Gaps in the practice of biosecurity of dairy farms at Gazipur district

Sl. No.	Biosecurity measure	% of farms complied				% of farms non-complied			
		Gazipur sadar upazilla	Sreepur upazilla	Kapasia upazilla	Kaligonj upazilla	Gazipur sadar upazilla	Sreepur upazilla	Kapasia upazilla	Kaligonj upazilla
Conceptual biosecurity									
1	Farm location Near to road	70	60	55	50	30	40	45	50
	Near to residential area	50	40	40	45	50	60	60	55
	Near to market	65	50	50	60	35	50	50	40
	Near to another animal farm/s	40	35	40	45	60	65	60	55
Structural biosecurity									
2	Fencing around the farm	70	60	55	50	30	40	45	50
3	East-west direction of shed	90	75	80	80	10	25	20	20
4	Concrete floor	90	80	90	90	10	20	10	10
5	Rodent-proof shed	30	20	18	20	70	80	82	80
6	Wild bird-proof shed	30	20	18	20	70	80	82	80
7	Separate store room	30	25	25	30	70	75	75	70
Operational biosecurity									
8	Restriction of entrance	10	15	10	10	90	85	90	90
9	No admittance sign	20	08	5	5	80	92	95	95
10	Gate keeper	10	05	10	10	90	85	90	90
11	Foot bath at farm gate	60	18	10	10	40	82	90	90
12	Use of protective/ dedicated clothing	05	03	2	03	95	97	98	97
13	Shoe change at farm gate	20	08	10	10	80	92	90	90
14	Hand wash at farm gate	40	15	20	20	60	85	80	80
15	Disinfectant spray at the farm	60	60	60	60	40	40	40	40
16	Vehicles do not enter into farm premises	70	70	70	70	30	30	30	30
17	Vehicles sprayed with disinfectantat entry	50	50	50	50	50	50	50	50
18	Feeder and waterer are cleaned daily	70	60	70	70	30	30	30	30
19	Sick animals are isolated in separate shed	80	75	80	80	20	25	20	20
20	Dead animals and farm wastes are disposed properly	80	75	80	80	20	25	20	20
21	Routine control of rodents	70	65	70	70	30	35	30	30
22	Farm premises and surrounding of sheds are kept clean	40	45	40	40	60	55	60	60
23	Visitor registrar maintained	15	08	8	4	85	92	92	96

Table 8: Factors associated with milking, milk handling, milk storage and transportation

Parameters	Study area	Categories	Number of respondents	Percent of total respondents
Follow scientific/hygienic way of milking and milk handling	Gazipur sadar upazilla	Yes	30	71.43
		No	12	28.57
	Sreepur upazilla	Yes	19	76.00
		No	06	24.00
	Kapasia upazilla	Yes	16	66.67
		No	08	33.33
	Kaligonj upazilla	Yes	17	70.83
		No	07	29.17
Follow scientific/hygienic way of milk storage and transportation	Gazipur sadar upazilla	Yes	25	59.52
		No	17	40.48
	Sreepur upazilla	Yes	17	68.00
		No	08	32.00
	Kapasia upazilla	Yes	15	62.50
		No	09	37.50
	Kaligonj upazilla	Yes	16	66.67
		No	08	33.33

infectious agents, vehicles must be kept clean and should not have access to the zones where the animals are housed.

Factors associated with milking, milk handling, milk storage and transportation

The factors associated with milking, milk handling, milk storage and transportation are shown in Table 8. The study showed that, in Gazipur sadar upazilla, about 71.43% respondents followed scientific/hygienic way of milking and milk handling and 28.57% didn't follow. On the other hand, in Sreepur upazilla, about 76.00% respondents followed scientific/hygienic way of milking and milk handling and 24.00% didn't follow, in Kapasia upazilla, about 66.67% respondents followed scientific/hygienic way of milking and milk handling and 33.33% didn't follow and in Kaligonj upazilla about 70.83% respondents followed scientific/hygienic way of milking and milk handling and 29.17% didn't follow.

The study showed that, in Gazipur sadar upazilla, about 59.52% respondents followed scientific/hygienic way of milk storage and transportation and 40.48% didn't follow. On the other hand, in Sreepur upazilla, about 68.00% respondents followed scientific/hygienic way of milk storage and transportation and 32.00% didn't follow, in Kapasia upazilla, about 62.50% respondents followed scientific/hygienic way of milk storage and transportation and 37.50% didn't follow and in Kaligonj upazilla about 66.67% respondents followed scientific/hygienic way of milk storage and transportation and 33.33% didn't follow.

Conclusion

Gazipur district is a crowded area in the country where huge numbers of peoples are staying and contributing to the development of formal-informal economic activities whose are dependent on locally producing milk and milk products. These products are not suitable for consumption when adulterates through different sources. Improved biosecurity compliance and farm management are the tools for the wholesomeness of milk and milk products. The present baseline survey provides a clear picture of the level of biosecurity compliance among the dairy farms of Gazipur district which are alarming for the country. It also provides the knowledge and attitude of the farmers about biosecurity of dairy farms. Dairy animals, due to their natural habits, are more vulnerable to infectious diseases which can spread the infectious organisms to other animals. Proper biosecurity measurement found effective to reduce the rate of infectious diseases load in dairy farms. The development and implementation of proper biosecurity measurement in dairy farms improve cattle health, welfare, and farm productivity. The results of this study will be useful to the farmers and researchers to identify the overall biosecurity problems and practices at Gazipur. So the findings of the study would help designing a practicable biosecurity model for the dairy producers in the country.

Acknowledgement

The author is grateful to the authority of Bangladesh Open University for granting financial support to do this research study. The author also expresses his thanks to the employees of veterinary hospitals and dairy farmers of the selected upazilla.

Conflict of Interest

The authors declare that there is no potential conflict of interest.

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