Chapter 1

Introduction

Within the past few decades, the poultry industry has become an established and well-known sector in the socio-economic context of Bangladesh. However, sometimes poultry farmers are compelled to face economic losses due to infectious diseases. Diseases considerably influence the productivity and health level of poultry. In Bangladesh, about 30% of annual chicken mortality is reported to occur due to different disease outbreaks (Giasuddin et al., 2002), including omphalitis (28.42%), salmonellosis (50.90%), Infectious coryza (0.56%) colibacillosis (13.46%), necrotic enteritis (1.88%) and mycoplasmosis (2.55%) (Ahmed et al., 2009).

Avian influenza (AI) is one of the most destroying and debilitating viral diseases in the poultry industry that causes higher morbidity and mortality rate with a loss of production leading to economic losses (Ahmed et al., 2009). The exceedingly pathogenic AI virus (HPAI-H5N1) was first observed in 2007, and low pathogenic avian influenza (LPAI-H9N2) was followed in 2009 in Bangladesh. These two subtypes of viruses are co-circulated and well embedded in Bangladesh's poultry population (Giasuddin et al., 2002).

Avian influenza is one of the most infectious viruses that affect birds (Sonali, breeders, layers, and broiler). The length of avian influenza outbreaks at the stature of infection endured for approximately three months in Bangladesh in 2008 due to an instantaneous fall in costs and consumer panic. The expenses of broiler dropped by around 28%, whereas prices diminished by 26.5%. One-third of consumers avoided eating chicken eggs and meat. Due to the collapse of this market, most farm owners have been forced to give up poultry farming due to the loss of capital. Bangladesh’s poultry industry confronted a tremendous loss estimated at taka 3858 core (38580 million) due to the Al attacks in 2007 and 2008. H5N1 and H9N2 Al viruses are concurrently endemic in poultry (Parvin et al., 2020). Poor management and violation of biosecurity procedures appear to be significant factors in the spread of HPAI.

Biosecurity is the set of implementing measures that can reduce the likelihood of introducing and spreading disease agents (Van Meirhaeghe et al., 2019). A farm’s production is directly linked to the ideal biosecurity practices (Al-Faisal., 2019). Breaches of biosecurity could critically contribute to disease outbreaks inside and outside of the chicken zone, which could subsequently increase chicken mortality and reduce the production of meat and eggs (Indranil Samanta et al., 2018). Currently, approximately 30% of the poultry flock in Bangladesh dies

out annually due to numerous disease outbreaks. Only 2.3% of the farmers in Bangladesh know biosecurity.

Biosecurity is fully maintained in the poultry farms of developed countries. European Union (EU) countries, including Australia and USA, follow strict legislation related to biosecurity and revoke poultry farm licenses in case of failure to maintain the biosecurity protocol. In Asian countries, poultry farms in Japan, Korea, and Malaysia are very careful about biosecurity maintenance (Id & Perrings., 2018). Among the South Asian countries, marginal farms in Bangladesh, India, and Pakistan are the most indifferent toward biosecurity (Conan et al., 2012). In 2010, the Government of Bangladesh recommended biosecurity measures to prevent the introduction and spread of various contagious diseases, including highly pathogenic AI, in commercial poultry farms (Rimi et al., 2017). Despite that, many poultry farm owners, especially those marginal farmers in Bangladesh, hardly follow biosecurity practices. A report mentioned that all the poultry farms in Tangail and Gazipur district, Bangladesh, did not maintain any biosecurity protocols. However, cleaning, disinfection and waste disposal were done on those farms daily (Rimi et al., 2017).

Viewpoint data from small commercial chicken farms is critical as it could give a fresh perspective to develop practice-oriented biosecurity intervention and implementation strategies. Moreover, this information could be helpful for Asian and African nations with comparable farming procedures that report HPAI prevalence (FAO 2007).Most developing countries like Bangladesh have minimal data related to biosecurity status in small-scale commercial poultry farms. Against this backdrop, the present study was undertaken to evaluate the biosecurity scenario and its impact on the poultry farms of Noakhali Sadar. Bangladesh.

Objectives:

1. To assess the biosecurity practices of a commercial chicken farm in the study region.

2. To know the constraints of implementing proper biosecurity.

Chapter 2

Materials and Methods

2.1 Study area

The survey was carried out in the Noakhali Sadar Upazila area, which is about 336.06 square kilometers. This Upazila is located between 22'38' and 22'59' north latitudes and between 90'54' and 91'15' east longitudes. Begumganj Upazila bounds it on the north, Subarnachar Upazila on the south side, Kabirhat Upazila and Companiganj Upazila on the east, Kamalnagar and lakshmipur Sadar Upazilas on the west. The investigation was directed from Noakhali Sadar Upazila, Noakhali. Noakhali Sadar Upazila contains 13 Unions, of which Kadir Hanif, Dharmapur, Binodpur, Ewazbalia, Ashwadia, and Niazpur Union were chosen for the study. The investigation area was selected because it had many broilers, layers, and Sonali farms with good communication facilities. The economy of this Upazila is agriculture dependent. One of the driving forces of this agriculture-dependent economy is poultry farms. The annual temperature of this Upazila is 32°C and winds at 23 km/h. Moreover 67% humidity exists in this Upazila. The annual rainfall in this area is about 1500 millimeters per year.

Figure 1: Study area of Noakhali Sadar Upazila.

2.2 Study period

A cross-sectional population survey was accomplished from 17 February 2022 to 28 April 2022 to assess the biosecurity status of chicken farms (layer, broiler, and Sonali) at Noakhali Sadar Upazila.

2.3 Data Collection

The livestock office and veterinary hospital in Noakhali Sadar, provided the key information and numbers of commercial chicken farms. All necessary data were collected from commercial chicken farms in various locations. In Noakhali Sadar, a total number of 33 chicken farms were chosen. A questionnaire was used to collect information from farmers, farm managers, and employees. The questionnaire was provided at some point during a face-to-face interview and contained essential information on biosecurity measures, farm design, farm management, and staff biosecurity knowledge.

2.4 Data Analysis:

All collected data were coded before being placed into a Microsoft Excel spreadsheet. The overall number of biosecurity measures was calculated and expressed as a frequency and percentage. Descriptive Statistical Analysis was used to examine the data.

Figure 2: Data collection from the farms.

Chapter 3

Results

3.1 Demographic parameters of farm owners:

Demographic parameters explained that most (60.61%) farm owners were male (Table 1). Most (48.48%) of the farmers had primary education, and only 12.12% of farm owners completed graduation. Farming (48.48%) was the main occupation, followed by business (30.33%). Most farmers belong to the higher income group (48.48%). Out of 33, 22 farm owners did not receive training on biosecurity.

Table 1: Demographic parameters of farm owners.

Variable	Category	Frequency	Percentage (%)
Farm ownership	Female	5	15.15
	Male	20	60.61
	Both	8	24.24
Owners educational level	Illiterate	7	21.21
	Primary	16	48.48
	Secondary	6	18.18
	Graduate	4	12.12
Main occupation	Farming	16	48.48
	Govt.	2	6.06
	Business	10	30.30
	NGO	1	3.03
	Others	4	12.12
Economic status	Low income (10000-30000 TK)	5	15.15
	Middle income (30000-50000 TK)	12	36.36
	High income (> 50000TK)	16	48.48
Previous Training on biosecurity	Yes	11	33.33
	No	12	66.67

3.2 Characteristics of Farms

Table 2 shows that the farmers owned 63.64% of farms, and the rest (36.36%) of the farms were rented. The majority (48.48%) of farms were categorised as large-scale chicken farms, followed by medium (39.39%) and small-scale (12.12%) farms. Broiler and layer were reared in 21.21 and 33.33% of farms, respectively. Only 24.24% of farmers reared Sonali chicken. The litter thickness was > 2 inches on most farms (45.45%). Around 72.73% of study farms were located adjacent to the other farms (cattle, sheep, goat).

Table 2: Characteristics of chicken farms.

Variable	Category	Frequency	Percentage (%)
Sources of premises	Owned	21	63.64
	Rented	12	36.36
Farm capacity (number)	Small scale (<500)	4	12.12
	Medium Scale (501-1000)	13	39.39
	Large scale (>1000)	16	48.48
Farm Type	Broiler	14	42.42
	Layer	11	33.33
	Sonali	8	24.24
Depth of litter in poultry house(inch)	<2	7	21.21
	2	11	33.33
	>2	15	45.45
Other farms (cattle, goat and sheep) adjacent to the poultry farm	Yes	24	72.73
	No	9	27.27

3.3. Biosecurity Evaluation

3.3.1. Conceptual Biosecurity:

As presented in table 3, 54.55% of farms were situated within the residence area. Moreover, a significant number (27.27%) of farms were located not more than 10 m away from the residence. Most farms (81.82%) were situated within 50 m from the main roadside area, and 31 (93.94%) farms were located less than 500 m from the closest farm area. Most (78.79%) of the farm shade is very close to the water. The primary source of drinking water for chickens was deep water on 28 farms. Around 63.64% of chicken houses and hatcheries were not constructed with impervious materials. The farmworker of 29 (87.88%) farms did not receive any training in biosecurity.

Table 3: Conceptual Biosecurity on the farm.

Biosecurity Indicators	Category	Frequency	Percentage (%)
Location of the farm from the residence (m)	Within the house	18	54.55
	<10	9	27.27
	>10	6	18.18
Distance of farm from the main road(m)	<50	27	81.82
	>50	6	18.18
Distance from shade to a water body	Close to farm	26	78.79
	Far from farm	7	21.21
Distance from the nearest farm (m)	<500	31	93.94
	>500	2	6.06
Drinking water source	Deep water	28	84.85
	pond water	5	15.15
	Yes	12	36.36

Chicken houses& hatcheries constructed of impervious material	No	21	63.64
Biosecurity training to Employees	Yes	4	12.12
	No	29	87.88

3.3.2. Structural Biosecurity:

Table 4 shows the structural biosecurity status in the study farms. Enclosed fences for security were observed on 29farms, while the remaining farms (4) had no fence boundary. A majority (72.73%) of farms had no footbath. Around 42.42% of farms restricted vehicles inside the farms, whereas 57.58% farms had no restrictions. Visitor and driver entrance was prohibited in 27 (81.82%) and 22(66.67%) farms, respectively. Most 31(93.94%) of the farms usually did practices disinfection, sanitization, and fumigation process into the farms. Most farms (75.76%) did not interchange equipment with other farms. The all-in-all-out system was followed in 78.79% of farms. However, only 42.42% of farms attempted a durable rodent supervision strategy.

Table 4: Structural Biosecurity on the farm.

Biosecurity indicators	**Yes (%)**	**No (%)**
Presence of a fence surrounding the poultry farm	29(87.88)	4(12.12)
Presence of a footbath on the gate	9(27.27)	24(72.73)
Prohibition of vehicle entry	14(42.42)	19(57.58)
Prohibition of entry of visitors	27(81.82)	6(18.18)
Disinfection, sanitization, and fumigation practices among the poultry farms	31(93.94)	2(6.06)
Farm driver not permitted to entry Poultry house	22(66.67)	11(33.33)
Equipment exchange with another farm	8(24.24)	25(75.76)
All-in-all out system	26(78.79)	7(21.21)
Biosecurity indicators	14(42.42)	19(57.58)

Presence of rodents and other animals in the farm

The majority (63.63%) of farms reported no insect infestation in sheds (Table 5). Small mammals like rats and mice were observed in 13 (39.39 %) farms. Many large animals like big mammals and foxes were reported in 15(45.45%) farms. About 54.55% of farms reported the presence of wild birds within the farm. The majority (66.67%) of farms reported waterfowl as the most common wildlife species in nearby water bodies. Domestic animals (cats, dogs, ruminants) were kept by many farms (75.76%).

Access to dogs and cats to the shed and range area was restricted in 87.87 and 36.36% of farms, respectively.

Table 5: Presence of rodents and other animals on the farm.

Animal type reported on farm	Category	Yes (%)	No (%)
Type	insect in shed	12(36.36)	21(63.64)
	Small mammals(rat, mouse)on the farm	13(39.39)	20(60.61)
	Large mammals (fox, jackal) in the shed	15(45.45)	18(54.55)
	wild birds in the shed	18(54.55)	17(51.52)
	wild birds in the nearest water body	22(66.67)	11(33.33)
	Domestic animals (cat, dog and ruminants) in farm	25(75.76)	8(24.24)
Dog/cat access to chicken facilities	access to shed	4(12.12)	29(87.87)
	access to range	21(63.64)	12(36.36)

3.3.3 Operational Biosecurity

Table 6 shows that special or separate cloth for workers was used only in 11farms while 22farms did not use any types of special clothes. A majority (84.48%) of farms did not have provisions for changing between farms within the same company. Around 81.81% of farms did not use safety shoes while working on the farm. However, 63.64% of the farms had separate isolation quarters for sick chickens. Only 42.42% of farms used different spaces for disposing of dead chickens. For farm waste disposal, 72.73% of farms buried it, and only 9.09% disposed

of it in sewerage. 18.18% of farms dumped it in open water bodies. For farm liquid waste disposal, 78.79% of farms used drainage canals, 15.15% dumped liquid waste into ponds, and only 6.06% of farms used septic tanks.

Table 6: Operational Biosecurity indicators.

Biosecurity indicators	**Yes (%)**	**No (%)**
Special or separate cloth for workers that will be used only on the farm while working	11(33.33)	22(66.67)
Change cloth between sheds within the same farm	5(15.15)	28(84.85)
Use of footwear	6(18.18)	27(81.81)
No access to the poultry compartment for visitors	26(78.79)	7(21.21)
Staff not having contact with other farms	14(42.42)	19(57.58)
Farm driver not permitted to entry Poultry house	23(69.70)	7(30.30)
Proper disposal of a dead chicken	14(42.42)	19(57.58)
Presence of isolation room for disease chicken	21(63.64)	12(36.36)
Making a call to the vet ,when chicken appeared sick	11(33.33)	22(66.67)
Vaccination	22(66.67)	11(33.33)
Waste disposal		
Burial	24(72.73)	9(27.27)
Sewerage	3(9.09)	30(90.90)
Open water body	6(18.18)	27(81.81)
Liquid waste disposal site		
Drainage canal	26(78.79)	7(21.21)
Pond	5(15.15)	28(84.84)
Septic tank	2 (6.06)	31(93.93)

3.4 Farmers' perception towards biosecurity

Farmer perception toward biosecurity is summarized in table 7. The majority (75.76%) of the farmers considered shed sanitization is extremely important for biosecurity. Vehicle and equipment sanitization between farms was crucial to 36.36% of farmers and not important to 12.12% of farmers. Wearing protective cloth on the farm was very important to 33.33% of the farmers and not important to 21.21% of the farmers. Disinfecting equipment between sheds was not important to 33.33% of the farmers. Using footbaths and hand washing was extremely important in 42.42% of the farms. Keeping records of visitors to the farm was less important to 21.21% of the farmers. Prohibiting the entry of farm animals into sheds was not important to 38.38% of farmers. Around 24.24% believed that it is very important to maintain proper biosecurity to prevent disease. Training on biosecurity was very important for 36.36% of the farmers.

Table 7: Farmer's perception towards biosecurity.

	Extremely important	**Very Important**	**Moderately Important**	**Important**	**Less Important**	**Not Important**
Shed sanitization	25(75.7)	4(12.12)	3(9.09)	1(3.03)	0	0
Vehicle & equipment sanitization between farms	12(36.3)	7(21.21)	3(9.09)	5(15.15)	2(6.06)	4(12.1)
Wearing protective clothing	6(18.18)	11(33.3)	2(6.06)	4(12.12)	3(9.09)	7(21.2)
Disinfectant of equipment between the shed	4(12.12)	3(9.09)	2(6.06)	6(18.18)	7(21.21)	11(333)
Footbath & hand washing	14(42.4)	7(21.21)	8(24.24)	4(12.12)	0	0
Visitor recording	0	0	4(12.12)	2(6.06)	21(63.6)	6(18.1)
Restricting access to farm animals to the shed	7(21.21)	3(9.09)	0	3(9.09)	8(24.24)	12(366)

Rodent control	8(24.24)	11(33.3)	3(9.09)	11(33.3)	0	0
Wild bird proofing shed	11(33.3)	2(6.06)	5(15.15)	8(24.24)	5(15.15)	2(6.06)
Restricted contact between farms	3(9.09)	7(21.21)	8(24.24)	4(12.12)	8(24.24)	3(9.09)
Most diseases can be prevented by proper biosecurity	0	8(24.24)	7(21.21)	4(12.12)	1(3.03)	13(399)
Training on biosecurity or farm management	5(15.15)	12(36.3)	6(18.18)	7(21.21)	3(9.09)	0

3.5 Different clinical diseases in the study farms

The farmers were asked to list the flock's most notable condition with unique characteristics from their perspective. Table 8 shows the frequency of different diseases in the study farms. Among different types of infections, IBD (30.30%) was noted as the most dangerous, followed by ND (15.15%), salmonellosis (3.03%), heat stroke (9.09%), and coccidiosis (6.06%).

Table 8: Different clinical diseases in the study farms.

Disease name	Clinical sign	Frequency	Percentage (%)
Salmonellosis	Whitish diarrhea, Ruffled feathers, high mortality	1	3.03
Cannibalism	Feather pecking, pecking at the skin on head, comb, wattle, toe	2	6.06
IBD	Trembling, huddling, ruffled feather, vent pecking	10	30.30
ND	Greenish or watery diarrhea, twisting of the neck, respiratory sign	5	15.15
Avian influenza	sneezing, coughing, rales, swollen infra orbital sinuses	1	3.03
Heat stroke	Labored breathing, panting, pale comb or wattle	3	9.09

Fowl cholera	Greenish diarrhea, cyanosis of Comb & wattle, Drowsiness	2	6.06
Coccidiosis	Brownish feces, rapid weight loss, droopiness	2	6.06
Mycoplasmosis	Tracheal rales , Watery eyes, gasping, coughing, nasal discharge	1	3.03
Brooder pneumonia	Dyspnea, gasping, accelerated respiratory sign	1	3.03
Colibacillosis	Respiratory distress, reduced appetite, poor growth	2	6.06
Ascites	Gurgling sounds, excessive abdominal fluid accumulation	3	9.09

3.6 Mortality rate in studied poultry farms

Out of the total farm surveyed, less than a 1% mortality rate was found in 39.39 % of farms (Table 9). In addition, 27.27 % of farms showed a mortality rate of over 4%.

Table 9: Mortality rate in studied poultry farms.

Mortality rate (%)	Frequency	Percentage (%)
<1	13	39.39
1.01-4	11	33.33
>4	9	27.27

3.7 Constraints of implementing proper biosecurity

The constraint of implementing biosecurity is presented in Figure3; among the factors, farmers' ignorance (27.27%) was found to be the significant constraint of implementing biosecurity which is followed by lack of training (21.21%) and financial problems (18.18%). Farmers' education (9.09%), lack of knowledge about disease (12.12%), and inadequate poultry extension services (9.09%) also limited the on-farm biosecurity implementation.

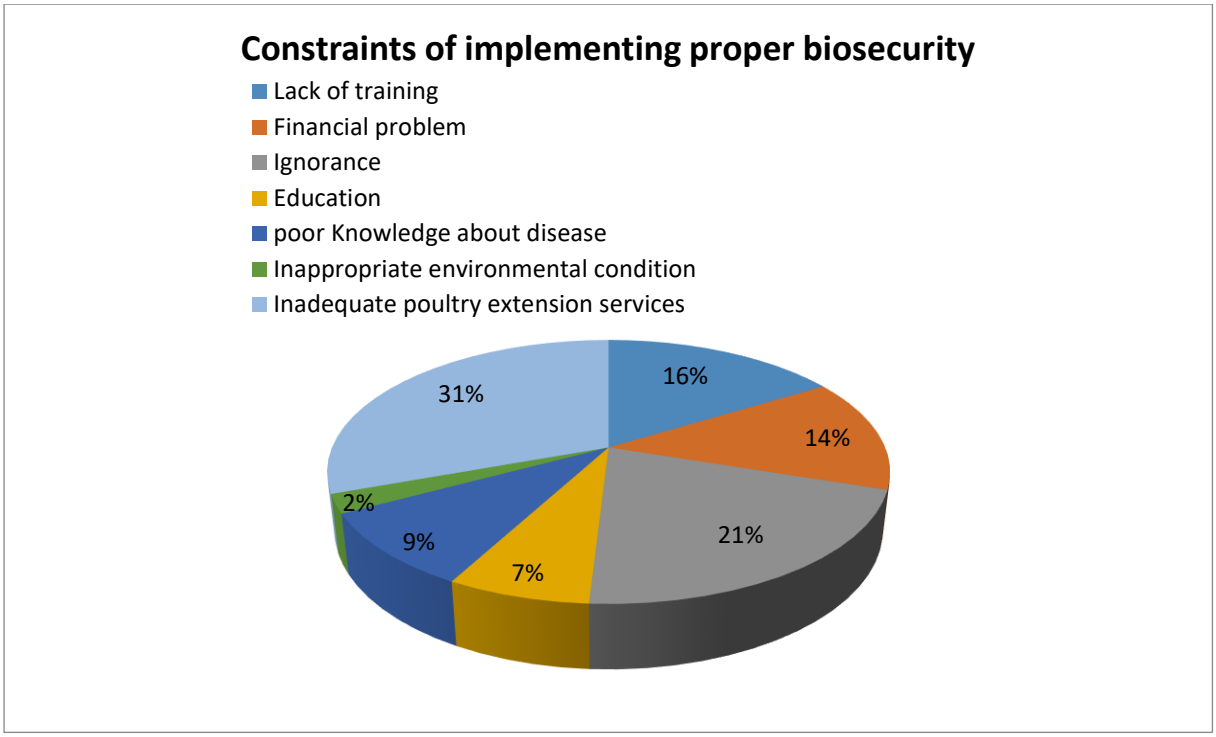

Figure 3: Constraints of implementing proper biosecurity

Chapter 4

Discussion

Biosecurity in poultry farms plays an essential role in the prevention of various types of contagious diseases. At Noakhali Sadar, there were a lot of large-scale poultry farms which were located close to the main streets (<50 m) and nearby (<500 m). This shows the risk of airborne infection of several diseases from the animals transported between the public street and poultry farms. Therefore, the distance to the closest poultry farm should be at least 500 m and preferably >1 km to reduce such transmission (Gelaude et al., 2014). In the study area, many (18 out of 33) poultry farms were located within the residential area, which is a direct breach of biosecurity protocol. Farms situated in residence could cause the pollution of air, water and soil that could affect both animal and human health and consequently result in an economic loss (Oguntoke et al., 2019).

Although the segregation is thought to be the main effective component of biosecurity measures (FAO 2008),it was not present on the farms in the study area. Besides, most farms were easily accessible to domestic animals (cats, dogs, and ruminants), rodents and wild birds from the nearest water reservoir. These practices pose a significant threat of spreading zoonotic diseases like AI. The study reported that the major risk factors for H5N1 outbreaks had been identified as the proximity of poultry sheds to people, highways, or water bodies, as well as the movement of various objects, while allowing vehicles through the gate, people, and other animals (Alhaji and Odetokun 2011; Ahmed et al., 2012; Gilbert and Pfeiffer 2012; Osmani et al., 2014).Rodents are also a vital vector and reservoirs and carriers of pathogens from chicken excrement or cadaver (Meerburg et al., 2006).

Concerning structural biosecurity, almost all the farms in this study did not have a footbath at the gate. This is not consistent with Racicot (2012), who reported that more than 90% of the farms provided workers with plastic footwear at the entrance gate, and around 85% of farms had footbaths for disinfection. Farm owners must be more conscious of the diseases carried by visitors' and farm workers' shoes. However, only a small number of chicken farms in this study forbade vehicles from entering the area and used tire spray or baths. This poses a severe risk because these trucks may have transmitted harmful microorganism across the farm (McQuiston et al., 2005).

Numerous poultry farms at Noakhali Sadar were disallowing visitor's access. It has been determined that human movement within farms is a significant risk key factor for poultry diseases like avian influenza (Vieira et al., 2009). A farm should only have one entrance to minimise the possibility of human movement (Ismael et al., 2021). The availability of dogs, cats and ruminants was ordinary across all types of a chicken farm. Most (63.64%) poultry farmers provide cat access to their chicken farms to help control rodents. However, cats may be able to spread virulent strains of Pasteurella multocida and Toxoplasma infection in chickens (Beltramea et al., 2012; Sambeek FV et al., 1995)

There were few waterfowl in the range when this survey was conducted, and this tendency implies that the distance between water bodies and sheds may impact the waterfowl in a specific range area. Coordinate contact with the chickens and waterfowl in particular zones can spread pathogens like the AI virus (Barnes et al., 2009). Despite not being common, pathogen transmission using aerial dispersion is additionally conceivable from LPAI-infected waterfowl (Swayne DE., 2008; Jonges et al., 2015). The presence and movements of waterfowl are known to be influenced by other additional factors; moreover, further study can be done on these topics, as well as others, like on-farm open space, feed, and rainfall (Atzeni M et al., 2016). The current study shows about 19 chicken farms out of 33 improperly disposed of chicken carcasses. In any case, carcasses of dead chickens and utilized litter must be disposed of rightly causes they are one of the significant sources of contagious agents (Van Limbergen et al., 2018; Wijesinghe et al., 2017).

The current assessment showed that more than half of the farms regularly cleaned and disinfected the sheds and surrounding from the perspective of operational biosecurity measures. A similar study reported that 88% of the farms practiced regular cleaning and disinfectant procedures (Birhanu et al., 2009).

There was a substantial inverse relationship between farmer perceptions of the necessity of wild bird-proofing sheds and wild bird-proofing shed compliance. Additionally, there was a strong negative correlation between the presence of wild birds in sheds and the farmer's perception of the significance of wild bird-proofing sheds. This indicates that farmers' perceptions of the necessity of wild bird management were poor. The lack of knowledge of the relevance of wild bird presence inside sheds in terms of infection transmission may be the cause of these relationships. These findings address the complicated issue of the factors that affect farmers' compliance with biosecurity requirements on farms; these aspects include perceived disease danger, practicability and advantages of the practice, and personality attributes

(Morrison et al., 2008). Several factors like complexity, responsibility, job experience, and education were found to be positively correlated with biosecurity compliance in studies conducted on Canadian chicken farms (Racicot et al., 2012).

In this study, a few factors, mainly farmers' ignorance, lack of training, knowledge about the disease, and financial problems, are pointed out to be the significant constraints of implementing an on-farm biosecurity protocol. Due to a lack of knowledge about the viruses that may be transferred from wild birds, there is likely a low perceived threat of wild bird presence within sheds, which contributes to the farmers' perception of the relevance of wild bird-proofing sheds low. Enhancing farmer adherence to biosecurity procedures that limit wild animal visitation to poultry farms is crucial for lowering the risk of introducing and spreading infectious diseases to poultry (Scott et al., 2016).

Conclusion

The above results have shown that most of the farms in Noakhali Sadar Upazila had deplorable biosecurity practices. According to the farmers' perception, most farms have said that maintaining biosecurity on the farm is not very important. But practicing biosecurity on farms is very important for the minority of farmers. As the farms of Noakhali Sadar Upazila do not maintain proper biosecurity, various diseases are reported, and Gumboro and Ranikhet diseases are more prevalent. There are many reasons for not practicing biosecurity in the study area, including lack of training, financial problem, and ignorance. In conclusion, this survey will give an overall scenario of farmers' perception and level of biosecurity practices in the study area. This information will further help to identify area needed to be improved in terms of biosecurity implementation.

Limitations

There were several limitations at the time of preparing this report. Notably, the duration of the study was minimal. There was not enough opportunity to work with farms outside a particular area. For this reason, the results of this report do not apply to the whole country, nor is it possible to present a realistic picture of the entire country in this report.

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