

**A clinical report on the occurrence of diseases in broiler at
Sitakunda, Chattogram in Bangladesh and their link with
biosecurity and effect on production**



A clinical report submitted by

Md. Omar Faroque

Intern id: 16

Roll No. 16/18

Reg. No. 01626

Session: 2015-2016

A report presented in partial fulfillment for the degree of
Doctor of Veterinary Medicine (DVM)

**Faculty of Veterinary Medicine
Chattogram Veterinary and Animal Sciences University
Khulsi, Chattogram-4225**

A clinical report on the occurrence of diseases in broiler at Sitakunda, Chattogram in Bangladesh and their link with biosecurity and effect on production



A Clinical report submitted as per approved by style and content.

Signature of the Author	Signature of the Supervisor
<p>Md. Omar Faroque Intern id: 16 Roll No. 16/18 Reg. No. 01626 Session: 2015-2016 Chattogram Veterinary and Animal Sciences University Khulsi, Chattogram-4225</p>	<p>Dr. Md. Ahaduzzaman Associate Professor Department of Medicine and Surgery Chattogram Veterinary and Animal Sciences University Khulsi, Chattogram-4225</p>

Content

Title	Page number
Content	3
List of tables	4
List of abbreviation	4
Abstract	5
Introduction	6-8
Methods and materials	9
Results	10-14
Discussion	15-16
Limitations	17
Conclusion	17
References	18-19
Acknowledgement	20
Biography	20
Questionnaire	21-22

List of tables

Topics	Table No
Prevalence of disease in broiler in Sitakunda, Chattogram	1
Antimicrobials used in broiler in Sitakunda, Chattogram	2
Antimicrobial's course in broiler in Sitakunda, Chattogram	3
Different aspects of biosecurity measurement of broiler farms in Sitakunda, Chattogram	4

Elaboration of all abbreviation

Abbreviation	Elaboration
NGO	Non-governmental organization
DLS	Department of livestock services
ND	Newcastle disease
CRD	Chronic respiratory disease
IBD	Infectious bursal disease
CMR	Crude mortality rate
HPAI	Highly pathogenic avian influenza
GPS	Grandparent stock
PS	Parent stock
FCR	Feed conversion ratio
Yr.	Year
Max.	Maximum
Min.	Minimum
CVASU	Chattogram Veterinary and Animal Sciences University

Abstract

A cross-sectional survey was conducted to observe the occurrence of diseases in small scale broiler farms and its link to biosecurity and effect on production at Sitakunda upazila of Chattogram district. . Data are collected from a preformed questionnaire from 23 broiler farms from February 2021 to May 2021. Results show that the most prevalent disease in study area was Newcastle disease (26.09%).None of the flock was raised without antibiotic and combined antibiotic is widely used (47.83%) to treat the infection. Analysis of biosecurity parameter found, 50% of farmers did not know what is biosecurity, 50% of the farmers did not use footbaths, 80% of the farmers did not provide hand washing for doctors or visitors, 100% of the farmers did not provide dedicated clothing to visit the farm, 86% farm had access of rodents, 21% farmers throw the dead bird in open space. Crude mortality rate (CMR) at day one was 38 per 1000 chicks. CMR during the brooding period was 6 per 1000 chicks. CMR after brooding period is 70 per 1000 birds, which is significantly higher than the CMR of brooding period ($P=0.004$).the number of birds ranged from 500 to 4000, the majority of the farm having 500 to 1000 birds. Almost more than, The results of the study suggest that biosecurity is a major issue in small and medium-scale poultry farming which needs to be addressed prevention of poultry diseases, protecting public health, and ensuring environmental hygiene.

Introduction

Bangladesh is one of a densely populated countries (1140 per square km) in the world where the majority of people lives in peri-urban and rural areas (SVRS Report-2020). In 2013, the per capita income of Bangladesh was 1044 USD based on economic review 2013, which uplifted to 2226 USD in 2021 according to economic review 2021. As the economic status of the people of Bangladesh is upgrading gradually, the demand for protein is also increasing. According to the census, a Bangladeshi consumes only 52.58 gram protein/ day which is low to meet our protein demand. According to the Dietary reference intake report, an adult should consume 0.8gm protein/day. Poultry, especially broiler chicken, is a substantial contributor to the supply of protein in Bangladesh as it is cheaper than other related protein sources. Broiler is produced in Bangladesh both in the household small scale and commercial large scale production system. The total population of broiler chickens is 525 million/year([Poultry sector study Bangladesh](#) (2020)). Most of the broiler farms are small-scale, ranging from about 500 to 1000 chickens per flock.

Small scale broiler farming in Bangladesh is gradually becoming more competitive and often passes turbulent periods sharing profit or loss. Intensified competition from the large scale producers and the public perception about small scale production may be dangerous reservoirs of the recent outbreak of Highly pathogenic avian influenza (HPAI) is also a reason to make small scale broiler farming more competitive(Elsedig E.A.A.)try farmers are poor therefore most of the poultry farms are small scale. Small scale poultry production is used by farmers to generate cash income and as a source of food for domestic consumption (Rana. K. M. A et al) however, the production sector is constrained by disease, predators, poor housing, poor management, lack of feed, low market prices and lack of markets. Small scale poultry farms seldom get training, vet care, vaccine, when they needed and reluctant to follow biosecurity probably due to lack of knowledge(KAWSAR . M.H. et al)

Biosecurity in poultry farms involves a set of fundamental practices and strategies. These measures prevent the entry and transmission of pathogens in the farms, thus minimizing the negative impact they can have on poultry production. In broiler farm, biosecurity conducts a lot of activities such as vaccination, use of disinfectant, footbath, personal hygiene, maintaining water quality, keeping visitors to a minimum, rodent control, proper disposal of dead birds, proper isolation procedure, litter removal, keep areas free and feed bin clean, fumigation, maintaining window period, etc. Biosecurity helps prevent the outbreak of disease and reduce risks, limit the spread of disease, keep out disease, decrease crude mortality rate, and enhance FCR. Biosecurity is mainly three types. 1) Conceptual biosecurity, the primary level of biosecurity which revolves around the location of animal facilities and their various components such as farms should not be near to locality, limiting the facility of vehicles, limiting access by personnel, and controlling the spread of wild animals 2) Structural biosecurity, the secondary level of biosecurity which deals with physical factors, such as farm layout, perimeter fencing, drainage, air filtration systems, enclosed load-outs, and housing design. Long-range planning and programming are important and should consider the on-site movement of vehicles, equipment, and animals; traffic patterns; and feed storage . 3) Operational biosecurity, the tertiary level of biosecurity which deals with routine procedures to prevent the introduction and spread of infection within a facility. Such processes and activities should be constantly reviewed as part of a disease control program and quickly adjusted in response to disease emergencies; likes include taking a shower or changing footwear and personal clothes with farm-dedicated clothes before entry into the farm, washing hands, and disinfecting equipment at the point of entry .

Biosecurity is a routine practice but it can play a great role in preventing outbreaks of a disease and it also helps in decreasing mortality in farms. aspergillosis, coccidiosis etc.. But there is a research gap in biosecurity in small-scale broiler production in Bangladesh. Therefore, this study was designed to achieve the following objectives.

Objectives:

- To know the present biosecurity status in small scale broiler farming in peri-urban areas
- To know the link between biosecurity and measures of disease and production

Materials and Methods



Figure: Sitakunda upazila, Cgattogram.

Study area and data collection

This study was conducted at Sitakunda Upazila of Chattogram district between February 2021 and April 2021 (Figure 1). A cross-sectional observational study was conducted to collect data associated with small-scale broiler farming. Data were collected through direct observation & interviews made with farmers using a structured questionnaire from 23 farms (Annex 1). Diagnosis of disease was based on post-mortem examination.

Data analysis

Data were recorded in Microsoft Excel and uploaded to JMP14 for analysis. A summary of statistics was conducted to estimate the frequency of categorical variables. The crude mortality rate is calculated as the number of deaths in a given period divided by the population exposed to the risk of death in that period and presented the results per thousand birds.

Results

Prevalence of different diseases: Results show that several diseases are prevalent in broilers at sitakunda Upazila of Chittagong district (Table 1). The most prevalent disease was ND which accounted in 6/23, 26.09% of farms.

Table 1: Prevalence of disease in broiler at Sitakunda in Chattogram district

Prevalent disease	N (%)
Brooder pneumonia	3(13.04)
Coccidiosis	1(4.35)
CRD	2(8.70)
CRD, IBD, Nephritis	1(4.35)
Heat Stress	1(4.35)
IBD, CRD	2(8.70)
IBD, E. Coli, Heat stress	1(4.35)
Mycoplasmosis	2(8.70)
ND	6(26.09)
ND, Heat stress	3(13.04)
Omphalitis	1(4.35)

Use of antimicrobials and their course: Different types of antimicrobials used for the treatment of broiler (Table 2). In most cases, multiple or combined antimicrobials are used (11/23, 47.83%). Apart from that Sulfur drugs (9/23,39%) and Ciprofloxacin (2/23, 8.70%) are commonly used. Most of the Antimicrobial's course was 5-7 days (17/23,73.91%) (Table 3)

Table 2: Uses of antimicrobials in broiler in Sitakunda, Chattogram

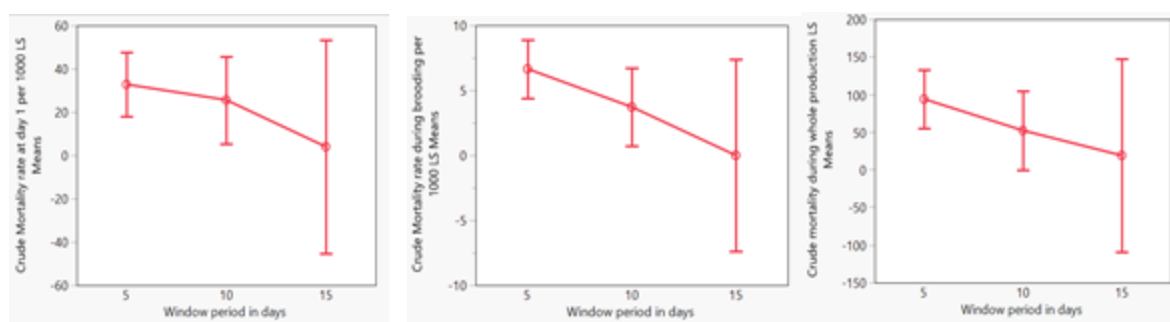
Names of Antimicrobials	N (%)
Ciprofloxacin	2(8.70)
Multiple	11(47.83)
Sulfar drug	9(39.13)
Tylosin	1(4.35)

Table 3: Antimicrobials Course in broiler in Sitakunda, Chattogram

Antimicrobial course (day)	N (%)
> 7-10	4(17.39)
3-5	1(4.35)
5-7	17(73.91)
6-7	1(4.35)

Crude Mortality Rate: Crude mortality rate (CMR) at day one was 38 per 1000 chicks. CMR during the brooding period was 6 per 1000 chicks. CMR after brooding period is 70 per 1000 birds, which is significantly higher than the CMR of brooding period ($P=0.004$). CMR during the whole production period was 76 per 1000 birds. No statistically significant difference was observed in CMR at day 1 ($P=0.36$), CMR during brooding ($P=0.47$) and CMR during the whole production period ($p=0.99$), based on fumigation protocol applied. Similarly, no significant effect on FCR ($P=0.08$). Window period had also no significant effect CMR at day 1 ($P=0.47$), CMR during brooding ($P=0.11$) and CMR during the whole production period ($p=0.28$) but a lower trends of mortality rate was observed in flocks where longer (10 to 15 days) window period was provided.

Graph 1: Graphs showing relation between Crude mortality rate and window period at day 1, brooding period, Window period in Sitakunda , Chattogram



Peri-urban broiler production system:

The mean number of birds per shed was 576 (Min 300 and Max 1000). The mean FCR is 1.39. Mean BW during selling is 1.78 ± 0.03 kg (Min 1.6 kg and Max 2.0 kg). The mean rearing period is 28 days (Min 25 days and Max 30 days). Farmers rely on both natural (12/23, 52%) and artificial (11/23, 47.83%) ventilation systems. No farm allowed the visitors to farm. 17/23, 73.91% of farm use foot bath, no farm provide dedicated cloth for Doctor, 1/23, 4.35% farm provide dedicated boot for farm, 6/23, 26.09% of farm use disinfectant before entering the farm and 86.96% have access to rodents. Farmers use several litter materials of which includes rice husk (9/23, 39.13%), wood shavings (12/23, 52.17%), and combination of them (2/23, 8.70) and all farmers turn litter (23/23, 100%) periodically after 28-30 days. Regarding to dead bird disposal, farmer dispose the bird by buried (11/23, 47.83), throw in drain (2/23, 8.70%), city corporation dust bin (4/23, 17.39%), open ground (5/23, 21.74%), and landfill (1/23, 4.70%). After the end of the batch, farmers maintained days 5 (13/23, 56.52%), 10 (9/23, 39.13%), and 15 (1/23, 4.70%) window period. Results also showed that 10/23, (43%) of farmers are more experienced than 5 yr. and 8/23 (34%) of farmers are experienced within 2-5 yr. 9/23 (39.13%) farmers did not receive any training and the remaining farmer received training from different NGOs and DLS. Farms in Sitakunda, Chattogram provide water to broiler farms from deep tube wells (19/23, 82.61%), deep wells (1/23, 4.70%), supply line (3/23, 13%).

Table 4: Different aspects of biosecurity measurement of broiler farms in Sitakunda, Chattogram

Different Biosecurity measurement	Traits	n (%)
Age of farm and farming experience	<1 year	2 (8.70)
	≥1 to <2 years	3 (13.04)
	≥2 to 5 years	8 (34.78)
	≥5 years	10 (43.48)
Training received	DLS	3 (13.04)
	NGO	6 (26.09)
	Both DLS and NGO	5 (21.74)
	No training	9 (39.13)
Ventilation system	Natural	12 (52.17)
	Both Natural and artificial (fan)	11 (47.83)
Visitors allowed	Yes	0(0)
	No	23(100)
Dedicated boot for shed	Yes	1 (4.35)
	No	22 (95.65)
Disinfectant used	Yes	6 (26.09)
	No	17 (73.91)
Litter materials	Rice husk	9 (39.13)
	Wood shavings	12 (52.17)
	The mixture of rice husk and wood shavings	2 (8.70)
Turning of litter	Yes	23 (100)
	No	0 (0)
Foot bath	Yes	17 (73.91)
	No	6 (26.09)
Hand wash/soap	Yes	6 (26.09)
	No	17 (73.91)

Dedicated cloth for doctor	Yes	0 (0)
	No	23 (100)
Maintain farm record	Yes	23 (100)
	No	0 (0)
Rodent	Yes	20 (86.96)
	No	3 (13.04)
Water source	Deep well	1 (4.35)
	Tube well	19 (82.61)
	WASA/supply line	3 (13.04)
Disposal of dead birds	Buried	11 (47.83)
	City corporation dust bin	4 (17.39)
	Drain	2 (8.70)
	Open ground	5 (21.74)
	Landfill	1 (4.35)
Fumigation after the end of the batch	Yes	8 (34.78)
	No	15 (65.22)
Window period (days)	5	13 (56.52)
	10	9 (39.13)
	15	1 (4.35)

Discussion

This study was conducted at Sitakunda upazila of Chattogram to explore the biosecurity status and its practices to relate with disease occurrence and production status.

In the study area the most prevalent disease was ND in adult birds (%) and brooder pneumonia (13.04%) in chicks. Another Study in Gazipur showed that in broiler the prevalence of Colibacillosis (33.4%) was higher followed by Omphalitis (23.8%), Infectious Bursal Disease-IBD (15.3%), Newcastle disease-ND (9.0%), mixed infection (7.4%), Gout (5.3%) and Coccidiosis (5.8%) (Md Arifur Rahman et al, 2017). Between Sitakunda, Chattogram, and Gazipur, the prevalence of the disease is different which might be due to geographical distribution.

In Sitakunda, Chattogram most of the farms use multiple antimicrobials (47.83%) and followed by Sulfur drugs (39.13%), Ciprofloxacin (8.70%), and tylosin (4.35). In another study of broiler farming in Nepal, The most commonly used antibiotics for treatment were tylosin (47%), colistin (47%), and dual antibiotic therapies with neomycin and doxycycline (33%). 26% of farms were using more than two antibiotics. (Ananta Koirala et al, 2021). In Nepal, Most of the farms use Tylosin but in Sitakunda, Chattogram only 4% of farms use it. On the other hand in both studies use multiple antimicrobials at a somewhat similar rate.

Crude mortality rate (CMR) at day one is 38 per 1000 chicks (3.8%) where 2% mortality is observed at day one (G.T. Tabler et al, 2004). Here, statistically calculated results show more mortality, it might be caused by mismanagement. CMR during the brooding period is 6 per 1000 chicks (6%), where the crude mortality rate in the brooding period is 7.6% (OK Awobajo et al, 2007) which is quite similar to the calculated result. There is no statistically significant difference between CMR on day 1 and at brooding period. The window period had also no significant result between CMR at day 1 and brooding period but there was a trend to low mortality when flock size is larger.

The results show that almost 4% of farmers have more than 5 yr. Experience and 34.78% have 2-5 yr. experience of farming. Almost 40% of farmers didn't receive any training. Tanzin et al (2019) stated that 65% of farmers did not receive training and 35% of farmers received training from different organizations.

In Sitakunda, Chattogram, 73.91% of farm use foot bath, no farm provide dedicated cloth for Doctor, 4.35% of farm provide dedicated boot for farm, 26.09% farm use disinfectant before entering the farm and 86.96% have access to rodents which indicate that most of the farms are at risk of disease transmission. M. M. Rahman et al (2017) stated that 9% of farms use foot bath at farm gate, 3% of farms provide dedicated cloth for the doctor, 13% provide shoes at shed entry, 48% use disinfectant at farm gate a, 93% farm has access to rodents and 100% farm maintain farm record.

Regarding Dead bird disposal, almost 48% of farmers buried, 22% place the dead bird in open ground, 17% use City Corporation Dust bin, 8% of farmers rush dead bird in the drain and 5% of farmers rush to landfall. According to Debashis Sarkar et al (2021), 32.26 % of farms are buried, 61.29% of farms are thrown up, 3.23 % produce Biogas, and 3.2 % use the dead bird as fish feed.

Limitation

- The number of farms was too small which isn't reflecting the whole population.
- The duration of the study period was too short to collect data.

Conclusions

This study shows a very clear picture of biosecurity management and its relation to the occurrence of diseases among small and medium-scale broiler farming in Bangladesh. Hope that this study may play a role to establish a standard practicable biosecurity protocol for small and medium-scale broiler farming in Bangladesh.

References

[Poultry sector study Bangladesh \(2020\)](#)

Elsedig E.A.A. , MI Mohd, Fatimah M.A. [Assessing the competitiveness and comparative advantage of broiler production in Johor using policy analysis matrix.](#)

Huque S.H., M. A. Saleque M. A, Khatun r. [Commercial poultry production in Bangladesh](#)

KAWSAR H.A. , CHOWDHURY D. H., RAHA K.S. and HOSSAIN M. A [An analysis of factors affecting the profitability of small-scale broiler farming in Bangladesh](#)

Rana A.A.M.K., M. S. Rahman and M. N. Sattar N.K. (2012) [PROFITABILITY OF SMALL SCALE BROILER PRODUCTION IN SOME SELECTED AREAS OF MYMENSINGH](#)

Md Arifur Rahman, Md Mostafijur Rahman, Monalisha Moonmoon, Khondoker Jahengir Alam, Md Zahirul Islam (2017) [Prevalence of common diseases of broiler and layer at Gazipur district in Bangladesh](#)

Ananta Koirala, Priyanka Bhandari, Hemant Deepak Shewade, Wenjing Tao, Badri Thapa, Robert Terry, Rony Zachariah, and Surendra Karki (2021) [Antibiotic Use in Broiler Poultry Farms in Kathmandu Valley of Nepal: Which Antibiotics and Why?](#)

Debashish Sarker, Nasima Akter and Marjina Akter (2021) [Analysis of poultry waste management system among selected farmers of Bagmara upazila, Rajshahi, Bangladesh](#)

[SVRS REPORT\(2020\)](#)

[ECONOMIC REVIEW \(2021\)](#)

HOSSAIN, KAZOL, SHAHADAT, MOHD (2019) [Scenario of the broiler farm biosecurity at Satkania upazila in Chattogram, Bangladesh.](#)

TANZIN, ABU ZUBAYER (2019) [Knowledge and Awareness Level Regarding Bio-Security Among Small Scale Poultry Farm in Noakhali.](#)

GILINSKY, E. (2006) [Biosecurity Procedures for Poultry Farm Visits. Guidance Memo, \(06-2005\).](#)

SHARMA, B. (2010) [Poultry production, management and biosecurity measures. Journal of Agriculture and Environment](#)

OK AWOBAJO et al (2007) [The mortality rate in the two breeds of broiler on brooding stage](#)

G.T. TABLER et all (2004) [Mortality Patterns Associated with Commercial Broiler Production](#)

Acknowledgment

All praises are due to the Almighty, whose blessings have enabled the author to accomplish this work. The author expresses his wholehearted senses of gratification, a sincere appreciation to his respected teacher and supervisor, **Dr. Md Ahaduzzaman**, Associate Professor, Department of Medicine and Surgery, Faculty of Veterinary Medicine Chattogram Veterinary and Animal Sciences University, whose ingenious and scholastic advice, judicious recommendations, constructive criticism, continuous encouragement, and untiring assistance have guided the author from the beginning of the inception of intern studies until to the completion of this report. The author also thanked the farmer who gave information for this study.

Biography

I am Md. Omar Faroque , son of Md. Abul Kasem and Farida Yesmin. I have passed my Secondary School Certificate (SSC) examination from Kutubdia Model High School, Cox's Bazar in 2012, and Higher Secondary Certificate (HSC) examination from Govt. City College, Chattogram in 2014. I enrolled for a Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU) Bangladesh during the 2015-16 session. I have an immense interest in joining the Bangladesh Civil Service (BCS).

Questionnaire

Occurrence of diseases in broiler at Sitakunda in Bangladesh and their link with biosecurity and effect on production

Farm/owner name:

Mobile number:

Location:

Age of farm (year):

Distance from locality:

Experience of farmer (in year):

Any training receive (from where):

Participate in regular training:

Yes/No

Number of bird per shed:

Area of shed:

Housing system:

Housing materials:

Ventilation type:

Type of curtain:

Curtain keep open (hour)/day:

Number of shed in farm:

Visitors allowed: Yes/No

Disinfectant for visitor or doctor available: Yes/No

Provide boot for doctor/visitor: Yes/No

Distance between sheds and if any things around shed (e.g. tree/pond):

Litter materials used:

New litter or partial used litter:

Remove manure frequently from farm: Yes/No

After how many days:

Disposal of used litter (where):

Foot bath use: Yes/No

if yes: Name:

Provide hand washing: Yes/No

if yes: Name:

Dedicated cloth use to visit farm: Yes/No

Maintain farm record: Yes/No

Rodent in farm (seen): Yes/No

Age of vaccination and vaccines provided with route (e.g. ND at day 0 by spray).....

.....

.....

Feed source: commercial or self-made

Water source:

Routine cleaning of feeder and waterer (day) and water source:

Any antibiotic use in feed or water after the arrival of chick and routinely.....

.....

Number of chick death after arrival to farm

Number of chicks dead during brooding period:

Disposal of bird after mortality (where and distance from farm):

Age of first infection shown by farmer before coming to you or fresh case:

Record of previous infection:

.....

Previous treatment history (medicine used with dose).....

.....

Average number of death per day due to previous infection:

Recovered after previous treatment: Yes/No

Previous treatment provided by: Vet/Non-vet

Current diagnosis:

Bird age:

Any visitors within the few days of infection: Yes/No If yes: when (day):

Current treatment.....

.....

Days required to recover:

Mortality rate after this treatment (number/day).....

Any other infection after this treatment (specify details with age) and before selling with treatment provided.....

.....

Age of selling:

Average weight per bird during selling:

Total cost for this flock:

Total income from this flock:

FCR if known:

Fumigation/ disinfecting the house after end of batch: Yes/No

Window period for next batch (next batch come after how many days):

