CHAPTER-I
INTRODUCTION

Poultry industry plays an important role in economic development and poverty alleviation of Bangladesh. The total chicken population is steadily increasing from about 143 million birds in 2001 to 195 million birds in 2006 (Dolberg, 2008) with growth rate of about 6.25% per year (Saleque, 2007). Normal requirement of animal protein as meat for a man is about 62.5 gm per day (Jabber, 1983). This sub-sector has proved as an attractive economic activity. Thereby, indicating its` importance for the entire economy. The sector accounts for 14% of the total value of livestock output and is growing rapidly (Saleque, 2009). It is reported that poultry meat alone contributes 37% of the total meat production in Bangladesh. Poultry contributes about 22-27% of the total animal protein supply in the country (Raihan, 2008). Besides Poultry farming in Bangladesh is now considered as a growing industry. It is an integral part of farming system in Bangladesh and has created direct, indirect employment opportunity including support services for about 6 million people (Ansarey, 2012). Poultry production is generally acknowledged as the most efficient and cost-effective way of increasing the availability of high protein food (FAO, 1987). Eggs have long been presented as the standard reference food that is perfectly balanced, containing most essential amino acids, minerals and vitamins. Approximately 11.5% of daily protein requirement and 5% of daily energy requirement is provided by one egg (Branckaert *et al*., 2000).

Among poultry, broiler rearing attributed its popularity to the farmers for its short life span and comparatively low capital investment (Raha, 2007). Broiler farming has also been playing a key role in providing meat containing high quality proteins and micronutrients, which has a tremendous impact on health and nutrition for the poor people in rural areas (Neumann et al 2002) and (Barroeta, 2007). Poultry meat production has had the largest expansion by a factor of four from 105 metric tons in 1992 to 420 metric tons in 2007. In 2006, total consumption of poultry meat is 5.9 kg per capita with 3.9 kg (66%) coming from the commercial broiler production sector (Dolberg, 2008).

Though the expansion and development of the poultry industry is remarkable but mortality of chickens due to outbreak of several infectious and non-infectious diseases are the major constrains for development of profitable poultry production in Bangladesh. Ali (1994) reported that almost

30% mortality of chickens in Bangladesh is due to outbreak of several infectious diseases. Outbreaks of concurrent diseases in poultry farm significantly affect the productivity and health status of the birds (Chanie *et al*. 2009). The prevalence of diseases in a particular area depends on various factors like geo-climatic condition, bio-security, management and husbandry practices, immunization, social awareness, etc. To establish commercial poultry farms, the incidence of poultry diseases of the area should be considered for prevention and control of the diseases. Considering the above facts the present study was undertaken to study the prevalence of the infectious & non-infectious diseases in both broiler & layer chickens. The present study was undertaken to investigate (post mortem) the causes of mortality and to find out the cause of reduction of production in poultry in Bangladesh.

Objectives:

1. To diagnose the poultry diseases by clinical findings and post-mortem examination in the study area.
2. To estimate the prevalence of the diseases of poultry at Upazilla Veterinary Hospital, Mirasarai under Chittagong district of Bangladesh.

CHAPTER-II
REVIEW OF LITERATURE

Literature on various aspects of diseases of poultry is highly voluminous, so only related literatures are reviewed in this Chapter.

2.1 Occurrence of infectious diseases of poultry

Ahmed *et al*. (2009) conducted an investigation on 199 broiler chickens in Gazipur district showed that Colibacillosis is the major problem for broiler production with a prevalence of 52.3%. Other prevalent diseases are Mycoplasmosis (12.6%), Omphalitis (11.6%), Infectious Bursal Disease (11.1%), Coccidiosis (4.5%), salmonellosis (1.1%) and mixed infection of IBD and Coccidiosis (1.5%).

Yunus *et al*. (2009) conducted a study in Chakwal district of Pakistan showed in broilers, incidence of Coccidiosis, ascites, and IBD decreased with increase in flock size, while Coccidiosis was the most prevalent disease during 2nd and 3rd week of their life. Incidence of Newcastle Disease, Mycoplasmosis and respiratory diseases increased linearly with increase in age of the broilers.

Rahman *et al*. (2007) reported among bacterial diseases salmonellosis (53.9%), Omphalitis (28.4%), Colibacillosis (13.3%), Mycoplasmosis (2.5%), necrotic enteritis (1.1%) and Infectious Coryza (0.59%) were found in chickens.

Islam *et al*. (2003) conducted a pathological investigation on poultry diseases in Sylhet region reported poultry diseases occur mostly in rainy season (56.3%), followed by summer (28.1%) and least in winter season (15.5%). IBD (24.2%) and Aspergillosis (17.5%) are the major prevalent diseases.

Saleque *et al*. (2003) reported Colibacillosis (26.6%), salmonellosis (24.2%), IBD (45.3%), ND (0.9%), Coccidiosis (1.9%) and Aspergillosis (1.1%) found in broiler chickens.

Rahman and Samad (2003) showed the pattern of occurrence of single disease infection (76.30%) and mixed infections (23.7%) of two (21.5%), three (1.8%) and four (0.3%) were associated with mortality of chickens in Bangladesh.

Giasuddin *et al*. (2002) reported incidence of Aflatoxicosis (27.5%) was highest followed by nutritional deficiency (12.4%), IBD (11.8%), Chronic Respiratory Disease (8.1%), ND (7.5%), salmonellosis (5.6%), Colibacillosis (94.4%), and fowl cholera (3.1%).

Talha *et al*.(2001) conducted necropsy of 381 cases of either dead or sick birds and observed IBD in 19.2%, ND in 10.2%, lymphoid leucosis in 1.6%, Colibacillosis in 5.5%, Infectious Coryza in

0.5%, Mycoplasmosis in 8.6%, Aspergillosis in 4.2%, Aflatoxicosis in 1.1%, deficiency disorder in 8.1% and miscellaneous diseases condition in 7.1% .

2.2 Clinical signs and post-mortem findings

2.2.1 Colibacillosis

Ewers *et al*. (2003) stated that infections with pathogenic *E. coli* (APEC) cause Colibacillosis, an acute and mostly systemic disease characterized by multiple organ lesions with air saculitis, pericarditis, perihepatitis and peritonitis resulting in significant economic losses in poultry industry worldwide.

Hanson *et al*. (2001) pointed that cellulitis can develop at any age of bird, and the lesions were frequently associated with other manifestations of Colibacillosis (pericarditis, perihepatitis, airsacculitis) in birds challenged from four to sixteen weeks of age.

Gross (1994) categorized the various pathological menifestations as yolk sac infection, air sac disease, bacteraemia, salpingitis, peritonitis, swollen head syndrome, cellulitis, enteritis, synovitis and osteomyelitis.

2.2.2 Salmonellosis

Samad (2005) reported in salmonellosis petechial haemorrhage or focal necrosis in the liver and spleen along with bronze discoloration are typical.

Whiteman *et al*. (1989) stated in pullorum disease classically there are gray nodules in one or more of the following sites: lung, liver, gizzard wall, heart, intestinal or caecal wall, spleen, peritoneum.

Chishti *et al*. (1985) reported that post-mortem lesion of pullorun infection which included bronze discoloration of liver (75%), mottling (25%), hemorrhagic (60%) and necrotic foci (11%). In infection due to *Salmonella gallinarum* the liver showed bronze discoloration (60%), mottling hemorrhage (45%) cases and necrotic foci (10%).

2.2.3 Omphalitis

Kahn *et al*. (2008) said that Omphalitis is a condition characterized by infected yolk sacs, often accompanied by unhealed navels in young fowl. It is infectious but non-contagious and affected chicks or poults usually appear normal until a few hours before death. Depression, drooping of the head, and huddling near the heat source usually are the only signs. Opportunistic bacteria (Coliforms, *Staphylococci*, *Pseudomonas spp, and Proteus spp*.) are often involved, and mixed infections are common.

Kamal (1989) described the necropsy lesions of Omphalitis as curled and considerably thicken unabsorbed yolk in all chicks. The covering of yolk appeared to be highly inflamed, thickened and edematous. The blood vessels around yolk were highly congested and hemorrhages were also evident in these areas. The livers in few chicks were markedly pale.

2.2.4 Mycoplasmosis

Whiteman *et al*. (1989) sited a history of chronic respiratory diseases accompanied by lowered feed consumption, poor gains or lowered egg production is suggestive of *Mycoplasma gallisepticum*.

Nunaya *et al.* (1995) Respiratory rales, sometimes coughing, ocular and nasal discharges characterize the disease but may often be confused with other diseases.

Bradburry (2001) stated gross lesions of respiratory tract may be almost rarely visible or consist of excess mucous and catarrhal exudates in nasal and Para nasal passages trachea bronchi and air sacs.

Rodrigues *et al*. (2001) reported in mixed infection with *E. coli* the pathological changes are gastroenteritis, hepatomegaly, hemorrhages on liver few pale colored foci, perihepatitis and congestion of kidneys. In addition hemorrhages in lungs exudates and linear hemorrhages in trachea, cloudiness and marked edema in the facial subcutis and eyelids due to exudation are also found.

2.2.5 Coccidiosis

Boado *et al*. (1991) reported Coccidiosis could occur at any stage of the chicken's life and during any season of the year. However, it was found to be more prevalent in summer season.

Kahn *et al*. (2008) said that *Eimeria tenella* infections are found only in the ceca and can be recognized by accumulation of blood in the ceca and by bloody droppings. *E. acervulina*, the most common infection, is characterized by numerous, whitish, oval or transverse patches in the upper half of the small intestine and may be easily distinguished on gross examination. *E. brunette* is found in the lower small intestine, rectum, ceca, and cloaca. *E. maxima* develop in the small intestine, where it causes dilatation and thickening of the wall; petechial hemorrhage; and reddish, orange, or pink viscous mucous exudates and fluid.

2.2.6 Infectious Bursal Disease

Whiteman *et al*. (1989) stated IBD is an acute, contagious, viral disease of young chickens characterized by diarrhoea, vent pickling, trembling, incoordination, inflammation followed by atrophy of the bursa of fabricious and a variable degree of immunosupression.

Calnek (1997) reported that the incubation period of IBD is very short and clinical signs of the disease are seen within 2-3 days. It is characterized by thigh muscle hemorrhage, swollen and edematous bursa, high morbidity and mortality in chickens.

Butcher and Miles (2001) found IBD occurred in two form sub-clinical form and clinical form, depending on the age at which chickens were infected. The subclinical form occurred in chickens less than 3 weeks of age. The clinical signs of the disease include dehydration, trembling, ruffled feathers, vent pecking and depression. Initially the bursa of fabricius was swollen (inflamed); appears edematous and hyperemic and had a gelatinous, yellowish transudate covering the aerosol surface.

2.2.7 Newcastle disease

Alexander DJ (2008) said that ND virus strains are grouped into 5 pathotypes based on the clinical signs induced in chickens (i) Viscero tropic velogenic cause a high virulent form of disease in which haemorrhagic lesions are characteristically present in the intestinal tract (ii) Neurotropic velogenic cause high mortality following respiratory & nervous signs (iii) Mesogenic cause respiratory and sometimes nervous signs with low mortality (iv) Lentogenic respiratory cause mild or inapparent respiratory infection and (v) Asymptomatic enteric cause inapparent enteric infection.

Whiteman *et al*. (1989) stated at necropsy hemorrhagic or necrotic focal lesions are present in the mucosa of the intestine. Hemorrhages occasionally occur on the mucosal surface of the provetriculus. Caecal tonsils often are necrotic and hemorrhagic.

Chakrabaarti (1993) said that though there was no age restriction as regard infection but the young birds are more susceptible over the old birds. The post-mortem findings of ND were congestion, petechiation, cellular infiltration of iris and anterior chamber of eye, air sacculitis, cloudiness of air sac, edema, exudation, hypertrophy of mesothelium, pin point (petechial) haemorrhage on the apex of proventricular glands, haemorrhage under the horney layer of the gizzard, ulceration or bran like deposition in intestine.

2.2.8 Aspergillosis

Boado *et* al (1914) recorded nodules in the lungs and the thoracic and abdominal cavities of chickens. The lesions depend considerably on the site of infection. Either localization/generalization may be observed. Individual lesions may be observed for example, in the syrinx or in a single air sac. The lungs are most frequently involved. Pulmonary lesions vary from miliary nodules up to larger nodules. In some cases there may be localized hepatization, and in others grossly visible mycelia masses may be present in the air passages and bronchi. There may be generalized involvement of the air sacs. Occasionally a circular disc-shaped necrotic mass with a concave surface, loosely attached to which there is a circular more or less flat or convex plaque, may be observed. Various manifestations of the disease have been described.

CHAPTER –III
MATERIALS AND METHODS

3.1 Study area

The study was undertaken at Upazilla Veterinary Hospital, Mirasarai of Chittagong district of Bangladesh.

3.2 Study period

The study was conducted within the period of February to March, 2018. All the procedures like data collection, post mortem, result analysis etc. are done within this period.

3.3. Data collection

Information about the management system and clinical signs exhibited by an individual bird during illness were recorded as provided by the respective poultry farm owners and staff through questionnaire. Beside this, name of the strains of birds, number of birds in farm, age of bird, vaccination record, and diseases found in the batch, name of vaccine used, number of birds died, treatment measures if taken were also recorded.

3.4 Working procedure

Post-mortem examinations of the dead and affected birds were done in the Veterinary Hospital of Ramu Upazilla under the guidance of Veterinary Surgeon. A total of 61 cases broiler birds and 18 cases layer birds were examined during the study period. Necessary information and data related to the diagnosis was taken from the farmers and workers of the farm.

3.6 Post-mortem examination

Post mortem examination of dead and clinically ill birds supplied to the veterinary hospital was done and diseases were recorded. The birds were examined systematically and gross pathological changes were observed and recorded carefully. Final diagnosis of the diseases was done based on clinical history, clinical signs and post-mortem findings.

Clinical signs and post-mortem findings were considered to fix a diagnosis for a particular disease are mentioned in Table -1 and Figure-1.

Table -1: Clinical signs and post-mortem findings of different diseases of poultry

Name of the disease	Clinical signs	Post-mortem findings
Colibacillosis	o Listless and ruffled feathers o Reduced food and water intake o Huddling at corner of the shed o Loss of body weight o Brown color droppings	o Distended and soft abdomen o Pericarditis (Figure-1.11) o Perihepatitis o Air sac infection o Omphalitis o Edema in the body cavities o Swollen and inflamed intestine
Salmonellosis	o Ruffled feather o Whitish to greenish diarrhea o Chalky white excreta adhered with the vent o Anemic comb and wattle	o Enlarged liver and spleen showing congestion and necrotic foci o Unabsorbed and inflamed yolk sac o Misshapen eggs (Figure-1.3)
Omphalitis	o Lathergic o Depressed and o Poor growth performance	o Distended and soft abdomen o Thickened and unabsorbed yolk o Cloudy and malodorous abdominal content o Blood vessels around the yolk were highly congested
Coccidiosis	o Ruffled feather o Poor growth o Bloody diarrhea and anaemia o Vent picking	o Caeca filled with blood tinged contents (Figure-1.7) o Caecal wall show patchy hemorrhages o Diffuse hemorrhagic striation throughout the intestine

Name of the disease	Clinical signs	Post-mortem findings
Newcastle Disease (ND)	o Depression and prostration o Loss of appetite o Greenish/yellowish diarrhea o Incoordination o Twitching of neck	o Pin point haemorrhage at the tip of the proventicular glands. (Figure-1.9) o Haemorrhagic/diptheric ulcers on the intestine and caecal tonsils o Congested trachea (Figure-1.8)
Infectious Bursal Disease (IBD)	o Soiled vent and feathers o Whitish and watery diarrhea o Anorexia, trembling severe prostration and death.	o Swollen and edematous bursa with necrotic mass. (Figure-5) o Haemorrhages in the thigh and breast muscles (Figure-4) o Haemorrhage at the junction of proventiculas and gizzard o Nephrosis
Avian Influenza	o Decreased egg production o Coughing, sneezing, o rales, lacrimation & sinusitis	o Thickened air sacs & contain fibrinous or caseous exudates o Edema of tracheal mucosa o Cyanosis, congestion , hemorrhages on wattle, combs & legs
Visceral gout	o Ruffled feather & moist vent o Sometimes greenish diarrhea o Depression, dehydration	o Swollen kidney o Urate crystals deposited in liver, kidney, air sac, joints, pericardium (Figure-6)
Aspergillosis	o Dysponea, gasping, labored breathing.	o Yellow white pin point hemorrhage in body cavities o White caseous nodule in the lung or air sac.(figure 2)

Figure 1.1: Postmortem of Broiler

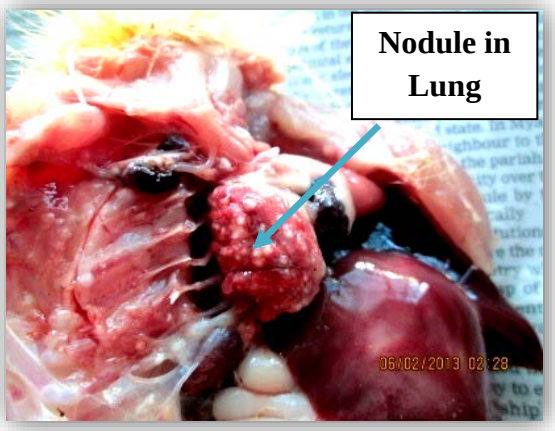

Figure.-1.2 Aspergillosis

Figure-1.3 Salmonellosis

Figure-1.4 Thigh Muscle

Figure-1.5 Gelatenous

Figure- Infectious Bursal Disesase

Figure-1.6 Visceral Gout

Figure-1.7 Cecal Coccidiosis

Figure 1.8 Congested Trahea

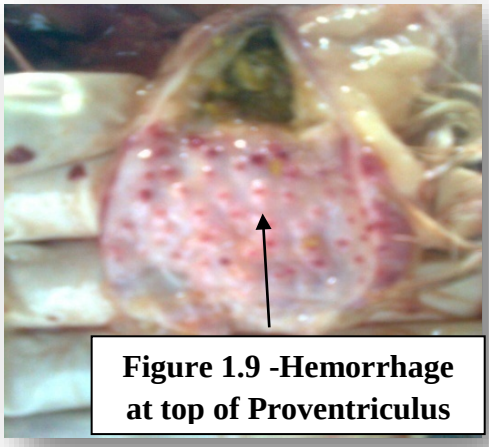

Figure 1.9 -Hemorrhage at top of Proventriculus

Figure -Newcastle Disease

Figure 1.10- Avian Inflenza

Figure 1.11-Collibacillosis

3.7 Statistical analysis

Data were imported and stored in Epi- info Software,Version 3.5.4. Descriptive statistics were performed by using Microsoft Excel-2007.

CHAPTER-IV

RESULTS

A total number of 79 cases of which 61 were broilers and 18 layers were examined through the entire study period. The prevalence of Infectious Bursal Disease (31.2%, 16.7%) and Newcastle disease (24.6%, 11.2%) Colibacillos (13.2%, 16.7%), Coccidiosis (11.5%, 11.2%), Omphalitis (9.8%, 11.1%), Aspergillosis (4.92%, 5.6%), Visceral Gout (3.3%, 5.6%), salmonellosis (1.6%, 22.2%) were found in broiler and layer respectively. Prevalence of the different diseases of broiler and layer are given in Table- 2.

Table -2: Prevalence of different diseases of poultry (broiler and layer)

Sl. No.	Name of Diseases	Prevalence of Poultry Diseases (%)(N=61)				P-Value
		Broiler (61)		Layer 18)		
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)	
01	**Infectious Bursal Disease (IBD)**	19	31.2	3	16.7	**0.228**
02	**Newcastle Disease (ND)**	15	24.6	2	11.2	**0.221**
03	**Colibacillosis**	8	13.2	3	16.7	**0.702**
04	**Coccidiosis**	7	11.5	2	11.2	**0.965**
05	**Omphalitis**	6	9.8	2	11.2	**0.874**
06	**Aspergillosis**	3	4.3	1	5.6	**0.914**
07	**Visceral Gout**	2	3.3	1	5.6	**0.657**
08	**Salmonellosis**	1	1.5	4	22.3	**0.002**
Total		**61**	**100**	**18**	**100**	

***P-Value = level of significance at 95 % confidence interval**

Table -3: Prevalence of different diseases of broiler in relation to age (N=61)

Sl. No.	Name of Diseases	Prevalence of Broiler Diseases (%)								P-Value
		Age Group (Days)								
		0 - 7		8-14		15-21		>21		
		No.	%	No.	%	No.	%	No.	%	
01	**Infectious Bursal Disease (IBD)**	0	0	2	3.3	5	8.20	12	19.8	**<0.000**
02	**Newcastle Disease (ND)**	0	0	2	3.3	7	11.5	6	9.9	**0.025**
03	**Colibacillosis**	1	1.5	0	0	4	6.6	3	4.8	**0.160**
04	**Coccidiosis**	1	1.6	2	3.3	0	0	4	6.6	**0.161**
05	**Omphalitis**	6	9.9	0	0	0	0	0	0	**<0.000**
06	**Aspergillosis**	1	1.7	1	1.7	1	1.7	0	0	**0.798**
07	**Visceral Gout**	0	0	1	1.7	1	1.7	0	0	**0.569**
08	**Salmonellosis**	1	1.7	0	0	0	0	0	0	**0.390**
Total		**10**	**16.4**	**8**	**13.2**	**18**	**29.5**	**25**	**40.9**	

***P-Value = level of significance at 95 % confidence interval**

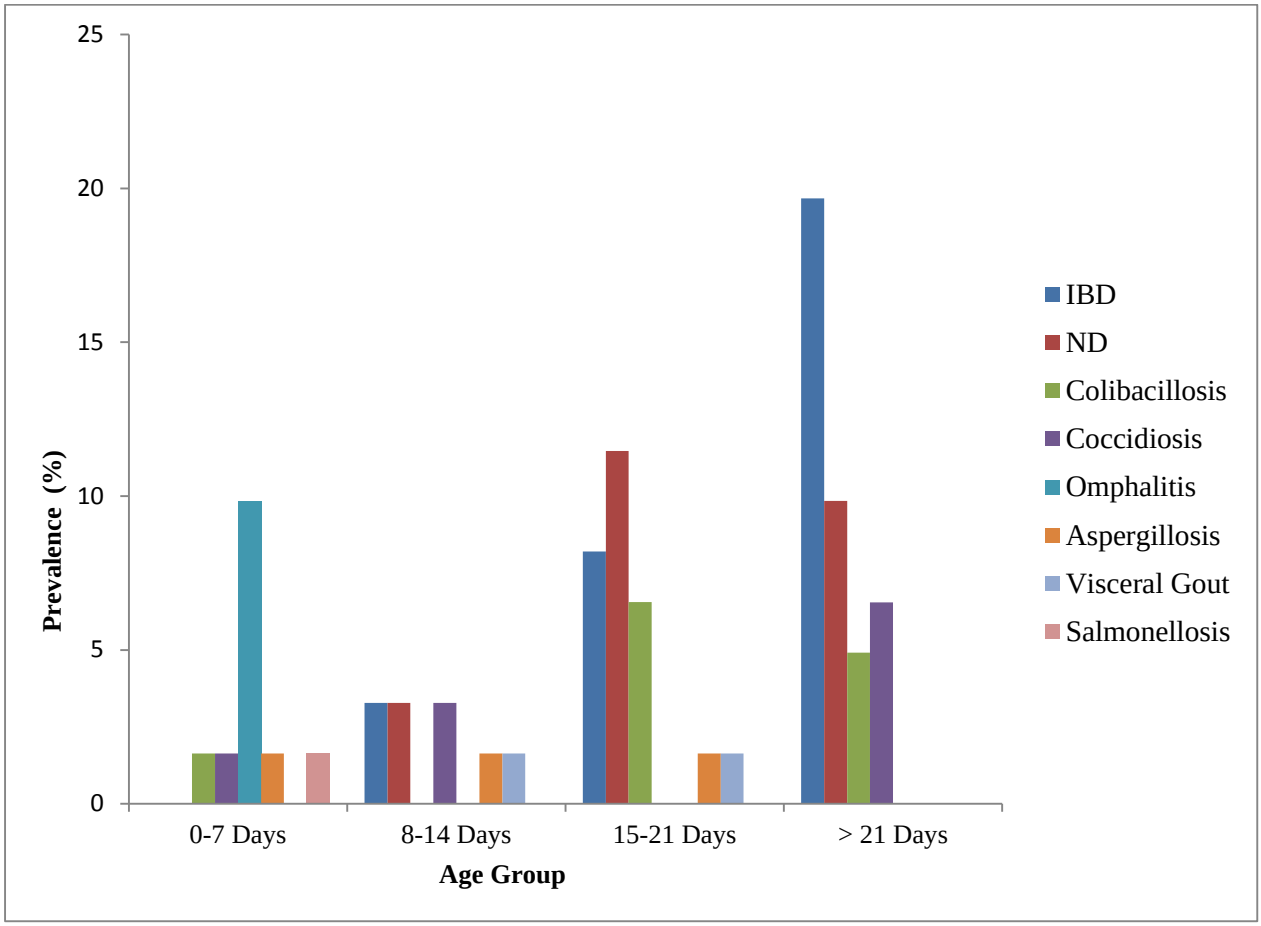

Fig.-2: Prevalence of different diseases of broiler in relation to age

The fig.- 2 showing that the highest number of cases was recorded in the age group of > 21 days (40.7%), followed by the age group of 15-21 (29.6%), 0-7 (16.5%) and 8- 14 days (13.3%) . Higher prevalence of IBD (16.7%) in > 21 days, ND (11.5%) in 15- 21 days, Colibacillosis (6.6%) in 15- 21 days, Coccidiosis (6.6%) in > 21 days , Omphalitis (9.9%) in 0-7 days, Aspergillosis (1.7%) in 0-7, 8-14 and 15-21days, Visceral Gout (1.7%) in 8-14, 15-21 days and Salmonellosis (1.7%) in 0-7 days were recorded .

Table 4: Prevalence of different diseases of layer in relation to age (N=18)

Sl. No	Name of Diseases	Prevalence of Layer Diseases (%)						P-Value
		Age Group						
		Grower (0- 8 wks)		Pullet (9-20wks)		Layer (>20 wks)		
		No.	%	No.	%	No.	%	
01	**Infectious Bursal Disease (IBD)**	2	11.2	1	5.6	0	0	**0.347**
02	**Newcastle Disease (ND)**	0	0	0	0	2	11.2	**0.125**
03	**Colibacillosis**	1	5.6	1	5.6	1	5.6	**1.00**
04	**Coccidiosis**	1	5.7	1	5.6	0	0	**0.595**
05	**Omphalitis**	2	11.2	0	0	0	0	**0.125**
06	**Aspergillosis**	1	5.6	0	0	0	0	**0.361**
07	**Visceral Gout**	0	0	0	0	1	5.6	**0.361**
08	**Salmonellosis**	0	0	2	11.2	2	11.2	**0.339**
Total		**7**	**38.9**	**5**	**27.8**	**6**	**33.5**	

***P-Value = level of significance at 95 % confidence interval**

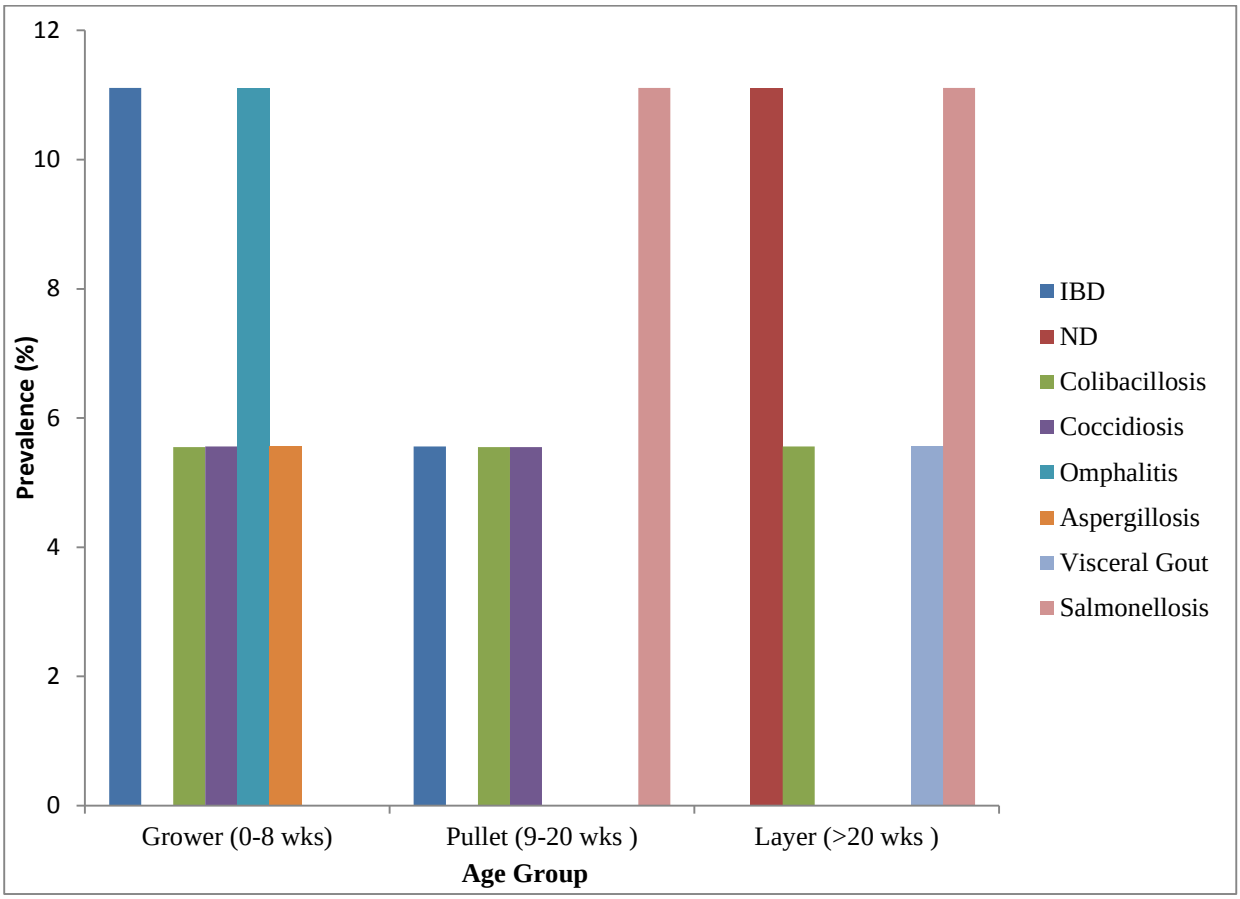

Fig-3: Prevalence of different diseases of layer in relation to age

The fig.- 3 showing that the highest number of cases was recorded in the age group of grower period (38.9%), followed by the age group of layer period (33.3%) and pullet period (27.7%). Higher prevalence of IBD (11.1%) in grower period, ND (11.1%) in layer period, Colibacillosis (5.5%) in grower, pullet and layer period, Coccidiosis (5.6%) in grower and pullet period, Omphalitis (11.1%) in grower period, Aspergillosis (5.6%) in grower period, Visceral Gout (5.6%) in layer period and Salmonellosis (11.1%) in pullet and layer period were recorded.

CHAPTER-V

DISCUSSION

The study revealed that the prevalence of Infectious Bursal Disease of broiler was highest at Mirsarai Upazilla (31.1%).The prevalence was higher than some of the previous reports evidenced by Islam *et al*. (2003) (24.3%), Talha *et al*. (2001) (19.1%), Ahmed *et al*. (2009) (11.1%) and Giasuddin *et al*. (2002) (11.8%). The prevalence of IBD in layer was recorded 16.7% which was lower than Talha *et al*. (2001) (19.2%) and higher than Ahmed *et al*. (2009) (11.1%) and Giasuddin *et al*. (2002) (11.8%). Most of the IBD infected farms in the study area were vaccinated against IBDV. Findings of the study indicated that in most cases vaccination could not protect the birds. This might be due to not maintaining proper cool chain, uneven level of maternal antibody, inexperience vaccinator, improper dose and faulty management system. The prevalence of Infectious Bursal Disease (31.2%) was higher in broiler in comparison to layer (16.7%). In relation to age in broiler, the prevalence of IBD was significantly ($p< 0.05$) higher compared to layer which support the report of Mbuko *et al.* (2010). In relation to age in broiler and layer, the higher prevalence of IBD was recorded 19.7% in the age of >21 days and 11.11% in grower period which supported the report of Mbuko *et al.* (2010).

In the investigation, prevalence of ND in broiler and layer was found 24.6% and 11.1% that was higher than Giasuddin *et al*. (2002); Islam *et al*. (2003) who reported 7.5% and 6.7% respectively. In relation to age in broiler and layer, the higher prevalence of ND was recorded 11.5% in the age of 15-21 days and 11.1% in layer period which supported the report of Yunus *et al.* (2008). In relation to age in broiler, the prevalence of ND was significantly ($p< 0.05$) higher compared to layer which supported the report of Yunus *et al.* (2008).

Colibacillosis in broiler and layer was recorded 13.1% and 16.7%. The prevalence was lower than 52.3% that was reported by Ahmed *et al*. (2009) in Gazipur district, but higher than the 12.1% that was reported by Talha *et al*. (2001) in Mymensingh region. In relation to age in broiler and layer, the higher prevalence of Colibacillosis was recorded 6.6% in the age of 15-21 days and 5.6% in layer period. Pandey *et al.* (1998) conducted a systemic study on *Escherichia coli* outbreak prevalence in which November to March recorded much higher number of outbreaks due to hot, humid and rainy season, which support the study. Stress may enhance the virulence of *E. coli*, leading to disease Talha *et al*. (2001).

Coccidiosis in broiler and layer constituted 11.5% and 11.1% of prevalence in the study which was close to the result of Islam *et al*. (2003) (9.8%) but disagreed with the report of Talha *et al*. (2001) (4.2%) and Ahmed *et al*. (2009) (4.2%). Some factors like improper cleaning disinfectant

before introducing day old chick increase susceptibility of diseases of Coccidiosis reported by Saleque *et al.* (2003).

Omphalitis in broiler and layer was recorded 9.8% and 11.1% in the study which was close to the report of Ahmed *et al.* (2009) (11.6%). In relation to age in broiler and layer, the higher prevalence of Omphalitis was recorded 9.8% in the age of 0-7 days and 11.1% in grower period which support the report of Amare *et al.* (2013) and the prevalence of Omphalitis was significantly ($p<0.05$) higher compared to layer which supported the report of Amare *et al.* (2013).

Aspergillosis in broiler and layer was recorded 4.9 % and 5.6 % which was lower than Islam *et al.* (2003) (17.5%). In relation to age, the prevalence of Aspergillosis in layer in grower period (5.56%) was higher than broiler (1.6%). This is due to faulty management system of poultry which supported the report of Kwanashie *et al.* (2012).

Visceral Gout in broiler and layer was recorded 3.3% and 5.6% which was similar to the report of Sonmez (1992) but disagreed with the report of Ibrahim *et al.* (2010) (1.1%). This due to intake high protein diet which support the findings of Mir *et al.* (2005) that mortality of 18.7 % was reported in Kashmir favorella poultry over a period of 6 month which was attributed to 16.4% crude protein in poultry feed .

Salmonellosis in layer was recorded 22.2%. This finding was closely to the result of Sikder *et al.* (2005) (23.5%). But Uddin (2010) reported that prevalence of Salmonellosis was 7.7%. Salmonellosis in broiler was recorded 1.7% which was lower than Uddin (2010) (7.7%). The prevalence of Salmonellosis (22.2%) was significantly ($P<0.05$) higher in layer compared to broiler (1.7%). The prevalence can vary in terms of age groups. It indicated that sero-prevalence varied with the increase of age of the birds, which supported the findings of Truong and Tieuquang (2003), Sikder *et al.* (2005) and Islam *et al.* (2006).The prevalence of salmonella infection was higher in summer season than in winter Sarker (2004). It might be due to the influence of hot weather and sudden rainfall.

CHAPTER -VI

CONCLUSION AND RECOMMENDATIONS

According to the study findings of poultry diseases situation in the broiler and layer industry at Mirsarai Upazilla in Chittagong district is unsatisfactory. The prevalence of Infectious Bursal Disease (31.1%), Newcastle Disease (24.6%) in broiler and Salmonellosis (22.2%), Infectious Bursal Disease (16.7%), Colibacillosis (16.7%) in layer were the major constraints for broiler and layer production in this area. Hence the farmers can't earn their profit. Due to failure of vaccine in case of IBD, viral diseases and bactrial diseases farmers both losses their poultry as well as the vaccine cost. This study suggest that, to maintain good farm practices it is very important to vaccinate the birds of the flock at proper time with proper dose and schedule. Besides, it is necessary to assess the management system and husbandry practices of those farms that were affected by different diseases. For confirmatory diagnosis further laboratory examination and advance techniques is needed to identify the specific diseases. However this study will stimulate our interest and show new light on the level of disease episodes prevailing at present days. Therefore it is expected that the present work may be of great value to create awareness among the farmers and related quarters to direct preventive measures to make poultry farming a successful enterprise.

CHAPTER_VII

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APPENDIX

QUESTIONNAIRE

Diagnosis of poultry diseases by postmortem examination at Mirsarai Upazila Veterinary Hospital

Date: Sample No.:

1. Name of the owner & address:.....
2. Total no. of birds:.....
3. Total death with date:.....
4. Age of the birds:.....
5. Type of feed: a) mash b) pellet …….....
6. Strain:.....
7. When the bird was died:.....
8. Clinical signs described by the owners:……..
9. Postmortem findings:

Head…….....……	Spleen……..……..
Trachea……	Proventriculus……...……
Lung ……..	Gizzard……
Liver ……	Air sac……..
Intestine ……	Caecal tonsil ……
Bursa ……	Yolk sac ……..….

others……..

10. Vaccination history:…….
11. Tentative diagnosis based on post mortem examinations:……
12. Treatment given:……

……..

Signature of the interviewer