POULTRY DISEASES IN SOME SELECTED AREAS IN SYLHET DISTRICT OF BANGLADESH

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Abstract

A pathological study was conducted on poultry diseases occurring at Sylhet district of Bangladesh during the period from March 2015 to February 2016 to know the disease pattern of poultry. A total of 1351 birds either sick or dead were studied in Field Disease Investigation Laboratory (FDIL), Sylhet and a total of 143 birds either sick or dead were examined at Upazilla veterinary hospital, Jaintapur. The diagnosis of different diseases were performed on the basis of history of the affected flock, visual examinations, post mortem examinations, pathological findings, isolation and identification of the causal agents, serology and age of affected birds. Cases found in FDIL were Newcastle disease (9.85 %), Infectious bursal disease (16.43 %), colibacillosis (14.51 %), omphalitis (10.14 %), salmonellosis (7.32 %), fowl cholera (3.11 %), aspergillosis (7.33 %), duck plague (9.16 %) and duck cholera (7.03 %). Disease prevalence was recorded as 38.04% among the age group of >2 - 8 weeks followed by 28.24% among 0 - 2 weeks of age, 6.66%among >8 - 20 weeks of age and 3.39 % among >20 weeks of age. It was found that prevalence of poultry diseases were significantly highest in summer season (47.36 %) followed by rainy season (25.4 %) and winter (24.02 %). Cases found in Upazilla veterinary hospital, Jaintapur were newcastle diseases (19.58%), coccidiosis (16.79%), duck plague (15.39%), infectious bursal diseases (14.68%), Nonspecific pneumonia (10.49 %), non-specific enteritis (7.69 %), duck cholera (5.59 %), helminthiasis (4.19 %), nutritional deficiency (3.50 %) and aspergillosis (2.10 %). Age-wise disease prevalence was recorded as 6.26 % for 0 - 2 weeks, 66.38 % for >2 - 8 weeks, 20.22 % for >8 - 20 weeks and 6.96 % for >20 weeks. Prevalence of poultry diseases were significantly higher in summer (40.5 %) followed by rainy season (32.11 %) and winter (27.2 %). The study may help to know the prevalence of poultry diseases for the improvement of poultry production in Sylhet region.

Keywords: Poultry diseases, prevalence, season.

Introduction

Bangladesh is one of the key players in the south Asian livestock industry, especially in poultry industry (Ladda Mongkolchaivivat, 2011). The livestock sector is the integral part of the agro-based economy. Chicken meat is relatively cheap and affordable source of animal protein (Yami and Dessie, 1997). Poultry industries play an important role in poverty alleviation and economic development of Bangladesh. Poultry meat contributes approximately 37 % of total animal protein supplied in the country (Rahman and Rahman, 1998). According to WHO-FAO joint survey, meat consumption⁻¹head in Bangladesh is 15.23 kg⁻¹year and poultry contributes 35.25 % of total meat supply (Akbar et al., 2013). Traditionally in Bangladesh, poultry rearing is one of the most important sources of income for rural women especially for landless and marginal farmers (Paul et al., 1990). The poultry sector employs about 5 million people and has experienced a long-term growth rate of about 4.50 %, which is highest in the economy (BLRI Reort, 2009). It is an important component of farming system and plays a significant role to 80 % rural people of Bangladesh. But it is true to say that this profitable sub-sector is seriously interrupted by a number of infectious and contagious diseases such as Newcastle disease(ND), Infectious bursal disease(IBD), Salmonellosis, Fowl cholera, Infectious Coryza, Chronic respiratory disease, Aspergillosis, Coccidiosis, Helminthiasis etc. The poultry sector in Bangladesh is now in a great challenge of these harmful diseases (Hossain et al., 2004). Bangladesh's long-term outlook as a leading producer of poultry products remains bright despite the bird flu outbreak that has held off its potential (Daily Star, 2011). The number of poultry farmers has reduced to about 90,000 from 1.5 Lakh due to 2007 - 08 outbreak of the bird flu scare (Daily Star, 2011). It is well known that

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poultry diseases are the major constraints for the developing the poultry industry (Karim, 2003). Poultry farmers face a wide range of diseases, which reduce the optimal productivity of the flock. On an average, 30 % poultry birds die annually in Bangladesh due to outbreak of several diseases (Ahmed and Hamid, 1992). Sylhet is the northeast part of Bangladesh with different geo-climatic condition. Poultry diseases are the major constraints for developing the poultry industry in the Sylhet region. Prevalence of a disease depends upon various factors such as geo-climatic condition (Sylhet is a hilly area and home of various parasites and rainfall is also higher), management practice and vaccination etc. To improve the poultry industry, it is important to know the occurrence of the diseases. The aim of this study is to know the disease pattern of the poultry farms in the Sylhet district of Bangladesh and this work reports the prevalence of poultry diseases may help an entrepreneur to establish commercial poultry farms.

Materials and Methods

A total of 1351 cases either dead or sick birds were studied in the Field Disease Investigation Laboratory (FDIL), Sylhet, Bangladesh. All the cases brought to the laboratory from different regions of the Sylhet district during the period from March 2015 to February 2016. The diagnosis of different diseases were performed on the basis of history of the affected flock, visual examinations, post mortem examinations, pathological findings, isolation and identification of the causal agents, serology and age of affected birds. Specific test kits were used to identify the diseases. Suspected materials were incubated in McConkey agar, Sabouraud dextrose agar, blood agar and cooked meat media for growth of *Salmonella, E. coli, Aspergillus, Pasteurella and Clostridium*, respectively. The growth obtained was identified by various biochemical and sugar fermentation tests. In some complicated cases suspected specimens were sent to the Central Disease Investigation Laboratory (CDIL) at Dhaka, Bangladesh for final confirmation. According to age, the birds were grouped as 0 - 2 weeks, >2 - 8 weeks, >8 - 20 weeks.

A total of 143 cases either dead or sick were studied in the Upazilla veterinary hospital, Jaintapur, Sylhet, Bangladesh. All the cases came to the hospital from different villages and areas of Jaintapur during the period from March 2015 to February 2016. The diseases were diagnosed by the history of the individual or flock, clinical findings, pathological lesions and in some cases using specific kits. Response to treatment also used for the diagnosis of the disease.

On the basis of climatic conditions, the year was divided into three seasons namely summer, rainy and winter. Summer season was considered from March to June, rainy season from July to October and winter was considered from November to February. Data were organized in the Microsoft Excel[®] spreadsheet and analyzed for percentage of disease conditions prevalent in different groups and season.

Results and Discussion

Occurrence of poultry diseases in Sylhet district found in FDIL with age-wise distribution were shown in Tables 1 and 2, respectively. The result of the study showed that Newcastle disease (ND), Infections bursal disease (IBD), Colibacillosis, Omphalitis, Salmonellosis, Aspergillosis were most common among total 1351 cases. The highest number of case recorded was IBD. Though different studies showed that ND was found frequently everywhere in another regions of the country. ND rate was lower than IBD here may be due to proper immunization of the flock. Present day, ND is controlled by the vaccine produced by LRI (Livestock Research Institute) namely BCRDV (Baby Chick Ranikhet Disease Vaccine) and RDV (Ranikhet Disease Vaccine). These vaccines are of good quality and show a better result after immunization. According to the results, prevalence of infectious bursal disease (IBD) was higher (16.43 %) followed by Colibacillosis (14.51 %), Omphalitis (10.14 %), Newcastle disease (9.85 %), Duck plague (9.16 %), Aspergillosis (7.33 %), Salmonellosis (7.32 %), Duck cholera (7.03 %), Coccidiosis (5.92 %), Mycoplasmosis (4.38 %), Fowl cholera (3.11 %), IBD + mixed *E. coli* infection (3.11 %), Nutritional deficiency (1.04 %) and Visceral gout (0.52 %) (Table 1).

The present study revealed that 16.43 % of IBD in Sylhet region was higher than from Dhaka and Mymensingh where it was reported as 10.99 %, 16.0 % cases of IBD, respectively (Bhattacharjee *et al.*, 1996 and Islam *et al.*, 1998). This may be due to land topographic variation. In Sylhet division IBD was one of the most prevalent diseases and previously it was recorded as 24.26 % (Islam *et al.*, 2003), which was higher from the present study. Along with high prevalence of IBD, morbidity rate of IBD was near about 100 % (Islam *et al.*, 2008) but mortality was 33 % (Saleque, 2003) to highest 80 % (Hoque *et al.*, 2001). Most of the IBD affected flocks were recorded as vaccinated.

Findings indicated that in most cases vaccination could not protect the birds due to faulty method of vaccination or break of vaccine. There are several factors that were involved in vaccination failure such as vaccine type, storage and handling, level of maternal antibody or administration of vaccine (Godwin *et al.*, 2001).

In the present investigation, 9.85 % of ND positive cases were found. Occurrence rate of ND in Sylhet district was slightly decreased where occurrence was recorded 13.84 % (Badruzzaman *et al.*, 2015), 10.24 % (Talha *et al.*, 2001) and 17.20 % (Islam *et al.*, 1998). The present findings would represent that ND occurrence rate was lower but reemergence of ND in commercial flocks is still a threat to the poultry industry in spite of availability use of ND vaccines.

Name of the disease	No of identified cases	Prevalence (%)
Newcastle disease (ND)	133	9.85
Infectious bursal disease (IBD)	222	16.43
Salmonellosis	99	7.32
Colibacillosis	196	14.51
Omphalitis	137	10.14
Coccidiosis	80	5.92
Fowl cholera	42	3.11
Aspergillosis	99	7.33
Mycoplasmosis	59	4.38
Chronic respiratory disease	2	0.15
Visceral gout	7	0.52
Nutritional deficiency	14	1.04
IBD + E. coli mixed infection	42	3.11
Duck plague	124	9.16
Duck cholera	95	7.03

Table 1. Overall prevalence of diseases in chickens at Sylhet district of Bangladesh found in FDIL d	luring the
period from March 2015 to February 2016 (n=1351).	

Table 2. Age group of birds affected with different disease registered in FDIL.

Disease	Age							
	0 - 2	Incidence	>2 - 8	Incidence	>8 - 20	Incidence	>20	Incidence
	weeks	rate (%)	weeks	rate (%)	weeks	rate (%)	weeks	rate (%)
Newcastle disease	03	0.22	117	8.66	11	0.81	02	0.14
Infectious bursal	20	1.48	212	15.69	0	-	0	-
disease								
Colibacillosis	47	3.47	107	7.92	25	1.85	17	1.25
Salmonellosis	57	4.21	20	1.48	07	0.52	15	1.11
Omphalitis	137	10.14	0	-	0	-	0	-
Coccidiosis	21	1.55	45	3.33	09	0.67	05	0.37
Fowl cholera	0	-	02	0.15	33	2.44	07	0.52
Aspergillosis	96	7.10	03	0.22	0	-	0	-
Nutritional deficiency	01	0.07	08	0.59	05	0.37	0	-

It is needed to be investigated if the reemergence of ND is due to vaccination failure or any other factors. High farm density has a great role in case of immunity breakdown of ND (Naik *et al.*, 2005) resulting increase the ND prevalence in this area. In this study there was no positive report of Avian influenza in Sylhet region although in Dhaka, Gazipur, Mymensingh and Bogra districts. Avian influenza was a prevalent disease and it was found that in layer, broiler, native bird and duck prevalence were 12.5%, 12.5%, 0.0%, and 2.5%, respectively (Rahman *et al.*, 2012).

Apart from viral infection among the other diseases, it was observed that Colibacillosis was 14.51 %, Salmonellosis was 7.32 %. Colibacillosis was slightly higher than previous survey 14.03 % (Badruzzaman *et al.*, 2015) and 4.42 % (Giasuddin *et al.*, 2002). Prevalence of Salmonellosis was 7.32 % which was lower than the previous study 12.18 %

(Badruzzaman *et al.*, 2015) and higher than 5.56 % (Giasuddin *et al.*, 2002). Prevalence of Colibacillosis in Mymensingh district was 13.12 % (Talha *et al.*, 2001) which was lower from the prevalence in Sylhet dristrict. In Sylhet region among all bacterial diseases prevalence of Colibacillosis was highest. It was due to expansion of poultry farming in Bangladesh, Colibacillosis has become a widespread problem.

Table 3	3. Seasonal	l prevalence o	of diseases in	n chickens	at FDIL	of Sylhet	district	of Bangladesh	during the
	period fro	om March 201	5 to Februa	ry 2016.					

Disease	No of	Summer		o of Summer Rainy		Rainy			Winter
	cases	No of	Prevalence(%)	No of	Prevalence(%)	No	Prevalence(%)		
		cases		cases		of			
						cases			
Newcastle disease	133	51	3.78	62	4.58	20	1.48		
Infectious bursal disease	222	112	8.29	80	5.92	30	2.22		
Salmonellosis	99	56	4.14	22	1.62	21	1.55		
Colibacillosis	196	82	6.06	35	2.59	79	5.85		
Omphalitis	137	91	6.74	29	2.14	17	1.25		
Coccidiosis	80	32	2.37	27	1.99	21	1.55		
Fowl cholera	42	9	0.66	10	0.74	23	1.70		
Aspergillosis	99	53	3.92	17	1.25	29	2.15		
CRD/Mycoplasmosis	61	35	2.59	12	0.89	14	1.04		
Visceral gout	7	3	0.22	2	0.14	2	0.14		
Nutritional deficiency	14	5	0.37	4	0.29	5	0.37		
Duck plague	124	79	5.85	23	1.70	22	1.62		
Duck cholera	95	32	2.37	21	1.55	42	3.10		

In Bangladesh prevalence of Salmonellosis in layer farm was recorded as 18 % (Barua *et al.*, 2012) which is slightly higher from the overall prevalence of the present study.

In the present study, 7.33 % cases of Aspergillosis were reported in Sylhet district, and in Mymensingh region positive cases was 4.20 % (Talha *et al.*, 2001) that was lower than Sylhet. Aspergillosis was the major diseases problem in broiler farming in Mymensingh (Rahman *et al.*, 2003) and it was reported that in this region positive cases was 4.20 % (Talha *et al.*, 2001). This variation may be due to the cold climatic condition of the Sylhet region.

Prevalence of Fowl cholera was identified 3.11 % in this study and it has been becoming a more prevalent disease day by day. Previous report showed that prevalence of Fowl cholera in Sylhet was 0.44 % (Islam *et al.*, 2003) which was lower to present findings. In the present study, Coccidiosis constituted 5.92 % of the total cases which is higher than the overall prevalence of Coccidiosis in Bangladesh was 3.08 % (Talha *et al.*, 2001).

Prevalence of diseases according to the age group of chickens was shown in Table 2. Disease prevalence was recorded as 38.04 % among the age group of >2 - 8 weeks followed by 28.24 % among 0 - 2 weeks of age, 6.66 % among >8 - 20 weeks of age and 3.39 % among >20 weeks of age. Age of the bird had a significant relationship on prevalence and mortality of the disease. Younger chicks were more susceptible to diseases, especially broiler chicks has of age 3 - 6 weeks were more susceptible to the disease (Saif *et al.*, 2000). According to age group, from 0 - 2 weeks Omphalitis 10.14 %, Aspergillosis 7.10 %, Salmonellosis 4.21 %, Colibacillosis 3.47 %, Coccidiosis 1.55 %, IBD 1.48 %, ND 0.22 %, Nutritional deficiency 0.07 %. According to age group of >2 - 8 weeks of age IBD 15.69 %, ND 8.66 %, Colibacillosis 7.92 %, Coccidiosis 3.33 %, Salmonellosis 1.48 %, Nutritional deficiency 0.59%, Aspergillosis 0.22 %, Fowl cholera 0.15 %. According to >8 - 20 weeks of age fowl cholera 2.44 %, Colibacillosis 1.85 %, ND 0.81 %, Coccidiosis 0.67 %, Salmonellosis 0.52 %. According to >20 weeks of age Colibacillosis 1.25%, Salmonellosis 1.11 %, Fowl cholera 0.52 %, Coccidiosis 0.37 % and ND 0.14 % (Table 2).

ND is highly contagious viral disease of domestic poultry as well as other species of birds regardless of age and sex variation. In case of semi-scavenging birds, ND affected a significant higher proportion (18.81 %) of birds older than 60 days of age and proportional mortality due to Fowl pox and IBD was higher in younger (Biswas *et al.*, 2005).

Poultry diseases in Sylhet

Prevalence of poultry diseases in Sylhet district found in Upazilla veterinary hospital, Jaintapur with age-wise distribution were shown in Tables 3 and 4 respectively. The result of the study showed that ND, IBD, Colibacillosis, duck plague, Salmonellosis, Aspergillosis were most common among total 143 cases. The highest number of case recorded was ND. Though previous data from FDIL showed IBD was highest in number. This is probably due to geographical location and environment of the region. Jaintapur has more hilly areas as well as marshy lands comparing to other areas of the Sylhet district that may make the birds susceptible to ND. Another factor may be the less availability of vaccines in the rural area level.

Disease	No of identified cases	Incidence rate (%)
Newcastle disease	28	19.58
Infectious bursal disease	21	14.68
Coccidiosis	24	16.79
Helminthiasis	6	4.19
Nutritional deficiency	5	3.50
Enteritis (non-specific)	11	7.69
Pneumonia (non-specific)	15	10.49
Duck plague	22	15.39
Duck cholera	8	5.59
Aspergillosis	3	2.10
Total	143	100

 Table 4. Occurrence of poultry diseases in Jaintapur upazilla.

According to the results obtained, prevalence of ND was highest (19.58 %) followed by Coccidiosis (16.79 %), Duck plague (15.39 %), IBD (14.68 %), Non- specific pneumonia (10.49 %), Non-specific enteritis (7.69 %), Duck cholera (5.59 %), Helminthiasis (4.19 %), Nutritional deficiency (3.50 %) and Aspergillosis (2.10%) (Table 4).

Disease	Age							
	0 - 2	Incidence	2 - 8	Incidence	8 - 20	Incidence	>20	Incidence
	weeks	Rate (%)	weeks	Rate (%)	weeks	Rate (%)	weeks	Rate (%)
Newcastle disease	01	0.699	18	12.58	07	4.89	02	1.39
Infectious bursal disease	02	1.39	19	13.28	0	-	0	-
Coccidiosis	01	0.69	20	13.98	03	2.09	0	-
Helminthiasis	0	-	01	0.70	02	1.39	03	2.09
Nutritional deficiency	0	-	03	2.09	02	1.39	0	-
Enteritis	0	-	02	1.39	06	4.19	03	2.09
Pneumonia	02	1.39	10	6.99	03	2.09	0	-
Duck plague	0	-	16	11.18	04	2.79	02	1.39
Duck cholera	0	-	06	4.19	02	1.39	0	-
Aspergillosis	03	2.09	0	-	0	-	0	-

Table	5. Age	group	of birds	affected i	in Jainta	pur Upazilla.
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Coccidiosis ranked second among all diseases which covered 16.79 %. It was may be due to the wet and marshy environment. An outbreak of Coccidiosis was noticed among different region on August 2015. So, the result of being higher the rate was normal compared to the FDIL cases (14.51 %). Coccidiosis constituted 16.79 % of the total cases which was higher than the study of Talha *et al.* (2001), but correlates with the result of Kutubuddin (1973); Sarker (1976) and Kamal (1989).

Helminthiasis was also higher in proportion (4.19 %) may be due to availability of helminth parasites as the region has many hilly areas.

Prevalence of diseases according to the age group of chickens was shown in the Table 4. Disease prevalence was recorded as 6.26 % for 0 - 2 weeks, 66.38 % for >2 - 8 weeks, 20.22 % for >8 - 20 weeks and 6.96 % for >20 weeks. The highest number proportion of disease case was studied in >2 - 8 weeks of age limit (66.38 %) which was more

higher than cases found in relevant age group in FDIL (38.04 %). Younger chicks were more susceptible to diseases compared to older birds (Table 5).

When ambient temperature is high, chickens have higher energy (feed) needs than when in thermo neutral environments. Major losses result from a less efficient conversion of feed to meat, which detrimentally impacts poultry health and productivity (Olanrewaju et al., 2010). Poultry flocks are particularly vulnerable to climate change because there is a range of thermal conditions within which animals are able to maintain a relatively stable body temperature in their behavioral and physiological activities. Hence, birds can only tolerate narrow temperature ranges to sustain the peak of their production for human consumption and any unpredictable climatic changes will therefore trigger a series of adjustment and readjustments by livestock and poultry birds in the struggle for survival which may have negative consequence on the viability of poultry production (Ravichandran and Mohamed, 2015). The environmental conditions affecting the performance and health productivity of chicken include temperature, relative humidity, light, sunshine prevailing at a given time, housing system and ventilation (Elijahand Adedapo, 2006). Ambient temperatures significantly influence the survivability and performance of the poultry production. According to Indian Council for Agricultural Research (ICAR) (2010), as the ambient temperature increased to \geq 34°C, the mortality due to heat was significantly high in meat type chickens by 8.4 %, the feed consumption of the chicken decreases from 108.3 g bird⁻¹day⁻¹ at 31.6°C to 68.9 g/bird/day at 37.9°C, the egg production also decreased by 6.4 % as compared to their standard egg production. Climate change alters global disease distribution, affects poultry feed intake, encourage outbreak of diseases which invariably affects poultry output (egg and meat) and also cost of production (Guis et al., 2011 and Elijah and Adedapo, 2006) reported in his study that high rainfall and relative humidity provides a conductive environment for breeding of parasites that causes outbreak of diseases which invariably reduces egg production. In Pakistan the period during April to June appeared to be comparatively safer for the broilers as low incidence of disease was recorded at this period (Abbas et al., 2015).

Disease	No		Summer	Rainy		Winter	
	of	No of	Prevalence (%)	No of	Prevalence (%)	No of	Prevalence (%)
	cases	cases		cases		cases	
Newcastle disease	28	13	9.09	11	7.69	4	2.79
Infectious bursal disease	21	9	6.29	7	4.89	5	3.49
Coccidiosis	24	5	3.49	11	7.69	8	5.59
Helminthiasis	6	2	1.39	3	2.09	1	0.69
Nutritional deficiency	5	2	1.39	1	0.69	2	1.39
Enteritis	11	7	4.89	2	1.39	2	1.39
Pneumonia	15	3	2.09	3	2.09	9	6.29
Duck plague	22	12	8.39	6	4.19	4	2.79
Duck cholera	8	4	2.79	2	1.39	2	1.39
Aspergillosis	3	1	0.69	0	-	2	1.39

Table 0. Season-wise prevalence of cases found in Jaintaput upazina	Table	6. Season-wi	e prevalence of	f cases found in	Jaintapur	upazilla.
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It was found that prevalence of poultry diseases were significantly highest in summer season (47.36 % in FDIL and 40.5 % in Jaintapur) followed by rainy season (25.4 % in FDIL and 32.11 % in Jaintapur) and winter (24.02 % in FDIL and 27.2 % in Jaintapur) (Tables 3 and 6). Several previous reports indicated that rainy season is more prevalent for diseases (Rashid *et al.*, 2013).

Report from FDIL in summer season showed that the IBD (8.29 %), ND (3.78 %), Colibacillosis (6.06 %), Omphalitis (6.74 %), Duck plague (5.85 %) and Salmonellosis (4.14 %). Whereas, in rainy season showed the incidence of IBD (5.92 %), ND (4.58 %), Colibacillosis (2.59 %), Omphalitis (2.14 %), Duck plague (1.70 %) and Salmonellosis (1.62 %) and in winter season showed the incidence of IBD (2.22 %), ND (1.48 %), Colibacillosis (5.85 %), Omphalitis (1.25 %), Duck plague (1.62 %) and Salmonellosis (1.55 %) (Table 3).

Report from Jaintapur upazilla veterinary hospital in summer season showed that Newcastle disease (9.09 %), IBD (6.29 %), Coccidiosis (3.49 %), Helminthiasis (1.39 %) and Duck plague (8.39 %). Whereas, in rainy season Newcastle disease (7.69 %), IBD (4.89 %), Coccidiosis (7.69 %), Helminthiasis (2.09 %), Duck plague (4.19 %) and in winter season showed that the Newcastle disease (2.79 %), IBD (3.49 %), Coccidiosis (5.59 %), Helminthiasis (0.69 %) and Duck plague (2.9 %) (Table 6).

The study revealed that most common diseases of the poultry in Sylhet district are Newcastle disease (ND), Infectious bursal disease (IBD), Salmonellosis, Colibacillosis, Coccidiosis, Omphalitis, Aspergillosis, Duck plague etc. in young chickens, especially chickens of 2 to 8 weeks of age were prone to different diseases. Most diseases occur in higher proportion in summer season compared to other times of the year. Proper immunization of the flock may save the birds from unwanted mortality. The quality of vaccine should be kept in mind to prevent the diseases. Necessary steps should be taken to prevent vaccine failure. Improved management practice e.g. hygiene and biosecurity should implement to keep away of disease agents. Use of proper drugs for treatment is important to save the lives. It is opined that if necessary steps are not taken at this present situation, the prevailing diseases will cause a great economic loss to the farmers and entrepreneurs of the Sylhet region as well as the total country.

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