Epidemiologic surveillance of Newcastle disease in Sonali chicken in Naogaon district, Bangladesh

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A R T I C L E I N F O	A B S T R A C T
	Newcastle disease (ND), an economically important disease, is one of the major threats in poultry sector of Bangladesh. A retrospective epidemiologic surveillance using diagnostic records of Upazila Livestock Office, Badalgachhi, Naogaon was carried out to determine distribution and association of Newcastle disease in Sonali chicken with demographic and temporal variable in a calendar year. ND cases in Sonali chicken were confirmed by post-mortem examination of the sick and dead birds. During the study period, 168 cases of different diseases in Sonali chicken were recorded in which 19% cases were ND. The prevalence rate of ND was 8.2%, the mortality rate was 0.6% and the CFR was 7.3%. Growing Sonali chickens were more susceptible than chicks. The highest susceptibility of ND was observed in 51-60 days' age group and the lowest in 0-10 days' age group. The highest ND cases were found on the starting of summer (22%) as well as winter season (19%). Among 32 ND cases, 14 (44%) from the farms were not taken schedule vaccination program. To minimize the risk of ND outbreaks and protect the non-infected flocks and regions, good biosecurity, hygienic management as well as proper vaccination are important.

Introduction

Bangladesh is an agro-based developing country and the growth and sustainability of agricultural production are prerequisite for attaining the rate of overall growth of the economy. Livestock is an important sub-sector of agriculture (Gofur, 2015, 2019). Poultry is one of the major components of livestock sub-sectors that committed to supply cheap sources of good quality nutritious animal protein to the nation. Poultry farming has turned out to be promising dynamic enterprise with enormous potential for rapid poverty reduction in Bangladesh. Poultry farming provides a substantial economic contribution and generates self-employment opportunities for the unemployed youth generation. A noticeable development has been taken place in poultry farming in Bangladesh (Uddin *et al.*, 2014). Commercial or intensive poultry farming has now turned into a profitable business in Bangladesh. Poultry industry in Bangladesh has made significant progress during the last two decades where commercial poultry farming started in 1980 in Bangladesh. Chowdhury (2013) stated that commercial poultry increased significantly during 1980-1990 (6%) and 1990-2000 (8%) in this country.

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Sonali chicken, the crossbred of Fayoumi female and RIR (Rhode Island Red) male developed in 1986, has been reported to perform better with respect to egg and meat production, rapid growth and low mortality under scavenging, semi-scavenging and intensive farming system (Uddin *et al.*, 2014). It was introduced in 1996–2000 in North-Bengal of Bangladesh (Mitchel, 2015). It has been taking its place besides the indigenous hens due to its adaptability and acceptability in the climatic conditions of Bangladesh (Azharul *et al.*, 2005). Sonali chicken are reared all over the country and reared for mainly meat purpose (Hamid, 2019). Sonali, with a phenotypic appearance similar to local chicken has higher market demand than exotic breed. As an important segment of livestock production, the Sonali chicken industry in Bangladesh is considered a great avenue for the economic growth and simultaneously creates numerous employment opportunities. About 76 percent of Sonali beneficiary has improved their conditions by rearing this type of poultry (Hossen *et al.*, 2012). There are about 300 farmers who are rearing almost 10 lakh Sonali chickens in Badalgachhi upazila of Naogaon district (Personal contact).

Newcastle disease (ND) is caused by Newcastle disease virus (NDV) which is actually avian paramyxovirus-1 (APMV-1), has caused severe economic losses in poultry all around the world (Alexander, 2000; Narayanan *et al.,* 2010). It is a highly contagious viral infection of domestic fowl, Sonali chicken, broiler and other bird species like turkey, pigeons and parrots (Haque *et al.,* 2010). It is also transmissible to human causing conjunctivitis (Nelson *et al.,* 1952). It is a major threat to poultry industry that presents primarily as an acute respiratory disease, but depression, nervous manifestations or diarrhea may be the predominant clinical form (Narayanan *et al.,* 2010; Parvez *et al.*, 2016). The disease can vary from mild to severe. Severity depends on the virulence of the infecting virus and host susceptibility. Occurrence of the disease is reportable and may result in trade restrictions. Virulent NDV strains are endemic in poultry in most of Asia, Africa and some countries of North and South America (Chang and Dutch, 2012). Therefore a retrospective epidemiologic surveillance was carried out to determinedistribution and association of Newcastle disease in Sonali chicken with demographic and temporal variable

in a calendar year. Although it is not an exact reflection of conditions, data from such study will be conclusive and useful if extended to more than one calendar year (Gofur *et al.*, 2007).

Methods

A retrospective epidemiologic surveillance of the Newcastle disease in Sonali chicken was conducted at Badalgachhi upazila (Fig. 3) in Naogaon, Bangladesh during one calendar year (October/2018 to September/2019). ND positive cases in Sonali chicken were confirmed by the Upazila Livestock Officer & Veterinary Surgeon of the Upazila Livestock Office, Badalgachhi, Naogaon through post-mortem examination of the sick and dead birds. We collected the data of sonali chicken from the poultry patient register of Upazila Livestock Office, Badalgachhi, Naogaon and analyzed with Microsoft excel. The incidence rate was calculated as per method of Thrusfield (2007).

a. *Determination of frequency of different diseases*: The data of Sonali chicken found in poultry patient register of Upazila Livestock Office, Badalgachhi, Naogaon during the period of October/2018 to September/2019 were collected and calculated for the frequency & frequency rate of different diseases.

b. *Determination of prevalence rate of ND*: Prevalence rate of ND was calculated by the number of sick birds of ND divided by the population at risk (i.e. the total number of birds in flock of different farms) and was multiplied by 100.

c. *Determination of mortality rate of ND*: Mortality rate of ND was calculated by the total number of dead birds of ND divided by the population at risk (i.e. the total number of birds in flock of different farms) and was multiplied by 100.

d. *Determination of case fatality rate (CFR) of ND*: CFR of NDwas calculated by the total number of dead birds of ND divided by the total number of sick birds of ND in flock of different farms and was multiplied by 100.

e. *Frequency of ND in relation of ages of Sonali chicken, months and area (different unions)* was also determined by analyzing the obtained data.

Results

The prevalence, the mortality and the case fatality rate of ND

We performed a surveillance of the Newcastle disease in Sonali chicken which came to Upazila Livestock Office from different unions of Badalgachhi upazila in Naogaon, Bangladesh. The total population of Sonali chicken was 278200 in Badalgachhi upazila. Among this population, a total of 168 cases came to Upazila Livestock Office in which 15 diseases were recorded in different frequency (Table 1). Among the diseases, the highest prevalent disease was ND which was about 19% (32 cases). The number of ND affected sick birds and dead birds were 22799 and 1663, respectively (Supplementary Table 1). The prevalence rate of ND was 8.2%, the mortality rate was 0.6% and the CFR was 7.3%.

Table 1. Occurrence of diseases and their frequency in Sonali chicken

Sl no.	Name of disease	No. of case	Frequency rate
1	Pox	01	0.6%
2	Gout	01	0.6%
3	Indigestion	01	0.6%
4	Neoplastic disease	02	1.2%
5	Fowl cholera	04	2.4%
6	Colibacillosis	04	2.4%
7	Mycotoxicosis	06	3.6%
8	Salmonellosis	08	4.8%
9	Parasitic infestation	11	6.6%
10	Malnutrition	11	6.6%
11	CRD	19	11.3%
12	Enteritis	19	11.3%
13	IBD	23	13.7%
14	Coccidiosis	26	15.5%
15	ND	32	19%
Total: 15 diseases		168 cases	100%

Occurrence of ND in relation to age

The age of ND affected Sonali chicken was in between 9-58 days. We divided the birds according to age into six groups. The highest frequency of ND was observed in the group of 51-60 days of age and the lowest frequency was in the group of 01-10 days of age (Fig 1). We found an increasing trend of ND occurrence with the advancement of age of Sonali birds, and this indicates that grower Sonali chickens were more susceptible than chicks.
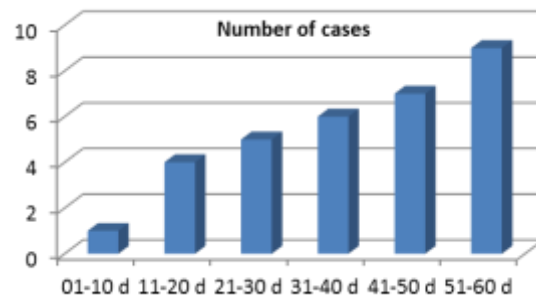
Fig. 1. Frequency of ND at different age groups of Sonali chicken; d, days

Occurrence of ND in relation to season of the year

We also calculated the ND occurrence month-wise. It is known that April and May are the hottest months, and December and January are the coldest months in Bangladesh. We found higher frequency of ND occurrence in these four
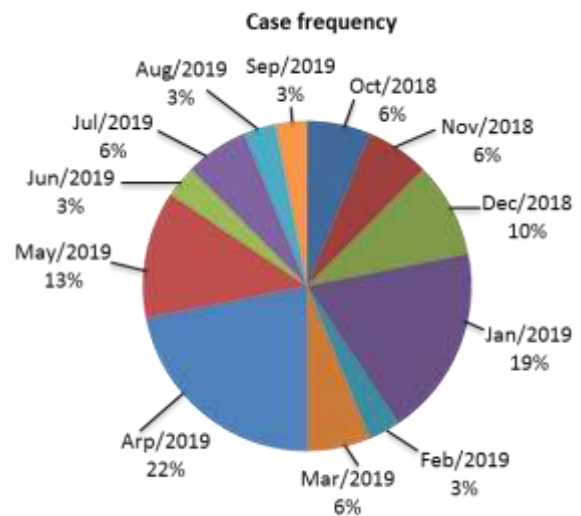
Fig. 2. Frequency rate of ND in different months of study; 18 and 19 indicates year 2018 and 2019, respectively.

months than others months though the highest ND cases (22%) were found in the month of April (Figure 2), indicates that during the summer and winter seasons, Sonali birds are more susceptible to ND.
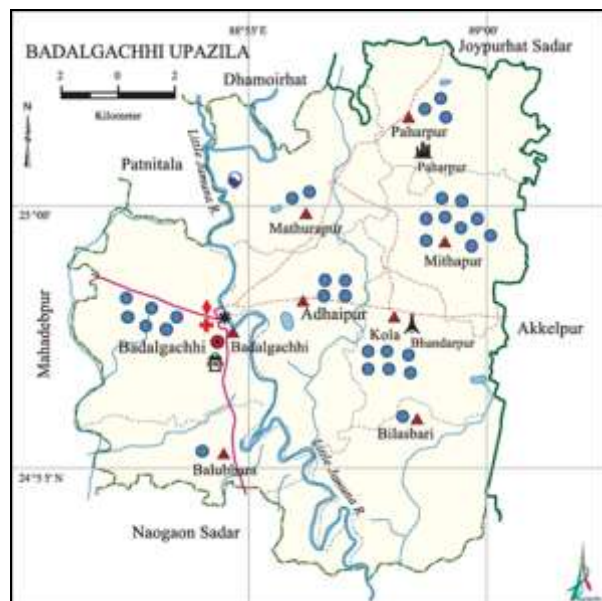
Fig. 3. Distribution of ND at different unions of Badalgachhi upazila in Naogaon, on geographical map indicating by blue colored round mark- ⬤ (number of cases)

Distribution of ND in Unions of Badalgachhi upazila

There are 8 unions in Badalgachhi upazila of Naogaon district of Bangladesh.The highest frequency (9) of ND occurrence was recorded at Mithapur union (Fig. 3)

Vaccination and ND

Among ND cases found from different unions of Badalgachhi upazila in Naogaon, 44% from the farms were not taken schedule vaccination program, indicating ND vaccines somehow did not work well.

Discussion

Epidemiological analysis and interpretation of serious poultry diseases is important at producer, national and international levels. Epidemiological analysis is increasingly important in demonstrating the true disease status of potential trading partners, and in assessing the risk associated with trade in different commodities (Astill *et al*., 2018). We performed a retrospective epidemiologic surveillance of the Newcastle disease in Sonali chicken in Badalgachhi upazila of Naogaon, Bangladesh. A total 168 with 15 different diseases of Sonali chicken was recorded

in the poultry patient register in Badalgachhi upazila, Naogaon during the period studied in which ND cases was 19%, the highest frequency rate due to the Newcastle disease virus (NDV) is highly contagious, and chickens are most susceptible. On the contrary, 11.24% of ND cases were recorded at Bogra Sadar upazila with the study of 258 cases (Talukdar *et al.,* 2017) and 47% Dinajpur district of Bangladesh (Parvez *et al*., 2016). This difference was may be due to the variation of the number of cases. All age group of chicken are susceptible to ND (Abdisa and Tagesu, 2017). In the present study, the highest frequency of ND cases found in the group of 51-60 days of age and the lowest frequency of ND found in the group of 01-10 days of age. The frequency of ND was gradually higher with the advancement of age i.e. grower Sonali chickens are more susceptible than chicks. The prevalence rate of ND was 8.2%, which was similar to 7.5% and 8.8%, reported by Giasuddin *et al*. (2002) and Saleque *et al*. (2003), respectively. The mortality rate of ND was 0.6% which was lower than Biswas *et al*. (2006) who reported 11%. Usually the mortality rate of ND was higher but in the present study the mortality rate is far lower due to the data were recorded on poultry patient register after infecting the Sonali chicken in farm within 1-2 days. Further data were not recorded on the patient register. According to variation in strains of NDV, the rate of mortality and morbidity in a flock is also variable (Haque *et al.,* 2010).

It is known that April and May are the hottest months, and December and January are the coldest months in Bangladesh. We found higher frequency of ND occurrence in these four months than others months indicates that during the summer and winter seasons, Sonali birds are more susceptible to ND, may be during the hottest and coldest months the immune system can't functions full due to hot and cold stress (Nagai and Iriki, 2001; Kokolus *et al*., 2014; Messmer *et al*., 2014). The highest cases were found at Mithapur Union may be due to the population of Sonali chicken at farm level are higher at Mithapur Union than others. Among ND cases, a large of cases from the farms taken schedule vaccination program indicating ND vaccines somehow did not work well may be due to storage in high temperature, inappropriate concentration, birds with malnutrition etc. (Ahmas and Sharif, 2018). Balanced nutrition is needed for adequate immune responses (Shamim *et al*., 2008).

Rahman and Adhikary (2016) reported that prevalence of poultry diseases is significantly highest in summer season than other seasons.

Conclusion, Limitations and Recommendations

The present surveillance surely indicates that ND is a highly contagious and fatal viral disease in Sonali chicken. Sonali chickens are more susceptible during winter and summer seasons, and the grower chickensare more susceptible than chicks. The limitations of the surveillance were the continuous data of affected flock were not recorded because the data would be changed according to the course of the disease. Only the data of first 1-2 days after infection were recorded on patient register. Infection on rest of the days was not recorded. Before starting of winter and summer season, the Sonali chicken should be reared with more intensive care. Schedule vaccination is very much important to minimize the outbreak. Active surveillance is especially recommended for further studies.

Acknowledgment

Competing interests

Authors have declared that no competing interests exist.

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Supplementary Table 1. All diseased cases of Sonali chicken at Badalgachhi, Naogaon during the study period (October/2018 to September/2019)

SL No.	Date	Monthly case number	No. of birds in flock	Age	Sick	Dead	Schedule Vaccination	Post mortem examination	Tentative diagnosis
1	17-10-18	18	40000	35 d	200	10	Yes	Done	Coccidiosis
2	18-10-18	20	18000	52 d	100	7	Yes	Done	Salmonellosis
3	18-10-18	21	10000	53 d	200	6	Yes	No	Enteritis
4	18-10-18	22	3600	22 d	220	8	No	Done	Mycotoxicosis
5	30-10-18	35	10000	41 d	1220	120	No	Done	ND
6	30-10-18	38	2300	9 d	329	20	No	Done	ND
7	31-10-18	41	1050	30 d	150	5	Yes	Done	CRD
8	01-11-18	2	1500	15 d	100	6	Yes	Done	IBD
9	11-11-18	20	1050	58 d	350	19	No	Done	ND
10	12-11-18	22	1500	8 d	250	10	Yes	Done	IBD
11	15-11-18	26	4500	12 d	100	7	No	Done	IBD
12	18-11-18	28	800	6 d	60	6	Yes	Done	Salmonellosis
13	20-11-18	29	800	14 d	100	0	Yes	No	Indigestion
14	20-11-18	31	3300	36 d	120	8	No	Done	Mycotoxicosis
15	22-11-18	33	500	34 d	20	2	Yes	Done	Coccidiosis
16	25-11-18	35	3500	57 d	400	19	No	Done	ND
17	25-11-18	36	5000	12 d	120	10	No	Done	IBD
18	27-11-18	39	3000	45 d	500	8	No	Done	Fowl Cholera
19	28-11-18	41	3000	23 d	100	9	Yes	Done	Coccidiosis
20	28-11-18	42	2000	30 d	400	7	yes	Done	CRD
21	29-11-18	44	70000	35 d	1200	0	Yes	Done	Enteritis
22	29-11-18	45	460	50 d	255	5	No	Done	Coccidiosis
23	03-12-18	2	4000	60 d	200	6	No	No	Coccidiosis
24	17-02-18	23	10000	30 d	300	10	Yes	Done	Coccidiosis
25	18-12-18	24	3300	31 d	100	0	Yes	Done	Gout
26	18-12-18	25	500	44 d	20	5	Yes	Done	ND
27	19-12-18	26	4000	22 d	200	7	No	Done	Colibacillosis
28	20-12-18	28	3500	45 d	500	0	Yes	No	Parasitic
29	20-12-18	29	3500	50 d	300	0	Yes	Done	Parasitic
30	23-12-18	33	15000	43 d	1500	140	Yes	Done	ND
31	24-12-18	37	70000	15 d	2000	72	No	Done	ND
32	27-12-18	46	4200	36 d	200	9	No	Done	Salmonellosis
33	27-12-18	48	10000	33 d	300	0	Yes	Done	Malnutrition
34	02-01-19	7	2000	57 d	200	16	No	Done	ND
35	03-01-19	9	1500	43 d	500	15	Yes	Done	Fowl Cholera
36	06-01-19	10	1100	27 d	300	5	No	Done	Coccidiosis
37	06-01-19	11	2500	16 d	250	14	Yes	Done	ND
38	07-01-19	12	2000	40 d	100	7	Yes	Done	Neoplastic
39	09-01-19	16	1100	22 d	50	3	Yes	Done	Salmonellosis
40	10-01-19	17	1200	36 d	200	8	No	Done	Coccidiosis
41	10-01-19	18	4000	20 d	120	5	Yes	Done	IBD
42	13-01-19	19	36	40 d	36	3	No	Done	CRD
43	13-01-19	20	70000	36 d	2250	150	Yes	Done	ND

44	15-01-19	24	14256	25 d	203	11	No	Done	CRD
45	20-01-19	27	2300	51 d	230	18	No	Done	ND
46	20-01-19	28	3500	23 d	350	7	No	Done	IBD
47	20-01-19	29	2200	17 d	200	18	Yes	Done	ND
48	21-01-19	31	10000	12 d	2200	128	No	Done	ND
49	22-01-19	33	5000	20 d	500	10	No	Done	IBD
50	22-01-19	34	3300	36 d	300	12	No	Done	Mycotoxicosis
51	24-01-19	36	2000	25 d	200	7	Yes	Done	IBD
52	27-01-19	39	4500	28 d	450	8	Yes	Done	IBD
53	04-02-19	5	4000	35 d	400	5	No	Done	Colibacillosis
54	12-02-19	10	3500	30 d	700	8	No	Done	Coccidiosis
55	24-02-19	21	3500	8 d	350	0	Yes	No	Enteritis
56	25-02-19	22	4000	52 d	400	26	No	Done	ND
57	27-02-19	24	40000	35 d	450	12	No	Done	Mycotoxicosis
58	27-02-19	25	2000	40 d	2000	0	No	No	Enteritis
59	04-03-19	2	1000	53 d	200	14	Yes	Done	ND
60	07-03-19	15	3000	33 d	300	0	Yes	No	Parasitic
61	07-03-19	16	2000	40 d	200	0	Yes	No	Parasitic
62	10-03-19	18	70000	30 d	2000	25	No	Done	CRD
63	21-03-19	60	12000	33 d	2000	15	Yes	Done	Coccidiosis
64	24-03-19	67	2500	26 d	300	10	Yes	Done	IBD
65	25-03-19	77	10000	55 d	2000	116	Yes	Done	ND
66	27-03-19	92	20000	25 d	3000	0	No	No	Enteritis
67	28-03-19	112	3000	19 d	300	6	Yes	Done	Coccidiosis
68	31-03-19	126	1400	36 d	300	11	No	Done	Coccidiosis
69	15-04-19	122	3000	49 d	200	5	Yes	Done	Salmonellosis
70	15-04-19	123	2000	58 d	250	0	Yes	No	Pox
71	15-04-19	124	3300	47 d	300	15	No	Done	ND
72	16-04-19	125	2500	26 d	200	0	No	No	Enteritis
73	16-04-19	126	1000	58 d	200	3	Yes	Done	Fowl Cholera
74	16-04-19	127	1000	28 d	100	10	No	Done	IBD
75	16-04-19	128	1350	45 d	150	28	No	Done	ND
76	17-04-19	140	6000	21 d	500	10	Yes	Done	IBD
77	17-04-19	141	1500	56 d	200	12	No	Done	Coccidiosis
78	21-04-19	156	2000	49 d	200	10	Yes	Done	Coccidiosis
79	21-04-19	157	1500	44 d	500	10	Yes	Done	IBD
80	21-04-19	158	2000	55 d	200	22	No	Done	ND
81	21-04-19	159	4000	22 d	200	9	Yes	Done	Colibacillosis
82	21-04-19	160	40000	35 d	500	11	Yes	Done	Coccidiosis
83	21-04-19	161	75000	55 d	600	0	Yes	No	Enteritis
84	23-04-19	173	1000	36 d	100	19	No	Done	ND
85	23-04-19	186	4500	45 d	300	10	Yes	Done	IBD
86	23-04-19	187	7500	38 d	500	15	Yes	Done	Coccidiosis
87	24-04-19	202	6000	28 d	200	0	Yes	No	Parasitic
88	24-04-19	203	2500	56 d	350	110	No	Done	ND
89	24-04-19	204	3200	36 d	200	10	Yes	Done	IBD
90	24-04-19	205	6000	43 d	300	0	Yes	No	Enteritis
91	24-04-19	206	10000	22 d	400	8	No	Done	Coccidiosis
92	24-04-19	207	4000	30 d	280	0	Yes	No	Parasitic
93	24-04-19	208	3500	25 d	350	10	Yes	Done	Mycotoxicosis
94	24-04-19	209	2500	18 d	270	8	Yes	Done	Salmonellosis

95	24-04-19	210	18000	55 d	500	7	Yes	Done	IBD
96	24-04-19	211	15000	43 d	1300	120	Yes	Done	ND
97	24-04-19	212	25000	35 d	200	0	Yes	No	Enteritis
98	24-04-19	213	16000	47 d	400	8	No	Done	Fowl Cholera
99	29-04-19	235	2000	23 d	20	0	Yes	No	Enteritis
100	30-04-19	243	16000	25 d	2000	50	Yes	Done	ND
101	06-05-19	35	2299	26 d	100	8	Yes	Done	IBD
102	07-05-19	41	3800	41 d	200	0	Yes	No	Malnutrition
103	08-05-19	47	3500	46 d	200	6	Yes	Done	Neoplastic
104	13-05-19	63	2000	43 d	50	5	Yes	Done	IBD
105	13-05-19	64	5000	23 d	30	8	Yes	Done	IBD
106	13-05-19	65	5000	47 d	100	7	Yes	Done	Coccidiosis
107	13-05-19	66	70000	45 d	500	20	No	Done	Coccidiosis
108	14-05-19	70	12000	32 d	200	4	Yes	Done	CRD
109	16-05-19	73	1880	25 d	200	0	Yes	No	Enteritis
110	16-05-19	74	5000	26 d	300	0	Yes	No	Enteritis
111	16-05-19	75	2100	55 d	200	5	Yes	Done	CRD
112	16-05-19	76	3000	47 d	500	17	Yes	Done	ND
113	16-05-19	77	4000	25 d	600	12	Yes	Done	ND
114	20-05-19	79	5000	22 d	1000	60	Yes	Done	ND
115	20-05-19	80	4000	18 d	200	8	Yes	Done	IBD
116	22-05-19	88	1600	15 d	200	4	Yes	Done	CRD
117	22-05-19	89	2000	50 d	100	5	Yes	Done	Mycotoxicosis
118	22-05-19	90	2600	22 d	200	6	No	Done	CRD
119	23-05-19	91	5000	15 d	200	10	Yes	Done	Salmonellosis
120	26-05-19	103	5000	18 d	200	5	Yes	Done	Coccidiosis
121	26-05-19	104	70000	32 d	500	5	Yes	No	Enteritis
122	29-05-19	112	10000	35 d	200	0	Yes	No	Parasitic
123	29-05-19	113	6000	28 d	700	120	Yes	Done	ND
124	29-05-19	114	5000	30 d	200	15	Yes	Done	IBD
125	29-05-19	115	6347	47 d	300	0	Yes	No	Parasitic
126	10-06-19	2	5000	47 d	500	6	Yes	Done	CRD
127	10-06-19	3	5000	57 d	200	5	Yes	Done	Enteritis
128	11-06-19	6	5000	33 d	300	55	Yes	Done	ND
129	17-06-19	13	70000	38 d	500	0	Yes	No	Malnutrition
130	27-06-19	26	2000	53 d	200	0	Yes	No	Malnutrition
131	27-06-19	27	10000	22 d	300	0	Yes	No	Parasitic
132	30-06-19	33	1600	33 d	200	3	No	Done	Coccidiosis
133	09-07-19	24	5000	37 d	20	0	Yes	No	Malnutrition
134	09-07-19	25	1650	24 d	50	2	Yes	No	Enteritis
135	09-07-19	26	1500	19 d	20	3	Yes	No	Enteritis
136	11-07-19	37	6000	28 d	1200	120	Yes	Done	ND
137	14-07-19	42	3000	25 d	300	0	No	No	Malnutrition
138	16-07-19	49	3800	25 d	300	5	Yes	Done	CRD
139	16-07-19	50	2500	36 d	200	0	Yes	No	Malnutrition
140	16-07-19	51	1700	30 d	300	2	Yes	No	Enteritis
141	16-07-19	52	10000	43 d	200	10	Yes	Done	CRD
142	18-07-19	55	1500	32 d	320	13	Yes	Done	ND
143	18-07-19	57	10000	33 d	200	8	Yes	Done	CRD
144	22-07-19	67	70000	55 d	500	0	No	No	Enteritis

145	23-07-19	68	7000	39 d	200	6	No	Done	Coccidiosis
146	23-07-19	69	5000	22 d	300	6	Yes	Done	CRD
147	23-07-19	70	2400	35 d	200	0	Yes	No	Malnutrition
148	25-07-19	78	7000	33 d	200	0	Yes	No	Malnutrition
149	25-07-19	79	6000	40 d	300	0	Yes	No	Parasitic
150	25-07-19	80	2000	24 d	30	0	Yes	Done	CRD
151	28-07-19	89	3000	50 d	100	3	Yes	Done	CRD
152	28-07-19	91	1000	49 d	100	1	Yes	No	Enteritis
153	14-08-19	22	5000	40 d	10	1	Yes	Done	Coccidiosis
154	18-08-19	26	110	35 d	10	2	Yes	Done	ND
155	25-08-19	51	4000	39 d	50	4	No	Done	Coccidiosis
156	27-08-19	58	9000	40 d	120	7	Yes	Done	IBD
157	28-08-19	59	5000	37 d	50	2	Yes	Done	Coccidiosis
158	29-08-19	63	3500	30 d	100	6	No	Done	IBD
159	29-08-19	64	2500	52 d	150	5	Yes	Done	Salmonellosis
160	02-09-19	5	3000	22 d	200	4	Yes	Done	CRD
161	02-09-19	6	8500	25 d	300	10	Yes	Done	Colibacillosis
162	03-09-19	7	7000	33 d	100	7	Yes	Done	Coccidiosis
163	03-09-19	8	2000	28 d	200	0	Yes	No	Malnutrition
164	04-09-19	9	2500	40 d	30	0	No	No	Parasitic
165	05-09-19	13	500	20 d	50	2	Yes	Done	CRD
166	11-09-19	16	5000	22 d	200	5	Yes	Done	CRD
167	15-09-19	21	1500	40 d	300	1	Yes	No	Malnutrition
168	17-09-19	29	90	35 d	20	5	Yes	Done	ND