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Investigation of poultry diseases outbreak in different seasons in Shulgara district of Balkh province

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Abstract

Understanding the occurrence of diseases will help to plan disease prevention effectively. Therefore, a field study was conducted to describe the occurrence of various broiler diseases in Shulgara district of Balkh province of Afghanistan. This research was conducted in 42 broiler farms of the study area. Totally, 537 cases of broiler diseases were recorded and subjected to diagnose. Disease diagnosis was made based on history, clinical signs, and results from postmortem lesions and findings. Occurrence of CRD was the highest one (23%) in broiler chickens followed by coccidiosis (18%), salmonellosis (12%), ND (10%), enteritis (9%), E. coli infections (7%), IBD, IB (7%), necrotic enteritis (6%) and BP (1%). Therefore, it is recommended to apply adequate and effective vaccination practices, brooding arrangements, and good sanitation and hygiene, and biosecurity measures.

Keywords: Poultry disease, Broiler, Shulgara, Afghanistan.

Introductions

Afghanistan economic system greatly rely on agriculture and livestock. Poultry products such as meat and eggs are the main source of animal protein for the afghan people. The poultry rapidly developed in Afghanistan in the last two recent decades. The main zone of poultry located in the east of Afghanistan and other parts of Afghanistan are late in this industry. It is a very profitable business for both individuals and entrepreneurs. Based on estimates, there are 10,000 farms in Afghanistan. The farms produce 219000 tons of meat annually according to the Afghanistan poultry union survey. The poultry sector is characterized by farm sizes ranging from farms with <1,000 to around 5000 chickens. Generally, the average flock size for broilers is approximately 2,000 to 3,000. This fast-growing sector, which plays important acts in socio-economic development especially rural livelihood development by creating employment opportunities. Commercial poultry farming has developed very rapidly since the last few years, but several factors diminished the growth rate of this sector. Poultry diseases are the main constraints for development of the poultry industry. Outbreaks of various forms of diseases are hampering poultry productivity. However, numerous infectious diseases posed a serious threat for the survival of particularly small-scale poultry farming, and the diseases inflicted heavy economic losses upon the country (based on ministry of agriculture, irrigation and livestock 2019 report).

Outbreaks of different types of diseases prevent the productivity of poultry. About 30% of poultry birds die annually in Bangladesh (Chanie, Neqash, and Tilahan 2009) [6], 8% in Iran (Bashashati, *et al.*, 2010) [5], 6 - 13% in Pakistan (Naveed, 1999; Zahir-ud-Din, 2001) [16, 18] due to several diseases. Production of broilers also significantly affected by diseases (Chanie, Neqash, and Tilahan 2009) [6] and many of them also have public health hazards (Islam *et al.* 2007; Haider *et al.*, 2008) [9, 7].

The major poultry diseases include Newcastle disease (ND), *Escherichia coli* infections, Infectious coryza, Infectious bronchitis (IB), Coccidiosis, Enteritis, Fowl pox, Salmonellosis, Hydropericardium syndrome (HPS), and Avian Influenza (AI) (Javed *et al.*, 1994; Khan *et al.*, 2000; Bano *et al.*, 2003; Ahmad *et al.*, 2008) [10, 13, 4, 1].

The mortality rate and occurrence of diseases belong to geo-climatic condition, bird's population, management practices, immunization and etc (Ahmed and Hamid, 1992; Ali, 1994) [2, 3]. Season, which is an incredibly important environmental factor, may have deep effects on occurrence of diseases in poultry (Yunus *et al.*, 2009) [17].

Newcastle disease is an infectious disease of economic significance to indigenous and

commercial poultry (Islam *et al.* 1998) ^[19]. Prevalence of infectious bursal disease (29.32%), salmonellosis (14.29%), new castle disease (11.78%), infectious bronchitis (9.27%), coccidiosis (6.93%), colibacillosis (6.43%), chronic respiratory disease (4.85%), visceral gout (4.68%), necrotic enteritis (1.59%), mycotoxigenesis (0.67%) and infectious coryza (0.08%) reported (Mohammad *et al.*, 2019) ^[15] The diseases prevalent mostly occurred due to poor vaccination, poor feed, housing, and through wild and migratory birds, poor management on farm and non-adherence to biosecurity measures (Khawaja *et al.*, 2005) ^[14].

The present study was conducted to investigate the incidence of different diseases in different seasons, which will provide baseline data for effective prevention, and control of infectious diseases in broiler.

Materials and Methods

The present study was conducted from January 2019 to December 2019 in order to know the present situation of broiler diseases in the broiler farms of Sholgara district located in Balkh division of Afghanistan.

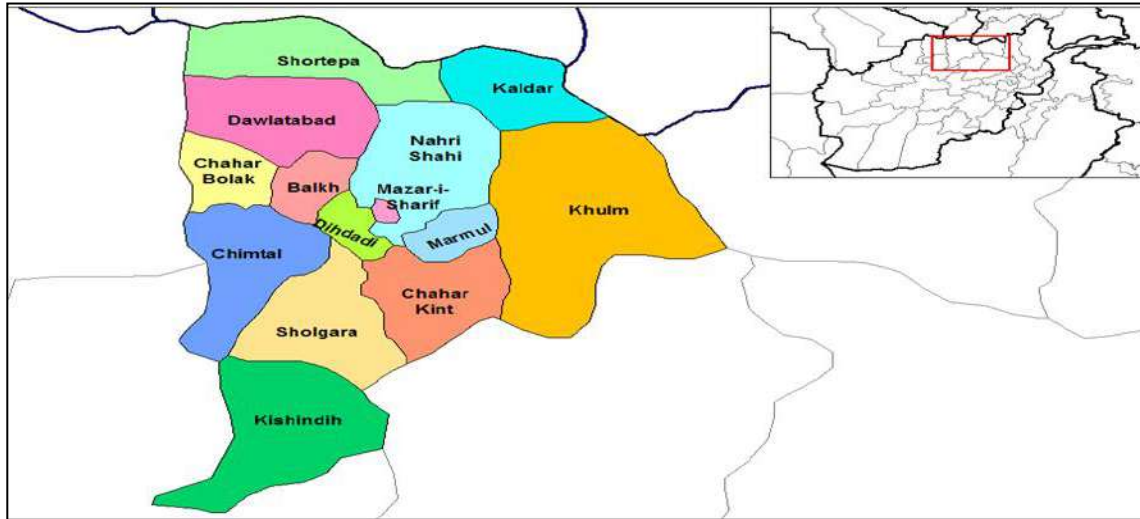


Fig 1: Map of Afghanistan showing the study area (sholgara district).

The necessary data and information were collected from the clinical record book and later analyzed to find the percentage of disease occurrence.

A total of 537 cases of broiler diseases documented in this time from 42 poultry farms. These cases were examined. The diagnoses were based on history, clinical signs, and postmortem findings. The percentage of causalities of each disease is found by interview with doctors of poultry and farmers.

To know the actual scenario of the diseases. data were recorded to study the seasonal occurrence the whole time was divided into four quarters.

Results and Discussions

Incidence of different diseases in broilers are presented in table 1. The results of present study show that various

diseases (IB, Gambro, ND, coccidiosis, E-coli, salmonellosis, enteritis, necrotic enteritis, CRD and Aspergelosis) affect the broiler farms. Occurrence of CRD was the highest one (23%) in broiler chickens followed by coccidiosis (18%), salmonellosis (12%), ND (10%), enteritis (9%), E. coli infections (7%), IBD, IB (7%), necrotic enteritis (6%) and BP (1%). These findings supports the survey that was conducted by Yunus *et al.* (2008), Khan *et al.* (2015), Mohammad *et al.* (2019, Javed *et al.* (1994) ^[10, 15], Khan *et al.* (2000), Bano *et al.* (2003) ^[4] and Ahmad *et al.* (2008) ^[1]. However, no incidence of Newcastle disease was noted at sholgara district from Jan to June 2019. This might be due to the difference in location or vaccination practices. Prevalence of CRD was the highest followed by coccidiosis, salmonellosis, ND, enteritis, E. coli infections, IBD and IB, necrotic enteritis and BP in broiler chickens.

Table 1: Occurrence of diseases in broiler with seasonal variation

Name of the Diseases	Quarters				Total of cases
	Jan, Feb & Mar (N=129)	Apr, May & Jun (N=143)	Jul, Aug & Sep (N=108)	Oct, Nov & Dec (N=157)	
IBD*	9 (23,1%) **	9 (23,1%)	10 (25,6%)	11 (28,2%)	39
IB	6(15.38%)	19 (48.71%)	10 (25.64%)	4 (10.25%)	39
ND	0	0	20 (39,21%)	31 (60.79%)	51
CRD	41 (33,88%)	37 (30.57%)	20 (16,52%)	23 (19.008%)	121
Salmonellosis	12 (19.04%)	22 (34.92)	12 (19.04%)	17 (26.98%)	63
E-coli	3 (7.5%)	13 (32.5%)	11 (27.5%)	13 (32.5%)	40
Enteritis	17 (35.4%)	18 (37.5%)	5 (10.41%)	8 (16.66%)	48
Necrotic enteritis	7 (22.58%)	0	5 (16.13%)	19 (61.29%)	31
BP	1 (16.66%)	0	1 (16.66%)	4 (66.68%)	6
Coccidiosis	33 (33.33%)	25 (25.25%)	14 (14.14%)	27 (27.27%)	99

* IBD, Infectious bursal disease; IB, Infectious bronchitis; ND, Newcastle disease; CRD, Chronic respiratory disease; BP, Broad pneumonia,

** Data is presented as frequency (percentage).

The period between Jan to June appeared to be safer for broilers due to lowest occurrence of murderous disease like ND. On the contrary, the period between July to December is very risky. The findings of present study were different from Khan *et al.* (2015) and Khan (1994) ^[11]. They reported that the occurrence of coccidiosis is high during July to September. It is also noted that coccidiosis is relatively less in dry season. The results of present research show that IB spreads mostly in dry season compared to seasons. It was noted that the occurrence of IBD and Salmonellosis had

similar trend throughout the year. The results of present study showed that CRD causes more economic losses compared to other mycoplasma species. Its occurrence had similar trend throughout the year. Birds of all age groups were susceptible to this disease but young birds were more prone to the infection than adults. These finding are similar with Mukhtar *et al.* (2012) ^[12] results. The results also depicted that the occurrence of diseases is different according to the season of the year, age and the level of casualties was also different (table 2).

Table 2: Prevalence of diseases according to season and age and its casualties.

Name of the diseases	Age of suffering	Season	Casualties (%)
IBD	After 17 days	Usually	15-30
IB	The third weeks	Jun-September	30-50
ND	After 15 days	October-December	Above 50 Sometime 100
CRD	After 17 days	Usually but in wet season more	5-10
Salmonellosis	From 2-8 days	Every time	10-30
<i>E. coli</i> infections	Up to 16 day	Every time	2-5
Enteritis	Every time	Every time	2-7
Necrotic enteritis	Every time	Every time	3
BP	Up to 15 day	In wet season	10-18
Coccidiosis	Every time	Usually but in wet season more	10-25

Occurrence of diseases and the subsequent casualties depend on farmers' management. There have been serious casualties in farms where there was mismanagement and no hygiene and no biosecurity. Broiler chickens were vaccinated against ND, IBD and IB but sometimes the

vaccine has not responded and has serious losses too. The reason of ineffectiveness of vaccine was not clear but might be no consideration of cool chain and its appropriate use in broilers. BP is also murderous disease but its outbreak is at the lowest level of the broiler diseases.

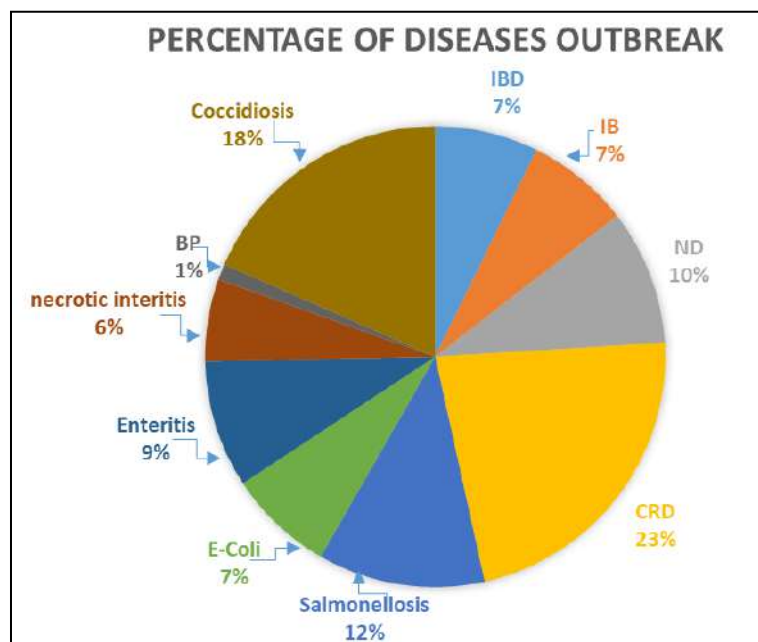


Fig 2: shows the prevalence of broiler disease in Shulgara broiler farms.

According to the results (Figure 2), the prevalence of CRD was the highest (23%) in broilers followed by coccidiosis (18%), salmonellosis (12%), ND (10%), enteritis (9%), *E. coli* infections (7%), IBD and IB (7%), necrotic enteritis (6%) and BP (1%). The prevalence of the diseases reported in present study are lower compared to the findings reported by Khawaja *et al.* (2005) ^[14]. They reported 40.33% prevalence of ND and the prevalence of the disease was high in winter season. The findings of present study

indicated that ND was still a threat to the poultry. Our findings are lower than the findings reported by other authors (Mohammad *et al.*, 2019) ^[15]. They reported 29.32% prevalence of infectious bursal disease. The IB disease is also threat for poultry that its occurrence is (7%) and near to (Mohammad *et al.*, 2019) ^[15] findings that who reported 9.25%. Among the bacterial diseases it was observed that prevalence of salmonellosis and *E. coli* infections were 12%

and 7% and it is near to the prevalence reported by other researchers (Mohammad *et al.* 2019) ^[15]. In the present study 18% of cases of coccidiosis was reported which is higher than 8.03% (Mohammad *et al.* 2019) ^[15]. This variation might be due to species variation and none use of anticoccidial drug in broiler feed.

In the present study 23% cases of CRD was reported that was higher than 11.66% which was reported by Mohammad *et al.* (2019) ^[15]. In our study the prevalence of aspergillosis was 1% and it was same with Mohammad *et al.* (2019) ^[15].

Conclusion

During this study it was found that the prevalence of broiler diseases is high in the study area. The results show that various diseases (IB, Gambro, ND, coccidiosis, E-coli, salmonellosis, enteritis, necrotic enteritis, CRD and Aspergelosis) affect the broiler farms. These diseases are highly infectious and cause mortality in broilers. Newcastle diseases and coccidiosis have negative effect on farmer economy and other diseases also can make economic losses to broiler farmers. The space between two farms are very close and the allowance of non-responsible persons and wild birds are not limited. To reduce and control the occurrence of viral diseases, the farmer should limit the contact of non-responsible person, local birds and migratory birds to farm, selecting a good hatchery and following the cool chain protocols in case of vaccination. In case of bacterial diseases proper sanitation and hygiene should be maintained and specific treatment should provide for their control. These findings may help researchers to further research or poultry advisors to make a strategy for the control of specific diseases.

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