International Journal of Poultry Science 1 (4): 102-105, 2002

Management and Disease Problems of Cockerels in Some Farms of Mymensingh, Bangladesh

G. C. Sil, P. M. Das, M. R. Islam * and M. M. Rahman
Department of Pathology, Bangladesh Agricultural University, Mymensingh, Bangladesh
E-mail: mrislam210@hotmail.com

Abstract: To find out the diseases occurring in cockerels and its relationship with the management of cockerel's farm an investigation was carried out from day-old chicks up to marketing at three different cockerel farms in Mymensingh district. In the farm 1, IBD appeared at the age of 31-35 day, the morbidity being 100% and mortality 28.57%. Vaccination at high environmental temperature and use of no fumigation, might be the managemental factors contributed in the causation of the malady. In the farm 2, the morbidity and mortality of yolk sac infection, hypovitaminosis-E, coccidiosis and miscellaneous condition were recorded 3.6 and 2.4%; 4.4 and 2.0%; 8.4 and 0.8%; 0.4 and 0.4%, respectively. However, litter management problem and problem in maintenance of optimum temperature in the shed might be related to these maladies. In the farm 3, the morbidity and mortality rates of the diagnosed diseases like IBD and hypovitaminosis E were 8.6 and 1.4%; 1.2 and 0.4%, respectively. The proportionate mortality of cockerels in these farms were 81.6% for IBD, 8.04% for hypovitaminosis E, 6.89% for yolk sac infection, 2.29% for coccidiosis and 1.14% for miscellaneous condition. IBD occurred in age group of >2-8 weeks, hypovitaminosis E in 0-2 and >2-8 weeks group, yolk sac infection in 0-2 weeks, coccidiosis in >8-20 weeks and the miscellaneous condition in 0-2 weeks group. The findings indicate that IBD is the major disease problem in cockerel farming in Mymensingh.

Key Words: Cockerel, disease problem, cockerel farming, management system

Introduction

Poultry farming in Bangladesh is now considered as a growing industry. But one of the major constraints in the development of poultry industry in Bangladesh is the outbreak of diseases, which cause about 30% mortality of chickens (Ali, 1996). Poultry meat mainly comes from two sources, broilers and cockerels. The small poultry farmers usually prefer to cockerel rearing due to low cost of day-old chicks, required less floor space and feed, cockerel-meat price is higher than the broiler-meat and the farmers believe that the cockerels are less susceptible to diseases in comparison to broilers. Although the farmers begin cockerel farming with great enthusiasm but sometimes they become dishearted when there is great mortality of cockerels due to disease out break. Management of farm in a scientific manner is a pre-requisite in the prevention of diseases. Most of the farmers do not follow the strict bio-security and hygienic principles.

Review of available literatures reveal that there is no work, so far carried on the diseases of cockerels in Bangladesh, its management and relation of management with the diseases. Considering the above-mentioned facts, the investigation was undertaken to find out the diseases occurring in cockerels of Mymensingh and its relationship with the managemental determinants of the farms that directly or indirectly predisposes the diseases.

Materials and Methods

The investigation was conducted at three different cockerel farms in the rural area of Trishal upazilla of Mymensingh district to find out relationship between the management and disease problems of cockerel farming. This investigation included the observations from day-old chicks up to marketing (60 days) of the cockerels i.e. from 5th August to 3rd October 2000. The management systems of these farms were closely observed by visiting them intensively and by taking regular information from the owners of the farms. The abnormal behaviours, if showed by the cockerels of different farms, were recorded properly. The morbidity, mortality, age of affection of various diseases/conditions were also noted. The affected or dead cockerels were collected as soon as possible for necropsy and diagnosis of diseases/conditions at department of pathology, Bangladesh Agricultural University, Mymensingh. The diagnosis of different diseases/conditions was performed on the basis of history, clinical signs and characteristic gross, as well as microscopic tissue alterations, clinical pathology and isolation and identification of bacteria. The management systems, feeding and watering systems etc. are shown in Table 1, vaccination programme shown in Table 2.

Bio-security measures taken in all the observed cockerel farms:

1. Visitors were not allowed to enter into the house.
2. Persons, taking care of birds took adequate precautions before entering the house.
3. Footbath containing potassium permanganate solution was used at the entrance point.
4. Dead birds were removed as soon as possible.
5. Sick birds were isolated when they were affected.
6. All equipments of the house were cleaned by disinfectant.
7. Fresh feed and clean drinking water were supplied.
8. The entrance of pet Animals, rodents and wild birds inside the house was prevented.

Results and Discussion

The thorough investigation of the three cockerel farms in Mymensingh identifies a number of maladies responsible for morbidity and mortality of cockerels. Diseases of cockerel diagnosed in farms along with morbidity, mortality patterns and age of the affected birds are shown in Table 3. Overall prevalence of diseases of cockerels with their age susceptibility and proportionate mortality rate is shown in Table 4.

In the farm 1, infectious bursal disease appeared at the age of 31-35 days where morbidity and mortality rates were 100 and 28.57%, respectively. It may be noted here that in the farm 1, hijack light was used to control the temperature. It is very difficult to maintain the temperature of the shed by means of hajack. It might be a contributory factor to lead the birds to stress condition which helped to cause outbreak of the malady. Moreover, fumigation of the farm was not done before bringing the chicks, which is the only way to make the shed free from infectious bursal

Table 1: Management system of observed cockerel farms

Events	Farm No. 1	Farm No. 2	Farm No. 3
Site of farm	About 4 Km from the highway and 6 m distance from another farm.	About 4 Km from the highway and 5 m distance from other farm.	About 4 Km from the highway and 0.5 Km distance from another farm.
Period of rearing	6th August to 3rd October, 2000	5th August to 28th September, 2000	6th August to 3rd October, 2000
Personnel involvement	2 in numbers	2 in numbers	3 in numbers
Type of housing	Intensive type, the roof of the house was made of straw and the floor was earth ground. Four sides were opened which were fenced by bamboo splatter.	Intensive type, three sides were opened and others were same as farm 1.	Intensive type and others were same as farm 1.
Cleaning and disinfection	Firstly, the farm was properly washed and cleaned with tube well water, then disinfected by spreading lime water before 15 days of brooding, again Iosan solution was sprayed before placement of day-old chicks. Polyethylene papers were used to cover all ventilators with provision for restricted ventilation.	Disinfected thoroughly by spreading diluted lime water before 12 days of brooding, then Iosan solution was sprayed before 2 days of placement of day-old chicks. Others were same as farm 1.	Same as farm 1.
No. and source of birds	224 day-old Harko strain cockerel chicks were collected from BRAC poultry Hatchery, Gazipur.	250 day-old BV 330 strain cockerel chicks were collected from Kagoli poultry Hatchery, Gazipur.	500 day-old Harko strain cockerel chicks were collected from BRAC poultry Hatchery, Gazipur.
Brooder house, litter and brooding temperature	As a chick guard paper broad was used. Fresh and dried rice husk was as litter material at a depth of 4 inches. Newspaper was placed on the litter. Hajack light, hung with the hover was used as a source of temperature. The brooding temperature was 92, 90, 90, 91 and 89 °F at day 1st, 4th, 8th, 10th and 13th respectively.	Depth of litter was at about 3 inches. Dry lime was spread around the brooder house. Others were same as farm 1. The brooding temperature was 92, 90, 89, 88 and 89 °F at day 1st, 4th, 8th, 10th and 13th respectively.	The brooding temperature was 90, 90, 88, 85 and 89 °F at day 1st, 4th, 8th, 10th and 13th respectively. Others were same as farm 1.
Temperature and lighting	The birds were exposed to continuous lighting of 24 hours. Hajack and Hariken were provided as a source of light and heat at night. The temperature was ranged from 85.5 91 °F.	The temperature was ranged from 85 to 92 °F. Others were same as farm 1.	The temperature was ranged from 86 to 89.5 °F. Others were same as farm 1.
Feeding and watering	Formulated broiler starter diet was fed between day-old and 25 days and broiler finisher diet was fed between 26 and 60 days. Feed and clean drinking water supplied *ad libitum*. In addition, vitamin and minerals were supplied with drinking water.	Formulated broiler starter diet was fed between day-old and 15 days and broiler finisher diet was fed between 16 and 57 days. Others same as farm 1.	Feed and water same as farm 1.
Floor space			
Day 0-15:	45.69 cm^2/bird	74.33 cm^2/bird	65.04 cm^2/bird
Day 16-57/60:	1791.81 cm^2/bird	546.30 cm^2/bird	706.11 cm^2/bird

disease virus. The cockerels were vaccinated against infectious bursal disease twice with Gumboro D78 at the age of 14 and 22 days. This indicates that the vaccination could not protect the birds. The factors of vaccination failure are usually classified as a) vaccine type, storage and handling b) condition of the bird and c) administration of vaccine. None of these factors can be ruled out as the cause of vaccine breaks, but from the history of vaccination it reveals that there was high temperature on the days of vaccination. Zulkifli *et al.* (1997) claimed high environmental temperature as one of the causes of vaccination failure. On the

Table 2: Vaccination schedule followed in the observed cockerel farms

Vaccines	Time of vaccination (days)			Name of diseases	Route of administration
	Farm 1	Farm 2	Farm 3		
MV5Clone 30	7	9	7	ND and IB	Intraocular
Gumboro D78	14	16	14	IBD	Intraocular
Gumboro D78	22	28	22	IBD	Intraocular
MV5Clone 30	31	39	31	ND and IB	Intraocular

* ND – Newcastle disease IB – Infectious bronchitis IBD – Infectious bursal disease

Table 3: Diseases of cockerel diagnosed in farms along with morbidity, mortality patterns and age of the affected birds

Farm	Total No. of birds	Disease diagnosed	No. affected	Age of infection (days)	No. of death	Morbidity (%)	Mortality (%)
1	224	Infectious bursal disease	224	31-35	64	100	28.57
		Yolk sac infection	9	7-10	6	3.6	2.4
2	250	Vitamin-E deficiency disorder	11	19-22	5	4.4	2
		Coccidiosis	21	56-57	2	8.4	0.8
		Miscellaneous disease condition	1	4	1	0.4	0.4
3	500	Infectious bursal disease	43	31-35	7	8.6	1.4
		Vitamin-E deficiency disorder	6	13-14	2	1.2	0.4

Table 4: Overall prevalence of diseases of cockerels with their age susceptibility and proportionate mortality rate

Diseases	Age (weeks)			Total No. of cases encountered	Mortality(%)
	0-2	>2-8	>8-20		
Infectious bursal disease	0	71	0	71	81.60
Yolk sac infection	6	0	0	6	6.89
Vitamin-E deficiency disorder	2	5	0	7	8.04
Coccidiosis	0	0	2	2	2.29
Miscellaneous disease condition	1	0	0	1	1.14

other hand, it was not known whether the parent stock was previous vaccinated and whether maternally derives antibodies contributed in this case.

In the farm 2, a total of 42 cockerels were affected out of 250, among them 14 died. The diseases or conditions encountered in this farm were yolk sac infection, hypovitaminosis E, coccidiosis and one miscellaneous condition with the morbidity and mortality rates of 3.6 and 2.4%; 4.4 and 2.0%; 8.4 and 0.8%; 0.4 and 0.4%, respectively. Yolk sac infection was observed in cockerels at the age of 7 to 10 days. It was not known whether the condition is hatchery borne or infection occurred later on. But it may be said that floor condition of the shed has contributed in this malady, as the floor was earth grounded. Maintenance of optimum temperature is essential to treat the yolk sac infection. Among the various causes of infection, *E. coli* is very common and this organism was isolated and identified. The disease, coccidiosis is usually related to litter and feed contamination. It is to be noted that out of 21 affected cockerels at the age of 56 to 57 days, only 2 died and mortality checked when proper treatment was given. Vitamin-E deficiency was recorded at the age of 19-22 days and the cause of vitamin-E deficiency might be due to vitamin-E deficient diets.

In the farm 3, infectious bursal disease and hypovitaminosis E were recorded with morbidity and mortality of 8.6 and 1.4%; 1.2 and 0.4%, respectively. The management of farm 1 and 3 were almost similar where fumigation was not performed and IBDV infection was recorded in both the farms. This indicates that the use of fumigation of the shed with formalin and potassium permanganate is essential to prevent IBDV infection. It further proved that vaccination and medication could never be the substitution of proper management of poultry farms.

The highest cockerel proportionate mortality was recorded 81.86% due to infectious bursal disease. This was followed by vitamin-E deficiency disorder 8.04%, yolk sac infection 6.89%, coccidiosis 2.29% and miscellaneous disease condition 1.14%.

Bhattacharjee *et al.* (1996) recorded the highest mortality of chickens due to infectious bursal disease (10.99%) diagnosed at the Central Disease investigation Laboratory, Dhaka, Islam *et al.* (1998) recorded 16.0% and Talha (1999) recorded 19.16% in Mymensingh district. These findings indicate that IBD infection re-emergent with enhanced virulence in Mymensingh district as well as in Bangladesh. The mortality rate of male chickens was recorded 83.56%, whereas the female was 16.44% due to IBD infection (Talha, 1999). As the findings were related to cockerels i.e. male chickens, the mortality was high which was correspondent to the findings of Talha (1999).

Kamal (1989) recorded yolk sac infection or omphalitis in 12.54%, Mayes (1987) recorded 0.1 to 7% and Byrne and Lowndes (1976) recorded 4.5% in chickens against 6.89% in cockerels as observed in this study. Cockerels of age group between 0-2 weeks were affected and died in this malady. The cause of unabsorbed yolk has been identified by cultural method. However, it is felt that scientific and hygienic management of incubators and brooders may reduce the frequency of chick losses due to such condition.

Vitamin-E deficiency disorder was recorded 8.04% with maximum mortality recorded at >2-8 weeks age group of cockerels. Talha (1999) reported 2.89% cases of birds died due to vitamin-E deficiency disorder. Islam *et al.* (1998) recorded 6.10% and Bhattacharjee *et al.* (1996) reported 8.22% cases related to malnutrition. The clinical signs exhibited by the vitamin-E deficient cockerels and associated lesions in this malady were almost similar to those reported by Sarker (1976).

Coccidiosis (2.29%), the only recorded protozoal disease was found to cause an outbreak among >8-20 weeks old cockerels. Kutubuddin (1973); Kamal (1989); Bhattacharjee *et al.* (1996); Islam *et al.* (1998); Talha (1999) recorded 14.66, 17.36, 9.40, 8.0

and 5.51% mortality of chickens due to coccidiosis. These findings indicate that coccidiosis is decreasing in Bangladesh. The reason of decreasing incidence of coccidiosis might be due to the awareness of the farmers and routine use of coccidiostats in their farms.

References

Ali, M. J., 1996. Current status of Veterinary Biologic Production in Bangladesh and their quality control. Proceedings of the BSVER symposium held on July 28,1994 at NIPSOM auditorium, Mohakhali, Dhaka, Bangladesh.

Bhattacharjee, P. S., R. L. Kundu, R. K. BISWAS, J. U. Mazumder, E. Hossain and A. H. Miah, 1996. A retrospective analysis of chicken diseases diagnosed at the Central Disease Investigation Laboratory, Dhaka. Bangladesh Vet. J., 30: 105-113.

Byrne, P. S. and K. M. Lowndes, 1976. Avian diseases diagnosed in Ireland. Poult. Abstr., 2: 247.

Islam, M. R., M. A. H. N. A. Khan, P. M. Das and A. S. M. Bari, 1998. Poultry diseases diagnosed at necropsy in 1997 and 1998 in the Department of Pathology of Bangladesh Agricultural University, Mymensingh. Proceedings of 5th BSVER Annual Scientific Conference held on 3-4 December 1998, at Bangladesh Agricultural University, Mymensingh.

Kamal, A. H. M., 1989. Pathologic investigation on the mortality of chicken in Bangladesh Agricultural University Poultry Farm. M. Sc. Thesis, Dept. of Pathology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh.

Kutubuddin, M., 1973. Pathological investigation on the cause of mortality of poultry birds in Bangladesh Agricultural University Poultry Farm. M. Sc. Thesis, Dept. of Pathology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh.

Mayes, F. J., 1987. A survey of early poult mortality in turkey flocks. Irish Vet. J., 41: 367-370.

Sarker, A. J., 1976. The prevalence of avian diseases in Bangladesh Agricultural University Poultry Farm, Mymensingh. Bangladesh Vet. J., 10: 61-66.

Talha, A. S. M., 1999. Pathology of poultry diseases occurring in Mymensingh. M. S. Thesis, Dept. of Pathology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh.

Zulkifli, I., B. M. Hair and A. M. Fauzi, 1997. Antibody responses to infectious bursal disease vaccinations in fasted broilers under high temperature and humidity. J. Vet. Malaysia, 9: 29-31