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PREVALENCE OF CESTODES IN SELECTED SMALL SCALE COMMERCIAL POULTRY FARMS OF HYDERABAD SINDH

A. S. Jatoi¹, N. Akhter², E. Bughio¹, A. H. Mirani³ and B. Bhutto²

¹Department of Poultry Production, Faculty of Animal Production and Technology, Shaheed Benazir Bhutto University of Veterinary and Animal Sciences, Sakrand, Pakistan

²Department of Veterinary Parasitology, ³Department of Veterinary Medicine, Sindh Agriculture University, Tandojam, Pakistan

ABSTRACT

In order to assess the prevalence of cestodes around Hyderabad region of Sindh, randomly selected 17 small scale commercial poultry farms were surveyed during September 2014 to March 2015. A total of 500 guts of freshly slaughtered commercial layers (289) and broilers (211 each) were examined. The results of this study envisaged that layers were severely infected with cestodes, while, broilers were free due to short life span, controlled feeding and their confinement housing thus no chance of prevalence of cestodes in these birds as compared to commercial layers. The results further showed that the prevalence of cestodes varied from farm to farm and within a farm. The overall prevalence of cestodes in commercial layers was found to be 34.95 percent in and around Hyderabad region. The overall infection rate of cestodes in layers was higher in Tando Muhammad Khan and Hyderabad regions, followed by Tando Allahyar, while, at Halla it was the lowest (41.67, 35.85, 33.85, 27.59 percent, respectively). The population of cestodes in layers ranged between 7.52 ± 0.4 , 7.38 ± 0.6 , 7.33 ± 0.3 , 8.47 ± 0.7 , respectively. The three cestode species identified were *Raillietina tetragona*, *Raillietina echinobothrida* and *Davainea proglottina*.

Keywords: cestodes, commercial, prevalence, poultry farms, species

INTRODUCTION

In Pakistan, poultry production sector has been playing a vital role in bridging the gap between supply and demand of animal protein foods for its ever-increasing human population. Poultry production in the country has been developing into two distinct sub-sectors, viz., rural or small scale poultry production and commercial poultry production. Cestode (tapeworm) infection is one of the major problem in small scale and commercial poultry maintained on litter systems which inflict heavy economic loss to the poultry in the form of retarded growth, reduced weight gain, decreased egg production, diarrhoea, obstruction of

Corresponding author: drasultan_jatoi@yahoo.com

intestine, morbidity and mortality (Anwar *et al.*, 1991; Shah *et al.*, 1999; Dube *et al.*, 2010; Tesfaheywet *et al.*, 2012). It has also been reported that parasitic infection or their concurrent infections result in immunosuppression, especially in response to vaccine against some poultry diseases (Nnadi and George, 2010). The cestodes of significant importance belong to two genera, i.e., *Railleitina* and *Hymenolepsis* (Matur *et al.*, (2010).

In the past several studies have been conducted on prevalence of cestode in free-range or backyard poultry in different parts of the country (Anwar, 1991; Ahmad, 1992; Shah *et al.*, 1999). Researchers and other stakeholders did not give attention to the incidence of cestode parasites on commercial poultry farms. Hence, considering the economic importance of the diseases caused by the cestodes in farms and dearth of information in the area, the present study was designed to investigate the prevalence and identify the cestode in selected small scale commercial poultry farms of layers and broilers.

MATERIALS AND METHODS

Collection of cestodes

The present study was conducted to investigate the incidence rate of cestode in culled commercial layers and broilers. For this purpose randomly selected 17 small scales commercial poultry farms of Hyderabad region were surveyed during September 2014 to March 2015. A total of 500 freshly slaughtered guts of layers (289) and broilers (211) were examined. The schedule for collection of freshly slaughtered intestines was followed keeping in view the sale point areas of culled layer and broilers of different poultry farms. Fortnightly visits were made to each poultry farm sale points for collection of intestines for detailed study. The samples thus collected were brought to the laboratory of the Department of Veterinary Parasitology, Faculty of Veterinary Sciences, Shaheed Benazir Bhutto University of Veterinary and Animal Sciences, Sakrand and Laboratory of the Department of Veterinary Parasitology, Sindh Agriculture University, Tandojam for detailed examination and collection of cestode species. The guts were incised longitudinally from esophagus up to cloaca. The incised intestines were immersed in Luke warm water for release of cestodes (tape worm) and their scolices. The intestinal contents were also examined by placing in black bottomed Laboratory trays to provide contrast to whitish cestodes. The worms were picked up with the help of fine forceps and transferred to normal saline solution for further detailed examination (Soulsby, 1982).

Permanent mounts and identification of cestodes

The recovered cestodes were fixed in 70 percent alcohol. Then placed in Harris Hematoxylin with 09 parts of distilled water for 1-2 hours, and then washed in several changes of water. After that placed successively in 30 and 50 percent alcohol for 30 minutes each then strain from 70 percent acid alcohol. After that it was washed in 70 percent alcohol for few minutes. Cestodes placed in 70 percent alkaline alcohol and 80 percent alcohol for two hours for dehydration. After complete dehydration, the material was kept in absolute alcohol for 10 minutes. After dehydration and staining, the cestodes parasites were placed on microscopic slide under a drop cover of Canada balsam and then covered with slide cover slip. The slides were dried in oven at 40°C. Cestodes were identified

under stereomicroscope with the help of key described by Raymond (1963) and micro photography was made with the help of camera through the dissecting microscope (Raymond, 1963).

Statistical analysis

The data thus collected were subjected to statistical analysis, following the standard statistical procedures (Lecherg *et al.*, 1965).

RESULTS AND DISCUSSION

The results of the present study regarding the prevalence of cestodes in selected small scale commercial poultry farms in and around Hyderabad region are given in Table 1-5. The results showed that the prevalence of cestode varied in farm to farm and within farm. The difference in incidence rate could be attributed to different management practices adapted in different farms. It was observed that, in layers the incidence rate of the cestodes among the poultry farms surveyed in this study ranged between 27.59 to 41.67 percent. The population of cestodes in layers ranged between 7.13 ± 1.385 to 8.00 ± 1.943 per bird in Tando Muhammad Khan, 6.00 ± 1.354 to 9.33 ± 1.043 per bird in farms at Tando Allahyar, 6.50 ± 1.033 to 8.00 ± 2.00 per bird in Halla and 7.61 ± 0.937 to 10.50 ± 1.773 per bird in farms at Hyderabad. Overall it was found that the prevalence of cestodes in layers was highest at Tando Muhammad Khan (41.67 percent), followed by Hyderabad (35.85 percent) and Tando Allahyar (33.85 percent) while, lowest at Halla (27.59 percent). The population of cestodes was in the rate of 7.13-7.68 per bird, the frequency for the value was the highest i.e., 7, followed by 8.81-9.37. Thus it shows that the cestodes in layers ranged in between 5 to 6. In the present study only three cestode species were identified i.e., *Raillietina tetragona*, *Raillietina echinobothrida* and *Davainea proglottina* in an incidence percentage of 4.7, 3.5 and 1.17 percent.

The results of the present study are in line with those of Panhwar (1996) who reported prevalence rate of cestode parasites as 36.20 percent and found five species of cestodes in layers poultry farms in district East Karachi, viz. *Raillietina tetragona*, *R. echinobothrida*, *Cotugnia digonopora*, *Amoebaenia sphunoides* and *Choanotaenia infundibulum*. Similar findings in exotic laying chickens were also reported earlier by Anwar *et al.* (1991); Buriro *et al.* (1992); Fakae *et al.* (1993) and Fatihu *et al.* (1993) who observed the overall prevalence of cestode 11.2, 12.0, 84.2, 16.6, 95.7 and 92.0 percent, respectively. However, Fatihu *et al.* (1993) reported that exotic chicken were infected exclusively with *Raillietina tetragona*. Avancini and Ueta (1990) studied life cycle of cestode parasites of caged layers in which 9 were positive for both *R. laticanalis* and *Choanotaenia infundibulum*, respectively. Shahin *et al.* (2011) conducted a study; thirty seven birds out of 860 examined chickens, showed infestation with different types of cestode worms with 4.3 percent in chickens of different ages representing all types of production. The recorded species of cestodes were *R. tetragona*, *R. echinobothrida* in an incidence percentage of 97.2 and 91.9 percent. The cestode infestation incidence in backyards; breeders; layers and broilers were 45.9, 27.9, 18.9, 5.4 and 0 percent. The highest incidence was recorded in backyard chickens while no infestation was recorded in broilers. Shah *et al.* (1999) also reported 16 percent prevalence of cestode parasites in exotic layers in

Faisalabad city and found five species viz. *Raillietina tetragona* (3.0 percent) and *R. echinobothrida* (2.0 percent). Similar finding were also reported earlier by Sayyed *et al.* (2000) who observed that higher prevalence of nematodes over cestodes in commercial layers in Pakistan. However, it was observed in the present study that, the broilers were free from cestode parasites. The probable reason for such a no prevalence of cestodes might be the short life span, received control feed and confinement of commercial broilers; therefore, there was no chance of prevalence of cestodes in these birds; whereas, in layers; minimal health care and improper sanitation are the major factors of these infections. The results of this study are close confirmation with Shahin *et al.* (2011); Baboolal *et al.* (2012) who reported no infection of cestodes in broilers. Similarly in another study, Sonune, (2012) reported no adult helminthes and helminthes ova in broilers. Contrarily to these Tesfaheywet *et al.* (2012) reported only 1.6 percent cestodes in broilers, among the helminth parasites.

Table 1. Prevalence of cestode in Tando Muhammad Khan (n=60)

Name of Farms	No. of birds examined (layers)	No. of birds infected	Mean (+SD) of parasites per bird	Percentage of infected birds (%)
Ali Poultry Farm	18	09	7.44±3.8	50.00
Khan Poultry Farm	22	10	7.13±3.9	45.45
Naeem Poultry Farm	20	06	8.00±4.7	4.761
Total	60	25	7.52±0.4	41.67

Table 2. Prevalence of cestode in Tando Allahyar (n=65)

Name of Farms	No. of birds examined (layers)	No. of birds infected	Mean (+SD) of parasites per bird	Percentage of infected birds (%)
Hussain Poultry Farm, Chambar	20	07	6.0±3.0	35.00
Chang Poultry Farm, Sanjar Chang	20	06	7.0±3.3	30.00
Choudhry Poultry Farm, Khokhar	08	03	9.33±1.6	37.05
Nabeel Poultry Farm, Tando Allahyar	17	06	7.20±3.1	35.39
Total	65	22	7.38±0.6	33.85

Table 3. Prevalence of cestode in Halla (n=58)

Name of Farms	No. of birds examined (layers)	No. of birds infected	Mean (+SD) of parasites per bird	Percentage of infected birds (%)
Memon Poultry Farm, Halla	20	06	7.50±3.1	30.00
Shah Poultry Farm, Matari	30	06	6.50±3.2	26.67
Bhitai Poultry Farm, Bhit Shah	08	02	8.00±4.0	25.00
Total	58	16	7.33±0.3	27.59

Table 4. Prevalence of cestode in Hyderabad (n=106)

Name of Farms	No. of birds examined (layers)	No. of birds infected	Mean (+SD) of parasites per bird	Percentage of infected birds (%)
Jamal Poultry Farm, Housri	15	03	7.67±1.7	20.00
Asad Poultry Farm, Tando Haider	20	05	9.02±3.1	25.00
Riaz Poultry Farm, Mousa Khatian	06	02	10.50±2.5	33.33
Shahid and Aslam Poultry Farms, Tandojam	30	10	7.61±3.9	33.33
Qureshi and Bhoora Khan Poultry Farms, Baldia Colony, Hyderabad	35	18	7.636±3.2	51.42
Total	106	38	8.47±0.7	35.85



Raillietina tetragona
Magnification: 2.5 x 3.2 = 8 X



Raillietina echinobothrida
Magnification: 2.5 x 3.2 = 8 X



Davainea proglottina
Magnification 2.5 x 3.2 = 8 X

Table 5. Over all mean of cestodes

Name of area	No. of birds examined (layers) (n)	No. of birds infected (n)	Percentage (%)
Tando Muhammad Khan	60	25	41.67
Tando Allahyar	65	22	33.85
Halla	58	16	27.59
Hyderabad	106	38	35.85
Over all mean	289	101	34.95

CONCLUSION

The present study revealed a moderate prevalence of cestodes in small scale commercial layer farms in and around Hyderabad region of Sindh. Minimal health care and improper sanitation are the major factors of these infections in the small scale poultry farms. Therefore, to minimize the risk of cestodes in commercial layers, it is suggested that management practices must be improved by better sanitation, balanced feeding, provision of clean drinking water, proper use of anthelmintics, etc.

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