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AN EPIDEMIC OF COCCIDIOSIS IN CHICKENS SOLD IN KEFFI CENTRAL MARKET, NASARAWA STATE, NIGERIA.

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ABSTRACT
The epidemics of coccidiosis in chickens were confined to Keffi central market of Nasarawa State. Species of *Eimeria* occurring in 250 stool sampled were examined using floatation method and 90(36%) were found infected with eight different species of *Eimeria*. The highest infection was recorded in *Eimeria mitis* 28(11%) with the least in *E. tenella* 1(0.0%) among the hybrid breeds of chicken. The different species of *Eimeria* were present in and among various breeds. In species predominance, shows the level of immunity of various breeds of chicken against the different species of *Eimeria*, though, there was no significant relevance in the spread of Eimeriasis among the hybrid and local breeds of chicken sold at Keffi central market ($\chi 2=102.40>5.99$) at 5% level of significance. However, farmers should ensure adequate safety standards and maintained the relative spread of *Eimeria* infection of chickens which are detrimental to man.

Keywords: *Eimeria, Epidemic, Coccidiosis, Chickens*.

INTRODUCTION

Poultry industry in Nigeria has accorded considerable increase in recent times (FAO, 2000), which in times has resulted in increased research into alternative and cheap feed resources urgently needed to sustain such growth. Thus, there is the need to continually focus attention on the health of the birds in order to realize the full potentials of the industry. Poultry coccidiosis remains one of the major threats to boosting poultry production in Nigeria (Halle *et al*., 1998) and parasitic diseases are most important due to their high incidence in poultry caused by the tropical environment conditions under which farmers operate. Coccidiosis in poultry and domestic farm animals is a parasitic protozoan disease caused by the development and multiplication of *Eimeria* species in the epithelial cells of the intestines of the stocks. Coccidial infections are ubiquitous in that they are found wherever susceptible livestock animals are reared because the sporulated oocysts of the parasites may survive for several months or even years in the environment which are readily available to animals. Coccidial infections are usually self limiting, but serious disease can develop when many pathogenic species of the causative agents are consumed by animals. Such observed several disease conditions result in poor feed efficiency under intensive rearing conditions (Merck, 1998).

In Keffi, large chicken farms are not common although individuals rear few chickens in close contact with humans, where they roam freely and scavenge for food. Their movement is uncontrolled and they hardly receive any prophylactic treatment or vaccination (Cocciforum, 2000). It is believed that these wandering birds are exposed to variety of parasitic infections including coccidiosis and as such act as potentials reservoirs and carriers of infection to other members and to more susceptible exotic breeds in commercials enterprises (Yakubu and Ajayi, 1995) Epidemiological studies have shown the importance of coccidiosis caused by several species of eimeria which are intracellular protozoans parasites. As a major parasitic disease of poultry in Nigeria (Majaro, 1980), it is among the most common diseases of poultry established in Keffi with higher incidences during the rains. Clinical coccidiosis is common under intensive rearing condition, poor nutrition, overcrowding and poor sanitation.

However, transmission of coccidiosis is chiefly by oral fecal route and without intermediate host (Tyzzer, 1932). It is determined that, the prevalence of eimeriasis in chickens sold in Keffi central market, will enlarge the best ways to prevent infection to man and maximizing output.

MATERIALS AND METHODS

Keffi, in Nasarawa state Nigeria, is located on latitude 8.5^{o}N of the equator and longitude 8.25^{o}E of greenwich meridian. The average temperature is between 20^{o}c and 25^{o}c. there are two seasons; wet and dry. The annual rainfall starts from late April to middle of September; Nassarawa state is bounded by Kaduna state to the north, Plateau state to the south and kogi state to the west (Akwa *et al*., 2007). Chicken are brought to the market from neighbouring villages around Keffi. Cages in which they were placed, were made of wire meshes and sanitary level under which they were kept was very low, 250 stool samples from birds were collected using a spatula and floatation method was implored for the identification of the oocysts.

Flotation method was adapted from Soulsby (1986) as a qualitative test for the identification of oocysts in faeces. It is based on the principle that the oocysts have a lower specific gravity than the floatation medium and such will float. After about one gram (1grm) of faeces was placed in a beaker and the faeces introduced into the medium using a glass rod, the mixture was poured into a test tube through a funnel. More of the floatation medium was added until a convex meniscus was formed. Here, a glass slide was gently placed on the preparation and left for 30 minutes. Then glass slide was carefully lifted up and the specimen covered with a glass cover.

RESULTS AND DISCUSSION

Both breeds of the domestic fowls were examined for coccidial infections. The breeds in their category 8(3.0%) were infected with *Eimeria brunett*e and 11 (4.0%) was high with *Eimeria mivati*, with the least in 1(0.0%) of *E. tenella* which is most virulent than *E. maxima* with 5(2.0%) respectively. Local breed were most infected 28(11.0%) with *E. mitis* follow by 18(7.0%) of *E. acervulina* with a difference in the prevalence rate of *E. praecox* 14(6.0%) (Table 1).

In Table 2, eight species of *Eimeria* were observed in the 250 chickens sampled. The most prevalent rate occurred between the ages of 20-24 yrs old, 14(33.3%) in cocks and 20yrs old hens 58(27.9%) with the least between the ages of 25yrs old 8(19.0%) and between 10-14yrs 8(19.0%) respectively. This represents the overall rate of infection in cocks 18(42.9%) lower than hens 72(34.6%). However, the young chicken were more exposed to *Eimeria* infection than the adults with less risk of infection, there was no statistical significant in the distribution of Eimeriasis among chickens ($\chi 2$=102.40>5.99 at 5% level of significance). Carefully, the slide so prepared was placed under a microscope and examined for oocysts of *Eimeria* differentiating them into specific species as described by Soulsby (1986).

Table 1: Prevalence of *Eimeria* species in chickens brought to keffi central market, Nasarawa State

Types of Breeds	*Eimeria acervulina*	*Eimeria brunette*	*Eimeria maxima*	*Eimeria mitis*	*Eimeria mivati*	*Eimeria necatrix*	*Eimeria praecox*	*Eimeria tenella*	**Total infection (%)**
Hybrid Breed (102)	-	8(3.0%)	5(2.0%)	-	11(4.0%)	5(2.0%)	-	1(0.0%)	30(29.4%)
Local Breed (148)	18(7.0%)	-	-	28(11.0%)	-	-	14(6.0%)	-	60(40.5%)

Table 2: Age distribution of coccidial infection in both sexes of chickens

	Age (weeks)				**Total No.examined**	**Total No. infected (%)**
Sexes	10-14	15-19	20-24	≥25		
Cocks	8(19%)	12(28.6%)	14(33.3%)	8(19.0%)	42	18(42.9%)
Hens	50(24.0%)	52(25.0%)	48(23.1%)	58(27.9%)	208	72(34.6%)
Total	58(23.2%)	64(25.6%)	62(24.8%)	66(26.4%)	250	90(36.0%)

%= percentage

The prevalence and severity of avian coccidiosis was determined by a number of factors which include breed, age and sex of birds, environmental factors such as temperature, humidity and presence of oxygen and also management factors such as level of sanitary conditions, overcrowding and housing. Hence, the susceptibility of *Eimeria* infections and indeed the prevalence of coccidiosis in any given avian population was determined by the factors mentioned above, consequently, the prevalence of *Eimeria* infection is not consistent either.

In this case, prevalence of *Eimeria* pathogenesis was 36% in contrast to the findings of kayode (1999) and Adamani (1997) who conducted research on the Jos Plateau and reported 18.7% prevalence respectively. The intensive breeding houses undergone chemical fumigation against coccidiosis and undoubtedly this explains the low infection rates among birds. Though, Radkowski *et al*. (1996) reported a variance of 0.04% prevalence rate among poultry birds slaughtered in the district of Olsztyn against 89.90% and 84.44% reported (McDougald *et al*., 1990) in Poland. It is evident that, the prevalence of coccidiosis is a product of determined factors present in the population study and location. Thus, the high infection rate of 36% obtained in this study may not be unconnected to the poor sanitary conditions, overcrowding and inappropriate housing management system which characterized the market environment. Therefore, it is not unlikely that many of the birds got infected on arrival at the market while awaiting prospective buyers.

Results obtained in the present study revealed that greater infection 42.9% was more in cocks than in hens 34.6%. Similarly, this coincides with the findings of McDougald *et al.* (1990) who reported greater percentage of infection in the female 89.90% than in the male 84.40%.

Susceptibility of various breeds studied, *Eimeria* was assessed and findings showed that local breeds had higher infection rate (40.5%) against hybrid breeds (26.5%). The possible factors responsible for the different levels of susceptibility among the chicken studied could not be immediately determined but it may not be unconnected with the immune status of the fowls. It is possible that the anti-coccidial therapy given to the hybrid breeds conferred on them higher immunity against *Eimeria* infection than the local breed. This may, however, not be conclusive as further specific study is required to establish this.

Therefore, this study makes a case for prompt and routine diagnosis of *Eimeria* infection to prevent outbreaks of coccidiosis or at least bring the disease to the barest minimum. Though, the administration of anti-coccidial chemotherapy (drugs/vaccine) can go a long way in minimizing mortality of poultry birds and indeed reduce losses on the part of the poultry farmer.

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