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Prevalence Of Coccidiosis Among Poultry Birds Slaughtered At Gwagwalada Main Market, Abuja, FCT, Nigeria.

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----------ABSTRACT----------

Poultry sector plays a vital role in income and employment generation as well as source of protein. This vibrant sector is seriously affected by coccidiosis, a protozoan parasite disease caused by the genus Eimeria. A survey of the prevalence of Coccidial infections in chickens was assessed by random sampling of bird faecal samples from Gwagwalada market, FCT. A total of 200 faecal samples were examined using concentration by flotation method. 138(69%) of the faecal samples were positive for coccidian oocysts. Eimeria species encountered were E. tenella, E. acervulina and E. maxima (respectively). E. maxima and E. tenella were found to be most common among young birds examined. Birds with their ages less than 3 months examined were 130 and had a prevalence rate of 70.77%. Birds which were 3 months and above (i.e. adults) examined were 70 and had the prevalence rate of 65%. Prevalence was extremely high (80%) in cockerel birds followed by laying birds (70%), however, local birds and broilers had the lowest, 66% and 60.67% respectively. Two-way ANOVA test shows that there is no significant difference between the types of chicken examined and the rate of infection in this research; meanwhile, there is a significant difference between the different coccideal species infection in chicken examined (p>0.05).There is also no significant difference between the numbers of chicken infected in relation to age of the chicken at 0.05 level of significance. The present findings suggest that this parasite (coccidian) may constitute sources of zoonotic infections for humans especially those who consume the cooked parasitized coccidian chickens and the caretakers. Birds infected with this parasite should be treated and chicken house should be periodically cleaned and disinfected.

KEY WORDS: *Eimeria sp, flotation method, Gwagwalada market, poultry birds, zoonotic infection.*

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I. INTRODUCTION

For many years, coccidiosis has been a major cause of poor performance and lost productivity in poultry and other farm animals. Coccidiosis is caused by protozoa of the phylum Apicomplexa, family Eimeriidae. In poultry, most species belong to the genus Eimerida and infect various sites in the intestine. The infectious process is rapid (4-7 days) and is characterized by parasites replication in host cells with extensive damage to the intestinal mucosa. Poultry coccidian are strictly host-specific, and the different species parasitize specific parts of the intestine. The life cycle is direct and involves oral ingestion of the infective transmission stage of the sporulated oocyst. Destruction of host tissue as a result of parasite development and multiplication leads to the various clinical manifestations observed in outbreaks of disease. Coccidia which are deep tissue invaders such as *E. matima*, *E. necatrix* and *E. tenella* cause severe necrosis, haemorrhage of the intestinal mucosa, and bloody diarrhea and many result in death. Signs include watery and bloody droppings, mortality (0-50%) and morbidity (0-100%), depression, poor weight gain and feed conversion, and a drop in egg production. In many Farm, 305 birds die annually due to the effect of disease (coccidiosis) which cause retarded growth, poor condition, reduced egg production and low vitality (Ajayi, 1981). Poultry coccidiosis, caused by several distinct species of *Eimeria*, remains the most economically significant parasitic infection of the poultry industry, worldwide (McDougald, 2003). The disease is endemic in most of the tropical and subtropical regions where ecological and management conditions favour an all-year round development and propagation of the causal agent (Obasi *et al*., 2006). Reports on infection prevalence, infection levels and frequencies of the different Eimeria species in commercial poultry are few and sporadic in this country. More knowledge of the etiology and population dynamics of mixed coccidial infections in commercial poultry is therefore needed (Haug *et al*., 2008).

Moreover, with the increasing interest in poultry production evidenced by the proliferation of poultry farms, it is pertinent to continually evaluate the prevalence, frequencies of the different Eimeria species and management issues associated with common poultry diseases such as coccidiosis in any given zone (Etuk *et al*., 2004).

II. METHODOLOGY

Study Area

The study was carried out in Gwagwalada main market. Gwagwalada is the headquarter of the Gwagwalada area council. Gwagwalada is located between latitude $8^0$57' and $8^0$55'N and longitude $7^0$03' and $7^0$06'E. Gwagwalada is one of the six (6) Area Councils in the administration of the Federal Capital Territory (FCT). It is one of the fastest growing urban centers in the FCT with a population of about 157,770 people (NPC, 2006) and occupied an area of approximately 1.44 square kilometer (Km^2). It is strategically located close to the heartland of the FCT. Gwagwalada Area Council is dominated by two main seasons; wet season, which starts from the month of April to October and the dry season occurs between the month of November and March (Balogun, 2001).

Study Population

A total of 200 chicken faecal samples were used and grouped into four (4). This includes Broilers, Layers, Cockerels and Local chicken faecal samples. The samples were obtained from chicken sellers at the Gwagwalada main market.

Faecal Sample Analyses

Freshly deposited feacal samples of poultry birds of different ages, breed, and sex were collected from the chicken sellers and examined thoroughly. The samples were collected with a spatula, which was washed and cleaned after each collection in order to avoid contamination. Each feacal sample was placed in a pre-labeled bottle indicating the age, breed and sex of the chicken. The presence and number of feacal oocysts were determined, using the concentration by flotation method. The principle allowed the eggs to float to the surface of the solution of higher Specific Gravity (S.G), which concentrates at the top and leaves debris lower down.
The higher the specific gravity of the solution, more eggs of various types will float. The specific gravity of eggs various types will float. The specific gravity of eggs and larva of helminthes and protozoan cysts vary from 1.05 to 1.15. One gram of faecal sample was weighed using a top loader balance. Put into a beaker and mixed with saturated salt solution of NaCl, it was thoroughly mixed and strained using 90 mesh sieve into another beaker. The filtrate was poured into test-tube of respective faecal sample number and these were placed in test-tube stands. Each test tube was then filled to the brim with salt solution of sodium chloride. Cover-slip was placed on test tube surface and was left to stand for 15 minutes after which they are gently lifted (without brushing against the tubes). They were then placed on microscope slides sideways in one quick movement to avoid our bubbles on the glass-slide and viewed under the microscope. This method is termed Direct Centrifugal Flotation (D.C.F), used by Lane (1922) for the mass diagnosis of hookworm infestation. Examination of the slides were carried out using x40 objective lens.

Statistical Analysis: Two way ANOVA and appropriate frequency tables were used to analyze data obtained from the study.

Results Analysis : Out of 200 faecal samples examined, 138 (69%) were found to be positive for Coccidian oocysts of the *Eimeria* species. The following species were encountered: *Eimeria maxima, Eimeria acervulnia, Eimeria tenella* and multiple infection with two or more species were also encountered. *E. praecox, E. mistis, E. mivati and E. brunette* were not encountered in this present study. Table 1 shows the prevalence of Coccidia species, the different faecal sample examined. *Eimeria maxima* was found to be highest in all breeds.

Table 1. Prevalence of Coccidial Species in Birds from Gwagwalada Market

***Eimeria* species**	**Number infected. N=200**	**Prevalence (%)**
E. maxima	84	42
E. acervulina	26	13
E. tenella	28	14

N= number examined

Table 2: Prevalence of Coccidian Infection in Relation To Age and Breed

Age	Breed	No Examined	No. Infected	Prevalence (%)
Less Than 8 weeks	Broiler	20	12	60%
	Layer	30	20	66.67%
	Cockrel	20	14	70%
	Local	60	46	76.67%
	Total	**130**	**92**	**70.77%**
3 months & Above	Broiler	10	8	80%
	Layer	10	8	80%
	Cockrel	10	10	100%
	Local	40	200	50%
	Total	**70**	**46**	**65.00%**

TABLE 3: Infection Rate of Eimeria Oocysts in Respect to Breed

BREED	NO. EXAMINED	NO. INFECTED	PERCENTAGE RATE OF INFECTION
BROILERS	30	20	66.67
LAYERS	40	28	70.00
COCKREL	30	24	80.00
LOCAL	100	66	66.00
TOTAL	**200**	**138**	**69.00**

Prevalence of coccidian infection in relation to age and breed are shown in tables 2&3. Out of 40 broiler birds examined among age less than 3 months, 24 were infected with prevalence rate of 60%, layers 66.67%, cockerel 70% and local birds 67%. In birds of 3 months and above, cockerel has the highest prevalence rate of 100%, followed by broiler and layer which have the prevalent rate of 80% respectively. However, local birds have the lowest prevalent rate (50%). The total number of birds less than 3 months examined was 130 and the infected birds were 92 (70.77%). Prevalence rate in those of 3 months and above was 65.00%. The prevalence of coccidian infection was high in birds less than 3 months compare to the 3 months and above old birds. Two-way ANOVA test on the chicken types and prevalence of coccidiosis shows that there is no significant difference between the types of chicken examined and the rate of infection in this research; meanwhile, there is a significant difference between the different coccideal species infection in chicken examined ($p>0.05$).There is no significant difference between the numbers of chicken infected in relation to age of the chicken at 0.05 level of significance.

Analysis for chicken type and coccidial species

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
Broilers	3	10	3.333333	2.333333
Layers	3	14	4.666667	16.33333
Cockrel	3	12	4	12
Local	3	33	11	63
Matenia	4	42	10.5	43
Acervulina	4	13	3.25	10.25
Tenella	4	14	3.5	1.666667

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*

Chicken Type	112.9167	3	37.63889	4.356913	0.059501	4.757063
CoccidialSp	135.5	2	67.75	7.842444	0.021183	5.143253
Error	51.83333	6	8.638889			
Total	300.25	11				

There is no significant difference between the types of chicken examined in this research; meanwhile, there is a significant difference between the coccidial species of chicken examined or found.

3.2 Analysis for number infected according to age of the chicken

t-Test: Paired Two Sample for Means

	Less than 8wks	*More than 3months*
Mean	11.5	5.75
Variance	61.66667	8.25
Observations	4	4
Pearson Correlation	#N/A	
Hypothesized Mean Difference	0	
Df	3	
t Stat	2.216599	
P(T<=t) one-tail	0.056701	
t Critical one-tail	2.353363	
P(T<=t) two-tail	0.113402	
t Critical two-tail	3.182446	

There is no significant difference between the numbers of chicken infected according to age of the chicken

III. DISCUSSION

Out of the total 200 chicken examined, 138 were infected with overall prevalence rate of (69%). Observation showed that the husbandry methods and the environment which they are been kept in the market (i.e. the place of purchase) support the development of oocysts through developmental stages. This may be attributed to the use of non Coccidiostats in poultry feeds and water. Poor poultry management where there is overcrowding, leaking water troughs and accumulation of faeces are factors that contributed to the high prevalence rate. Birds' feed and water are contaminated by oocysts because the environment is damp especially that of the market place where nobody care about cleaning the chicken cages. The number of *Eimeria* sp oocysts in the litter increases significantly at the time of slaughter and at the time of placement of a subsequent flock. This discovery gotten from this study also correspond with the statement and findings of Stayer *et al.* (1995) where he stated that overcrowding, accumulation of faeces and contamination of feed and water by faecal materials increases the number of *Eimeria* sp oocyst. It was also discovered from the result and during the course of this study that the practice of using the same litter for many grows out of birds further exacerbates the problem of persistent *Eimeria* spp. Furthermore, it was observed that environmental control of Coccidian is virtually impossible because it has been shown that the soil underneath previously used litter may still contain viable Coccidial oocyst and when you introduce a day-old checks into such sheds, it will allow sufficient Coccidial oocysts exposure, to allow the chicks to be infected. Coccidia results in retarded growth, at least in the early growth period of the chicks. This shows why the young birds are more susceptible to the parasite than the older birds from the result. This result and discovery also corresponds with the work of Reyna *et al.* (1983) where he observed the same problem as stated above. The oocyst prevalence in the faecal samples examined from the result, revealed that the birds had different levels of sub-clinical infections in the sense that only very few of the chickens show sign of illness even though they were excreting oocysts. This corresponds to the findings of Reed and Johnson (1970) that light infection may be without clinical symptoms.

This low incidence of clinical Coccidiosis could be due to wide spread use of Coccidiostats in either the feeds or drinking water.

Therefore, from results obtained here, it can be seen that the current Coccidiostats as they are used today do not appear to totally suppress the production of oocysts.Despite the fact that some numbers of the faecal materials examined during the course of this work were negative for oocysts at the time of collection, it is possible that some of these chickens might be harbouring Coccidia in the schizogonous and/or gametogonous stages of development at the time that the samples were collected.Today's poultry farmers and marketers of chicken in the market places should therefore guide their poultry birds seriously against helminthes ova of ascaris, strongyloides, tape worms, eggs of mites and adult worms since these have been found from this study work to be the gateway of other parasitic infections particularly Coccidiosis. Keep litter dry and stared frequently, remove wet spots and replace with dry litter. Avoid over-crowding and if coccidiaosis does break out, start treatment immediately. A Coccidiostat is included in the feed in an attempt to control the disease without eliminating the coccidian parasites. The aim is to allow the coccidian parasites to survive and multiply in the gut of the birds in sufficient numbers to stimulate immunity, which will then be lifelong. Prevention of the disease transmission from birds to man include wearing gloves whenever caring for, or handling birds, feces or eggs, blood, nasal discharges, or fluids draining from wounds. After removing the gloves, wash hands with soap and water. Although a normal, healthy adult person may have only mild symptoms of a particular zoonotic disease, that person may spread the disease to others. Therefore, good hygiene is not only to protect the person working directly with poultry, but all persons with whom they have contact.

REFERENCES

[1] Ajayi SE. Poultry Coccidiosis, Its Sources, Orientation of Infection, Prevention and Control. Nigeria Livestock Farmer. 1981; 2(1): 3-4.

[2] Bachaya HA, Raza MA, Khan MN, Iqbal Z, Abbas RZ, Murtaza S and Badar N. Predominance and detection of different eimeria species causing coccidiosis in layer chickens. The Journal of Animal & Plant Sciences. 2012; 22(3): 597-600.

[3] Balogun O. The Federal Capital Territory Of Nigeria: A Geography of Its Development. University of Ibadan Press Limited. 2001.

[4] Etuk EB, Okoli IC, Uko MU. Prevalence and management issues associated with poultry coccidiosis in Abak agricultural zone of AkwaIbom, State, Nigeria. International Journal of Poultry Science. 2004; 3 (2): 135-139.

[5] Fabiyi JP. Coping with parasitic diseases in poultry. Nigerian Livestock Farmer. 1984; 41: 12-13.

[6] Haug A, Gjevre AG, Thebo P, Mattsson JG, Kaldhusdal M. Coccidial infections in commercial broilers: epidemiological aspects and comparison of Eimeria species identification by morphometric and polymerase chain reaction techniques: Review, Avian pathology. 2008; 37: 161- 170.

[7] Levine ND. Veterinary Protozoology. Iowa State University Press, Ames, Iowa, USA. 1985.

[8] McDougald LR. Coccidiosis.In: YM. Saif, HJ. Barnes, JR. Glisson, AM. Fadly, LR. McDougald& DE. Swayne (Eds.), Diseases of Poultry.11th ed. Ames, Iowa, USA: Iowa state press. 2003: 974-991.

[9] Muazu A, Masdooq AA, Ngbede J, Salihu A E, Haruna G, Habu AK, Sati MN, Jamilu H. Prevalence and identification of species of *Eimeria* causing Coccidiosis in poultry within Vom, Plateau State, Nigeria. Int. J. Poul. Sci. 2008 7: 917-918.

[10] NPC. Location of Gwagwalada Area Council (FCT) In: The Latitude and Longitude of Gwagwalada Zone of Nigeria. 2006: 26-35.

[11] Obasi OL, Ifut OJ, Offiong EA. An outbreak of caecal coccidiosis in a broiler flock post Newcastle disease vaccination. Journal of Animal and Veterinary Advances. 2006; 5 (12): 1239-1241.

[12] Reyna, Edwards HY, Eshetu, J. Animals in the Service of Man. 10,000 years of Domestication. J. M. Dent and Sons Ltd. 1983:28-31.

[13] Slayer PA, Mallison AS. Prevalence of *Eimeria* species in Broiler; Avian Diseases. American Association of Avian Pathologists (AAAP). 1995; 41(3):204-208.