A Post-Mortem Evaluation of Coccidiosis and Helminthiasis of Poultry Birds Slaughtered at Lafia Ultra Modern Market, Lafia, Nasarawa State, Nigeria

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ABSTRACT
Poultry diseases remain one of the major threats to boosting poultry production in Nigeria. The common internal parasitic infections occurring in poultry include gastrointestinal helminths and Eimeria species that cause considerable damage and great economic losses to the poultry industry due to malnutrition, decreased feed conversion ratio, weight loss, lowered egg production and death in young birds. To this end, a post-mortem evaluation of coccidiosis and helminthiasis of poultry birds (Gallus gallus domesticus) slaughtered at Lafia Ultra Modern Market, Lafia, Nasarawa State was carried from May to August 2017. A total of 100 fresh faecal samples from slaughtered chickens was collected into properly labeled sterile bottles and conveyed immediately to the Zoology Laboratory at Federal University Lafia for the recovery of helminths and detection of coccidioacysts. Faeces were grossly examined for blood, colour, mucus and presence of adult worms and proglottids. Adult worms and proglottids seen were removed with forceps and preserved in sample bottles containing 10% formalin for further identification. Concentration technique enlisted was the Simple Salt (NaCl) Floatation. Of the 100 fresh faecal samples examined only 24% were infected with helminths while none had coccidia infection. Cestodes had a higher prevalence of 11% over nematodes with 9% while 4% had co-infection. However, prevalence rate between types of helminths showed no significant difference (P > 0.05). Of the five helminth species recorded, Raillietina species was the most prevalent parasite 34% while the least was Choanotaenia infundibulum 2%. Therefore, there was a very high significant difference (P < 0.001) in prevalence rate between species of helminths. The males were more infected 30% than the females 18%, however there was no significant difference (P = 0.2207) in prevalence rate between gender. Local breed were more infected 30% while none of the exotic breed was infected 0%. Thus, there was a very high significant difference (P < 0.001) in prevalence rate of helminth parasites between breeds. This study showed a complete absence of trematodes and Eimeria species while cestodes and nematodes were implicated as the major cause of helminth infection in domestic chicken. Good management practices focusing on sanitation, proper housing, and good nutrition and deworming aimed at improving local chicken farming and production in Lafia should be instituted as chickens have the potential of supplementing the protein deficit of Nigerian diets in future.

Keywords: Anesthesia, Adverse effects, European badger, Geriatric, Cubs, Seizures Gastrointestinal helminths, Trematodes, Eimeriaspecies, Gallus gallusdomesticus

INTRODUCTION
Poultry refers to domesticated birds kept for meat or egg production (Muazu et al., 2008; Ugwu, 2009; Getu, 2014) and generally plays a vital role in the national economy as a revenue provider and provides employment (Nnadi & Goerge, 2010; Eduvie, 2002; Nnadi and George, 2010; Al-Jamaaen et al., 2013; Opara et al., 2014; ; Letebrhan et al., 2015). In 1998, poultry meat represented 28% of the world total meat consumption compared to 26.5% for beef (Nnadi and George, 2010; Quiroz-Castañeda & Dantán-González, 2015). It is also estimated that poultry provides 12kg of protein needs per inhabitants each year whereas cattle provides 5.3 kg (Nnadi & George, 2010; Roy, 2013; Nghonjuyi et al., 2014). Moreover, when compared to a number of other livestock species, fewer social and religious taboos are related to the production, marketing and consumption of poultry products. For these reasons, poultry
products have become one of the most important protein sources for man throughout the world (Radfar et al., 2012; Beyene et al., 2014).

Poultry production in Africa and parts of Asia is still distinctively divided into commercialized and village enterprises subsector each with its peculiarities. The former comprises of strains specifically developed on the basis of primary products into parent stocks, layers and broilers each with its specialized equipment and management practice. The latter however, consists of indigenous domestic fowls (Gallus domesticus) variously referred to as local chicken, backyard poultry, village chickens and/or free range chickens (Njue et al., 2001; Al-Jamaien et al., 2013; Kaboudi et al., 2016). For most African countries, backyard poultry accounts for more than 60% of the total national flocks (TNF) (Biu et al., 2012; Garbi et al., 2015). In Nigeria, the poultry population is estimated to be 160 million; comprising of 72.4 million chickens, 11.8 million ducks, 4.7 million guinea fows, 15.2 million pigeons, and 0.2 million turkeys million which is estimated at US $250. Backyard poultry constitute about 60%, and thus the most important form of poultry production (Onyeagocha et al., 2010; Akintunde et al., 2015; Barde et al., 2015; Omokaro, 2015) but faced with disease threat (Lasseinde, 2002; Etuk et al., 2004; Akintunde & Adeoti, 2014).

A lot of losses in poultry have been linked to disease causing agents such as viruses, bacteria and parasites. It has been estimated that more than 750 million chickens, guinea fowls and ducklings in Africa die each year as a result of various infections such as coccidiosis and helminthiasis (Sonaiya, 1990). Coccidia and helminths are among the common poultry parasites (Nnadozie, 1996; Afia et al., 2019) with predilection to the gastrointestinal tract. They exert their effects on the host by different ways such as blood sucking, tissue destruction during larval migration, feeding, mechanical or chemical irritation of contact surfaces, and liberation of toxic metabolites and obstruction of excretory ducts, air passages or blood vessels (Nielsen, 1976; Kassai, 1999). Avian coccidiosis is an enteric parasitic disease causing production losses, high morbidity (due to acute, bloody enteritis) and mortality rates (Shirley et al., 2005). A parasitic infestation brings about unthriftiness, poor growth and feed conversion, decreased egg production, and in severe cases, death.

Poultry coccidiosis is an economically important disease in chicken caused by the intracellular protozoa parasite of phylum Apicomplexa, order Eucoccidioida, family Eimeriidae, and genus Eimeria (Jurissen et al., 1996; Taylor et al., 2007). Eimeria is a single celled obligate intracellular protozoan parasite in the epithelial cell of the intestine (Alberta, 2007; Patrick & Mgber, 2010; Lai et al., 2011). About 1800 Eimeria species affect the intestinal mucosa of different animals and birds (Nematollahi et al., 2008; Muazu et al., 2008; Kaboudi et al., 2016). Chickens are highly susceptible to about eleven different species of the genus Eimeria. The most common species are Eimeriatenella, which causes caecalcoccidiosis, while E. acervulina and E. maxima cause chronic intestinal coccidiosis (Kaboudi et al., 2016). In Nigeria, the disease is caused by Eimeriatenella, E.necatrix, E. bruneti, E. acervulina, E. mitis and E.praeox (Owai and Gloria, 2010; Jatau et al., 2012). Coccdiosis remains one of the most expensive and common diseases in poultry production (Dalloul & Lilheloj, 2006) which has caused a huge loss of at least 1.5 billion every year to the world's commercial chicken producers (Arabkhazaeli et al., 2011; 2013; 2014). It is a major parasitic disease of poultry with a substantial economic impact to the poultry industries in Nigeria (Etuk et al., 2004; Musa et al., 2010; Usman et al., 2011). Poultry coccidiosis generates economic losses due to morbidity, mortality, reduced body weight plus the expenses related to preventive or therapeutic control and/or vaccinations (Williams, 1999; Dalloul & Lilheloj, 2006; Putta lakshmamma, 2008). It is probably the most common disease in modern poultry production, where confinement rearing is practiced (Lorenzoni, 2010; Amare et al., 2012).

Helminths are also parasites found mostly within the gastrointestinal tract of both domesticated and wild birds that are known to impede physiology and growth of these birds. They cause avian helminthiasis (Afia et al., 2019). Poultry helminths are commonly divided into three main groups; nematodes (roundworms), trematodes (flatworms) and cestodes (tapeworms) (Jordan & Pattison, 1996). Nematodes constitute the most important group of helminth parasites of poultry both in number of species and the extent of damage they cause; the main genera include Capillaria, Heterakis and Acaridae (Jordan & Pattison, 1996). Ascaridiagallli has been incriminated as the most
common and most important parasite of poultry (Hodasi, 1969; Pam et al., 2006; Luka & Ndams, 2007). The cestodes of significant importance are of the two genera Raillietina and Hymenolepis (Oniyi et al., 2001; Luka & Ndams, 2007). Trematode infections are not very common in domestic chickens as Prosthogonimusustowi has been the only species reported from the forest belt of Ghana (Hodasi, 1969).

Helminthiasis causes interference with the host metabolism resulting in poor feed utilization and reduced growth rate as well as size and age at maturity and these have been described as common characteristics of village chickens (Permin & Hansen, 1998; Afia et al., 2019). Helminthiasis also leads to malabsorption, diarrhoea, anaemia and other states of poor health, particularly in young birds (Ehrenberg & Ault, 2005; Hotez et al., 2007).

There is a paucity of information regarding the incidence of these gastrointestinal parasites in slaughtered poultry birds in Lafia, Nasarawa State capital and such knowledge is essential in understanding the epidemiology of the diseases as well as the design of their appropriate control measures. Hence, a post-mortem on gastrointestinal parasites of poultry birds slaughtered in Lafiaultra modern market was investigated.

**MATERIALS AND METHODS**

**Study Area**

Lafiaultra modern market is located in Lafia, Nasarawa state. Lafia is a town in central Nigeria (Latitude 8°24'N, 9°1'E and Longitude 8°13'E, 9°8'N). It has a total landmass of about 2797.53 km² Lafia L.G.A shares boundary with Plateau State in the north east, Obi and Doma L.G.A in the South, Nasarawa Egg on the West and Wamba LGA in the North (Agidiet al., 2017). It is the capital city and the largest town in Nasarawa State having a population of 330,712 inhabitants according to the 2006 census. The main economic activities of the State are agriculture; cash crops such as yam, cassava and melon. Production of minerals such as salt is also another major economic activity in the state. Livestock keeping especially cattle is also practiced in the State, with large number of cattle herds’ resident and grazing within and around Lafia and other Local Government Areas.

Lafia L.G.A has a tropical sub-humid climate, with two distinct seasons which are wet season and dry season. The wet season lasts for seven months which is between April and October, while the dry season is between November and March. Rainfall is moderately high in Lafia, ranging from 1200mm to 1600mm. Average maximum and minimum daily temperatures are 35°C and 21°C in rainy season and 37°C and 16°C in dry season respectively (Agidi et al., 2017).

**Sample Collection**

A total of 100 fresh faecal samples from slaughtered chickens in Lafiaultra modern market was collected and examined for gastrointestinal helminths and coccidiaoocysts during the month of May to August 2017. The faecal samples were collected into properly labeled sterile bottles and conveyed immediately to the Zoology Laboratory at Federal University Lafia for the recovery of helminths and detection of coccidiaoocysts.

**Preparation and Examination of Samples**

Direct Microscopic Examination

Faeces were examined for blood, colour, mucus and presence of adult worms and proglottids. Adult worms and proglottids seen were removed with forceps and preserved in sample bottles containing 10% formalin for further identification (Souls by, 1982) and examined for morphology under the light microscope at 10x magnification. Identification of helminths were performed according to the helminthological keys (Souls by, 1982).

Direct Microscopic Examination

Direct microscopic examination was done by placing a very small quantity of faecal dropping on a glass slide using a tooth pick and emulsifying with a drop of normal saline and Lugol’s iodine on different slides and placed with a cover slip to view on the microscope (Suwansakri et al., 2002).

Concentration Technique Statistical Analysis

Concentration technique enlisted was the Simple Salt (NaCl) Floatation as described by Gillespie (2006) and Parmeshwarappa et al. (2012). About 2 gram of the faecal sample was placed in a test tube and 30ml of the salt solution was added to make an emulsion by mixing the solution with the faeces and strained through a metal tea strainer into a second test tube. The salt solution was added until a meniscus was formed in the test tube. A glass cover slip was placed over the meniscus and allowed to remain for 15-20 minutes after which the cover slip was displaced over the meniscus and allowed to remain for 15-20 minutes after which the cover slip was placed over the meniscus and allowed to remain for 15-20 minutes after which the cover slip was
removed and placed on a slide then examined under the microscope.

**Statistical Analysis**

The prevalence (P) in percentage was calculated using the formula:

\[ P = \frac{n}{N} \times 100 \]

Where;

- n is the number of positive samples analyzed at that point in time, and
- N is the total number of chickens sampled at that point in time.

Data obtained were analyzed using R Console software (Version 3.2.2). Proportions of helminth parasites in faecal samples of slaughtered Gallus gallus domesticus were compared using Pearson's Chi-square test. Also, Pearson's Chi-square test was used to compare prevalence rate across helminth species found, prevalence rate of the infection in relation to sexes and as well as breed of poultry. The P-values < 0.05 were considered statistically significant.

**RESULTS**

**Prevalence of Gastrointestinal Parasites of Gallus Gallus domesticus Slaughtered in Lafia Ultra Modern Market**

The prevalence of gastrointestinal parasites infection in this study is shown in Table 1. Out of a total of 100 domestic chickens studied 24 (24.0%) were infected with helminths. Cestodes had the highest prevalence of 11 (11.0%), followed by the Nematodes with prevalence of 9 (9.0%), and a mixed infection of both Nematodes and Cestodes 4 (4.0%) was the least. No protozoa and trematode was recorded in this study 0 (0.0%). Prevalence rate between the helminths showed no significant difference \((\chi^2 = 3.25, df = 2, P = 0.1969)\).

**Helminth Parasite Species of Infected Gallus Gallus domesticus Slaughtered in Lafia Ultra Modern Market**

Twenty four (24.0%) domestic chickens were infected by five species of gastrointestinal helminth parasites which comprised three Cestodes and two Nematodes, including mixed infections. The Cestode parasites recovered in the chickens were Raillietinaspecies8 (33.3%) (Plate 1) which was the most prevalent Cestode parasite recovered, Hymenolepiscantaniana2 (8.3%) and Choanotaenia infundibulum 1 (4.2%). The Nematode parasites included Ascaridiagalli7 (29.2%) (Plate 2) which was the most prevalent nematode parasite recovered and Strongyloidesavium2 (8.3%). There was also a mixed infection of Strongyloidesavium and Ascaridiagalli1 (4.2 %), Strongyloidesavium and Raillietina species 1 (4.2%) and Ascaridiagalli and Raillietina species 2 (8.3%) (Figure2). Therefore, there was a significant difference \((\chi^2 = 77.69, df = 7, P < 0.0001)\) in prevalence rate between species of helminth parasites.

**Sex-Specific Prevalence of Helminth Parasites of Gallus Gallus domesticus Slaughtered in Lafia Ultra Modern**

The sex-specific prevalence of the helminth parasites showed that 15 males were infected with four species of helminth parasites which were Ascaridiagalli5 (10.0%), Choanotaenia infundibulum 1 (2.0%), Hymenolepiscantaniana 2 (4.0%), Raillietinaspecies5 (10.0%) and a mixed infection of Ascaridiagalli and Raillietina species 2 (4.0%). While 9 females were infected with three species of helminth parasites which were Ascaridiagalli 2 (4.0%), Strongyloidesavium 2 (4.0%), Raillietina species 3 (6.0%), mixed infections of Strongyloidesavium and Ascaridiagalli 1 (2.0%) and Strongyloidesavium and Raillietina species 1 (2.0%) (Table2). Although the males were more infected than the females, there was no significant difference \((\chi^2 = 1.5, df = 1, P = 0.2207)\) in prevalence rate between sex.

**Breed-specific Prevalence of Helminth Parasites of Gallus gallus domesticus Slaughtered in Lafia Ultra Modern Market**

Out of 80 local breeds of chickens examined, 24 were infected by Ascaridiagalli7 (8.8%), Strongyloidesavium2 (2.5%), Choanotaenia infundibulum 1 (1.3%), Hymenolepiscantaniana 2 (2.5%), Raillietinaspecies8 (10.0%), with mixed infections of Strongyloidesavium and Ascaridiagalli 1 (1.3%), Strongyloidesavium and Raillietina species 1 (1.3%) and Ascaridiagalli and Raillietina species 2 (2.5%). While out of 20 exotic breeds examined, none were infected by any gastrointestinal parasites (Table 3). Therefore, there was a significant difference \((\chi^2 = 24, df = 1, P < 0.0001)\) in prevalence rate of helminth parasites between breeds.
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Table 1. Prevalence of gastrointestinal parasites of Gallus gallusdomesticus slaughtered in Lafia ultra modern market (N = 100)

<table>
<thead>
<tr>
<th>Parasite group</th>
<th>No. infected</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protozoa</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nematodes</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Cestodes</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Trematodes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mixed infections</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

Note: $\chi^2 = 3.25, df = 2, P = 0.1969$

Figure 1. Helminth parasite species of infected Gallus gallusdomesticus slaughtered in Lafia ultra modern market

Table 2. Sex-specific prevalence of helminth parasites of Gallus gallusdomesticus slaughtered in Lafia ultra modern market

<table>
<thead>
<tr>
<th>Parasite species</th>
<th>Males No. infected</th>
<th>Prevalence (%) (N=50)</th>
<th>Females No. infected</th>
<th>Prevalence (%) (N=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaridiagalli</td>
<td>5</td>
<td>10.0</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Strongyloidesavium</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Choanotaenia infundibulum</td>
<td>1</td>
<td>2.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Hymenolepiscentaniana</td>
<td>2</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Raillietina species</td>
<td>5</td>
<td>10.0</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Strongyloidesavium and Ascaridiagalli</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Strongyloidesavium and Raillietina</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Ascaridiagalli and Raillietina species</td>
<td>2</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>30.0</td>
<td>9</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Note: Prevalence between sex: $\chi^2 = 1.5, df = 1, P = 0.2207$

Table 3. Breed-specific prevalence of helminth parasites of Gallus gallusdomesticus slaughtered in Lafia ultra modern market

<table>
<thead>
<tr>
<th>Parasite species</th>
<th>Local breed No. infected</th>
<th>Prevalence (%) (N=80)</th>
<th>Exotic breed No. infected</th>
<th>Prevalence (%) (N=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaridiagalli</td>
<td>7</td>
<td>8.8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongyloidesavium</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Choanotaenia infundibulum</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Hymenolepiscentaniana</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Raillietina species</td>
<td>8</td>
<td>10.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongyloidesavium and Ascaridiagalli</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongyloidesavium and Raillietina</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Ascaridiagalli and Raillietina species</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>30.0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Note: Prevalence rate between breeds: $\chi^2 = 24, df = 1, P < 0.0001$

Figure 2. Plates 1 and 2 are helminth parasites recovered from the faeces of local Gallus gallus domesticus slaughtered in Lafia Ultra modern market

DISCUSSION

This study showed a complete absence of trematodes and coccidial parasites in both local and exotic Gallus gallus domesticus slaughtered in Lafia Ultra modern market. The nonappearance of trematodes agrees with several studies by Fabiyi (1972) in Bauchi, Gadzama and Strivastava (1986) in Borno State, Oyeka (1989) in Anambra State, Fatihu et al. (1991) and Luka and Ndams (2007) in Zaria, Kaduna State, Yoriyo et al. (2008) in Bauchi State, and Afia et al. (2019) in Ibesikpo LGA, Akwalbom State, Nigeria. Also, the absence of trematodes may be due to non-accessibility of the birds to infected snails (Puttalakshmamma et al., 2008).

The nonexistence of coccidia infection in this study could be due to the administration of anticoxidia medication to the birds by the poultry owners in view of the fact that it is one of the most common and rampant poultry disease (Musa et al., 2010) and as well may be attributed to the complex life cycle of Eimeriaspecies which are in three distinctive phases including merogony (schizogony), gametogony and sporogony (during which the oocyst must undergo a final process called sporulation before they are again infective. Sporulation requires warmth (25°C–30°C), moisture and oxygen) (Yun et al., 2000). Coccidiosis is most prevalent among young chicks of 1-5 weeks of age, with oocysts appearing in faecal samples of the chicks as early as 7 days of age while the clinical disease manifestation occurs by the 4th week (Majero et al., 2001; Obasi et al., 2001). In this study, faecal samples examined where those of older birds hence the apparent absence of coccidiooocysts. Earlier reports by Reyna et al., (1983) showed that older birds are resistant to coccidia infection due to previous exposure and recovery. This also collaborates the absence of coccidia infection in the older birds used in this study. On the contrary, a study by Kaboudi et al. (2016) on the prevalence of coccidiosis in free-range chickens in Sidi Thabet, Tunisia recorded 31.8% overall coccidiosis infection which spread across E. tenella (61.5%), E. maxima (12%), and E. acervulina (1.5%). Kaboudi et al. (2016) observed mixed Eimeriaspecies infection with overall prevalence of 26.5%. Also, the finding in this study contrasts several earlier reports from other parts of Nigeria including; Jos-Plateau (Fabiyi, 1972; Pam et al., 2006), Anambra State in south east of Nigeria (Oyeka, 1989) and in Zaria where Eimeria species was found as the commonest and most important parasite infection of poultry (Fatihu et al., 1991; Jordan & Pattison, 1996; Onyee et al., 2001; Luka & Ndams, 2007).

The outcome of this study is in accordance with the works by Yoriyo et al. (2008) and Afia et al. (2019) in which cestodes and nematodes were implicated as the major cause of helminth infection in domestic chicken. The observed high prevalence of both parasites could be due to the high availability of infective stages and the ability of their infective stages to survive outside the host for a long time before they are picked up again. Furthermore, the birds may have fed on insects, mites and worms which may be carriers of the infective stages of the parasites. The domestic chickens feed on a wide range of contaminated diets within their habitats which predisposes them to parasitic infections (Smyth, 1976; Frantovo, 2000).

Out of the 100 faecal samples examined, 4% had mixed infections of cestode and nematode parasites which may probably be as a result of common food preference which could have been
contaminated by the two parasites. According to Kennedy (1975), this occurs at a particular time which enhances the establishment of mixed or single infection. This finding is in agreement with Afia et al. (2019) who recorded a mixed infection of about 38% in chickens.

The higher prevalence of cestodes recorded in this study is similar to earlier reports by Dede and Richards (1998), Onyiie et al. (2001), Audu et al. (2004), Atsineka and Banke (2006) and Afia et al. (2019). Raillietina species (33.3%) was the most prevalent cestode encountered in this study. They are considered as cosmopolitan, and contribute to nutrient depletion in birds (Cheng, 1973). Also, Afia et al. (2019) showed that the occurrence of Raillietina species was the highest (19%) in chickens. The high prevalence of Ascaridiagalii (29.2%) over other nematodes may possibly be due to the ability of its eggs to withstand harsh climatic conditions due to thick albuminous shells (Ashour, 1994), direct life cycle and capability for early infection by the second larval stages (Souls by, 1982). The study by Afia et al. (2019) recorded Ascaridiagalii as the most prevalent (41.9%) of the nematodes identified in chickens. This is contrary to the finding of Mukaratirwa et al. (2001) in a survey of parasitic nematode infections of chickens in rural Zimbabwe who found Allodapabrutias the most abundant.

The lack of variation in prevalence of helminths in relation to male and female chickens sampled suggests that both gender are susceptible to helminthic infection. This is in accordance with previous studies by Magwish et al. (2002) and Uhuo et al. (2013). However, in this study helminths infected more males than females probably due to the fact that they move about to distant locations in search of breeding mates thereby end up feeding on food items everywhere.

The prevalence of infection in local breed (30.0%) was significantly higher than the exotic breed (0.0%). This is not unusual because of their free range mode of management practice which allows them free access to virtually all types of environment and hence, predisposing them to various forms of infections. This agrees with Ruff et al. (1991) and Abebe et al. (1997) who stated that free ranging chickens are more prone to disease acquisition. Also, Afia et al. (2019) recorded significant variation in the prevalence rate of helminthic infection between broiler and local chickens..

**CONCLUSION**

No trematode or coccidial infection was recorded in both breeds of Gallus gallusdomesticus. Only the local breeds of poultry birds had helminth infections. This study indicated that cestodes and nematodes are highly significant helminth problems of local free range chickens in the study area. Therefore, good management practices focusing on sanitation, proper housing, good nutrition and deworming aimed at improving local chicken farming and production in Lafia should be instituted as chickens have the potential of supplementing the protein deficit of Nigerian diets in future. Measures should be taken to control these helminth parasites by educating the farmers on the impact of the disease and conditions that increase the prevalence of the disease in a locality.

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