

Prevalence of Gastro-Intestinal Parasites of Local Chickens (*Gallus Gallus Domestica*) in Kano, Nigeria

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ABSTRACT

The study was conducted to determine the gastrointestinal parasites of local chickens (*Gallus gallus domestica*) slaughtered at Chicken Market in Sabon-Titi junction along Panshekara Road, Kano State, Nigeria. A total of 220 (102 male and 118 female) faecal samples from the gastro-intestinal tracts of already slaughtered chicken were examined from March to September, 2015 using direct smear and sodium chloride floatation methods for the presence of gastrointestinal parasites and later examined under light microscope for morphological identification. The result showed that out of 220 samples examined, 181 which accounted for 82.3% found to be infected with one or more parasite. Higher infection rate was found among male (46.8%) than female (35.5%) chicken. The helminths species found were, *Ascaridia galli* (22.4%), *Strongyloides avium* (20.6%), *Heterakis gallinarum* (18.1%), *Choanotaenia infundibulum* (13.9%) and *Raillietina echinobothrida* (9.3%), while the gastrointestinal protozoan isolated is *Coccidian spp* (15.7%). Prevalence rate among male and female chicken is statistically not significant at $p < 0.05$. There is need for a sustainable control strategy with a view to achieving improved control measures on poultry management system towards healthy production of livestock chickens for human consumption.

Keywords: Gastrointestinal, Helminthes, Chicken, *Gallus gallus domesticus*, Kano.

INTRODUCTION

Poultry is one of the most vital sources of animal protein and farm manure [1]. The bird offers man with products such as meat and eggs of high nutritional value and other socio-economic benefits [2]. The chickens are the most intensively raised birds out of the domesticated species and one of the most advanced and lucrative animal production enterprises [3]. They play significant role national economic development by improving the income of small scale farmers and improving nutritional status of the population. The chickens are generally raised in a free-range system, scavenging around the compound of households, feeding on the locally available resources like earthworm, household refuse, insects, residue from harvest, animal and human faeces etc [4].

However, the development of chickens is greatly affected by parasite. The parasitic diseases cause difficulties in poultry management and significant limitation to its development. These parasites produce a major factor limiting productivity by affecting the

growth rate of the chickens causing organ malfunctioning and finally death [5]. However, effective control measures can be realistic if based on a detailed knowledge of the epidemiology of the endemic infectious agents. Nematodes, Cestodes and trematodes are important parasites of poultry production. These parasites can be found in the intestine or faecal dropping especially when expelled as fresh Specimen [6]. Several species of cestodes (Tapeworm) may live in the intestinal tract of chicken. More than 1,400 tapeworms have been described in domesticated poultry and wild birds which are common in poultry free range or backyard flocks [7]. Helminthosis was considered to be an important problem of local chicken and helminths parasites have been incriminated as a major cause of ill-health and loss of productivity in different parts of Nigeria [6]. Poultry reared in rural scavenging system face various hindrances among which helminthiasis plays a vital role. Hence studies conducted in different parts of the world indicated that the proportion of chicken infection with gastrointestinal helminthes is high, therefore helminthes are considered to be

an important cause of ill health and reduction in poultry productivity [4].

These parasites are found more frequently in the warm seasons, when the intermediate hosts are abundant. Beetles and houseflies inhabiting poultry houses act as intermediate host for most species of cestodes [8]. Although the prevalence of parasitic infection has been greatly reduced in the commercial production system, mostly due to improve housing, hygiene and management operations [9]. A large number of helminthes are still widely distributed throughout the world in free –range poultry. In studies by Ruff [10], 100% of the rural scavenging chicken examined in Cross River Nigeria, was positive for one or more helminthes parasites. In another study, Saidu et al. [11] reported 45% of *Ascaridia galli* and 35% *Heterakis gallinarum* [9,12,13] all reported high prevalence of multiple infections in their survey Management practices, level of bio-security, availability of intermediate hosts and possibly the game reservoir are key factors for high prevalence of helminthes infection in free range or rural scavenging system of poultry [14]. The present study was aimed to determine the prevalence of some gastro-intestinal parasite of local chicken in Kano, Nigeria.

MATERIALS AND METHODS

Study Area

The study was conducted at Chicken Market at Sabon-Titi Junction along Panshekara road in Kano city. Kano state is located in the North-Western Nigeria with coordinates 11⁰ 30 N (latitude) 8⁰ 30 E (longitude). It shares borders with Kaduna state to the south- west, Bauchi state to the South-East, Jigawa state to the East, Katsina state to the North. It has a total area of 20,131km² (7,777sqm) and population of 11,058,300 [15].

Table1. Prevalence rate based on sex of the local chickens examined

Sex	No. examined	No. infected	No. of uninfected	Prevalence (%)	X ² value
Male	112	103	09	46.8	1.436*
Female	108	78	30	35.5	
Total	220	181	39	82.3	

Key: * The p-value is 0.23078, the result is not significant at p<0.05

Prevalence of Helminths and Protozoan Parasites

The results of prevalence of helminths and protozoan parasite among 220 local chickens examined between March and September in Kano, Nigeria is presented in Table 2. It can be observed from the result that the helminthes

Samples Collection

The gastrointestinal tracts of 220 (118 male and 102 female) were collected in a specimen bottles containing 10% formalin from Sabon-Titi chicken Market along Panshekara road in Kano city from March to September, 2015.the samples were transported to the Laboratory of biological Science Department Kano State University of Science and Technology Wudil for further treatment.

Examination of Parasite

The gastrointestinal tracts of sample were spread and separated into different sections. The lumen was removed, emptied and washed and its mucosal surface was carefully rubbed to remove any parasite in the surface as described by Fatihu et al. [16]. The collected parasites (visible worms) were fixed, preserve in a specimen bottle containing 10% formalin and counted. The mucosal surface of the lumen was then scrapped into clean Petri dish and observed under microscope for smaller helminths and protozoan parasite morphological identification as described by Ruprah et al. [17] and Calneck et al. [18]. Samples of chicken examined were positive with different classes of helminthes and protozoan parasites.

RESULTS

Prevalence Rate Based on Sex

The prevalence rate of parasitic infection among 220 local chickens examined between March and September in Kano, Nigeria is presented in Table 1. The result showed that out of 220 samples examined, 181 which accounted for 82.3% found to be infected with one or more parasite. Higher infection rate was found among male (46.8%) than female (35.5%) chicken. Prevalence rate among male and female chicken is statistically not significant at p<0.05.

species found nclude; *Ascaridia galli* (22.4%), *Strongyloides avium* (20.6%), *Heterakis gallinarum* (18.1%), *Choanotaenia infundibulum* (13.9%) and *Raillietina echinobothrida* (9.3%), while the gastrointestinal protozoan isolated is *Coccidian spp* (15.7%).

Table2. Prevalence rate of helminths and protozoan parasites among 220 local chickens

Parasite	Infected male	Infected female	Total	Prevalence (%)
<i>Ascaridia galli</i>	57	43	100	22.4
<i>Strongyloides avium</i>	53	39	92	20.6
<i>Heterakis gallinarum</i>	43	38	81	18.1
<i>Choanotaenia infundibulum</i>	34	28	62	13.9
<i>Raillietina echinobothrida</i>	25	17	42	9.3
<i>Coccidian spp</i>	38	32	70	15.7
Total	250	197	447	100

Incidence Rate of Helminths and Protozoan Parasites

The results of incidence rate of helminths and protozoan parasite in local chickens examined between March and September in Kano, Nigeria is presented in Table 3. It can be observed from the result that the helminthes species found with

Table3. Incidence rate of helminthes and protozoan parasites among 220 local chickens

Parasite	Infected male	Infected female	Total	Incidence rate (%)
<i>Ascaridia galli</i>	57	43	100	46
<i>Strongyloides avium</i>	53	39	92	42
<i>Heterakis gallinarum</i>	43	38	81	37
<i>Choanotaenia infundibulum</i>	34	28	62	28
<i>Raillietina echinobothrida</i>	25	17	42	19
<i>Coccidian spp</i>	38	32	70	32

DISCUSSION

The study determined the prevalence and incidence rate of gastro-intestinal parasite of local chicken in Kano, Nigeria. The findings of the study indicated high prevalence of gastro-intestinal parasite in local chickens in poultry market at Sabon Titi Kano. Out of 220 samples examined, 181 samples were found to be infected which accounted for 82.3%. Several studies were conducted by many researchers on prevalence of gastro-intestinal parasite among different types of poultry. The highest prevalence in the present study agrees with the reports of Gadzama [13] who reported prevalence of (91%) in Borno State of Nigeria. The high incidence of gastro-intestinal parasite in the present study might be as a result of continuous exposure of chickens to the free range conditions which facilitated infections as it may be attributed that local chickens satisfy their nutrient requirements by moving from place to place, seeking their food in the superficial layers of the soil which is often contaminated with living organisms of all kinds, including various insects or worms, human and animal wastes which serve as intermediate hosts for parasites that infest poultry and other animals as reported by Abebe et al. [14] and Gadzama [13].

According to the present study, higher infection rate was found among male (46.8%) than female

the following incidence rate; *Ascaridia galli* (46%), *Strongyloides avium* (42%), *Heterakis gallinarum* (37%), *Choanotaenia infundibulum* (28%) and *Raillietina echinobothrida* (19%), while the gastrointestinal protozoan isolated is *Coccidian spp* (32%).

(35.5%) chicken. However, prevalence rate among male and female chicken is statistically not significant at $p < 0.05$. This result was inconformity with the report of Yoriyo et al. [9] who found higher infection among male chicken than female ones. The results also correlate with that of Adang et al. [19] who found helminths infection among male chicken higher than that of the female chickens. On the other hand, the result was contrary to the finding of Ohuo et al. [20] who found higher prevalence rate of parasitic infection among female chickens (51.3%) than male chickens (48.7%). The lower prevalence rate of gastro-intestinal parasite in female chickens may be attributed reduction of their feeding habit and feeding niche during breeding season and incubation period. In addition to that, the chicken owners tend to give special treatment to the female during such period which reduces their chance of picking infection. But the male chickens increase their niche by moving freely in search of food and mate which lead to increase in picking infection. The male chicken are, therefore, more exposed to parasitic infection than female counterpart [19].

Based on the finding of the present study, the gastro-intestinal samples examined were infected with various types of parasites. A total of 5 helminths species and 1 protozoan parasite was recorded. The helminths parasite include

Ascaridia galli (22.4%), *Strongyloides avium* (20.6%), *Heterakis gallinarum* (18.1%), *Choanotaenia infundibulum* (13.9%) and *Raillietina echinobothrida* (9.3%), while the gastrointestinal protozoan isolated is *Coccidian spp* (15.7%). Several studies was conducted on gastro-intestinal parasite of chicken [21,22,23,24]. *Ascaridia galli* is the most prevalent parasite encountered in the present study. This correlate with the findings of Eshetu *et al.* [22]; Sayyed *et al.* [23]; Kaingu *et al.* [24] who found higher incidence of *Ascaridia galli*. The *Ascaridia galli* causes stunted growth, low productivity, irritation and inflammation of the mucosa thus interfering with the absorption of food [20].

The finding of the present study indicated that the local chickens in the study area were kept under poor hygienic condition and low input management system. This lead the chicken exposed to a wide variety of gastrointestinal helminthes, which could be associated with their indiscriminate scavenging behaviors. This assertion agrees with that of Ruff [10] who states that unprotected chicken are more prone to disease acquisition thus, the prevention and control measures with better management system of local chickens should be put in place to reduce parasitic infection.

CONCLUSION

The present study has indeed proved that gastro-intestinal parasites such as helminthes and protozoan are prevalent in local chickens, this could be traced with warm environmental condition which create and support the eggs and early stage of development and hence increase survival and transmission of these parasites which was supported by the period of the research though not captured. The number of male chickens infected by this gastrointestinal parasite is greater than female chickens. There is need for a sustainable control strategy with a view to achieving improved control measures on poultry management system towards healthy production of livestock chickens for human consumption.

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