

Assessment of Intestinal Parasites of Commercial Layers in Selected Local Government Areas of Rivers State, Nigeria and Their Public Health Implications



Wokem GN^{1*} and Obiyor ET²

¹Department of Medical Laboratory Sciences, Rivers State University, Nigeria

²Department of Animal and Environmental Biology, University of Port Harcourt, Nigeria

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***Corresponding author:** Wokem GN, Department of Medical Laboratory Sciences, Faculty of Science, Rivers State University, Nkpolu Oroworukwo, Port Harcourt, Nigeria, Email: g.ndrwokem@yahoo.com

Abstract

The study was carried out from April to July 2016 in selected Local Government Areas of Rivers State; Ikwerre, Emohua, Etche, Ahoada and Obio/Akpo LGAs. The aim was to assess the presence of intestinal parasites in commercial layers and to relate the findings to their public health importance. Two hundred birds' faecal samples were randomly collected from the selected farms and analyzed using salt saturation floatation technique. Out of 200 faecal samples examined, 130 (65%) samples were infected with *Ascaridia galli* 39(30%), *Eimeria species* 54(41.5%), *Heterakis gallinarum* 13(10%), *Capillaria spp* 3(2.3%) and *Trychostrongylus spp* 16(12.3). Mixed infection were observed in 34(26.1%) samples consisting of *A. galli* + *Eimeria spp* + *H. gallinarum*, *Eimeria species* + *Heterakis gallinarum* + *Trychostrongylus species*, *Eimeria species* + *Ascaridia galli* + *Heterakis gallinarum* + *Trychostrongylus species*. The prevalence rates from each of the LGAs were 75%, 45%, 70%, 55% and 80% respectively. There was no statistical significant different observed in the different LGAs ($P > 0.05$) but Obio/Akpo recorded slightly higher prevalence than other LGAs ($P < 0.05$). Age groups were categorized in weeks with their infection prevalence rates 1-5 (37%), 6-10 (70%), 11-15(60%) and 16-20 weeks (85%). There was high significant difference between the age groups. ($\chi^2 = 20.935$, $P = 0.000$). Well constructed questionnaire were used to evaluate poultry farmers management practices in their farms, information extracted showed that most of the farms were having poor ventilation, overcrowding of birds, water spillage, poor hygienic practices and negligence by farmers to treat their birds at the right stage. It was concluded that reduction in production and reproduction potentials in poultry farms have adverse effects on the quality and quantity of protein available for public consumption.

Keywords: Intestinal parasites; Commercial layers; Rivers state

Introduction

In Nigeria, poultry is divided into two sectors, commercialized and the village enterprise popularly known as free range. Commercial poultry farmers are the major producers of poultry products in large quantities with specialized equipments and management approach Agbolade et al. [1].

On estimate, poultry industry contributes about 88.6% of all meat consumed in the world and thereby constitute a major food and protein sources [2]. In Africa, Nigeria rates very high in poultry farming and consumption of poultry products; unrestricted by any religion or culture. Apart from well known factors like avian influenza, new castle diseases and a few others that cause constrains in the production of poultry products in Nigeria, Rivers State inclusive; parasitism is a major factor that threatens poultry farming. Parasitic diseases have significantly interfered with poultry productivity and commercial farming. It reduces the economic income and in turn negatively affects the development of the industry. Intestinal parasites of poultry

are common in this part of the country because of the favorable climatic conditions for their development and also poor management practices among farmers due to poverty.

Helminthes and protozoans are the major intestinal parasites that affect poultry farming. *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria species* and *Raillietina species* are all helminthes. Coccidian is a class of Protozoa that causes a well known disease referred to as coccidiosis. It is caused by different *Eimeria species*. Losses due to reduced productivity such as poor weight gain, poor egg production and rate of mortality caused by parasitic protozoans and helminthes are economically very important to the poultry industry. The parasites have serious impact on poultry health, productivity, quality and quantity of products as reported by Aman et al., (2013). Considering the public health significance of chicken, its economic values, nutritional and social importance in the globe and in Nigeria in particular, the relevance of this study cannot be over emphasized. It is an assumed fact that parasitic diseases infest both exotic and

local breeds of domestic birds reducing optimum productivity in layers. This assumption has geared many researchers into understanding the mode of parasitic infestation towards formulation of control and eradication strategies. Results from such research include those of Luka & Ndams [3], Matur et al. [4], Hadipour et al. [5], and Okafor-Elenwo & Elenwo [6]. This study is aimed at assessing the presence of intestinal parasites of commercial Layers and relating the findings to their public health importance.

Materials and Methods

Study areas

The study was carried out in Ikwerre, Obio/Akpo, Emohua, Ahoada and Etche Local Government Areas in Rivers State, Nigeria. Climatic conditions are typical of the rainforest ecological zone. Each of the LGAs selected has its latitude and longitude. Ikwerre has a total area of 1,380KM². It lies at latitude 4° 54'280N and longitude 6°53'2.62'E, Obio/Akpo has a total area of 260KM² and lies at latitude 4° 45N and longitude 6°51.00 E; Etche is at latitude 4° 58'37.00N and longitude 7° 03'1700E, Emuoha lies at latitude 4° 88N and longitude 6° 87.26E while Ahoada lies at latitude 6° 87.26N and longitude 6° 38'59.9"E. The LGAs randomly selected were those in agreement with the criteria set for selection.

Sample Collection and Analysis

The study involved weekly collection of faecal samples for a period of three months, from April to July 2016. Prior to faecal sample collection, poultry farm owners' permission was solicited using an introductory letter from the Department of Animal and Environmental Department, University of Port Harcourt, Nigeria and only those farmers who consented to the request had their farms included for the study.

A total of two hundred (200) faecal samples were collected from commercial layers. The age of the birds were grouped in weeks. Data were collected using a well structured questionnaire, observations and interviews from the twenty-five selected poultry farmers who responded to the study. Freshly voided

faecal samples were randomly collected using spatula into separate labelled wide-mouth sample bottles. They were taken to the laboratory for analysis and microscopy. In the laboratory each sample was analysed for intestinal parasites qualitatively using saturation salt solution (Brine) flotation technique as described by Urquhart et al. [7] and Cheesbrough [8]. Unprocessed samples were preserved using 10% formol saline and kept for analysis the next day. Weighed 2g of each sample was put into a test tube and 10ml of saturated salt solution was added into the test tube and stirred to get a uniform mixture. The mixture was strained through gauze into a wide mouth bottle, after which more saturated salt solution was added to the mixture filling the bottle to the brime until the test tube almost overflowed with an upper meniscus. A clean glass slide was placed on top of test tube with contents touching the slide. The mixture was allowed to stand for 20 minutes in an erect position and the coccidian oocyst and worm eggs were expected to float to the top. Afterward, the glass slide was carefully removed by lifting it straight up and turned and then covered with a cover slip for microscopy; to identify helminthes parasites and eggs as well as protozoan oocyst. The slides were examined under x10 and x40 objectives respectively. The process was repeated until all the samples were examined.

Statistical analysis

Chi- square test was used to compare the prevalence among groups for statistical differences and similarities with probability value of 0.05 as significant.

Table 1: Prevalence of intestinal parasites of layers in the five selected Local Government Areas, in Rivers State.

LGAs	No. of Samples Examined	No. of Infected Samples	% Prevalence
Ikwerre	40	30	75
Ahoada	40	22	55
Obio/Akpo	40	32	80
Emuoha	40	18	45
Etche	40	28	70

Table 2: Prevalence of intestinal parasites in relation to age of the layers Chicken.

Breed	Age (weeks)	No. of samples Examined	No. of Positive Sample	Prevalence (%)	Ch ²	P-Value
Layers	5-Jan	80	30	17	20.935	0
	10-Jun	40	28	70		
	15-Nov	20	12	60		
	16-20	20	17	85		

Table 3: Parasites recovered from layers faecal samples in the LGAs.

LGAs/Parasites	<i>Ascaridia galli</i>	<i>Eimeria spp</i>	<i>Heterakis gallinarum</i>	<i>Trychostrongylus spp</i>	<i>Capillaria spp</i>	Unknown spp
Ikwerre	10	11	1	1	-	-
Emohua	4	9	1	-	2	3
Etche	9	6	4	3	-	-
Obio/Akpo	9	8	5	7	1	2
Ahoada	7	10	2	5	-	-

Out of a total of 200 faecal samples examined in five LGAS, 130(65%) faecal samples were infested as shown in Table 1. Obio/Akpo recorded the highest prevalence 80%. Intestinal parasites prevalence from each of the LGAs were 75%, 45%, 70%, 55% and 80% respectively. There was a higher statistical significant difference observed in the highest (80%) and least (45%) prevalence rates in the LGAs ($P < 0.05$). Table 2, shows that layers of week 1 -5 had the list prevalence (17%) while 16- 20 weeks old had the highest (85%) which is statistically significant ($P < 0.05$). Table 3, shows the parasites recovered as thus: *Ascaridia galli* 39(30%), *Eimeria species* 54(41.5%), *Heterakis gallinarum* 13(10%), *Capillaria spp* 3(2.3%) and *Trychostrongylus spp* 16(12.3). Mixed infection were observed in 34(26.1%) samples which were *A. galli* + *Eimeria spp* + *H. gallinarum*, *Eimeria species* + *Heterakis gallinarum* + *Trychostrongylus species* + *Eimeria species* + *Ascaridia galli* + *Heterakis gallinarum* + *Trychostrongylus*

species. In Figures 1a & 1b below, of a total of twenty-five filled questionnaires retrieved from the farmers, incidence of water spillage was 100%. The presence of foot bath at the entrance of the poultry rooms were observed in only 20% of the farms. Also, 60% of the farmers have separate rooms for their sick birds and 60% only disinfect their poultry rooms before restocking. Although, 100% of the farmers use quality feeds for their birds, good ventilation was observed in 80% of the farms while hygienic level was poor in 60%. Farmers who use good water sources were 60%. Figure 2 indicates that only 20% of the farmers dispose their litters once in two weeks, 30% dispose theirs once per batch and 50% dispose once in a month. Figure 3, indicates that 80% of the farmers purchase their birds at a day old from different large farms like Zartech, Chimero, Obasanjo and Niger chicks Companies and only 20% of the farmers purchase 2- 4 weeks old bird from other retailers.

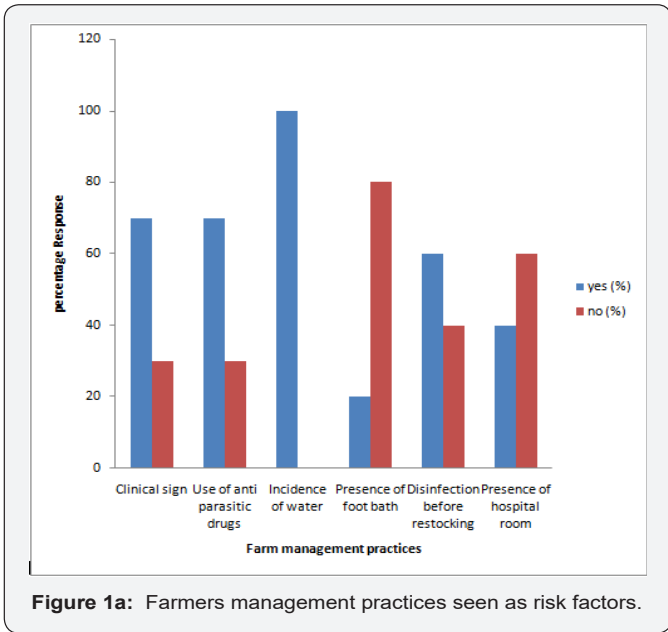


Figure 1a: Farmers management practices seen as risk factors.

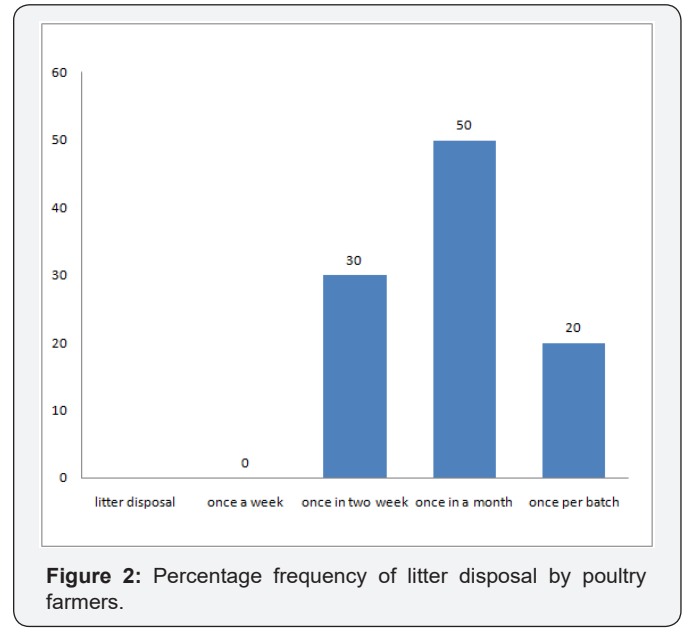


Figure 2: Percentage frequency of litter disposal by poultry farmers.

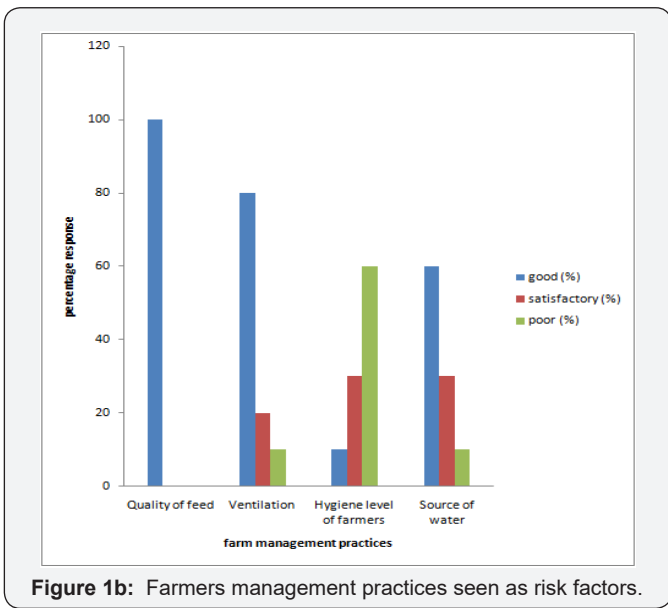


Figure 1b: Farmers management practices seen as risk factors.

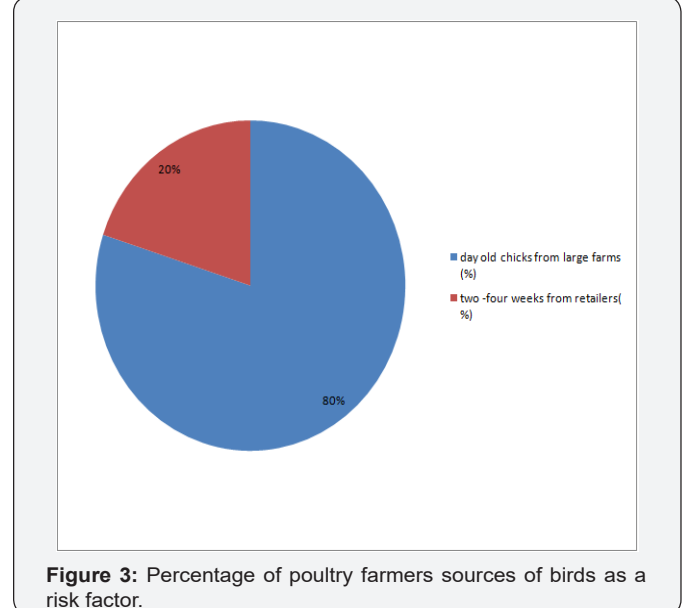


Figure 3: Percentage of poultry farmers sources of birds as a risk factor.

Discussion

Out of 200 layers' breed faecal samples collected, 130(65%) were positive for intestinal parasites; parasites discovered were *Eimeria species* 54(41.5%), *Ascaridia galli* 39(30%) samples and mixed infection 39(34.3%). In layers breed; *Eimeria species* were found in more samples than *A. galli*. The result of this study is in agreement with Salam, [9], Agishi, et al. [10], who made similar observations in their work on intestinal parasites of Chicken. The high parasitic prevalence observed may be attributed to poor management practices observed in some of the poultry farms in the study areas. The older litters were not removed and replaced with new dry wood shaving or saw dust very often; thereby making the poultry room floor wet and cake which in conducive for these parasites to thrive. Again water spillage, leakages from the roof of the poultry house, and the wet litters served as favourable environment for the parasites to incubate as also observed by Kolade et al. [11] and Elenwo et al. [12]. Moreover, the high prevalence rate of *Eimeria* oocyst in the faecal samples may be due to poor management in the poultry house hence coccidial oocyst were always present and spread very easily in a poor managed poultry house especially when left humid with caked litters as stated by Bachaya et al. [13]. Mixed infections of two or more species of parasites per faecal sample collected was very common in the study areas, and this has also been recorded by other scientists like Heyradin et al. [14], Ohaeri & Okwum [15] and Junaidu et al. [16] in their studies.

Parasitic burden were more in birds of 16-20 weeks old. The higher prevalence in the older birds may be due to decreased immunity in the older chicken. It may also be attributed to farmers' negligence in treating their birds at the right stage which later manifested on the birds at older age when they could no longer be treated with antibiotics and anti-helminthic agents, hence this may delay or stop entirely their egg laying period or reproductive potentials and so reduce the quantity of protein made available for public consumption. Another possible reason is that, the layers eating habit is increased at their older stage which may likely expose them to picking indiscriminately resulting to more infection from contaminated feeds, as contributed by poultry farmers.

Conclusion

In conclusion, the findings of the study have shown that intestinal parasites are highly prevalent in commercial layers in the studied LGAs in Rivers State, Nigeria. There are high levels of poor management practices, poor skills and negligence among the farmers which expose the layer breed of birds to these prevailing parasites. The poultry farmers are therefore encouraged to take appropriate measures in the control of intestinal parasitic diseases in Rivers State by administering anthelmintic agents at the right stage. Improved management skills and good farming practices may be cost effective as well as increase poultry production potentials.

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