



Gastrointestinal Parasites of Local And Exotic Breeds of Turkeys [*meleagris Gallopavo*] In Gwagwalada Area Council, Abuja, Federal Capital Territory, Nigeria

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Accepted December 2019, and Published December, 2019

ABSTRACT

This study was carried out to determine the gastrointestinal parasites in local and exotic breed of turkeys reared in Gwagwalada, Guinea savannah Zone of Nigeria. It was conducted between May and September, 2017. One hundred [100] faecal samples were collected from local and exotic breeds of turkeys in Gwagwalada Area Council and examined for the presence of gastrointestinal parasites eggs and oocysts using flotation and sedimentation methods. The following parasites eggs/oocysts were identified in the study; Ascaridia spp [47%], Strongyloides spp [32%], Cappilaria spp [26%], Heterakis spp [25%], Tetrameres spp [24%], Spirurid spp [15%], Raillientina spp [13%], Davainea spp [10%], Subulura spp [6%], Oxyuris spp [6%], Cyathostoma spp [5%], Syngamus spp [5%]. The Oocysts identified belonged to Eimeria spp [41%], Cryptosporidium spp [34%], Sarcocystis spp [6%], Trichomonas spp [4%]. A total of 95% of the turkeys were infected, with majority of the birds having mixed infection. Interestingly, none of the turkeys examined was infected with trematodes. There was no statistically significant difference in prevalence [$p > 0.05$] among the Turkeys. There was difference [$p < 0.05$] in the prevalence of infected male and female turkeys. The females had higher Infestation with the parasites than the males. There was no significant difference [$p > 0.05$] among the age groups. The prevalence of gastrointestinal parasites in this study shows a higher occurrence in exotic breed of turkeys 58.9% when compared to the local breed 41.1%. The domestic turkeys raised are hosts of a great number of gastrointestinal parasites which is attributed to the production system to which they belong. Therefore, Turkeys raised in free range condition of breeding should have a boundary and food served to them to reduce their search for food which exposes them to intermediate hosts of parasites.

Keywords: prevalence, gastrointestinal parasite, turkeys,

INTRODUCTION

Poultry occupies an important position in the provision of animal protein [meat and egg] to man and generally plays a vital role in the National economy as a revenue provider. Poultry production in Africa and parts of Asia is still distinctively divided into commercialized and village enterprise subsector, each with its peculiarities. Poultry production specifically includes chickens, ducks, guinea fowl, turkey and ostrich [1, 2]. Turkey and chicken productions however make up the main component of the commercial poultry [3].

The poultry industry is the largest and the most automated, vertically integrated and intensified of the animal production industries [4]. In many countries of the world, poultry has become one of the most popular components of the livestock industry. The domestic turkeys [*Meleagris gallopavo*] are one of the most important and widely distributed game bird species in Northern America, and Europe, but in the rest of the world, especially in developing countries, its potential has been overlooked largely because modern turkeys are highly bred for intensive production, thereby rendering the birds inappropriate for home production [5].

Turkeys are large poultry birds, fast gaining popularity among peasant farmers in Nigeria due to their quick turn over rate, higher feed conversion rate and minimum land requirements. The turkeys compliment chicken production. They are said to thrive more in arid conditions, they tolerate heat as compared to chickens [6]. The turkey has higher quality meat with low fat content. Male turkeys are bigger than the female turkeys.

Though the impact of parasitic diseases in farm birds reared on cage systems have diminished

due to modernization in poultry farming and biosecurity measures, but farm birds maintained on deep litter system and backyard free ranging birds still remain susceptible to parasitic infestation via litter droppings and scavenging habits. The common internal parasitic infestations occurring in poultry include cestodes, nematodes and coccidian [7]. These worm infestations may cause considerable damage and great economic loss to the poultry industry due to malnutrition, decreased feed conversion ratio, weight loss, lowered egg production and death in young birds. Improved poultry management practices are responsible for the reduction in incidence of parasitic infestations. However due to abundance of intermediate host that visit the poultry pens for food material or feeding such as beetles, ants, and houseflies on poultry litter droppings are responsible for transmission of various helminthes [7]. This study, is therefore, aimed at investigating the gastrointestinal parasites of local and exotic breed of turkeys in Gwagwalada Area Council of Abuja in the Federal Capital Territory, Nigeria.

MATERIALS AND METHODS

Study area

This study was conducted in the Gwagwalada Area Council which is one of the six Area Councils of the Federal Capital Territory, Abuja, Nigeria. It is located geographically in the central part of Nigeria, between latitudes 8°-25°¹¹ and 9°-29°¹¹ and longitudes 6°-45°¹¹ and 7°-45°¹¹ East of the Greenwich [8]. It has a guinea savannah type of vegetation, with rainy season stretching from April to October and dry season from November to March. The temperature ranges from 30-37°C yearly with the highest

temperature of the area experienced in the month of March.

Study methods

A total of 100 freshly voided faecal samples from 58 exotic and 42 local breeds of turkey from Gwagwalada Area Council, were collected between May and September, 2017. Turkeys of different age groups and sexes kept in deep litter system were included in the study. The samples were collected with a spatula, which was washed and cleaned after each collection to avoid contamination. Each faecal sample was placed in a sample bottle and labelled properly indicating the date, breed and sex of the turkey.

Direct microscopic examination, centrifugation floatation and sedimentation technique as described by [9], were used to analyse the faecal samples. Identification of the eggs or oocysts were based on their morphology and size. The faecal samples were examined using saturated sugar solution for floatation and sedimentation techniques to identify the eggs or oocysts using the light microscope at x100 objective.

Data analysis

Data collected on prevalence and numbers of gastrointestinal parasites in faecal samples of each breed were statistically analysed. The test statistics was applied at $P \leq 0.05$ level of significance to know whether or not there were significant differences.

RESULTS

95 [95%] of the birds were found to be positive for gastrointestinal parasites while 5 [5%] of the sampled birds were found to be negative.

This study revealed a total prevalence of 299 individual gastrointestinal parasites infecting turkeys in Gwagwalada Area Council, nematodes had the highest individual prevalence of 211 [71%] in both local and exotic breeds, followed by protozoa 75 [25.5%] and cestode 13 [4.5%] infections respectively [figure 1].

Out of the 211 individual nematode parasites, *Ascaridia spp* had the highest prevalence rate of 47 [22.3%], followed by *Strongyloides spp* 32 [15.2%] and *Heterakis spp* 25 [11.8%]. While out of the 75 individual protozoan parasites, *Eimeria* had the highest prevalence of 41 [54.7%] and *Cryptosporidium spp* 34 [45.3%]. The only Cestode parasite observed was *Rallietina spp* which infected 13 of the turkeys [Figure 2].

The prevalence of gastrointestinal parasites according to the sex showed, 87 [91.6%] were females [Table 1]. The males had, 8 [8.4%]. This result was statistically significant [$P < 0.05$].

A higher infestation based on age was observed among the 7 months old turkeys, 64 [67.4%], followed by the 6 months old turkeys, 18 [18.9%] and the 4 months old turkeys had a prevalence of 7.4%. The least prevalence was observed among the adult turkeys that were one year old and above [3.2%] [Table 2]. There was no statistical significant difference [$p > 0.05$] in prevalence of gastrointestinal parasite infection between all the ages.

The prevalence of gastrointestinal parasites infection in table 3 reflects a higher occurrence in exotic breeds showing 58.9% prevalence when compared to the local breeds with 41.1% prevalence. However, there is no significant difference [$P > 0.05$] in the infection of both breeds.

The female turkeys of exotic breeds had a higher prevalence rate of infection 94.6% when compared to male with 5.4% Table 4. However, there was a statistically significant difference [$p < 0.05$] in prevalence of gastrointestinal parasite infection between gender as observed in the study.

Gastrointestinal parasites infection in exotic breeds of turkeys shows a higher prevalence of 60.7% among seven months old turkeys, the 6 months old turkeys showed 30.4% whereas younger turkeys of 4 months was 8.9%, there was no infections in one and two year old turkeys [Table 5]. There was no statistically significant difference [$p > 0.05$] in prevalence of gastrointestinal infection between the ages.

The prevalence of gastrointestinal parasite infection of local turkeys reveals that females had the highest prevalence infection rate of

87.2% while the males had a lower infection rate when compared with females showing 12.8% [Table 6].

The prevalence of gastrointestinal parasites infections among local turkeys according to their ages showed highest prevalence of 53.6% in 7 months old turkeys, but lower [5.4%] prevalence in older turkeys of 1 and 2 years old [Table 7]. In younger turkey poults of 4 months and 6 months the prevalence showed 3.6% and 32.12% respectively.

Double infection was 26%, which was greater than single infection of 15%, while triple infection was slightly higher than single infection, 17%, same as quintuple infection but followed closely by 20% [Table 8].

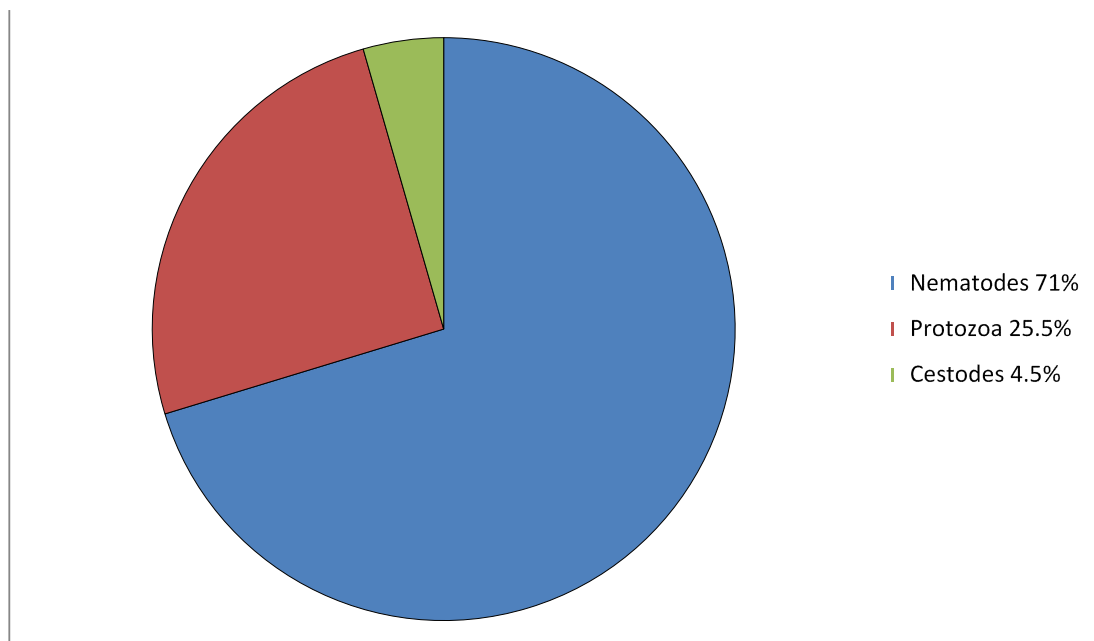


Figure 1: Pie chart p revalence of gastroin testinal parasite in turkey in Gwagwalada Area Council by type of parasite

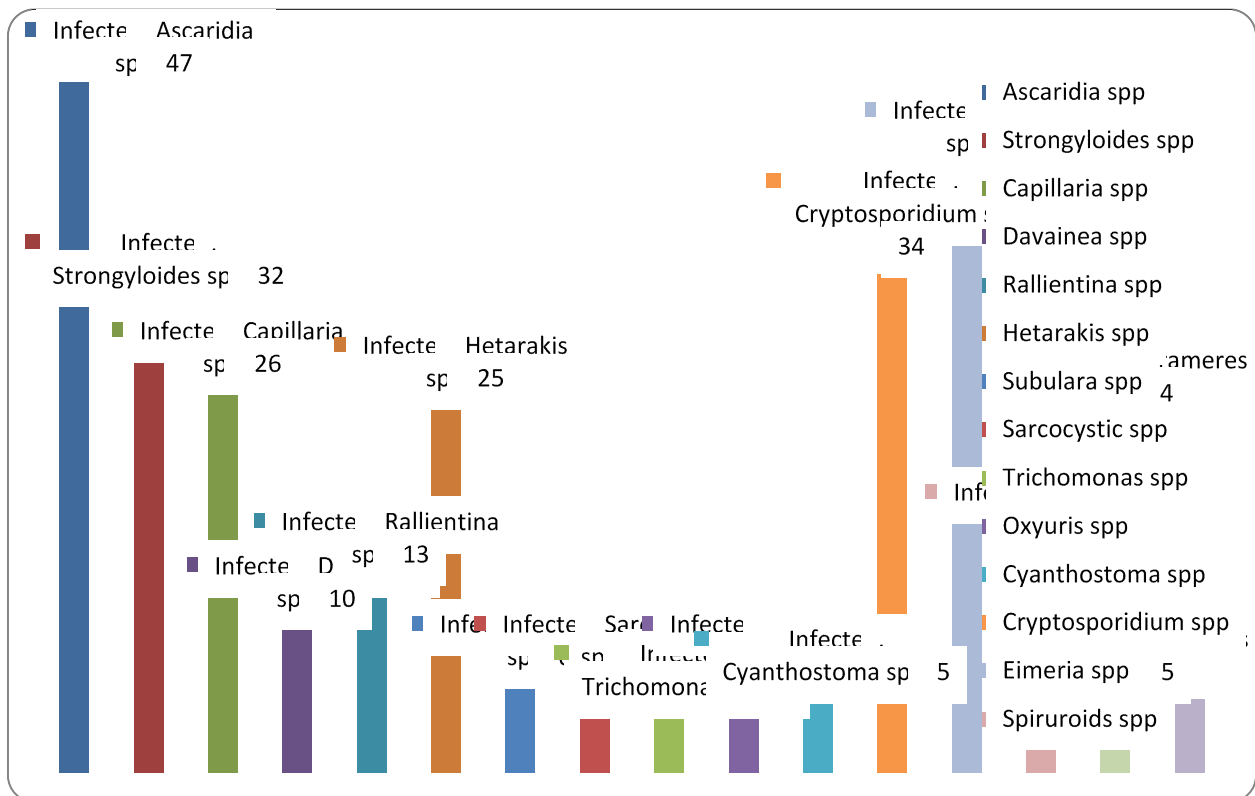


Figure 2: Bar chart prevalence of infected turkeys with each of the gastrointestinal parasites

Table 1: The prevalence rate of gastrointestinal parasites among the breed of turkeys in Gwagwalada Area Council.

Breed	Infected	Non-infected	Total
Exotic	56[58.9%]	2[40%]	58 [58%]
Local	39[41.1%]	3[60%]	42 [42%]
Total	95[100%]	5[100%]	100[100.0%]
$\chi^2 = 0.700$	df = 1	p = 0.403	

Table 2: Prevalence of gastrointestinal parasites in turkeys in Gwagwalada Area Council according to Sex

Sex	Infected [%]	Non-infected [%]	Total [%]
Male	8[8.4]	2[40]	10[10]
Female	87[91.6]	3[60]	90[90]
Total	95[95]	5[5]	100[100.0]
$\chi^2 = 5.263$	df = 1	p = 0.022	

Table 3: prevalence of gastrointestinal parasites among turkeys in Gwagwalada Area Council according to Age

Age	Infected	Non-infected	Total
4 months	7[7.4%]	0[0%]	7[7%]
6 months	18[18.9%]	0[0%]	18[18%]
7 months	64[67.4%]	3[60%]	67[67%]
1 year	3[3.2%]	1[20%]	4[4%]
2 years	3[3.2%]	1[20%]	4[4%]
Total	95[95]	5[5]	100[100]
$\chi^2 = 8.091$	df = 1	p = 0.088	

Table 4: The prevalence of gastrointestinal parasites according to the sex of exotic turkeys

Sex	Infected	Non-infected	Total
Male	3[5.4%]	1[50%]	4[6.9%]
Female	53[94.6%]	1[50%]	54[93.1%]
Total	56	2	58[100.0%]
$\chi^2 = 5.994$	df = 1	p = 0.014	

Table 5: Prevalence of gastrointestinal parasites in exotic turkeys according to Age.

Age	Infected	Non-infected	Total
4 months	5[8.9%]	0[%]	5[8.6%]
6 months	17[30.4%]	0[%]	17 [29.3%]
7 months	34[60.7%]	2[%]	36 [62.1%]
1 year	0[0%]	0[%]	0 [0%]
2 years	0[0%]	0[%]	0 [0%]
Total	56[96.5%]	2[%]	58[100%]
$\chi^2 = 1.2566$	df = 2	p = 0.531	

Table 6: The prevalence of gastrointestinal parasites in local turkeys according to sex

Sex	Infected	Non-infected	Total
Male	5[12.8%]	1[33.3%]	6 [14.3%]
Female	34[87.2%]	2[66.7%]	36 [85.7%]
Total	39	3	42[100%]
$\chi^2 = 0.957$ $df = 1$ $p = 0.328$			

Table 7: The prevalence of gastrointestinal parasite in local turkeys according to age

Age	Infected	Non-infected	Total
4 months	2[3.6%]	0[0%]	2[3.5%]
6 months	1[32.12%]	0[0%]	1[2.3%]
7 months	30[53.6%]	1[33.3%]	31[53.3%]
1 year	3[5.4%]	1[33.3%]	4[6.9%]
2 years	3[5.4%]	1[33.3%]	4[6.9%]
Total	39[100]	3[100]	42[100%]
$\chi^2 = 4.794$ $df = 4$ $p = 0.309$			

Table 8: Mixed parasitic infections among turkeys in Gwagwalada Area Council.

Breed	Non-Infected	Single infection	Double infection	Triple infection	Quadruple infection	quintuple infection
Local	3[60%]	7[46.7%]	11[42.3%]	4[23.5%]	7[35%]	10[58.8%]
Exotic	2[40%]	8[53.3%]	15[57.7%]	13[76.5%]	13[65%]	7[41.2%]
Total	5[%]	15[%]	26[%]	17[%]	20[%]	17[%]

DISCUSSION

The overall prevalence of infection with gastrointestinal parasites recorded in this study was 95%. This finding is greater than 57.7% reported by [6] from Kaduna metropolis, Kaduna State and by [3] in Owerri, South Eastern Nigeria.

The prevalence of 95% recorded in this study is closely in agreement with the report of [7] in Bangalore, India. This discrepancy could be related to the differences in weather conditions

such as temperature, humidity, precipitation and wind speed.

Ascaridia spp had the highest prevalence rate in both local and exotic breed. This specie has been reported in several studies as the commonest and most important helminth infection in poultry by [10, 2]. Elsewhere in Africa, several studies have strongly supported that *Ascaridia galli* is the commonest and most important helminthes infection of poultry [11, 12]. Nematodes had the highest prevalence as

compared to cestodes, with *Ascaris* having a prevalence of 26.0%. This finding agrees with earlier findings of [13, 14], which indicates that nematode parasites are always more prevalent than the cestodes. The nematodes do not require intermediate hosts as the cestodes do and are mostly soil transmitted. Their eggs can remain viable for a long time enabling the turkeys to constantly pick up the viable eggs from the droppings that contaminate the environment as they feed and increase parasite burden.[15, 14].

The prevalence of Protozoan species closely followed *Ascaridia species*, with *Cryptosporidium species* showing the prevalence of 34%, and *Eimeria species* 41%. This agrees with [16], showing that the prevalence of *Eimeria species*, in the North central Nigeria is within the range of 36 – 43%, but lower than [17] and slightly higher than [6] who reported 22.45%.

The study revealed that the turkeys were parasitized by a variety of helminths especially nematodes. This could be due to the fact that parasites are more predominant in the tropical countries since the climate and environmental conditions of the area tend to favour their growth. Secondly, the management system of the turkeys and lifecycle of the parasites determine the varieties of parasites the bird can acquire. Turkeys reared extensively on free range tend to acquire infection with a wide range of parasites having direct life cycle because of their increased exposure to larger areas of land and various intermediate hosts of parasites [18]

This study revealed high prevalence of gastrointestinal parasites of turkey. High parasites prevalence in the turkeys causes damaging infections and source of high economic losses in the industry, through meat condemnation and morbidity [19]. The high prevalence recorded in this study could be due to the fact that domestic turkeys naturally feed on a

wide range of diet that predispose them to parasitic infections. Foods such as seeds, forages and kitchen wastes expose them to the intermediate hosts [cockroaches, beetles, grasshopper, earthworms etc.] of certain pathogens [20]. A feature of this study was the complete absence of trematodes in the gastrointestinal tracts of the local turkeys. This could be due to the complex life cycle of the trematodes that requires at least an intermediate host which may be in the same habitat with the turkeys. The absence of such habitats helps to break the lifecycle of the trematodes thereby reducing the spread of the worms [21]. Over the years, turkeys were only raised under semi intensive conditions by only the rich in Nigeria for their personal consumption. It is only recently when more individuals could afford raising these birds in their backyards which to a great extent has increased the chances of the turkeys to harbor more gastrointestinal parasites. In addition to that, a considerable amount of human and animal wastes are discharged into the soil daily thereby leading to the contamination of the soil with the infective stages of pathogenic organisms, of which the birds readily swallow during feeding [22].

More of the turkeys were infected by more than one species of parasites than those infected by one species of parasite. This is likely due to the system of production in which they were kept, which exposes them to picking various eggs of different parasites at a time.

In conclusion, this study revealed a high prevalence of gastrointestinal parasitic infection in exotic breed of turkeys. The prevalence of the parasites is higher in female than in male.

The domestic turkeys raised are hosts of a great number of gastrointestinal parasites which is attributed to the production system to which they belong. Therefore, Turkeys raised in free

range condition of breeding should have a boundary and food served to them to reduce their search for food which exposes them to intermediate hosts of parasites.

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