SHORT COMMUNICATION REPORT

GASTROINTESTINAL PARASITES OF DOMESTIC CHICKEN *GALLUS-GALLUS DOMESTICUS* LINNAEUS 1758 IN SAMARU, ZARIA NIGERIA

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The exotic or local breed of the domestic fowl *Gallus-gallus domesticus* Linnaeus 1758 is reared by rural and urban house holders who use their eggs and meat as a source of animal protein and farm manure (Kekeocha 1984; Frantovo 2000).

Gastrointestinal parasites which invade the host possess morphological and physiological features such as small thread like cylindrical body, hooks, and hard body cuticle enhance their adaptation to long living and existence in their hosts. These parasites constitute a major factor limiting productivity of the poultry industry by affecting the growth rate of the host resulting in malfunctioning of organs and eventually death (Soulsby 1982).

In the USA, an estimated annual loss of U$ 200 million dollars have been reported while $45 million is spent yearly on prevention and medication of poultry diseases (Reid 1978). The domestic chicken has a wide range of feeding habits from grains, fruits to insects which may be carrying stages of parasites, thus predisposing them to parasitic infections (Adang 1999; Oniye 2000). Heavy gastrointestinal helminthiasis is characterised by emaciation, mucoid diarrhoea, loss of appetite, anaemia, weakness, paralysis and death. Associated with parasitic infections are acute or catarrhal inflammation, maceration and thickening of gastrointestinal tract (Fatihu *et al.* 1991).

Multiple helminthiases is common in poultry that are kept extensively while heavy infestation is common in intensively managed stock in which they cause severe pains that affect the normal activities of the birds resulting to death. This paper reports on the occurrence of gastrointestinal parasites of the domestic chicken in Zaria Nigeria to determine the prevalence and most preferred sites of infection in the host.

Source of Birds: A total of 92 local chicken breed slaughtered at the Samaru market, Zaria Nigeria were examined for the presence of gastrointestinal parasites. The gastrointestinal tracts were collected into sample bottles containing 10% formalin and taken to the laboratory for examination.

Laboratory analysis: The gastrointestinal tracts were separated into gizzard, crop, small intestine, large intestine and caecum after which each region was cut open by dissection. The intestinal scrapping and floatation methods were used to collect the parasite (Soulsby, 1982; Wood *et al.* 1982).

Data analysis: Chi-square was employed to compare infestation rates.

Out of the 92 birds examined about 62% were infected with various species of gastrointestinal parasites, comprising 7 species of protozoa and 5 species each of cestode and nematode (Table 1).

The protozoan parasites encountered were *Eimeria tenella* Railliet & Lucy 1891, *E. brunetti* Levine 1942, *E. mitis* Tyzzer 1929, *E. acervulina* Tyzzer 1929, *E. necatrix* Johnson 1930, *E. maxima* Tyzzer 1929 and *E. mivati* Edgar & Siebold 1964. Of these, *E. tenella* was the most prevalent and *E. mivati* the least abundant. The protozoan parasites showed the highest prevalence during the rainy season than the dry season, suggesting that low humidity and warm environmental conditions favour the development of these parasites.

The cestode parasites encountered were *Raillietina tetragona* Molin 1858, *R. echinobothrida* Megnin 1880, *R. cesticillus* Molin 1858, *Choanotaenia infundibulum* Bloch 1779 and *Hymenolepis carioca* de Magalhaes 1898 out of which *Hymenolepis carioca* was the most prevalent and *R. cesticillus* the least. Cestodes are known to interfere with the metabolisms of certain compounds: they absorb glucose and galactose and stored them as glycogen as well as absorbed amino acids, polypeptides and proteins (Cheng 1973).

The nematode parasites recovered included *Ascaridia galli* Shrank 1788, *Heterakis gallinarum* Shrank 1788, *Hartertia gallinarum* Theiler 1919, *Gongylonema ingluvicola* Ransome 1904, *Syngamus trachea* Montagu 1811 out of which only *A. galli* and *H. gallinarum* were most prevalent and the remaining rare.

Of the 3 parasitic groups encountered, the protozoans were the most prevalent followed by cestodes and nematodes. Both cestodes and nematodes showed high predilection for specific sites in the gastrointestinal tract of the birds. Most of the helminth parasites were restricted to the small intestine, particularly the duodenum where there is optimum concentration of saline and glucose (Fatihu *et al.* 1991). Earlier report (Smyth 1976) suggests that the preference for the small intestine by these parasites is to complement their physiological osmotic feeding nature where nutrients exist in dissolved form.

TABLE 1: NUMBER AND PERCENTAGE OF CHICKENS INFECTED WITH GASTROINTESTINAL PARASITES (N=92)

Parasites	No. infected	Species specific rate
Protozoa		
Eimeria tenella	26	28.3
E. brunette	10	10.9
E. mitis	9	9.8
E. acervulina	8	8.7
E. necatrix	4	4.4
E. maxima	3	3.3
E. mivati	2	2.2
Cestode		
Raillietina tetragonal	22	23.9
R. echinobothrida	12	13.0
R. cesticillus	9	9.8
Choanotaenia infundibulum	10	10.9
Hymenolepis carioca	23	25.0
Nematode		
Ascaridia galli	40	43.8
Heterakis gallinarum	31	33.7
Hartertia gallinarum	1	1.0
Gongylonema ingluvicola	1	1.0
Syngamus trachea	2	2.2

The results showed that most of the parasites prefer to colonise the small intestine than the large intestine. No parasite was recovered in the crop and gizzard (Tables 2, 3 and 4) and only *E. tenella*, a protozoan, was recovered from the caecum (Table 2).

TABLE 2: SITE PREFERENCES OF PROTOZOAN PARASITES IN THE GASTROINTESTINAL TRACTS OF DOMESTIC CHICKEN IN ZARIA, NIGERIA (N=92)

Preferred Sites	Parasite	No. infected	Species specific rate
Caecum	*Eimeria tenella*	26	28.3
Large intestine	*E. brunette*	10	10.8
	E. necatrix	4	4.3
Small intestine	*E. mitis*	9	9.7
	E. acervulina	8	8.6
	E. maxima	3	3.2
	E. mivati	2	2.2

The domestic chicken feed on a wide range of diets, a habit that predispose them to parasitic infections (Smyth 1976) with many of the foods carrying infective stages of the parasites thereby serving as intermediate hosts in chickens that are free ranging. (Frantovo 2000). In addition, the prevalence of some nematodes in the caecum e.g *Heterakis gallinarum* could be attributed to their fairly developed digestive system which gives them greater chances of establishing a host-parasite relationship.

TABLE 3: SITE PREFERENCES OF CESTODE PARASITES IN THE GASTROINTESTINAL TRACTS OF DOMESTIC CHICKEN IN ZARIA NIGERIA (N=92)

Preferred Sites	Parasites	No. infected	Species specific rate
Large intestine	*Raillietina tetragonal*	9	9.7
	R. echinobothrida	4	4.3
	R. cesticillus	4	4.3
	Hymenolepis carioca	10	10.8
Small intestine	*R. tetragonal*	13	14.1
	R. echinobothrida	8	8.6
	R. cesticillus	5	5.4
	Choanotaenia infundibulum	10	10.8
	H. carioca	13	14.1

TABLE 4: SITE PREFERENCES OF NEMATODE PARASITES IN THE GASTROINTESTINAL TRACTS OF DOMESTIC CHICKEN IN ZARIA NIGERIA (N=92)

Preferred sites	Parasites	No. infected	Species specific rate
Caecum	*Heterakis gallinarum*	5	5.4
Large intestine	*Ascaridia galli*	15	16.3
	Gongylonema ingluvicola	1	1.1
	Syngamus trachea	1	1.1
Small intestine	*A. galli*	25	27.2
	H. gallinarum	26	28.3
	Hartertia gallinarum	1	1.1
	S. trachea	1	1.1

The presence of certain conditions especially moisture appears to favour the high infection rates with worms particularly those with a direct life cycle (Kennedy 1975; Audu *et al*. 2004).

No parasites were recovered from the crop and gizzard, an indication that the hostile nature of these regions may be serving as hindrance to their establishment since the regions are always filled up with grains and undigested items like stones (Ssenyonga 1982).

Both *S. trachea* and *G. ingluvicola* occurred in the small intestine but not in the crop (Table 4), agreeing with earlier observations (Fabiyi 1972; Ssenyonga 1982 & Wood 1982). The heavy worm load in the gastrointestinal tracts of the birds might be due to continuous ingestion of infested droppings or infested intermediate hosts of organisms such as beetles, cockroaches, earthworm, flies and grasshoppers that are readily available to them in poorly managed stocks (Abdu 1986; Majaro 1993).

The lesions observed on the intestinal walls of the infected chickens may be due to the severe infestation or heavy worm

burden in the caecal mucosa layer with haemorrhage and necrosis in the submucosa. This is in accordance with the observations of Anderson *et al*. (1976) & Majaro (1993) that intestinal mucosa of the birds severely infected with coccidian species showed deeply red lesions of variable sizes especially in the small intestine and caecum due to the large number of oocysts ingested.

Mixed infections of two or more species of parasites per bird was common in the present study. This might be attributed to food preference at a particular time which determines the establishment of mixed or single infection (Kennedy 1975).

The present study revealed high prevalence of parasitic infection in domestic chicken slaughtered in Zaria, Nigeria, which could serve as a silent source of economic loss to the poultry industry through reduced productivity. Therefore more attention should be focused towards the improvement of the management and care of free ranging chickens.

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