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Prevalence of Gastrointestinal Parasites among Pigs in the Ejisu Municipality of Ghana

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Abstract: The study investigated the prevalence of gastrointestinal parasites among pigs in the Ejisu municipality in the Ashanti Region of Ghana. Semi structured questionnaire designed to seek information on husbandry practices and animal health care issues on pig farms were administered to farm owners in ten randomly selected pig farms. 10g each of faecal sample was taken aseptically per rectum from twenty randomly selected pigs on each farm and examined at the Kumasi Regional Veterinary Laboratory using the flotation technique in a saturated solution of sodium chloride. The Eggs per gramme (EPG) was determined using a McMaster counting chamber. 56(28%) out of 200 pigs were infected with endoparasites. Four parasites were identified with prevalence of 14.5%, 11%, 2% and 0.5% for *Coccidia Spp*, *Strongyle spp*, *Ascaris suum* and *Trichuris suis* respectively. Majority of infections (32.5%) were from a single species. The intensity of infection was low with a mean EPG ranging from 100 – 429. It is recommended that the quarterly prophylactic deworming of pigs against endoparasites should be adapted and the type of anthelmintic used changed annually in order to reduce parasite resistance.
Keywords: Gastro-intestinal, Infection, Parasites, Pigs

INTRODUCTION

Swine production forms an integral part of the rural economy in many parts of the world [1]. Pig rearing is becoming an important livestock business in Ghana, where its population is estimated to be 536,000 [2]. The areas noted for intensive production include the Ashanti, Greater Accra and Brong Ahafo regions. The major breeds of pigs reared include the Ashanti black, large white and their crosses. Pig production is expected to supplement animal protein deficiency and help alleviate poverty. Pig production has a number of advantages over other livestock sectors. These include higher and quicker returns on investment, early maturity, short generation interval and smaller space requirements for production [3,4]. However, swine Production is faced with a number of constraints including cost and availability of feed, finance, diseases and marketing [5, 6]. The major diseases confronting pigs in the tropics include African swine fever, Swine influenza, parasitic and non infectious diseases. Parasitic diseases are a major obstacle to the growth of the pig industry and are considered to be next in importance after African swine fever [7]. Gastro-intestinal parasites belong to three classes of parasites, trematodes, cestodes and nematodes respectively. These parasites are collectively called helminths. Helminthiasis in pigs is often associated with subclinical infections; poor feed conversion and delayed achievement of market weight [8]. Information on the epidemiology of parasites of animals is very important in assisting farmers to develop preventive measures. Several studies have been conducted into the prevalence and economic importance of gastrointestinal parasites in pigs in some African countries. The common pigs parasites identified in these studies included *Strongyle spp, Ascaris spp, Trichuris spp , Eimeria spp, oesophagostomum spp, Strongyloides spp and Dicrocoelium spp*[9,10,11,12]. Information on the prevalence of porcine gastrointestinal helminthiasis in Ghana is scanty. This study therefore seeks to investigate gastrointestinal parasitic infections among pigs in the Ejisu municipality and determine the species prevalence and intensity of infection.

MATERIALS AND METHODS

Study area

The study was carried out in the Ejisu municipality near Kumasi in the Ashanti region of Ghana. This municipality has one of the largest pig populations in the Ashanti region. It lies within Latitude 1° 15‘ N and 1 ° 45‘ N and Longitude 6° 15‘W and 7° 00‘W and stretches over an area of 637.2 km². The municipality experiences tropical rainfall characterized by a bimodal regime lasting from March to July and from September to November. The mean annual rainfall is 1200 mm. Temperatures range between 20°C in August and 32°C in March.

Data collection

Semi-structured questionnaire to address husbandry practices and animal health care issues on pig farms were administered to ten randomly selected farmers in the Ejisu municipality between February and March, 2013. On each farm, 10 grammefaecal samples were taken aseptically per rectum individually from twenty randomly selected pigs, including piglets, growers and adults. The samples were taken in the morning from pigs which had not been treated with anthelmintics for the past three months. Pigs up to 10 weeks of age were considered piglets, 10 to 16 weeks, growers and above 16 weeks adults.

The selected animals were clinically healthy and no preference was given to sick animals. The collected samples were placed in sterile plastic containers and stored on ice in a Coleman box. They were then transported to the Regional Veterinary Laboratory in Kumasi for parasitological examination on the day of collection. Samples were collected from one farm per visit during the period of the study.

Laboratory procedures

The faecal samples were first grossly examined for the presence of whole worms or segments. The samples were processed using the flotation technique in a super saturated solution of sodium chloride and then examined using a light microscope. *Helminth ova and coccidia oocyst were identified as described [13,14]*. The McMaster technique was then used to count eggs per gram (EPG) in positive samples.[15]. The EPG was obtained by multiplying the total number of eggs in the grid of the chamber by 100.

Data analysis and presentation

The prevalence and intensity of infection was analysed using descriptive statistics.

RESULTS

General Characteristics of sampled pigs

The age and sex distribution of sampled pigs is presented in Table 1.

Majority (57.5%) were females, while 42.5% were males. This included a total of 29% (n= 58) piglets, 46% (n= 92) growers and 25 % (n= 50) adults.

The pigs were fed with self-prepared rations containing ingredients such as maize grain, wheat bran and concentrates. This was sometimes supplemented with cassava and plantain peels. The main source of water on the farms was from bore holes. Farmers had access to veterinary services and frequently used levamisole, albendazole and piperazine as anthelmintics. Deworming was done once every quarter.

Table-1: Distribution of sampled pigs according to sex and age.

Sex/Age	Piglets	%	Growers	%	Adults	%	Total	%
Male	28	14	40	20	17	8.5	85	42.5
Female	30	15	52	26	33	16,5	115	57.5
Total	58	29	92	46	50	25	200	100

Parasitological Profile of Sampled Pigs

28% (n = 56) of the sampled pigs were found to be infected with gastrointestinal parasites.

Four parasites of veterinary importance were identified with a species prevalence of 14.5%, 11%, 2% and 0.5% for *Coccidia Spp, Strongyle Spp, Ascaris suum and Trichuris suis* respectively (Table 2). The majority of infections were with a single parasite (21%), while infections with mixed parasites were 7%. Mixed infections included *Coccidia* and *Strongyle Spp*(n=8) and *Trichuris suis* and *Strongyle Spp*(n=1). The prevalence of parasites was significantly higher in female pigs than in male pigs.

Table-2: Species prevalence by sex.

Parasite/ Sex	Male	Female	Total No infected	% infected
Coccidia Spp	12	17	29	14.5
Strongyle Spp	9	13	22	11
Ascaris suum	1	3	4	2
Trichuris suis	0	1	1	0.5
Total	22	34	56	28

Intensity of infection or worm burden

The intensity of infection or worm burden was estimated by counting the Eggs per grammefaecal sample (EPG). The intensity of infection in different age groups is presented in Table 3. The EPG was not determined for *coccidia oocysts*. The mean EPG was highest in adults and lowest in piglets for all the three parasites. For *Strongyle Spp*, the highest mean EPG was in adults (429), while the lowest was in piglets (100).The highest mean EPG for *Ascaris suum* infection was 400 in adults, while the lowest was 100 in both piglets and growers. *Trichuris suis* was recorded only in adults with a mean EPG of 200. The EPG range for

various parasites was: *Strongyle Spp* (100-1400), *Ascaris suum* (100-700) and *Trichuris suis* (100-200).

Table-3: Intensity of infection (Mean EPG) by age of pigs and type of parasite.

	Age group/ Mean EPG				
Parasite	**Piglets**	**Growers**	**Adults**	**Overall mean**	**Range**
Strongyle spp	100	226	429	327	100-1400
Ascaris suum	100	100	400	250	100-700
Trichuris suuis	0	226	429	200	0-200

DISCUSSIONS

This paper discusses the prevalence of gastrointestinal parasites in farm pigs in Ejisu municipality in the Ashanti region of Ghana. The overall prevalence of 28% observed is lower than a prevalence of 91% in the Upper East Region of Ghana [16].

This reason for this variation in prevalence is due to the difference pig husbandry systems. The pigs in the former report were scavenging pigs while those in the current study were intensively reared hybrid pigs. Scavenging pigs are often not dewormed at all.

The observed prevalence is also lower than reports in some parts of Sub Saharan Africa [17-20].This seeming low prevalence may be explained by the fact that faecal samples were collected during the months of February to March, when parasite infection rates are generally lower due to the prevailing weather conditions of low relative humidity and high ambient temperatures. These conditions often retard the development of parasites outside their hosts. Another possible reason was the regular deworming observed in the farms. Four parasites of veterinary importance, *Coccidia Spp, Strongyle spp, Ascaris suum and Trichurissui s* were reported in this study. The parasites identified in this study are the common parasites of swine. These findings are similar to reports that *Trichuris suis, Ascaris suum,* human hookworm, *Stephanurus dentatus* and *Isospora suis* were the most prevalent parasites in pigs on a research farm **[**17].

Another report identified *Isosporasuis, Oesophagostomumdentatum*, *Trichuris suis* and *Metastrongylussalini*as the prevalent parasites in pigs meant for slaughter [20]. In terms of infections, single infections were more prevalent (32.5%) than mixed infections (7%). Mixed infections were between *Strongyle* and *Coccidia Spp* (n=8) and *Trichuris suis* and *Strongyle*(n=1).

In this study, more females were infected than males. This finding differs from reports that the prevalence of infection was higher in male pigs than in female pigs in parts of Nigeria [17,20]. Female pigs are usually kept for longer periods than males and are therefore more predisposed to helminths. Another reason is that the former are known to have immunosuppression during pregnancy and lactation and easily succumb to helminthiasis.

The mean EPG for these parasites ranged from 100 to 427. Consequently pigs in this study had low level infections (EPG< 500). However in some individual cases, the EPG was greater than 500 especially in adult pigs. The mean EPG values are comparatively lower than values reported in Burkina Faso and Kenya [22,23]. In the Eastern part of Burkina Faso, the pigs were scavengers and therefore more likely to be infected as they feed on whatever was available.

The EPG values were as follows: *Ascaris suum* (100-1,400), *Strongyloidesransomi* (100-4,200), *Oeso phagostomum spp*. (100-1,000), *Hyostrongylus rubidus* (100-1,800), *Globocephalus spp*. (100-400) and *Trichuris suis* (100-200).

Adult pigs had comparatively higher EPG values than growers and piglets. These findings are in tandem with the biology of the parasite. The higher prevalence in adults than in growers and piglets is due is to prolonged exposure of adults to infective stages of nematodes.

CONCLUSION AND RECOMMENDATIONS

Four parasites with prevalence rates of 14.5%, 11%, 2% and 0.5% for *Coccidia Spp, Strongyle Spp, Ascaris suum and Trichuris suis* respectively, were identified. The intensity of infection was low and infections with a single parasite were more prevalent than mixed infections. It is recommended that the quarterly prophylactic deworming of pigs against endoparasites should be adapted and the type of anthelmintic changed annually in order to reduce parasite resistance.

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