Prevalence of Swine Gastrointestinal Parasites in Four Selected Local Government Areas of Nasarawa State, Nigeria

G. P. Karaye, A. G. Dogo, D. Iliyasu, and H. K. Madu

Department of Parasitology and Entomology, University of Jos, NIGERIA

Department of Theriogenology and Production, University of Ilorin, NIGERIA
Department of Agricultural Technology, Federal College of Horticultural Technology. Dadain Kowa, Gombe state. NIGERIA

***Corresponding author:** disambo@yahoo.com

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Abstract

Gastrointestinal parasitic infections in swine are one of the major challenges in pig production in Nigeria. It causes substantial reproductive losses, poor reproductive performance and production in swine industry. Internal parasites are known to deteriorate the wellbeing of pigs by robbing the essential nutrients that are required for optimum reproduction and productivity. It also injured some vital organs which play key role in metabolic activities and assimilation process. The consequences are anorexia, poor growth rate, anaemia, emaciation, infertility and condemnation of affected organs after slaughter. The study was designed to collect two hundred feacal samples from 4 local government area (Laminga, Tammah, Nasarawa and Kusa) of Nasarawa state between (March to July 2015). Fifty samples were randomly collected from each local government areas within the study period. The samples collected were evaluated microscopically for different prevalence of gastro intestinal parasites GIT in pigs. Five species of gastrointestinal parasites were identified with prevalence of 13.5 % for Ascaris suum and strongyloides while Fasciola, trichuris suis cyst and Oesophagustomum oocyst had a prevalence of 7.5 % and 2.5 % respectively. A prevalence of 61.5 % was observed as overall species prevalence in the 200 fecal samples analysed. Therefore, there is a need for combined efforts to control parasites infections for optimum production of pigs and prevention of zoonotic helminthiasis.

Key words: Gastrointestinal Parasites, Prevalence, Reproductive Losses and Prevention of Zoonotic Helminthiasis

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Introduction

Gastrointestinal parasitic infection in swine is a major hindrance to profitable pig production and cause of substantial reproductive loss and poor reproductive performance in swine industry in Nigeria (Nsoso *et al*., 2000; Boes *et al*., 2000). Internal parasites are known to deteriorate the wellbeing of pigs by robbing the essential nutrients that are required for optimum reproduction and productivity (Esrony, *et al*., 1997). Prevalence of 23.4 % of internal parasites has been reported in Morogoro region of Tanzania by (Esrony, *et al*., 1997). The internal parasites is also known to injured some vital organs which play key role in metabolic activities (Ngowi, *etal*., 2004). The consequences are anorexia, poor growth rate, anaemia, emaciation, infertility and condemnation of affected organs after slaughter (Nsoso *et al*., 2000; Ngowi, *et al*., 2004). Severe case of helminthiasis in young pigs has been reported and is commonly associated with diarrhea, loss of electrolytes and death (Stewart and Hoyt 2006). High morbidity and mortality associated with helminthes infection compromised the productivity and reproductive performance of pigs in Africa. (Marufu *et al*., 2008; Nissen *et al*., 2011). Other enteric diseases which could serve as an impediment to pigs production includes: Post weaning diarrhea, Edema disease, *Salmonellosis*, *Entamoebiasis*, *Coccidiosis* and Rota viral enteritis (Silva *et al*., 1999). Porcine production has a high potential to contribute to economic gains as pigs have high fecundity, high feed conversion efficiency, early maturing, short gestation period, pigs are multiparous and relatively small space requirement for piggery (Rekwot *et al*., 2003). Pigs provide about 40 % of meat as animal protein around the globe. In spite of these advantages, diseases and poor herd health management practices pose significant challenges to efficient management and profitable swine production in developing countries including Nigeria (Rekwot *et al*., 2003; Adebisi, 2008).The sustainable development of the swine industry is faced with same constraints like helminthiasis (Aliaga-Leyton *et al*., 2011). Therefore the current study is designed to identify the common important gastro-intestinal parasites of pigs in predominant pig production area in the four Local Government areas namely Laminga, Tammah, Nasarawa (oversea) and Kusa of Nasarawa state, Nigeria.

Materials and Method

Study Area

Nasarawa state is centrally located in the middle belt region of Nigeria. The area lies within latitude 8^{o} 32′N and longitude 8^{o} 18′E and occupied a land area of about 27, 117 square km with total population of 20, 40097. The State is bordered with Kaduna state in the north, Abuja, the Federal Capital Territory to the west, Kogi and Banue states to the south and Taraba and Plateau states to the east, Agriculture is the mainstay of its economy throughout the year it is within the North Central Geo-political zone of Nigeria. (Marcus and Bimbol, 2007).

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Sample Collection

Two hundred feacal samples were collected from 4 local government area (Laminga, Tammah, Nasarawa and Kusa) of Nasarawa state within (March- July 2015). Fifty samples were randomly collected from pigs farms in the five local government areas considered for the study, within 5 months of the study period. The faecal samples were collected from the rectum of the pigs, following proper restraint, the person gloved and lubricates his hand before inserted into the rectum and scooped some feces. The face were transferred into well labeled polythene bags and transported under cool box at 10 °C to the Department of Parasitology and Entomology Laboratory, at the National Veterinary Research Institute Vom, for examination. Faecal egg count and helminths identification were determined as described by (Ngowi, *et al*., 2004)

Laboratory Examination

The fecal samples were grossly examined for the presence of adult parasite. Microscopic Examination was also carried out using direct normal saline method and Iodine method.

Direct Fecal Smear Method

A drop of (0.85 %) normal saline was placed at the centre of a clean grease free slide and a small portion of the stool was picked by applicator stick and smear was made and covered with a cover slip and examined under the microscope using × 10 and × 40 objectives respectively.

Iodine Method

A drop of 1% iodine was placed at the centre of a clean grease free glass slide and a small portion of the feces was emulsified in the drop using applicator sticks. The smear was covered with a cover slip and examined under the microscope using × 40.

Formal Ether Sedimentation Technique

The formal ether sedimentation technique was employed to analyze the collected samples for intestinal parasites. About 1g of faces is placed in 10ml of 10 % formol solution in a screw capped bottle and shaken vigorously to mix then filtered with a wire sieve into a centrifuge tube, 3- 5ml of diethyl ether was added to the supernatant. It was centrifuged at approximately 200 × g for five minutes. A stick was used to loosen the layer of fecal debris from the side of the tube. The tube was inverted to discard the ether, fecal debris and formol solution. The bottom of the tube was tapped to suspend the sediment and a drop of the sediment was placed on clean grease free glass slide and covered with cover slip and examined microscopically using ×10 and × 40 objectives.

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Result

Five species of gastrointestinal parasites were identified and the overall species prevalence was 16.5 % and13.5 % for *Ascaris suum* and *strongyloides* while Fasciola, *trichuris suis* cyst and *Oesophagustomum* oocyst had a prevalence of 7.5 % and 2.5 % respectively as presented in Table 2. A prevalence of 61.5 % was observed in the 200 fecal samples analysed. Coccidian oocyst, the only protozoan parasite encountered, had a prevalence of 14 % (Table 1). One hundred and three (123) samples were positive for the ova of various swine helminthes (Table 3). Laminga local government recorded the highest prevalence of 18% followed by Tammah and Nassarawa (Oversea) Local Government areas had 17.5% and 16.5 respectively. Kusa local Government had the least prevalence of 10.5%. Based on species, *Ascaris suum* had the highest prevalence of 16% followed by coccidian oocyst 14% and *Strongyloides* 13.5% while *Trichuris suum* oocyst had the lowest prevalence of 2.5%.

Table 1: Prevalence of Intestinal Parasites of Swine in Four Selected Local Government Areas in Nasarawa State.N=50

Location	Positive	Negative	Prevalence
Laminga	36	14	18%
Tammah	35	15	17.5%
Nassarawa (over sea)	33	17	16.5%
Kusa	19	31	10.5%
Total	123	77	62.5%

Table 2: Distribution of Different Species of Gastrointestinal Parasites in the Fecal Samples Swine (n=50)

Parasite species	Positive	Prevalence
Strongyloides	27	13.5 %
Coccidian oocyst	28	14 %
Ascaris ova	33	16.5 %
Fasciola ova	15	7.5 %
Trichuris cyst	5	2.5 %
Oesophagustomum oocyst	15	7.5 %

Table 3: Species of Parasites Identified From the Gastro Intestine of Pigs in Four Selected Local Government Areas in Nassarawa State

Local Govt Areas	Ascaris Ova	Strongyles Ova	Oocysts of coccidian	Trichuris Ova	Strongyloides Ova
Laminga	12 (12.0 %)	8 (12.5 %)	4 (20.0 %)	4 (13.3 %)	8 (16.6 %)
Tammah	10 (10.0 %)	10(15.6 %)	3 (15.0 %)	4 (13.3 %)	8 (16.6 %)
Nasarawa	20 (20.0 %)	8 (12.5 %)	3 (15.0 %)	3 (10.0 %)	4 (8.3 %)
Kusa	8 (8.0 %)	6 (9.4 %)	0 (0.0 %)	4 (13.3 %)	4 (8.3 %)
Total	50	32	10	15	24

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Discussion

The study revealed 61.5 % prevalence of gastrointestinal parasites recorded among the pigs from the four local government areas compared to 23.4 % prevalence reported in Tanzania by (Esrony *et al*., 1997). The prevalence is significantly higher compared to 32.5 % and 50% reported by (Sowemimo *et al*., 2012) and (Nwoha and Ekwurike, 2011) in pankshin, Plateau state, and Umuahia, Abia State, Nigeria respectively. But higher prevalence 91% was reported in Burkina Faso (Tamboura *et al*., 2006; Obonyo, *et al*., 2012). The high prevalence recorded in this study may be attributed to poor animal husbandry and biosecurity measures in place. Similar findings were observed by (Obonyo *et al*., 2013) in Kenya. The differences in prevalence of GIT helminthes may also be associated with differences in environmental conditions, stocking rate, nature of their diet immunity status (Kumar, *et al*., 2002). The prevalence of GIT helminthes of pigs of each local government area may reflect the actual situation of the endemic helminthiasis in the area. The helminth burden was significantly involved *Ascaris spp* and *Strongyloides* compared to Coccidia oocyst examined. The presence of high count of helminthes eggs and the oocysts signifies that pigs were at parasites endemic arears. The parasites infections may have compromised their performance and production. Therefore, there is a need for combined efforts to control parasites infections in pigs study areas, for optimum production of pigs. In conclusion, this study revealed parasitic infection as threat to pig production in Nasarawa state, infected pigs in the area may saver as risk factor for spreading of the disease among humans and animals. In the community pig production remains one of the major sources of income, therefore there is need to combat the menace of gastro intestinal parasites infection for optimum production and prevention of zoonotic helminthiasis in the areas.

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