Tropical Journal of Applied Natural Science
ISSN: 2449-2043
Vol. 3 Issue 1 (2025)

https://tjansonline.org/view-paper.php?id=72;

Volume/Issue: Volume 3, Issue 1 **Published:** July 19, 2025

Transmission Dynamics and Intensity of Ecto and Endo Parasites of *Suisscrofa* IN Selected Farms in Anambra State

***Nwokolo, L. O., Emmy-Egbe, I. O. andIgbodika, M. C.**
Department Of Biological Sciences,

Faculty of Natural Sciences

Chukwuemeka Odumegwu Ojukwu University, Anambra State Nigeria

***cm.igbodika@coou.edu.ng**

ABSTRACT

This study investigated the intensity of infection and risk factors of intestinal and ectoparasites in intensively managed pigs in Anambra State, Nigeria, between April 2021 and March 2022. A total of 600 pigs from seven farms were randomly selected, and their faecal and blood samples were examined for intestinal parasites, eggs, and haemoparasites using conventional procedures. The results showed overall prevalence rates of 25.0% for intestinal helminth parasites, 18.3% for intestinal protozoa parasites, 15.8% for haemoparasites, and 10.3% for ectoparasites. Eight helminth species were identified, including Hookworm, *Ascaris suum*, *Trichuris suis*, and *Strongyloides ransomi*, with varying intensities of infection. The majority of worm burdens were of low (67.3%) and mild (28.1%) infections, while only 4.7% were of high intensity. Statistical analysis revealed significant associations between parasite infections and certain farming practices, such as non-disinfection of pens and equipment (85.4%), rearing pigs of different ages together (71.4%), and infrequent removal of dung (85.7%). The use of Ivermectin was the most common antihelminthic treatment (71.4%), and more than half of the pig farms (57.1%) administered drugs themselves. The study highlights the high prevalence of endo and ectoparasitic parasites in individual pigs and the widespread practice of dangerous farming methods by farmers. The findings emphasize the need for improved farming practices, regular deworming programs, and proper parasite control measures to reduce the risk of parasitic infections in pigs.

Key Word: Hookworm, Ectoparasitic, Farming, Blood and Intestinal, Helminthiasis.

INTRODUCTION

Pig rearing is primarily resourceful and seen as sources of meat protein in the study area. Ham, pork, bacon and gammon are processed as protein while pig skin and hairs are commercially harnessed for leather and brush production which is very profiting. Pig keeping has therefore become an indispensible component of the rural economy; contributing significantly to job creation, poverty alleviation and meat production (Akanni *et al*., 2017).They are the major causes of significant damage and economic losses especially to the pig industries as a result of condemnation of affected organs after slaughter (Weng*et al*., 2005; Adebisi, 2008; Weka and Ikeh, 2009; Nissen *et al*., 2010; Alfonso *et al.,* 2011; Roepstorff *et al.,* 2011).The most important harmful effects of the ectoparasitic infestations of swine are blood loss, restlessness or decreasedactivity of the hosts, dermatitis, pruritis and the transmission of different pathogens, which ultimately result in decreased reproductive performance, reduced weight gain, poor feed conversion efficiency, and skin lesions. The intestinal parasites of swine are widespread, of which every producer should be aware of their presence and the resulting losses. Several factors influence the amount of losses. The presence of endoparasites, housing, ıanagement, feeding, geographical location nd pigbreed are the most important.)espite the subclinical infections, the conomic importance of endoparasites riginatesfromseveral sources among which ; the reduced fertility of sows, reduced feed ıtake and daily weight gain, lower feed onversion efficiency, lower leanmeat roportion of the carcass, significant ıcrease of the condemnation of lungs and ver, and in the clinical forms, if ccompanied by other diseases, the ıortality rate may increase significantly Ózsvári, 2018).

METHODOLOGY

Study Area: The study locations covered the following geographical region of Anambra State; APF=Aroma Pig Farm Awka South Local Government; MPF= Masden Pig Farm Agulu in Anaocha Local Government; NPF=Nippon Pig Farm, Oyi Local Government; OPF= Oluchi Pig Farm, Ihiala Local Government; OPFM= Okwe Pig Farm, Mgbakwu Awka North Local Government; EPF= Echi Pig Farm, Urum Awka North Local Government and HPF= Hosanna Pig Farm, Amansea Awka South Local Government. Anambra State is located in the tropical rain forest zone with a derived savannah (Plate 2.1). Geographical Anambra State is one of the thirty- six (36) States of

Nigeria which is located geographically in the South-Eastern parts of the Country. Anambra state lies within the latitude 050 32’ and 060 45'N and longitude 060 43’ and 070 22'E respectively, Onyenweife, G. I and Nwozor, K. K., (*2025*) (fig. 2.1).

Anambra State climate is humid and this humidity is in its highest between March and November. The mean daily temperature is 26.7◦C (80.1◦F). The rainy season and dry season are the only weather periods that recurs in Anambra State. The average annual rainfall in Anambra state is about 2,000 millimetres (2000mm) which arrives intermittently and becomes very heavy during the rainy season. Other climatic conditions affecting the state include harmattan, a dusty trade wind lasting a few weeks of December and January. Anambra State is hot all year round. The vegetation of Anambra State urban areas has been reduced by human activities from tropical rainforest vegetation to derived guinea savannah vegetation Igwe and Egbueri (2018). In most of the study locations major occupation of the people is farming, livestock production and trading. The water sources are mainly from borehole, public potable water supply and wells. Pig farm ownership is common. Most pigs were confined within pig pens in clusters organized by the farm owner. Stray pigs were hardly seen in Anambra State due to the State government policy on stray animals in the Anambra State.

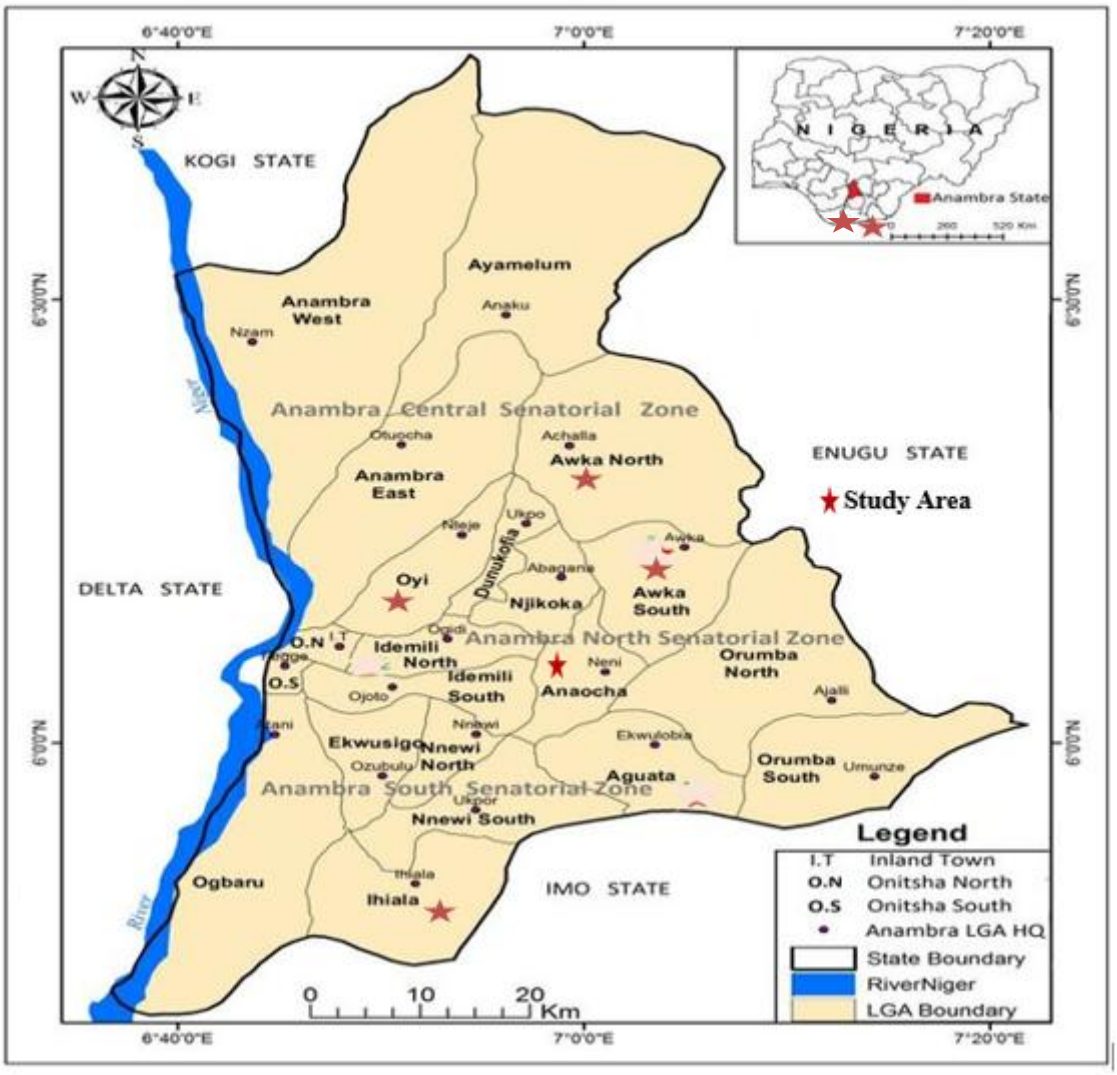

Fig. 2.1: Map of Anambra State Showing the 21 Local Government Areas with sample sites

Key locations: APF=Aroma Pig Farm Awka; MPF= Masden Pig Farm Agulu; NPF=Nippon Pig Farm, Oyi; OPF= Oluchi Pig Farm, Ihiala; OPFM= Okwe Pig Farm, Mgbakwu; EPF= Echi Pig Farm, Urum; HPF= Hosanna Pig Farm, Amansea.

Ethical Approval: This practical section of this study is covered in ethical approval obtained from the Anambra State Agricultural Development Programme, Awka.

Advocacy Visits: The advocacy visits conducted to pig farmers was within the study locations. In this section there was interaction and learning between the pig farmers were on the proposed research. This established justification to the farmers' experienced challenges. Confidentiality, veterinary advice and services were promised and rendered in return for their cooperation. The provisions of the European convention for the protection of vertebrate animals used for experimental and other scientific purposes were observed.

Research Design: The work was a survey study in which six hundred pigs were selected from cluster farms in the study are for the determination of intestinal parasites. The pigs were grouped into males and females, piglets, growers and finishers. Biological samples (faeces, blood and ectoparasites) were collected at monthly interval from August 2021 to July 2022, and analyzed in the laboratory using standard methods.

Selection of Study Sites (Farms): A pilot survey was conducted to determine the number of willing farmers and the suitability of their herd population for the study. Farm clusters were identified during the preliminary surveys of both rural and urban areas respectively and consisted of farms ranging from 10 to 20 pig pens. Two farms were purposively selected from farm clusters in each senatorial zone. Thus seven pig farms were randomly selected for the study from the three senatorial zones which consists of AnambraNorth senatorial zone, Anambra South senatorial zone and Anambra Central senatorial zone.

Selection of Sample Size and Sample Size Determination

The sample size was determined using the sample size formula by Daniel (1999).

$$n = \frac{Z^2 P\,(1-P)}{d^2}$$

where;

n= sample size

z= confidence limit at 95%=1.96

d= degree of accuracy or precision= 0.05

p –prevalence in population being tested = 0.50%=0.50

$$n = \frac{(1.96)^2 \times 0.50\,(1-0.50)}{(0.05)^2}$$

The selected pigs consisted of piglets (<4weeks), growers (4-17weeks) and finishers (>17week).

Determination of Prevalence and intensity of Intestinal Helminthes Parasites of Pigs in the Study Area

This involved three major processes namely:

Collection of faecal samples

Six hundred faecal samples were collected directly from the rectum of the pigs to ensure that they are completely fresh. Twenty (20 g) of faeces was collected from each pig. The samples were placed in plastic containers with tight lids, and 3% formalin admixed to the faeces (approx. 1 mL formalin to 4 g faeces) to preserve the sample and the parasite eggs. The pack was put in icepack food flask and transported to National Veterinery Research Institute Laboratory, Jos for analysis where they were stored in a refrigerator (approx. 4°C) prior to analysis.

Processing of faecal samples for examination

The faecal examination was carried out using Roepstorff and Nansen (1998) method for flotation and sedimentation techniques. One gram of each faecal sample was collected and

mixed with 4ml of 10% formol water in a test tube using an applicator stick. The mixture was sieved using a strainer into a beaker. The suspension was transferred into a test tube and 4ml ethyl acetate added. The whole mixture was stirred and centrifuged for 1minute at 3000 r.p.m. Plastic bulb pipette was used to loosen the layer of fatty faecal debris and was inverted to discard the supernatant. The sediment in the test tube wasturned in upright position, and the sediment resuspended again. Plastic pipette was used to transfer a drop of the suspended sediment to a clean grease free slide which was covered with a clean cover slip and examined microscopically using x10 and x40 objective lens. The ova were identified using morphological features as described by Cheesbrough, (2009).

Questionnaire survey

Structured and pretested closed-ended-questionnaires were used to elicit data onsocio-demographic characteristics of farmers such as gender, age, occupation, and level of education, management practices, pig farming experience, herd health management practices, knowledge of farmers of pig diseases and use of veterinary services, screening for parasites, pattern of anthelmintic administration to pigs and involvement of pig farmers in certain farm practices that could enhance acquisition and spread of parasites among pigs in intensive management system and bio-security measures.. Informed consent was sought and obtained from 50 pig farm owners or managers surveyed. Respondents who were not proficient in use of the English language were interviewed in native language. Afterwards, completed copies of the questionnaire were collected and the responses collated for statistical analysis.

Analysis of Data

Data obtained were represented in Tables and later statistically analyzed using version 20.0 of Statistical Package for Social Sciences (SPSS) (IBM Incorporated). Also, Chi-square was used as a statistical tool to determine association between the different parasites and seasonal variation in relation to location, gender, age of the pigs under study. The p – value of 0.05

was considered significant at 95 % confidence intervals

RESULTS & DISCUSSION

Majority of the worm burden were of low (67.3%, 101/600) and mild (28.1%, 42/600) infections(Table 4.1)**.**Only 7(4.7) were of high intensity. Only 2 (12.5%) pigs had high intensity of Hookworm infection. Similarly, 2(10.0%) of pigs studied recorded high intensity of *ascaridosis*. Four (6.8%) of pigs had high intensity of *trichuriasis*.

The result from the study revealed the pig farmers socio-demographics. The percentage proportion of the socio-demographic characteristics distribution of pig farmers within sampled farms revealed that a significant difference exist across all the observed socio-demographic characteristics and practices of farmers. With respect to age, majorities (30.0 %) were within the age group of31 – 40 years and least was within (15-19) < 20 years (12 %). Those in the age brackets of 21-30 years, 41 – 50years and > 50 years (51 and above) recorded (16.0%), (20.0%) and (24.0%) respectively. Mean age of farmers was (40.6 years). More men (64.0%) than women (36.0%) kept pigs.

Occupation status revealed that those who were sole farmers had the highest proportion

(52.0 %) and least was students (6.0%). Traders were sparsely found as pig farmers due to their trading business other than pig farming. Status of educational level showed that the highest proportion of the farmers (44.0 %) were of secondary level while the primary level education was (36.0 %) and least were of tertiary level (20.0%), (Table 4.2). Majority (76.0%) of the respondents knew intestinal helminthiasis while 72.0% were aware of ectoparasite infections. About 68.0% were aware of intestinal protozoa parasite infections. However, only 48.0% of the respondents were aware of haemoparasite infections.

Table 4.1: Intensity of intestinal helminth infections among pigs in the study area

		Intensity		
Intestinal helminth infection	Total No. infected (%)	Low infection (<200 EPG) (%)	Mild infection (200-499 EPG) (%)	High infection (≥500 EPG) (%)
Hookworm	16(10.7)	10(62.5)	4(25.0)	2(12.5)
Ascarissuum	20(13.3)	15(75.0)	3(15.0)	2(10.0)
Trichurissuis	44(29.3)	30(68.2)	11(25.0)	3(6.8)
Strongyloidesransomi	20(13.3)	12(60.0)	8(40.0)	0(0.0)
***Capillaria* sp.**	12(8.0)	8(66.7)	4()33.3	0(0.0)
***Oesophagostomum* sp.**	16(10.7)	10(62.5)	6(37.5)	0(0.0)
***Taenia* sp.**	12(8.0)	8(66.7)	4(33.3)	0(0.0)
Paramphistomumsuis	10(6.7)	8(80.0)	2(20.0)	0(0.0)
Total	150(25.0)	101(67.3)	42(28.1)	7(4.7)

Key: % = Percent; EPG = Egg per grams;

Table 4.2: Pig farmer's socio-demographics

Variable	Frequency	% frequency
Age (years)		
<20	6	12.0
21-30	8	16.0

31-40	15	30.0
41-50	10	20.0
>50	12	24.0
Total	50	100.0
Gender		
Male	32	64.0
Female	18	36.0
Total	50	100.0
Educational level		
Primary	18	36.0
Secondary	22	44.0
Tertiary	10	20.0
Total	50	100.0
Occupation		
Students	3	6.0
Civil servants	8	16.0
Traders	13	26.0
Farmers	26	52.0
Total	50	100.0

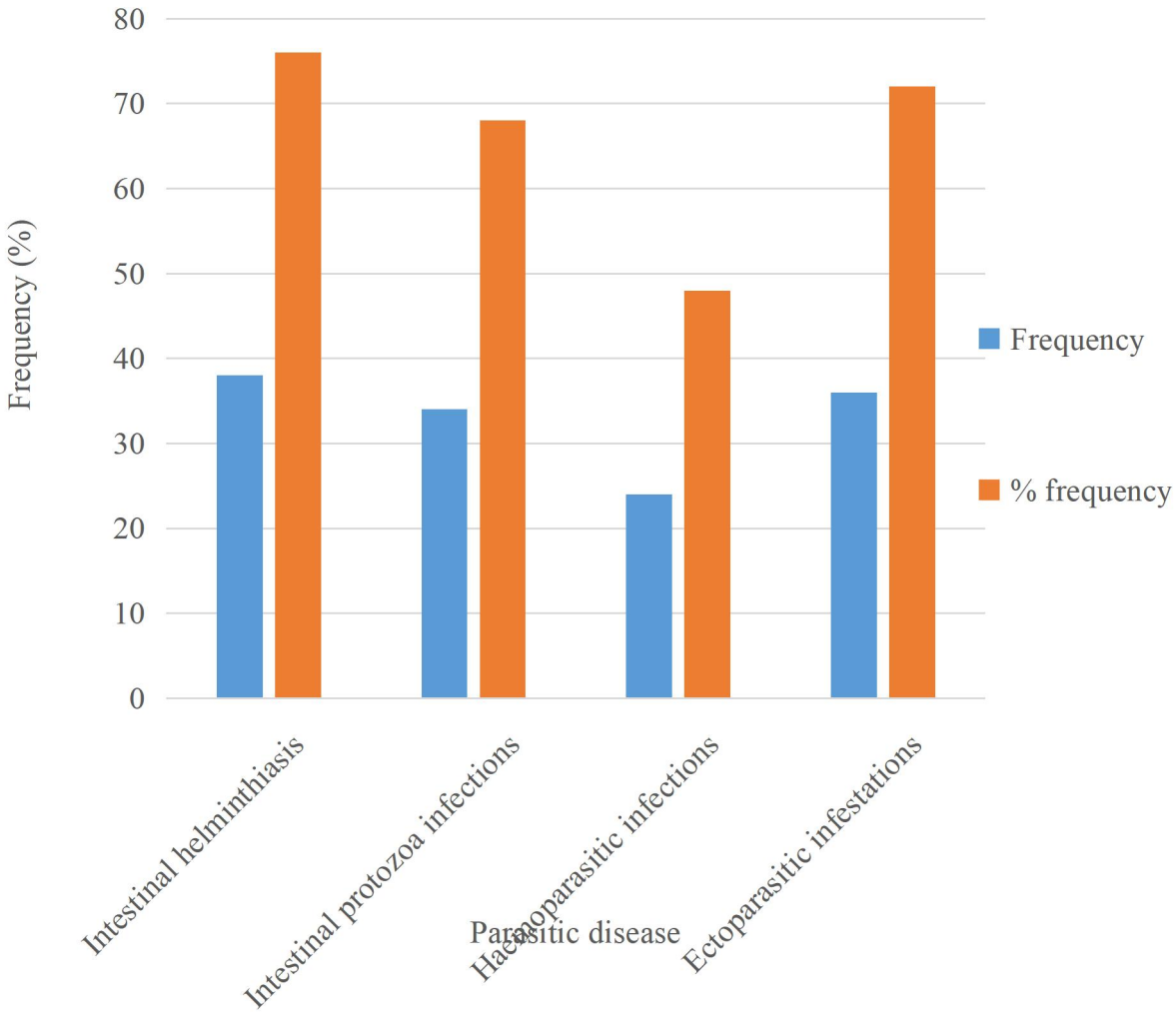

Figure 4.1:Knowledge of pig parasitic diseases

Table 4.3 Farm management practices of pig farmers in the study area

Farm management practices	Numberof respondents (%)	No of farms infected (%)
Infrequent removal of dungs		
Yes	40(80.0)	6(85.7)
No	10(20.0)	1(14.3)
Rearing pigs of different ages together		
Yes	44(88.0)	5(71.4)
No	6(12.0)	2(28.6)
Non-disinfection of pen and equipment		
Yes	38(76.0)	6(85.7)
No	12(24.0)	1(14.3)
Non-availability of routine deworming programme		
Yes	31(62.0)	3(42.9)
No	19(38.0)	4(57.1)
Early weaning at less than 6 weeks of age		
Yes	10(20.0)	2(28.6)
No	40(80.0)	5(71.4)
Non-quarantine of newly procured or exposed pigs		
Yes	32(64.0)	6(85.7)
No	18(36.0)	1(14.3)
Availability of vaccination		
Yes	44(88.0)	6(85.7)
No	6(16.0)	1(14.3)
Veterinary screening for parasites		
Yes	18(36.0)	2(28.6)
No	32(64.0)	5(71.4)

CONCLUSIONS

This study reveals a high prevalence and moderate intensity of helminth infections in pigs across Anambra State, with at least eight species identified. The combined effect of these parasites likely reduces productivity. Risk factors influencing parasite infestations were identified, enabling the design of effective helminth control measures. Some farmers implemented prophylaxis programs, including hygiene practices and disinfection, but more comprehensive control strategies are needed to mitigate the impact of helminth infections on pig productivity.

DECLARATION

The Author declared no conflict of interest

REFERENCES

Adebisi, O.R. (2008). Gastrointestinal helminths and public health; overview of a neglected sector.*The Internet Journal of Veterinary Medicine,***4** (2): 212 – 215.

Akanni, O.N., Anyika, K.C., Frank, M. Christiana., Jatau, J.D. (2017). Prevalence of gastro-intestinal parasites in pigs in Jos South Local Government Area of Plateau State, Nigeria.*The Saudi Journal of Life Sciences,* **2** (5): 140 – 142.

Alfonso, S.M., Vaz, Y., Nevez L., Pondia, A.O.O., Las, G., Willingham, A.L., Vilhena, M., Duante, P.C., Jost, C.C., Nom Mohammed, E.V. (2011). Human and Porcine *Taenia solium* infections in Mozambique: Identifying research priorities. *Animal Health Research Review,***12**(1): 123 – 129.

Cheesbrough, M., (2009). *District Laboratory Practice in Tropical Countries* 2nd ed., Part 1, Cambridge University Press. P. 191 – 306.

Igwe O, Egbueri J.C. (2018). The Characteristics and the Erodibility Potentials of Soils from Different Geologic Formations in Anambra State, Southeastern, Nigeria. *Journal of the Geological Society* of India. 92: 471– 478.

Nissen, S., Poulsen, H., Nerfsun, P., Olsen, A., Roepstorff, A., Rubaine C. and Thansburg, S.M., (2010).Prevalence of Gastrointestinal Nematodes in Growing Pigs in Kabale District of Uganda.*Tropical Animal Health Production,***43**(3):567 – 572.

Onyenweife, G. I and Nwozor, K. K., (*2025*) Innovations for SDG 6: Development of Novel Depth-to-Potable Groundwater Map of Anambra State, Southeast Nigeria *International Journal of Innovative Environmental Studies Research 13(1):107-124,* DOI:10.5281/zenodo.14854579

Ózsvári, L., (2018). Production impact of parasitisms and coccidiosis in swine.*Journal of Dairy, Veterinary and Animal Research*, **7** (5): 217 – 222.

Roepstorff, A., Mejer, H., Nelsum, P. and Thamsborg, S.M. (2011). Helminth Parasites in Pig: New challenges in pig production and current research highlights.*Veterinary Parasitology,* **180**(1-2): 72 – 81.

Weka, R.P. and Ikeh, E.L., (2009).Seroprevalence of

Cysticercosis and Intestinal Parasitism in Pigs in Jos Metropolis. *Journal of Animal Veterinary Advances,* **8:**883 – 887.

Weng, Y.B., Hu, Y.J., Li, Y., B.S., Li, R.Q., Xie, D.H., Gasser, R.B. and Zhu, X.Q., (2005). Survey of Intestinal Parasites In Pigs from Intensive Farms in Guangdong Province, Peoples Republic of China. *Veterinary Parasitology,***127** (3-4): 333 – 336.