



Prevalence of Trypanosomes in Intensively Managed Pigs in Umuahia, Abia State, Nigeria.

***¹E. Kalu and ²C.S. Ukwueze**

¹Department of Veterinary Public Health and Preventive Medicine

²Department of Veterinary Medicine

Michael Okpara University of Agriculture, Umudike, Abia State

**Corresponding Author: ekenmakalu2@gmail.com*

Abstract

This study was carried out in Umuahia, Abia state with the aim of finding out the prevalence of trypanosomes in pigs reared under strict intensive farming system. A total of 160 intensively reared large white pigs were used. Blood samples collected were examined for trypanosomes using wet mount, buffy coat and thin smear stained with Geimsa. The study revealed zero prevalence of trypanosomosis. The questionnaire survey also revealed that majority (71.4%) of the pig farmers were males and all were educated. 57.1% of the farmers had SSCE, while 42.9 had tertiary education. It was also observed that most of the farmers had up to 10 – 15 years of experience in pig farming. The survey also showed good management practices by the farmers which may have contributed to the zero prevalence obtained in this study.

Key words: Prevalence, pigs, trypanosomes, intensive management.

Introduction

Pigs are among the most common livestock in Nigeria (Adebisi, 2008). Prominent among their usefulness are provision of animal protein for human consumption, employment generation (livestock farming, processing and marketing) and revenue generation with significant contribution to the nation's Gross Domestic Product (GDP) (Adebisi, 2008). The pig population in Nigeria

stands at 4.4 million pigs, about 78% of these are found in the sub humid zones of the Northern and Southern Guinea savannah (Shaibu, 1997). More pork is consumed than any other meat in the world (FAOSTAT, 2001). In 1998, pork represented 39% of the world's total meat consumption compared to 28% for poultry and 26.5% for beef (Anonymous 1999). Environmental restrictions due to the increasing human population, urbanization, and land use pressure have compelled

most communities in Southeastern Nigeria to adopt intensive and semi-intensive systems of livestock production instead of the extensive (traditional) system of management (Anonymous,1999). In the intensive management system, small-scale producers with a unit of approximately 50 pigs usually provide feed, housing (often with concrete floors), and veterinary services for the pigs (Payne 1990; Holmes, 1991).

Natural infections of pigs with trypanosomes have been reported in many parts of the country (Agu and Bajen, 1986; Onah 1991, Omeke and Onuora, 1992, Omotanse *et al.*, 2000). African Animal Trypanosomosis (AAT) is a major constraint in pig production in Nigeria (Madubunyi, 1988). The species known to affect pigs are *Trypanosoma brucei*, *T. congolense* and *T. simiae* (Uilenberg, 1998). The disease is transmitted cyclically by Tsetse fly of *Glossina species* or transmitted mechanically by other biting flies such as *Tabanus* and *Stomoxys* species, which extend the infection to over 10 million km² in the Sub Saharan Africa which is inhabited by most of the pastoral and semi pastoral African tribes (Murray and Gray, 1984). Among the impacts of the AAT is the economic impact which is considered to be the most imposing threat to farmers. The disease directly affects the milk and meat productivity of animals, reduces birth rates, increases abortion rates as well as mortality rate. All these affect

the herd size and herd composition (Swallow, 1999).

Porcine trypanosomosis is not only of economic importance for pig farming, but it is also of public health importance. Pigs can become carriers of *Trypanosoma brucei gambiense* and *T. brucei rhodesiense* which are zoonotic infections (Gibson *et al.* 1978; Waiswa *et al.*, 2003). This work was therefore designed with the main objective/aim to determine the prevalence of porcine trypanosomosis in intensively reared pigs in Umuahia and its environs.

Materials and Methods

Study area

The study was carried out in Umuahia. Umuahia is the capital city of Abia state and it is made up of Umuahia North and Umuahia South Local Government areas. These Local Governments are also composed of clans such as Umuopara, Ibeku, Olokoru, Ubakala and Ohuhu. Umuahia is located at longitude 5^o 35'N and latitude 7^o 25'E, at an altitude of 122 meters above sea level, it has a total land area of 600 km².

Study population

Seven (7) farms located in Umuahia South and Umuahia North that practised intensive system of management were sampled. A total of 160 pigs were screened in the 7

different farms visited between the months of June to September 2014.

Sampling and sampling methods

Sample collection

Each animal was carefully restrained and the ear vein was properly disinfected using methylated spirit. Heparinized capillary tubes were used for blood collection. This was performed by piercing the marginal ear vein with a sterile needle. The heparinized capillary tubes were filled through capillary action and one end was sealed with a sealant (plastacine). After the exercise the samples were immediately transported to Veterinary Medicine Laboratory, Michael Okpara University of Agriculture, Umudike for analysis.

Laboratory analysis

Blood samples were analyzed on arrival for the presence of trypanosomes using wet blood mount buffy coat method and blood smears stained with Geimsa (Adam *et al*, 1971). The packed cell volume was determined using Micro-haematocrit technique (Murray *et al.*, 1977).

Questionnaire survey

A well-structured questionnaire containing relevant questions (such as their management practices) was also administered to the farmers. This was to help collect information on the management practices on each farm. The questionnaires were administered through oral interviews and by observations of the environment.

Data analysis

The data collected were analyzed using SPSS version 20. Frequencies and mean values of PCV were determined. The PCV of the blood samples were also summarized as means \pm standard deviation.

Results

Out of the 160 pigs sampled, 84(52.5%) were females, 76(47.5%) were males. Adult pigs were 96(60%) while 64(40%) were weaners (Table 1). None (0%) of the sampled pigs was positive for trypanosome infection. Twenty seven (16.8%) of the pigs had Packed Cell Volumes (PCV) that were below the normal range, 127(79.4%) had PCV that were within the normal range and 6(3.8%) had PCV values that were slightly higher than normal.

TABLE 1: The frequencies and mean PCV of all the sampled pigs by age and sex.

| SEX | AGE | | TOTAL |
|--------|--------------------|-------------------|--------------------|
| | ADULTS | WEANERS | |
| MALE | 38 (37.55 ± 5.85) | 38 (40.74 ± 2.10) | 76 (39.14 ± 4.65) |
| FEMALE | 58 (35.33 ± 3.67) | 26 (38.38 ± 1.33) | 84 (36.27 ± 3.43) |
| TOTAL | 96 (36.21 ± 4.76) | 64(39.78 ± 2.16) | 160 (37.64 ± 4.29) |

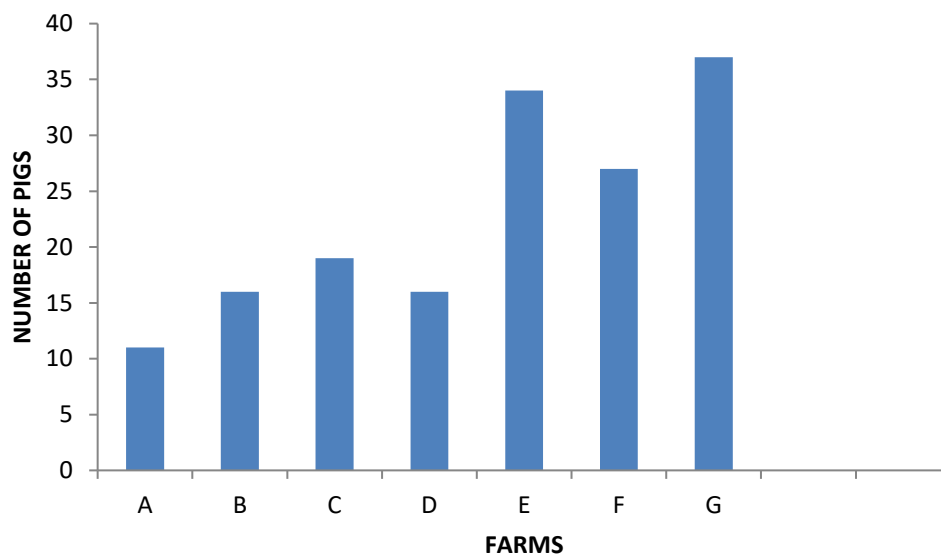


Fig 1: The frequencies of animals sampled in the different farms.

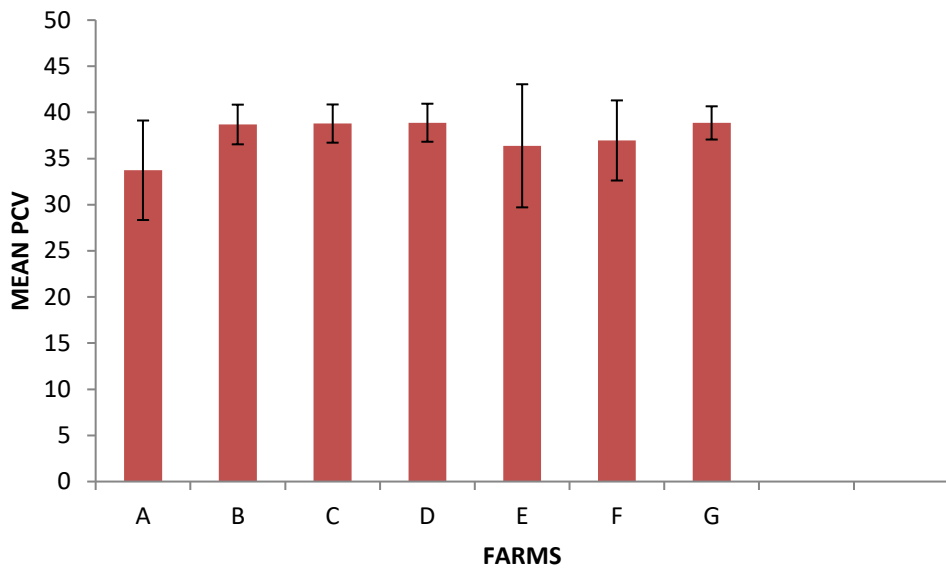


Fig 2: The mean PCV of pigs in the various farms sampled

The mean PCV of all the sampled pigs is represented in Fig 2. The mean PCV of pigs in the different farms is also represented in Fig 2.

Mean PCV of the adult pigs was 36.21 ± 4.76 while that of the weaners was 39.78 ± 2.16 (Table 1). Out of the 160 pigs sampled, 11(6.9%) were sampled in farm A, 16(10%) in farm B, 19(11.9%) in farm C, 16(10%) in farm D, 34(21.2%) in farm E, 27(16.9%) farm F and 37 (23.1%) in farm G.

Questionnaire analysis

Analysis of the questionnaire showed that most (71.4%) of the pig farmers were males while 28.6% were females. All respondents were educated with 57.1% having SSCE while 42.9% had tertiary education. Majority (57.1%) of the respondents had 10 - 15 years of experience in pig farming while 28.6% had 1-5 years experience and 14.3 % had 5-10 years experience. Of the respondents, 57.2% kept pigs for breeding and sales, 42.9% kept pigs for breeding, sales and slaughter. Of the farms were well netted while 71.4% had inappropriate netting. 85.7% of the farmers fed their pigs with concentrates while 14.3% used palm kennels cakes. All (100%) of the farmers used sloppy concrete floors with good drainages and they all used bore hole as their source of water. 42% of the respondents deworm their pigs at intervals of 3 months, 14.3 %

said they deworm when it seems necessary and 42.9% deworm every month. Most farmers (57.1%) use animal health workers during the deworming exercise while 42.9% of farmers deworm the pigs by themselves. All the visited farms had no history of worm infection or tick infestation on their farms and it was observed that good hygienic status was observed and surrounding bushes were cut.

Discussion

From the study majority of the sampled pigs were females, which indicate that, most of these intensively reared pigs were kept mainly for breeding purposes. The laboratory analysis of the blood samples showed zero prevalence of trypanosomes in intensively reared pigs in Umuahia. The reason could be attributed to the management practices, ecological factors and low tsetse (vector) abundance in the zone (Jordan, 1986; Ohaeri, 2010). This result also agrees with the findings of Nwoha *et al.* (2013) who observed a similar result in pigs in Ikwuano local government area of Abia State. Also the sampled pigs were intensively reared in sties which had dwarf walls with nets and concrete sloppy floors. The zero prevalence of trypanosomes could also be attributed to the intensive management, good hygiene of the environment and immune status of the animals.

The PCV of all the sampled animals in the various farms were within the normal range except farm A which, had significantly lower ($P < 0.05$) PCV. The difference in the level of PCV could be attributed to the feeding method of the farm in question where pigs were fed with palm kernel cakes only. Palm kernel cakes have low nutrition value when compared with concentrates with high protein and iron which helps in the production of red blood cells and hence normal PCV (Fritshe *et al.*, 1993). According to Raham and Kalita (2008), feeding is one of the most important aspects of pig farming. It was also noticed that the younger animals had PCV values higher than those of the adult pigs (Table 1). This however agrees with the fact that most parameters of young animals are often higher than those of the adults (Nagabushanam *et al.*, 2005).

The questionnaire analysis showed that 100% of the farmers had acquired some level of education which could help them in the disease prevention and management. Atal and Dukhabanhu (2012) stated that, the level of a farmer's education affects productivity which is usually positive, continuous and significant in production. Also majority of the farmers had experience of between 10 – 15 years and could have gained experience in management practices over the years. Eighty five percent (85%) of the farmers fed their pigs with compounded feeds (concentrates) while 14.3% used palm kernel cakes which could have

resulted in the low packed cell volume obtained in the latter group of pigs. The questionnaire survey also revealed that the farmers have had no previous cases of tsetse flies around their farms. All these factors could have contributed to the zero prevalence reported in this study.

Conclusion and Recommendation

It was concluded from the study that, sustainable and productive pig production is possible when pigs are reared intensively and good management practices are strictly adhered to. It was also noted that the years of experience, level of education and awareness of good management practices, will also contribute to the overall productivity of pig production. Pig farmers are advised to practice intensive farming system, acquire a level of education which will help sustain productivity and maintain proper management practices such as proper construction of sty, adequate feeding and seek appropriate veterinary services.

References

- Adebisi, R.O (2008). Gastro intestinal helminthes and public health: overview of a neglected sector. *The Internet Journal of Veterinary Medicine*.
- Agu, W.E. and Bajeh, Z.T. (1986). An outbreak of fatal *Trypanosoma brucei brucei* infection of pigs in Benue

- State of Nigeria. *Tropical Veterinarian* 4: 25-25.
- Anonymous, (1999). Positive demand pattern for pork. *Pig International Magazine*. Mt Morris, Illinois: Watt Publishing Company. 28:32-38.
- Atal B.D. and Dukhabandhu S. (2012). Farmers educational level and agricultural productivity: a study of KBK district of Odisha. *International Journal of Education Economics and Development*. 3: 363-373.
- FAOSTAT (2001). World meat production and trade. <http://apps.fao.org/>
- Fritsche, T., Kaufmann, J. and Afister, K. (1993). Parasite Spectrum and Seasonal Epidemiology of Gastrointestinal Nematodes of Small Ruminants in the Gambia. *Veterinary Parasitology*, 49: 271-283.
- Gibson, W., Mehlitz D., Lanham S.M. and Godfrey D.G. (1978). The identification of *Trypanosoma brucei gambiense* in Liberian pigs and dogs by isoenzymes and by resistance to human plasma. *Tropenmedizin und Parasitologie* 29: 335-345.
- Holmes, D.H.(1991). Systems of pig production. In: Coste R, Smith AJ, Eds. *The Tropical Agriculturalist*. 1st ed. London, UK: Macmillan Press 16: 99-100.
- Jordan, A. M (1986). Trypanosomosis Control and African Rural Development London and New York, p. 357.
- Madubunyi, L. C. (1988). The Collapse of *Glossina tachnoides* Population in two Peridomestic Agro Ecosystem in Nsukka Area of Anambra State, Nigeria. *Insect Science application* 9: 361-366
- Murray M., Murray P. k. and McInyre W.I.M (1977). An improved parasitological technique for diagnosis of African Trypanosomosis. *Trans. Roy. Soc. Trop. Med. Hyg.*,71: 325-326.
- Murray, M. and Gray, A.R. (1984). The current situation on animal trypanosomosis in Africa. *Prev. Vet. Med.* 2: 23-30.
- Nagabushanam R., Kodarkar M.S. and Sarojini R. (2005). *Textbook of Animal Physiology*. 2nd Edition.
- Nwoha R. I. O., Onyeabor, A., Igwe, K. C., Daniel, G., Onuekwusi, G.C.O and Okah, U. (2013). Prevalence of haemoparasites in livestock in Ikwuano local government area of Abia state. *Journal of fisheries and livestock production*. 2:1-3
- Omeke, B. C. O. and Onuora G. J. I. (1992). Comparative effect of *Trypanosoma brucei brucei* and *Trypanosoma congolense* on the reproductive capacity of boars in tsetse endemic zones. *Animal Reproduction Science*. 27: 225-237
- Omotainse, S. O., Edeghere, H., Omoogun, G. A., Thompson,

- G., Igweh, C. A., Ukah, J. A. C., Ikenga, M. A. and Halid, I. (2000): The prevalence of animal trypanosomosis in Konshisha local government area of Benue State, Nigeria. *Israel Journal of Veterinary Medicine*. **55**:1-4.
- Onah, D.N. and Uzoukwu, M. (1991). Porcine cerebral *Trypanosoma brucei brucei* trypanosomiasis. *Tropical Animal Health and Production* **23**: 39-44.
- Payne, W.J.A. (1990) Pigs. In: An Introduction to Animal Husbandry in the Tropics. 4th Ed. New York, New York: Longman Scientific and Technical; **639**: 666-672
- Rahman, S., Barthakur, S. and Kalita, G. (2008). Pig production and management system in Aizawl District of Mizoram, India. *Livestock research for rural development*. **20**:9.
- Shaibu, B., Ahiju, A. and Bakshi J.S. (1997). *Nigerian national research strategy plan: 1996-2010*. Department of Agricultural Science. Federal ministry of Agriculture and Natural Resources, Abuja.
- Swallow, B.M. (2000). Impacts of Trypanosomosis on African Agriculture. PAAT Technical and Scientific Series 2. Food and Agriculture Organization (FAO), Rome. p 52
- Waiswa, C., Olaho-Mukani, W. and Katunguka-Rwakishay, A. E. (2003). Domestic animals as reservoirs for sleeping sickness in three endemic foci in south-eastern Uganda. *Annals of Tropical Medicine and Parasitology* **97**:149- 155.
- Ohaeri, C.C. (2010). Prevalence of Trypanosomosis in Ruminants in parts of Abia State, Nigeria. *Journal of Animal and Veterinary Advances*, **9**: 2422-2426.
- Uilenberg, G. (1998). A field guide for the diagnosis treatment and prevention of African Animal Trypanosomosis. Adopted from the original edition by Boyt W.P. FAO Rome. 45-135.