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Survey on knowledge of trypanosomosis amongst livestock farmers in Kachia and Saminaka local government areas of Kaduna state, Nigeria

J Anthony & VA Maikai*

Department of Biochemistry, Kaduna state University, Tafawa Balewa Way, Kaduna, Nigeria

*Correspondence: Tel.: +2348028472629; E-mail: ambrosev2003@yahoo.com

Abstract

Animal trypanosomosis is a major constraint to livestock production and Agriculture in Africa especially Nigeria. The survey was conducted to assess the knowledge of farmers about trypanosomosis in Kachia and Saminaka Local Government Areas of Kaduna state, Nigeria. A total of two hundred questionnaires were randomly distributed to mainly animal health workers and livestock farmers to obtain relevant information. The study revealed that 32 (34.1%) and twenty four (34.3%) respondents from Kachia and Saminaka were mainly livestock farmers respectively, and 42 (44.7%) and 39 (55.7%) were between the ages of 21-40 years of age. Forty three respondents (45.8%) from Kachia and 15 (21.5%) Saminaka had knowledge of the disease and said the disease was as a result of bite by tsetsefly, with twenty eight (29.8%) Kachia and twenty nine (41.4%) Saminaka, they gave the clinical symptoms of the disease to include: - foul smell, weakness, progressive emaciation, low milk production and abortion. The respondents reported that infection of animals with the disease was associated with migration of the animals during the rainy season into the forested areas. Knowledge of management of the disease was reported by eighteen (19.1%) Kachia and fourteen (20.0%) Saminaka to include consulting of health professionals and the use of trypanocidal drugs. The survey showed that the livestock farmers did not suffer significant losses, Kachia twelve (2.8%) and Saminaka, eleven (2.0%) in their animal population as a result of the disease. The study showed that the livestock farmers had some knowledge on trypanosomosis and its management.

Keywords: Animal trypanosomosis, Kachia, Knowledge, Livestock farmers, Saminaka

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Introduction

Trypanosomosis remains a major constraint to the development of livestock in sub-Saharan Africa and a big part of Africa is rendered unsuitable for the production of livestock due to the presence of tsetse flies (Grace, 2003; Dransfield & Brightwell, 2004; Maudlin *et al.*, 2004). Estimates show that about 50–70 million animals are exposed to the disease (Geerts & Holmes, 1998; Geerts *et al.*, 2001). Ten million square kilometres of land that could be lush and fertile is not in production because of this tsetse transmitted disease. Trypanosome infection in livestock can lead to severe production losses (Connor, 1989; FAO, 2002; Maudlin *et al.*, 2004) to the extent of affecting overall meat supply including

individual and community incomes, thus aggravating poverty (Jones *et al.*, 2000). Trypanosome induced annual losses in cattle production alone were estimated in the range of 1.0–1.2 billion dollars in sub-Saharan Africa (FAO, 2002). Disease-control is based on the decimation of tsetse flies, breeding of trypanotolerant species and the prophylactic and therapeutic use of trypanocides (Leach & Roberts, 1981; Kinabo, 1993). Vector control and breeding of trypanotolerant animals have not been successful as control methods hence, the reliance on chemotherapy. Chemotherapy of African trypanosomosis still remains far from being satisfactory, as a result of growing resistance to the

few drugs currently available (Cojia *et al.*, 1993; De Koning, 2001; Maikai *et al.*, 2007). Most of the available drugs are highly toxic (Matovu *et al.*, 2001). Without treatment, the disease is 100% fatal (WHO, 2000) but when treated early, the recovery rate is over 90% (WHO, 2014). The elimination of this disease could result in increased milk and meat production with high crop production as a result of more access to land by farmers. One approach to the control of this disease, could involve awareness of the disease by the livestock keepers.

Several studies on prevalence of animal trypanosomosis have been carried out in Nigeria (Abenga *et al.*, 2004; Ameen *et al.*, 2008; Enwezor *et al.*, 2009; Andrew *et al.*, 2014; Fasanmi *et al.*, 2014). The first approach to combating is the knowledge of the disease by farmers. However, there is paucity of information on the knowledge of trypanosomosis by livestock farmers, hence this survey was carried out to determine the knowledge of farmers on the disease in Kachia and Saminaka Local Government areas of Kaduna state, Nigeria.

Materials and Methods

Study area

Saminaka is a town in Lere Local Government Area of Kaduna state in the Northern Guinea Savanna vegetation of Nigeria situated at 10°50'N and 7°54'N. It has a land mass of 2,158 km² and has a population of 331,161 (NPC, 2006). The study area includes Maijire, Abadawa, Saminaka, Ungwan Makama, Ungwan Bawa, Kawuce, Juran Kari. The occupation of the people is mainly farming and trading, the tribes found within the locality include Kurama, Hausa, Amarwa, Warsa and Fulani. Saminaka has a rainy season from May to October and harmattan season from November to February, while the hot season is from March to June. The study was conducted in the month of April-October 2015.

Kachia is a town and a Local Government Area of Kaduna state in the Northern Guinea Savanna vegetation of Nigeria situated on 9° 52' N, and 7° 57' N. It has a land mass of 4,632 km² and a population of 244,274 (NPC 2006). The study area includes, Kachia, Ankwa, Agunun Dutse, Jaban Kogo, Gora, Parc and Sabon Sarki. The main occupation of the people in the area is farming and trading. The tribes are Bajju, Ikulu, Kadara and Jaba. The rains fall from May to October and harmattan is experienced from November to February. The study was conducted in the month of April-October 2015.

Sampling strategy

A multistage random sampling procedure was used (Mahama *et al.*, 2004) to select districts, livestock keepers/herders, animal health professionals, peasant associations and farmers in the study areas. The sample size of participants was determined using the formular: $n=0.25/SE^2$ as described by Arsham, 2002.

Study design

A total of two hundred (200) questionnaires were specially designed and administered randomly to animal health professionals, farmers, cattle herders and for non-literate or busy respondents interviews were conducted to obtain information from respondents on the knowledge of trypanosomosis disease, its impact and management.

Statistical analysis

A Microsoft excel programme was used to manage the raw data. SPSS 16 was used to analyze and interpret the data. A simple descriptive statistics (frequency and percentage) was used to analyze the qualitative data.

Results

Biodata of the respondents

Table 1 shows the biodata of the respondents, 42 (44.7%) respondents from Kachia and 39 (55.7%) from Saminaka were between 21-40 years, while 35 (37.2%) from Kachia and 10 (14.3%) from Saminaka were between 41-65 years old. Thirty three (35.1%) from Kachia and 27 (38.6%) from Saminaka had secondary education. The occupation of the respondents was mainly cattle herding, 32 (34.0%) from Kachia and 24 (34.3%) Saminaka, while 31 (33.0%) Kachia and 13 (18.5%) Saminaka were Livestock health workers (Table 1).

Knowledge of respondents on the causes of infection and clinical signs of trypanosomosis.

The respondents reported the causes of trypanosomosis to be as a result of tsetse fly (locally called "kudan tsando") bite, 43 (45.8%) from Kachia and 40 (57.0%) from Saminaka (Table 2); while 10 (10.6%) from Kachia and 7 (10.0%) from Saminaka reported drinking water as the causes of infection. Twenty-five (26.6%) respondents from Kachia and 20 (28.6%) from Saminaka reported that goats were mainly affected and 42 (44.6%) from Kachia and 38 (54.3%) from Saminaka reported that cattles were mainly affected by the disease (Table 3), while 14 (14.9%) from Kachia and five (7.1%) Saminaka respondents reported mixed (cattle, goats and

Table 1: Biodata of respondents

	Kachia (n=94)		Saminaka (n=70)	
	N	%	N	%
<u>Age</u>				
0-20 years	17	18.1	21	30.0
21-40 years	42	44.7	39	55.7
41-65 years	35	37.2	10	14.3
<u>Educational qualification</u>				
Primary	30	31.9	18	25.7
Secondary	33	35.1	27	38.6
Tertiary	21	22.4	21	30.0
No School	10	10.6	4	5.7
<u>Occupation</u>				
Farmer	10	10.6	15	21.5
Livestock Marketer	11	11.7	10	14.3
Cattle Herder	32	34.1	24	34.3
Livestock Health Worker	31	33.0	13	18.5
Community leader	10	10.6	8	11.4

Table 2: Causes of trypanosomosis and infection as reported by respondent

Causes	Kachia (n=94)		Saminaka (n=70)	
	N	%	N	%
Tick bite	28	29.8	40	57.0
Tsetse Fly bites	43	45.8	15	21.5
Blood sucking insect	13	13.8	15	21.5
Dirty water	10	10.6	7	10.0

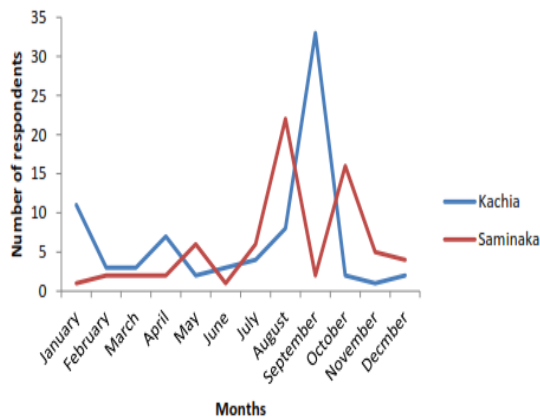


Figure I: Months in which infection was frequent as reported by respondents in Kachia and Saminaka

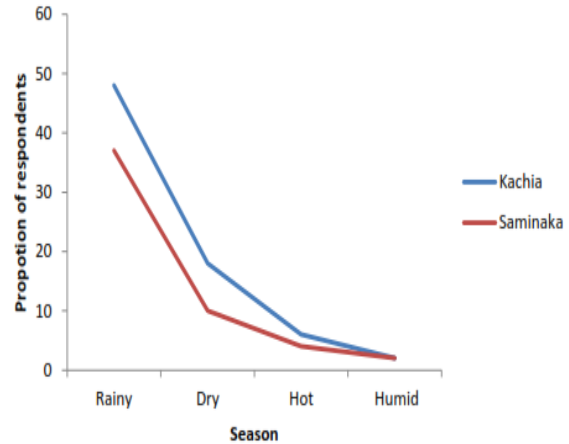


Figure II: Seasonal migration patterns of animals as reported by respondents in Kachia and Saminaka

sheep) were all affected. More than 30 % of the respondents in Kachia and Saminaka reported that infection with the disease was highest during the month of August to October (Figure I), which appeared to be associated with the migration patterns reported by the respondents during the rainy season (Figure II). Twenty-eight (24.4%) respondents from Kachia and 29 (27.4%) from Saminaka reported observed signs of infection with

the disease to include; foul smell, weakness, progressive emaciation, low milk production and abortion (Table 4).

Knowledge of disease management

The results of management of animal trypanosomosis, as reported by the respondents, are shown in Table 5. Eighteen (19.1%) respondents from Kachia and 14 (20.0%) respondents from

Table 3: Animals mostly affected by Trypanosomosis as reported by respondents.

Animal	Kachia (N=94)		Saminaka (N=70)	
	N	%	N	%
Goat	25	26.6	20	28.6
Sheep	13	13.8	7	10.0
Cattle	42	44.7	38	54.3
Mixed	14	14.9	5	7.1

Table 4: Observed clinical signs of trypanosomosis as reported by respondents

Clinical Signs/Symptoms	Kachia N=94		Saminaka (N=70)	
	N	%	N	%
Weak and Dull	2	2.1	2	2.9
Foul smell	28	29.8	29	41.4
Loss of appetite	32	34.1	29	41.4
Loss of weight	25	26.6	2	2.9
Eyes and Nose discharge	2	2.1	3	4.3
Lethargy	3	3.2	3	4.3
Abortion in Pregnant Animal	2	2.1	2	2.9

Table 5: Management of trypanosomosis as reported by respondents.

Engaging service of health Professional	Kachia (N=94)		Saminaka (N=70)	
	N	%	N	%
Veterinary doctor	18	19.1	14	20.0
Livestock assistant	25	26.6	18	25.7
Local methods	6	6.5	7	10.0
Drugs:				
diminal plus	13	13.8	8	11.4
diminazene aceturate ("mai leda")	16	17.0	12	17.2
isometamidum chloride	9	9.6	6	8.6
Herbs	7	7.4	5	7.1

Table 6: Animal mortality as a result of the disease by the respondent

	Total number of animals	Number of deaths	Mortality ratio (%)
Kachia	421	12	2.8
Saminaka	550	11	2.0

Saminaka reported to engage the service of a veterinary doctor, while 25 (26.6%) from Kachia and 18 (25.7%) from Saminaka reported to engage the services of a livestock assistant and 6 (6.4%) from Kachia and 7 (10.0%) from Saminaka reported that they treated the animals using herbs after signs of the disease was noticed. The drugs used in treatment of this disease by the farmers are shown in Table 5. Sixteen (17.0%) from Kachia and 12 (17.2%) from Saminaka reported to use trypanocides such as Diminazene aceturate and 9 (9.6%) from Kachia and 6 (8.6%) from Saminaka reported use of Isometamidium chloride while 7 (7.4%) from Kachia and five (7.1%) from Saminaka reported use plant herbs. Treatment was reported to be done once in a year after migrating into the forested areas during

the farming season. To control the tsetsefly bites, forty (42.5%) of respondents from Kachia and thirty five (50.0%) from Saminaka reported the use of "pour on", insecticide. Table 6 shows the mortality with Kachia having 421 animals with twelve (2.85%) while Saminaka had 550 with thirty (5.45%) deaths.

Discussion

The survey results indicate that most respondents were between the ages of 21 -40 years, and had secondary school formal education. Their occupation was mainly cattle herding and livestock health. The normal age range for human activity is between these ranges provided by the respondents. It is not surprising that their occupation is mainly livestock production, since the survey was targeted at those

who keep livestock. The results revealed that most respondents were familiar with the trypanosomosis which they locally call "sammore". The attainment of secondary school formal education, was an added advantage which enable them identify the disease and effectively managed it, resulting in low mortality and morbidity as reported. This is similar to the findings of Enwezor *et al.* (2009) who reported in a survey of bovine trypanosomosis in Kachia grazing reserve of household awareness of trypanosomosis. The study indicated that animals were infected following bites by the tsetsefly which the respondents called locally "Kudan tsando". Seyoum *et al.* (2013) reported similarly findings that most livestock keepers in Gimbo and Guraferda were familiar with bovine trypanosomosis. Our survey revealed that cattle, goats and sheep were the animals mainly affected; this is not surprising as these animals are kept by livestock keepers and normally involved in migration to find food in bushy and forested areas. This finding is similar to that reported by Enwezor *et al.* (2006) that trypanosomosis is prevalent in sheep, goats and cattle. Our studies showed that infections are usually high at the peak of rainy season (August-September), and associated with the migration of the animals to the forested areas infected with tsetsefly. This finding supports the reports of Seyoum *et al.* (2013) who observed infection to be at peak level of rainy season. Seyoum *et al.* (2013) also reported that wet and warm months of the year favour growth of the vectors and trypanosomes.

The respondents gave symptoms of the disease to include; foul smell, eye and nose discharges, emaciation and abortion in pregnant ones. This is similar to the report of Catley *et al.* (2002); Grace *et al.* (2009) and Seyoum *et al.* (2013) who observed signs of progressive emaciation, weakness and reduced performance. Seyoum *et al.* (2013) also reported the detection of the disease depends on the experience of the livestock keepers. Treatments of trypanosomosis have been reported to rely mainly on the use of chemotherapeutic drugs such as diminazene aceturate and Isometamidium chloride (Leach & Roberts, 1981; Fairlamb, 1990; Abatan, 1991; Kinabo, 1993). The result of the survey showed that a high percentage of the respondents

knew what to do in the event of infection to their animals. According to livestock farmers, trypanocidal drugs or plant herbs are commonly administered by animal health personnel (Veterinary doctor and animal health assistant workers) while some reportedly treated the animal by themselves. The survey showed that the respondents mainly used Diminazene aceturate which they referred to as "Mai leda". This corroborates the reports of Seyoum *et al.* (2013), who reported that Diminazene aceturate and Isometamidium chloride are the most common drugs used in the study areas.

The survey showed that trypanosomosis accounted for 2.0% to 2.8% mortality in cattle, goats and sheep. This is lower than the 6.6% and 4.4% mortality rates in cattle reports by Tesfaye *et al.* (2011) in southern rift valley and Northwest Ethiopia. The differences could be due to the knowledge of disease management by farmers in Kachia and Saminaka. Enwezor *et al.*, (2009) similarly reported that awareness of trypanosomosis by livestock keepers is very critical for effective control. Awareness of the disease by the farmers surveyed and interviewed will also make it easier for implementation of effective control measures against the disease with community participation in mind.

In conclusion, the study shows that respondents' knowledge of livestock farmers on trypanosomosis in Kachia and Samianka area of Kaduna state, Nigeria. were familiar with trypanosomosis and strongly acknowledged that it is one of the main constraint to livestock production. Most of the livestock keepers had secondary school education which was a factor in the identification of disease and disease management. Livestock owners also recognized the vector, tsetse fly and associated it with the disease trypanosomosis. They also had good knowledge of the suggestive signs of trypanosomosis and its impact on agricultural activity and on the livelihood and wellbeing of cattle as well as on the owners themselves. In general; farmers are fully perceived and well aware of trypanosomosis and its vector, impact, seasonality and intervention options. The knowledge of trypanosomosis by the livestock herders greatly assisted in its management and hence the reported low mortality and morbidity.

References

Abatan MO (1991). Combination therapy of trypanosomiasis using diminazene and non steroidal anti-inflammatory drugs. *Journal of Chemotherapy*, 3(4): 232-235.

Abenga JN, Enwezor FNC, Lawani FAG, Osue HO & Ikemereh ECD (2004). Trypanosome prevalence in cattle in Lere area in Kaduna state, North central Nigeria. *Revue*

- d'élevage et de médecine vétérinaire des pays tropicaux*, **57** (1-2):45-48.
- Ameen SA, Joshua RA, Adedeji OS, Raheem AK, Akingbade AA & Leigh OO (2008). Preliminary studies on prevalence of ruminant trypanosomiasis in Ogbomoso area of Oyo state, Nigeria. *Middle East Journal of Scientific Research*, **3**(4): 214–218.
- Andrew T, Ibrahim JL, Maikai BV, Baraya K, Daniel J, Timothy T, Kingo JL & Ogbale M (2014). Prevalence of trypanosoma species found in cattle slaughtered in Tudun Wada abattoir Kaduna Nigeria. *Nigerian Journal of Biotechnology*, **28**: 60-64.
- Arsham H (2002). Descriptive sampling data analysis Statistical thinking for managerial decision making. <http://homeubalte.edu/ntsbarsh/businessstat>, retrieved 04-01-2016.
- Catley A, Irungu P, Simiyu K, Dadye J, Mwakio W, Kirangu J & Nyamwaro SO (2002). Participatory investigations of bovine trypanosomiasis in Tana river district, Kenya. *Medical and Veterinary Entomology*, **16**(1): 55–66.
- Cojia N, Woundualew M, Majiwa PAD, Leaks SGA, Rowlands GJ, Authie E, Dieterenand GDM & Peregrine AS (1993). Epidemiology of cattle trypanosomiasis in Glube valley south west Ethiopia. *Acta Tropica*, **53**(2): 151-163.
- Connor RJ (1989). Final Report of the Regional Trypanosomiasis Expert. RTTCP Report. Pp 1-5.
- De Koning HP (2001). Uptake of pentamidine in *T. brucei brucei* mediated by three distinct transporters: Implication for cross resistance with arsenicals. *Molecular Pharmacology*, **59**(3): 586-592.
- Dransfield RD & Brightwell R (2004). Community participation in tsetse control: the principles, potential and practice. In: The Trypanosomiasis. (I Maudlin, PH Holmes, MA Miles, editors) Wallingford, UK: CAB International Publishing. 533–546.
- Enwezor FNC, Umoh JU, Esievo KAN & Anere JJ (2006). Prevalence of trypanosomes in sheep and goats in the Kachia grazing reserve of Kaduna state, northwest Nigeria. *Bulletin of Animal Health and Production in Africa*, **54**(4): 306–308.
- Enwezor FNC, Umoh JU, Zaria LT & Anere JJ (2009) Survey of bovine trypanosomiasis in the Kachia grazing reserve, Kaduna state, Nigeria. *Veterinary Parasitology*, **159**(2): 121–125.
- FAO (2002). Food Agriculture and Food Security: The Global dimension, WFS02/Tech/Advance Unedited Version. FAO, Rome. Pp 19–28.
- Fairlamb AH (1990). Future prospects for the chemotherapy of humans trypanosomiasis I. Novel approaches to the chemotherapy of trypanosomiasis. *Transaction of Royal Society of Tropical Medicine and Hygiene*, **84**(5): 613-617.
- Fasanmi OG, Okoroafor UP, Nwufoh OC, Bukola-Oladele OM & Ajibola ES (2014). Survey for trypanosoma species in cattle from three farms in Iddo Local Government Area, Oyo state. *Sokoto Journal of Veterinary Sciences*, **12**(1). 57-61.
- Geerts S & Holmes PH (1998). Drug Management and Parasite Resistance in Bovine Trypanosomiasis in Africa Technical and Scientific Series 1, FAO/WHO/IAEA/OAU.
- Geerts S, Holmes PH, Diall O & Eisler MC (2001). African bovine trypanosomiasis. The problem of drug resistance. *Trends in Parasitology*, **17**(1): 25–28.
- Grace D (2003). Participative Trypanosomiasis Control in Burkina Faso. Working paper 2: *International Livestock Research Institute* (ILRI). Pp 1-16.
- Grace D, Randolph T, Affognon H, Dramane D, Diall O & Clausen PH (2009). Characterization and validation of farmers' knowledge and practice of cattle trypanosomiasis management in the cotton zone of West Africa. *Acta Tropica*, **111**(2): 137–143.
- Jones TW, Picozzi K, Cuellar HM & Cuellar AM (2000). Evaluation of enzyme linked immunosorbent assays for the diagnosis of bovine trypanosomiasis in Bolivia. In: Application of Enzyme Immunoassays to Improve the Diagnosis and Control of Livestock Trypanosomes (R Dwinger, editor). IAEA TECDOC. Pp 1-10.
- Kinabo LDB (1993). Pharmacology of existing drugs for animal trypanosomiasis. *Acta Tropica*, **54**(3-4): 169-183.
- Leach TM & Roberts CJ (1981). Present status of chemotherapy and chemoprophylaxis of animal trypanosomiasis in the eastern hemisphere. *Pharmacology and Therapeutics*, **13**(1): 91–147.

- Mahama C, Dsquesnnes M, Dia ML, Losson B, Dedeken R & Geerts S (2004). A cross sectional epidemiology survey of bovine trypanosomosis and its vectors in Savelugu and West Mamprusi districts of northern Ghana. *Veterinary Parasitology*, **122**(1): 1-13.
- Maikai, VA, Salka MN, Adeiza AA & Makeri HK (2007). Assessment of isometamidium chloride and diminazene aceturate in laboratory mice infected with field isolates of *T. congolense* from naturally infected cattle. *Journal of Production Agriculture and Technology*, **3**(1) 147 – 152.
- Matovu E, Enyam JC, Schmid C, Seedbeck T & Kaminsky R (2001). Melarsoprol refractory. The gambiense from Omugo north western Uganda. *Tropical Medicine & International Health*, **6**(5): 479-411.
- Maudlin I, Holmes PH & Miles MA (2004). The Trypanosomiasis. CAB International. CABI Publishing. Wallingford, UK. Pp 369-401.
- National Population Commission (NPC) (2006). Nation and State Population Census: 2006 Census Priority Tables. www.population.gov.ng, retrieved 13-04-2010.
- Seyoum Z, Terefe G & Ashenafi H (2013). Farmers' perception of impacts of bovine trypanosomosis and tsetse fly in selected districts in Baro-Akobo and Gojeb river basins, Southwestern Ethiopia. *BMC Veterinary Research*, **9**: 214.
- Tesfaye D, Speybroeck N, Deken RD & Thys E (2011) Economic burden of bovine trypanosomosis in three villages of Metekel zone, Northwest Ethiopia. *Tropical Animal Health and Production*, **44**(4): 873–879.
- WHO (2000) African Trypanosomiasis. *In*: Report on global surveillance of epidemic prone infectious diseases. WHO/CDS/CSR/ISR/2000.I. www.who.int/mediacentre/, retrieved 02-05-2009.
- WHO (2014). Trypanosomiasis, Human African (sleeping sickness). *Fact sheet N°259*. World Health Organization. www.who.int/mediacentre/factsheets/ Retrieved 25-02-2014.