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Prevalence of *Bovine trypanosomosis* in Lafia Abattoir, Lafia. Nasarawa State.

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Abstract

T*rypanosome prevalence in cattle was estimated in May, 2016 in Lafia abattoir, Nasarawa State of Nigeria. The study was subsequent to reports of Trypanosomosis outbreaks, which had resulted in deaths of cattle that led to yearly migration of semi-nomadic Fulanis out of the area, especially during the rainy season. Blood samples randomly from 150 cattle were examined for presence of trypanosomes using the buffy coat technique and Giemsa thin blood smears. The common breeds identified were the White Fulani and Sokoto Gudali. The White Fulani had higher infection status (55.81%) than the Gudali (38.09%). Cattle one to two years old had a significant (P<0.05) infection rate of 59 high compared to cattle above two years 15 and to 6 obtained in animals less than one year old. The infections were mainly due to T. vivax, T. congolense and T. brucei. Infections were higher among the females than the males but not statistically significant (P > 0.05). From this study, it is clear that trypanosomosis is still a major obstacle to livestock production in Lafia and its environs and that the incidence rate is similar in young and adult animals. The diagnosis of trypanosomosis in tsetse or domestic livestock is a basic requirement for epidemiological studies as well as for planning and implementing control operations.*

Keyword: Bovine, Trypanosomosis, Lafia abattoir.

Introduction

Africa trypanosomosis is responsible for 3 million livestock death and 55,000 people death annually in agriculture and mixed farming (ILRAD, 1990; Mulumba, 2003; Abenga *et al*., 2003). About 35 million doses of trypanocidal drugs are administered annually in Africa (Geerts and Holmes, 1998). In Nigeria, eleven of the twenty-two species of tsetse flies are known to infest over 80% of the 928,300km² of landmass, and are widely distributed from latitudes 4ºN and13ºN in the country (NITR, 1989; Onyiah, 1997). The most important trypanosome species in Nigeria are *Trypanosoma brucei*, *T. congolense*, *T. vivax*, and *T. evansi* in livestock, while *T. gambiense infect* human. In the last three years, the disease is most devastating in terms of poverty and lost of agricultural production (Hursey, 2000). Other losses include; reductions in herd sizes as a result of deaths, drop in calving rate, reduced market value of animals as a result of emaciation, drop in milk production and reduced work efficiency of drought animals (Swallow, 2000; Danbirni *et al.*, 2010). In some instances, infected animals show no overt signs of disease but can succumb if stressed, for example, by work, pregnancy, milking or adverse environmental

conditions (Luckins, 1988). This study focused on determining the prevalence of bovine trypanosomosis in Lafia abattoir, Nasarawa State.

Materials and Methods

Study Area

Lafia abattoir is located in the state capital of Nasarawa state, located in the North Central part of Nigeria between Latitude 8'35^{o}N and longitudes 8'32^{o}E; mean temperature of 32^{o}C and altitude 181.53m. It is bounded by so many district and other local governments. The dry season is from November to April and the wet season from May to October. During the period study most of the rains fell between the months of May and October. The driest months were December, January and March. The mean monthly maximum temperatures were from 31.8 °C-39.1 °C and minimum from 17.1 °C-26.2 °C (NIMET, 2016).

Animal sampling

A systematic random sampling was used to obtain a sample of 150 cattle of different breeds, ages and sexes. Animals one year and under were considered as young calves, whereas those one to above two years were regarded as adults. The animals were made up mostly of white Fulani breeds of cattle (Bunaji) and few Sokoto Gudali. From each animal, five milliliters (5ml) of blood were taken from the jugular vein at slaughter into specimen bottles containing ethylene diamine tetra acetic acid (EDTA) and conveyed in cold boxes with ice packs to the laboratory for analysis.

Laboratory examination

The examination was done in the laboratory using the Hematocrit Centrifugation Technique (HCT) where cappillary tubes are fill up to 2/3rd with blood and centrifuged to concentrate the parasites (Woo, 1971), Buffy Coat Method (BCM) here the parasites are located and identify within the buffy coat region and Giemsa stained thin films where smares are made, stainned with Giemsa and view under an oil immersion field. The Packed Cell Volume (PCV) of each animal was also determined using a hematocrit reader. Trypanosome species were identified based on their morphological structure from Giemsa-stained thin films.

Data analysis

Animals were grouped according to the parasite species identified from their blood and expressed as percentages of the total to show the prevalence rate for each parasite species. Prevalence rates of infection in animals were analyzed using was expressed in a descriptive statistics. Groups were then subjected to Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS) version 17.0.

Results and Discussion

Prevalence of Trypanosomosis on Breeds of cattle.

In the 150 cattle sampled in Lafia, 129 cattle were White Fulani (WF) and 21 were Sokoto Gudali (SG) (Table 1).This study has shown that animal trypanosomosis is prevalent in Lafia and its environs. The overall rate of 53.33% positive cases was higher than the 4.3% overall prevalence rate for Nigeria obtained from the country wide survey within the EEC-trypanosomosis control project between 1989 and 1996 (Onyiah, 1997). This suggests that animal trypanosomosis is a problem in this area and the present findings agree with the work by Agu *et al*. (1989), who reported a rate of 9.4% in parts of Kaduna State. Similarly, a much similar rate of 53.4% was reported by Maikaje (1998) during an outbreak of bovine trypanosomosis in Kaura LGA of Kaduna State. The high prevalence of animal trypanosomosis in Kaduna State appears to indicate a general increase in the menace of the disease in the State.
White Fulani (WF) had the highest trypanosome prevalence (55.81%), followed by Sokoto gudali (SG) with 38.09%, the results were statistically significant ($P < 0.05$). The majorities (55.81%) of the trypanosome infections detected and identified parasitologically in White Fulani were *T. vivax* (43.05%), *T. congolense* and *T. brucei* accounted for the minority 30.55% and 26.38%, respectively. In Sokoto Gudali, trypanosome infections detected and identified were *T. vivax* (50%), *T. congolense* and *T. brucei* accounted for the minority 37.5% and 12.5%, respectively (Table 1). Breed-specific rate in this study showed that the White Fulani had higher infection rate than Skoto Gudali. This observation had been noted earlier by Quadeer *et al*. (2008) where they compared the White Fulani and the Red bororo, and they observed that the White Fulani had higher prevalence with the least recorded for Red bororo. Some breeds of cattle have been shown to possess degree of innate resistance against species of trypanosome. The distributions of trypanosomes observed are in consonance with report of Omotainse *et al*. (2000), which observed similar trends in their studies.

Table 1: Prevalence of trypanosomosis on breeds of cattle.

Breed	No. of sample	No. positive (%)	T.v	T.c	T.b
WF	**129**	**72** (55.81)	**31** (43.05)	**22** (30.55)	**19** (26.38)
SG	**21**	**8** (38.09)	**4** (50)	**3** (37.5)	**1** (12.5)

WF = White Fulani; SG = Sokoto Gudali; Tv = *Trypanosoma vivax*; Tc = *T. congolense;* Tb = *T. brucei*

Prevalence of Trypanosomosis on Age of cattle.

20 cattle were under one year, 106 were between 1 to 2 years and 24 cattle were above 2 years. Of these 20 young cattle, parasitological examinations showed three *T. vivax,* two *T. congolense* and one *T. brucei* infections. In the animals between 1 to 2 years, thirty showed *T. vivax*, twenty- five *T. congolense* and four *T. brucei* infections, bringing to fifty-nine the number of trypanosome-infected cases. Finally, in the animals above 2 years fifteen were found positive 53.33% with *T. vivax,* 33.33% with *T. congolense* and 13.34% with *T. brucei* (Table 2). Calves less than

one year old had an infection rate of 59 compared to 6 obtained in animals less than one year old, but this was statistically significant; the infections were mainly due to *T. vivax*. This finding was in line with previous report of Tesfaheywet and Abraham (2012). Rowland *et al* .(1995) in Ghibe valley indicated that suckling calves are not allowed to go out with their dams until they are weaned off. Young animals are also naturally protected to some extent by maternal antibodies (Fimmen *et al*., 1992). This could result in low prevalence of trypanosome in the youngs. Animals between 1 to 2 years were more exposed to vector bites because of their grazing habits, whereas, the calves are always kept in their byres (herd/shed) most of the times and grazed near settlement. This could be ascribed to the mechanical transmission or the shorter development cycle in the anterior station of the tsetse fly (Daniel *et al.,* 1994; Sam-wobo *et al.,* 2010). The dominance of *T. vivax* infections observed in this study agrees with several workers' findings in Nigeria and West Africa, (Esuruoso, 1974; Hoare, 1972 and Losos, 1986). This could be explained in terms of grazing behaviours of the normal and strength (Sam-wobo *et al.,* 2010).

Table 2: Prevalence of Trypanosomosis on Age of cattle.

Age	No. of sample	No. positive (%)	T.v	T.c	T.b
< 1 year	**20**	**6** (30)	**3** (50)	**2** (33.33)	**1** (16.67)
1- **2 years**	**106**	**59** (55.66)	**30** (50.84)	**25** (42.38)	**4** (6.78)
>2 years	**24**	**15** (62.50)	**8** (53.33)	**5** (33.33)	**2** (13.34)

Tv = *Trypanosoma vivax*; Tc = *T. congolense;* Tb = *T. brucei*

Prevalence of Trypanosomosis on Sex of cattle.

Female cattle showed higher infection (55) compare to male cattle (21) thirty-eight showed *T. vivax,* twelve *T. congolense* and five *T. brucei* infections in female compare twelve showed *T. vivax,* seven *T. congolense* and two *T. brucei* infections in male. (Table 3).

Table 3: Prevalence of Trypanosomosis on Sex of cattle.

Sex	No. of sample	No. positive (%)	T.v	T.c	T.b
Male	**64**	**21** (32.81)	**12** (57.14)	**7** (33.33)	**2** (9.52)
Female	**86**	**55** (63.95)	**38** (69.09)	**12** (21.81)	**5** (9.09)

Tv = *Trypanosoma vivax*; Tc = *T. congolense;* Tb = *T. brucei*

Sex prevalence rates revealed a slightly higher percentage among the females, which may however be attributed to the differences in sample sizes, statistically there was no significant difference in the prevalence rates. Onyiah (1997) and Quadeer et al. (2008), in separate studies observed no statistically significant difference in the prevalence rates of cattle by sex. Also to note, is that there is no criteria for which tsetse flies or other biting flies in trypanosomosis uses to discriminate between male or females, all they require is a blood meal for development, though it has been

suggested in several reports about the preference of tsetse and Tabanids to cattle against other species (Dinka and Abebe, 2005).

Conclusion

Animal trypanosomosis is a major obstacle to livestock production in Lafia and its environs, Nasarawa state. Since Lafia the state capital of Nasarawa state lies within the tsetse belts, it therefore appears appropriate that chemotherapeutic and chemoprophylactic as well as tsetse control programs should be extended to the area in order to curtail the menacing effects of the disease and arrest the flight from the area of the seminomadic Fulanis during the rains.

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