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*Full length Research paper*

# Prevalence of Trypanosomiasis among Sheep and Goats slaughtered at Sokoto Central Abattoir.

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**The study was conducted to determine the prevalence of trypanosomiasis in sheep and goat; slaughtered at Sokoto central abattoir. Blood samples were collected from 60 sheep and goats, in sample bottles containing EDTA, and analyzed for the presence of Trypanosomes using Giemsa thick blood smears technique. Wet film and thick blood smear were prepared according to standard procedure and stained with giemsa stain for the detection of the parasites. The result obtained revealed that 19% of sheep and 6% of goats slaughtered in Sokoto central abattoir were infected with trypanosomiasis. The prevalence of disease based on cattle animal gender, showed that females were more infected than males. Based on this study it can be concluded that, there is need to educate the farmers and sheep and goat rearers on the occurrence, effects and means of protection from Trypanosomiasis in the study area.**

**Key words:** Trypanosomiasis, Sheep, Goat, Intestinal parasites of cattle, Sokoto.

## INTRODUCTION

Small sized ruminants like sheep and goats are main source of daily protein supplement and also contribute income to small scale farmers. Productions of small ruminants are greatly affected by parasitic disease; such parasites interfere with growth and development of ruminants, weight gain and can even cause death of the affected animal.

In Nigeria for instance, the incidence of poverty is widespread. It is much higher in the rural areas where a greater proportion of the population lives. The World Bank (1996) recorded the total population of the poor in Nigeria at 34.7 million, with the incidence, depth and severity of poverty more in the rural than in urban areas. Meanwhile, small ruminants (sheep and goats) form an important economic and ecological niche in agricultural systems of rural communities across developing countries. This is because small ruminants make a very valuable contribution to household income, especially to the poor people in the rural areas. These contributions range from animal proteins-meat and milk and skins.

In some cultural settings, women are often not entitled to own land and since agriculture (crop production) provides only seasonal employment, rearing small ruminants would provide employment and income as a subsidiary occupation. Livestock are often regarded as producers of milk and meat, income generators, and reservoirs of wealth (Coppock*et al*., 2006).

Also, small ruminants provide cultural and economic benefits for households. In the same vein, while a 10 to 15 kg ruminant carcass is easily handled by a rural household for either home consumption or sale without means of preservation, slaughtering even a steer (when it is available) for the same purposes is generally impracticable and uneconomical and is therefore a rare event. Where access to cash is limited and livestock marketing is not organized, small ruminants are directly exchanged for grain.

Small ruminants are often slaughtered in honor of a special guest, a visiting friend or relative, for festivities and religious rituals. Small ruminants are also kept by poor rural households for ready cash income to meet immediate needs such as acquiring agricultural inputs, paying school fees and purchasing larger animals such as cattle.

This is because rural households find it easier to find a buyer for a goat or a sheep than a cow. More importantly, small ruminants play a key role in stock association building between members living in the same community in rural areas (Okello, 1985).

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Generally, sheep and goats production tend to be extensive. According to Ogbadoyi*et al.* (2011), small ruminants are kept using a number of different production systems including subsistence in which the animals are tethered; extensive in which they are allowed to roam and tend for themselves and intensive in which they are kept in total confinement. Considering the facts that goats and sheep typifies the small ruminants commonly found in most rural communities and the roles these animals play in the livelihood of small-scale and resource-poor holders, these species have, however not been accorded attention.

The most common internal parasites in sheep and goats are: lung worms (*Dictyocaulus*spp. or *Muelleriuscapillaris*); stomach worms (*Haemonchuscontortus*, commonly called barber pole worm); liver flukes (*Fasciola hepatica*); and intestinal parasites, the most common of which are coccidia (*Eimeria*or*Isospora*). These parasites interfere with normal growth and development as well as weight gain and cause delayed maturity in ruminants.

Trypanosomiasis is the name of several diseases in vertebrates caused by infection with the extra-cellular protozoan parasite of the genus *Trypanosoma.*

African trypanosomiasis is responsible for 3 million livestock death and 55,000 peopledeath annually in agriculture and mixed farming (Mulumba, 2003;Abenga et al., 2002). About 35 million doses of trypanocidal drugs are administered annually in Africa (Geerts and Holmes, 1998). In Nigeria, eleven of the twenty-twospecies 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). Trypanosomes of major threat to goat, sheep and other ruminants include *Trypanosomavivax, Trypanosomacongolense*and *Trypanosome brucei*. In Nigeria, animal trypanosomiasis constitutes a major obstacle to food security in spite of attempts towards chemotherapeutic and tsetse control. The disease, not only causes millions of livestock deaths, but also reduces calving rates, milk yield and work efficiency of draft animals. It has been established that domestic animals are potential reservoir hosts for Trypanosome.

It is a debilitating disease of man, domestic and wild animals characterised by parasitaemia, pyrexia, anaemia, loss of condition, reduced productivity and high mortality (Losos and Ikede, 1972; Anosa, 1983; Murray *et al*., 1984).

Trypanosomiasis constitutes a major threat to food security in several parts of sub-Saharan Africa. Trypanosomiasis has been known to cause not less than 3 million livestock deaths each year, 20%less incalving, 25% reduction in milk yields, and 50% reduction in livestock numbers. It also cause low quality of hide and skins of the livestock (Abenga*etal*., 2002).

Tsetse fly transmitted African trypanosomosis is responsible for 55,000 human 3 million livestock deaths annually in Nigeria (Abenga*et al*., 2002; Samdi*et al.,* 2010) and hinders mixed farming through reduced work efficiency of draft animals (Hassan *et al*., 2016).

## MATERIALS AND METHODS

### Study Area

Sokoto state is located $13.083^0$N and $5.250^0$E near the extreme North West of Nigeria. The name Sokoto (which is the modem version of the local name, Sakkwato) is of Arabic origin, representing Suk means market. Being the seat of Caliphate, the city is predominantly muslims and an important center of Islamic learning in Nigeria. The Sultan who head the caliphate is effectively the spiritual leader of Nigerian Muslims.

The vegetation in Sokoto is Sudan Savannah in which rain fall start in late May or June to September or early October. Theharmattan period is between November and February with a temperature of $11^0$c to $43^0$c. The weather in Sokoto is usually very hot and dry. Domestic mammals found in Sokoto include cattle, camels, donkeys, goats, sheep, horses etc.

### Sample Collection

60 blood samples were collected randomly from sheep and goats brought for slaughtering at the abattoir. 5.0ml of blood sample were collected in samples bottles containing Ethylene Diamine Tetra Acetate (EDTA) and thoroughly mixed to prevent the blood sample from clotting.The bottles were labeled with sheep and goat, gender and sample number and date of collection. The samples were immediately transported to the parasitology laboratory of UsmanuDanfodiyo University, Sokoto for analysis.

### Sample Analysis

Wet blood films were prepared as described by (Cheesbrought, 1997) as follows. Micropipette was used to measure 5.0ml of blood sample and then dropped on the glass slide for the thin film preparation. Cover slip was then held at an angle of about $130^0$ and the blood is allowed to spread and cover slip was then moved forward until the blood fizzles out, drawing into a thin film. The smear were fixed using methanol, this is to prevent the distortion of the specimen.

The slide was allowed to dry for about 15 minutes. Staining was done using giemsa stain; which is an alcohol based stain. The slides were dipped into the giemsa for about 45 minute and then rinse with distilled water without allowing blood smear to wash off, and then allow it to drying. After drying, a drop of oil immersion was placedon each slide and examined under the

**Table 1**: Prevalence of trypanosomiasis among sheep and goats samples collected from sokoto central abattoir

| Group | No.Examined | No. infected | % prevalence |
|---|---|---|---|
| Sheep | 26 | 5 | 19 |
| Goat | 34 | 2 | 6 |
| Total | 60 | 7 | 11.66 |

Values are expressed as mean ±SEM of three replicates (p<0.05) **(**One-way ANOVA followed by Duncan Multiple range Test).

**Table 2:** Distribution of Trypanosomiasis based on gender of goats

| Goat | No Examined | No. infected | % prevalence |
|---|---|---|---|
| Male | 14 | 0 | 0.00% |
| Female | 20 | 2 | 10.0% |
| Total | 34 | 2 | 5.88% |

Values are expressed as mean ±SEM of three replicates (p<0.05) (One-way ANOVA followed by Duncan Multiple range Test).

**Table 3:** Distribution of Trypanosomiasis based on gender of sheep

| Sheep | No Examined | No. infected | % prevalence |
|---|---|---|---|
| Male | 10 | 2 | 20.0% |
| Female | 16 | 3 | 18.0% |
| Total | 26 | 5 | 19.23% |

microscope for the presence of parasite using the oil immersion objective (x100).

## IDENTIFICATION

*Trypanosomaevansi*is similar in shape with *T. evansi*in all Mammals although it is different in size. The parasites were identified based on their morphology and anatomy, presence of undulating membrane, position of kinetoplast and length of free flagellum as described by (Luckin*et al.,* 1992).

The data obtained were subjected to analysis of variance (ANOVA). One- way Analysis of Variance (ANOVA) was conducted at 5% probability.

## RESULTS

The general overall result showed the prevalence of trypanosomiasis in sheeps and goats samples collected from sokotocentre abattoir. Out of 60 (34 goats and 26 sheep) samples screened for trypanosomiasis, 7 were infected with trypanpsomes which showed a prevalence of 11.66% (table 1). Prevalence rate among sheep was higher than prevalence of disease among goats; as out of 26 sheep examined 5 sheep were infected which showed prevalence rate of 19% while; 34 goats that were examined for disease 2 were found infected which show 5% prevalence of trypanosomiasis (table 1).

Occurrence of trypanosomiasis based on gender of goat showed that out of 14 male examined no one was infected with disease which showed 0 % prevalence and out of twenty(20) females examined two(2) were infected which showed 10% prevalence of trypanosomiasis (table 2).

The distribution of trypanosomiasis on the gender of sheep showed that out ten (10) males examined (2) were infected with disease, which gives 20 % prevalence; while out of sixteen (16) females, (3)three were infected with 18.75 % prevalence (table 3).

## DISCUSSION

The result of this study showed that out of sixty samples, (sheep were 26 samples while goats were 34) examined for trypanosomiasis, only seven (7) (five sheeps and Two goats) were infected with trypanosome parasites which showed an infection of 11.66 % (table 1). This prevalence is less than reported by Hassan et al.(2016), (35-55%)in Nasarawa State.

Less occurrence of disease among goats, showed that goats are less susceptible to the disease than the sheep or sheep have less strong immune system than the goats, or it can be due to availability of vegetation in certain area which favor the survival of vector (Tse-tse fly) and hence forth occurrence of infection. This result is in agreement with the finding of Bourdichon*et al.,* (1998),

that Sheep are more infected than goat because sheep are highly vulnerable to trypanosomiasis.

Less occurrence of trypanosomiasis among goats showed that some other factors are attributing low occurrence rate. Sex prevalence rates revealed a slightly higher percentage among the females, which may however be attributed to the differences in sample sizes;Onyiah (1997) and Quadeer*et al.* (2008), in their studies observed no statistically significant difference in theprevalence rates of cattle by sex; they further concluded that that there is no criteria for whichtsetse flies or other biting flies in trypanosomiasis uses to discriminate between male and females, all they require is a blood meal for development.Though it seems quite reasonable; but it can be said thatfemales are more susceptible for disease than the males, may be due to the fact that their immunity becomes low due to pregnancy and lactation.

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