Prevalence of ticks in sheep and goats in Abeokuta and its environs

Iposu S.O.[1], *Okwelum N.[1,2], Kumapayi A.O.F.[1], Talabi A.O.[3], Sanwo K[1]. And Takeet M.I[3].

[1]College of Animal Science and Livestock Production, Federal University of Agriculture, Abeokuta, Nigeria.[2]Institute of Food Security, Environmental Resources and Agricultural Research, Federal University of Agriculture, Abeokuta, Nigeria.[3]College of Veterinary Medicine, Federal University of Agriculture, Abeokuta, Nigeria.

*Corresponding Author's Name: Dr. Okwelum Ngozi

E-mail Address: drjhephzi@yahoo.com

Abstract

This study evaluated the association of breed, sex, age and location of herd/flock (village, peri-urban and sales point) with prevalence and distribution of ticks in sheep and goats in Abeokuta and its environs. A total of 300 sheep and 300 goats were randomly selected from the three locations. The estimated age, sex, and breeds of each animal were determined. Thereafter, they were examined for presence of ticks. Ticks were collected into universal bottles containing 1% formaldehyde. The type, location and load on each animal were also recorded. The ticks were identified up to species level. Data on the animals, management factors and the prevalence of tick were processed into contingency tables to establish the association between the prevalence of tick and the age, sex, breed, and location using Chi-square (X^2) test statistics. Rhipicephalus evertsi and Boophilus spp were the tick species observed in the sheep. There were significant associations ($P < 0.05$) of prevalence of ticks, with age and location of goats, and breeds and location of sheep, respectively. It was thus concluded that animal factors of age, breed and location were significantly associated with tick infestation in sheep and goats. West African Dwarf (WAD) and O'uda breeds of sheep exhibited various levels of tick infestation while most of the Yankassa were tick-free. Tick infestation was more common with sheep of the sales point and village locations. It was therefore recommended that effective tick control measures should be instituted to prevent adverse effects of these parasites on the health and production of these animals.

Key words: Prevalence, Ticks, Sheep and Goats, Abeokuta

Introduction

Ectoparasites are known to cause harm indirectly, particularly when present in large numbers, causing disturbances and increasing levels of behaviour such as rubbing, which may lead to reduced grazing time and self-wounding (Berriatua *et al.*, 2001). Importantly, some ectoparasites also act as vectors of protozoa, bacteria, viruses, cestodes (tapeworms) and nematodes (Heim and Kihm, 2003). Ectoparasites have a major effect on the husbandry, productivity and welfare of livestock (Rehbein *et al.*, 2003).

Small ruminants are important contributors to food production in Nigeria, providing 35% of meat consumption and 14% of milk consumption (Asfaw, 1997). Small ruminant production is constrained by the compound effects of diseases, poor feeding and poor management (Getachew, 1995). Skin problems caused by ticks result in serious economic loss to smallholder farmers, the tanning industry and the country as a whole. According to Bayou (1998), skin problems due to external parasite cause 35% of sheep skin and 56% of goat skin rejections. There is paucity of information on the prevalence of ticks of

sheep and goats in relation to their production potential in Abeokuta and its environs, hence this study aimed at determining the prevalence of ticks of sheep and goats in Abeokuta, its environs and identify risk factors associated with the problems in relation to sex, age, and location.

Materials and Methods

Study area: The survey was concentrated around Abeokuta and its environs, namely Abeokuta South, Abeokuta North, Odeda and Obafemi/Owode Local Government Areas. Sheep and goats managed under village, peri-urban and sales point locations in all these areas were used for the study.

Sample collection: A total of 300 sheep and 300 goats were randomly selected from the three locations (peri-urban, village and sales point). The estimated age, sex, breed and body condition of each selected animal was determined, and animals were examined for presence of tick individually. Samples of tick were collected with the permission and assistance of the owners. Care was taken to minimize discomfort to the animals. The location and severity of the tick on each animal were recorded. Each animal's body was inspected and brushed with special attention paid to the ears, the area around the eyes, the axillae and the groin. Animals infested with ticks were noted and the ticks on each of the animals were collected into universal bottles containing 1% formaldehyde. Laboratory examination of the ticks was done at the Parasitology Laboratory, College of Veterinary Medicine, Federal University of Agriculture, Abeokuta, Nigeria. Collected ticks were separated and identified using MAFF (1987) identification keys.

Statistical analysis of data: Data on management factors and the prevalence of ticks were processed into contingency tables to establish the association between prevalence and the various features of sheep and goat production system using Chi-square(X^2) test statistics of Genstat package (Genstsat Release 7.2 DE, Copyright 2007, Lawes Agriculture Trust, Rothamsted Station). Means with significant difference were further expressed in descriptive statistics to show their trend graphically.

Data Sheet: Infestation: 0 – None, if no tick was found; 1 – Low, if few ticks were found only at the inter-digital spaces; 2 – Moderate, if ticks were found at the inter-digital spaces and the head region; and 3 – Severe, if ticks are present in the inter-digital spaces, perineal, body trunk and the head region.

Results

The two major species of tick recorded were *Rhipicephalus evertsi* and *Boophilus spp,* and the major predilection site being the ears.

Chi-square analyses of some animal factors associated with tick species of goats in the study area are shown in Table 1. Age and location of goats were significantly associated with prevalence of ticks. Significant association ($p<0.05$) of age of goat with prevalence of ticks ($P = 0.025$) is shown in Figure 1. This was reflected in proportions of adult goats showing various levels of tick infestation while there were no tick infestation recorded in young goats. Significant association ($P = 0.001$) of location of goat with ticks prevalence is shown descriptively in Figure 2, which was reflected in some proportions of goats at sales point showing severe (2.7%) and moderate (2.7%) levels of ticks prevalence while these levels were absent in the village and peri-urban locations. As a corollary, larger proportions of the peri-urban and village goats had no incidence of tick

Table 1: Chi-Square Table of factors associated with Prevalence of ticks in Goats and Sheep

	Animal Species	
	Goat	**Sheep**
Age	*9.3 (P = 0.025; 3)	6.21 (P = 0.102; 3)
Sex	2.9 (P = 0.404; 3)	5.60(P = 0.471; 6)
Breed	5.1 (P = 0.528; 6)	*42.5 (P < 0.001; 6)
Location	*24.2 (P < 0.001; 6)	*61.0 (P < 0.001; 6)

* Significant associations

Note: Values in parentheses are corresponding Probability levels (P) and degrees of freedom, respectively.

infestation (99.2% and 97.3%, respectively) compared to 'no incidence' proportion of the goats at sales point (86.6%).

Chi-square analysis of some factors associated with prevalence of tick in sheep is shown in Table 1. There were significant association (P<0.05) between breeds of sheep and the prevalence ticks. Significant association (P<0.05) was also observed between location of sheep and the prevalence of ticks. There were however, no significant associations of age and sex of sheep with prevalence of ticks.

Significant association of breeds of sheep with ticks infestation (P=0.001) was reflected in some proportions of O'uda (32.4%, 17.6% and 0%) and WAD (18.2%, 7.6% and 19.1%) breeds showing low, moderate and severe levels of infestation of ticks, respectively, while none of the Yankassa breed had severe and moderate levels of ticks infestation. Only 2.4% of Yankassa sheep were infested with ticks at low level (Figure 3).

The highest level of ticks prevalence was recorded among village sheep at 34.0%, 5.0% and 21.0% for severe, moderate and

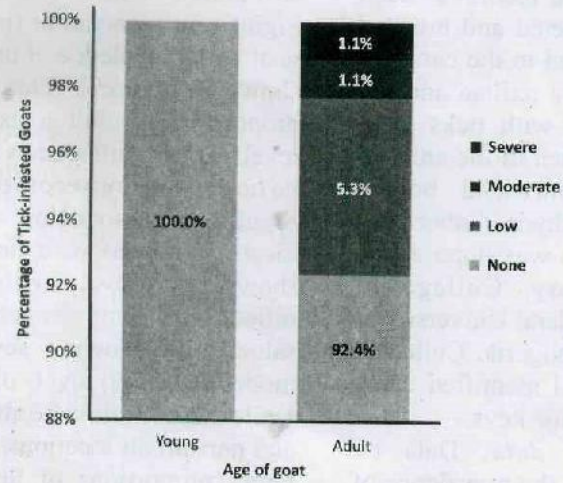

Figure 1: Significant Association of Age of goat with Prevalence of Ticks

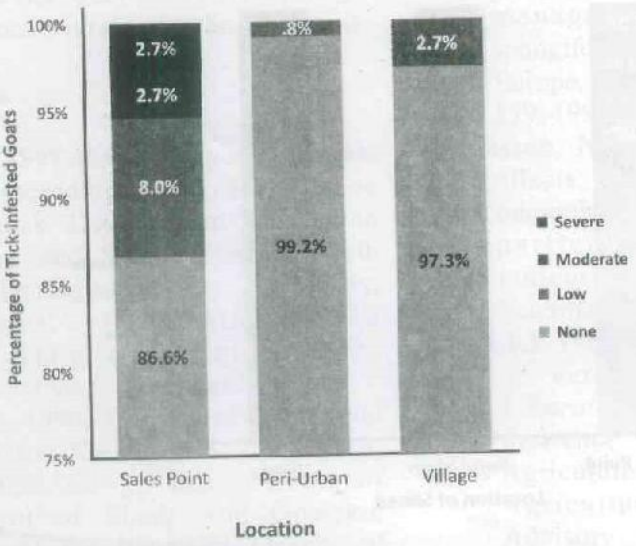

Figure 2: Significant Association of Location of goat with Prevalence of Ticks

low levels of prevalence of ticks, respectively, while the lowest was recorded in peri-urban sheep with 0.0%, 8.0% and 12.0% for severe, moderate and low levels, respectively, reflecting the significant association of location of sheep with tick infestation (Figure 4).

Discussion

It was revealed that ticks are common ectoparasites in Abeokuta and its environs. The presence of more ticks on the ear, the scrotum and the perineal area than on the

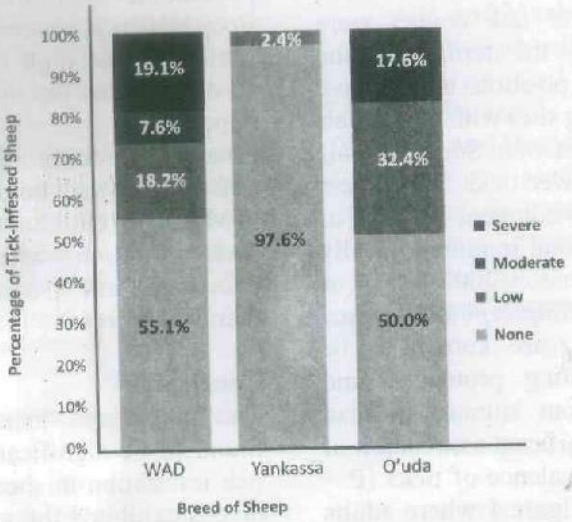

Figure 3: Significant Association of Breed of Sheep with Prevalence of Ticks

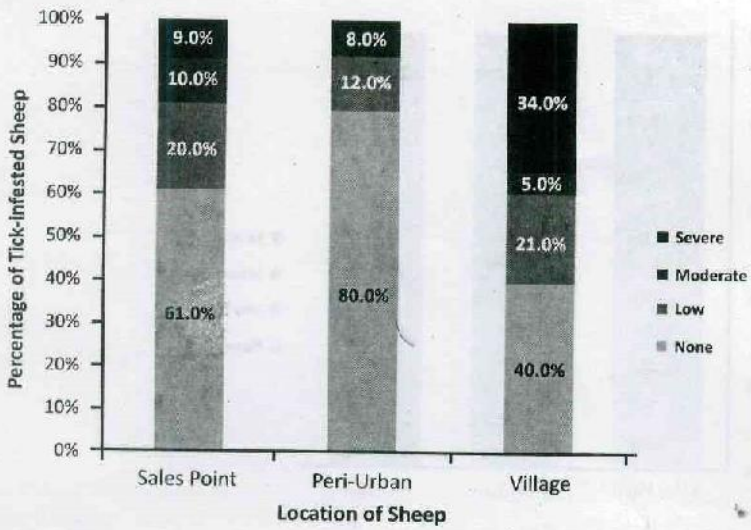

Figure 4: Significant Association of Location of Sheep with Prevalence of Ticks

belly and the sternum may be ascribed to the fact that ticks prefer warm and moist predilection sites that also provide protection from the environment and predation from birds (Muchenje *et al.*, 2008). These findings, however, are in contrast with Webb and David (2002) in the Tswana, Simmental and the Brahman cattle breeds, where higher tick counts were observed on the belly, the sternum and the perineal areas. These positions tend to have long hairs, suggesting sites with longer hair are prone to tick infestation. Some animals consistently carry fewer ticks than others kept in the same environment because of their abilities to respond immunologically to tick infestation (Jonsson, 2006). Some of the ticks identified, *Rhipicephalus evertsi* and *Boophilus spp.*, are known to be capable of transmitting protozoan and ricketsial disease from animals to man (Dipeolu, 1975). Significant association of age of goat with prevalence of ticks (P = 0.025) is shown in Figure 1 where adults have higher prevalence than the young. Dwarf breeds were less infested than long-legged breeds, but infestation increased with age.

Two species of ticks *Rhilicephalus vertsi* and *Boophilus spp.* were identified in sheep and goat. This is similar to earlier findings (Ofukwu and Akwuobu, 2010). The high population of *Rhilicephalus vertsi* and *Boophilus spp.* observed in this area can be attributed to high humidity which is favourable for the survival of these tick population.

Finally, the infestation of sheep and goat by tick was not high compare to that reported in Makurdi (Ofukwu and Akwuobu, 2010). Tick infestation was more severe in sheep than in goat and also in West African Dwarf than others breeds.

Conclusion

The 'breed' and 'location of stock' were found to be significantly associated with tick infestation in sheep; WAD and O'uda breeds exhibited the various levels of tick infestation while most of the Yankassa were

found to be tick-free. Tick infestation was more common with sheep at the sales point

References

Asfaw W. 1997. Country report: Ethiopia. In: Proceedings of a Seminar on Livestock Development Policies in Eastern and Southern Africa, 28th July–1st August 1997, Mbabany, Organized by CTA, OAU/IBAR, The Ministry of Agriculture, Cooperative, Swaziland.

Bayou K. 1998. Control of sheep and goatskin diseases. In: Ian, B.C., Bayou, B. (Eds.), Proceedings of Control of Sheep and Goatskin Diseases for Improved Quality of Hides and Skin. 13–14 February 1998. FAO, Addis Ababa.

Berriatua, E., French, N.P., Broster, C.E., Morgan, K.L. and Wall, R. 2001. Effect of infestation with *Psoroptes ovis* on the nocturnal rubbing and lying behaviour of housed sheep. Appl. Anim. Behav. Sci. 71, 43–55.

Dipeolu, O.O. 1975. Survey of blood parasite in domestic animals in northern Nigeria. Historical review (1923 – 1966). Trop Anim Hlth Prod 2: 49 – 52,

Getachew T. 1995. Parasites of small ruminants. In: Gray, G.D., Uilenberg, G. (Eds.), Parasitological Research in Africa. Proceedings of International Conference, BOBO DIOULASSO. Burkina Faso.

Heim D. and Kihm U. 2003. Risk management of transmissible spongiform cephalopathies i n Europe. Rev. Sci. Tech. OIE 22, 179–199.

Jonsson, N.N. 2006. The productivity effects of cattle tick (Boophilus microplus) infestation on cattle, with particular reference to Bos indicuscattle and their crosses. Veterinary Parasitology 137, 1–10.

M.A.F.F. 1987. Helminthology, *In: Manual of Veterinary Parasitological Laboratory Techniques. Reference Book 418.* Ministry of Agriculture, Fisheries and Food: Agricultural Development and Advisory Service. H. M. S. O., London, pp. 2 - 68.

Muchenje, V., Dzama, K., Chimonyo, M., Raats, J.G. and Strydom, P.E. 2008. Tick susceptibility and its effects on growth performance and carcass characteristics of Nguni, Bonsmara and Angus steers raised on natural pasture. Animal, 2(2), 298–304.

Rehbein S., Visser M., Winter R., Trommer B., Matthes H.F., Maciel, A.E. and Marley, S. E. 2003. Productivity effects of bovine mange and control with ivermectin. Vet. Parasitol. 114, 267–284.

Webb E. and David M. 2002. The efficacy of Neem seed extract (Azadirachta indica) to control tick infestation in Tswana, Simmental and Brahman cattle. South African Journal of Animal Science 32, 1–6.

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