



PREVALENCE OF *FASCIOLOSIS* IN SMALL RUMINANTS SLAUGHTERED AT YOLA MODERN ABATTOIR, ADAMAWA STATE, NIGERIA.

*Ardo, M.B. and Aliyara, Y.H.

Department of Animal Science and Range Management, ModibboAdama University of Technology, Yola, Nigeria.

*Correspondence author: +2348034964952, E-mail: ardofuty@yahoo.co.uk

ABSTRACT

A cross sectional study was conducted from January to December 2012 on 4013 animals (1596 sheep and 2417 goats) at Yola modern abattoir, Adamawa State, Nigeria, based on post mortem examination. The objective of the study were to estimate the prevalence rate as well as the distribution of Fasciola infections in slaughtered small ruminants according to age, sexes and season. A total of 4013 slaughtered sheep and goats were examined at post mortem and 22(0.55%) liver flukes cases were recorded. Out of the 1596 sheep and 2417 goats examined during the period 13(0.32%) and 9(0.23%) were infected with Fasciola respectively. There was no statistical significance ($P>0.05$) on the prevalence of infection between the species. However according to age, out of the 359 young sheep and 759 young goats examined, 1(0.06%) and 0(0%) were infected respectively. Out of the 1237 and 1658 adult sheep and goats examined, 12(0.76%) and 9(0.37%) were infected respectively. Among the sheep and goats, the adults were found to be more infected than the young. Statistically the difference was significant ($P<0.05$). According to sex, out of the 471 rams and 969 bucks examined, 2(0.12%) and 1(0.04%) were infected respectively. Out of the 1125 ewes and 1448 does examined, 11(0.70%) and 8(0.33%) were infected respectively. There was statistical variation ($P<0.05$) among male and female in both species. According to season goats were more infected during the rainy season than dry season and whereas sheep were more infected during dry season. There was no statistical significance ($P>0.05$) between the seasons in sheep, but in goats it was significant ($P<0.05$). The monthly prevalence showed peak in December for sheep and September for goats. The results show Fasciola infection affects both sheep and goats in Yola modern abattoir Nigeria.

Key words: Fasciola infection, Modern abattoir, Prevalence, small ruminants, Yola

INTRODUCTION

Fasciolosis is an economically important disease of domestic livestock, in particularly cattle, sheep, goats and occasionally man. The disease is caused by digenean trematodes of the genus *Fasciola* commonly referred to as liver fluke. The two species most commonly implicated as the aetiological agents of fasciolosis are *Fasciola hepatica* or temperate liver fluke and *Fasciola gigantica* or tropical liver fluke (Mas-coma *et al.*, 2005). Worldwide losses in animal productivity due to fasciolosis were conservatively estimated at over US \$3.2 billion per annum (Urquhart *et al.*, 1996). In addition fasciolosis is now recognized as an emerging human disease. The World Health Organization (WHO) has estimated that 2.4 million people are infected with *Fasciola* and 180 million are at risk of infection (Anon, 1995).

Most of the reports on prevalence of Fasciolosis were based on data gathered passively from slaughter house records, which shows that fasciolosis is common in sheep and goat in Enugu, Nigeria (Okoli *et al.*, 2000), and also in Maiduguri, Nigeria (Mbaya *et al.*, 2010). The clinical signs of the acute and sub-acute forms are seen in animals of all ages and various nutritional statuses (Soulsby, 1982). The pathology of fasciolosis may be divided into hepatic fibrosis and hyperplasia colangitis (Losos, 1995). Migration of the immature flukes in the liver

produces migratory tracts within which, a traumatic destructions of the liver parenchyma, haemorrhage and necrosis occur (Soulsby, 1982).

Knowledge on the prevalence of the parasite is crucial for any attempt on prevention and control. Despite the presence of large number of small ruminants in Adamawa State and suitable environment for the parasite, study on small ruminant Fasciolosis was not so far done in Yola, Adamawa state. There is scanty information on the study of Fasciolosis in small ruminants in Yola, Adamawa State. The objectives of the study was to estimate the prevalence rate as well as the distribution of the disease in slaughtered small ruminants according to age, sexes and season.

MATERIALS AND METHODS

The study area

This research study was carried out at the Yola modern abattoir, Adamawa State, which is situated between Jimeta and Yola town of Adamawa State (North Eastern Nigeria). The abattoir is owned by the Adamawa state Government, and managed by the Ministry of Livestock and Nomadic Resettlement. The abattoir is the major source of meat for the people of Yola and its environs.

It lies between latitude 9° 14' N of the equator and longitude 12° 14' E of the Greenwich meridian. The annual rainfall ranges between 700mm and 1600mm which starts in May and ends in October. The wettest months are from July to September and dry season commences fully in November and ends in April. The relative humidity ranges between 20-30% and the mean monthly temperature ranges between 26°C to 39°C. It is located in the Sub-Saharan and Northern Guinea Savannah Zone. (Adebayo and Tukur, 1999).

Study Animals

The study animals were local breeds of sheep and goats brought from the various local governments to Yola Modern Abattoir for slaughter. All animals were managed under extensive management system by the local farmers.

Data Collection

A cross-sectional study was conducted from January to December, 2012. A total of 4013 comprising 1596 sheep and 2417 goats were slaughtered and examined. A regular visit was made to Yola Modern Abattoir at 6:00am seven (7) times in a week and this was done for one calendar year. Sex, age and season of slaughter of the study animals were recorded. Ages were recorded by looking at the appearance of the incisor teeth 2 tooth; 1 to 1½ years, 4 tooth 2 years, 6 tooth or full mouth 2½ to 3 years and worn to broken mouth over 3 years of age.

Post Mortem Examination

During the post mortem examination, livers were examined visually and by palpation of the entire organ. Then, it was followed by transverse incision of the liver across the thin left lobe in order to confirm the case. The flukes so recovered through squeezing of the liver were preserved in 10% formalin and kept in the Animal Science Laboratory of the Modibbo Adama University of Technology, Yola.

Statistical Analysis

The data were analyzed and presented using descriptive statistics such as means and percentages. Chi-square was used to establish association between fluke infection and sex, age and season.

Student t-test was used to determine the significance of difference in the mean distribution of the flukes between the variables. Differences of means were considered significant at P<0.05

RESULTS

Table 1 shows the prevalence of small ruminant Fasciolosis examined in Yola Modern Abattoir between January and December, 2012. Out of the 1596 sheep and 2417 goats examined, 13 (0.32%) and 9 (0.23%) were infected with *Fasciola* respectively. And the overall prevalence in both species was 22 (0.55%). For sheep, peak prevalence was in the dry season month of December while none was encountered in the month of February. Whereas for goats peak prevalence was in rainy season month of September with none in February and November (Figure 1). There was no significant statistical variation (P > 0.05) in the prevalence of infection between sheep and goats. Table 2 shows the prevalence of *Fasciola* infection according to age and sex for the period. Out of the 359 young sheep and 759 young goats (< 12 months) examined, 1 (0.06%) and 0 (0%) were infected respectively. It was also observed that out of the 1237 adult sheep and 1658 adult goats examined, 12(0.76%) and 9 (0.37%) were infected respectively. Between different age groups the adult's sheep and goats were more affected than the young. The difference was statistically significant (P<0.05). Similarly, out of the 471 rams and 969 bucks examined, 2 (0.12%) and 1 (0.04%) respectively had *Fasciola* infection. Out of the 1125 ewes and 1448 Does examined, 11 (0.7%) and 8 (0.33%) were infected respectively. Among the sexes in both sheep and goats females were more infected (P<0.05) than in males.

Table 3 shows seasonal prevalence of *Fasciola* infection. Out of the 814 sheep and 1360 goats examined, during the dry season, 8 (0.50%) and 2 (0.08%) were infected respectively. In wet season, out of 782 sheep and 1057 goats examined, 5 (0.32%) and 7 (0.29%) were infected respectively. Between the seasons, sheep were more infected during the dry season than in the rainy season while goats are more infected during the rainy season (P<0.05).

Table 1: Prevalence of *Fasciola* infections in Sheep and Goats Slaughtered at Yola Modern Abattoir in 2012

Species	Total No. Examined	Total No. infested (%)
Sheep	1,596	13 (0.32) ^a
Goat	2,417	9 (0.23) ^a
Total	4,013	22(0.55)

Superscripts with similar letter indicate no significant difference (P>0.05)

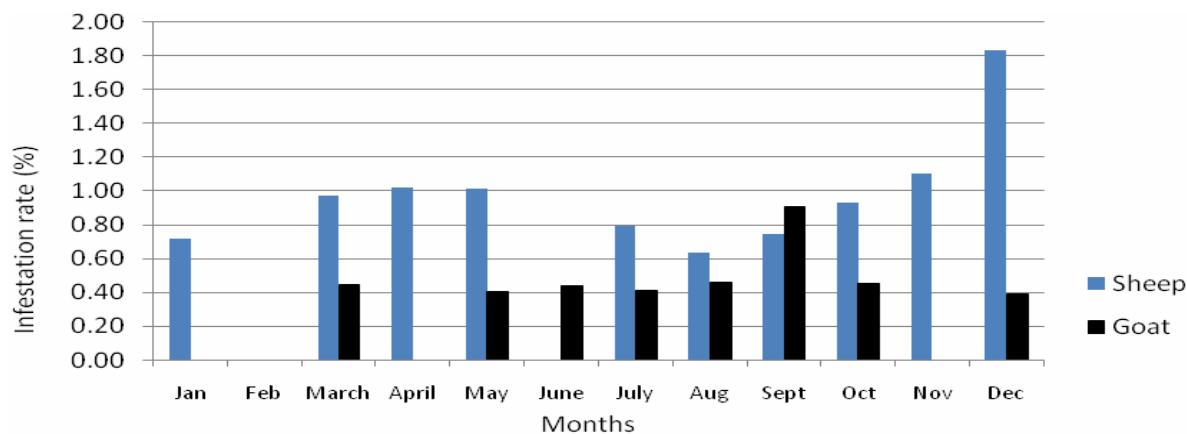


Fig. 1: Monthly Prevalence of Fasciolosis among sheep and goat slaughtered in Yola modern Abattoir in 2012

Table 2: Prevalence of *Fasciola* infections in Sheep and Goats Slaughtered at Yola Modern Abattoir according to Age and Sex in 2012

	Sheep		Goat	
	No. Examined	No. Infested (%)	No. Examined	No. Infested (%)
Age				
Young	359	1(0.06) ^b	759	0(0) ^a
Adult	1,237	12(0.76) ^a	1,658	9(0.37) ^b
Total	1,596	13(0.82)	2,417	9(0.37)
Sex				
Male	471	2(0.12) ^a	969	1(0.04) ^a
Female	1,125	11(0.70) ^b	1,448	8(0.33) ^b
Total	1,596	13(0.82)	2,417	9(0.37)

a, b - Superscripts letters indicates significant difference ($P \leq 0.05$)

Table 3: Seasonal Variation in Prevalence of *Fasciola* infections in Sheep and Goats Slaughtered at Yola Modern Abattoir in 2012

Season	Sheep		Goat	
	No. Examined	No. Infested (%)	No. Examined	No. Infested (%)
Rainy Season (May - Oct)	782	5(0.32) ^a	1,057	7(0.29) ^b
Dry (Nov-April)	814	8(0.50) ^a	1,360	2(0.08) ^a
All Season	1,596	13 (0.82)	2,417	9(0.37)

a, b Superscripts letter indicate no significant difference ($P > 0.05$) and a, b Superscripts letters indicate significant difference ($P \leq 0.05$)

DISCUSSION

Prevalence of sheep and goats *Fasciola* infections were 0.32% and 0.23% respectively with overall prevalence of 0.55% by post mortem examination of livers. In this study, both sheep and goats were infested and infection was higher in sheep than goats. This could be because sheep are more prone to the infection since they graze more often with cattle in areas with germinating pasture along river banks and flood plains where contact with metacercarial-encysted grass blades is common. Studies on the prevalence of *Fasciola gigantica* have been carried out in some parts of Nigeria (Ademola 2003; Mbaya *et al.* 2010; Ardo, 2009, Umar *et al.* 2009; Ardo *et al.* 2013). The results show that the adult sheep and goats were more infested than the young ones. This agrees with findings of Mbaya *et al.* (2010). This probably is associated with the fact that lambs and kids graze less together with the adult. The difference in infection may be more of immunity in one age group than in other (Soulsby, 1982). The study also revealed that

female sheep and goats harboured more infection than the males.

A similar observation where female ruminants exhibited increased susceptibility to helminthosis was associated to hormonal activity, especially at pregnancy (Ibrahim *et al.* 2002; Soulsby, 1982). This is likely the situation since post mortem results showed most of the females slaughtered within the period were at various stages of pregnancy (trimester). Another possible explanation to the variation could be due to the fact that females stay longer in flock/herd for the purposes of reproduction and breeding.

Seasonal prevalence of fasciolosis among sheep showed that infections were higher during the dry season compared to rainy season. This is in consonance with the findings of Ademola (2003) but varies from that of Mbaya *et al.* (2010), who reported higher prevalence during the rainy season in Maiduguri, Borno State.

Temperature, humidity and rainfall patterns are known to play an important role in the epidemiology of fasciolosis (Ardo, 2009). Goats were more infected during the rainy season than dry season. This is in agreement with findings of Kamani *et al* (2007) and Mbaya *et al.* (2010) in Maiduguri which is in the same semi-arid north eastern Nigeria. The current findings showed the monthly peak prevalence for sheep was December and September for goats. But Mbaya *et al.* (2010) in the same north east reported a monthly peak prevalence of July and August for sheep and July for goats.

These findings show that fasciolosis is a prevalent problem of small ruminants in Yola,

Adamawa state. The prevalence of fasciolosis is a function of the climatic conditions, availability of pasture and water and other livestock management practices that influence the parasite.

CONCLUSION AND RECOMMENDATIONS

Fasciolosis occur in sheep and goats in Yola, Nigeria and is a major source of liver condemnation in small ruminants in Yola modern abattoir. Control measures should be taken by destruction of intermediate host (snail population). Periodic anthelmintic treatment should be given to get the maximum benefit from small ruminants. Avoiding low lying pasture along the river Benue will help in controlling fluke infection.

REFERENCES

- Adebayo, A.A. and Tukur A.L. (1999) Adamawa in maps. Publication of Department of Geography, Federal University of Technology, Yola in Cooperation with Paraclete Publishers pp4, 23 – 26.
- Ademola, I. (2003): Metrological changes and their influence on the epidemiology of Fasciolosis in Food animals slaughtered in Oyo state. *Nigerian Veterinary Journal* 24: 35 – 38.
- Anonymous, (1995): Control of Food Borne Trematodes infections. Technical Report Series No. 849. WHO Geneva pp157.
- Ardo, M.B. (2009). Epidemiology and aspects of Economic Studies on Bovine Fasciolosis in Adamawa State, Nigeria. PhD thesis, Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine University of Nigeria, Nsukka Pp 184.
- Ardo, M.B. Aliyara, Y.H. and Lawal H. (2013); Prevalence of Bovine Fasciolosis in Major Abattoirs of Adamawa State, Nigeria. *Bayero Journal of Pure and Applied Sciences*, 6(1): 12 – 16.
- Ibrahim, M.A., Patrick, V.K. and Alhaji, A.M. (2002); An Analysis of the effects of socio-economic status of farmers and season variation on the marketing of pregnant does for meat in Borno State. *Agro Satellite* 1: 2 – 12.
- Kamani, J., Yidawi, J.P., Buba, S., Dahiru, J.J. and Bukar, M.D.Y. (2007); Seasonal incidence of ovine fasciolosis in Maiduguri, Borno State, Nigeria. An Abattoir survey. In: proceeding of the 44th Annual Congress of the Nigerian Veterinary Medical Association 222 – 225.
- Losos, G.J. (1995); *Infectious Tropical Disease of Domestic Animals* 1st Edition, Longman Scientific and Technical New York pp 851 – 894.
- Mas-Coma, S., Brgues, M.D. and Valero, M.A. (2005): Fasciolosis and other plant-borne trematodezoonoses. *International Journal of Parasitology*, 35(2): 1255 – 1278.
- Mbaya, A.W., Shingu, P. and Luka, J. (2010): A Retrospective Study on Prevalence of Fasciola infection in sheep and goats at slaughter and Associated Economic Losses from condemnation of infected liver in Maiduguri Abattoir, Nigeria. *Nigerian Veterinary Journal* 31(3): 224 -228.
- Okoli, I.C., Agoh, E.C., Okoli, G.C., Idemili, G.C. and Umesiobi, D.O. (2000): Bovine and Caprine Fascioliasis in Enugu State, Nigeria. Retrospective analysis of abattoir records (1993 – 1997) and six months prevalence study. *Bulletin of Animal Health and Production in Africa*. 48: 7 -11.
- Soulsby, E.J.L. (1982): *Helminths, Arthropods and Protozoa of Domestic Animals*. 7th Edition. Bailliere Tindal and Company London 800 – 809.
- Umar, A.G., Nwosu, C.O. and Philip, H.R. (2009). Seasonal Prevalence and economic importance of bovine Fasciolosis in Jalingo Abattoir, Taraba State, Nigeria. *Nigerian Veterinary Journal* 30(3): 44 – 50.
- Urquhart, G.M., Armour, J., Duncan, J.L., Dunn, A.M. and Jennings, F.W. (1996): *Veterinary Parasitology* 2nd Edition. University of Oxford, Longman Scientific and Technical Press, U.K. pp 100 – 109.