Prevalence of fascioliasis among slaughter sheep in selected abattoirs in Imo State, Nigeria

Njoku-Tony, R.F and Okoli, G.C

Department of Environmental Technology, School of Engineering and Engineering Technology, Federal University of Technology, P.M.B. 1526 Owerri, Imo State, Nigeria.
Corresponding author: Njoku-Tony, R.F, Email- tonyrosefeechi@yahoo.com

Abstract: A 12 months study on fascioliasis in sokoto gudali sheep of Hausa origin (northern part of Nigeria) was carried out in five different abattoirs in Imo State, Nigeria between 2004 and 2005.The abattoirs were Obinze, Okigwe, Afor-Enyiogugu, Afor-Ogbe, and Orlu .The objective of the study was to determine the prevalence of fascioliasis among slaughter sheep in selected abattoirs in Imo state. Five grams of feces and liver from freshly slaughtered sheep of both sexes, and from different locations and ages were collected, taken to the laboratory and analyzed for fasciola eggs and adult flukes. Direct smear, formol ether concentration and sodium chloride floatation methods were used to harvest the eggs and adult parasites. Out of 367 sheep examined, 64 (17.2%0) were infected. Infection was highest in Obinze abattoir (29.6%) followed by Afor Enyiogugu abattoir with (29.0%) Okigwe (15.6%), Orlu (12.5%) and Afor Ogbe (12.4%). Infection was highest in females than in males and was also sex dependent. Among adult sheep (>2yrs) examined , 59 (14.9%) were infected while out of 38 young goats (<2yrs), 5 (13.2%) were infected. Infection level rose with increased rainfall with the highest level observed at the peak of the rainy season and dropping during the dry season months. The number of parasites were 180, and mean worm load 281. Intensity was higher in males than in females. This result therefore calls for an improved disease control and adequate sanitation programme for sheep rearers in the study area.
[Njoku-Tony, R.F and Okoli, G.C. **Prevalence of fascioliasis among slaughter sheep in selected abattoirs in Imo State, Nigeria.** Journal of American Science 2011; 7(2):361-366]. (ISSN: 1545-1003). http://www.americanscience.org.

Keywords-Fascioliasis, worms, slaughter sheep, abattoirs, tropics, Nigeria.

Introduction

Fasioliasis is caused by *Fasciola gigantica,* a digenetic trematode which belongs to the family fasciolidae. They are very important liver parasite of cattle, sheep and goats (Ruminants). The adult inhabits the bile duct and gall bladder of liver in these animals. Inside their host, the liver flukes cause severe damage which may lead to the death of the animals (Anosike, 2005). Fascioliasis is one of the helminthic trematodes that constitute both economic and public health constraints to a profitable ruminant production in tropical Africa (Adams and Mckay, 1966, Fabiyi, 1982). Fascioliasis has been implicated as the cause of morbidity and mortality in the production of ruminants (Onwuliri 1993, Okoli 2000). These ruminants however have also been found to harbour other helminthic mixed infections as recorded by Anosike (2005). Such as Dicrobothriasis, cotylophomiasis among others. This infection brings about decrease in meat production and subsequent economic loss. The nutritional and health value of the animal deteriorates leading to poor carcass quality and loses (Shar-Fisher and Say, 1987).

Materials and Methods

The Study Area

Imo State is one of the south eastern states of the Federal Republic of Nigeria. It is located within latitude $5^o10'$ and 5^o67N, and longitude 6^o36 and $7^o28'E$. The state is bound on the North West by Anambra State, on the south-west by River State and on the eastern boarders by Abia State. The state has two main geographical regions-The coastal plain, covering the central and southern parts of the state and the Plateau and escapement zones in the northern parts of then state. The soil of the coastal plain is sand/loan and vegetation is typical rainforest, while that of the Northern-eastern geographical plain is clay with rich savannah vegetation. There are two distinct seasons, the rainy and dry season with the wet or rainy season lasting from March to October with peak rainfall occurring in July and September and short slightly drier spell in August, Popularly known as August break. Annual rainfall ranges from o.omm to 2,500mm. The mean temperatures over most of the state is 27^0C, while relative humidity is about 70;80% (IMSG, 1993) . The main occupation of the populace is agriculture. There are civil and public servants also, as well as fishermen and traders.

Sample Collection

A total of 367 sheep were examined for fascioliasis in five selected abattoirs in Imo State,

Nigeria namely Okigwe, Afor ogbe, Obinze, Afor Enyiogugu, and Orlu. Five grams of feces were collected from the rectum of these sheep and analyzed in the laboratory under 48hrs. Egg counts according to Fleck and Moody (1988) was done after preliminary ident ification of eggs at X10 magnification (WHO, 1991). Age of sheep was determined by estimation of dentition (Andrew et al, 1990). Sex was also observed and recorded. Prevalence was expressed as the percentage of sheep infected, while intensity was recorded as number of eggs per 5 grams of feces. The study lasted for one year (September 2004 to August 2005).

Statistical Analysis

Descriptive statistic as provided by the SPSS 17.O© and MS Exel 2010 software used to represent ensuing data. The test of homogeneity of variance in means of disease prevalence was conducted with the one way analysis of variance (ANOVA). Gender and age relatedness to disease prevalence were explored with the chi square test of significance. The influence of rainfall on disease prevalence was explored using the pearson product moment correlation coefficient(r).

RESULT

A test of variance of equality in mean prevalence of fascioliasis across the sampling location revealed significant difference F (16.24)> Fcrit (4.04) at P< 0.05.

Table 1 showed the prevalence of fascioliasis among sheep slaughtered in five selected abattoirs in Imo State Nigeria. Out of the 367 sheep examined 64 (17.2%) were infected. Infection however varied from one Abattoir to another. Highest infection was at Obinze (29.6%) followed by Afor Enyiogugu (26.3%), Okigwe (15.6%) and (12.5) and (12.4%) in Orlu and Afor-Ogbe respectively. Table 2 illustrated the sex related distribution of fascioliasis. Of 312 male sheep examined, 53 (17.0%) were infected while the 55 females gave 11(20.0%) prevalence.

Age related distribution of *F.gigantica* in sheep is shown in table 3. Out of 329 adult sheep (>2yrs) examined, 49(14.9%) were infected, while out of 38 young sheep (<2yrs), 5(13.2%) were infected.

Table 4 showed the monthly prevalence and Mean Worm Load (XWLD) of *F. gigantica* in the slaughter sheep. Total number of parasites was 170 and Mean Worm Load (XWLD) was 266. Infection level rose with increase in rainfall with highest level observed at the peak of the rainy season and dropping during the dry season months. Sex related egg counts were shown in table 5. Of the 6O(93.8) infected male sheep 40(66.7%) were having egg counts of 0-49, while 15(25.0%) had 55-99, and 5(8.3%) had egg counts of 100-199. In the female category, out of the 4(6.3%) infected female sheep, 2(50.0%) were having egg counts of 0-49, 2 (50.0%) had egg counts of 50-99. Total number of sheep having 0-49 egg counts were 42(65.6%), 17(26.6%) had egg counts of 50-99 while 5(7.8%) had egg counts of 100-199.

Table 1: Prevalence of fascioliasis among sheep slaughtered in selected abattoirs in Imo State, Nigeria.

Abattoir location	Number examined	Number infected	Percentage (%) infected
Orlu	72	9	12.5
Okigwe	90	14	15.6
Obinze	54	16	29.6
Afor-Enyiogugu	38	11	26.0
Afor Ogbe	113	14	12.4
Total	367	64	17.2%

Table 2: Sex related distribution of fascioliasis among slaughter sheep

	Male				**Female**			
Abattoir location	Number examined	Number infected	% infected	No examined	Number infected	% infected	Total no examined	Total number infected
Orlu	62	7	11.3	10	2	20.0	72	9(12.5%)
Okigwe	78	13	16.7	12	2	16.7	90	14(15.5%)
Obinze	39	13	33.3	15	3	20.0	54	16(69.6%)
Afor-Eyiogugu	30	8	26.7	8	2	25.0	38	10(26.3%)
Afor ogbe	103	12	11.7	10	2	20.0	113	14(12.4%)
Total	312	53	17.0	55	11	20.0	367	64(17.4%)

Table 3: Age related distribution of fascioliasis among sheep

Old sheep (>2years)				**Young sheep (<2years)**		
Abattoir location	Number examined	Number infected	% infected	Number examined	Number infected	Percentage infected
Orlu	100	11	11.0	13	1	7.7%
Okigwe	64	7	10.9	8	2	25.0
Obinze	84	17	20.2	6	2	33.3
Afor-Enyiogugu	49	14	28.6	5	-	-
Afor Ogbe	32	10	31.3	6	-	-
Total	329	49	14.9	38	5	13.2%

Table 4: Monthly Prevalence and mean worm load of fascioliasis in sheep in relation to rainfall.

Month	Rainfall in mm	Number examined	Number infected	% infected	Total no of parasites	Mean worm load (XWLD)
Sept. 2004	309.1	18	6	33.5	15	250.00
Oct. 2004	322.9	5	-	-	-	-
Nov. 2004	37.0	10	-	-	-	-
Dec. 2004	0.0	17	-	-	-	-
Jan. 2005	38.3	15	-	-	-	-
Feb. 2005	84.3	10	-	-	-	-
March. 2005	103.1	15	2	80.0	29	145.0
April 2005	82.2	17	2	54.5	30	150.0
May 2005	469.8	20	12	13.3	10	83.3
June 2005	500.7	22	11	85.7	12	109.0
July 2005	260.0	25	05	52.0	19	320.0
Aug. 2005	190.5	20	14	60.0	30	214.3
Sept. 2005	490.6	20	12	60.0	35	291.6
Total		367	64	17.4	180	281

Table 5: Sex related egg counts of F. gigantica in sheep

Egg/5 grams of feces	**No of males** ♂	**No of females** ♀	**Total no (%)**
0-49	40(66.7)	2(50.0)	42(65.6%)
50-99	15(25.0)	2(50.0)	17(26.6%)
100-149	5(8.3)	-	5(7.8%)
150-199	-	-	-
>200	-	-	-
Total	60(93.8)	4(6.3)	64

Output

1. **Graphs**

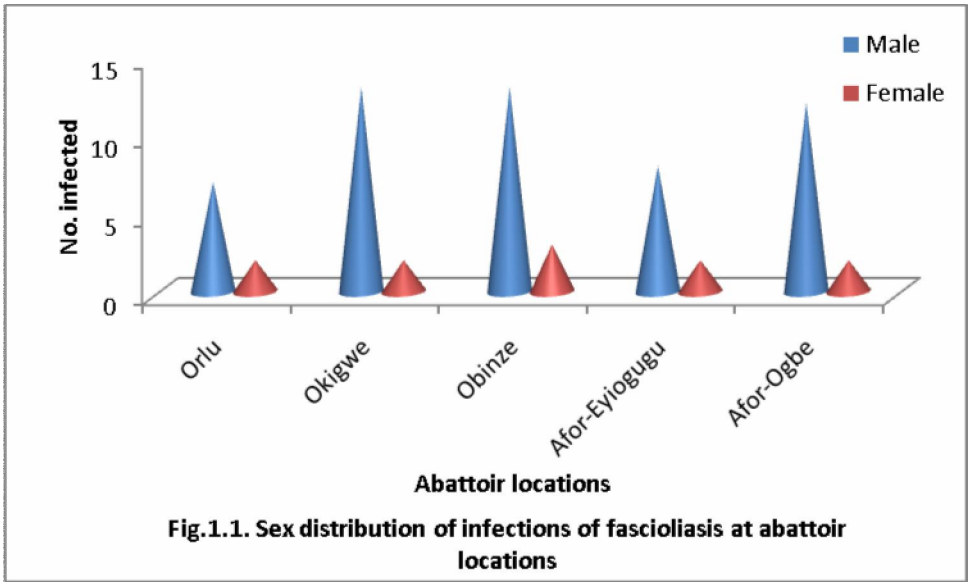

Fig.1.1. Sex distribution of infections of fascioliasis at abattoir locations

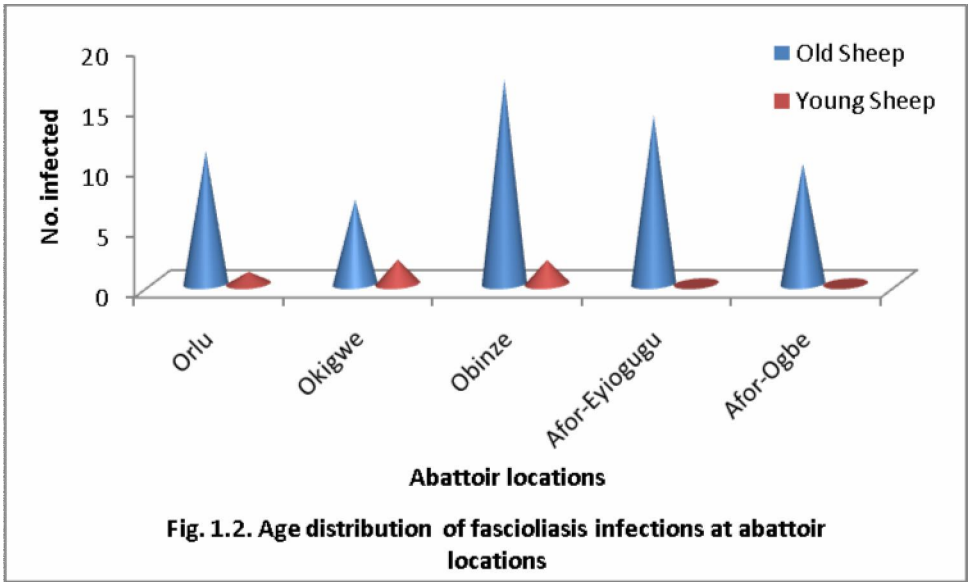

Fig. 1.2. Age distribution of fascioliasis infections at abattoir locations

Discussion

Fascioliasis or Liver rot is considered an important parasitic disease of ruminants and has been implicated as the commonest disease of the liver leading to liver condemnation. The 17.2% prevalence of fascioliasis obtained in this present study agrees with the results of Alonge (1979), Okoli et al, (2000), Okoli (2001) and Okoli et al, (2002) in the north and eastern Nigeria, and in East Africa. Infection varied from one abattoir to another and may have been influenced by varying ecological and climatic parameters of the areas that this sheep that were imported from the northern part of the country must have grazed on before getting to the slaughter locations (Agbola, 1979; Aladi, 1999). Highest infection rate was recorded in Obinze (29.6%). This abattoir plays host to most of the sheep that come from the northern part of the country. Again Obinze is a mini settlement for Hausa ethnic group, majority of who trade on sheep. This town has the physico-chemical parameters and the ecological factors that favour the growth of the infecting snails. Njoku-Tony, (2007). Infection was higher in males (20.0%) than in females (17.0%). This is in line with the work of Njoku-Tony (2007) while working on fascioliasis in ruminants in Imo State. It was observed that few females were brought out to the abattoirs for slaughter. Further investigations revealed that the females are kept back for reproductive purposes and milk production. This factor actually hindered the proper assessment of the females; however the few that were

examined also haboured the infection. Fascioliasis infection was therefore not gender related among slaughter sheep at the abattoirs sampled.

Prevalence of the infection also varied between the adult (>2yrs) and the young sheep (<2yrs). More adult were infected than young sheep. The variance may be as a result of method of recruitment and husbandry. However, more adult sheep were examined than young sheep. On investigation, it was discovered that meat from young sheep are not mature and so not good for consumption, and this therefore reduces the market value for the young sheep. There may also be no progressive resistance to the infection with *F. gigantica*, this is in line with the work of Enyenihi et al, (1975). While working with nematodes and cestodes, Enyinihi et al (1975) showed that there was always a close association between age and intestinal helminth. Fascioliasis infection was however not gender related. Monthly distribution, prevalence and mean worm load (XWLD) of *F. gigantica* revealed a gradual rise in infection with increased rainfall. Highest infection was between April and September (Fabiyi 1982, Blood et al, 1989; Shar-Fisher and Say 1989). This rise in the rate of infection during the rainy season suggest that the sheep must have picked the infection during the late dry season (LDS) and the early rainy season (ERS) these are seasons with little or no rainfall and therefore coincides with the bionomics of their snail intermediate host (Anosike 2001). Mean worm load however did not correspond with the physical manifestation as infected sheep still look healthy (Shar-Fisher and Say, 1989). The 17.2% prevalence of this infection however is of public health and veterinary interest and calls for the need for improved health and environmental surveillance and adequate control program.

Conclusion

This study therefore gives an overview on the prevalence and distribution of fascioliasis in Imo State. It furthermore suggest the need for a state as well as nationwide baseline data on the prevalence and distribution of *F. gigantica* infection.

REFERENCES

1. Adams, J.W. and Mckay, J. (1966). *Nature* 216, 212
2. Agboola, J.A. (1979). *Agricultural atlas of Nigeria*. Oxford University Press, Oxford, London.
3. Aladi, No (1999). Current trends in the production, handling and sales of meat in Nigeria B.Agric. Tech. *Project Report.* Federal University of Technology, Owerri, Nigeria.
4. Alonge, D.O and Fasami, E.F. (1979). A survey of abattoir data in Northern Nigeria. *Tropical Animal Health Production*, 1: 57-62.
5. Andrew, C.E, Milles, B.M. and Ettunne, S. (1990). A survey of the intestinal nematodes of business in Namibia. *Journal of tropical medicine and Hygiene*, 42 (3): 243-247.
6. Anosike, J.C., Okafor, F.C., Mbata G. (2001). Studies on *Paramphistomum cervi* infections of ruminants in Imo State. *Bulletin of Animal Health and Production in Africa* 23(3):289
7. Anosike, J.C., Opara, M.N., Okoli C.G., Okoli I.C., (2005). Prevalence of parasitic helminthes among ruminants in Etiti area of Imo State, Nigeria. *Animal production research advances* 1(1): 13-19.
8. Blood, O.C and Radostits O.M. (1989). *Veterinary Medicine 7th edition. Balliere Tindall* London.
9. Enyenihi, U.K. Okon, E.D. and Fabiyi, J.P (1975). *Bulletin of Animal Health and Production Africa.* 23(3): 289.
10. Fabiyi, J.P and Adeleye G.A (1982). Bovine fascioliasis on the Jos Plateau, Northern Nigeria. *Bulletin of Animal Health and Production in Africa*, 30(1): 41-43.
11. Fabiyi, J.P, and Adeleye, G.A. (1982). Bovine fascioliasis on the Jos plateau Northern Nigeria. *Bulletin of Animal health and production in Africa*, 30 (1): 41-43.
12. Fleck, M. and Moody V. (1988). Diagnostic techniques in medical parasitology. Butterworth and Co. Ltd London
13. Imo State Government (IMSG 1993). Directory of Primary schools and their requirement in Imo State Ministry of Education, Owerri, Imo State, Nigeria P. 81
14. Njoku-Tony, R.F (2007). Ecological studies on some human and animal trematodes in parts of Imo State, Nigeria Ph.D thesis, Imo State University, Owerri, Nigeria.
15. Okoli, I.C. Agoh, E.C, Okoli, G.C., Idemili, G.C. and Umesiobi, O.O (2000). Bovine and Caprine fascioliasis in Enugu State, Nigeria: Retrospective analysis of abattoir records (1993-97) and six months prevalence study. *Bulletin of Health production in Africa.* 48: 7-11.
16. Okoli I.C. (2001). Analysis of abattoir records for Imo State, Nigeria, 1995-1999: 1: Disease incidence in cattle, sheep and goats. *International journal of Agriculture and Rural Development*, 2: 97-103.
17. Okoli, I.C., Nwokocha, J.R., Okoli C.G. and Ogundu U.E. (2002).
18. Prevalence of fascioliasis and oesophagostomiasis among slaughter animals in

Imo State Nigeria and their correlation with emaciation diagnosed at ante-mortem. *Tropical veterinarian,* 20(3): 139-148.
19. Onwuliri, C.O.E., Anosike, J.C., Nkem C.N. and Payne, V.K. (1993). The ecology of animal parasitic nematodes in endemic areas of Jos, Nigeria. *Applied parasitology*, 34:131-137.
20. Shar-Fisher, M. and Say, R.R. (1989). Manual of tropical veterinary parasitology. *CAB International,* Wallingford, U.K.
21. Steel, R.G.D. and Torrie, J.H (1980). Principles and procedure of statistic, 2nd Ed. *McGrew-Hill*, New York NY, 389P.
22. World Health Organization (WHO) (1991). Basic Laboratory Methods in Parasitology. WHO Geneva. 103.

1/12/2011