Bovine Fascioliasis Among Slaughtered Cattle In Selected Abattoirs In Imo State, Nigeria

R.F Njoku-Tony

Department of Environmental Technology, Federal University of Technology, P.M.B. 1526, Owerri, Imo State
tonyrosefeechi@yahoo.com; 08068186166

ABSTRACT: A study of fascioliasis involving a 12 months fecal examination of humped Sokoto gudali cattle from the Northern part of Nigeria for eggs and adult fluke that cause fascioliasis was carried out in five different abattoirs in Imo State, Nigeria between 2004 and 2005.The abattoirs are Okigwe, Achingali, Orieagu, Orlu and Afor ogbe. The objective of the study was to determine the prevalence and distribution of fascioliasis in cattle slaughtered in different abattoirs of Imo-State, Nigeria. Feces from the rectum of freshly slaughtered cattle were collected and analyzed in the laboratory for fasciola eggs, and their livers sliced to harvest adult flukes. Direct smear, formol ether concentration and sodium chloride floatation methods were used to harvest the eggs and adult flukes. Out of 2,400 cattle examined, 560 (23.3%) were infected. Infection was highest in Okigwe abattoir (34.2%), followed by Achingali (28.7%), Orieagu (25.6%), Orlu (6.5%) and Afor Ogbe (4.5%). Infection level rose with increase in rainfall. Highest infection was observed at the peak of the rainy season July-November and dropping during the dry season December-May .Intensity was higher in males than in females. Result recorded higher infection in the males than the females. Data was analyzed by chi square, analysis of variance and pearson product moment correlation coefficient (r) This result therefore underscores the importance of enforcing disease control programmes and adequate health education for cattle rearers in Imo State, Nigeria. Njoku-Tony, R.F. Bovine Fascioliasis in cattle slaughtered in some abattoirs in Imo state, Nigeria.
[R. F Njoku-Tony. **The Effects Of Rural Infrastructure Development On Crop Farmer'S Productivity In Osun State. World**Rural Observations 2011;3(1):59-63]. ISSN: 1944-6543 (print); ISSN: 1944-6551 (online).

Keywords- Bovine, Fascioliasis, worms, Slaughter cattle, Abattiors**,** Prevalence, Nigeria

Introduction

Parasitic diseases constitute a global problem and thus considered as major obstacle in the health and performance of animals (Okoli, 2001). The economic importance of cattle, their association with man and their possible role as carriers of zoonotic parasites necessitates the study of their diseases (Fabiyi and Adeleye, 1982).

Millions of carcasses and livers are lost due to damages caused by Fasciola infections in animals such as cattle, sheep and goats (Okoli et al, 2000). Slaughter-house data generated from ante and post mortem inspections of food animals revealed the diseases of economic and public health importance such as, Paramphistomiasis, Microbothriasis, and fascioliasis (Okoli, 2001). There has been much attention on cattle than other ruminants in respect to this infection. This could be probably because cattle stands as the chief source of animal protein in this country,(Ogunrinade et al, 1981 and Hyera, 1984) thus investigators consider disease of this animal of greater economic importance than others(Okwuosa,1979).

Fascioliasis or liver rot is a parasitic disease of the livers of ruminants such as cattle, sheep, goats, deer, horses, buffallos and other grass eating mammals. This infection causes traumatic and toxic damages to the part of the animal's meat that is affordable to the low income earners (Alonge and Fasami, 1979). As the liver is the organ of metabolism for the body of animals, damage to it means impaired energy supply to the body and subsequent health problems (Fabiyi and Adeleye, 1982). Attempts to carryout studies on this disease have most of the times resulted to the study of their intermediate snails (Asumu,1975). Based on the above, we investigated the prevalence and distribution of this infection in some sites in Imo State. This will update the existing information upon which necessary health programmes will be planned.

Materials And Methods

The Study Area

Imo State is one of the southeastern states of Nigeria. It is located within latitudes $5^{o}10'$ and $5^{o}67N$, and longitudes $6^{o}36$ and $7^{o}28'E$. The state is bounded 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 part of the state. The soil of the coastal plain is sandy/loan and vegetation is typical rainforest, while that of the North-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 0.0mm to 2,500mm. The mean temperature over most of the state is 27°C, while relative humidity is about 70-80% (IMSG, 1993). Agriculture is a major socio-economic activity of the populace. There are civil and public servants also, as well as fishermen and traders.

Sample Collection

A total of 2,400 cattle were examined for fascioliasis from five(5) different abattoirs in Imo State, Nigeria, namely Okigwe, Afor ogbe, Orlu, Orieagu and Achingali. Five grams of feces were collected from the rectum of these cattle and analyzed in the laboratory under 48 hrs. Egg counts according to Fleck and Moody(1988) was done after preliminary identification of eggs using x10 objective and x10 eye piece WHO (1999). Age of cattle was determined by estimation of dentition(Andrew et al`, 1990). Sex was also recorded. Prevalence was expressed as the percentage of cattle infected, while intensity was recorded as number of eggs per 5grams of feces.

Statistical Analysis

Data obtained were analyzed by simple chi-square analysis.

$$\frac{\text{R total X column total}}{\text{Grand total}}$$

$$X^2 = \frac{(o - \sum)^2}{\sum}$$

X^2 = cal value

X^2 tab = $Xdf(\alpha) = X^2_{(5-1)(0.05)} = X^2_{4(0.05)}$

4 at 5%-9.49 tabulated.

Descriptive statistics as provided by the SPSS 17.0© and MS Exel 2010 software were 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 determined using the Pearson Product Moment Correlation Coefficient(r).

Results

A test of homogeneity in mean prevalences of fascioliasis in cattle across the sampling locations revealed significant difference F(16.24)>Fcrit(4.04) at P<0.05.

Table 1 showed the distribution of fascioliasis in cattle slaughtered in selected abattoirs in Imo State, Nigeria. Out of 2,400 cattle examined, 560 (23.3%) were infected. Infection varied from one abattoir to another. Peak infection was at Okigwe abattoir(34.2%), followed by Achingali(28.7%), Orieagu(25.6%), Orlu(6.5%) and Afor Ogbe(4.5%). Table 2 showed the distribution of the infection according to sex. Of the 1,580 males examined, 521(33.0%) were infected while the 820 female cattle examined recorded 39(4.8%) infection prevalence. Age related distribution of *F. gigantica* in cattle in Imo State is shown in table 3. Out of 2,308 adult cattle examined, 558 (24.2%) were infected, 2(2.2%) out of 92 young cattle examined were infected.

Table 1. Prevalence rate of fascioliasis in cattle slaughtered in Imo state, Nigeria.

Abattoir Location	Number Examined	Number Infected	% Infected
Afor Ogbe	790	138	4.5
Orieagu	500	128	25.6
Okigwe	480	164	34.2
Orlu	230	15	6.5
Achingali	400	56	28.7
Total	**2,400**	**560**	**23.3**

Table 2: Sex related distribution Of Fascioliasis In Cattle Slaughtered In Selected Abattoirs in Imo State, Nigeria

Ruminant	Abattor location	Males			Females			Total number examined	Total number infected
		Number examined	Number infected	% infected	Number examined	Number infected	% infected		
Cattle	Achingali	450	115	28.8	0	0	0.00	400	115(28.7)
	Okigwe	450	156	34.5	30	8	26.7	480	164(34.2)
	Orlu	40	10	25.0	190	5	2.63	230	15(6.5)
	Orieagu	340	110	32.4	160	18	11.3	500	128(25.6)
	Afor Ogbe	350	130	371	440	8	1.8	790	138(4.50)
	Total	**1580**	**521**	**33.0**	**820**	**39**	**4.8**	**2400**	**560(23.3)**

Table 3: Age related distribution of *fasciola gigantica* in Imo State, Nigeria

Abattoir location	Adult cattle (>2yrs)			Young Cattle (<2yrs)		
	Number examined	Number infected	% infected	Number examined	Number infected	% infected
Afor Ogbe	782	136	17.4	8	2	25.0
Achingali	320	115	36.0	80	0	0.0
Okigwe	478	124	26.0	2	0	0.0
Orlu	228	55	24.1	2	0	0.0
Orieagu	500	128	25.6	0	0	0.0
Total	**2308**	**558**	**24.2**	**92**	**2**	**22**

Table 4 showed the monthly distribution, prevalence and mean worm load of *F. gigantica* in slaughtered cattle in Imo State, Nigeria. Out of 2,400 cattle examined from September 2004 to September 2005, 560(23.3%) were infected. Total number of parasites was 674, while total mean worm load (XWLD) was 25.5. Rainfall range was between 0.00mm to 500.7mm through the year.

Table 4: Monthly Distribution, Prevalence and Mean worm Load of *F. gigantica* among slaughtered Cattle in Imo State, Nigeria

Year/months	Rainfall (mm)	Number examined	Number infected	% infected	Total no of parasite	Mean worm load
September 2004	309.1	250	33	13.2	73	2.2
October 2004	322.9	200	42	21.0	65	1.54
November 2004	37.0	220	102	46.4	71	0.69
December 2004	0.0	300	66	22.0	12	0.18
January 2005	38.3	161	75	46.6	20	0.26
February 2005	84.3	199	48	24.1	13	0.34
March 2005	103.1	29	13	45.0	20	1.5
April 2005	182.2	200	18	9.0	28	1.55
May 2005	469.8	121	17	14.0	30	1.76
June 2005	500.7	150	13	8.7	100	7.69
July 2005	260.0	200	19	9.5	120	6.31
August 2005	190.5	250	95	38.0	80	0.84
September 2005	490.6	120	19	15.8	42	2.2
Total		**2,400**	**560**	**23.3**	**674**	**25.51**

Table 5 showed the sex related egg counts of *F. gigantica* in cattle in the study area. Of 521 infected male cattle, 61(75.3%) had egg counts of 0-49, 10(12.3%) were having egg counts of 50-99, while 10(12.3%) had egg counts of 100-149. Amongst the infected females, 23(59.9%) had egg counts of 0 – 49, 10(25.6%) had egg counts of 50-99, 4(10.3%) had egg counts of 100-149. total number of cattle infected was 120 (7.5%).

Table 5: Sex Related Egg Counts of *Fasciola gigantica* in Cattle

Eggs/5grammes of feces	Number of infected male cattle	Number of infected female cattle	Total number of infected cattle (%)
0-49	61(75.3)	23(59.9)	84(70.0)
50-99	10(12.3)	10(25.6)	20(16.7)
100-149	10(12.3)	4(10.3)	14(11.7)
>200	0(0.0)	0(0.0)	0(0.0)
Total	**521**	**39**	**120(7.5)**

DISCUSSION

The results of the present study showed that 23.3% of the cattle were infected with fascioliasis this is inline with previous researches carried out by (Alonge and Fashami,1979, Okoli et al,2000, Shillhorn Van Veen et al,1979) on liver condemnation of ruminants in different slaughter houses in the country. Fascioliasis is therefore one of the commonest reasons for liver condemnation in the study area. Infection varied from one abattoir to another and may have been influenced by the varying ecological and climatic conditions of the areas where they must have grazed upon before getting to the abattoirs (Agbola, 1979), (Aladi, 1999). Highest infection rate was recorded in Okigwe abattoir (34.2%). Okigwe is known to have the largest cattle market in the area and therefore plays host to cattle imported from the northern part of Nigeria. This agrees with the work of Anosike (2005) on prevalence of parasitic helminthes in ruminants in Etiti area of Imo State, Nigeria. The area is criss-crossed with exposed and contaminated water bodies with aquatic vegetation surrounding them, these vegetation supports the growth of vector snails that carry the transmitting parasite (Njoku-Tony, 2007). Okigwe area also shares common boundaries with some contaminated and endemic states as Abia State, Enugu State and Ebonyi State (Nduka et al, 1995). It was observed that more male cattle were brought to the abattoir for slaughter.(Anosike et al,2005). This factor hindered proper assessment of the females and made the determination of the prevalence rate of the disease in the females a little difficult. However the few that were examined had the infection. (Njoku-Tony, 2007). Infection was both high and serious in adult cattle than the young cattle. This suggest that there could be resistance of the infection by young cattle or their intestine are too tender for worm attachment. (Hill and Onabamiro, 1975). Young cattle are not subjected to long distant movement along their trade route and this may have reduced their chances of picking the infection while grazing (FAO, 1999). Adult cattle on the other hand must have grazed on contaminated areas while traveling through their trade route from the north (FAO,1999). Monthly distribution, prevalence and mean worm load(XWLD) of *F.gigantica* in cattle revealed a gradual rise in infection with increased rainfall. Highest infection was between April and September (Folorunso and Ogunsusi,2000). The manifestation of high rate of infection during the rainy season suggests that goats must have picked the infection during the late dry season (LDS) and the early rainy season (ERS). This correlates with the work of Okoli (2002).

These are seasons with little or no rains and coincide with the bionomics of their snail intermediate host (Fabiyi and Adeleye, 1987).There is however significant relationship between the mean worm load and the egg counts in the parasite. Nevertheless, mean worm load (XWLD) does not show any significant physical manifestations as infected cattle still look healthy (Okoli et al,2000). The prevalence rate of this infection in cattle however is of public health and veterinary interest and calls for the need for improved surveillance and adequate sanitation programme.

CONCLUSION

This present study therefore reveals that fascioliasis is one of the parasitic diseases leading to liver condemnation in ruminants and other grass eating animals in the study Area. The 23.3% prevalence of the infection therefore calls for adequate environmental and veterinary health enlightenment programme for early detection of infected animals by cattle rearers in the study area.

Acknowledgment The author is grateful to the Department of Animal and environmental biology, Evan Enwerem University, Owerri. I also acknowledge Prof. B.E.B Nwoke and Prof. C.N. Ukaga for their support.

Corresponding Author:
Dr Njoku-Tony, R.F
Department of Environmental Technology
Federal University of Technology, Owerri.

REFERENCES

1. Andrew, C. E, Milles, B.M and Ethune, S. (1990). A survey of the intestinal nematods of business in Namibia. *Journal of tropical Medicine and Hygiene*, 42 (3) 243-247.
2. Anosike, J. C.; Opara M. N., Okoli, G.C., Okoli, I. C. (2005). Prevalence of Parasitic helminthes among ruminants in Etiti Area of Imo State, Nigeria. *Animal Production Research Advance* 1(1): 13 – 19.
3. Agboola, J.A. (1979). Agricultural atlas of Nigeria. Oxford University Press, Oxford, London.
4. Alonge, D.O. and Fasami, E.F. (1979). A survey of abattoir data in Northern sNigeria. *Tropical Animal Health Production* 1: 57-62
5. Aladi, N.O (1999). Current trends in the production, handling and sales of meat in Nigeria. Agricultural Technology Project report, Federal University of Technology, Owerri.

6. Asumu, D. I. (1975). Studies on the Biology of snails and their larval trematodes in Ibadan fresh water system. Ph.D Thesis, University of Ibadan.
7. Fabiyi, J. P. and Adeleye, G.A. (1982). Bovine Fascioliasis on the Jos Plateau, Northern Nigeria with particular reference to economic importance: *Bulletin of Animal Health production of Africa* 30(1): 41 – 43.
8. Fleck and Moody (1988). Diagnostic Techniques in medical Parasitology. *Butterworth and Co. Ltd London.*
9. Folorunso, O. R. and Ogunsusi, R.A. (2000): Prevalence of Fasciola and Paramphistomum Specie infection in slaughtered cattle in Ondo State. Book of Proceedings, 28th annual NSAP Conference, 19th – 23rd March, 2000 Umudike.
10. FAO (Food and Agricultural Organization) (1999). Report of the expert consultation in helminth infections of livestock in developing countries. Rome Italy. Pp 23 – 27.
11. Hill, D.W. and Onabamiro S.D. (1961) sited in Enyenihi, U.K. (1975). *Bulletin of Animal Health and Production of Africa* 23(3) 289.
12. Hyera, J.M.K. (1984). Prevalence, seasonal variation and economic significance of fascioliasis in cattle as observed at Irianga abattoir between 1976 and 1980. *Bulletin of animal Health production in Africa.* 32:356 – 359.
13. IMSG (Imo State Government) (1993). Directory of Primary schools and their requirement in Imo State Ministry of Education, Owerri, Imo State, Nigeria P.81.
14. Nduka, F.O., Ajaero, C.M and Nwoke B.E.B (1995). Urinary Schistosomiasis among school children in an endemic community in South eastern Nigeria. *Applied Parasitology.* 36 (1): 34-40
15. 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.
16. Ogunrinade, A.F. and Okon, E.D. (1981): The prevalence of Bovine fascioliasis in Nigeria. *Bulletin of Animal Health Production in Africa* 29:351 – 387.
17. 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 Production in Africa* 48: 7 – 11.
18. Okoli I. C. (2001). Analysis of abattoir records for Imo State, Nigeria, 1995 – 1999: I. Disease incidence in cattle, sheep and goats. *International Journal of Agriculture and Rural Development*, 2: 97 – 103.
19. Okoli, I.C, Nwokocha, J.R, Okoli, C.G and Ogundu, U.E (2002). Prevalence of fascioliasis and oesophagosto miasis among slaughter animals in Imo State, Nigeria and their relation with emaciation disease at ante-mortern. *Tropical veterinaria* 20(3):139-148
20. Schillhorn Van Veen, T.W., Shonekan, R.A.O. and Fabiyi, J. P. (1974). A host parasite checklist of helminthes parasites of domestic animals in Northern Nigeria. *Bulletin of Animal Health Production in Africa* 23(2): 269 – 288.
21. WHO (1999) – Report of the WHO information consultation of schistosomiasis control. Geneva. December 1998 WHO/CDS/SIP/99.2

4th Feb. 2011