



The Prevalence of Liver Flukes In Cattle Sheep and Goat: A Case Study of Kuje Abattoir F.C.T Abuja

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Abstract

The prevalence of liver flukes infection in ruminant across sexes, breeds and ages (cattle, sheep and goats) slaughtered at Kuje Area council abattoir was investigated. A total of one thousand one hundred and forty nine (1149) animals were sampled at the abattoir from July – October, 2012. Seven hundred and sixty two (762) cattle, one hundred and sixty seven (167) sheep and two (220) goats were sampled. Ante-mortem and post-mortem inspection were carried out during the investigation. During post-mortem examination of the body constitution, weight infestation level of the animal were carried out prior to slaughtering and after during the period of investigation. Thirty-three (4.33%) cattle both male and female were infected with Fasciola species, 2 (1.19%). One 1 (0.45%) were infected with Fasciola gigantica. Two hundred and nine, (14.83%) Fasciola species found in male, 1184 (83.03%) species found in female cattle. 11 (0.78%) Fasciola species found in male sheep 2 (0.14) found in female sheep, 3 (0.21%) species found in male goats. Due to severity and heavy infestation of Fasciola species in female adult cattle in which one had up to a load of 150 Fasciola species in the liver. The cattle were highly emaciated accompanied with loss of weight prior to slaughter, and remarkable damage to the liver. This resulted in low level of the plane of nutrition in such animal with the result of fibrous meat quality due to activities of the parasites. The result established significant presence of Fasciola gigantica in the ruminant animals (cattle, sheep and goats) slaughtered at the Abattoir.

Introduction

Meat derived from cattle, sheep and goats provides major sources of animal protein for the people of Nigeria, (Eweunife and Eneanya, 2006). Nigeria is blessed with high population of livestock and a vast grazing land, estimating the cattle population in Nigeria to be 13.9 million, (Rim, 1992). The figures indicated were the actual census conducted by the Resource Inventory Management Limited in 1992. All other subsequent yearly figures are projected. The 2001 estimated livestock population comprises about 15.6 million cattle, 28.69 million sheep and 45.26 million goats. This shows an increase in population when compared with the report on research done by Rim (1992) and FMARD (2001). Livestock population is found mostly in the northern part of the country, therefore, cattle, sheep and goat is the main stay of livestock industry. The average body weight of Nigerian adult cattle (white Fulani) was; bull 350-665kg and adult cow 250-380kg, (Tawah *et al.*, 1996). It is expected that the rate of protein consumption in Nigeria would be high. Shortage of protein much especially that of animal origin is prevalent in parts of Africa where it is estimated that on the average, 10g of animal protein is consumed per day, compared to the recommended daily intake of 35g (FAO, 1986). Also it has been reported that the average Nigerian consumes only 4.5gm of animal protein per day which is below the F.A.O. recommended value of 35gm, (Atsu, 2002). It is important to avoid losses in flocks and herds from diseases and parasites. Livestock disease, whatever their etiological agents, either mild or severe have some economic importance to the stock raising and ultimately to the region where the disease occurs, (Ogunsusi, 1980).

These ruminants incidentally serve as definitive host to the parasitic helminthes, trematodes of the family, *Fasciolidae*, commonly known as liver flukes. There are various species of these but economically important one, *Fasciola gigantica* in the tropics and *Fasciola hepatica* in the temperate region, (Tolosa and Tigre, 2007). Fascioliasis caused by *Fasciola gigantica* is one of the most important hepatic diseases causing economic losses in ruminants. Apart from its great veterinary importance throughout the world, it is also a known zoonosis affecting a number of human populations, (Adekunle et al., 2008). *Fasciola gigantica* is a parasite of the liver and bile ducts of cattle, sheep and goats and wild ruminants in Africa and Asia. It is of great veterinary importance, causing the disease fascioliasis in cattle, accounting for considerable economic loss annually (Ukoili, 1990).

In the tropical countries information about *Fasciola gigantica* infection in animals is derived from abattoir records of slaughtered animals particularly bovine. Although data from abattoir is useful for identification of problems and may be used to reveal the prevalence, seasonal variation and economic importance of the diseases, it does not avail any information regarding the development of disease in live animal, (Ekwunife and Eneaya, 2006). The objective of this study was To determine the prevalence of liver flukes in cattle, sheep and goats slaughtered in Kuje Area Council of FCT Abuja. and to examine the period in which animals are most affected, in the area. determine the route of the animals coming to the slaughters abattoir and to examine the effects of infestation in the livestock

Materials and Methods

Study Area

This research was carried out at Kuje Area Council abattoir. Kuje Area council is one of the six Area councils in the Federal Capital Territory Abuja. The area council is located on latitude 8.89oN north of the equator and on longitude 7.24oE of the prime meridian on the map of the world. The climatic condition is tropical continental with a distinct wet and dry season. The rainy season occurs from April-October and the dry season from November – April, with an annual rainfall of 1100mm-1600mm. The temperature ranges between 30°C-37°C (Nigeria physical setting, Abuja, 2003).

Kuje area council shares boundaries with Municipal area council in the north, Gwagwalada area council in the west, Abaji area council in the south and Toto Local Government Area of Nasarawa State in the East. The area council is about 25km to Nnamdi Azikiwe International Airport (Nile Guide, 2011).

Kuje area council has a population of about 128,109 people, predominantly farmers, with a land mass of about 1,800sq kilometer with a favourable climate for agricultural production. The main farm produce of the area are:- Yam, Maize, G/corn, Mellon, G/nut, Plantain and Timber exploitation. The Agricultural land support livestock production with good number of Fulani herdsmen and other tribes that are into cattle, sheep, goats and pigs farming with also large poultry farms. There are thick forests and good number of hills among which are undulating and flat land that support agricultural production. The area council support Federal Capital Territory with 30% farm products. Kuje area council has Gade, Gbagyi, as the major tribes with other tribes like Basa, Hausa, Mada, Egbira, Igbo, Yoruba and other tribes as settlers,(Nigeria Physical setting Abuja, 2003).

Research Animals

Cattle, sheep and goats were brought from Kuje and environs, Tunga and Lambata cattle market in Niger state, Lafia cattle market in Nasarawa State, Kastina and Zamfara cattle market in northern Nigeria.

Data Collections

Visitations were made to the abattoir to collect samples of *Fasciola spp*s from slaughtered animals (cattle, sheep and goat), slaughtered very early in the morning for the period of study. Before the animals were slaughtered, anti-mortem inspection was carried out on the animals physically. Post-mortem examination were conducted through the assistance of the veterinary officer attached to the abattoir on all the organs of the animal including liver, lungs, intestine and other visceral organs. The liver of all ruminant animals slaughtered in the abattoir were incised and examined for *Fasciola species* by making length wise incision of the ventral side of the liver in such a way that the bile duct is cut open. The total number of liver flukes found on each of the animal, were recorded.

The total number of cattle sheep and goats were recorded according to their ages, sexes, breeds and their source. The liver flukes found were properly washed and put in a transparent container containing preservative chemical (formaldehyde) for preservation and morphological and species identification. Other findings, apart from liver flukes were also recorded.

Data Analysis

Data analysis were done using simple statistical description and inferential statistics using simple percentages concerned with discovering, clarifying of relationship among variables (Ekwunife and Eneaya, 2006) and the use of t-test.

Results

The results presented in Table 1 for the sampled animals recorded indicated that diarrhoea was a common health condition in cattle (white fulani) ,Sheep and Goats brought for slaughter at the Abattoir. The exception was the case of Dermatophilosis in Red Bororo cattle.. The breeds of cattle were those of Red Bororo and white Fulani with average age of 7years and average weight of 380kg. The breeds of sheep were Yankasa, West African Dwarf and Balami with average weight of 38kg and average age of 4years. In Goats, the breeds were those of West African Dwarf and Red Sokoto and weighed 32kg on average lower than sheep with 38kg but averaged the same age of 4years. Table 2 is the sum total of the number of animals slaughtered and recorded according to breeds and sexes. Total number of cattle slaughtered were 762 with 503 Bulls and 259 cows. Sheep were 167 in number with 141 Rams and 26 Ewes. Goats were 220 in number with 149 Bucks and 71 Does. Total across breeds and sexes slaughtered were 1149 animals. Table 3 is a vivid distribution of all animals slaughtered during the period of study across sexes and breeds on monthly basis. A sum total of 1149 of animals including cattle , sheep and goats were slaughtered. In the month of July a total of female and males slaughtered were 170, August 372 ,September 381 and October 226 totally 1149 animals. Table 4 is the number of *Fasciola gigantica* pathogenic parasites recorded according to breeds and sexes expressed in percentages. Male cattle recorded 209(14.83%) while the females recorded 1184(84.03%). Male Sheep recorded 11(0.7%) while the Ewes recorded 2(0.14%). Male Goats recorded 3(0.22%) while there no liver fluke recorded in the case of females.

Table 1: Types of animals, average weight, breeds and status of health

Animal	Average age	Breed	Diseases/condition observed	Average weight of animals
Cattle	7 years	White Fulani	Diarrhoea	380kg
Sheep	4 years	Red bororo	Dermatophilosis	38kg
		Yankasa	Diarrhoea	
Goat	4 years	WAD sheep	Diarrhoea	32kg
		Balami		
		WAD goat		
		Red sokoto		

Table 2: Total number of animals sampled according to sexes

Animals	Sex		
Breed	Male	Female	Total
Cattle	503	259	762
Sheep	141	26	167
Goat	149	71	220
Grand total	793	356	1149

Table 3: Total numbers of animals (cattle, sheep and goats) slaughtered on monthly bases

Month	Animals	Number slaughtered		
Month	Animal	Male	Female	Total
July	Cattle	57	42	99
	Sheep	20	6	26
	Goat	25	20	45
Total		102	68	170
August	Cattle	177	75	252
	Sheep	49	3	52
	Goat	47	21	69
Total		273	99	372
September	Cattle	175	88	266
	Sheep	42	13	56
	Goat	47	16	63
Total		264	117	381
October	Cattle	94	54	148
	Sheep	30	4	34
	Goat	30	14	44
Total		154	72	226
Grand total		793	356	1149

Table 4: Total number of liver flukes sampled in the animal according to sexes animal (Number and percentages of fasciola species found in animal according to sexes)

Breed	Male	Female	Total
Cattle	209 (14.83%)	1184(84.03%)	1393(98.86%)
Sheep	11(0.78%)	2(0.14%)	13(0.92%)
Goat	3(0.22%)	=	3(0.22%)
Grand Total	223(15.82%)	1186(84.17%)	1409(100%)

Discussion

The result obtained from this research indicates that there was prevalence of *fasciola species* in Kuje and its environs. Out of seven hundred and sixty two (762) cattle sampled in Kuje abattoir, thirty three (33) cattle had *fasciola gigantica* in their liver. Other studies across the country also indicate the prevalence of *fasciola species* in the area they covered, (Ekwunife et al., 2006; Ibronke, 2010 and Olusegun et al., 2011).

Base on the information gathered from cattle dealers and the butchers in Kuje area council indicate that, seventy percent (70%) of the ruminants (cattle, sheep and goats) slaughtered in Kuje abattoir were brought from other states. This report agreed with the research conducted at Onitsha abattoir in eastern and western part of the country (Ekwunife et al., 2006). The states where most of the animals were bought include; Niger, Nasarawa and other northern state of Nigeria. The research reveals that cattle brought from Nasarawa State has the highest number of *Fasciola species* when compared to other states and the Federal Capital Territory (F.C.T).

It was also observed that, female ruminant animals were more infected than the males. Female had 84%.03% as against 14.83% in male. Highly matured female cattle had more fasciola infection than young ones. This could be as a result of cattle farmers keeping female ruminant animals longer in years and accumulate more in number than male for the purpose of reproduction. Pregnant females were not usually permitted to be de-wormed because of the phobia of abortion. Observation and information revealed that, that action could increase their survival rate and becoming tolerant to infestation. It could also be that, during nursing of their young ones, the female will always want to graze near the river banks where there is fresh pasture and incidentally high presence of snail which host metacercariae. Since the farmers have no technical ability to detect tentative signs that could be identified as effect of fascioliasis, animal will have full load of the flukes for years without the farmer identifying and treating the animals of infestations.

The differences found between the prevalent rate in cattle, sheep and goat could be that, cattle which had infestation rate higher were because they spend more time on grazing grasses which could already had snail infestation and consequently may be infested with flukes, and unless in the absence of grasses, cattle will not graze on other feeds. Other animals like sheep and goats had less infestation probably because they always grazed behind cattle. They may have less changes of feeding on grasses that are infested. Goats which mostly do not graze like other ruminant animals depend mostly on herbs that are on hills which has less intermediate host for liver flukes. (Nayeb et al., 2011).

The prevalence of *Fasciola gigantica* on animal could be due to geographical location and seasonal variation, (Olusegun et al., 2011). This study was done during the rainy season, and that was the time snail which harbour metacercariae, survive and multiplied, because of that, animals ingest high number of the worms. In the southern part of the country were the rate of rainfall is high, there is a tendency of high infestation rate and snail survival because of that, there is high prevalence in the south than in the north, Ekwunife et al. (2006).

Reasonable numbers of infected liver with heavy flukes are hard, small with rough and uneven surface, with lots of fibrous tissues. During the research, it became clear that the infected liver were not condemned rather all are sent to the market for human consumption. Humans could easily be affected through the consumption of infected liver. This could cause serious problem to human health.

Conclusion

It was discovered that Fascioliasis had a high prevalence in the animals slaughtered in the study area which indicated severe liver damage from the animals sampled. Apart from these, other additional losses such as general weight loss, lower milk production, and impaired

reproductive performance were of greater economic importance. The management practices would have no doubt contributed to intense infestation, and heightened by the infestation of helminthes in livestock, consequently resulting in low production and reproduction generally.

References

- Adekunle, A.O. and Ayinmode, A.B. (2008). Seasonal prevalence of *Fasciola gigantica*, infections among the sexes in Nigeria cattle. *Veterinary Scientists* 7 (3) 143 – 145.
- Animals (1998). Proceeding of the viii symposium of the international society of veterinary epidemiology and economic, Rome. Pp 8 – 9.
- Ansari-Lari, M. and Moazzai, A. (2006). A retrospective survey of liver flukes disease in livestock base, on abattoir data in Shiraz, south of Iran, *Prev. vet. Med.* Pp 73, 93 – 96.
- Ashrafi, K. and Massoud, J. (2004). Evidence suggesting that *Fasciola gigantica* may be the most prevalent causal agent of fascioliasis in Northern Iran. *Iranian Journal of public Health*, Pp 33:31-37.
- Atsu, D.W. (2002). Contributory role of animal production in National development: Proceeding of 7th Annual Conference. Animal Science Association of Nigeria. (ASAN).
- Behn, C.A and Sangster, N.C. (1999). Pathology, pathophysiology and clinical aspect, *In: Dalto, J.P. Fasciolosis*, Wallingford, Oxon, UK CAB, Pub: Pp 31 – 46.
- Best, T.W. (1970). Engleword Cliff, N.J. Prentice Research in Education 2nd Edition, hall.
- Borary, J.C. (1995). Flukes of domestic animal. World Animal Science series.
- Curry, J.J., Huss, Perry, R.A and Mukhebi, A.W. (1996). A frame work for the analysis and livestock disease control, with examples from Vasin, Gishu district, Kenya.
- Baker, M.J. (2009). To identify beef cattle parasite. Northern New York Agricultural Development Program, Cornell University, 607-255-5923; Clinton country.
- Ekwunife, C.A. and Eneanya, G. I. (2006). *Fasciola gigantica* in Onitsha and environs, *Animal Research International* 3(2) 444-450.
- Esteban, J.G., Bargues, M.D. and Mas-coma, S., (1998). Geographical distribution, diagnosis and treatment of human; a review 58, 13-24.
- Weather, F.I., Boray, J.C. (1999). Fasciolicide efficacy, action, resistance and its management. *Vet. Journals*, 158(2)-122.
- F.A.O. (1986). Food and Agricultural Organization, African Agriculture, the next 25 years.
- Farid, H. (1997). Human infection with *Fasciola hepatica* and *Dicrocoelium* in istahan area, central J, ran, *J. parasitol.*
- FMARD (Federal Ministry of Agriculture and Rural Development) (2003). Report of the presidential committee on livestock, volume one, consolidated report. Department of livestock and pest control services.
- Fischer, M.S. and Ralph, S.R. (1989). *Manual of tropical veterinary parasitology*, English edition, published by C.A. international; Wallingford.
- Hall, H.T.B. (1977). *Disease and parasite of livestock in the tropics*; Longman publisher: London, Pp 174.
- Hassan, A.Z. and F.B. (2003). *An introduction to veterinary practice*, Ahmadu Bello University press Ltd: Zaria Nigeria.
- [Http://www.Standord.Edu/class/humbio103/parasites](http://www.Standord.Edu/class/humbio103/parasites). (2001). Retrieved on 10/09/2012.
- Hutchison, G.W. and Love, S. (2007). Prime facts. Liver flukes disease in sheep and cattle (March, 2007).
- Ibara, F. and Vera-quiroy H. (2004). Determination of the effective dose of an experiment, Fasciolicide in naturally and experimentally infected cattle. *Vet. Parasitology* 120 9 (1-2): 65-74.

- Igbedio (1993). Under Nutritional in Nigeria Dimension. College of Food Technology, University of Agriculture Makurdi Nigeria.
- Jain, P.C. (2002). General veterinary parasitology, published by Jay pee brothers: India, pp 112.
- Lloyd, J., Boray, J.C. and Campbell, N.J. (2001). Identifying liver snails; Prime fact: 476.
- Mas-coma, S. (1988). Small mammals, a natural definitive host of the liver flukes.
- Mas-coma, S. (2004). Human fascioliasis epidemiological pattern in human endemic area of South America, Africa and South East Asia, Journal Trop. Med: Public health.
- Moghaddam, A.S., Massoud, J. and Mas-coma, S. (2004). Human and animal fascioliosis in Mazandaran province northern Iran, 94:61-69.
- Ndarathl, C.M. Wagghela, S. and Semenyé, (1989). Bulletin of animal health and production in Africa, 37:205-208.
- Nile Guide Project. (2011). NG and U=utt;p//www.Localyte.Com/attraction/57084=Kuje-Nigeria.Retrieveon03/09/2012.
- Nigeria Physical Setting Abuja. (2003). Ww.onlineNigeria.Com/linkabujaad.
- Ogunsusi, R.A. (1980). A brief analysis of the major ruminant animal, Nigeria Journal of Animal production; Pp 3,18-27.
- Olusegun, J.T.S. (2011). Prevalence of fascioliasis in cattle, department of biological science, Yaba college of Technology, Yaba Lagos Nigeria.
- Olusi, T.A. (1997). The prevalence of liver helminth, parasite of ruminants in Maiduguri, Borno State, Nigeria. Bulletin of Animal Health and Production in Africa: 44:151-154.
- Raji, M.A. (2010). Pathological condition and lesson observed in bovine, Academic Journal of full length research paper.
- Kaplan, R. (1994). DVM. Department of infection Disease at the university of Floridas College of veterinary Medicine.
- Rim. (1992). Nigeria livestock resources, four volume reports presented to the Federal Government of Nigeria by Resources Inventory and Management Ltd (1) Executive summary and atlas, (2) National synthesis (3) State report (4) Urban reports and commercially managed livestock survey, Roherdan, University, press.
- Roberts, J.A. (1997). Acquisition of resistance against *Fasciola gigantica* by Indonesian thin tail sheep. Vet parasitol 73 (3-4): 21-24.
- Sallow, B. (1998). Impacts of trypanosomiasis on Africa Agriculture, proceeding of the 24th ISCTRC Meeting, Maputo: 29th September to 31th October, 1997, in press.
- Schillhorn, Van Veen, T.W. (1976). Tropical Animal Health and Production: 8.243-247.
- Soulsby, E.J.L. (1996). Helminths, Arthropod and Protozoan of domesticated animals. Reprinted edition, Baillere Tindall and Cassessell LTD: London.
- Tarah, C.L. and Rege, J.E.O. (1996). White Fulani Cattle of West and Central Africa.
- Tolosa, T. and Tigre, W. (2007). The prevalence and economic significance of Bovine Fascioliasis at Jimma, Abattoir, Ethiopia. The internet journals of Veterinary medicine: 3(2): 1 – 10.
- Williams, G. and Payne, W.J.A. (1982). An introduction to the Animal Husbandry in the Tropics 3rd edition and Longman UK 266-300.