Prevalence of *TaeniaSaginata* and *Fasciola Hepatica* in Cows and Goats Slaughtered in Mbale Municipality Abattoir

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Abstract:- **The main purpose of this study was to assess the prevalence of *Taeniasaginata* and *Fasciola hepatica* in cows and goats slaughtered in Mbale Municipality abattoir and to compare the prevalence rate of those parasites among the gender of cows and goats. Also to assess the level of knowledge among the local communities rearing the animals in regards to prevention and control of helminthes infestations. A quasi experimental design was used in this study. One hundred (100) tissue samples of liver, tongue and muscles of the cows and goats each were collected in well labeled polythene bags, taken to the parasitology laboratory for analysis using Postmortem method. One hundred and fifty (150) questionnaires were randomly distributed to the respondents. The results showed that the prevalence of *Taeniasaginata* and *Fasciola hepatica* was significantly higher in cows than in goats slaughtered in Mbale abattoir. Prevalence did not show a significant variation among the male and female cows and goats. The level of education among the local communities in Lira and Mbale significantly influenced the mode of animal grazing and source of drinking water for animals, while mode of meat consumption and defecating sites were not significantly influenced by the level of education. Based on the findings, the study recommended that public should be made aware of the helminthes infection (*Taeniasaginata* and *Faciola hepatica)* and the need to prevent their animals from getting into contact with these parasites so as to reduce their infestation rates. Further still, the government should assist farmers acquire drugs to deworm their infected animals and also offer extension services to them, sensitizing farmers on the knowledge of prevention and control of *Taeniasaginata* and *Faciola hepatica.***

Key words: **Prevalence, *Taeniasaginata, Fasciola hepatica*, cows, Goats and Abattoir.**

I. INTRODUCTION

Background to the Study

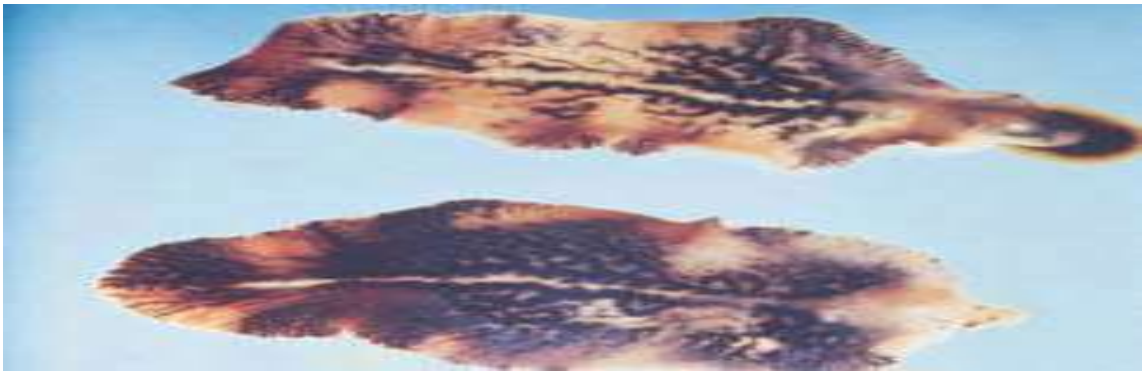
Taeniasaginata and *Fasciola hepatica* are helminthes belonging to phylum Platyhelminthes (Abuseir*et al.*, 2006). Helminthes are worms with many cells that inhabit the human gut. These include Nematodes (roundworms), Cestodes (tapeworms), and Trematodes (flatworms) (Fan, 1988). These organisms are multicellular with complex reproductive life system and life cycles involving an intermediate host for the development of larval stages and a definitive host for the adult form as infectious stage to affect the animals.

The helminthes' parasites which invade the host possess morphological features, for example the body of Cestodes is divided into three parts, the head (scolex), neck and proglottids. The head of Cestodes possesses suckers which are used for attachment to their hosts. The head of some of these species may also possess hooks. Cestodes are generally called tapeworms because of the body is tape of leaf-like (Aubry*et al.*, 2005). On the other hand, Trematodes are all parasitic when adults and they may be ecto or endo parasites of vertebrates. Their body is covered with complex teguments and the adults lack cilia. They have one or more suckers which they use for attachments to their host (Babalola, 2006).

These intestinal parasites cause a significant morbidity and mortality in endemic countries as reported by Eckert, (2005). For example they could affect the performances of cows and goats in terms of fertility rate or even loss of lives. Diseases caused by these parasites are common in Africa, some parts of Eastern Europe, the Philippines, and Latin America Somers, Morse and Stephen,(2010). These parasites are found in places where beef is eaten even in countries such as the United States with strict federal sanitation policies. In the US however, the incidence of infestation is low, but 25% of cattle sold are still infected (Larry & John, 2009). The total global infestation is estimated to be between 40 and 60 million Eckert, (2005).

FIGURE 1

FIGURE 2



II. MATERIALS AND METHODS

Study Area

Location

Mbale district is located in the Eastern Region of Uganda. The population of the district is estimated at close to a 500,000 thousand people. It lies within the geographical coordinates of longitudes 33^0 20' East and 0^0 50 North (fig.1).

Figure 3.3: Location of the Study districts in Eastern Uganda

Climate

The district of Mbale receives rainfall which ranges 1200mm to 1800mm per annum. The district was characterized by reduced rainfall during the December to February period, this will likely increase water stress for crops and may lead to scarcity of water for domestic use during that period. Higher rainfall in the wet seasons (March, April, May and September, October and November) can be expected to increase erosion. Overall, a clear trend of more rainfall throughout the year is apparent ADF, (2010).

The district has the maximum temperatures ranged between 30.2 ^{0}C and 17.2 ^{0}C. Minimum temperature ranged between 13.7 ^{0}C and 12.9 ^{0}C. There has been an increase in temperatures between 0.4 ^{0}C and 1.2 ^{0}C in mean monthly temperatures in Mbale during the 2001-2011 periods ADF, (2010).

Research Design

The quasi Experimental research design has been used in this study (which comprises the use of laboratory analysis and questionnaire). This involved random sampling of cows and goat's meat in Mbale municipality abattoir in order to determine the occurrence of *Taeniasaginata* and *Faciola hepatica*. At the source of the animals slaughtered in Mbale abattoir (Lira and Mbale districts), purposive sampling of households that rear cows and goats was done. The questionnaires were issued to household heads.

Collecting data on the prevalence of Taeniasaginata and Fasciola hepatica

Collection of tissue samples

Inspection of the animals was made while at rest and in motion for any obvious sign disease. It also involved the visual examination of carcasses and tissue with keen attention being directed to livers, tongues and muscles and incision of suspected tissues. A total of 200 tissue samples (liver, tongue and muscles) were collected from cows (100) and goats (100) slaughtered in the Mbale municipal council abattoir. Less than 1/4kg of each tissue were collected and packed in to well label polyethene bags and taken to the parasitology laboratory for analysis at Islamic University in Uganda Mbale main campus.

Laboratory screening of tissues

Postmortem examination was conducted to screen the tissue samples for the presence of *Taeniasaginata and Faciola hepatica*. The examination was done by incising the tissue and pressed with the thumb and holds firmly on the slab. However, during the incisions some of the liver fluke was found (Gracey& Huey, 1999). The incised tissue sample was stained using 10ml of 10% formalin and was allowed to dry for 10 minutes. The stained tissue was viewed under light microscope at x10 and x40 magnifications Abusier*et al.*, (2006)[1] and (CFIA Meat Hygiene Manual of Procedures, Section 4.6.1, 2007).

Identification of the worms

Parasites of *Taeniasaginata* and liver flukes of *Faciola hepatica* were identified after the viewing of stained tissue under the light microscope and then were recorded to show the infestation level among the cows and goats slaughtered in Mbale abattoir.

Statistical Analysis

The data were coded, entered and then analyzed using Statistical Package of Social Science (SPSS) program, version 20. Descriptive results were presented as frequencies and percentage to assess the prevalence rate of *Taeniasaginata* and *Faciola hepatica* among cows and goats. Chi-square was also used to compare the prevalence rate of *Taeniasaginata* and *Faciola hepatica* among the gender of cows and goats.

III. RESULTS AND DISCUSSIONS

A total of 200 animals (100 cows and 100 goats) were screened for the prevalence of *Taeniasaginata and Faciolahepatica.* The prevalence of *Fasciola hepatica,* the prevalence was higher in cows and very low in goats. Results from the screening showed that the infestation by these parasites varied between the parasites and the two groups of animals studied. However, 71(71%) of cows and 18(18%) of goats were also affected by *Fasciola hepatica* (Table 4.1). For the case of *Taeniasaginata* was very low in both cows and goats slaughtered in Mbale abattoir at a rate of 24% and 5% respectively (Table 4.2). This showed that there was variation between two species of animals in terms of prevalence of helminthes parasites under study. The findings are in agreement with the work of Sabbaghian*et al.,* (2008)who reported an infestation of helminthes at a rate of 54% in cattle and 11.2% in goats. Furthermore, the findings are in disagreement with the results of Mansoorian (1998) who found out that goats in south Asia were more prone to *Faciola hepatica* infestations than cows.

Table 4.1 Prevalence of *Fasciola hepatica* among Cows and Goats

Host	N	Yes f (%)	No f (%)	mean	sd	median	Trimmed
Cattle	100	71 (35.5)	29 (14.5)	0.71	0.39	1	0.76
Goat	100	18 (9.0)	82 (41.0)	0.18	0.46	0	0.1

Source: Results of the analysis, (2015)

Table 4.1 shows the prevalence of *Fasciola hepatica* on Cattle and Goat. The result indicates that 35.5% of Cattle host the parasite while only 9.0% of Goats host the parasite. On the other hand, the parasite was not found in 14.5% of Cattle and 41.0% of Goats. This shows that *Fasciola hepatica* is more prevalent in Cattle than in Goats. To confirm this, it can be observed that the mean score of the distribution in the case of Cattle is 0.71 (SD = 0.39), indicating more prevalence, and that of the Goats is 0.18 (0.46), indicating less prevalence.

Table 4.2 Prevalence of Taenia Saginata among Cows and Goats

Host	n	Yes f (%)	No f (%)	mean	Sd	median	Trimmed
Cattle	100	24 (12.0)	76 (38.0)	0.24	0.43	0	0.18
Goat	100	5 (2.5)	95 (47.5)	0.05	0.22	0	0

Source: Results of the analysis, (2015)

Table 4.2 shows the prevalence of *TaeniaSaginata* on Cattle and Goats. The result presented in the table shows that the parasite is hosted by 12% of Cattle and 2.5% of Goats. However, the parasite was not found in 38% of Cattle and 47.5% of Goats. The mean score of the distribution for Cattle is 0.24 (SD = 0.43) while that of Goats is 0.05 (SD = 0.22). This confirms the prevalence of *TaeniaSaginata* in Cattle.

Table 4.3 Prevalence of *Faciola hepatica* by gender

Host	N	Yes f (%)	No f (%)	mean	Sd	median	Trimmed
Female	95	42 (21.0)	53 (26.5)	0.44	0.5	0	0.43
Male	105	47 (23.5)	58 (29.0)	0.45	0.5	0	0.44

Source: Results of the analysis, (2015)

Table 4.3 shows the prevalence of *Faciola hepatica* in male and female Cattle and Goats. The result shows that the parasite is present in 21% of the female hosts and 23.5% of the male hosts. However, it can be seen that the parasite was not present in 26.5% of the female hosts and 29% of the male hosts. The mean score in female is 0.44 while that of male is 0.45, indicating the prevalence of the parasite in male hosts among Cattle and Goats. However, the no much difference was noted in terms of the prevalence between the male and female hosts.

Table 4.4 Prevalence of *TaeniaSaginata* by Gender

Host	n	Yes f (%)	No f (%)	mean	sd	median	Trimmed
Female	95	15 (7.5)	80 (40.0)	0.16	0.37	0	0.08
Male	105	14 (7.0)	91 (45.5)	0.13	0.34	0	0.05

Table 4.4 shows the prevalence of *TaeniaSaginata* in male and female hosts. The result shows that the parasite is present in 7.5% of the female hosts and 7% of the male hosts. However, the parasite is not present in 40% of the female hosts and 45.5% of the male hosts. The mean distribution of the female is 0.16 while that of the male is 0.34. These results show that *TaeniaSaginata* is more prevalent in Female hosts, although there is no much difference between the two groups.

Table 4.5 Correlation coefficient of *Taeniasaginata* and *Fasciola hepatica* among the slaughtered cows and goats in Mbale abattoir

N	T	Df	R	p-value
200	7.28	198	0.45	0.000

Source: Results of the analysis, (2015)

Table 4.5 shows the correlation coefficient between *Faciola hepatica* and *TaeniaSaginata* among the hosts. The result presented in the table shows a moderate and significant correlation between the two parasites (t = 7.28; df = 198; r = 0.45; p-value = 0.00). This result shows that the presence of one parasite could lead to the presence of the other parasite.

Local community Practices in the Prevention and Control of Taeniasaginata and Faciola hepatica

Results in this section are based on only two districts, namely Lira and Mbale. These districts were chosen because the animals in the districts were more prone to infestations with *Taeniasaginata* and *Faciola hepatica*. One hundred and fifty (150) questionnaires were administered to the respondents in both Mbale and Lira districts. However, a total number of one hundred and forty six (146) questionnaires were returned by the respondents giving a response rate of 97.3%. The findings are presented in Table form as shown under the appropriate sections.

Cross tabulation to show the relationship between Education Level and Practices

The cross tabulation revealed that there was a significant effect on education level on the mode of grazing (Chi-square test, $p<0.01$), Table 4.6). It can be seen that 71 respondents that had not received formal education practiced open grazing system due to their illiteracy and 10 among them also practiced zero grazing system. However, 40 respondents with the formal education practiced open grazing system while 25 practiced zero grazing system. These results seem to indicate that, lack of formal education among the respondents led them to engage more often on open grazing than zero grazing systems. A relatively higher proportion of respondents that had attained tertiary education were practicing zero grazing. Zero grazing at times expensive requiring injection of capital which affordable by the highly educated with salary jobs. Those with low education, most probably do not have such capital to practice zero grazing hence adopting open grazing that does not require capital.

Table 4.6: Level of Education and Grazing Practices

Level of education	Grazing practices		Total	Chi-square (p-value)
	Open grazing	Zero grazing		
No schooling	71	10	81	.000
Primary school	5	1	6	
Secondary school	27	10	37	
Tertiary education	8	14	22	
Total	**111**	**35**	**146**	

Source: Results of the analysis, (2015)

There was a significant effect of education level on the animal's source of drinking water (Chi-square test, $p=0.04$, Table 4.7). For example, of the 82 respondents who had not received formal education, 42 respondents took their animals to the swamps, 21 took their animals to open wells, 4 took the animals to protected wells and 13 took them to home troughs. However, 31 respondents with the formal education were using swamps, 9 among them were using open well while 5 of them were using protected wells and the remaining 21 were using home trough.

Table 4.7: Level of Education and Animal's Source of Drinking Water

Level of education	Source of animal's drinking water				Total	Chi-square(p value)
	Swamp	Open well	Protected well	Home trough		
No schooling	42	21	4	13	82	.004
Primary school	4	0	1	1	6	
Secondary school	22	6	3	7	40	
Tertiary education	5	3	1	13	22	
Total	**73**	**30**	**9**	**34**	**146**	

Source: Results of the analysis, (2015)

Level of education attained had significant influence on mode of meat consumption (Chi-square test, $p=0.158$, Table 4.8). Of the 79 respondents who had not attained formal education, 78 respondents claimed to consume well cooked meat and only 1claimed to consume half cooked meat. However, 64 respondents among that had received formal education consumed well cooked meat while 3 among them consumed half cooked meat. Since majority of the respondents cooked their meat well before consumption, therefore, it could be any other factor that influences mode of consumption other education level.

Table 4.8: Level of Education and Consumption of Meat

Level of education	Consumption of meat		Total	
	Cooked	Half cooked		Chi-square (p value)
No schooling	78	1	82	0.158
Primary school	6	0	6	
Secondary school	36	3	39	
Tertiary education	22	0	22	
Total	**142**	**4**	**146**	

Source: Results of the analysis, (2015)

There was no significant effect of education level on the choice of defecation site of the respondents (Chi-square test, p=0.09, Table 4.9). Thirty two respondents that had not received formal education defecated in the bush while 46 defecated in pit latrine. On the other hand, 18 respondents with the formal education defecated in the bush while 50 defecated in pit latrine.

Table 4.9: Level of Education * Defecating Site of Household

Level of education	Defecating site of household		Total	
	In the bush	In the pit latrine		Chi-square(p value)
No schooling	32	46	78	.009
Primary school	1	5	6	
Secondary school	16	24	40	
Tertiary education	1	21	22	
Total	**50**	**96**	**146**	

Source: Results of the analysis, (2015)

IV. CONCLUSIONS

Prevalence of Taeniasaginata and Fasciola hepatica among the slaughtered cows and goats in Mbale abattoir

The study concludes that there was a significant difference in the prevalence of *Taeniasaginata* and *Faciola hepatica* among cows and goats slaughtered in Mbale municipality abattoir within the period of study. The mean number of cows was greater than that of goats. Hence, cows had a high level of prevalence of *Taeniasaginata* and *Faciola hepatica*

Recommendations

Prevalence of Taeniasaginata and Fasciola hepatica among the slaughtered cows and goats in Mbale abattoir

Public should be made aware of the helminthes infection (*Taeniasaginata* and *Faciola hepatica)* and to prevent their animals from getting contact with these parasites so as to reduce their infestation rates.

Prevention and control of intestinal helminthes in cows and goats

Government should assist farmers with drugs to deworm their infected animals and also offer extension services to them and sensitization of farmers on the knowledge of prevention and control of *Taeniasaginata* and *Faciola hepatica.*

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