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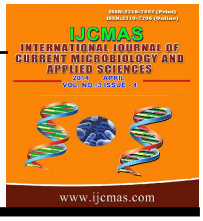

Original Research Article

On Farm Study of Bovine Fasciolosis in Lemo District and its economic loss due to liver condemnation at Hossana Municipal abattoir, Southern Ethiopia

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Keywords

Abattoir, Bovine, Economic loss, Fasciolosis, Hossana, Lemo, Prevalence

A B S T R A C T

Fasciolosis caused by Fasciola hepatica and Fasciola gigantica is a zoonotic helminth infection of ruminants and causes of an important economic loss. The cross-sectional study was conducted from February to April 2012 at Lemo district and Hossana municipal abattoir to determine the prevalence of fasciolosis, identify the predominant Fasciola species and to determine fluke burden, severity of liver pathological lesions of cattle slaughtered and assess the direct economic loss because of bovine fasciolosis due to liver condemnation. In this study, the sample population of 384 cattle from the Peasant Associations were randomly selected and coprologically examined by sedimentation techniques and 384 cattle were selected by systematic sampling techniques for postmortem examination at Hossana municipal abattoir. The overall prevalence of bovine fasciolosis on farm and abattoir study was 34.9% and 30.5%, respectively. The infection rate of bovine fasciolosis on farm and abattoir study was significantly associated ($p<0.05$) with age, breed, body condition, origin of study animals as well as the type of Fasciola species, liver pathology and worm burden. However, there was no statistically significant association of bovine fasciolosis with sex of cattle ($p>0.05$).It was noticed that a higher (37.5%) prevalence rate was identified in young than adult (33.3%) cattle and higher (61.9%) in Holstein than cross (35.7%) or indigenous (33.1%) breed. Cattle with thin body condition were higher in infection rate than average or fat. The predominant Fasciola species identified was Fasciola hepatica (55.6%) followed by Fasciola gigantica (19.6%).The average mean fluke burden was 27.48 flukes per affected liver. The mean fluke burden in mixed Fasciola species (34.00 ± 6.255) was higher and least in Fasciola hepatica (27.85±3.620).The mean fluke burden that contributed for the liver pathological lesion categories of moderately, severely and lightly affected livers was (34.37±4.369), (26.76± 2.712) and (7± 0.513), respectively. A direct economic loss identified in cattle due to liver condemnation by fasciolosis at Hossana municipal abattoir was estimated 88,806.85 Ethiopian birr Per annum. Bovine fasciolosis was a prevalent parasitic disease and cause a considerable economic loss in the study area. Therefore, the role of host factors (age, sex, breed and body condition) and conducive environment for the development of intermediate host snails should be clearly recognized by all stakeholders in order to understand their effects on the disease occurrences as well as in control and prevention of fasciolosis in cattle.

Introduction

Fasciolosis is an important parasitic disease of domestic ruminants caused by digenean trematodes of the genus *Fasciola* commonly referred as liver flukes. The two species most commonly implicated, as the etiological agents of fasciolosis are *Fasciola hepatica* and *Fasciola gigantica* (Lotfy *et al*., 2002). It is a serious disease

of herbivorous animals (Torgerson and Claxton, 1999), leading to huge economic losses in livestock production, while human infection has long been seemed to be accidentally (Mas-Coma *et al.,* 2005). The distribution of *Fasciola hepatica* is limited to temperate areas and high land of tropical and sub-tropical regions while *Fasciola gigantica* is wide spread in most parts of tropical Africa. Thus, the distribution of two *Fasciola* species overlap in many African and Asian countries and sometimes in the same country, although in such cases the ecological requirements of the flukes and their snail intermediate host is distinct (Mas-Coma *et al*., 2005; Walker *et al.,* 2008).

The geographic distribution of *Fasciola* species is dependent on the distribution of suitable species of snails such as *Lymnae natalensis* and *Lymnae truncatula,* the most common intermediate hosts and usually associated with herds and flocks grazing wet marshy land area. Both *Lymnae* species are needed for the parasite's life cycle to be completed. According to Thomas (1883) and Brown (2005), the distribution of fasciolosis is associated with the favorable climatic and ecological conditions for development, spread and maturity of parasite and it's life cycle stages in various areas. In view of the worldwide spread, occurrence and zoonotic nature, fasciolosis has emerged as a major global and regional concern affecting all domestic animals and infection is most prevalent in regions with intensive cattle production (WHO, 2008). From the many parasitic problems of farm domestic animals, fasciolosis is the most important disease, which causes direct and indirect economic loss on livestock production, particularly of sheep and cattle (Keyyu *et al*., 2006). The disease is the major cause for the considerable economic losses in the cattle industry, mainly through mortality, liver condemnation, reduced production of milk, meat and expenditures for anthelmintics (Hillyer and Apt, 1997). Therefore, the objectives of this study were to assess the current on farm and abattoir prevalence of bovine fasciolosis and associated economic loss in Lemo district.

Materials and Methods

Study Area

The study was conducted at selected areas of Lemo district and Hossana municipal abattoir of Hadiya Zone, Southern Ethiopia. Hadiya Zone is one of the 13 Zones in the southern Nation Nationalities of Ethiopia. The highest altitude in the Zone is 2970 m.a.s.l at the Summit of Sengiya Mountain in the Duna district and the lowest is 800 m.a.s.l in Gibe River valley. The zone is divided into ten districts and one city administration. Lemo district is one of ten administrative districts found in Hadiya zone and located at a distance of 230 km in the North East from Addis Ababa and 187 km from Hawassa, the capital city of the region.

According to the information obtained from Hadiya Zone Agricultural Office, mixed farming system (livestock and crop production) is widely practiced. The district consists of 35 Peasant Associations and has a total of 137, 889 cattle population of which 12,066 cattle are found in the study areas of four selected Peasant Associations namely, Ambicho, Belessa, Shecha and Lereba were selected purposively by considering their cattle populations, availability of suitable breeding site for intermediate host and transport access. The study area located

approximately at an altitude of 2200 m.a.s.l with the mean annual rainfall of 1172.75 mm and mean annual temperature of $18c^0$. Geographically, it is located between 7^0.42′-7.75′N latitude and $37^{0.}$80′-38.07′E longitude (HZSA, 2010).

Study Design and Sampling Techniques

A cross-sectional study was conducted from February-April 2012. Besides, simple random and systematic sampling techniques were used to collect all the necessary data such as fecal (Simple random technique) samples and abattoir (systematic sampling) survey of the study animals. Accordingly, the study was conducted at selected area of smallholder farms of Lemo district and Hossana municipal abattoir.

Sample Size Determination

Since there was no earlier work done on farm study of bovine fasciolosis and its economic loss due to liver condemnation at the study area, the sample size was determined by taking the prevalence of 50% fasciolosis using the formula given by Thrusfield (2005). Accordingly, 384 cattle were sampled from four selected peasant association of the study area owned by smallholder farmers and additionally 384 cattle were systematically sampled from the cattle brought to the Hossana municipal abattoir for slaughter during the study period.

Coprological examination

Fecal samples were collected directly from rectum of randomly selected cattle by hands protected by rubber gloves, using two fingers (i.e., middle and index fingers). Each sample was clearly labeled with animal's identification, date and place of collection (location). Samples were packed and dispatched in cool box and then, transported to the Lemo District Animal Health Laboratory by preserving with 5% formalin in the universal bottles to avoid development of eggs and hatching. In the laboratory, Coprological examination was done to detect *Fasciola* species eggs using the standard sedimentation technique as described by Hanson and Perry (1994). The qualitative sedimentation technique was used for detecting trematode eggs in the fecal samples.

Postmortem examination

A total of 384 cattle identified during antemortem inspection were examined through inspection and systematic incision of bile duct to recover adult *Fasciola* species. A collection of *Fasciola* species from each cattle was examined macroscopically using their morphological features (Soulsby, 1982; Urquhart *et al.*,1996).

I. *Fasciola* species identification: After collecting the flukes in the universal bottle containing 5% formalin as a preservative, *Fasciola* species were easily identified based on morphological characters such as shape, size. They were classified as *Fasciola hepatica* (relatively small sized), *Fasciola gigantica (*relatively large sized and more leaf like), mixed forms (*Fasciola hepatica* and *Fasciola gigantica*) and un-differentiated or immature forms of *Fasciola* species (Urquhart *et al*.,1996).

II. Types of infection: are classified as *Fasciola hepatica, Fasciola gigantica*, mixed Fasciola species (*Fasciola hepatica, Fasciola gigantica*) and juveniles.

III. Severity of liver pathological lesions: Categorization of affected livers

were classified as lightly, moderately and severely affected liver based on the severity of pathological lesion. Lightly affected: when a quarter of the liver was affected or if one bile duct was prominently enlarged on the ventral surface of the liver; moderately affected: if half of the liver was affected or the bile ducts were hyper plastic and severely affected: If the entire organ was affected or if the liver is cirrhotic and triangular in outline according to Ogunrinade and Adegoke (1982).

IV. Assessment of condition: The immediate decisions at postmortem inspection was classified in to the following categories of judgment such as approved as fit (healthy liver) for human consumption and totally condemned (infected liver by *Fasciola* species) as unfit for human consumption (FAO, 1994; Herenda *et al*., 2000).

V. Fluke burden: The flukes recovered from the affected livers during postmortem examination of cattle were made to determine the fluke burden in the study animal. The mean fluke burden per affected liver was calculated from the total number of flukes counted divided by total number of affected livers based on Hammond and Swell (1974).

Estimation of direct economic loss due to liver condemnation

The direct economic loss was analyzed on the bases of liver condemnation due to bovine fasciolosis at Hossana municipal abattoir. It was analyzed by considering the average number of annually slaughtered cattle in the abattoir from retrospective recorded data, the mean selling price of one liver from at Hossana town and overall prevalence of bovine fasciolosis in Hossana municipal abattoir from the present study. The information on the price of liver was obtained from the butchers in the town. Hence, direct economic loss was calculated on annual basis according to the formula adopted from Ogunrinade and Ogunrinade (1980).

Data Analysis

Obtained Data was recorded, entered and managed into MS Excel work sheet and analyzed using SPSS version 16. The prevalence of fasciolosis was calculated using the number of infected individuals divided by the number of cattle examined x 100. Chi-square (χ^2) was used to evaluate the association between fasciolosis with sex, age, breed, body condition, location (study farms) of the cattle. parasitic burden with the type of *Fasciola* species and liver pathology were computed using mean comparison to obtain mean fluke burden. In all statistical analysis, confidence level was held at 95% and P-value is <0.05 (at 5% level of significance) was considered as significant. Direct economic loss was computed using the formula adopted by Ogunrinade and Ogunrinade (1980).

Results and Discussion

Prevalence of Bovine Fasciolosis

A total of 384 cattle were coprologically examined from the selected areas of smallholder farms in Lemo district for the occurrence of fasciolosis, of which, 134 were found infected with fasciolosis, resulting in an overall prevalence of 34.9% (Table 2).The overall prevalence of bovine fasciolosis (34.9%) in the present study was in agreement with the earlier findings that was 34% by Rahmeto (1992) around Wolliso, However, the overall prevalence

of bovine fasciolosis in the present study was lower than the previous findings of 50.98% by Dejene (2008) The present study also showed higher prevalence of bovine fasciolosis as compared to the 25.46% by Khan *et al*.(2009). The variation in overall prevalence of bovine fasciolosis among different areas of the study may depend on some factors such as, snail population, choice of diagnostic method, livestock management system and suitability of the environment for survival and distribution of the parasite as well as the intermediate host might have played their own role in such differences (Thomas, 1883; Yildirim *et al*., 2007; Shiferaw *et al.,* 2011)

As the shown in Table 1, from the total of 152 male and 232 female cattle examined, 63(41.4%) and 71(30.6%) were positive for fasciolosis, respectively. Analysis indicated that, there was no significant association (χ^2=0.688, p=0.407) between prevalence of fasciolosis and sex of study animals. The result of the study (Table 1) indicated that, younger cattle (37.5%) were more affected as compared to adults (33.3%). Statistical analysis of the data showed that the presence of significant association (χ^2 =4.573, P = 0.029) of *Fasciola* infections with age group. The present finding was in line with previous studies by Shiferaw *et al*. (2011) around Assela, Mufti (2011) from Pakistan region, Kiyyu *et al*. (2003) from southern highlands of Tanzania, Nganga *et al*. (2004) from area of Kenya, who reported that there was an age difference in the prevalence of fasciolosis. The possible explanation might be younger cattle were more susceptible and less resistant to infection of fasciolosis than adults. Hence, young animals with weak and less developed immunity were more likely to be affected by fasciolosis than older animals in which acquired immunity was well developed through repeated challenge of the disease (Ogunrinade and Adegoke, 1982; Kuchai *et al*., 2011; Mungube *et al*., 2012).

Out of the total 384 cattle examined, 335, 21 and 28 were Indigenous, Holstein and Cross-breed cattle, respectively (Table 2). The prevalence of fasciolosis was 33.1%, 61.9% and 35.7% for Indigenous, Holstein and Cross breed cattle, respectively. There was statistically significant (χ^2 = 7.135, P = 0.028) association of fasciolosis with breeds.

Regarding the effects of breed as showed in Table 2, the infection was breed dependent (χ^2=7.135, P = 0.028) and the highest infection rate was observed in Holstein breed (61.9%) followed by Cross breed (35.7%) and Indigenous breed (33.1%). This was in agreement with literature, which states that Holstein breed are most affected than cross-breed and Indigenous cattle breed were less likely to be affected than both breeds (Castelino and Preston, 1979; Mufti, 2011). This could be explained by the fact that, the higher prevalence rate in Holstein breed and followed by cross-breed may be due to the less adaptively capacity with the environment and Indigenous breeds are acquired a high degree of immunity as a result of repeated natural exposure to parasitic infections (Cohen and Watten, 1967). Out of 77, 87,119 and 101 cattle examined in Ambicho, Belessa, Shecha and Lereba Peasant Associations, 28(36.4%), 26(29.9%), 54(45.4%) and lastly 26 (25.7%) were found to be positive for fasciolosis, respectively. There was statistically significant (χ^2 =10.515, P=0.015) association in prevalence of fasciolosis among different study location (farms) of cattle examined (Table 2). The

highest prevalence of fasciolosis was recorded in Shecha (45.4%) peasant associations followed, in descending order, by Ambicho (36.4%), Belessa (29.9%) and Lereba (25.7%). Statistical analysis of the prevalence among peasant associations indicated that, there was a significant association ($p< 0.05$) of infection rate of disease with animal origin. Accordingly, the occurrence of bovine fasciolosis in Shecha Peasant Association was the highest when compared to Ambicho, Belessa and Lereba. Shecha has more appropriate environmental conditions for the occurrence of intermediate hosts including flooded natural pastures, watershed areas, slowly flowing waterways and rivers for the presence of relatively more infection rate of fasciolosis in cattle. The finding of the present study was in agreement with the earlier findings by Torgerson (1999), who reported that the interaction of various environmental factors that increase the likelihood of fasciolosis in cattle and causes variation of infection rate between the localities.

Prevalence of Fasciola Species Infection in Cattle

From the total of 384 cattle slaughtered at Hossana municipal abattoir, 117 (30.5%) were found positive for fasciolosis on postmortem examination. This study was comparable with the previous findings of 30.43% by Hailu (1995) from Hawassa, 29.75% by Rahel (2009) from Alaba, 31.5% by Wakuma (2009) from Bedele, 32.3% by Mihreteab *et al.* (2010) from Adwa, 28.63% by Rahmeto *et al*. (2010) from Hawassa and 29.75% by Mulat *et al.* (2012) from Gondar abattoirs. The finding of current study (30.5%) was relatively higher when compared with the 14.4% overall prevalence reported by Daniel (1995) from Dire Dawa, 14% by Fufa *et al*. (2010) from Soddo, 20.3% by Kassaye *et al*. (2012) from Addis Ababa abattoir, and found to be lower than the prevalence of 46.58% by Tadela and Worku (2007) from Jimma and 54.5% by Abie *et al.* (2012) from Jimma slaughter houses. The variation of prevalence rate in different study areas were probably due to the ecological and climatic difference between the localities and the characters of soils that is important for multiplication of snail hosts (Abie *et al*., 2012).

As shown in Table 3, from the total of 377 males and 7 females, 114 (30.2%) and 3 (42.8%), respectively were positive for of fasciolosis. Among 24 young and 360 adult cattle examined during study period, 14 (58.3%) and 103 (28.6%), respectively were positive for fasciolosis. Out of 343 Indigenous, 30 Holstein and 11Cross-breed cattle examined, 97(28.3%), 15 (50%) and 5 (45.5%), respectively were positive for *Fasciola* species infection. This study revealed that there was no significant difference (χ^2=0.517, P =0.440) in fasciolosis infection on sex basis (Table 5). This finding was in agreement with the earlier records reported by Opara (2005). The number of slaughtered males in the abattoir was higher than females. Even if the number of female cattle that come to abattoir were fewer in number as compared to males, the number of positive females was higher in proportion than males, hence the sample size matters in this case.

As Table 3 shown, young cattle (58.3%) have significantly higher (χ^2= 9.382, P=0.002) prevalence rate of fasciolosis when compared to adult ones (28.6%).This may be attributed to the fact that the immunity against disease increases with age (Dwinger, 1982; Yilma and

Mesfin, 2000; Shiferaw *et al*., 2011; Mufti, 2011) or it could also be (most probable) because of few number of young animals presented for postmortem examination. The prevalence of fasciolosis in Holstein breed were significantly ($p<0.05$) higher in susceptibility than Cross-breed. Indigenous breeds are less vulnerable than both breeds (Table 5). The result of this study was in agreement with the findings of Kabir *et al.* (2010) from Bangladesh. Higher infection rate of fasciolosis was recorded in holistein breed cattle in this finding might be due to its few number as compare to cross or indigenous breeds that came to postmortem examination. Hence, the sample size matters.

Association of Severity of Liver Pathological Lesion with Fluke Burden in Cattle

There was a statistically significant variation ($F = 171.47$, $P=0.000$) of mean fluke count between the levels of severity of liver lesions (Table 9). The average mean fluke count encountered during the study was 27.48 flukes per affected liver and it was lower as compared to the report by Dechasa *et al*. (2012), who reported 50 flukes per affected liver. The possible reason of being less in average mean flukes count may be due to the lack of rainfall and moisture at a point of study period for the replication of snails as well as *Fasciola* species (Brown, 2005).

The mean fluke burden in lightly, moderately and severely affected livers was found to be

7.00±0.513, 34.37±4.369 and 26.76±2.712, respectively. It was higher in moderately affected livers and followed by severely affected livers. The result of this study was in agreement with the works by Dwinger *et al*. (1982) from Argentina, Mihreteab *et al*. (2010) from Adwa, Rahmeto *et al*. (2010) from Hawassa, Dechasa *et al*. (2012) from Jimma municipal abattoirs. The mean fluke burden in moderately affected livers was higher than severely affected livers. This may be attributed to the fact that, the bile ducts of severely affected livers become calcified, fibrosed and having acquired resistance and that leads to block the further passage of undefined immature flukes in severely affected livers (Ramato, 1992; Yilma and Mesfin, 2000; Dechasa *et al*., 2012).

Direct economic loss

A direct economic loss as a result of fasciolosis in cattle was estimated on liver condemnation at Hossana Municipal abattoir. The calculation on direct economic loss of bovine fasciolosis was based on the average number of cattle slaughtered per year, mean selling price of the cattle livers at Hossana town and the prevalence of fasciolosis in the present study (30.5%). The average market price of 1Kg of meat and one liver at Hossana town was taken as 120 and 55 Ethiopian birr, respectively. The mean number of cattle slaughtered in this municipal abattoir was 5294 per year depends on two years recorded data.

The direct economic loss was calculated according to the mathematical formula derived by Ogunrinade and Ogunrinade (1980) as follows:

$$ALC = MCS \times MLC \times P$$

Where ALC=Annual loss from Liver

Table.1 Prevalence of fasciolosis by sex and age based on coprological examination of cattle owned by smallholder farmers in Lemo district, southern Ethiopia from February-April, 2012

Age group	Male		Female		Total	Total			
	№ examined	№ Positive (%)	№ examined	№ Positive (%)	№ examined	№ Positive (%)	95% CI	OR	χ^2 (P-value)
Young	65	30 (46.2%)	79	24 (30.4%)	144	54 (37.5%)	29.6-45.9		
Adult	87	33 (37.9%)	153	47(30.7%)	240	80 (33.3%)	27.4-39.6		
Total	152	63 (41.4%)	232	71(30.6%)	384	134 (34.9%)	30.1-39.9	1.652	4.573 (0.029)

Sex: (χ^2=0.688, P-value = 0.407), OR = 0.863
Male 95% CI = 33.5 - 49.7, Female 95% CI= 24.7- 37.

Table.2 Prevalence of *Fasciola* species infection by breed of cattle and study farms in Lemo district, southern Ethiopia from February-April, 2012

Variables		№ examined	№ Positive (%)	95% CI	OR	χ^2	p-value
Breed	Indigenous	335	111(33.1%)	28.1-38.5			
	Holstein	21	13 (61.9%)	38.4-81.9			
	Cross breed	28	10 (35.7%)	18.6-55.9			
	Total	384	134 (34.9%)	30.1-39.9	1.247	7.135	0.028
Location	Ambicho	77	28 (36.4%)	25.7-48.1			
	Belessa	87	26 (29.9%)	20.5-40.6			
	Shecha	119	54 (45.4%)	36.2-54.8			
	Lereba	101	26 (25.7%)	17.6-35.4			
	Total	384	134 (34.9%)	30.1-39.9	1.023	10.515	0.015

Table.3 Prevalence of fasciolosis by sex, age and breed of cattle slaughtered at Hossana municipal abattoir, southern Ethiopia from February-April, 2012

Variables		№ of examined	№ of positive	95% CI	OR	χ2 (p-value)
Sex	Male	377	114 (30.2%)	25.4-35.1		
	Female	7	3 (42.8%)	9.8-81.6		
	Total	384	117 (30.5%)	25.9-35.3	0.869	0.517 (0.440*)
Age	Young	24	14 (58.3%)	36.6-77.9		
	Adult	360	103 (28.6%)	23.9-33.6		
	Total	384	117 (30.5%)	25.9-35.3	2.445	9.382 (0.002)
Breed	Indigenous	343	97(28.3%)	23.5-33.4		
	Holstein	30	15 (50%)	31.3-68.7		
	Cross-breed	11	5 (45.5%)	16.7-76.6		
	Total	384	117 (30.5%)	25.9-35.3	1.799	7.344 (0.005*)

*Fisher's Exact Test

Table.4 Parasitic burden, types of infection and related liver condition

Infection type	Liver pathological state			Total	F-test(P-value)
	Light (Mean±SEM)	Moderate (Mean±SEM)	Severe (Mean±SEM)	(Mean±SEM)	
F. h	9.00 ±0.966	32.46±5.897	25.23±3.318	27.85±3.620	
F. g	7.00±0.775	37.80± 8.715	24.00±3.786	29.30±6.240	
Mixed	0	36.09±10.424	31.44±6.245	34.00±6.255	
Juvenile	5.67±0.527	0	0	5.67±0.527	
Total	7.00±0.513	34.37± 4.369	26.76±2.712	27.48±2.636	171.47(0.000)

F. h = *Fasciola hepatica*, F. g = *Fasciola gigantica*
Mixed *Fasciola* species = *Fasciola hepatica* + *Fasciola gigantic*

Condemnation

MCS= Mean annual Cattle Slaughtered at Hossana abattoir

MLC= Mean cost of one liver in Hossana town and

P= Prevalence rate of the fasciolosis at the present study.

ALC = MCS x MLC x P

= 5294 x 55ETB X 30.5%

= 88,806.85 Ethiopian birr (ETB)

Therefore, the direct economic loss that may result due to liver condemnation by *Fasciola* species in cattle was estimated to be 88,806.85 Ethiopian birr (5,045.8 USD) per annum (1USD~ 17.60 Ethiopian birr). The direct economic loss due to liver condemnation in Hossana municipal abattoir was closely related with the earlier records of 87,577 ETB (Abie *et al*., 2012) from Jimma, 57,960.00 ETB (Miherteab *et al*., 2010) from Adwa and 106,400 ETB (Rahmeto *et al.* 2010) from Hawassa. The financial loss recorded in the present study was found to be lower when compared with the previous findings of 142,128.00 ETB (Abdul, 1992) from Soddo, 266,741ETB (Mulgeta *et al*., 1993) from Kombolcha, 236,516.00ETB (Eyakem, 2008) from Adama town, 726,561.50ETB (Abayneh, 2010) from Arbaminch and relatively higher when it compared with 3,360.00ETB (Fuad, 2008) from Harar abattoir, 12,414.47 ETB (Dejene, 2008) from Arsi and 32,075.41 ETB (Mulat *et al*., 2012) from Gondar.The variation of economic loss in different study areas may be due to the variation in number of cattle slaughteredin the study abattoirs and the a verage market price of one liver.

The outcome of this study confirmed that, bovine fasciolosis was prevalent parasitic disease of cattle in the study area. It was associated ($p<0.05$) with age, breed, body condition and location of cattle. The occurrence of bovine fasciolosis in this study suggested that there was the presence of favorable ecological and climatic conditions for the development and survival of the *Fasciola* species as well as intermediate hosts in the study area.

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