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Major Parasitic Causes of Organ Condemnation in Bovine and Its Economic Importance at Gimbi Municipal Abattoir, West Wollega Zone, Ethiopia

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Abstract: Ethiopia is one of the countries endowed with large and diverse livestock resources. However, many factors affect the maximum benefit to be obtained from livestock production and parasitic diseases are the major factors. A cross-sectional study was carried out from June 2013 to September 2014 to determine the major edible organs condemnation due to fasciolosis and hydatidosis and providing the baseline data on their status and economic importance in the study area. In this study animal altitude, body condition, age and breed were used as the major variables to determine the rejection rate of the specific organs due to fasciolosis and hydatidosis. A total of 384 cattle were examined at ante and post mortem using standard inspection procedures. Among these animals 1.3% cases of lameness, 2.1% cases of branding, 2.3% local swelling and 8.9% abrasion were observed during ante mortem inspection. On the other hand, during postmortem examination, organs of 53.1% animals were harboring with one or more parasites involving different visceral organs. So, the overall rejection rate of livers 40.9% (36.8% due to only liver fluke and 4.2% due to both liver fluke and hydatid cyst) were condemned. In relation to hydatidosis overall rate of 12.3% organs were (6.3 % of lung, 0.5% of spleen, 4.4 % of lung and liver and 1.1% of lung and spleen) condemned. The result of present study shows insignificant association in all study variables ($p>0.05$), except in sex of animals in which male animals were more than two times ($P = 0.014$, OR=2.29) to be affected by the diseaseas compared to female animals in the study area. An annual loss of 76,002Ethiopian birr (3964.63USD, exchange rate 19.17) per annum was incurred in the abattoir due to condemnation of organs. In conclusion,the results revealed that the main causes of organ condemnation in the current were fasciolosis and hydatidosis. Therefore, the epidemiology and economic losses due to fasciolosis and hydatidosis has to be studied in detail and subsequent control measures should be in place at all levels.

Key words: Abattoir · Cattle · Ethiopia · Fasciolosis · Gimbi · Hydatidosis · Organ Condemnations · West Wollega

INTRODUCTION

The livestock sector globally is highly dynamic, contributes 40% of the global value of agricultural output and support the livelihoods and food security of almost a billion people [1]. Beyond their direct role in generating food and income, livestock are a valuable asset, serving as a store of wealth, collateral for credit and an essential safety net during times of crisis [2, 3].

In Ethiopia livestock production is an integral part of the agricultural system. The livestock sub sector accounts for 40% of the agricultural gross domestic product (GDP) and 20% of the total GDP without considering other contribution like traction power, fertilizing and mean of transport [4, 5]. Livestock and livestock products are the major foreign exchange earns. Only second to coffee; with hides and skins contribute in the most. However, currently the overall livestock production constraints in

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Ethiopia are feed shortages, livestock diseases, low genetic potential of indigenous livestock and lack of marketing infrastructure and water shortages [6, 7].

Additionally, a significant loss results from death of animals, inferior weight gain and condemnation of edible organs and carcass at slaughter each year. This production loss to the livestock industry estimated at more than 900 million USD annually [8, 9].

The main causes of organ condemnation during postmortem inspection are diseases originated by parasites, bacteria and virus. Parasites in the tropics are responsible for far greater losses to meat industry than other diseases. Similarly like many other tropical countries of Africa, it is well known that parasitic diseases are among the major factors responsible for the low productivity of livestock in Ethiopia. These infections not only cause clinical diseases and mortalities but also cause economic losses through production losses and condemnation of specific organs at slaughter [10].

Among many prevalent parasitic diseases, fasciolosis is one of the most striking diseases of ruminates. Fasciolosis is disease caused by the trematode helminthes of the genus *fasciola*, commonly members of this genus are known as liver flukes and the primary hosts are sheep and cattle. However other domestic animal and human are infected. Fasciolosis is one of the major parasitic disease that infect an enormous loss to cattle and sheep production through mortality, reduction in weight gain, loss of meat and milk and reduction in working power. Fasciolosis accounts for serious economic losses particularly in Africa through reduced productivity and condemnation of large number of infected livers as the condition suitable for the survival and multiplication of snail intermediate host which exist mostly in the tropical country [11].

Hydatidosis is caused by *Echnococcus granulosus* which is found in the small intestine of carnivores and metacestode (hydatid cyst) is found in cattle. Adults are 7mm long and usually possess three or four proglotid. The adult tapeworm is comparatively harmless to the dog although in large numbers enteritis may be seen. The pathogencity of hydatid cysts depends on the severity of the infection and the organ in which it is situated [12].

Various researchers have undertaken studies at abattoirs and surveys were conducted to determine the prevalence and economic importance and cause of meat condemnation in Ethiopia. Much attention has given to the parasitic cause of organ condemnation (Fasciolosisand hydatidosis). These are annually to be a major economic and public health importance in meat inspection [13]. Even though the parasites have a major economic and public importance, no study has been carried out and there is no valuable information regarding the issue in the study area. Therefore, this study was aimed at assessing the importance of parasitic diseases as a cause of organ condemnation and estimating the magnitude of direct economic losses attributed to organs condemned.

MATERIALS AND METHODS

Study Area: The present study was conducted in Gimbi Municipal Abattoir of Gimbi urban administrations, West Wollega Zone of Oromiya Regional State; Western Ethiopia. West Wollega is one of the 18 Administrative Zones of Oromiya National Regional State. Administratively, the Zone has 21 districts; of which 19 are rural districts and 2 are urban administrations which are again subdivided into 533 kebele administrative units (487 rural and 46 urban Kebeles). Gimbi Town, which is located at a distance of 441 km from Addis Ababa, is the capital of the Zone, it is located between 8°12'-10°03' N (Latitudes) and 34°08' - 36°10'E (Longitudes). An average annual temperature of the Zone varies from 15°C to over 25°C [14].

The an average annual rainfall of the Eastern high lands ranges from 1800-2000 mm, while in the central plateaus, it ranges between 1600-1800 mm and in the remaining parts of the Zone, it becomes between 1200-1600 mm. In the Southwestern parts of the Zone, it is even less than 1200 mm [14].

Livestock population of West Wollega Zone is estimated to be 1,775,404 Bovines, 385,098 Ovine, 353,385 caprines, 137,926 Equines, 2,066,678 poultry and 620,397 Bee colonies [15].

Study Design: A cross sectional study design was employed from June, 2013 to September, 2014 to assess the importance of parasitic disease as a causes of organ condemnation and to estimate the magnitude of direct economic losses attributed to condemned organs in cattle slaughtered by collecting data on events associated with organ condemnation in cattle slaughtered at Gimbi municipal abattoir, West Wollega Zone, Oromiya Regional State.

Study Animals: The animals used in this study were all apparently healthy cattle originating from neighboring provinces and Gimbi area of Ethiopia and slaughtered at Gimbi municipal abattoir.

Sample Size Determination: The total numbers of cattle for the study was calculated based on the formula given by Thrusfield [16] with 95% confidence interval and at 5% absolute precision by using systematic random sampling method. In this study, 50% prevalence was considered to calculate the sample size using the following formula.

$$n = \frac{1.96^2 \text{ Pexp (1-Pexp)}}{d^2}$$

where:
n = Required sample size;
exp = Expected prevalence;
d^2 = Desired absolute precision.
n = $1.962x\ 0.5(1-0.5) = 384\ (0.05)^2$

Data Collection Methods

Ante Mortem Examination: Ante mortem inspection was conducted on individual animals while they enter individually and in mass after they entered in to the lairage. For the ante mortem inspection, records of age breed and body condition were done. The animal's teeth were generally used as an indicator of age when actual birth dates are not available [17]. Both sides of the animals were inspected at rest and in motion. Moreover, the general behavior of the animals, signs of the diseases, any abnormalities, breed and origin and body condition of the animals were recorded.

Post mortem Examination: During post mortem examination, organs of the abdominal and thoracic cavity namely lung, heart, liver, kidney and spleen were systematically inspected for the presence of the parasites like liver fluke and hydatid cyst by applying the routine meat inspection procedures which consists primarily examination followed by a secondary examination. The primary examination involves visualization of the organs where as secondary examination involves further incisions in to each organ.

Economic Loss Assessment: To assess the economic losses due to fasciolosis and hydatidosis, only direct economic losses were considered and the calculation was based on condemned organs like liver and lungs. To calculate cost of condemned edible organs, 15 different butchers, 6 meat inspectors and 18 residents or households in the Gimbi town were interviewed randomly to establish the price per unit organ and the average organ price was determined and this price index was used to calculate the loss [18]. The analysis was based on annual slaughter capacity of the abattoir considered, market demand, average market price of each organ in Gimbi town and the rejection rate of specific organ. Information obtaining is subjected to mathematical computation by modifying the formula of Nicholson and Butter worth [19].

EL= Sr X Coy X Roz

where:
EL = Estimated annual economic loss due to organs condemnation
Srx = Annual cattle slaughter of the abattoir
Coy = Average cost of each cattle liver/lung/spleen
Roz = Condemnation rate of cattle liver/lung/spleen

Statistical Analysis: The data collected from the abattoir was recorded in the format developed for this purpose and later on entered into the Microsoft excel 2007 program and analyzed using STATA 11.0 soft ware. A statistically significant association between variables is considered to exist if the computed p-value is less than 0.05.

RESULTS

Ante Mortem Examination: Out of 384 cattle inspected during ante mortem inspection in Gimbi municipal abattoir, different abnormalities were found in 56 (14.6 %) that means Abrasion 34 (8.9 %), L ameness 5 (1.3%), Brand 8 (2.1%) and Localized swelling 9 (2.3%). However, these animals were passed for slaughter with caution of through postmortem examination (Table 1).

Post Mortem Examination: From the total slaughtered cattle, organs of 204 (53.1 %) animals were infected with parasites harboring one or more parasites involving different visceral organs; that is 141 (36.8%) of liver due to only liver fluke and 16 (4.2%) of liver due to both liver fluke and hydatid cyst, 24 (6.3 %) of lung, 2 (0.5%) of spleen, 17 (4.4 %) of lung and liver and 4 (1.1%) of lung and spleen were rejected because of fasciolosis and hydatidosis or both of them (Table 2).

Rate and Major Condemned Organs Due to Major Parasitic Diseases: Fasciolosis was found to be the main cause of liver condemnation and a total of 36.8% livers were rejected due to fasciolosis. So, this result revealed that liver fluke was the dominant or prevalent liver parasite in the study area. Hydatidosis was found to be the main parasitic causes of lung, spleen, liver and lung

Fig. 3: Hydatid cyst on liver and lungs of different animals during Post mortem examination

Table 1: Disease condition or abnormalities encountered during ante mortemInspection (N=384)

Condition or Abnormalities	N° of Cattle Affected (%)	Judgment
Abrasion	34 (8.9%)	Judgment passed for slaughter but they need special attentions during PMI
Brand	8 (2.1%)	
Lameness	5 (1.3%)	
Localized swelling	9 (2.3%)	
Total	56 (14.6%)	

Table 2: The overall condemned organs during postmortem inspection

Organs	Total N° of Condemned Organs	Percent (%)
Liver	157	36.8
Lung	24	6.3
Spleen	2	0.5
Liver and Lung	17	4.4
Lung and Spleen	4	1.1
Total	204	53.1

Table 3: Major parasitic causes of liver, lung, spleen, liver and lung, lung and spleen and heart condemnation

	Major Parasites		
Condemned Organs	Liver fluke	Hydatid cyst	For both Liver fluke and Hydatid cyst
Liver only	141 (36.8%)	-	16 (4.2%)
Lung only	-	24 (6.3%)	-
Spleen only	-	2 (0.5%)	-
Liver and Lung only	-	17 (4.4%)	-
Lung and Spleen only		4 (1%)	-
Heart only	-	-	-
Total	141(36.8%)	47 (12.3%)	16 (4.2%)

and lung and spleen 6.3 %, 0.5%, 4.4% and 1% respectively. Even though an examination was carried out during the study period, no parasite was recorded in heart. Therefore, this study was aimed at assessing the importance of parasitic diseases as a cause of organ condemnation and estimating the magnitude of direct economic losses attributed to organs condemned. Therefore, this study was aimed at assessing the importance of parasitic diseases as a cause of organ condemnation and estimating the magnitude of direct economic losses attributed to organs condemned (Table 3).

Association of Body Condition and Rejection Rate of Specific Organs: According to body conditions, comparison was also made on the rate of parasites in the study area. Out of animals examined the majority parasites like liver fluke (*Fasciola*), hydatid cyst and both liver fluke (*Fasciola*) and hydatid cyst 1.6%, 0.8% and 0.3% were from animals with poor body condition and about 6.8%, 1.3% &0.3% of them were from medium while 28.4%, 10.2% and 3.6% from animals with good body conditions respectively. However, the result indicates that there was no statistical difference among body condition scores of slaughtered animals (Table 4).

Table 4: Association of animal age, breed, sex, Body Condition, Altitude and Rejection rate of specific organs (N=384)

	Major parasites					
Categories	For only Liver fluke	For only hydatid cyst	For both fluke and hydatid cyst	P-value	OR	95% CI (Lower and upper)
Breed	-	-	-			
Local	125 (32.6%)	46 (12%)	16 (4.2%)			
Cross	16 (4.2%)	1 (0.3%)	-			
Total	141(36.8%)	47 (12.3%)	16 (4.2%)			
Body Condition	-	-	-			
Poor	6 (1.6%)	3 (0.8%)	1 (0.3%)			
Medium	26 (6.8%)	5 (1.3%)	1(0.3%)	0.92	0.95	0.4 - 2.5
Good	109 (28.4%)	39 (10.2%)	14 (3.6%)	0.51	1.35	0.6 -3.3
Total	141(36.8%)	47 (12.3%)	16 (4.2%)			
Altitude	-	-	-			
Highland	23 (6%)	12 (3.2%)	5 (1.3%)			
Midland	113 (29.4%)	35 (9.1%)	11(2.9%)	0.19	0.7	0.4 - 1.2
Lowland	5 (1.3%)	-	-	0.35	0.5	0.2 - 1.9
Total	141(36.8%)	47 (12.2%)	16 (4.2%)			
Sex	-	-	-			
Male	117 (30.5%)	41 (10.7%)	13 (3.4%)	0.014	2.29	1.2 - 4.4
Female	24 (6.3%)	6 (1.6%)	3 (0.8%)			
Total	141(36.8%)	47 (12.3%)	16 (4.2%)			
Age	-	-	-			
Young	18 (4.7%)	7 (1.8%)	1 (0.3%)			
Adult	102 (26.6%)	33 (8.6%)	15 (3.9%)	0.1	0.6	0.3 - 1.2
Old	21 (5.5%)	7 (1.8%)	-	0.6	1.2	0.6 - 2.2
Total	141(36.8%)	47 (12.2%)	16 (4.2%)			

Association of Sex and Rejection Rate of Organs Due to Specific Major Parasites: Comparison was made on the rate of female and male. Out of animals examined the majority parasites (Liver fluke, hydatid cyst and both liver fluke and hydatid cyst) 30.5%, 10.7% and 3.4% were from males while about 6.3%, 6% and 0.8% of them were from females respectively (Table 4). However, there was statistical difference between the two sexes (Table 4).

Association of Age and Rejection Rate of Organs Due to Specific Major Parasites: Analysis of age wise prevalence of liver fluke, hydatid cyst and both liver fluke and hydatid cyst indicated that the difference in prevalence among the three age groups were 4.7%, 1.8% and 0.3% in young, 26.6%, 8.6% & 3.9% in adult and 5.5%, 1.8% and nothing has been seenin old respectively (Table 4).

Association of Breed and Rejection Rate of Organs Due to Specific Major Parasites: According to breeds of animals included in the study, comparison was also made on the prevalence of parasites in the area. Out of animals examined the majority parasites like liver fluke (*Fasciola*), hydatid cyst and both liver fluke (*Fasciola*) and hydatid cyst 32.6%, 12% and 4.2% were from local breed of animals and about 4.2%, 0.3% and with no prevalence rate in case of both liver fluke (*Fasciola*) and hydatid cyst in cross breed of animalsrespectively (Table 4).

Association of Altitude and Rejection Rate Organs Due to Specific Major Parasites: Based on altitudinal differences the target area was broadly classified in to highland, midland and lowland. Thus, comparison was made on the prevalence of the parasites were liver fluke, hydatid cyst and both hydatid cyst and fluke having 6%, 3.2% and 1.3% in highland, 29.4%, 9.1% and 2.9% in midland and 1.3% nothing has been recorded in case of hydatid cyst and both hydatid cyst and fluke in lowland respectively. There was no significant variation in prevalence between the three-agro climates at individual level ($p > 0.05$) (Table 4).

Economic Loss Assessment: Out of 384 slaughtered animals,157 (40.9%) both fasciolosis and hydatidosis infected livers, 24 (6.3%) only hydatidosis infected lung, 2 (0.5%) hydatidosis infected spleen, 17 (4.4%) hydatidosis infected liver and lung and 4 (1%) hydatidosis infected lung and spleen of cattle were corresponding to an estimated total loss due to the presence of parasites. In the Gimbi Municipal abattoir,

the average annual cattle slaughtered rate was estimated to be 2500 heads while by taking the average market price of each lung, liver and spleen as 7.10, 65.20 and 2.30 Ethiopian Birr respectively,the economic loss due to organ condemnations at a single abattoir at Gimbi Municipal abattoir was estimated (Table 5).Hence the direct annual economic loss due to rejection of organ was calculated based on average price per organ at Gimbi town according to the formula:

EL= Sr X Coy X Roz

EL = Estimated annual economic loss due to organs condemnation
Srx = Annual cattle slaughter of the abattoir
Coy = Average cost of each cattle liver/lung/spleen
Roz = Condemnation rate of cattle liver/lung/spleen

For liver: EL = Sr X Coy X Roz
EL = 2500 X 65.2 X 0.409 = 66,667 ETB

For lung: EL = Sr X Coy X Roz
EL = 2500 X 7.1 X 0.063 = 1,118.25 ETB

For Spleen: EL = Sr X Coy X Roz
EL = 2500X 2.3 X0.005 = 28.75 ETB

For Lung and Liver: EL = Sr X Coy X Roz
EL = 2500 X 72.3X 0.044 = 7,953 ETB

For Lung and Spleen: EL = Sr X Coy X Roz
EL = 2500 X 9.4 X 0.01 = 235 ETB

Total ground cost of all organs =76,002ETB

Finally, based on the relevant information mentioned above, the cost associated with condemnation of organs was estimated to be 76,002 Ethiopian birr (3964.63USD, exchange rate 19.17) per annum.

DISCUSSION

The current study which was carried out in Gimbi municipal abattoirrevealed that different abnormalities like Abrasion (8.9%), Lameness (1.3%), Brand(2.1%) and Localized swelling (2.3%) were detected in 56 (14.6 %) head of cattle. However, these animals were passed for slaughter with great caution thorough postmortem examination because some of these different abnormalities either might be symptom of diseases or resulted from the long journey from market area to the abattoir as animals derived on their foot.

All organs were examined for the presence of parasites or other abnormalities during postmortem examination and the result revealed thatorgans of 204 (53.1%) animals were infected with parasites harboring one or more parasites involving different visceral organs; that is 141 (36.8%) of liver due to only liver fluke and 16 (4.2%) of liver due to both liver fluke and hydatid cyst, 24 (6.3 %) of lung, 2 (0.5%) of spleen, 17 (4.4 %) of lung and liver and 4 (1.1%) of lung and spleen were rejected because of fasciolosis and Haydatidosis or both of them.Comparatively larger prevalence rate of bovine hydatidosis were also reported from Morocco and Kenya in which the prevalence of 23.0 % [20] and 19.4% [21]were recorded, respectively. This might be due to the frequent contact between the infected animals, backyard slaughtering, poor public awareness and factors like difference in culture, social activity and attitude to dogs.

Hydatidosis (*Echinococcosis)* is one of the most geographically widespread zoonotic diseases and known to be important in livestock and public health in different parts of the world (Especially in undeveloped and developing countries)and its prevalence and economic significance has been reported by different researchers in different geographical areas. The prevalence may however vary from country to country or even within a country.

The variation in prevalence between different countries and regions may be attributed mainly to strains difference in *E. granulosus* that exist in different geographical situations [22].

A higher prevalence rate of bovine hydatidosis (48.7%) has been reported from Ngorongoro district of Arusha region, Tanzania [23] and also 34.15% prevalence rate has been reviewed and summarized from abattoir survey over a period of 15 years from Ethiopia [24]. The prevalence of the disease in cattle slaughtered at Ambo municipal abattoir was also high (29.69%) [25, 26] also reported high prevalence rate of bovine hydatidosis (22.1%) in cattle slaughtered at Tigray region.

The result of present study revealed that moderate prevalence rate of bovine hydatidosis (12.3%) was recorded in cattle slaughtered at Gimbi municipal abattoir which is lower than the previous prevalence of disease discussed above but comparablewith the prevalence rate of disease reported from Burdur (Turkey) 13.5% [27] and

from Thrace (Turkey) 11.6% [28]. This might be due to the abundance and frequent contact between the infected intermediate and final hosts. It could also be associated to slaughtering of aged cattle which have had considerable chance of exposure to the parasitic ova, backyard slaughtering of small ruminants and provision of infected offal's to pet animals around homesteads (Locally 'kircha'). Other factors like difference in culture, social activity and attitude to dog in different regions might have contributed to this variation [29].Moreover, poor public awareness about the disease and presence of few slaughter houses could have contributed to such a higher prevalence rate.

Bovine fasciolosis is wide spread ruminant health problem and causes significant economic losses to live stock industry. Its prevalence and economic impacts has been reported by different researchers found in different parts of the world.

The study conducted by [30] indicated the existence of bovine fasciolosis in almost all regions of Ethiopia in their reports. However, the prevalence rate, epidemiology and the species involvement vary with locality and this is mainly attributed to the variation in the climate and ecological condition such as altitude, rainfall and temperature and livestock management system. One of the most important factors that influence the occurrence of bovine fasciolosis in an area is availability of suitable snail habitat [31]. Different studies were carried out on the importance of bovine fasciolosis in different parts of Ethiopia and showed enormous economic impact of the disease mainly due to affected liver condemnation at the abattoirs and loss of live stock production [25].

According to the information gained from Zonal Livestock Resource, Development and Health Agency, there is no registered information on prevalence rate of bovine fasciolosisin the study area. The overall abattoir prevalence of bovine fasciolosis obtained from the present study (36.8%) was relatively high and almost higher than the previous reports or findings from Bedelle (31.5%) [32], (27.1% and 29.8%) from Wolisso and Nekemte abattoirs, respectively. However, the prevalence is much lower when compared with several reports from different abattoirs of the country like at Gondar abattoir (90.65%) [33], atDebre-Birhan abattoir (88.57%), at Jimma (58.24%) [34], at Ziway abattoir (56.6%) [35], at kombolcha (53.58%) [36], at Sodo abattoir (47%) [37], at and 46.58% at Jimma abattoir [38]. These differences within the country are attributed mainly to variations in the ecological and climatic conditions such as altitude, rainfall and temperature, although differences in livestock management system and the ability of the inspector to detect the infection may play a part.

The prevalence of bovine hydatidosis shows significance association with age and body condition scores of the cattle slaughtered at Adigrat Municipal Abattoir [39]. But it showed insignificant association in this study, except in sex of animals. But, the work done by [40] and [41] concluded that sex has no impact on the infection rate. Even though both male and female are equally susceptible to the disease, male animals were two times more susceptible (P=0.014, OR=2.29) to be affected by the disease as compared to female animals in the study area. This significant effect of sex on the rate of major parasites might be due to the management system with longer exposure of male outdoor while females are kept indoor at the beginning of lactation [42].

Even though this study showed statistically insignificant variation (P>0.05) with age, high rate of infection of major parasites (Liver fluke only, Hydatid cyst only and both) were seen in adult (26.6%, 8.6% and 3.9%) than the old (5.5%, 1.8% and young (4.7%, 1.8% and 0.3%) age groups. 26.6%, 8.6% and 3.9% in adult and 5.5%, 1.8% and nothing has been seenin old in case of both) respectively (Table 4). This might be most of the slaughtered animals were adults, which were most likely culled due to inefficiency for draught purpose. And next to adult, old animals are likely to have a higher possibility of acquiring infection due to their longer exposure to infection and to lower immunity to combat infection. Additionally, the reason for lower prevalence in young cattle may be early culling ofthe infected young cattle through slaughtering before they reach old age.

As reported by [43] and [44], animals with poor body condition were highly infected with hydatidosis. During the period of study, infection rate of bovine fasciolsis was statistically analyzed on the base of body condition to study the impact of the disease in debilitating (Emaciating) infected animals. But the result of the present study of the disease was not in agreement with previous studies. Based on the comparison made among body condition, high infection rate of major parasites like liver fluke, hydatid cyst and both (28.4%, 10.2% and 3.6%) from animals with good body conditions and followed by animals with medium or moderate (6.8%, 1.3% and 0.3%) and poor or thin (1.6%, 0.8% and 0.3%) respectively. However, the result of study indicated that infection rate

has no statistical significance (p>0.05) amongthe animals with poor (Thin), medium (Moderate) or good body conditions body condition of slaughtered animals (Table 4).

According to comparison made among breeds of animals included in the study, the prevalence rate of parasites (Liver fluke, hydatid cyst and both) was higher in local (32.6%, 12% and 4.2%) than cross breed (4.2%, 0.3% and with no prevalence rate in case of both in cross breed) respectively (Table 3). Similarly, comparison was made on the prevalence rate of the parasites based on altitudinal differences and animals those came from midland (29.4%, 9.1% and 2.9%) and slaughtered at Gimbi Municipal abattoir was highly attacked by the parasites than highland (6%, 3.2% and 1.3%) and lowland (1.3% nothing has been recorded in case of hydatid cyst and both) in respectively. However, there was no significant variation in prevalence between the three-agro climates at individual level (p > 0.05) (Table 4).

As reported by [30], an annual loss of 360 million Ethiopian Birr per annual on the national basis. Economic importance of bovine fasciolosishas been the main concern of several workers in Ethiopia. The direct economic loss incurred during this study as a result of condemnation of different organs of cattle was estimated about 76,002 ETB per annumwhich is relativelylarger than report from Nekemte estimated as 662,084.00 ETB [45] and from Gondar [46] where they estimated the annual loss of 674,093.038 ETB. This shows that these parasites are economically important parasites of cattle and causes zonotic diseases in the study area.

CONCLUSION

In conclusion the results in the present study revealed that the main causes of organ condemnation were fasciolosis and hydatidosis. The infection rate of fasciolosis and hydatidosis in cattle slaughtered at Gimbi municipal abattoirs is high and moderate respectively. Both fasciolosis and hydatidosis are the most highly parasitic disease causes of organ condemnation in cattle of the study area and incurring huge economic loss due to organ condemnation.Therefore, awarding the community not to allow dogs to eat condemned infected organs. Epidemiology and economic losses due to fasciolosis and hydatidosis has to be studied in detail and subsequently control measures should be in place at all levels.

Competing Interests: All authors have declared that no competing interests exist.

Authors' Contributions:

HB and ZA: Conception of the research idea, designing and data collection and interpretation and manuscript reviewing.
HD: interpretation of the results and drafting the manuscript with ZA.
All authors read and approved the final manuscript.

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