



Prevalence and economic significance of Bovine Hydatidosis in Jigjiga Municipal Abattoir, Eastern Ethiopia

Mohammed Kedir

College of Veterinary Medicine, Jigjiga University, Ethiopia

Abstract

A cross-sectional study was conducted from November 2024 to April 2025 to estimate the prevalence and economic impact hydatidosis in cattle slaughtered at Jigjiga municipal abattoir. Out of the total 338 cattle examined, 42(12.4%) were found to harbor hydatid cysts. Significant variation was observed among different body condition of animals ($P < 0.05$) and the highest prevalence was recorded in animals with poor body condition 25.4% than animals with medium 11.54% and good body condition 6.72%. However, no such association was observed in prevalence of hydatid cysts and sex, age and origin of study animals. From the examined cattle, 18(42.9%), 12(28.6%), 4(9.5%), 3(7.14%), 2(4.76%) and 3(7.14%) study animals have hydatid cysts in their lungs, livers, heart, kidney, spleen and both liver and lung, respectively. Out of the total 89 hydatid cysts counted, 34(38.2%) were fertile, 26(29.2%) sterile, and 29(32.6%) were calcified. Of the 34 fertile cysts subjected for viability test, 14 (41.2%) were viable while 20 (58.8%) were nonviable. The total annual economic loss from organ condemnation and carcass weight loss due to bovine hydatidosis at Jigjiga municipal abattoir was estimated to be 7,490,839 ETB (55,528.8 USD). From the result, it can be concluded that hydatidosis is one of the most prevalent and economically important disease in the study area. Therefore, appropriate control and prevention measures need to be taken in order to minimize the economic loss associated with the problem and to prevent the zoonotic risk to the public health.

Keywords: Abattoir; Bovine Hydatidosis; Economic Significance; Jigjiga; Prevalence

1. Introduction

Ethiopia has the largest livestock population in Africa, having an estimated number of 70 million heads of cattle, 42 million sheep, 52 million goats, 8 million camels and 56 million poultry (CSA, 2021). Livestock serve for Ethiopian economy as source of cash income and means of savings, import and export commodities, and provide raw

materials for industries like the leather industry (Grumiller and Raza, 2019). In spite of having the largest livestock population in Africa, the contribution for the economic aspect of the country is still lowest and livestock disease can be considered as major constrain. Among the many prevalent livestock diseases, parasitism represents a major constraint to livestock development in the tropics and hydatidosis is the major parasitic

diseases contributing to low productivity of meat production due to carcass or organ condemnation (Akeberegn *et al.*, 2017).

Hydatidosis, also known as cystic echinococcosis (CE), is a zoonotic parasitic disease caused by the metacestodes (larval stages) of the tapeworm *Echinococcus granulosus* (Gessese, 2020). The disease is associated with huge economic losses and great public health significance worldwide (Bekele *et al.*, 2024). A wide variety of animal species, both domestic and wild, that act as intermediate hosts have made *Echinococcus granulosus* widely distributed across the globe (Dana, 2018), and it induces significant economic loss through organ condemnation, decreased hide value, carcass weight, and decreased productivity (Abebe *et al.*, 2021).

Echinococcus species have an indirect life cycle and must develop in both an intermediate and a definitive host. Dogs and foxes are the primary definitive hosts for the adult parasite while numerous herbivorous animals act as intermediate hosts for the larval stages (Hiko *et al.*, 2018). Adult worms live in the small intestine of the definitive host, and they reproduce, releasing eggs into the environment in the feces of the host animal. Segments containing eggs (gravid proglottids) or free eggs are passed in the feces of the definitive host, a carnivore. The eggs are ingested by an intermediate host, in which the metacestode stage and protoscolices develop. The cycle is completed if such an intermediate host is eaten by a suitable carnivore (Mitiku and Amenu, 2017).

All disease-causing species of *Echinococcus* are transmitted to intermediate hosts via the ingestion of eggs and are transmitted to definitive hosts by means of eating infected, cyst-containing organs (Tadesse and Negash, 2022). The transmission of *Echinococcus* species from intermediate to definitive host is the result of predator-prey relationships existing between hosts; however, it can be modified by human behavioral factors for synanthropic cycles, and man is usually a dead-end intermediate host (Akeberegn *et al.*, 2017). The outcome of infection in livestock causes severe disease and death in humans and results in

economic losses in the form of treatment costs, lost wages, and livestock annual production losses. This might be attributed to backyard slaughter practices, an increase in the population of stray dogs, and the absence of a control program (Serda and Jago, 2017). The distribution of *E. granulosus* is higher in developing countries, especially in rural communities where there is close contact between the dog (the definitive host) and various domestic animals, which may act as intermediate hosts (Yusuf *et al.*, 2017).

In Ethiopia, hydatidosis is one of the major endemic diseases, especially where sheep, goats, cattle, camels, and pigs are still slaughtered traditionally, and offals are easily accessible to scavenging dogs and other wild carnivores (Megersa, 2010). Furthermore, the absence of proper meat inspection, traditional practices of backyard slaughtering systems, lack of sufficient awareness about foodborne diseases, and the presence of a large stray dog population are thought to contribute significantly to the prevalence of the disease in Ethiopia (Guduro and Desta, 2019).

The diagnosis and treatment of CE is very difficult and the disease can be asymptomatic in living animals. Because of the disease is under reported and can take up to 5 to 10 years for the cysts to cause problems. Treatment of CE in humans is through medical and surgical means and also puncture and aspiration, injection and re-aspiration (PAIR).

Control and preventive measures are mainly all about to break the life cycle between the definite and the intermediate host. These measures include regular periodic de-worming of dogs, proper meat inspection, educating the public on the risk to humans, avoiding feeding offal's to dogs, prevention of dog enter to slaughter house, destroying all offal's containing cysts and washing vegetables before eaten. The disease can be controlled successfully through centralizing the slaughtering of animals for food in veterinary control units, and ensuring sanitary conditions for slaughtering are also conventional control measures (Lechamo and Geinoro, 2019; Temesgen, 2020).

Hydatidosis has been known and documented in Ethiopia as early as 1970; it is still a major cause of organ condemnation in most Ethiopian abattoirs and leads to huge economic losses in the livestock sector (Alemu *et al.*, 2013). Several reports had indicated that Hydatidosis is widely prevalent in livestock population of various regions of Ethiopia (Degefu and Damet, 2013). Even though several studies were conducted on the prevalence of hydatidosis on different abattoir, it was limited information on the current status of the disease in the study area. So, it would be essential to have information on the current status of hydatidosis to forward pertinent recommendations.

Therefore, the objectives of the current study were:

- To estimate the prevalence of hydatidosis in cattle slaughtered at Jigjiga municipal abattoir.
- To estimate direct and indirect financial losses associated with the disease at the study area.

2. Materials and Methods

2.1 Description of the Study Area

The study was conducted in Jigjiga municipal abattoir. Jigjiga is the capital city of Somali Regional State (SRS) and it is found eastern part of Ethiopia at 630 km away from Addis Ababa and 105 km from Harar city with population size of 105,634. Jigjiga is situated at an altitude of 1660 m above sea level and it is astronomically located at 9°20' N latitude and 45°56' E longitude. The climate of Jigjiga is semi-arid type which is characterized by high temperature and low rainfall. The mean annual rainfall is about 543 mm and mean annual temperature is about 22 °C (CSA, 2015). Livestock population of Jigjiga was 270,662 cattle, 462,725 sheep, 180,250 goats, 12,116 equine and 934,906 camels (ESRSLPDB, 2014).

2.2. Study Design

A cross-sectional study was conducted from November 2024 to April 2025 to study the prevalence of hydatid cysts in cattle at Jigjiga

municipal abattoir and to estimate its direct and indirect financial losses. Risk factors, organ distribution, and cyst characterization were also assessed and included in the study.

2.3. Study Population

The study animals included were cattle brought to Jigjiga municipal abattoir from different areas for slaughtering purpose during the study period. This population comprised cattle of different sex, age, body condition, and originating from different districts around the town.

2.4. Sample Size Determination and Sampling Method

The sample size was calculated using the formula given by Thrusfield (2018), based on the previous study, taking 10.9% expected prevalence of Mohamed *et al.*, (2017) with a 95% confidence interval (CI) and 5% desired absolute precision.

Where: Therefore $N = \frac{Z^2 \cdot P \cdot d}{E^2}$

N = required sample size;

1.96 is the value of Z at the 95% confidence interval;

P_{exp} = expected prevalence;

d = desired absolute precision;

Accordingly, the calculated sample size was found to be 149. However, 189 animals were added to increase the level of accuracy of determining the prevalence, the study sample size had been increased to 338. The sampling of study animals were conducted by systematic random sampling method.

2.5. Study Methodology

2.5.1. Ante-mortem Examination

Ante mortem inspection was carried out using visual examination on each of the study animals. Regular visits (2 days per week) were made to Jigjiga municipal abattoir during the period from November 2024 to April 2025. On average 20 animals were examined per week. During ante mortem inspection, age, sex, body condition

scoring and origin of the animals were recorded and each of the study animals was given an identification number by using a permanent marker. The age of animals was determined by incisors of animal's teeth (De-Luata and Habel, 1986). The body condition scoring was also classified into three categories: poor (Scores 1, 2, and 3), medium (Scores 4-6), and good (Scores 7-9) (Nicholson and Butterworth, 1986).

2.5.2. Post-mortem Inspection

The visceral organs (liver, lung, heart, kidney and spleen) were examined visually, palpated, and incised to detect presence of hydatid cysts. The existence of hydatid cysts and the location of these cysts throughout the organs were noted in every organ. In order to further characterize the cysts, hydatid cysts were carefully removed and collected separately (on organ basis) in clean containers. Characterization of hydatid cysts was performed in order to evaluate their condition (Habtie, 2019).

2.5.3. Cyst Characterization

The fertility of cysts was examined microscopically. Each cyst was cut, opened with scissor and the content of the cyst was poured into a clean petri dish. A drop of cyst fluid was put in a clean slide and then examined under the microscope (40×) for the presence or absence of protoscolices. The protoscolices present as white dots on the germinal epithelium or brood capsule or hydatid sands within the suspension, such cysts were characterized as fertile cysts. Fertile cysts were subjected for viability test. The viability of protoscolices was determined by flame cell motility. For clear vision a drop of 0.1% aqueous eosin solution was added to equal volume of protoscolices in Hydatid fluid on the microscopic slide with the principle that viable protoscolices should completely or partially exclude the dye while non-viable protoscolices absorb the stain. (Dalimi *et al.*, 2002). The cyst which contained no protoscolices as well as calcified, or degenerated was considered as infertile cyst. Furthermore, infertile cysts were classified as sterile or calcified. Sterile hydatid cysts were characterized by their smooth inner lining, usually with a

slightly turbid fluid content. Typical calcified cysts produce a gritty sound feeling up on incision (Kebede *et al.*, 2009).

2.6. Data Management and Analysis

The data obtained from ante-mortem and postmortem findings and characterization of cysts were coded and uploaded into the Microsoft Excel 2013 spread sheet computer program and analyzed using Stata version 11 to compare the infection status with regard to hypothesized risk factors like sex, age, body condition score, origin and cyst characteristics like cyst type (fertile, sterile, degenerated, or calcified) and protoscolices viability (viable and nonviable). The associations of risk factors with disease prevalence were determined using a chi-square (χ^2) test and P-values of less than 0.05 are regarded as significant.

2.7. Estimation of Economic Loss

Direct and indirect losses were the basis for the estimation of the annual economic losses due to hydatidosis. Direct loss was calculated on the basis of condemned organs, whereas indirect losses were estimated on the basis of live weight loss caused by hydatidosis. Accordingly, the economic values of the loss from organ condemnations were evaluated by considering the following parameters. These includes information on the mean retail market price of the organs (Lungs, liver, spleen, heart and kidney) at Jigjiga town obtained from butchers during the study period and the average annual slaughter rate of cattle at Jigjiga municipal abattoir estimated from the retrospective data recorded from the last three years. Using current organ condemnation rates and price indices combined with annual cattle slaughter rate at the abattoir (secondary data), annual economic losses associated to Hydatidosis was calculated by using the formula described by Ogunirale, (1980) as follows.

$$LOS = (NAS \times PLu \times CPLu) + (NAS \times PLi \times CPLi) + (NAS \times PHr \times CPHr) + (NAS \times PKi \times CPKi) + (NAS \times PSp \times CPSp)$$

LOC: Loss Due to Organ Condemnation;
 NAS: Mean Number of Cattle Slaughter Annually
 PLu: Percent Involvement of Lung
 CPLu = Current Mean Retail Price of Lung;
 PHr: Percent Involvement of Heart
 PLi: Present Involvement of Liver
 PSp: Percent Involvement of Spleen
 PKi: Percent Involvement of Kidney
 CPHr: Current Mean Retail Price of Heart;
 CPLi: Current Mean Retail Price of Liver;
 CPSp: Current Mean Retail Price of Spleen;
 CPKi: Current Mean Retail Price of Kidney;

Likewise, the following parameters were considered to estimate the economic loss due to carcass weight loss: Information on the mean market cost of 1 kg beef at Jigjiga town obtained from restaurants during the study period. The average annual slaughter rate of cattle at the abattoir obtained from retrospective data. A 5% estimated carcass weight loss due to bovine hydatidosis described by Getaw *et al.*, (2010) was taken into account to determine the carcass weight loss. Average carcass weight of an Ethiopian zebu was taken as 126 kg (ILCA, 1979). Thus, indirect loss was calculated as:

$$LCWL = NAS \text{ ph CpB } 5\% 126\text{kg}$$

Where: LCWL = loss from carcass weight loss; NAS = average number of cattle slaughtered annually; ph = prevalence of hydatidosis; CpB = current average price of 1 kg of beef in Jigjiga Town; 5% = estimated carcass weight loss due to hydatidosis; 126kg = average carcass weight (dressing percentage) of adult zebu. The total financial loss is calculated by considering the loss from both organ condemnation (LOC) and carcass weight losses (LCWL), that is:

$$\text{Total loss} = \text{LOC} + \text{LCWL}$$

3. Results

Overall Prevalence of Hydatid Cysts: In the current study, a total of 338 cattle examined and the overall prevalence of hydatid cyst in cattle slaughtered at the Jigjiga Municipal Abattoir was found to be 12.4% (42/338) (Table 1).

Table 1: Overall prevalence of hydatid cyst

Number of animals examined	Number of positive	Prevalence (%)
338	42	12.4

Prevalence Association with the Potential Risk Factors: In relation to sex groups of animals slaughtered at the Jigjiga municipal abattoir, the prevalence of bovine hydatidosis was 14.95% (16/107) and 11.26% (26/231) for female and male animals, respectively. There was no statistically significant variation in the prevalence of bovine hydatidosis among sex group ($p > 0.05$) (table 2).

From 109 young animals, 12 (11%), and from 229 adult animals, about 30 (13.1%), were found to harbor the hydatid cyst. There was not statistically significant difference ($p > 0.05$) between these two age groups in the prevalence of hydatid cysts. About 63 animals with poor, 156 medium, and 119 good body condition were examined and

accounted for hydatid cysts presence of 16(25.4%), 18(11.54%), and, 8(6.72%), respectively. There was statistically significant variation ($p < 0.05$) in the prevalence of hydatid cysts among animals of body conditions. The prevalence was highest in poor body condition than medium and good body conditions. Animals in poor body condition were 2 times ($OR=2.221$) more likely to acquire the diseases than the medium and good body condition.

According to this result the origin of cattle was not significantly associated with hydatidosis ($P > 0.05$). However, higher prevalence 15% was observed in cattle brought from Fafan, while prevalence of 11.02% and 8.33% was found in cattle originated from Babile and Jigjiga respectively (table 2).

Table 2: The prevalence of bovine hydatidosis among different risk factors.

Risk factors		Number of Examined	Number of positive	Prevalence (%)	Chi-square (χ^2)	P-Value	Odds ratio
Sex	Female	107	16	14.95	0.919	0.338	0.721
	Male	231	26	11.26			
Age	Young	109	12	11	0.297	0.586	0.821
	Adult	229	30	13.1			
Body Condition	Poor	63	16	25.4	13.41	0.001	2.221
	Medium	156	18	11.54			
	Good	119	8	6.72			
Origin	Jigjiga	60	5	8.33	2.113	0.348	0.957
	Babile	118	13	11.02			
	Fafan	160	24	15			

Distribution of Hydatid Cyst in Visceral Organ of Cattle: Over all distribution of hydatid cyst in different visceral organs of cattle slaughtered at the study abattoir was shown in (Table 3). The post-mortem inspection revealed that the distribution of cysts involved lung liver, heart,

kidney and spleen. From the examined cattle, 18(42.9%), 12(28.6%), 4(9.5%), 3(7.14%), 2(4.76%) and 3(7.14%) study animals have hydatid cysts in their lungs, livers, heart, kidney, spleen and both liver and lung, respectively.

Table 3: Distribution of hydatid cyst in different organs of infected cattle.

Organ examined	No of infected organs	Prevalence (%)	Prevalence from infected animals
Lung only	18	5.3	42.9
Liver only	12	3.6	28.6
Heart only	4	1.2	9.5
Kidney only	3	0.9	7.14
Liver and lung	3	0.9	7.14
Spleen	2	0.6	4.76
Total	42	12.4%	100%

A total of 45 visceral organs were found to be affected by hydatid cyst. Among different visceral organs infected lung 21(46.7%), liver 15(33.3%), heart 4(8.9%), kidney 3(6.7%) and spleen 2(4.4%) were affected. From the total 89 cysts

counted, the highest number was counted from lung 21(50.6%), followed by 15(28.1%), 3(8.9%), 4(7.9%), and 2(4.5%) from liver, kidney, heart and spleen respectively (Table 4).

Table 4: Number and distribution of hydatid cyst within the infected organs.

Organs	No of positive organ	No of cyst counted	Proportion of cyst obtained (%)
Lung	21	45	50.6
Liver	15	25	28.1
Heart	4	7	7.9
Kidney	3	8	8.9
Spleen	2	4	4.5
Total	45	89	100

Hydatid Cyst Characterization: Out of the total 89 hydatid cysts counted, 34(38.2%) were fertile, 26(29.2%) sterile, and 29(32.6%) were calcified (table 5).

Table 5: Fertility/sterility status of hydatid cysts collected from different organs of infected cattle.

Organs	Number of cysts	Fertile (%)	Sterile (%)	Calcified (%)
Lung	45	18(20.2)	19(21.3)	8(8.99)
Liver	25	11(12.4)	3(3.4)	11(12.4)
Heart	7	0	1(1.1)	6(6.7)
Kidney	8	3(3.4)	3(3.4)	2(2.2)
Spleen	4	2(2.2)	0	2(2.2)
Total	89	34(38.2%)	26(29.2%)	29 (32.6%)

Out of the 34 fertile cysts subjected for viability test, 14(41.2%) were viable while 20(58.8%) were nonviable (table 6).

Table 6: Viability rate of fertile cysts collected from different organs of infected cattle.

Organs	No of fertile cysts	Viable (%)	Non-viable(%)
Lung	18	7(38.9)	11(61.1)
Liver	11	5(45.5)	6(55.4)
Kidney	3	1(33.3)	2(66.7)
Spleen	2	1(50)	1(50)
Total	34	14(41.2)	20(58.8)

Number of infected organs and economic loss estimation: In the present study, a total of 21lung, 15 liver, 4 heart, 3 kidneys, and 2 spleen were condemned due to the detection of hydatid cysts. The economic loss due to organ condemnation caused a direct annual economic loss of 241,303.2 ETB (table 7). Indirect losses resulting from a decrease in carcass weight were calculated to worth 7,249,536 ETB annually. This

was accomplished by accounting for both 5% drop in carcass weight caused by bovine hydatidosis and the average carcass weight of adult cattle in Ethiopia (126 kg) (ILCA, 1979). The total economic loss caused by bovine hydatidosis was calculated by adding the direct and indirect economic losses at the municipal abattoir in Jigjiga. This resulted in an overall economic loss of 7,490,839.2 ETB.

Table 7: Direct economic loss due to organ condemnation as a result of bovine hydatidosis during the study period.

Organ examined	Number (%) of organs condemned	Average current market price (Birr)	Annual slaughter rate of cattle	Total price (Birr)
Lung	21(6.21)	80	11600	57,628.8
Liver	15(4.4)	300	11600	153,120
Heart	4(1.2)	150	11600	20,880
Kidney	3(0.89)	60	11600	6194.4
Spleen	2(0.6)	50	11600	3480
Total	45			241,303.2ETB

4. Discussion

The overall prevalence of hydatidosis in cattle slaughtered at the Jigjiga municipal abattoir during the study period was 12.4%. This finding was comparable with the 12.2% previously reported by Worku, (2017) in Elfora export abattoir. But this prevalence was higher than the 10.7% reported by Ahmed *et al.*, (2024) in Haramaya, 9.4% reported by Belina *et al.*, (2015) in Harar and the 6.51% reported by Akebergn *et al.*, (2017) at Debre Berhan Municipal Abattoir. However, the prevalence obtained in this study was lower than several studies that conducted in Dire Dawa Municipal Abattoir 20.1% by Miheret *et al.*, (2013); the 52.5% by Mandefro *et al.*, (2019) in Adama, and the 49.74% by Derbew and Mohammed, (2022) in Jimma municipal abattoir. The difference could be due to differences in geographical location, climatic conditions, seasonal variation, environmental conditions, and offal disposal habits, intermediate host contamination rates, animal feeding status, livestock stocking intensity, and livestock movement, which could all be factors that affect the prevalence of hydatidosis.

In this study, an assessment was done on the relationship between different risk factors and cyst infection. Sex, age body condition, and origins of the study animals were considered as risk factors. The current study showed that there was not statistically significant prevalence variation between animals of different sex groups ($p > 0.05$) even though higher prevalence rate was

observed in females 16 (14.95%) than male animals 26 (11.26%). Similar finding has been reported in Harar by Abera *et al.*, (2014).

Similarly, there was not statistically significant association ($P > 0.05$) between the age category of animals. However, there was statistically significant variation of prevalence ($p < 0.05$) obtained among the different body conditions of the study animals. The prevalence of hydatidosis was significantly higher in cattle with poor body condition 25.4%, followed by medium 11.5%, and good 6.7%. This finding is agreement with the finding of Ahmed *et al.*, (2024) in Haramaya. The reason for this is possibly that animals with poor bodily conditions have a higher risk of contracting hydatid cyst infection due to low immunity. It also might be due to the animals under poor body condition had previously faced on nutritional and health problems. Moderate to severe infection, the parasite may cause retarded growth, reduced quality and yield of meat and milk as well as live weight loss (Mohamed *et al.*, 2017). The prevalence of disease among the animals from the various place of origins was not significant association ($P > 0.05$). However, higher prevalence 15% was observed in cattle brought from Fafan, while prevalence of 11.02% and 8.33% was found in cattle originated from Babile and Jigjiga respectively. This result was in agreement with the report of Yohannes and Masresha, (2019) in Hawassa municipal abattoir.

In the current study, the prevalence of hydatidosis among different organs involved in harboring the

cyst showed that the lung 42.9% was found to be the most commonly affected organ, followed by the liver 28.6% and heart 9.5%. Similar findings were reported by Ibsa, (2024) at Fedis District. This could be explained by the fact that the liver and lung possess the greatest capillary sites encountered by the migrating *Echinococcus granulosus* onchospheres (hexacanth embryo), which adopt the portal vein route and primarily breach the hepatic and pulmonary filtering systems sequentially before any other peripheral organ is involved. However, the development of hydatid cysts occurs occasionally in other organs like the spleen, kidney, and heart and other organs and tissues when onchospheres escape into the general systemic circulation, as reported by Alula (2010). In this study, out of the total 89 hydatid cysts counted, 34 (38.2%) were fertile, 26 (29.2%) sterile, and 29 (32.6%) were calcified. Those of 38.2% of the cysts were fertile and 15.7% of the fertile cysts were proved to be viable and 22.5 were non-viable.

In the current study, the annual economic loss due to bovine hydatidosis at Jigjiga municipal abattoir from visceral organs condemnation and carcass weight losses was assessed to be 7,490,839.2 ETB (55,528.8 USD). This finding was higher than 5,444,564.4 ETB estimated in Bushoftu by Bekele *et al.*, (2024) and 3,730,328 ETB estimated by Gebeyeh and Achenif, (2019) Debire Birhan municipal abattoir. However, it was lower than 10,531,776.12 ETB that estimated by Wossene and Dubie, (2020) in Bahir Dar municipal abattoir. The differences in financial loss estimation in various abattoir studies may be due to the variations in the prevalence of disease, mean annual number of cattle slaughtered in different abattoirs and variations in the retail market price of organs.

5. Conclusion and Recommendation

The study indicated that bovine hydatidosis is prevalent and causes considerable economic losses due to organ condemnation and indirect weight loss at Jigjiga municipal abattoir. The current finding showed that the body condition of

the study animals was found as a significant risk factor for hydatidosis infection in the study area. It was also evident that the lung and liver were the two organs with the highest cystic echinococcosis prevalence as compared to other organs, which potentially leads to a higher rate of condemnation of these organs. Based on the result of the study and the above conclusion the following recommendations are forwarded:

- Appropriate meat inspection and proper disposal of condemned organ should be performed in abattoir.
- Prohibition of back yard slaughtering
- Regular deworming of dogs should be practiced.
- The number of stray dogs should be reduced in community by responsible body.
- For the abattoir to produce safe and wholesome meat for the consumer, standard regulations and functioning meat inspection procedures should be correctly carried out.
- To stop the disease's cycle of transmission, condemned organs must be burned in a designated spot, preventing dogs and other wild animals from having easy access to the offals.

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