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A Study on Major Causes of Organs Condemnation and Their Financial Losses in Cattle Slaughtered at Gondar ELFORA Abattoir, Northwestern, Ethiopia

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Abstract: The study was conducted from November 2009 to April 2010 on cattle slaughtered at Gondar ELFORA abattoir with the aim of the major causes of organ condemnation and to estimate the financial losses attributed to the condemned organs. Routine antemortem and postmortem inspection procedures were followed throughout the study and the abnormalities encountered were recorded. A total of 791 bovines were examined at antemortem and 56 animals were found to have abnormalities /conditions like depressions, emaciations, fever, lameness, local swelling, branding and tick infestation. Out of 3840 organs belonging to 768 slaughtered animals examined at postmortem 377(49.08%) livers, 263 (34.24%) lungs, 36(4.68%) hearts and 74 (4.81%) kidneys were rejected due to gross abnormalities. The major causes of organ condemnation were fasciolosis (46.15%) and hydatidosis (36.87%) for liver; hydatidosis (76.04%) and pneumonia (11.40%) for lung; hemorrhage (35.13%) and nephritis (27.02%) for kidney and pericarditis (63.88%) for heart. The direct annual financial loss due to condemnation of these organs was calculated to be 211,674.45 ETB per annual, rendering them unfit for local market on aesthetic grounds or considering their zoonotic risks to human beings. To this end, public education on the effect of animal -disease, application of strict control measures accompanying epidemiological studies and exercising appropriate meat inspection procedures were forwarded to minimize organ condemnation and as well as to safeguard the welfare of the public.

Key words: Abattoir · Antemortem inspection · Cattle · Condemnation · Economic loss · Gondar · Postmortem inspection

INTRODUTION

In Ethiopia livestock contributes about 30-35% of agricultural gross domestic product and more than 85% of farm cash income. Livestock have been known to provide multitude of ruminant services to the producers and the nation. They provide high quality food from consumption of fibrous and unusable resources. They serve as sources of cash income and means of savings, important export commodity and provide raw materials for industries like leather industry. In Africa in general and in Ethiopia in particular, the level of ruminant livestock production does not commensurate with its size. The condition of livestock productivity of Ethiopia is worthless when compared to other African countries [1].

Diseases that occur in livestock have two major impacts on the society. These are economic and public health impacts. These two major impacts have highly pronounced effect on the large scale abattoirs where there are large numbers of animals' slaughtered and large number of worker present. In addition to the risk on them, abattoirs' have high responsibility to provide risk free products to the society [2].

Slaughterhouses provide an excellent opportunity for detection on both economic and public health importance. Frequent encounters of bovine pathological lesions in the lungs, heart, kidney, gastro-intestine and liver have been constant features in the annual reports of various government stations [3-5]. Any observation and information obtained at slaughter house can contribute to the understanding of slaughtered animal diseases to make diagnosis within the slaughter line. Some of these surveys had been centered one or two organs of the body. A wide variation has been recorded in the incidence of abnormalities found in different geographical locations. These findings are affected by various factors such as the degree of veterinary supervision and critical appraisal of abnormalities by person caring out the survey [6, 7].

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Even though various investigation have been conducted through abattoir survey to determine the prevalence and economic losses resulting from organs condemnation in Ethiopia, most of the survey focused on parasitic cases such as hydatidosis and fasciolosis [8-10].

Parasitic diseases that include hydatidosis, fasciolosis and cysticercosis which could be zoonotic constitute a major economic problem by lowering the productivity of cattle and in addition to losses from condemnation of affected organs, humans can accidentally ingest the eggs or larvae and became infected [11, 12]. Each year a significant economic loss results from mortality, poor weight gain, condemnation of edible organs and carcasses at slaughter. This production loss in the livestock industry is estimated at more than 900 million USD annually [13-15].

Meat inspection is commonly perceived as the sanitary control of slaughter animals and wholesome for human consumption. The responsibility for achieving this objective lies primarily with the relevant public health authorities who are represented by veterinarians and meat inspectors at abattoir stage [16]. The purpose of meat inspection is to insure that only apparently healthy, physiologically normal animals are slaughtered for human consumption and that abnormal, animals are separated and dealt with accordingly to ensure that meat from animals is free from diseases, wholesome and no risk to human health. These are achieved by antemortem and postmortem inspection procedures and by hygienic dressing with minimum contamination whenever appropriate hazard analysis critical control point (HACCP) principles should be used [16].

The importance of antemortem inspection in the abattoir has long been recognized in all attempts to avoid the introduction of clinically diseased animals into the slaughter hall. Antemortem inspection should be done within 24 hours of slaughter and repeated if slaughter has been delayed over a day. This examination before slaughter also serves to obtain information that will be useful in making sound postmortem inspection [17]. A proper antemortem inspection of the animal makes the task of routine postmortem inspection simpler and straight forward procedure. Experiences have shown that full antemortem inspection can represent at least 50% of meat inspection, making the postmortem examination much more efficient and less laborious. It is appoint where animal health welfare can be controlled and in many countries forms a vital link with livestock production, preventive veterinary medicine and disease control on the farm.. Antemortem inspection can also make major contribution to meat quality by insisting on a high standard animal cleanliness, good livestock handling and lairaging [18].

Postmortem inspection is a screening or sorting process to separate the normal from the abnormal. It is the center around which meat hygiene revolves since it provides information indispensable for the scientific evolution of clinical signs and pathological processes that affect the wholesomeness of meat [16, 19, 20]. All gross lesions should be identified at least in general way [19]. Inspection carried out as soon as possible after completion of dressing [19]. The final judgment as to the action to be taken with an organ, a carcass or parts of the carcass is based on the total evidence produced by observation, palpation, incision, smell, any antemortem sign and result of any tests [21, 17].

In Ethiopia many studies have, been under taken to identify the major disease conditions encountered during antemortem and postmortem inspection. The-study conducted by Shiferaw [22] and Mezgebu [23] at Nazareth and Gondar abattoirs revealed that emaciation, swelling, lameness, skin diseases and branding were the major antemortem finding that contribute for the low carcass quality.

The main causes of organ condemnation during postmortem inspection are diseases originated by-parasites, bacteria and viruses. Of these diseases, liver fluke in liver and hydatid cyst in liver and lung are mainly involved [17].

Fasciolosis is caused by two trematode species, *Fasciola hepatica* and *Fasciolagigantica,* which develop in different livestock species, mainly sheep and cattle, but also in many other domestic herbivorous animals. Their life cycle appears to be markedly influenced by characteristics of the environment and/or human activities [24]. Adult parasite produce fertilized eggs which are passed in the bile and faeces onto pasture. The eggs hatch in the presence of water or moisture into larvae called miracidia. If miracidia find a suitable intermediate host *(Lymmeatruncatula,* which is aquatic snail), it will develop into sporocyst. The sporocystdivided to form radiae. The radiae transforms into cercariae which are the final larval stage. Then they leave snail and encyst into metacercariae. After ingestion by herbivorous animal, the cyst wall is digested in the duodenum and the larvae cross small intestine wall and peritoneal space to the liver. It penetrates the liver and makes its way to the bile ducts and matures within a few weeks [16].

Hydatid disease in cattle is caused by the larval stage of the 2-7 mm long tape worm *echinococcus,* which lives in the intestines of dogs and other carnivores. Several strains of *E. granulosus*exist: the cattle /dog strains is primarily responsible for hydatid disease in cattle [18]. The eggs laid by the tape worm in its intestinal habitat are excreted. They are then ingested by the intermediate hosts which are sheep, cattle, swine and other mammals including man and hatch in the intestine. The embryo then migrates through the blood stream to various organs of the host. They may become lodged in the liver and lungs where they develop into hydatid cysts. The majority of the cyst is sterile,particularly in cattle. Affected organs are unfitfor consumption [20].

Contamination with infectious organism during slaughter and dressing is also the most important sources of meat borne public health hazards.Thoughsome sources of contaminations are obviously involved when the carcass leaves the slaughter floor, contamination by contact remains as possibility in all operations during the subsequent handling process [19].

Various surveys have been conducted to determine the prevalence and economic losses resulting from condemnation of organs and carcasses in Ethiopia. Most of the surveys paid much attention to the parasitic causes of meat condemnation, but not other causes. Fasciolosis and hydatidosis are usually considered to be of major economic and public health importance [15,25-27].

There is lack of information on specific causes of organ condemnation and prevalence of diseases or conditions that lead to organ condemnation and proper evaluations of economic losses due to organ condemnation resulting from various diseases at Gondar ELFORA abattoir. Therefore, the objectives of the study were:-

- To identify the major causes of organ condemnation in cattle slaughtered at Gondar ELFORA abattoir.
- To estimate the magnitude of direct annual economic losses attributed to the condemned organs in the abattoir.

MATERIALS AND METHODS

Study Area Description: The study was conducted from November 2009 to April 2010 in North Gondar, Northwestern part of Ethiopia. Gondar is located 727 km north western Addis Ababa in Amhara regional state. It is divided into three major agro-climatic zones: highland, mid-highland and lowland. The altitude ranges from 550 meters in the west to 4620 meters in the Semein Mountain in the north. The rainfall varies from 880 mm to 1772 mm with a monomodal distribution, while the minimum and maximum temperatures are in the order of-10°C in the highland and 44.5°C in the West. The area is also characterized by two seasons, the wet season from June to September and the dry season from October to

Annex 1: Bovine age determination by Dentition

Average estimated age (Years`)	
2 (18-24 months)	First pair incisor erupt
2.5 (24-30 months)	Second pair incisor erupt
3 (36-42 months)	Third pair incisor erupt
4-5 (42-54 months)	Fourth pair incisor erupt
5	All incisor is wear
6-7	First pair incisor is leveled and neck is visible
8	Second pair incisor is leveled and neck is visible
9	Third pair incisor is leveled and neck is visible
>10	Four pair incisor is leveled and neck is visible

Source: De-lahunta and Habel (1986)

Annex 2: Antemortem and post mortem examination format

1. General information

Region _____ city_____ Name of abattoirs_____ Date_____

No. of slaughter cattle on the day:_____ Name of investigator_____

2. Specific data

S.NO	ID	Species	Sex	Age	Breed	Origin	Ante mortem examination	Judgment For slaughter	Postmortem examination				Judgment for human consumption
									Liver	Lung	Heart	Kidney	

May. According to zonal agriculture office the livestock population of Gondar registered, cattle 1,936,514, sheep, 524,083, goats, 682,264, poultry 2,124,000, donkey 223,124, mule, 12,473, horse 36,828 and camel. 606.

The farming system of the study area is characterized by a mixed crop-livestock production system. Transhumance, from the highlands to western lowlands, is practiced as an important strategy to secure grazing resources for the highland livestock during the dry season of the year. In the case of the lowlands, crop farming is not as intensive as high and mid-highland areas and livestock has larger contributions to the farmer's livelihoods [28, 29].

Study Population: Out of a total randomly selected 791 cattle on antemortem, 768 of which were slaughtered, of cattle presented for slaughter were 621 (80.9%) local breed and 147 (19.1%) cross breed. From the total 768 slaughtered cattle, 592 (77%) old and 176 (22.9%) adult age groups were studied in the abattoir. Total cattle presented for slaughter were inspected at antemortem and postmortem examination using their specific identification numbers and recorded accordingly on the format prepared for this purpose (Annex 2). They were originated from different parts of Amhara national regional state mainly from Gondarzuria, Azezo, Fogera, Chilga, Dabat and Dembia. Animals were transported to the abattoir using vehicles and on foot.

Study Design and Methodology: A cross-sectional study was conducted on slaughtered cattle at Gondar ELFORA abattoir from November 2009 to April 2010. Study subjects were selected using the systemic random sampling method. Three working days were selected out of a week for conducting both antemortem and postmortem examination.

Abattoir Survey

Antemortem Inspection: Before the animals were slaughtered, antemortem inspections were conducted on individual animals while the animals were entering into the lairage and after they entered into the lairage in mass. Both sides of the animals were inspected at rest and in motion. The cattle were identified based on marks written on their body surface using paint color. Moreover the general behavior of the animal's signs of diseases and abnormality of any type were registered according to the standard antemortem inspection procedures [19]. The age, breed and origin of each animal were also recorded. Following the judgments passed by FAO [18], animals fit for human consumption were allowed for slaughter.

Postmortem Inspection: Postmortem examination involved visual examination, palpation and systemic incision of organs with keen attention to being directed to liver, lung, heart and kidney to look the presences of cysts, parasites and other abnormalities. Pathological lesions were identified and judged according toFAO [18] guideline on meat inspection for developing countries and the results were recorded.

Assessment of the Financial Loss: Financial losses due to condemnation of organs were considered in the study period. The financial loss estimation was based on the annual slaughter capacity of the abattoir considering market demand, average market prices in the locality and rejection rates of specific organs. The total financial loss of condemned organs of cattle at Gondar ELFORA abattoir was estimated using the following formula set by Ogunriade and Ogunrinade [30] as follows:

EL = $\sum srx$ X Coy X Roz

EL= Annual economic loss estimated due to organ condemnation from local markets

$\sum srk$=Annual cattle slaughter rate of the abattoir

Coy = Average cost of each bovine liver/ lung/ heart/ kidney

Roz = Rejection (condemnation rate of Bovine liver/lung/heart/kidney

Data Management and Statistical Analysis: All the data obtained from antemortem and postmortem in the study were stored in Microsoft (MS) Excel 2007 spread sheet programme and then were analyzed using STATA7.0 interceded statistical software programme [31]. The association between condemnation rates of specific organs and the age, breed, origin of animals were evaluated by Pearson's chi-square (χ^2) and the difference were regarded statistically significant if p-value is less than 0.05.

RESULTS

Abattoir Survey

Antemortem Inspection: A total of 791 animals presented for slaughter were examined before slaughter for detection of any abnormalities during study period in Gondar

Table l: The unit price of edible organs in the butcher houses at Gondar town in the year 2009-2010

		Unit Price (ETB)	
Species	Organ	Birr	Cent
(Bovine)	Liver	30.0	0.0
	Lung	10.0	0.0
	Heart	15.0	0.0
	Kidney	10.0	0.0

ELFORA abattoir. Out of which 56 (7.07%) cattle were found to have various abnormalities or conditions listed bellow (Table 2).

Postmortem: After thoroughly visual inspection, palpation and systemic incision of each organ at postmortem examination from the total of 768 cattle slaughtered at Gondar ELFORA abattoir, 377 (49.09%) livers, 263 (34.24%) lungs, 74 (9.64%) kidneys

Table 2: Summary of abnormality/ conditions encountered during antemortem inspection at Gondar ELFORA abattoir (2009-2010)

			Animal Origin			
Conditions/ Abnormality	Number of animals	Percentage	Highland	Mid-Highland	Lowland	Judgment
Fever	5	8.93%	3	0	2	Suspend from being slaughter
Depression	11	19.64%	6	3	2	Suspend from being slaughter
Emaciation	7	12.50%	4	1	2	Suspend from being slaughter
Tick infestation	13	23.21%	7	2	4	Passed for Slaughter
Local swelling	9	16.07%	4	2	3	Causal slaughter
Lameness	4	7.14%	3	0	1	Causal slaughter
Branding	7	12.50%	3	3	1	Causal slaughter
Total	56	100%	30	11	15	

Table 3: Total number of animals slaughtered and number of rejected specific organs

			Number of rejected organs			
Species	Age	Total no of slaughtered animals	Liver	Lung	Kidney	Heart
(Bovine)	Adult old	176	90	65	23	5
		592	287	198	51	31
Total	768	377	263	74	36	

Table 4: Summary of gross pathological conditions presented in liver condemnation and rejection rate in Gondar ELFORA abattoir in the year (2009-2010)

	Age			
Pathological lesions	Adult	Old	Total	Rejection rate
Fasciolosis	43	131	174	46.15%
Hydatidosis	31	108	139	36.87%
Hydatidosis and fasciolosis	7	19	26	6.86%
Cirrhocisis	5	11	16	4.24%
Calcification	2	12	14	3.71%
Abscessation	2	6	8	2.12%
Total	90	287	377	100%

and 36 (4.69%) hearts were condemned from local market based on their gross pathological observations.

Gross Pathological Conditions of Liver and its Rejection Rate: From the total 768 cattle slaughtered, 377 (49.09%) liver were totally condemned due to gross abnormalities encountered during the study period are summarized in (Table 4). Fasciolosis, hydatidosis, fasciolosis and hydatidosis, cirrhosis, calcification and abscessation were responsible for rejection of 174 (46.15%), 139 (36.87%), 26 (6.89%), 16 (4.24%), 14 (3.71%) and 8 (2.12%) livers, respectively. Fasciolosis was determined to be the major cause of liver condemnation followed by hydatidosis (Table 4).

Gross Pathological Conditions of Lung and its Rejection Rates: Out of the total 768 cattle slaughtered, 263 (34.24%)lungs were rejected due to gross abnormality. Hydatidosis was responsible for the rejection rate of 200 (76.04%) lungs being principal cause. Other causes of lung condemnation were found during the study period were pneumonia, emphysema and abscessation with rejection rate of 11.40%, *10.64%* and 1.90% respectively.

Gross Pathological Condition of Heart and its Rejection Rate: Out of the total cattle examined on postmortem 36 (4.68%) of hearts were condemned due to gross abnormalities. The major gross pathological conditions

Table 5: The association of various factors with liver rejection rate in slaughtered cattle

	Age		Breed		Animal origin	
	Adult	Old Local	Cross	Highland	Mid-Highland	Lowland
Number of animals Slaughtered	176	592 621	147	392	201	175
Number of cattle with liver condemnation	90	287 305	72	197	100	80

Pearson's chi-square (χ^2) =0.3831; p=0.593

Table 6: Diseases/abnormalities found in rejected lungs

	Age			
Pathological Lesion	Adult	Old	Total	Rejection rate
Hydatidosis	51	149	200	76.04%
Pneumonia	6	24	30	11.40%
Emphysema	8	20	28	10.64%
Abscessation	0	5	5	1.90%
Total	65	198	263	100%

Table 7: The association of various factors with lung rejection rate in slaughtered cattle

	Age		Breed		Animal origin		
Number of animals	Adult	Old	Local	Cross	Highland	Mid-Highland	Lowland
Slaughtered	176	592	621	147	392	201	175
Number of cattle with Lung condemnation	65	198	210	53	150	62	51

Pearson's chi-square (χ^2) =0.7321; p=0.392

Table 8: Summary of pathological conditions presented on heart condemnation and its rejection rate in Gondar ELFORA abattoir (2009-2010)

	Age			
Pathological lesion	Adult	Old	Total	Rejection rate
Pericarditis	2	21	23	63.88%
Hydropericardium	l	5	6	16.66%
Hydatidosis	1	3	4	41.11%
Cysticercusbovis	l	*2*	3	8.33%
Total	51	31	36	100%

Table 9: The association of various factors with heart rejection rate in slaughtered cattle

	Age		Breed		Animal origin		
Number of animals	Adult	Old	Local	Cross	Highland	Mid-Highland	Lowland
Slaughtered	176	592	621	147	392	201	175
Number of cattle withheart condemnation	5	31	27	9	18	8	10

Table 10: Summary of gross pathological conditions presented on kidney condemnation and its rejection rate in Gondar ELFORA abattoir (2009-2010)

	Age			
Pathological lesion	Adult	Old	Total	Rejection rate
Hemorrhage	7	19	26	35.13%
Nephritis	5	15	20	27.02%
Renal culiculi	7	2	9	12.16%
Hyderonephrosis	1	7	8	10.81%
Infarcts	1	5	6	8.10%
Hydatidosis	2	3	5	6.75
Total	23	51	74	100%

Table 11: The association of various factors with kidney rejection rate in slaughtered cattle in Gondar ELFORA abattoir (2009-2010)

	Age		Breed		Animal origin		
Number of animals	Adult	Old	Local	Cross	Highland	Mid-Highland	Lowland
Slaughtered	176	592	621	147	392	201	175
Number of cattle with kidney condemnation	23	51	63	11	43	18	13

Pearson's chi-square (χ^2) = 0.9673; p = 0.202

Table 12: Average annual estimated financial loss due to organ condemnation

Organ	Average Rejection Rate	Average Annual Slaughter rate of cattle in Gondar ELFORA abattoir	Average price of organs at Gondar town	Total (ETB)
Liver	49.08%	30.00ETB	161,227.8	
Lung	34.24%	10,950	10.00ETB	37,492.8
Heart.	4.68%	15.00ETB	7,686.9	
Kidney	4.81%	10.00ETB	5,266.95	
Total (ETB)			211,674.45	

that lead to heart rejection were: pericarditis 23 (63.88%), hydropericardium 6 (16.66%), Hydatidosis 4 (11.11%) and *Cysticercusbovis*3 (8.33%).

Gross Pathological Condition of Kidney and its Rejection Rate: A total of 74 kidneys were condemned during the study period due to gross pathological abnormalities. Hemorrhage, nephritis, renal culicuii, infarcts and hydatidosis were the abnormalities determined with respective rejection rate of 35.13%, 27.02%, 12.16%, 10.81%, 8.10% and 6.75% respectively. And hemorrhage was found to be the principal cause followed by nephritis for the rejection of kidneys.

Annual Financial Loss Estimation: The annual financial loss from domestic markets due to organ condemnation at Gondar ELFORA abattoir was estimated at 211,674.45 ETB. This total loss could be due to diseases and human factors either as a result of mishandling animals during transports to the slaughter operations in the abattoir. Using all necessary information in the formula set byOgunriade and Ogunrinade [30], annual financial loss was estimated. The retail market price was determined from the interview made with the butcheries in Gondar. Annual slaughter rate of cattle was estimated from abattoir records of the lasttwo years.

DISCUSSION

Routine antemortem and postmortem inspection procedures were followed throughout the study and the abnormalities encountered were recorded. The most common abnormalities encountered during antemortem inspection were emaciation, fever, depression, localized swelling, tick infestation, lameness and branding.

In the study, depressed, emaciated and febrile animals during antemorten were not passed for slaughter. Localized swelling, branding and lameness were found in some animals during antemortem examination and animals with such abnormalities passed for slaughter by considering that the problem was localized to skin and subcutaneous tissue. Some of localized swellings were found near to the lateral side of the neck region and pus was evacuated during dressing of the carcass. The presences of localized swelling and lameness were probably as a result of trauma while being driven to market places and during transportation to the abattoir using inappropriate vehicles. Localized swelling might be probably due to infectious causes following mechanical damage to the neck. In such cases,the affected parts were trimmed off and the rest part of the carcass was passed as fit for human consumption.

In the present study, out of the total 768 cattle slaughtered and examined 377 (49.08%) of livers, 263 (34.24%) of lungs, 74 (4.8%) of kidney and 36 (4.68%) heart were totally condemned due to gross pathological conditions as unfit for human consumption. The rejected organs which were found unfit for human consumption and as pet animal feed were incinerated in the abattoir to break the life cycle of disease transmission. Parasitic disease like fasciolosis and hydatidosis were found to be the major and economically important disease conditions that caused liver and lung rejection from local market. The current study revealed that livers were the principal

condemned organs followed by lungs from 768 cattle examined at postmortem. The most frequently observed pathological conditions encountered on liver were fasciolosis, hydatidosis. fasciolosos and hydatidosis, cirrhosis, calcification and abscessation, causing considerable financial losses in the study area. Condemnation rate of bovine livers due to fasciolosis (46.15%) was almost similar to previous study conducted in Gondar which has a figure of 43.6% by Yimam [9] and relatively lower when compared to 64.2% in Mekelle [32], 86% in Keffa [33], "58% in Bahir Dar [34] and 68.7 in Kombolcha ELFORA meat factory abattoir [35].

From the total of 768 cattle slaughtered, 263 lungs were rejected. Hydatidosis, emphysema, pneumonia and abscessation were the cause of rejection. Hydatidosis was found to be the principal cause of lungs condemnation. In addition to this it was also determined to be the second largest causes of liver condemnation that accounts for destruction of 200 (76.04%) of lungs being unfit for consumption. Like with, it has been stated that among the main causes of organ condemnation during post mortem inspection, liver flukes in liver and hydatid cyst in the liver and lungs are mainly involved [17].

In agreement with the present study many researches explained that livers and lungs were the most commonly affected organs by hydatid cyst. The reason is lung and liver contain the highest capillary bed in the body and therefore the majority of oncosphers are filtered out and trapped in the fine blood capillaries and only small number of onchospher reach in the reaming organ [19].

During this study 200 (76.04%) lungs and 176 (36.87%) liver were condemned as result of hydatid cyst. This result indicated that higher rate of hydatidosis were observed in lungs than in livers. It was also suggested that particularly the lung is the organ most affected by hydatidosis, because at old age the liver capillaries are dilated and most cysts passed directly to the lung [19]. So the reason why higher number of hydatid cyst found in the lung was, cattle slaughtered in the abattoir were very old. This prevalence rate of hydatidosis is high comparing-with the prevalence.rate of 46.8%, 38.8% and 46.8% by Jobre *et al*. [15] and Yilkal [36] and Andualem [37] from DebreZeit, Dessie and Kombolcha respectively.

The possible reason might be suggested that in Ethiopia certain deeply rooted traditional activities could be commonly described as substantiating the spread of backyard animal slaughter practice, the corresponding absence of rigorous meat inspection procedure and long standing habits of most Ethiopians to feed their dogs with condemned offal's which facilitate the maintenance of the perfect life cycle of Hydatidosis [22].

The present study suggested that bovine kidneys were rejected mainly due to hemorrhage, nephritis, renal culculi, infarcts and hyderonephrosis. However, hemorrhage and nephritis accounts for the most and major cause for the kidney to be condemned which comprises about 26 (35.13%) and 20 (27.02%). This is because of the higher incidence of focal interstitial nephritis in older cattle [38]. The kidney and heart are unlikely to produce the pronounced financial loss effect associated with liver and lung.

The overall kidney condemnation rate of 4.8% reported in this study is lower than that of reported by Jembere [10] with 8.6% in Nazreth abattoir. However, it is higher than 4.2% and 3.8% reported byMonaghan and Hannan [38] and Amaatredjo *et al*. [39] respectively.

The rejection rate of the heart noted in this study 4.68% is higher when compared to 2.7% reported by Shiferaw [22] from Nazreth abattoir and 0.6% reported by Mezgebu [23] from Gondar abattoir.

The financial loss that occurs in Gondar ELFORA abattoir was analyzed as those direct losses occurring through condemnation of organs. A total loss of 211,674.45 ETB in cattle was incurred in the abattoir only due to condemnation of edible organs. The indirect losses from body weight gain, public health implication and poor flaying techniques those down grade the quality of hides and other considerations were not included in the analysis in this study.

CONCLUSION AND RECOMMENDATIONS

Disease is the major concern to the livestock industry as it causes extensive financial waste as a result of direct and indirect economic losses like Ethiopia which has large number of animal population. The main factors that may have contributed to the prevalence and distribution of the disease are backyard slaughtering system, the presence of packs of stray dogs, the relations excising between livestock and pet animals, the nil emphasis given to the health of pet animals, the limitation of slaughter house and the improper disposal of waste-material from the abattoir. According to the result of the present study, hydatidosis, fasciolosis, pneumonia, hemorrhage and pericarditis are the most common and major causes of rejections of organs such as liver, lung, kidney and heart of cattle to be rendered from local market and which accounts 211,674.45ETB financial losses per annum. In addition to the economic loss incurred, the finding of hydatidosis at such high rate signifies the presence of *echinococcus*is in higher prevalence in the final host. So that the public health significance is immense.

Thus the result of this study may be valuable for the country by providing data inmonitoring disease conditions and an indicator for the amount of work to be done by veterinary sector of ministry of agriculture and other responsible governmental and nongovernmental bodies, animal owners and consumers at large.

Therefore, based on the finding of the study regarding to the economic losses and public health significance, the following recommendations are forwarded:-

- Standard meat inspection procedure should be properly conducted in municipal and export abattoir to provide safe and wholesome meat to the consumers.
- Cooperation of veterinary and medical personnel's is important in order to control most meat zoonotic disease and thus provide safe and wholesome meat to consumer.
- Public awareness should be created regarding management practice, treatment, vaccination and deworming of animals.
- Immediate, safe and controlled elimination of all condemned abattoir materials should be practiced.
- Dogs owners should be advised to feed their dogs with properly cooked offals to enable the control of hydatidosis.

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