

A Study on the Major Causes of Organ and Carcass Condemnation in Cattle Slaughtered at Wolaita Sodo Municipality Abattoir

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Abstract

A cross-sectional study was conducted from November 2011 to March 2012 in Wolaita Sodo municipality abattoir to identify the major causes of organ and carcass condemnations and to estimate the direct economic losses due to organs and carcass condemnations. The study was conducted on cattle slaughtered at Sodo municipal abattoir. From the cattle slaughtered in this abattoir, 408 were selected randomly and examined by antemortem and postmortem examination for two days per week of visiting the abattoir (Saturday and Wednesday). Standard antemortem and postmortem inspection procedure was used for the study throughout the study period. During the antemortem examination, the following abnormalities were detected lameness 5(1.22%), local swelling 3(0.73%), rough hair coat 10(2.45%), emaciation 3(0.73%) and depression 2(0.49%). Out of 408 cattle inspected at postmortem examination; 111(27.2%) livers, 46(11.27%) lungs, 36(8.8%) kidneys, 9(2.2%) hearts and 1(0.25%) whole carcasses were rejected due to gross abnormalities. In liver 82(20.9%) fasciolosis and 15(3.67%) hydatidosis, in lung 28(6.86%) hydatid cyst, in kidney 19(4.65%) hydatid cyst and in heart 4(0.98%) pericarditis and 3 (0.73%) hydatid cysts were found as the major causes responsible for rejection of respective organ. There was statistically significant difference observed between the judgments given and the different body condition categories ($\chi^2 = 14.294$; $p = 0.006$) of cattle. The current study revealed that fasciolosis and hydatidosis were the major causes of condemnation that lead to huge economic losses. The average annual economic losses was calculated and found 354,821.8 Ethiopian birr due to condemnation of organs and carcass. Therefore, in order reduce this loss and to control major disease problem with animals' government and private agencies should have to work together on abattoir data.

Keywords: Abattoir, Antemortem, Carcass, Cattle, Condemnation, Organ, Postmortem, Sodo, Wolaita

1. Introduction

Ethiopia has the largest livestock population in Africa, which plays an important role in the lives of its people. Livestock and livestock products are also constitute one of the major export resources of the country and play a vital role in the country's economy (ESTC, 1997). Even though, the livestock sub sector contributes much to the national economy, its development is hampered by different constraints. These include rampant animal diseases, poor nutrition, poor husbandry, poor infrastructure, and shortage of trained man power and lack of government policies (PACE-Ethiopia, 2003).

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 more than 900 million USD annually (Jobre *et al.*, 1996). Meat inspection, in addition to its primary function of insuring safe and healthy meat to consumer, has function of monitoring diseases in the national herd and flock by providing feedback information to the veterinary service to control or eradicate disease and in developing countries it plays a major role in providing and serving as a source of information and reference center for disease prevalence (Nfi and Alonge, 1987).

As meat is the main source of protein to human it should be clean and free from disease of particular important to the public such as tuberculosis, hydatidosis, cysticercosis and fasciolosis (Sirak, 1991). Meat products coming from different conditions are often deteriorated due to bacterial infection or contaminated, which may cause food poisoning or diseases in consumers. In many developing countries, regulations concerning meat inspection and/or control are inadequate or non-existent allowing consumers to be exposed to pathogens including zoonotic parasites (www.Sciencedirect.com). Meat inspection is commonly perceived as the sanitary control of slaughter animals and meat. The aim of meat inspection is to provide safe and wholesome meat for human consumption. The responsibility for achieving this objectives lies primarily with the relevant public health authorities, who are represented by veterinarians and meat inspectors at the abattoir stage (FAO,

2007). A thorough meat inspection procedure requires two steps; antemortem and postmortem inspections.

The importance of antemortem inspection in the abattoir has long been recognized in an attempt to avoid the introduction of clinically diseased animals into the slaughter hall. Ante mortem inspection should be done within 24 hrs of slaughter and repeated if slaughter has been delayed over the day. This examination before slaughter also serves to obtain information that will be useful in making sound postmortem inspection (Teka, 1997).

Routine postmortem inspection of a carcass or an organ should be carried out as soon as possible after completion of dressing. The final judgment as to taken with an organ, a carcass or parts of a carcass is based on the total evidence produced by observation, palpation, incision, any antemortem signs and the results of any laboratory tests (Teka, 1997). The main purpose of postmortem examination is to detect and eliminate abnormalities, including contamination, thus ensuring the only meat fit for human consumption is passed for food (Grace, 1999).

Study conducted in different abattoirs of Ethiopia revealed that parasitic infection of livers; pneumonia, pericarditis and nephritis are found to be the major causes of organ condemnation (Yimam, 2003). Parasites in the tropics are responsible for greater losses to the meat industry than other diseases. In Ethiopia Fasciolosis has been reported to be one of the major disease problems of livestock industry and exist in almost all regions; however the prevalence rates, epidemiology and fasciola species involved vary significantly with locality (Geremew, 2010). Similarly like many other tropical African countries it is well known that parasitic diseases are among the major factors responsible for the low productivity of livestock in Ethiopia (Abebe, 1995). These infestations not only cause clinical disease and mortalities but also cause economic losses through production losses and condemnation of whole carcass and specific organs at slaughter (Jobre *et al.*, 1996).

It is necessary to be aware of the extent to which the public is exposed to certain zoonotic diseases detected in abattoirs and the financial losses through condemnation of affected organs and carcass (Nfi and Alonge, 1987). A significant economic loss incurred each year in the different abattoirs in Ethiopia are due to mortality, inferior weight gain and condemnation of edible organs at slaughter (Jobre *et al.*, 1996; Abebe, 1995). In view of this, proper evaluation of major causes of organ and carcass condemnation is important to determine the type and scope of control measures to be implicated.

Therefore objective of this study were:

- To identify major causes of organ and carcass condemnation of cattle, and
- To determine the economic loss due to the condemned organs and carcasses of cattle slaughtered at Sodo municipality abattoir, Wolaita.

3. Materials and methods

3.1. Study Area

The study was conducted from November 2011 to March 2012 at Wolaita Sodo municipality abattoir which is located at about 330km away from Addis Ababa. The Wolaita Sodo is found between 6.4°-7.1°N latitudes and 37.4°-38.3°E longitude, in the southern nation nationalities and people regional state. The climate is tropical with mean annual rainfall of 1370.6mm and mean annual temperature of 19°C (WZFEDD, 2003).

3.2 Study Animals

The study was conducted on cattle slaughtered at Sodo municipal abattoir. The animals destined for slaughter were all males originated from different parts of the Wolaita zone. They were transported to the abattoir on foot. A total of 408 animals destined for slaughter were inspected during Antemortem and postmortem inspections with their specific identification numbers and recorded accordingly on a format prepared for this purpose (**Annex 1**).

3.3. Sampling method and Sample Size Determination

The simple random sampling method was used for sampling and sample size was determined by the formula given by Thrusfield (2005).

$$N = \frac{1.96^2 P_{exp} (1 - p_{exp})}{d^2}$$

Where n= required sample size,

P_{exp} = expected prevalence,

d^2 = absolute precision (0.05)

Therefore, using the expected prevalence (50%), since there was no previously reported prevalence, and 5% absolute precision at 95% confidence interval, number of cattle required to estimate major causes of organ and carcass condemnation was calculated to be 384. However, to increase level of accuracy and precision of determining prevalence, sample size was increased to 408.

Every animal during the study period was examined and data was recorded. In this study, according to

Pace and Wake Man (2003), cattle were grouped into young (<2 years), young adult (2 – 6 years), and adult (\geq 6years) and age estimation based on eruption of one or more incisor teeth according to De-Lahunta and Habel (1986) were recorded. In this study, cattle were randomly sampled using systematic random sampling methods. They were selected for every 2nd entry and examined by antemortem and postmortem examination for two days per week of visiting the abattoir (Saturday and Wednesday).

3.4. Data collection Procedure

3.4.1. Antemortem examination

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. Moreover, the general behavior of the animals, gait, structure, conformation, body condition scoring and signs of disease and abnormalities of any type were registered according to the standard antemortem examination procedures. Following these, judgments were passed based on FAO (2007). Animals fit for human consumption were allowed for slaughter.

3.4.2. Postmortem examination.

During postmortem examination, liver, lungs, heart, kidney and carcass were thoroughly examined by visualization, palpation and incisions where necessary for the presence of cyst, parasites and other gross abnormalities. Pathological lesions were differentiated and judged according to guidelines on meat inspection for developing countries and the results were recorded. The decisions at postmortem inspection are classified into the following categories of judgment such as, approved as fit for human consumption, conditionally approved as fit for human consumption, totally condemned as unfit for human consumption and partially condemned as fit for human consumption according to FAO (2007) guideline on meat inspection for developing countries.

3.5. Assessment of Economic Loss

The annual slaughter rates were estimated from retrospective abattoir record. The analysis was based on the average annual slaughter capacity of the abattoir considering market demand, average market prices in local market and the rejection rates of specific organ and carcass in Sodo municipality abattoir. Average market price of each organ and carcass was determined from interviews made with personnel's of the abattoir and butcher men. The economic loss due to condemnation was estimated by the formula set by Ogunrinade (1980) as follows:

$$EL = \sum Srx \times Coy \times Roz$$

Where;

EL= average annual economic loss estimated due to organ and carcass condemnation from local market.

$\sum Srx$ = average annual cattle slaughter rate of the abattoir.

Coy= average cost of each cattle liver/lung/heart/ kidney and carcass.

Roz = average condemnation rate of cattle liver/lung/heart/kidney and carcass.

3.6 Data Analysis

Data generated from both antemortem and postmortem examination were recorded in Microsoft excel worksheet and were analyzed using Statistical Package for Social Sciences (SPSS) software version 19. The significant difference among the prevalence rates of organs and carcass were determined using Descriptive statistics; Chi-Square test (χ^2). The data obtained during the study was subjected to 95% confidence interval. P –values less than 0.05 was considered as statistically significant.

4. Results

4.1. Antemortem Findings

In current study a total of 408 cattle were inspected by antemortem and 23(5.63%) cattle were found to have abnormalities that pose especial care in postmortem inspection or suspend the cattle from being slaughtered. Among the abnormalities encountered in antemortem, 5(1.22%) lameness and 10(2.45%) rough hair coat was the highest in young adult and adult age categories (**Table 1**). An animal which shows a sign of depression were delayed from slaughter for further investigation; others were tagged with an identification number and subjected for slaughter.

Table 1: Summary of abnormal conditions encountered during antemortem examination (December, 2011- March, 2012).

Conditions encountered	Young-adult (n=125)	Adult (n=283)	Total (n=408)
Lameness	2(1.6 %%)	3(1.06%)	5(1.22%)
Rough hair coat	4(3.20 %)	6(2.12%)	10(2.45%)
Local swelling	1(0.8%)	2(0.70%)	3(0.73%)
Emaciation	1(0.8%)	2(0.70%)	3(0.73%)
Depression	1(0.8%)	1(0.35%)	2(0.49%)
Total	9(7.20%)	14(4.94%)	23(5.63%)

4.2. Postmortem Findings

From total of 408 cattle slaughtered in Sodo municipality abattoir during study period 111(27.20%) livers, 46(11.27%) lungs, 36(8.8%) kidney, 9(2.2%) heart and 1(0.24%) whole carcass were condemned from local market based on gross abnormalities (**Table 2**). The liver (27.20%) and lung (11.27%) were the organs condemned in higher frequency.

Table 2: Rejection rates of specific organs and carcasses based on age categories

Age category	Total number of cattle slaughtered	Frequency of lesions and percentage of rejected organs (%)				
		Liver	Lung	Kidney	Heart	Carcass
Young-adult	125	25(20.00%)	7(5.60%)	10(8.00%)	5(4%)	6(4.8%)
Adult	283	86(30.38%)	39(13.78%)	26(9.10%)	4(1.4%)	19(6.71)
Total	408	111(27.20%)	46(11.27%)	36(8.80%)	9(2.2%)	25(6.12)

(November, 2011- March, 2012).

The highest number of organ and carcass is condemned from adult cattle while lower rate of organ and carcass was rejected from young adult cattle (**Table 3**). There was statistically significant difference observed between the judgments given and the two age categories ($\chi^2 = 9.889$; $P=0.007$) of cattle.

Table 3: The rejection rates and the association between age and judgments given (November, 2011- March, 2012).

Age categories	Total number of cattle slaughtered	Judgment given		Total
		Partial condemnation	Total condemnation	
Young-adult	125	19(15.2%)	24(19.2%)	43(34.40%)
Adult	283	41(14.48%)	97(34.27%)	138(48.76%)
Total	408	60(14.70%)	121(29.65%)	181(44.36%)

$\chi^2 = 9.889$; $p=0.007$

The highest rate of condemnation of carcass and organ was observed in poor body conditioned animal (**Table 4**). From total of 122 poor body conditioned cattle slaughtered 54.09% of organs and or carcass were judged by total and partial condemnation from which 14.75% were partially condemned and 39.34% totally condemned. The lower rate of condemnation of carcass and organ was observed in good body conditioned animal. From total of 85 good body conditioned cattle slaughtered 30.58% of organs and or carcass were judged by total and partial condemnation from which 11.76% were partially condemned and 18.82% were totally condemned. There was statistically significant difference observed between the judgments given and the different body condition categories ($\chi^2 = 14.294$; $p= 0.006$) of cattle.

Table 4: The rejection rates and the association between body condition scoring and judgments (November, 2011- March, 2012).

Body condition	Total number of cattle slaughtered	Postmortem Judgments given		
		Partial condemnation (%)	Total Condemnation (%)	Total and partial condemnation
Poor	122	18(14.75)	48(39.34)	66(54.09%)
Medium	201	28(13.93)	50(24.87)	78(38.80%)
Good	85	10(11.76)	16(18.82)	26(30.58%)
Total	408	56(13.72)	114(27.94)	170(41.66%)

$\chi^2 = 14.294$; $p=0.006$

The principal causes of liver condemnation were parasitic like fasciolosis 82(20.09%) and hydatidosis 15(3.67%) and also other pathological lesions like calcification 4 (0.98%) and abscess 2(0.49%) in both age

categories (**Table 5**). There was no significant statistical difference ($\chi^2 = 8.713$; $P = 0.367$) observed in causes of liver condemnation between young-adult and adult cattle examined.

Table 5: Causes of liver condemnation and its rejection rates (November, 2011- March, 2012).

Causes of Liver condemnation	Young adult (n=125)	Adult (n=283)	Total (n=408) %
Fasciolosis	21(16.8%)	61(21.5%)	82(20.09%)
Hydatidosis	3(2.4%)	12(4.24%)	15(3.67%)
Hepatitis	-	3(1.06%)	3(0.73%)
Abscess	-	2(0.7%)	2(0.49%)
Cirrhosis	-	2(0.7%)	2(0.49%)
Calcification	-	4(1.41%)	4(0.98%)
Necrosis	-	1(0.35%)	1(0.25%)
TB	1(0.8%)	1(0.35%)	2(0.49%)
Total	25(20%)	86(30.38%)	111(27.2%)

$\chi^2 = 8.713$; $p = 0.367$

The principal causes of lung condemnation were hydatidosis 28 (6.86%) and also other pathological lesions like pneumonia 7(1.7%) and emphysema 5(1.22%) in both age categories (**Table 6**). There was no significant statistical difference ($\chi^2 = 7.443$; $P = 0.190$) observed in causes of lung condemnation between young-adult and adult cattle examined.

Table 6: Causes of lung condemnation and its rejection rates (November, 2011- March, 2012)

Causes of lung condemnation	Young-adult (n=125)	Adult (n=283)	Total(total=408)
Hydatidosis	4(3.2%)	24(8.48%)	28(6.86%)
Emphysema	1(0.8%)	4(1.41%)	5(1.22%)
Abscess	-	4(1.41%)	4(0.98%)
TB	1(0.8%)	1(0.35%)	2(0.49%)
Pneumonia	1(0.8%)	6(2.12%)	7(1.7%)
Total	7(5.6%)	39(13.78%)	46(11.27%)

$\chi^2 = 7.443$; $p = 0.190$

The principal causes of condemnation of kidney were hydatidosis 19 (4.65%) and also other pathological lesions like nephritis 10(2.45%) and renal calculi 5(1.2%) in both age categories (**Table 7**). There was no significant statistical ($\chi^2 = 1.272$; $P = 0.866$) difference observed in causes of kidney condemnation between young-adult and adult cattle examined.

Table 7: Causes of kidney condemnation and its rejection rates (November, 2011- March, 2012).

Causes of kidney condemnation	Young adult (n=125)	Adult (n=283)	Total(408)
Hydatidosis	5(4%)	14(4.94%)	19(4.65%)
Nephrosis	1(0.8%)	1(0.35%)	2(0.49%)
Renal calculi	2(1.6%)	3(1.06%)	5(1.20%)
Nephritis	2(1.6%)	8(2.82%)	10(2.45%)
Total	10(8%)	26(9.20%)	36(8.8%)

$\chi^2 = 1.272$; $p = 0.866$

The principal causes of condemnation of heart were pericarditis 4(0.49), hydatidosis 3(0.98%) and abscess 2(0.98%) in both age categories (**Table 8**). There was no significant statistical difference ($\chi^2 = 1.476$; $P = 0.688$) observed in causes of heart condemnation between young-adult and adult cattle examined.

Table 8: Causes of heart condemnation and its rejection rates (November, 2011- March, 2012)

Causes of heart condemnation	Young-adult (n=125)	Adult (n=283)	Total (n=408)
Hydatidosis	2(1.6%)	1(0.35%)	3(0.73%)
Pericarditis	3(2.4%)	1(0.35%)	4(0.98%)
Abscess	-	2(0.70%)	2(0.49%)
Total	5(4%)	4(1.41%)	9(2.20%)

$\chi^2 = 1.476$; $p = 0.688$

The principal causes of partial condemnation of carcass were bruise 22(5.39%) in both age categories and C. bovis 2(0.98%) in adult cattle (**Table 9**). The bovine tuberculosis is the only cause that resulted in condemnation of whole carcass during study period. There was no significant statistical difference ($\chi^2 = 1.476$; $P = 0.688$) observed in causes of carcass condemnation between young-adult and adult cattle examined.

Table 9: Causes of carcass condemnation and its rejection rates (November, 2011- March, 2012)

Causes of carcass condemnation	Young adult (n=125)	Adult (n=283)	Total(n=408)
TB	-	1(0.35%)	1(0.24%)
C. bovis	-	2(0.70%)	2(0.49%)
Bruise	6(4.8%)	16(5.65%)	22(5.39%)
Total	6(4.8%)	19(6.71%)	25(6.12%)

$\chi^2 = 1.476$; $p = 0.688$

4.3. Assessment of Economic Loss

Average annual slaughter rates of Wolaita Sodo municipality abattoir was 9,400 cattle. Using the formula set by Ogunrinade (1980) the average annual direct economic loss due to organs and carcass condemnation in local market at Wolaita Sodo municipality abattoir was calculated to be 354,821.8 ETB.

Table 10: Findings of economic loss assessment (November, 2011- March, 2012).

Organ/carcass	Average rejection rate of organs and carcass	Average current price for each carcass
Liver	27.20%	100 ETB
Lung	11.27%	10 ETB
Heart	2.2%	30 ETB
Kidney	8.80%	30 ETB
Carcass	6.12%	100/Kg ETB

5. Discussions

In the current study, out of the total 408 cattle (125 young adult and 283 adult) slaughtered 25(20%), 7(5.6%), 10 (8%), 5 (4%) livers, lungs, kidneys and hearts of young adult cattle respectively and 86(30.38%), 39 (13.78), 26(9,1%) and 4 (1.4%) livers, lungs, kidneys and hearts and 19(6.71%) carcass of adult cattle respectively were condemned due to gross abnormalities or lesions. Of the organs including carcass condemned, liver (27.2%) and lung (11.27%) constitute the major portion. The rate of condemnation for liver was the highest among the human edible organs, and was the highest form all organs. This result agree with the result reported by Mezegebu (2003), Said (2007) and Fitsum (2009) at Gondar, Ambo and Hawassa abattoir that revealed liver and lung were highly rejected organs during postmortem inspection.

The most commonly encountered abnormalities during antemortem inspection were lameness 5(1.22%), rough hair coat 10(2.45%), localized swelling 3(0.73), emaciation 3(0.73) and depression 2(0.49). Similar antemortem finding were reported by other investigations in other abattoirs (Marta, 2010) at Sebeta municipality abattoir, (Chemere, 2011) at BahirDar municipality abattoir. This similar result may be due to related husbandry and management practice of livestock throughout country. Lameness was due to stress and consequent physical trauma, frequent striking by stick during driven the animals on foot to the abattoirs and overcrowding in lairage. Also localized swelling could be due to faulty injection of drug and emaciation is due to infestation of animal by GI tract parasites.

In the current study, out of the total 408 cattle (125 young adult and 283 adult) slaughtered 25(20%), 7(5.6%), 10 (8%), 5 (4%) livers, lungs, kidneys and hearts of young adult cattle respectively and 86(30.38%), 39 (13.78), 26(9,1%) and 4 (1.4%) livers, lungs, kidneys and hearts and 19(6.71%) carcass of adult cattle respectively were condemned due to gross abnormalities or lesions. Of the organs including carcass condemned, liver (27.2%) and lung (11.27%) constitute the major portion. The rate of condemnation for liver was the highest among the human edible organs, and was the highest form all organs. This result agree with the result reported by Mezegebu (2003), Said (2007) and Fitsum (2009) at Gondar, Ambo and Hawassa abattoir that revealed liver and lung were highly rejected organs during postmortem inspection.

In current study, it was investigated that from the total number of cattle slaughtered, 20.9% liver were condemned due to fasciolosis and 6.86% lung were condemned due to hydatid cyst. This infers that majority of organs condemned in this abattoir was due to fasciolosis and hydatid cysts. This result is in agreement with reports of Andualem (2007), Said (2007), Shegaw (2008) and Fitsum (2009) who stated that liver flukes in the liver and hydatid cyst in lung were among the main causes of organ condemnation during postmortem inspection.

In the present study, a prevalence of 27.2% fasciola was observed at Wolaita Sodo abattoir. In Ethiopia fasciolosis has been reported to be one of the major disease problems of livestock industry (Manyazewal, 1995). Research conducted by several investigators on prevalence of bovine fasciolosis in different parts of the country revealed highest prevalence and wide distribution of fasciola at different part of the country than present study. However the prevalence rates, epidemiology and Fasciola species involved vary significantly with locality (Geremew, 2010). Shegaw (2008), Andualem (2007), Birhanu (2006), Tilahun (1994) and Sirak (1991) reported rejection rate of 35.2%, 43.7%, 36%, 71% and 58% of liver due to fasciolosis at Mekelle, Kombolcha, Addis Ababa, Addis Ababa and Bahirdar respectively. The relative low prevalence of

bovine fasciolosis in this study as compared to the results reported elsewhere in the country could be due to absence of surface water body in the area.

In this study, 19(4.65%) kidney, 15(3.67%) liver and 28(6.86%) lung was condemned due to hydatidosis, which refers to kidney and lung was most common organ affected by hydatidosis. This result opposes report of many researchers who stated that liver and lung were the most common organs affected by Hydatid cyst (Jobre *et al.*, 1996; Sirak, 1991). The reason for high prevalence of Hydatid cyst in liver and lung is that lung and liver contain the highest capillary bed in the body and therefore the majority of the oncospheres are filtered out and trapped in the fine blood capillaries and only small number of oncospheres reaches the remaining organs (Gracey, 1986). In current study 6.86% of Hydatid cyst in lung was very low compared to the previous prevalence rates reported by Andualem (2007), Shegaw (2008) and Seid (2007) as 25.2%, 19.4% and 26.7%. These variations in prevalence may be due to difference in the origin of animals brought from and also due to changes in environment and epidemiological factors.

The rate of carcass condemnation observed in this study which was 6.12%. Bruising was one of the major causes of partial condemnation of carcass. It is stated that bruising during transportation is the major source of economic loss in Africa. Apart from affecting carcass value, bruising has also animal welfare implication as excessive use of sticks which driving to the abattoir is greatly responsible. Other minor cause of carcass condemnation is *Teania saginata* infection which has been known in Ethiopia for many centuries. In the current study the lower prevalence rate of 0.49% bovine cysticercosis were observed

Different lesion like calcification, cirrhosis, pneumonia, emphysema, renal calculi pericarditis and nephritis were commonly observed causes for condemnation of edible organs. Pneumonia is the major causes of lung condemnation. Pneumonia could be due to the transport stress of animals destined for the slaughter and this condition is also an indicative of violation of animal's welfare from farm to slaughter.

Many workers in Ethiopia have indicated an annual basis the higher economic loss was condemnation of edible organs and carcass due to parasitic infestation (Birhanu, 2006; Andualem, 2007, Shegaw, 2008; Fitsum, 2009). The average annual cattle slaughter capacity of Wolaita Sodo municipality abattoir based on the retrospective data is 9,400 and according to this study the estimated loss due to the condemnation of organs and carcass was 354,821.8 of Ethiopian birr.

6. Conclusions and Recommendations

Ethiopia has large livestock population in Africa. However, the great livestock potential is not properly exploited due to various constraints such as disease, which is the major concern to the livestock industry as it causes extensive financial waste as a result of direct and indirect economic losses. To alleviate this problem it requires investment and commitment in identifying major diseases prevalent in the country and abattoir survey is one of this tools.

In this study a considerable number of organs were condemned from cattle slaughtered at Wolaita Sodo municipality abattoir due to hydatidosis and fasciolosis. The pathological lesions like pneumonia, pericarditis, abscess and bruising were also among the major causes for organ and carcass condemnation of cattle. Hydatidosis which was one of the causes of liver condemnation has implication of public health hazard in addition to its economic effect. An annual direct loss of 354,821.8 million of Ethiopian birr was incurred in this abattoir. In line with this conclusion the following recommendations are forwarded.

- In order to control major disease problem with animal's government and private agencies should have to work together with abattoir data.
- The veterinary extension service should be improved to create community awareness in the prevention and control of the disease in collaboration with government.
- The epidemiology of those disease causing organ and carcass condemnation should be studied in detail and control measures should be undertaken.
- Government should provide the abattoir with adequate facilities for efficient meat inspection procedures with effective control of rejected meat and offal for proper disposal of condemned offal and good management of abattoir.

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