Major Causes of Organ Condemnation and Estimated Financial Loss in Dromedary Camels Slaughtered at Jigjiga Municipal Abattoir, Somali Regional State, Ethiopia

ABSTRACT

A cross sectional study was conducted between November 2018 to June 2019 with the aim of determining the prevalence of causes of organ condemnation with associated potential risk factors and estimating the magnitude of the direct economic losses from rejected organs. A total of 432 camels slaughtered at Jigjiga Municipal Abattoir abattoir were rondomly selected; 180(59%) male, 103(81%) female, and in age 102(60.7%) young, 181(68.6%) adult, and in body condition score; poor 41(97.6%), medium 98(81.6%), and good 144(53.3%). Based on origin of the animal, 16(22.2%), 20(34.5%), 3(23.1%), 19(29.7%), 29(19.7%), 16(20.5%) from Jigjiga, Dahagbur, Kabridahar, Fik, Babile, Shinile were detected one or more pathological signs respectively. During antemortem examination 140(32.36%) camels showed various abnormalities. such as localized lesions 52(12.03%), local swelling 18(4.16%), lacrimation 17(3.93%), nasal discharge 15(3.47%), rough hair coat 13(3.00%), lamness 12(2.77%), depression 8(1.85%) and blindness 5(3.57%). Upon postmortem inspection, the overall prevalence was 504(29.1%); 254(58.7%) lungs, 203(46.9%) liver, 40(9.25%) heart, 7(1.6%) kidneys were condemned. Some of the major cause of lung condemned were due to 103(23.8%) hydatid cyst, 68(15.7%) emphysema, and 48(11.1%) pneumonia. Lvier rejection were due to hydatid cyst, 25(5.8%) calcification, 82(19.0%) cirrhosis. Heart condemnation were due to 9(2.1%) calcified cyst, 4(0.9%) pericaditis, 13(3.0%) hydatid cyst. Kidney rejection rate were caused by 3(0.7%) hydatid cyst, 4(4.0%) hydronephritis. There was statistically significant between body condtion score, and sex of the animal with the rate of organ condemnation ($P<0.05$). While, age and origin of the animal were not statistically significant with the prevelance of organ condemnation ($P>0.05$). Lung and liver were most commonly condemned organs followed by heart and kidney in camel slaughtered at Jigjiga Municipal Abattoir. The financial loss due to edible organs condemned in this study was estimated to 773,143,000 ETB / 16,734,696.97 USD. Therefore, appropriate strategies should be established for prevention, and control of this level of condemnation rate of organs and to sustain the massive monetory loss caused by the rate of organs condemned in the studied area.

Keywords:Dromedarycamels; Jigjiga, Ante-mortem; organ condemnation; financial loss; rejection rate.

1. INTRODUCTION

World camel population number estimated to be 35 million heads[1], most ofwhich are in Ethiopia, Somalia, Niger, Kenya, Chad, Mali, Mauritania and Pakistan. Fivebordering countries-Somalia, Ethiopia, Kenya, Sudan, and Djibouti hold 84% of African andmore than half of the world's camel population [2]. EthiopiaisanagrariancountrywithhugelivestockpopulationinAfricapossessingover4.5millionheadsof *Camelusdromedarius*,[3].

"Meat is the main source of protein for man and it should be clean and free from diseases ofparticular importance to the public such as tuberculosis (TB), hydatidosis, cysticercosis andfasciolosis"[4]."Meatiscondemned at Municipal Abattoirto break the chainofsome zoonoses suchas hydatidosis and fasciolosis which are not directly transmitted to man through meat" [5,6].

"Meatinspectionattheabattoirisacrucialneedforfoodsafetyanddiseasecontrol.Itisoneof the most widely implemented and longest- running systems of surveillance that involvesthe screening of animals and meat for wholesomeness for human consumption" [7].Similarly, "abattoir meat inspection is esential to remove gross abnormalities from meat anditsproductstopreventdistributionofcontaminatedmeatandtoassistdetectinganderadicationofacertainlivestock diseases"[8].
"TheresultsofmeatinspectionatMunicipalAbattoirswithappropriatetrendsindicatepossible risks due to unsafe meat obtained from camel carcasses at the Municipal Abattoirs.Such risks are eliminated by strict veterinary inspection of animals prior to slaughter as wellasmeatandparenchymatousorgansafterslaughter.MunicipalAbattoirsprovideanexcellent opportunity for detecting pathological lesions of both economic and public healthimportance"[9].

"Animaldiseasesareconsideredasamajorhealthproblemandcauseasignificanteconomiclossincountrieswherelivestockproductionisanimportantsegmentoftheagricultural practice" [10]. For instance, diseases in camels cause considerableeconomiclossesduetothecondemnationofedibleorgans/decreasedmeatandmilkproduction [11].

Most of the studies conducted in JigjigaMunicipal Abattoir have focused only on specificdiseasessuchasfasciolosisandhydatidosis.Asaresultofthis,thereisnocompleteinformationaboutcausesoforgancondemnationatJigjiga Municipal Abattoir.Inlinewiththis,itwouldbeessentialtohavecomprehensiveinformationonoccurrenceofvarious diseases and causes of organ rejection and their financial loss to establish appropriatestrategyforprevention and controls. Therefore, the objectives of the study were.todeterminetheoverallprevalence andcausesoforgancondemnationwithrespecttoassociated factorsand to estimatetheannual financialloss ofthecondemnedorgans in camels slaughteredat JigjigaMunicipalAbattoir.

2. MATERIALS AND METHODS

2.1 StudyAreaandPeriod

The study was conducted on Jigjiga city. Jigjiga is the capital city of the Somali RegionalState which is found on the Eastern part of Ethiopia (Fig. 1) about 630 km and 105 kmaway from Addis Ababa and Harar towns respectively. Human population size of Jigjiga isestimated about 763,509. Jigjiga is situated at an altitude ranging from 1,660 to 1,710 mabove the sea level at geographic coordinates of approximately $9^0$20' N latitude and$45^0$56' E longitude. The climate of Jigjiga is semi-arid type which is characterized by hightemperature and low rainfall. The mean annual temperature and mean annual rainfall is about22^0C and 543 mm respectively [12]. There is one sub-standard abattoir in jigjiga city which is owned by jigjiga municipality and environmental protection office, that aims to provide officially inspected and safe meat (beef, camel, goat and mutton) for consumers. the abattoir has separate compartment to slaughter animals for Christian and Muslim residents on average, 41 cattle for Christian and 20 for Muslims were slaughtered per day and average of 15 camels were slaughtered per day [13].

Fig. 1. Map of study area Jigjiga, Eastern Ethiopia [14]

2.2 StudyPopulation

The study population was *Camel dromedary* slaughtered at Jigjiga Municipal Abattoir received fromdifferentsources includedJigjiga,Degahbur,Kabridahar,Fik,Babile, andShinile.Slaughtered animals were both male and female. Simple rondom sampling methed was usedas a sampling technique. All camels presented for slaughtered during the investigation periodweresampledforthisepidemiologicalstudy. Mostly,extensivemanagementcarewaspracticedtocamelsslaughteredbutsometimesspecialcarewasgivenforfatteningpurpose.

2.3 StudyDesign

Across-sectionalstudywasconductedfromNovember 2018 to June 2019 todeterminetheprevalence of major causes of organ condemnationand economic significance in camelsslaughtered at Jigjiga Municipal Abattoir. During the period of study, four visits per weekwere made purposively out of 7 slaughter days in a week. Camels were selected by simplerondom sampling per visit 9 animals were recorded in a day. The first animals were selectedrandomly and the rest with equal intervals and were subjected for both antemortem anddetailedpostmortem inspections.

2.4 SamplingMethodandSampleSizeDetermination

methods and 95% confidence interval with required 5%precision,the samplesizewasdetermined bytheformulaof Thrusfield and Christley [15].

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

Where;n= required sample sizePexp=expected prevalenced=required precision

Theexpectedprevalenceis50%withtherequiredprecision(d)of5%(0.05).Bysubstitutingthevalue in the aboveformula, we get thesamplesize:

$$n = \frac{1.96^2 \times 0.5(1 - 0.5)}{(0.05)^2}$$

Therefore, the calculated sample size was 384 camels, but 48 samples were added with theintentionofmaximizingtheaccuracy,andincreasingprecisionlevelandthecalculatedsamplesizewas 432 camels.

2.5 Study Methodology

2.5.1 Ante-mortemexamination

Pre slaughter examinations of camel were conducted in the lairage by grouping the animalsbased on their age, body condition score and place of origin. Ante-rmortem inspections wereconducted on individual animals while the animals entering into the lairage and after theyentered into the lairage s. Both sides of the animals were inspected at rest and inmotion. The body condition scoring for camels wasconducted based on theguidelines given by Faye [16]. The scoring was conductedby looking at the back and flank and then classified as poor (0 and 1), medium (2 and 3) andgood(4and 5). Moreover, the general behavior of the animals, nutritional status, cleanliness and signof diseases or abnormalities were recorded according to the procedures by Gracey [17].

2.5.2 Post-mortemexamination

Postmortem Examination was conducted based on the guidelines set on manual on meatinspection for developing countries [18]. Accordingly, the liver, lung, heart,andkidneywereexaminedthroughvisualization,palpationandsystematicincisionforanypathologicallesion(s).

2.6 Financial LossAnalysis

Toanalyzefinanciallossduetoorgancondemnation, theaverageannualslaughtercapacity of theabattoir, the average market price of eachorganin Jigjigacity andtherejectionrateof eachorganwereused.Theaveragemarketpricewas alsodeterminedby interviewing different butchers. The financial loss due to the condemnation of organs wasestimatedbytheformulagiven byOgunrinade[19]as follows;

EL= Σsrx* Coy*Roz

Where
EL = Annual economic loss estimated due to organ condemnation.
Σsrx=Annual camelslaughter rate of theabattoir.
Coy=Averagecostofeachcamel liver/lung/heart/kidney.
Roz =Condemnationrateofeachcamelliver/lung/heart/kidney.

2.7 DataManagementandAnalysis

The data collected were entered into the Microsoft excel 2010 spreadsheet and analysed byusing the SPSS version 20.The data were summarized as a table and Chi-square (X^2) testwere used to compare prevalence among sex, age, and body condition, and origin.In allcases,95%confidenceintervalsand(P<0.05)weretobeconsideredasstatisticallysignificance.

3. RESULTS

Out of the 432 camels inspected at ante-mortem 140(32.4%) camels were found to haveabnormalities (Table 1). Age wise the selected animals were divided into young (168) of lessthan 7 years and adult (264) of 7 or above

years. Slaughtered animals were male (305) andFemale(127).Based on the bodyconditionscoreanimalswereclassifiedintopoor(42),Medium (120) and Good (270). All slaughtered animals were marked for identification purpose andcodewasgiven.Following were the abnormalitiesencounteredduringante-mortemexamination; localized lesions 52(12.03%), local swelling 18(4.16%), lacrimation 17(3.93%),nasaldischarge15(3.47%),roughhaircoat13(3.00%),lameness12(2.77%),depression8(1.85%) and blindness 5(3.57%). All these abnormalities were considered mild and approvedforslaughterpurpose. (Table 1)

Table1.Abnormalconditionsencounteredduringante-morteminspection

Abnormal conditions	No. animals affected	Camels affected in percent
Localizedlesions	52	12.03
Localizedswelling	18	4.16
Lacrimation	17	3.93
Nasaldischarge	15	3.47
Roughhaircoat	13	3.00
Lamness	12	2.77
Depression	8	1.85
Blindless	5	1.15
Total	140	32.4%

3.1 OverallPrevalence

The postmortem examination was performed for all slaughtered camels (n=432).Out of the 432 inspected lungs (254) were rejected forhavinggrossabnormalities;hydatidcyst (23.84%),emphysema (15.74%),pneumonia (11.11%),calcifiedcyst (5.32%),andabscess (2.77%).Similarly,atotalnumberof (203) livers were condemned for having different abnormalities; cirrhosis (18.98%), Hydatidcyst (17.82%),calcification (5.78%),anddiscoloration (4.39%).Formthetotalcamelsslaughtered(40)heartswererejectedforvariousabnormalconditions;hydatid cyst (3.00%), calcified cyst (2.08%), and pericarditis (0.92%). In addition, kidneys [7]were not approved for finding gross pathological changes; (0.92%), and hydatidcyst (0.69%) (Table 2)

Table2.Causesoforgancondemnationandtheirpercentage %

Organ	Causes	Numbercondemned	Percent(%)
Lung	Hydatidcyst	103	23.8
	Emphysema	68	15.7
	Pneumonia	48	11.1
	Abscess	12	2.8
	Calcifiedcyst	23	5.3
Liver	Hydatidcyst	77	17.8
	Calcification	25	5.8
	Discoloration	19	4.4
	Cirrhosis	82	19.0
Heart	Calcifiedcyst	9	2.1
	Pericarditis	4	0.9
	Hydatidcyst	13	3.0
	Adhesion	14	3.2
Kidney	Hydatidcyst	3	0.7
	Hydronephritis	4	0.9
Total		**504**	**116.6**

3.2 RiskFactorsandRateof Prevalenceof OrganCondemnation inCamels

The Cause of organ condemnation with respect to sex revealed that higher prevalence infemales 103(81%) than in males 180(59%) camels and it showed there is statistical significance ($P<0.05$). Regarding the age of animals, a higher prevalence was recorded in adults 181(68.6%)

than in young 102(60.7%) animals but there were no statistically significant between age and cause of organ condemnation rate (P>0.05). Related to body condition the highest prevalence was in poor with the percentage 41(97.6%) followed by medium 98(81.6%) and good 144(53.3%) body condition scores. There was a statistically significant between the rejection rate and the body condition score of animals. (P<0.05). Based on the origin of the animal the highest prevalence is under 20(34.5%) Dagahbur, followed by 19(29.7%) Fik, 3(23.1%) Kabridaher, 16(22.2%) Jigjiga, 16(20.5%) Shinile, then 29(19.7%) Babile. There was no statistically significant (P>0.05). (Table 3)

Table 3. Distribution of all risk factors with the rejection rate of each variable

Variable	Category	No. inspected	Rejection rate n(%)	X^2	P- value
Sex	Male	305	180(59)	19.36	0.000*
	Female	127	103(81)		
Total		**432**	**283(65.5)**		
Age	Young	168	102(60.7%)	2.79	0.094
	Adult	264	181(68.6%)		
Total		**432**	**283(65.5)**		
Origin	Jigjiga	72	16(22.2)		
	D/hbur	58	20(34.5)		
	Kebridaher	13	3(23.1)	6.77	0.238
	Fik	64	19(29.7)		
	Babile	147	29(19.7)		
	Shinile	78	16(20.5)		
Total		**432**	**103(23.8)**		
Body Condition	Poor	42	41(97.6)	50.75	0.000*
Score	Medium	120	98(81.6)		
	Good	270	144(53.3)		
Total		**432**	**283(65.5)**		

3.3 EstimationofDirectannualEconomicLosses

The average means annual camel slaughtered at JigjigaMunicipal Abattoir was estimated tobe 9,125 heads; rate of condemnation of the current study were 254(58.7%), 203(46.9%),40(9.25%), 7(1.6%) lung, liver, kidney and heart respectively. The total annual loss wascalculated773,143,000 ETB/ 16,734,696.97 USD (1USD=46.20 ETB at the moment of study). (Table 4)

Table4.Estimateddirect annualfinancialloss

Organs condemned	Toral No. of Organs condemned	Rejection rate %	Annual slaughter rate of camels in the abattoir	Average Price in ETB	Financial loss in ETB
Lungs	254	58.7%	9,125	140	**74,989,250**
Liver	203	46.9%		1,500	**641,943,750**
Heart	40	9.25%		150	**54,750,000**
Kidney	7	1.6%		100	**1,460,000**
Total	**540**	**116.6%**			**773,143,000**

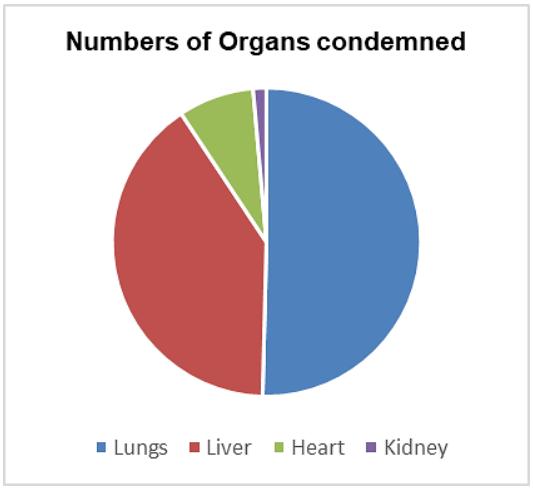

Fig. 2. Total Number of organs condemned During study period in Jigjiga Slaughter ETB House (n=432)

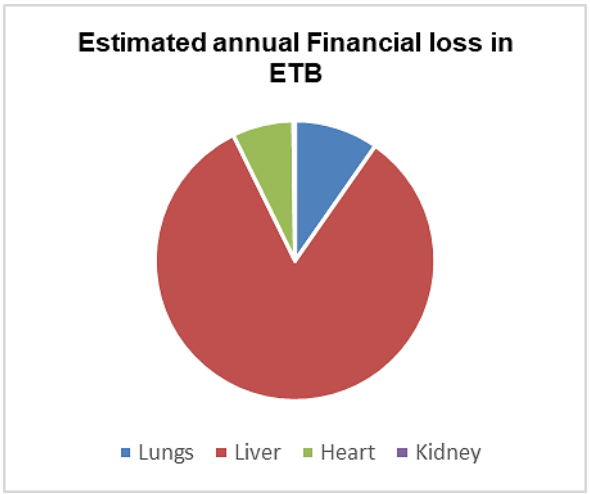

Fig. 3. Estimated annual loss in Jigjiga Municipal Abattoir with 773,143,000 ETB annual slaughter capacity

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4. DISCUSSION

In thepresentstudy,themostcommonlyencountereda bnormalitiesduringante-morteminspectionwereLocalizedlesions52(12.03 %),localswelling18(4.16%),lacrimation17(3.93%) , nasal discharge 15(3.47%), rough hair coat 13(3.00%), lameness 12(2.77%),depression 8(1.85%) and blindness 5(3.57%). With an overall prevalence of 140(32.4%).Localized lesion was the highest in prevalence than the others and blindness was the leastvariableduringassessment of ante-mortem examination.

In this study, out of 432 inspected camels 504 organs were condemned with the overallprevalence 504(29.1%). This finding is relatively very closer to the findings of 28.6%,28.3% [20,21] in Dire dawa municipal abattoir,and Hawassa municipal abattoir respectively. This result is much lower than 55.21% asreported by Teddy [22] from Arba Minch municipal abattoir.However, this findingis considered relatively higher than the findings of 23.3%, 24.9%, 20.7%, [23,24,25] in Akaki Abattoir Addis Ababa, Assellamunicipal abattoir, Jimma municipal abattoir respectively. Moreover this output had muchhigher than the findings of 17%, 17.5%, 14.7%, 14.% 13.85%, 13.5%, 12.3%, 4.7%, [21], [26,27,28,29,30,31,32] in Addis Ababa municipal abattoir, Hawassa municipal abattior, WolaitaSoddomunicipalabattoir,Gondarmunicipal abattoir,Dessiemunicipalabattoir,Adamamunicipa labattoir,WolaitaSoddomunicipalabattoir,Adigrat municipalabattoirrespectively.This variation may be due to the variety of origins that animals were brought from and also to the differences among sanitation standards in abattoirs.

Sex-related distribution of organ condemnation and rejection rate in this study stated thathigherprevalenceinfemale103(81%)thanmale 180(59%)camels.Thisfindinginagreement with reports showed female has higher prevalence (63.95%) than male (41.05%)Male 84 (21.81%) female 301 (78.18%) [20,23],from Dire dawa municipal abattoir, and Akaki abattoir respectively. On contrary, this resultwasindisgreementwiththefindingsofShitahu n [26]thosereportedMale249(57.3%)animalshadhig herprevalencethantheFemale9(2.1%)inAddisAba baabattoir

Enterprise.Similarly,reportfromTeddy[22]statedth ereisslightlyhigherprevalenceinmales206(55.5%) thaninfemalecattle6 (46.1%). Sex was statisticallysignificant different with prevalence of organ condemnation rate (P<0.05) This variation inprevalence rate might be due to physiological and hormonal effect among animals [33].

In context of age this current study revealed that low prevalence was recorded in young102(60.7%) than in adult 181(68.6%) animals. This result agreed with the findings of Assefa [34]whoreportedyoung51(4.9%)animalshadlower prevalencethanadults211(19.6%) from Addis Ababa abattoir Enterprise. Similarly, a report of Teddy [22]was statedslightlyhigher prevalenceinmales206(55.5%)thaninfemale 6(46.1%)from Jimma Municipal Abattoir. There was no statistically significant different (P>0.05). Thehighest infection rate in adult animals than younger ones might be due to the decreasedimmunityin olderanimals thanyounger ones[35].

In this study the prevalence of organcondemnation with aspect of body condition score oftheanimalhigherprevalencewasrecordedinpoor 41(97.6%),followedbymedium98(81.6%),andgoo d144(53.3%).Thisfindingisinlinewiththereportof As mare[36]whichwasexpressedthathigherprevalenc einpoor47(29.7%),Medium67(38.3%), and good 15(29.4%) from Bahir dar municipal abattoir.This result is similar alsoto the report of Wondemagegnehu [31] Poor 48(39.34), medium 50(24.87), good16(18.82)fromWolaitaSoddomunicipalabatt oir.However,thisdisagreedwiththeobservations of Shitahun[26] who referred higher prevalencein good247(56.9),than medium 8(1.8), than poor 3(0.69) from Addis Ababa municipal abattoir. Body conditionscore was statistically significant with rate of organ condemnation (P<0.05). This variationmaybeduetowhenanimalssuffershortage orscarcityofnutrition,theirimmunitycompromised. Hence, possibly this can be accounted for the higher prevalence in poor bodyconditionedanimals [37].

In the current study prevalence of organ rejection rate with respect of animal origin wasrelativelyhigherfromDagahbur20(34.5%)follo wedbyFik19(29.7%),Kabridaher3(23.1%), Jigjiga 16(22.2%), Shinile 16(20.5%), then Babile 29(19.7%). This finding is indisagreementwith thereport of Nejashand Walkite [20].

This finding agreed with the report of lowland has higher prevalence than midland andhighland [8] in Luna Export abattoir. While, this result disagreed withthe report of Yalew [29] high prevalence rate for highland than midland and lowlandfrom Dessie municipal abattoir. For origin there was no statistically significant different(P>0.05). The difference in the prevalence of different places in this study may be due to thedifferenceinmanagementpractice,environment factorsandclimatevariationandhusbundaryaction.

In the present study disease encountered during postmortem examination were hydatid cyst,emphysema, pneumonia, abscess, and calcified cyst in lungs with prevalence rate (58.7%).hydatid cyst, calcification, discoloration, and cirrhosis in liver with the rate of(46.9%).Calcified cyst, pericarditis, hydatid cyst, and adhesion in heart (9.25%). Hydatid cyst, andhydronephritisinkidneys(1.6%)amongallthese themostpathologicalfindingsinslaughteredcamels attheabattoirwerelunglesionswithtotalnumberof(2 54)lungsfollowedby(203)liver,(40)heat, and(7)kidneys.

The overall prevalence of this study of hydatid cyst in lungs (23.8%) and in liver (17.8%).This finding is relatively closed with reports of (18.7%), (16.62%), (18.86%) of Dawit [38] [23,38] respectively.Thisresultwas lower thanthe report of (28.6%) lung (28.2%) that followed by liver (21.2%) byMersha [39,40] inDireDawa, and Assella municipal abattoir respectively. This resultsmuch lower than with the report ofHaimanot [41] (73.75%) liver, (14.34%) lungs.Similarly, lower than the report (35.25%) byAhmadi[42]inIranand(32.85%)byMohamed [43]inSaudiArabiainlung on other hand, this finding hadhigher prevalenceofcamelhydatidosisreported (4.5%)by Woubet [44] in Hararmunicipal abattoir, Ethiopia. And.Hydatid cyst was most frequently reported abnormalitieswith precent in this study dueto itssize,bloodsupplyandavailabilityofoxygensupply [45].

On this study the prevalence rate of pneumonia and emphysema were 48(11.11%), 68(15.7%)respectively. This finding agreed with the report of (16.88%) Pneumonia and init wasdisagreed (5.63%) for the Emphysema by Haimanot [41] from Dire dawa municipalabattoir.Similarly,theresultwasdisagree dwiththereportof(6.77%)EmphysemabyAmene [10]fromJimmamunicipalabattoir.However,thisout comemuchlowerthan the report of (43.75%)Emphysema by Seboka from Addis Ababa Abattoir. [46]

Thisresulthigherthan(3.33%),(6.0%)pneumoniab yJemalo[24,47] from Asselle municipal abattoir, and from Nigeria. Thevariationsoftheinfectionrates couldbedueto

the variations in the temperature,environmental conditionsand the nature of the pasture and the way of rising and grazing oftheseanimals. Theprevalencemayhowever vary from country to country or even withinacountry. Generally,the variationinprevalencerateamong different geographicallocationscouldbeascribedtothestrain differencesof*Echinococcus granulosus* thatexistsin differentgeographicallocationsand differentspeciesoflivestock [48].

For liver condemnation rate of this study revealed 203(46.9%); 77(17.8%) hydatid cyst,25(5.8%) calcification, 19(4.4%) discoloration, 82(19.0%) this study is indicated that hydatidcystwasthemostpathologicallesioncauseo flivercondemnationwhereasthewholefrequency of liver condemnation is similar to the report of 46.2% Asmare [36] inJimma municipal abatoir and its closely related to the report 43.95% by Nigatu [49]in Addis Ababa abattoir. This finding also higher than the reports of (29.7%)report ofAsmare [36] in Bahir dar minicipal abattoir and (8.83%) by Tenaw [23] inAkaki Abattoir, (31.1%)[50] in Gondar ELFORA abattoir (31.1%) [51] in Gondar ELFORA abattoir and (17.58%) [32] inAdigrat abattoir. And also (40.9%) [24] in Assella Municipal Abattoir.And[27,52] in which they reported 39.68% 20.28%in Nigeriaand Wolaita Soddo municipal abattoirrespectively. These findings are much lowerthan thereports of (66.55%) [53] fromKombolcha MunicipalAbattoir and 61.1%[54] from Gondar municipal abattoir. 59.37%, of Bedaso [55] inAdama municipal abattoir. These differences within the country areattributed mainly tovariationsintheecologicalandclimaticconditions suchasaltitude,rainfall,andtemperature, although differences in livestock management system and the ability of theinspectorto detect theinfection mayplayapart[28].

Therateofheartcondemnationofthisfindingswere40(9.25%);14(3.2%)Adhesion,13(3.0%) hydatid cyst, 9(2.1%) calcified cyst, 4(0.7%) pericarditis. This result is similar withthe report of 8%, 7.86% by Ahmed [9], % by Nigusu [49] in IsmailiaAbattoir, and Addis Ababa abattoir respectively. This finding is higher than reports of 1.55%,4.43%, 3.71% 1.0%, 0.44%, [56,29,57,51,10] from Addis ababa Akaki abattoir, Dessie municipalabattoir, Mekelle municipal abattoir, Gondar municipal abattoir, Jimma municipal abattoirrespectively. This finding is closely related to the report of3.1% on hydatidcystHoweveron other hand is higher than 4.9% on pericarditis [25] in Jimma municipalabattoir. And also, This result in line with the report of 2.3% hydatid cyst and in higher than in2.2%pericarditisbyJemalo [24]fromAssellamunicipalabattoir.Oncontrary,higher prevalence were reported 11%by Amene [10] in Jimma Municipal Abattoir.This result disagreed with the report of 10.67%, hydatid cyst 4.2% pericarditis [40]fromDiredawamunicipalabattoir.Thisfindingmuchhigherreportswererecorded 36% in pericarditis by Kambarage [58] from Gondar ELFORA Abattoir.Differencesintherejectionrate oforganswithdifferentcausesmayalso be due todifferences in the prevalence of the diseases and variationsinanimalmanagementsystems[30].

In this present study the prevalence rate of condemnation in kidneys 7(1.66%); hydatid cyst3(0.7) and hydronephritis 4(0.9%). This finding is closer than the report of 1.8% [20] from Dire dawa municipal abattoir. This finding higherthanthe report of0%[56]inAddis Ababa Akaki. However, this result, lower than the reportof 6.5%, by Shitaye [21] from Hawassa municipal abattoir. This result was seemed tobe close than the report of 0.1% hydatid cyst by Jatenie [30] from Adama municipalabattoir.Thisfindingmuchlowerthanwitht hereportof21.43%hydronephritisbyHaimanot [41] from Dire dawa municipal abattoir. Variationintheproportionoforgans condemned due to gross pathologicalchangesmay be due to differences in agro-ecological condition oftheanimalenvironmentthatcouldbefavorabletoth ecausativeagent, livestock management system andimproper disposal of condemned organs [21].

Thefinanciallossesincurredthisstudyestimatedasr esultoforganrejectionwas773,143,000 ETB / 16,734,696.97 USD.Thisresultis higher withthe reportsof 3,535,937.50ETB/ 153,736.41 USD [54] from Adama municipal abattoir. This finding ofthe current study was also higher than the reports of 1,839,760.00 ETB/99,446.49USD, 182,448.9ETB/8365.38USDbyBiressawandDene ke[59,24],Diredawamunicipal abattoir, and Assella municipal abattoir respectively. Moreover, the result washigher than the reports of 122,617.70 ETB/6,288.08 USD,80,470.37 ETB/3,688.988 USD, [29,20] from Dire dawa municipal abattoir, andfromDissiemunicipalabattoir.Variationsinthea mountofeconomiclostindifferentabattoirs probably duetothedifferencesintheprevalenceofdiseases, rejectionrateoforgans, slaughtering capacityofthe

abattoirs, local market price of organs and management,ofanimals [32].

5. CONCLUSION AND RECOMMENDATIONS

The current study deals with diseases caused by organ condemnation and their extensivefinancial impact. This study revealed an overall prevalence 29.1%. Lung was the mostlycondemned organ in this study with the reason of hydatid cyst, emphysema, pneumonia,abscess and calcified cyst. The second organ was liver by cirrhosis hydatid cyst, calcification,and discoloration. In heart it was rejected by hydatidcyst, adhesion, calcified cyst, andpericarditis. In kidney it was condemned by hydatid cyst and hydronephritis.Thus, propermeat inspectionsareessentialtoremovegrossabnormalities from meat and its productsin order to prevent thedistribution of contaminated meat to the public and Affected meatwere condemnedandrendered as unfit for human consumption. Lack of knowledgeabout the diseases caused by organs to condemn and economic impact. Inappropriate disposalof abattoir materials were sustainedthe occurrence of the disease in the study area. Onlypathognomic lesion were used as diagnose. Lack of well-trained inspectors at abattoir andcommunity awareness for the meat borne diseases. Pets were not restricted for the entrance ofabattoir and there was no direct estimation on economic loss caused by rejection rate of organs inthisslaughterhouse. Therefore its recommended that Propermeatinspectionfordetection and public safety, public awareness raising about raw meat consumption, law prohibits contaminated offal sales for pet feed and effective farm animal health management that can potentially decrease financial losses and boost the sectors economic return.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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