**Gross Pathological Study On Pulmonary Lesions Of Cattle Slaughtered In Kombolcha Elfora Abbattoir, Southern Ethiopia**

Desalegn Zemene1\*, Dagninet Molla1, Desalegn Zeberga2

Corresponding author; Dagninet Molla

**Abstract:** A cross- sectional study was conducted from November, 2015 to April, 2016 to assess the major causes of pulmonary lesions in cattle slaughtered at Kombolcha elfora abattoir, based on gross pathological examination. Out of the total 384 cattle examined during ante-mortem examination, 37(9.7%) animals were having different clinical signs during physical examination. From the observed abnormalities, tick infestation 12(3.1%), lameness 7(1.8%), depression 6(1.6%) and respiratory signs 4(1.1%) were abnormalities which have been detected at a higher percentage during ante-mortem examination. Postmortem examination was performed carefully on the 384 cattle slaughtered at the abattoir. During postmortem examination the major causes of pulmonary lesions are hydatidosis 30(7.81%), lung worm 26(6.77%), emphysema 26(6.77%), tuberculosis 24(6.25%), pneumonia 24(6.25%), abscess 18(4.68%) and calcification 16(4.16%) which were the main causes of lung rejection during meat inspection. Out of those cattle slaughter, 164 (42.70%) of lungs were condemned because of one or more abnormalities. There was not statistically significant difference (p> 0.05) in the lung condemnation rate among the age, sex and breed of animals. However, body condition score of animals were found to be significant influence on the lung condemnation rate (p< 0.05). The possible causes for the occurrence of the lesions are discussed and the results are compared with works done on cattle in Ethiopia. Therefore, due to lung condemnation result economic losses and hence the present study indicated that immediate need for prevention and control of the cause of pulmonary lesions which lead lung condemnation. Finally based on the results obtained, recommendations are forwarded for further study and for the control and prevention of the pulmonary diseases of cattle.

[Desalegn Zemene, Dagninet Molla, Desalegn Zeberga. **Gross Pathological Study On Pulmonary Lesions Of Cattle Slaughtered In Kombolcha Elfora Abbattoir, Southern Ethiopia.** *Researcher* 2016;8(10):23-31]. ISSN 1553-9865 (print); ISSN 2163-8950 (online). <http://www.sciencepub.net/researcher>. 4. doi:[10.7537/marsrsj081016.04](http://www.dx.doi.org/10.7537/marsrsj081016.04).

**Key words**: *cattle, Kombolcha, lung, pulmonary lesion*

**1. Introduction**

Ethiopia has largest livestock population in Africa, which is estimated to be 53.99% million cattle, 49.56 million sheep and goat, 1.9 million horse, 6.75 million donkey and about 0.92 million camels and 50.38 million chickens (6). Hence, an increase in cattle production could contribute to the attainment of food self-sufficiency in the country particularly in response to protein requirement for the growing human population as well as to enhance the export earnings (13).

Despite the number of population, their potential use is hampered by rampant animal diseases, poor nutrition, poor husbandry; poor infrastructure and shortage of trained man power and other constraints (32). Each year a significant loss results from death of animals, inferior weight gain, condemnation of edible organs and carcass at slaughter. This production loss to the livestock industry is estimated to be more than 900-million USD annually (20). Knowledge of specific causes of organs and carcass condemnation is very important to design and apply effective control measures, improve animal husbandry and avoid some losses related to preventable diseases (11). Data gathered on animals slaughtered at abattoir can be a convenient and inexpensive source of information. As the matter of the fact, abattoir based survey provide information on the epidemiology of livestock disease extent of exposure public to zoonotic diseases and estimate the financial losses incurred through condemnation of affected organs and carcasses ( 29).

The world human population is growing at faster rate than food production and this increase is mainly in developing counties, which are unable to assure adequate food for their people. Developing countries have nearly 2/3 of the world’s livestock population, but produce less than a third of the worlds meat and fifth of its milk (12). Monitoring and other conditions at slaughter has been recognized as one way of assessing the disease status of herd, however this source of information is not fully exploited worldwide (26). Abattoirs played an important role in surveillance of various diseases of human and animal health importance. Surveillance at the abattoir allows for all animals passing in to human food chain to be examined for unusual signs, lesions or specific disease and main causes of organ condemnation during post mortem inspection are diseases originated by parasites, bacteria and viruses. Flukes in liver and *hydatid cyst* in lung, liver and kidney, are mainly involved (38; 28; 37). Parasites in the tropics are responsible for far greater loss to meat industry than any other disease (20). Similarly like many other tropical countries in Africa, it’s well known that parasitic diseases are the major factors responsible for low productivity in live stock in Ethiopia. Although various investigations have been conducted through abattoir survey to determine the prevalence and economic loss resulting from organ condemnation in Ethiopia, most of the surveys were focusing only on parasitic cases such as hydatidosis and fasciolosis (20).

Animal diseases are one of the primary constraints in increasing the productivity of food animals in sub-Saharan Africa. Pulmonary diseases like tuberculosis, *hydatid cyst*, and lung worms are among the most important causes of economic loss due to carcass condemnation and public health problems. Infectious diseases of respiratory tracts of farmed animals are caused by a combination of infectious agents and predisposing factors (10). Under rearing conditions most ruminant livestock harbor some disease conditions without clinical manifestation. During abattoir ante-mortem inspections, hundreds of such animals are passed for slaughter (31;30). The prevalence of pulmonary lesions in Kombolcha has not been previously studied. In view of the importance of the problem, a study will be undertaken with the Following objectives;

* To assess the major pulmonary lesions leading to lung condemnation.
* To determine the association between risk factors and prevalence of pulmonary lesions.

**2. Materials And Methods**

**2.1. Study area**

The study was conducted from November 2015 to April 2016 at Kombolcha town which is found in Amhara National Regional State (ANRS) in South Wollo Zone. Kombolcha is located 375Km North East of Addis Ababa at an altitude of 1500-1840 m.a.s.l. The annual average rainfall is 750-900 mm with a mean minimum and maximum temperature of 11.7 and 23.9°C, respectively. The area receives a bimodal rainfall where the short rainy seasons are between March and May while the long rain season extends from June to end of September. The relative humidity of the area varies from 23.9-79%. The total livestock population in and around kombolcha Town recorded that 19687 Cattles, 6905 Sheep, 11133 Goats, 774 Horses, 2629 Donkeys, 77 mules, 29915 poultry, 624 bee colony and 331 male camels (22).

**2.2. Study population and sample size determination**

2. 2.1. Study population

The study population constitutes of local and cross breed cattle originating from different localities and districts in and around Kombolcha town. The majority of animals slaughtered were local breeds and age wise adult animals took the greater proportion.

2.2.2. Sampling method and sample size determination

To determine the sample size 50% prevalence is used and 95% confidence interval with 5% absolute precision is chosen. The sample size would be determined by the formula given by Thursfield (40).

N= 1.962xPexp (1-Pexp)

 d2

Where N = the total sample size

Pexp= expected prevalence

d= absolute precision

**2.3. Study Design**

The study conducted was basically cross sectional type based on active abattoir survey data investigation.

**2.4. Study methodology**

2.4.1. Active abattoir survey

A cross sectional study was conducted from November 2015 to April 2016 to identify the major causes of pulmonary lesions of cattle slaughtered at Kombolcha elfora abattoir.

**Ante mortem examination**

During ante mortem examination of the animals and the relevant information including age, breed, physical condition and health status were recorded. Body condition score of the selected animals were recorded and standard grades given as described by (Nicholson and Butterworth, 1986). The judgments have also been passed on the procedure given by (FAO, 2007).

**Postmortem examination**

Postmortem examination was conducted by visualization, inspection, palpation and systematic incision of the organ particularly the lung for the presence ofabscesses, hydatid cyst, lung worm, tuberculosis, pneumonia, emphysema, calcification and other abnormalities (Gracy *et al*., 1999). The judgments have also been passed based on the procedure given by (FAO, 2007).

**2.5. Data Management and analysis**

Collected data was entered in to Microsoft excel and summarized by descriptive statistical methods like percentage and proportion. Then data was also analyzed by using version 20 of statistical package for social science (SPSS) software. The results of this study were considered statistically significant when P value is less than 0.05.

**3. Results**

During the study period a total of 384 cattle were screened for any gross post mortem pulmonary lesions with the objective of identifying the prevalence of pulmonary lesions encountered on cattle lungs.

**3.1. Clinical findings**

Physical examination was carried in 384 of the selected animals; in which 9.7% (n=37) had abnormalities during ante-mortem inspection. From the abnormalities tick infestation 3.1% (n=12), lameness 1.8% (n=7), depression 1.6% (n=6) and Respiratory signs 1.1% (n=4) have occurred relatively at higher proportion than other abnormalities. The major abnormal conditions encountered during physical examination are summarized in (table 1).

Table1: Disease conditions or abnormalities encountered during physical examination.

|  |  |  |
| --- | --- | --- |
| Disease or abnormalitiesDepressionRespiratory signsLocalized woundLamenessBrandingUnilateral blindnessTick infestationTotal | Animals with disease or abnormalities (%) | Total (%)6(1.6)4(1.1)3(0.8)7(1.8)3(0.8)2(0.5)12(3.1)37(9.7) |
| Young adults(n=145) Adults (n=239)3(0.8) 3(0.8) |
| 1(0.3)0(0)2(0.5)0(0)0(0)3(0.8)9(2.4) | 3(0.8)3(0.8)5(1.3)3(0.8)2(0.5)9(2.3)28(7.3) |

**3.2. Pathological findings**

All animals that had been passed in the ante-mortem inspection were subjected to post-mortem examination. A total of 384 cattle (145 young adult and 239 adult age groups) were slaughtered and thoroughly examined by following standard post-mortem inspection procedure. Rates of lung condemnation from the affected lung with its prevalence of pulmonary lesions were hydatidosis 7.81% (n=30), emphysema 6.77% (n=26), lung worm 6.77% (n=26), tuberculosis 6.25% (n=24), Pneumonia 6.25% (n=24), abscess 4.68% (n=18) and calcification 4.16% (n=16) based on gross pathological finding of lungs.

Table 2: Frequency and prevalence of different pulmonary lesions encountered in lungs of cattles slaughtered at Kombolcha elfora abattoir.

|  |  |  |
| --- | --- | --- |
| Lesion type | Frequency | Prevalence(%) |
| Hydatidosis | 30 | 7.81% |
| Emphysema | 26 | 6.77% |
| Lung worm | 26 | 6.77% |
| Tuberculosis | 24 | 6.25% |
| Pneumonia | 24 | 6.25% |
| Abscess | 18 | 4.68% |
| Calcification | 16 | 4.16% |

Table 3: Distribution of the different pulmonary lesions among age, breed and body condition score.

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Category level | No | Pathology |
|  |  |  | Hydatidosis | Emphysema | Lung worm | tuberculosis | Pneumonia | Abscess | Calcification |
| Age | Young adult | 145 | 12 | 8 | 12 | 4 | 7 | 5 | 8 |
| Adult | 239 | 18 | 18 | 14 | 20 | 17 | 13 | 8 |
|  | p-value |  | 0.792 | 0.446 | 0.361 | 0.028 | 0.370 | 0.371 | 0.302 |
| Breed | Local | 371 | 28 | 25 | 26 | 23 | 24 | 18 | 16 |
| Cross | 13 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
|  | p-value |  | 0.301 | 0.893 | 0.323 | 0.827 | 0.344 | 0.416 | 0.444 |
| BCS | Poor | 130 | 9 | 2 | 15 | 13 | 14 | 5 | 10 |
| Medium | 147 | 15 | 16 | 8 | 8 | 10 | 10 | 3 |
| Good | 107 | 6 | 8 | 3 | 3 | 0 | 3 | 3 |
|  | p-value |  | 0.036 | 0.008 | 0.021 | 0.025 | 0.003 | 0.02 | 0.045 |

3.2.1. Hydatidosis

Hydatidosis was encountered in 7.81% (n=30) of lungs. They were varied in number from few to numerous on single lungs. Most of the cysts had calcified or yellowish material inside the capsule but the rest had clear water like fluid.

Table 4: Prevalence of lesions of pulmonary hydatidosis among age, breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage (%) | X2 | p-value |
| Age | Young adult(145)Adult(239)Total(384) | 121830 | 3.1%4.7%7.8% | 0.069 | 0.792 |
| Breed | Local(371)Cross(13)Total(384) | 28230 | 7.3%0.5%7.8% | 1.071 | 0.301 |
| BCS | Poor(130)Medium(147)Good(107)Total(384) | 915630 | 2.3%3.9%1.6%7.8% | 2.033 | 0.036 |

3.2.2. Emphysema

Out of the examined 384 cattle lungs, 6.77% (n=26) of the lungs had shown evidence of emphysema. Grossly, the emphysematous lung was pale, enlarged and puffy. It crepitates on palpation. There was also evidence of rib imprints on the surface of lungs.

Table 5: Prevalence of emphysema among age, breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage (%) | X2 | p-value |
| Age | Young adultAdultTotal | 81826 | 2.1%4.7%6.8% | 0.580 | 0.446 |
| Breed | LocalCrossTotal | 25126 | 6.5%0.3%6.8% | 0.018 | 0.893 |
| BCS | PoorMediumgoodtotal | 216836 | 0.5%4.2%2.1%6.8% | 9.663 | 0.008 |

3.2.3. Lung worm

Prevalence of pulmonary lung worm infection among the cattle examined was 6.7% (Table 2) and Clinically affected animals show a sign of loss of appetite, reduced growth, increase respiratory rate and coughing.

Table 6: Prevalence of lesions of pulmonary lung worm among age breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage(%) | X2 | p-value |
| Age | Young adult(145)Adult(239)Total | 121426 | 3.1%3.6%6.7% | 0.836 | 0.361 |
| Breed | Local(371)Cross(13)Total | 26026 | 6.7%0% | 0.977 | 0.323 |
| BCS | Poor(130)Medium(147)Good(107)total | 158326 | 3.9%2.1%0.8%6.7% | 7.760 | 0.021 |

3.2.4. Pneumonia

The prevalence of pneumonic lungs during the study period was 6.25% (n=24) of the total pulmonary lesions. Grossly pneumonic lungs have pleurisy, dark red in color which has a liver like consistency.

Table 7: Prevalence of pneumonia among age, breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage(%) | X2 | p-value |
| Age | Young adultAdultTotal | 71724 | 1.8%4.4%6.2% | 0.804 | 0.370 |
| Breed | LocalCrossTotal | 24024 | 6.2%0%6.2% | 0.897 | 0.344 |
| BCS | PoorMediumGoodTotal | 1410024 | 3.6%2.6%0%6.2% | 11.741 | 0.003 |

3.2.5. Pulmonary tuberculosis

Prevalence of pulmonary tuberculosis among the cattle examined was 6.3% (Table 4) and grossly these lesions have a granuloma and have a number of tubercline lesions distributed in lung, other organs and carcass.

Table 8: Prevalence of Tuberclosis among age, breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage(%) | X2 | p-value |
| Age | Young adultAdultTotal | 42024 | 1.0%5.3%6.3% | 4.847 | 0.028 |
| Breed | LocalCrossTotal | 25126 | 6.0%0.3%6.3% | 0.48 | 0.827 |
| BCS | PoorMediumGoodTotal | 138334 | 3.4%2.1%0.8%6.3% | 5.453 | 0.025 |

3.2.6. Abscess

Abscess was encountered in 4.68% (n=18) of cattle lungs. Grossly, these lesions were 1-3 cm in diameter containing whitish or yellowish thick pus.

**Table 9: Prevalence of abscess among age, breed and body condition score**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No of examined animals | No of affected animals | Percentage(%) | X2 | p-value |
| Age | Young adultAdultTotal | 51318 | 1.3%3.4%4.7% | 0.801 | 0.371 |
| Breed | LocalOldTotal | 18018 | 4.7%0%4.7% | 0.662 | 0.416 |
| BCS | PoorMediumGoodTotal | 510318 | 1.3%2.6%0.8%4.7% | 2.528 | 0.02 |

3.2.7. Pulmonary calcification

Prevalence of pulmonary calcification among the cattle examined was 4.2% (Table 7) and grossly these lesions were Irregulary rounded and frequently honey combed and have a gritty sound upon incision with knife.

Table 10: Prevalence of calcification among age breed and body condition score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No  of examined animals | No of affected animals | Percentage (%) | X2 | p-value |
| Age | Young adultAdultTotal | 8816 | 2.1%2.1%4.2% | 1.064 | 0.302 |
| Breed | LocalCrossTotal | 16016 | 4.2%0%4.2% | 0.585 | 0.444 |
| BCS | PoorMediumGoodTotal | 103316 | 2.6%0.8%0.8%4.2% | 6.208 | 0.045 |

**4. Discussion**

Meat inspect

And also Gracey (19) suggested that meat inspections was conducted in the abattoir for the purpose of screening and removing animals products with pathological lesions which are unsafe for human consumption and having poor aesthetic value. It was indicated that meat inspection assists in monitoring disease in the national herd and flock by providing feedback information to the veterinary service to control or eradicate disease and to produce wholesome products and to protect public from zoonotic hazards. The present study assesses the type and frequency of gross pulmonary lesions encountered in cattle lungs slaughtered at Kombolcha Elfora Abattoir.

In present study, the most commonly encountered abnormalities during ante-mortem inspection were tick infestation 12(3.1%), lameness 7(1.8%), depression 6(1.6%), and respiratory signs 4(1.1%). In this study; only depressed animals encountered during ante-mortem examination were delayed from being slaughtered. Teka (38) reported that diseased animals that show signs of abnormality during ante-mortem inspection should not be allowed to enter the slaughter house for slaughter. Out of the total 384 cattle examined during ante-mortem inspection, abnormalities were detected in 9.7% (n=37). This study was in line with Getachew (18) signs such nasal discharge, coughing and depression were the most probably related to stress due to lack of feed and water, immune suppression and overcrowding during transportation. Similarly, Regessa*et al*. (2013) reported that most causes of lameness was trauma caused by inappropriate vehicles and loading and off-loading negligence during transportation to market places and to the abattoir.

Out of 384 cattle lungs examined, 42.70% (n=164) were found with one or more pulmonary lesions. Of those causes hydatidosis and emphysema were the most important causes of pulmonary lesions. There was statistically significant difference between body condition score in the prevalence of lung (p<0.05). However, the difference between breed, sex and age was not statistically significant with the prevalence of pulmonary lesions, even though there was high prevalence in local breeds. The probable reason for significant difference between body conditions score could be due to acquired immunity in the host.

The current study result in the prevalence of pulmonary lesions by hydatidosis is 7.81% which was lower than the result 19.37% and 12.17% reported by Shegaw *et al.* (36) in Mekelle and Lati *et al*. (25) in wellega respectively. The present study was comparable to 7.95%, 8.4% and 6% observed by Hamdy *et al*. (1980), Pampiglicone (1986) and Abdurahman (1) respectively.

And also the present study is lower 15.2% as reported by kebede *et al*. (24) in Birre-Sheleko and Dangila abattoirs, and 16% in Wolaita Sodo town by Kebede *et al.* (23) and lower than 32.1% by Gebretsadik (2009) in Mekelle. However, the present finding was higher than the report of Alembran and Haylegebriel (2) with 5.1% at Adigrat municipal abattoir. This variation in prevalence of hydatidosis could be due to differences in animal husbandary system, illegal slaughtered of animals, lack of proper disposal of infected carcass and the presence of stray dog which maintain the life cycle of the parasite and their relations with animals Mesele *et al*. (27). Different prevalence results may be reported from the same area due to variations in the number of animals examined, the duration and months of the study period.

In present study, disease condition in lung was significantly higher in poor body condition animals (18.8%) than medium (18%) and good (6.2%) body condition animals. This finding was disagree with a previous study by Lati *et al*. (25) who reported 23.02%, 25% and 16.66% from animals with good, medium and poor body conditions in wellega municipal abattoir. The differences between body conditions score may be due to animals with poor body condition have low immunity to hydatid disease. Moderate to severe infection the parasite may cause retarded growth, reduced meat and milk production as well as live weight (Polydorou, 1981).

With regards to emphysema in this study accounted 6.77% which is higher than the rate reported by Yifat *et al*. (2012) 1.5% from Gondar but equal the rate reported by Amene *et al*. (2011) 6.77% from Jimma and lower than Genet *et al.* (16) 10.5% from Gondar abattoir. In this study the encountered emphysema could be due to excessive destruction of alveolar walls as a result of an imbalance between proteases produced by phagocytes and antiproteases produced in the lungs as a defense mechanism, secondary to obstruction of outflow of air or agonal at slaughter as indicated (Dungworth, 1993; Lopez, 2001).

In the present study the Prevalence of verminous pneumonia was 6.77% which is statistically significant with the age of the cattle and with the body condition of the cattle (p < 0.05). The disease was more likely to occur among the Young adult than adult cattle. This might be due to young adult animals have no previous exposure of diseases as compared to adult animals. The current study is higher to reported by Samuel (35) 0.96% verminous pneumonia and Amene *et al*. (3) also reported similar results from Jimma in western Ethiopia. But, high prevalence of the lesions was reported by Rahman *et al*. (33) in Bangladesh parasitic pneumonia 29.85%. The variation in the present study may be due to agroecology of the area and different management practices of the animals.

The overall prevalence of pneumonia in this study was 6.25%, which is higher than 2.45% Genet *et al*. (16). And lower than 8.8% Raji *et al*. (34) in cattle slaughtered at Zaria. A number of factors may explain in the difference prevalence of pneumonic lungs, including stress factors such as exposure to dust from the environment or exhaustion during travelling of long distance of pastoral livestock in search of pasture and water and when animals are taken to livestock markets or abattoirs and parasitism Benard *et al*. (2011).

In the present study, overall prevalence tuberculosis was 6.25% which was higher than the results reported by Demelash *et al*. (9) and Teklu *et al.* (39) in Yabello municipal abattoir 4.2% and Hosanna 4.5%, respectively. On the other hand, the present results are less than those of previous reports from Butajira municipality abattoir 11.50% Abdurohman, (1), Addis Ababa and Adama 10.10% Demelash *et al*. (9), Adama municipal abattoir 24.70% Tefrea, (2009) and 19.8% record from cattle slaughter in rural Tanzania Cleaveland *et al.* (7). This could indicate the endemicity of the disease and high infection rate prevailing in the general population of slaughter cattle in Ethiopia.

In this study abscess was encountered in 4.68% of the cases. This was comparable with and Bekele (2008) who reported 3.85%, and higher than the results of Abdurahman (1) and Ahmed (1998) who reported a prevalence of 0.3%, 1.4% in cattle, respectively. Moreover, this study was lower than prevalence of pulmonary abscess that was recorded by Al-Tarazi, (2001) with a prevalence of 10.34% in cattle. This might be dueto Pulmonary abscess arise from either focal residues of severe, supportive lobar or bronchopneumonia or from septic emboli lodging in the pulmonary vascular bed. The most common sources of septic emboli include ruptured hepatic abscess in cattle, suppurative metritis, mastitis, septic arthritis and omphalophlebitis in farm animal and bacterial endocarditis (right side) in all species (Dungworth, 1993; Lopez, 2001). Additionally the two less common causes of pulmonary abscess are aspiration of foreign bodies and direct traumatic penetration of the lungs (Dungworth, 1993; Lopez, 2001; Radostits *et al*., 2007).

The overall prevalence of calcification in this study was 4.2%, which is comparable with Fufa and Debele (14) who reported 5.32% at Wolatia Sodo abattoire and lower than 10.2% Asmare *et al*.(5) in cattle slaughtered at Bahir Dar municipal abattoir. This might be causing this pathological lesion include viruses, bacteria, rickettsial and helminthes that might have zoonotic importance. So, those other causes of organs rejection were important Cadmus *et al*. (2009). In general, high prevalence of pulmonary lesions could be due to the older age of the animals at slaughter with possibility of exposure to one or more of the agents which causes respiratory disease through time at least once, similar to previous observations (Richard, 1979; Bekele, 2008) in camels, (Abayneh, 1999; Solomon, 2007) in cattle and (Islam 1979) in sheep.

**5. Conclusion And Recommendations**

In this study out of 384 lungs of cattle examined 42.70% were found with one or more pulmonary lesions, indicating pulmonary diseases as an important constraint of cattle production in cattle rearing areas. The existence of different pulmonary lesions together in one animal indicated that one lesion as a predisposing factors or a sequel to the other lesions. The etiology of pulmonary disease is so complex and multifactorial. Therefore, those lesions encountered in this study may also play a role as a predisposing factors for respiratory disease outbreak under the influence of stress factors such as environmental change, extremes of climatic conditions, transportation and shortage of feeds and water or alone. The respiratory tract is constantly exposed to pathogens from the environment and respiratory commensal organisms. Most cattle had one or more pulmonary lesions on postmortem examination but were apparently healthy during clinical examination. This masks the presence of the disease until necropsy. This together with poor of veterinary service in cattle rearing areas increases the problem of respiratory diseases on cattle production. Taking these facts into consideration the following recommendations are forwarded:

* Further and subsequent studies should be undertaken to investigate pulmonary lesions.
* Detailed studies on the etiology of the different pulmonary lesion should be undertaken.
* Awareness of the public about hydatidosis and tuberculosis should be increased through public education and infected organs should be properly disposed.
* Strong collaboration among governmental organization, nongovernmental organization, veterinarian (researchers) and farmers should be made in order to study on active respiratory disease, to determine the impact of respiratory disease on cattle production and to design control and prevention strategies.

**6. Acknowledgements**

First and foremost, I would like to thank the Almighty God and lord of the universe because without him him nothing was possible.

I also like to thank meat inspectors at Kombolcha elfora abattoir and owners of slaughtered animals for their valuable information and support.

When it comes to emotions, words don’t mean anything but I will be failing in my duty if I do not place on record deepest sense of gratitude to my family, whose love, patience and enormous sacrifice made it possible for me to complete my thesis.

My deeper feeling also goes to all staff member of SVM for their cooperation and strengthens in all activities with me in my campus educational life.

Lastly, I would like to express my great gratitude to my beloved friends.

**References**

1. Abdurohaman, M. (2009): Crosssectional study of bovine tuberculosis in Butajira municipal abattoir. DVM Thesis, University of Gondar, Faculity of veterinary medicine, Gondar, Ethiopia.
2. Alembrhan, A. and Haylegebriel, T. (2013): Major causes of organ condemnation and economic loss in cattle slaughtered at Adigrat municipal abattoir northen Ethiopia. *Vet. Wld*., 6(10): pp. 734-738.
3. Amene, F., Eskindir, L. and Dawit, T. (2012): The Cause, Rate and Economic Implication of Organ Condemnation of Cattle Slaughtered at Jimma Municipal Abattoir, Southwestern Ethiopia. *Glo Vet*, 9(4): pp. 396-400.
4. Asmare, A., Biniyam, A. and Meresha, C. (2012): Major causes of lung and liver condemnation in cattle at Bahir Dar municipal abattoir. African *J app, sci*. 4(5): pp. 165- 171.
5. Asseged, B. (1999): Bovine tuberculosis a cross-sectional and epidemiological study in and around Addis Ababa, MSc thesis, Addis Ababa University, Faculty of Veterinary Medicine, Debre Zeit, Ethiopia.
6. Central Statistical Authority (CSA), (2013): Agricultral statistical report, Addis Ababa, Ethiopia.
7. Cleaveland, S., Shaw, D., Mfinanga, S. and Shirima, G. (2007): Mycobacterium bovis in rural Tanzania: risk factor for infection in cattle and human populations. Tuberculosis, 87: pp. 30-43.
8. CSA, Central Statistical Authority (2008): Federal Democratic Republic of Ethiopia, Agricultural Sample Enumeration Statistical Abstract.
9. Demelash, B., Inangolet, I., Oloya, B. and Asseged, M. (2009): Prevalence of bovine tuberculosis in Ethiopia slaughter cattle based on post-mortem examination. Pp: 1007- 1021. *Trop Anim Hlth* and *Prod,* 41: pp. 755-765.
10. Eddy, R., Boyd, H., Blowey, R. and Andrew, A. (1992): Bovine medicine diseases and husbandry of cattle. 1st Ed.
11. Edwards, D., Christiansen, K., Johnston, A. and Mead, G. (1999): Determination of farm level risk factors for abnormalities observed during post-mortem meat inspection of lambs: a feasibility study. *Epi and Inf*, 123: pp. 109-119.
12. FAO (Food and Agriculture Organization), (1995): Manual on meat inspection for developing countries. Animal and Health Production papers food and Agriculture organization of the United Nation, Mekelle, Ethiopia.
13. FAO, (2007): Manual on meat inspection for developing Countries. Animal and health production papers Food and Agriculture organization of the United Nations: Mekele University, Mekele, Ethiopia.
14. Fufa, A. and Debele, H. (2013): Major causes of organ condemnation for cattle and its finicia l impact at Wolatia Sodo municipality abattoir, Southern Ethiopia. *Glo.Vet* 11(6): pp. 730-734.
15. Gebretsadik, B., Kassahun, B. and Gebrehiwot, T. (2009): Prevalence and significance of fasciolosis in cattle in Mekelle Area of Ethiopia. *Trop. Anim. Hlth. Prod*., 47(7): pp. 1503-1504.
16. Genet, M., Tadesse, G., Basaznew, B. and Mersha, C. (2012): Pathological conditions causing organ and carcass condemnation and Their Financial losses in cattle slaughtered in Gondar, North west Ethiopia. *Afr. J. Basic Appl Sci*., 4(6): 200-208.
17. Getachew, E. (2008): Major diseases of export oriented livestock in Export abattoirs in/around AdanLibenWoreda, Debrezeit. Online DVM thesis, Faculity of Veteri nary Medicine, Haramaya University, Ethiopia.
18. Gracey, J., Collins, O. and huey, R.(1999): Meat hygiene, 10th ed. London, Bailliere, Tindall.
19. Jobre, Y., Lobago, F., Tiruneh, R. and Abebe, G. (1996): Hydatidosis in there selected regions of Ethiopia. An assessment trial on its prevalence, economic and public health importance. *Rev. Med. Vet.,* 147: pp. 797-804.
20. KAOAR, (2016): Kombolcha agricultural office of animal resource recording sheet (2016) found.
21. Kebede, N., Abuhay, A., Tilahun, G. and Wossene, A. (2009a): Financial loss estimation, prevalence and characterization of hydatidosis of cattle slaughtered at Debre Markos municipality abattoir, Ethiopia. *Trop. Anim. Hlth. Pod.* 141: pp. 1787-1789.
22. Kebede, N., Gebre- Egziabher, T., Tilahun, G. and Wossene, A. (2009b): Prevalence and effects of hydatidosis in cattle slaughtered in Birre- Sheleko and Dangila Abattoirs, North- western Ethiopia. Zoonoses*, Pub. Hlth*. pp 1-6.
23. Lati, E., Biresaw, S., Berhanu, S. and Eyob, H.(2015): Causes of organ condemnation, its public health and financial significance in Nekemte municipal abattoir, Wellega, Western Eth.J. vet. Medium. *Anim. Hlth*., 7(6): Pp 205-214.
24. Mellau, L., Nonga, E. and Karimurbo, D. (2010): A slaughter house Survey of Liver lesion in slaugherered cattle, Sheep and Goats at Arusha, Tanzania. *Res. J.Vet. Sci*, 3: pp. 179-188.
25. Mesele, A., Solomon, T. and Desie, S. (2013): Cystic Echinococcosis of cattle in Jimma municipal Abattoir, south West Ethiopia. *Glob. Vet.,* 11(6): pp. 771-775..
26. Mezegebu, Y. (2003): Major cause of organ condemnation in ruminants slaughtered at Gondar Abattoir, North Western Ethiopia. DVM thesis, Faculty of Veterinary Medicin e, Addis Ababa University, Debre-Zeyit, Ethiopia.
27. Nfia, A. and Alonge, D. (1987): An Economic survey ofabattoir data in fako division of southwest province, Cameroon (1978-1980). Bull. *Anim. Hlth. Prod. Afr*., 38: pp. 239-42.
28. Okoli, I., Nwokeocha, J., Okoli, C. and Ogundu, U. (2002): Prevalence of fascioliasis and oesophagostomosis among slaughtered animals in Imo State, Nigeria and their correlation with emaciation diagnosis at ante-mortem. *Trop. Vet*. 20(3): pp. 139 – 148.
29. Okolo, M. (1985): Pathological conditions found in goats killed at slaughter houses in Nsukka. Nigeria *Journal of Animal Production*, 12(1): pp. 61 – 67.
30. PACE-Ethiopia (2003): Experiences and the way forward on community based Animal Health Service delivery in Ethiopia. Proceedings of a workshop held in Addis Ababa, Ethiopia, Pp. 6.
31. Rahman, A., Nooruddin, M., Begum, N. and Lee, J. (2003): Epidemiological study of pulmonary lesions and diseases in slaughter cattle. College of Veterinary Medicine, Bang ladesh Agricultural University. Korean *J. Vet*., 26(1): pp. 81-88.
32. Raji, M., Salami, S. and Ameh, J. (2010): Pathological conditions and lesions observed in sla ughtered cattle in Zaria abattoir*. J. Cli. Path. And Med.* 1(2): pp. 9 – 12.
33. Samuel, T. (2007): Gross and Microscopic pulmonary lesions of camels from Eastern Ethiopia. *Trop. Anim. Hlth. Prod*., 40: pp. 25-27.
34. Shegaw, S., Ashwani, K. and Kassaw, A. (2009): Organ condemnation and economic loss at Mekelle municipal abattoir, Ethiopia. *Glob. Vet*., 48: pp. 17-22.
35. Sirak, A.(1991): Cause of organ condemnation in Bahir dar abattoir. Faculty of Veterinary Medicine, Addis Ababa University, Debre Zeit, Ethiopia, DVM Thesis...
36. Teka, G. (1997): Meat hygiene. In food hygiene principles and methods of Food borne diseas es Control with special reference to Ethiopia, Pp: 99- 113.
37. Teklu, A., Asseged, B., Yimer, E., Gebeyehu, M. and Woldesenbet, Z. (2004): Tuberculous l esions not detected by routine abattoir inspection: the experience of the Hossana municipal abattoir, in Southern Ethiopia. *Re.Sci.Tech OIE*, 23: pp. 957-964.
38. Thrusfield, M. (2005): Veterinary Epidemiology.3rd edition. UK, Blackwell Science Ltd. Pp:233- 250.

10/25/2016