

Study on Prevalence of Rumen and Reticulum Foreign Bodies in Cattle Slaughtered at Shashemene Municipal Abattoir, Oromia Region, West Arsi Zone, Ethiopia

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Abstract: Across-sectional study was conducted on 384 cattle (375 male and 9 female) from November, 2015 to April, 2016 at Shashemene Municipal Abattoir, Oromia Regional State, West Arsi Zone Ethiopia, with the objectives to assess the prevalence of rumen and reticulum foreign bodies, identifying types of foreign bodies and associated risk factors for the occurrences of foreign bodies. During ante mortem examinations detail information on individual animals were done for the assessment of age, sex, breed, body condition and their place of origin. Postmortem examination was employed for the recovery of foreign body from rumen and reticulum. From total of 384 cattle examined, 47/384 (12.24%) were found positive for the occurrence of indigestible foreign bodies in rumen and reticulum. When the prevalence was compared between sex, among different age groups, among different body condition score and site of lodgment higher prevalence of foreign bodies 44.5%, 36%, 80% and 11% were observed in female, age older than 10 years, animal having poor body condition score and site of lodgment respectively. There was highly statistically significant difference in the prevalence among sex, age, body condition score and site ($P < 0.05$). Rumen harbored mostly plastic materials while reticulum was the major site for the retention of metallic objects. Plastics were recovered as the most common foreign bodies followed by clothes and leather. Therefore, continued awareness creation should be instituted in to the animal health care services to avoid the risk of foreign body ingestion by animals and appropriate solid waste disposal system need to implement in the study area to prevent health risk for ruminants and also to protect the environment.

Key words: Abattoir • Cattle • Foreign Body • Prevalence • Reticulum • Rumen • Shashemene

INTRODUCTION

Ethiopia is a home for many livestock species and believed to have the largest livestock population in Africa. An estimate indicates that the country is a home for about 54 million cattle, 25.5 million sheep, 24.06 million goats, 1.91 million horses, 6.75 million donkeys, 0.35 million mules and about 0.92 million camels in the country. From the total cattle population 98.95% are local breeds and the remaining are hybrid and exotic breeds [1].

Cattle play significant contribution in Ethiopian economy as source of meat, milk, drought, income and foreign exchange and the country has great potential for increased livestock production, both for local use and for

export. However, as other livestock in the country their contribution is below the expected potential this is mainly due to the prevalent livestock diseases, poor management system, inadequate nutrition, lack of support services and inadequate information on how to improve or animal breeding, marketing and processing and poor genetic performance. Thus, the country is not utilizing this huge potential livestock resource and an improvement in this sector [2].

Cattle have three non-glandular fore-stomach compartments they are rumen, reticulum and omasum. These are the sites for fermentative digestion. The fourth glandular compartment, the abomasum is the true stomach which is responsible for the next phase of enzymatic

digestion [3]. Environmental pollution is one of the growing problems for grazing animals due to absence of recycling industries, cleaning of environment cultures and improper disposal of plastic bags. Plastic bags resist to biodegradation and pollute for decades and centuries and pose great risk to human health and environment [4]. Ingested foreign bodies in cattle are divided in to two main groups; the first category is foreign bodies of metallic origin and foreign bodies of non metallic origin [5].

The bovine species does not have highly sensitive prehensile organs such as lips and tongue that discriminate sense of taste. As a consequence, cattle kept in farmyards stables or at other sites close to human mechanical activities are prone to swallow metallic objects such as nails and pieces of wires that have been carelessly left in their feeding areas. Honeycomb-like structure of the reticulum provides many sites for fixation of a foreign body and contractions of the reticulum may be sufficient to push a sharp foreign body through the wall, inducing the disease [6]. Free grazing animals eat plastic bags especially in towns and villages. These plastic bags are indigestible and their accumulation in the rumen of grazing animals may lead to adverse effect on health [7]. The entry and migration of foreign bodies through the body tissues lead to many complications based on nature of the foreign body entrance in to the tissues [8].

The bovine fore-stomach are affected highly due to ingested foreign bodies which are the subject of attention almost all over the world and also major economic importance due to severe loss of production and production ability and sometimes death of the animal and the ingestion and lodgment of foreign bodies are common in the bovine[9]. Reports from cattle reared in urban and sub-urban environments indicate that impaction of rumen from the accumulation of foreign bodies, such as plastic bags causes' interference with the flow of ingesta leading to distention of rumen and absence of defecation [10]. The presence of these foreign materials in the rumen and reticulum also hampers the absorption of volatile fatty acids and consequently reduces the rate of animal fattening [11].

Ruminants are notorious for ingestion of foreign bodies mainly related to nutritive deficiency and feeding management of the animals and it may also occur during period of feed scarcity [11]. Feed shortage usually occurs at specific time of the year in most part of Ethiopia. Moreover, most owners do not provide supplementary

feed to animals. These in turn may predispose the animals to negative energy balance and force them to feed on unusual materials including plastics, clothes, leather, ropes and even metallic substances [12].

Cattle are more susceptible to foreign body syndrome than small ruminants because they do not use their lips for prehension and are more likely to eat chopped feed [13]. The common symptoms observed in the affected animal were bloat and abnormal bulging of the left side para lumbar fosse, depression, complete or partial anorexia followed by loss of weight, ruminal impaction and reduction of milk [14]. The ingestion of foreign bodies causes various problems in different organ of the animal mainly in rumen and reticulum. The problem that are caused vary with the duration that the foreign body has been present, the location of foreign body, the degree of obstruction that is caused as well as problems associated with the material of the foreign body [2].

Traumatic reticulo-peritonitis, also known as hardware disease is relatively common diseases in adult cattle caused by the ingestion of foreign bodies. Among the numerous diseases of foreign body syndrome in ruminant species, traumatic reticulo-peritonitis (TRP) and traumatic pericarditis (TP) is the most common [15].

Traumatic reticulo-peritonitis disease in cattle is caused by the ingestion of foreign bodies in the reticulum swallowed metallic objects such as nail or pieces of wire fall directly on the reticulum or pass into the rumen and subsequently carried over the rumeno-reticular folds into the cranio-ventral part of the reticulum [16]. The perforation of the wall of reticulum allows leakage of ingesta and bacteria which contaminates the peritoneal cavity, resulting in local or diffuse peritonitis [17].

Gastrointestinal foreign bodies are among the most common surgical emergency in veterinary medicine. However solid environmental pollution (foreign bodies) has been given lesser attention to be treated as a separate health problem. In Ethiopia, information regarding the magnitude and occurrence of fore stomach foreign bodies is very limited. The fact that rumen impaction by these foreign bodies is mainly asymptomatic in nature and only diagnosed in live animals if the material is accumulated in large amounts and thus, it can be adequately studied in abattoirs. Therefore, the objectives of the present study were to assess the prevalence of rumen and reticulum foreign bodies in cattle slaughtered in Shashemene Municipal Abattoir, to study the risk factors associated with the occurrence of foreign bodies in cattle and to identify the types of rumen and reticulum foreign bodies.

MATERIALS AND METHODS

Study Area: The study was conducted in selected districts of West Arsi zone from November 2015 up to April 2016 in Shashemene districts, namely Shashemene Municipal Abattoir. Shashemene is located 250 km south of the capital Addis Ababa and 25 km north of Hawassa. Geographically the area lies within the Rift Valley, with altitudes ranging from 1700 to 2600 meters above sea level (m.a.s.l) and located at 7° 05'N to 7° 19'N and 38° 23'E to 38° 41'E. It receives an annual rainfall of 700–950 mm and has an annual minimum and maximum temperature range of 12–27°C. Out of the total area of 76, 888 hectares, crop land accounts for 48, 975 hectares and the rest 7440, 5160 and 1320 hectares are forest land, grazing land and land for other purposes, respectively. The urban settlement accounts for 1733 hectares. The cattle population in the districts is 184, 549 [18].

Study Population: The study was conducted on 384 apparently healthy slaughtered cattle at Shashemene Municipal Abattoir from November, 2015 to April, 2016. The animals were originated from different agro-ecological zone (Shashemene, Arsi negelle and Kofole) which have different management system. Animals were both local and cross breed cattle kept under extensive and semi-intensive farming systems. Even though, the study animals were kept under broad range of management, animals in most of the rural areas were kept to graze pasture on grassland and supplementary feedings of crop residue when pasture is scarce especially during long dry season. During the study different risk factors like sex, age, breed and body conditions of animals were considered.

Study Design: A cross sectional study was conducted from November, 2015 to April, 2016 in Shashemene Municipal abattoir to assess the prevalence of the rumen and reticulum foreign bodies, to identify the types of foreign bodies and to study their associated risk factors like sex, age, breed, body conditions and origin of the studied animals. Each animal selected for the study was further identified by providing a unique identification number that could be used for both ante mortem and post-mortem examinations of the animal. During the study time the animals were categorized into three groups as young, adult and old based on dentition eruption.

Sample Size Determination and Sampling Method: As a scientific work the study was carried out by determining the sample size according to Thrusfield [19] for an infinite

population with 95% confidence level, 5% desired absolute precision by considering expected prevalence of the rumen and reticulum foreign bodies in cattle in the study area. Therefore, according to Thrusfield [19] the sample size was determined as follows:

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

where:

n = Required Sample Size

P_{exp} = Expected Prevalence

d = desired absolute precision

There was no previous study on the occurrence of rumen and reticulum foreign bodies of cattle slaughtered in Shashemene Municipal Abattoir. The sample size for this work were determined using 50% expected prevalence and 5% absolute precision at 95% confidence level using the above formula, 384 cattle are intended to be sampled.

Cattle slaughtered during each visit day were selected by systematic random sampling using regular interval to study the prevalence of foreign body and identification of types of foreign bodies in rumen and reticulum in cattle slaughtered in Shashemene Municipal Abattoir.

Data Collection

Ante Mortem Examination: Ante mortem examination on individual animals was done for assessment of age, sex, breed, body condition and origin. Age was categorized into three groups young (≤ 5 years), adult (5-10 years) and old (≥ 10 years) based on dentition eruption described by De-Lahunta and Habel [20]. Sex male and female and also the body condition of cattle was recorded as poor, medium and good based on the appearance of the animal and manual palpation of the spinus and transverse processes of the lumbar vertebrae described by Nicholson and Butterworth [21] and breeds was classified as local and cross breed based on the species of animal brought to abattoir and the Origin of animals (Shashemene, Arsi nagelle and Kofolle). During Ante mortem examination each animals was marked for the identification by writing a code on its gluetal muscle.

Post Mortem Examination: In the postmortem examination rumen and reticulum were examined immediately after being slaughtered in the evisceration stage, the stomach was carefully removed from the abdominal cavity and open and explored for the presence of any foreign non-dietary material by visualization and palpation.

All the contents were examined thoroughly for the presence of foreign bodies. Any foreign bodies obtained during inspection was washed, dried, identified and labeled. When the finding is positive, the location and type of the foreign bodies were recorded otherwise recorded as negative in post mortem recorded sheet.

Data Management and Statistical Analysis: The data collected was entered and scored in Microsoft excel worksheet. Before subjected to statistical analysis, the data was thoroughly screened for errors and properly coded. For analysis, SPSS Microsoft software Version 17.0 was used. Descriptive statistical analysis such as table was used to summarize and present the data collected. The prevalence of rumen and reticulum foreign bodies was calculated as percentage by dividing total number of animal positive for foreign bodies to the total number of animals examined. Pearson chi-square (χ^2) test was employed to assess the existence of association between prevalence of the foreign bodies and different potential risk factors considered.

RESULT

Overall Occurrence and Prevalence of Foreign Body: From the total of 384 cattle (9 female and 375 male) examined for the presences of any indigestible foreign bodies in their rumen and reticulum, 12.24% (47/384) of them were found positive. From these foreign bodies, 5 (1.3%) and 42 (10.93%) were Penetrating Foreign Bodies (PFBs) and Non-Penetrating Foreign Bodies (NPFBs) respectively. Metallic foreign bodies are frequently recovered from reticulum and non-metallic foreign body recovered from rumen. The types of foreign bodies were plastics, cloth, leathers, nails, needles and wires. Among this plastic 20 (5.2%) and cloth 12(3.13%) was the most commonly observed positive cases.

Prevalence of Foreign Bodies with Regard to Sex: Of the 47/384 (12.24%) total prevalence of foreign bodies of cattle slaughtered in Shashemene municipal abattoir, 43 (11.5%) and 4 (44.5%) were detected both in male and female animals, respectively. A highly statistically significant difference ($P < 0.05$) was observed among the sex group in the occurrences of foreign bodies (Table 1).

Prevalence of Foreign Bodies with Regard to Age: The study animals were grouped in to three as young (≤ 5 year), adult (5-10 years) and old (≥ 10 years). From 16, 343 and 25 animals examined with the age of young, adult and old, 2 (12.5%), 36 (10.5%) and 9 (36%) were found positive

respectively. Foreign bodies were more frequently encountered in old animals than the other two groups. The statistical analysis also showed that there exist highly significant differences among the three age groups ($p < 0.05$) in the occurrences of foreign bodies (Table 2).

Prevalence of Foreign Bodies with Regard to Breed: Among the total number of 384 animals examined, 317(82.6%) were local breeds and 67(17.4%) were cross breed. From this examined breeds of animals, 13(19.4%) is cross breed and 34(10.72%) is local breed that is positive for the occurrence of foreign bodies. The prevalence of rumen and reticulum foreign bodies were higher in cross breed cattle 13(19.4%) than that of the local breeds 34 (10.72%) but there is no statistically significant difference (Table 3).

Prevalence of Foreign Bodies with Regard to Body Condition Score: The slaughtered animals in Shashemene municipal abattoir were categorized into good, medium and poor body condition. From 339, 40 and 5 animals examined with good, medium and poor body conditions, 24 (7.08%), 19 (47.5%) and 4 (80%) were positive for the occurrence of foreign bodies, respectively of their group. There were highly statistically significant differences ($P < 0.05$) between different body condition score and foreign body distribution in rumen and reticulum (Table 4).

Prevalence of Foreign Bodies with Regard to Origin: Animals slaughtered in Shashemene municipal abattoir were come from three different districts (Shashemene, Arsi nagele and Kofole). The highest frequencies of rumen and reticulum foreign bodies observed in cattle originated from Shashemene 20 (16.13%), while the lowest from Kofole 9 (7.8%). The result revealed that there is no statically significant differences ($p > 0.05$) existence in the prevalence of foreign bodies among the origin of animals (Table 5).

Prevalence of Foreign Bodies with Regard to Lodgment: From 47 positive cases of foreign body, 42(11%) were found in rumen and 5 (1.3%) is found in reticulum. Metallic foreign bodies like wires 2 (40%), nails 2 (40%) and needles 1 (20%) were most frequently recovered from reticulum and non-metallic foreign bodies; Plastics 20 (47.6%), cloth 12 (28.6%) and Leathers 4 (9.5%) were highly prevalent foreign body in the rumen. The Prevalence ($P < 0.05$) of foreign bodies to these sites was highly statistically significant (Table 6).

Table 1: Prevalence of Foreign Body with Regard to Sex

Foreign Body	Sex		Total
	Male	Female	
Negative	332(86.5%)	5(55.6%)	337(87.7%)
Plastic	17(4.5%)	3(33.3%)	20(5.2%)
Cloth	12(3.2%)	-	12(3.2%)
Leather	4(1.1%)	-	4(1.04%)
Needle	1(0.3%)	-	1(0.26%)
Rope	2(0.5%)	-	2(0.52%)
Wire	2(0.5%)	-	2(0.5%)
Nail	1(0.3%)	1(11.1%)	2(0.52%)
Leather and plastic	1(0.3%)	-	1(0.26%)
Cloth and plastic	3(0.8%)	-	3(0.78%)
Positive	43(11.5%)	4(44.4%)	47(12.24%)
Overall	375(97.6%)	9(2.34%)	384(100%)

p-Value = $\chi^2=35.531$

Table 2: Prevalence of Foreign Body with Regard to Age

List of foreign body	Age			Total
	Young	Adult	Old	
Negative for foreign body	14(87.5%)	307(89.5%)	16(64%)	337(87.7%)
Plastic	-	17(5%)	3(12%)	20(5.2%)
Cloth	-	9(2.6%)	3(12%)	12(3.1%)
Leather	1(6.25%)	2(0.58%)	1(4%)	4(1%)
Needle	-	1(0.3%)	-	1(0.3%)
Rope	1(6.25%)	1(0.3%)	-	2(0.5%)
Wire	-	2(0.58%)	-	2(0.5%)
Nail	-	1(0.3%)	1(4%)	2(0.5%)
Leather and plastic	-	1(0.3%)	-	1(0.3%)
Cloth and plastic	-	2(0.58%)	1(4%)	3(0.8%)
Total positive	2(12.5%)	36(10.5%)	9(36%)	47(12.24%)
Total	16(4.16%)	343(89.3%)	25(6.5%)	384(100%)

P-Value = 0.002 $\chi^2=39.743$

Table 3: Prevalence of Foreign Body With Regard to Breed

List of foreign body	Breed		Total
	Local	Cross	
Negative for foreign body	283(73.7%)	54(14.06%)	337(87.7%)
Plastic	14(4.4%)	6(8.9%)	20(5.2%)
Cloth	7(2.2%)	5(7.5%)	12(3.1%)
Leather	4(1.26%)	-	4(1%)
Needle	1(0.32%)	-	1(0.3%)
Rope	1(0.32%)	1(1.5%)	2(0.5%)
Wire	2(0.63%)	-	2(0.5%)
Nail	2(0.63%)	-	2(0.5%)
Leather and plastic	1(0.32%)	-	1(0.3%)
Cloth and plastic	2(0.63%)	1(1.5%)	3(0.8%)
Total positive	34(10.72%)	13(19.4%)	47(12.24%)
Total	317(82.6%)	67(17.4%)	384(100%)

P-Value = 0.233 $\chi^2=11.659$

Table 4: Prevalence of Foreign Body With Regard to Body Condition Score

List of foreign body	Body Condition Score			Total
	Poor	Medium	Good	
Negative for foreign body	1(0.26%)	21(5.5%)	315(82%)	337(87.7%)
Plastic	2(40%)	8(20.0%)	10(3%)	20(5.2%)
Cloth	1(20%)	4(10.0%)	7(2.06%)	12(3.1%)
Leather	1(20%)	1(2.5%)	2(0.6%)	4(1%)
Needle	-	-	1(0.3%)	1(0.3%)
Rope	-	1(2.5%)	1(0.3%)	2(0.5%)
Wire	-	2(5.0%)	-	2(0.5%)
Nail	-	1(2.5%)	1(0.3%)	2(0.5%)
Leather and plastic	-	1(2.5%)	-	1(0.3%)
Cloth and plastic	-	1(2.5%)	2(0.6%)	3(0.8%)
Total positive	4(80%)	19(47.5%)	24(7.08%)	47(12.24%)
Total	5(1.3%)	40(10.4%)	339(88.3)	384(100%)

P-Value = 0.000X2 = 105.989

Table 5: Prevalence of Foreign Body With Regard to Origin

List of foreign body	Origin			Total
	Shashemene	Arsi nagele	Kofole	
Noforeign body	104(83.9%)	127(87.6%)	106(92.2%)	337(87.7%)
Plastic	9(7.3%)	4(2.75%)	7(6.1%)	20(5.2%)
Cloth	5(4.03%)	6(4.2%)	1(0.9%)	12(3.1%)
Leather	2(1.6%)	2(1.4%)	-	4(1%)
Needle	-	1(0.7%)	-	1(0.3%)
Rope	1(0.8%)	1((0.7%)	-	2(0.5%)
Wire	-	2(1.4%)	-	2(0.5%)
Nail	2(1.6%)	-	-	2(0.5%)
Leather and plastic	-	-	1(0.9%)	1(0.3%)
Cloth and plastic	1(0.8%)	2(1.4%)	-	3(0.8%)
Total positive	20(16.13%)	18(12.4%)	9(7.8%)	47(12.24%)
Total	124(32.3%)	145(37.76%)	115(30%)	384(100%)

P-Value = 0.248 $\chi^2 = 0.248$

Table 6: Prevalence of Foreign Body With Regard to Lodgment

List of foreign body	Lodgment		Total
	Rumen	Reticulum	
Negative for foreign body	-	-	337(87.76%)
Plastic	20(47.6%)	-	20(5.2%)
Cloth	12(28.6%)	-	12(3.1%)
Leather	4(9.5%)	-	4(1%)
Needle	-	1(20.0%)	1(0.3%)
Rope	2(4.8%)	-	2(0.5%)
Wire	-	2(40.0%)	2(0.5%)
Nail	-	2(40.0%)	2(0.5%)
Leather and plastic	1(2.4%)	-	1(0.3%)
Cloth and plastic	3(7.1%)	-	3(0.8%)
Total	42(11%)	5(1.3%)	384(100%)

P-Value=0.000 $\chi^2=768.00$

DISCUSSION

The present study revealed an overall prevalence of 12.24% (n= 47) of rumen and reticulum foreign body in cattle slaughtered at Shashemene Municipal Abattoir.

Thus, this level of prevalence of foreign bodies could bring about paramount economic importance and causes loss of production and even it might cause mortality in animals. Ingestion of indigestible foreign materials by ruminants is a common worldwide problem that is reported

from Sudan [7] and Nigeria [11]. Hailat [13] from Jordan reported that 25 million of USD estimated loss in productivity and health associated with plastic impaction.

The present study is almost agreed with the report of Desiye and Mersha [2] who reported 13.22% prevalence of for stomach foreign bodies in Jimma municipal abattoir. The present report is higher than the report of Sileshiet *al.* [22] in Gonder 8.6% and lower than the report of Rahel [23] in Hawassa 17.07%. Significantly higher prevalence (77.41%) was reported by Ismael *et al.* [24] of adult dairy cattle cases having indigestible foreign bodies suffering from recurrent rumen tympany in Jordan. The difference in the prevalence rate may be due to differences in the origin of animals presented for slaughter and type of waste management system between the countries.

Highest prevalence (19.2%) of foreign bodies was detected in female animal's compared to that of male animals. This finding is in line of agreement with the report done by Roman and Hiwot [25] they have also reported that higher degree of occurrence of foreign bodies was detected in female animals than that of male animals. This may be associated with increased appetite of female animals due to the nutritional demands during pregnancy and lactation or it may be due to female animals are more exposed to the environmental pollution as they kept for production purpose for longer period of time than male animals.

Highest prevalence (36%) of foreign bodies was detected in older cattle compared to that of young and adult cattle. This finding is in agreement with the work of Ravindra *et al.* [26], who reported the highest prevalence (93%) of foreign bodies in older cattle. Rahel [23] also reported (17.85%) of the animals had higher frequency of foreign bodies in rumen and reticulum in old age animals. Radostitis *et al.* [16] reported that old dairy cattle are the most commonly affected group. The highest prevalence in old cattle might be associated with increase of exposure through life and gradual accumulation of foreign bodies in the rumen and reticulum. In Ethiopia, feed shortage is prevailing particularly during the long dry season and most owners of ruminants do not supply supplementary feed to their livestock's due this the animal was forced to feed all sorts of foreign body around the environment.

Even though, it is not statistically significant the result of this study indicated that prevalence was higher in the cross-breed cattle (19%) than that of local breeds cattle (10.72%). These finding is in line of agreement with the work of Desiye and Mersha [2] and Rahel [23] who reported fore stomach foreign bodies with the prevalence of (58.82%) and (70%) respectively in cross breed's cattle.

Sileshi [22] also reported that cross breed animals are more exposed for indigestible foreign bodies than the local breeds cattle. This may be due to the introduction of the Holstein Friesian cross breed cows though they are producing more milk requires high demand of nutrition and their massive size they need large quantity of feed as compared to that of local breed. Also the farmers are not in a position to feed them adequately as they need so that these animals was faced nutritional deficiency and developed abnormal behaviors which obviously lead to the consumption of all sorts of foreign bodies, they come across in the grazing and surrounding areas.

The highest frequency of occurrence of rumen and reticulum foreign bodies were detected in animals of poor body condition (80%) followed by medium (47%) and good (7.08%) body condition score animals. This finding agrees with the work of Desiye and Mersha [2] who recovered foreign body at higher prevalence from the rumen and reticulum of poor body condition animal. In Similar study, the highest prevalence of foreign body in animal with poor body condition was reported by Khurshaid *et al.* [27]. Roman and Hiwot [25] also reported that the Prevalence of foreign body is higher in small ruminants with thin and emaciated body condition score than that of average, fat and obese. Poor body condition is may be due to the contribution of the foreign body that leads to hinder the process of fermentation, mixing of content and cause anorexia that leads to poor body condition and the animal loss its weight after it has been exposed or it might be due to the interference of foreign body with the absorption of volatile fatty acid (VFA).

Even though it is not statistically significant, the result of this study indicate that the highest prevalence of foreign body was observed in animals originated from Shashemene (16.13%) and the lowest in those originated from Kofolle (7.8%). Rahel [23] also reported higher prevalence rate 30.5% in Hawassa urban area. The difference in prevalence rate is may be due to differences in the origin of animals presented for slaughter and type of waste management system between the urban and rural areas and in urban area metallic foreign materials from old fences and from construction of buildings are left unwisely. Ingestion of foreign bodies is associated with shortage of forage and increased pollution of grazing land with indigestible foreign bodies.

This study shown that; of the total of 47 (12.24%) positive causes of foreign bodies, 42 (10.93%) occurred in the rumen and 5(1.3%) occurred in reticulum. The finding is in line of agreement with the work of Tesfaye *et al.* [12] who reported that the highest number of foreign bodies

occurring in the rumen (79.2%) than reticulum (20.8%). Roman and Hiwot [25] who also reported that, Plastics, Clothes, Leathers, Rope, Nails, Wires and Needles were the most commonly recovered foreign bodies from rumen and reticulum of ruminants. Most of the non-metallic foreign bodies lodged in rumen while metallic foreign bodies lodged in reticulum. The higher prevalence of foreign body in rumen may be due to the fact that many ingested feeds pass to the rumen due to its larger size. Ingestion and lodgment of foreign bodies are common in the bovine primarily due to indiscriminate feeding habits.

The occurrences of this foreign bodies in the study area might be associated with rapid industrialization, increase in the garbage disposal mostly in plastic bags, increased urbanization, keeping animals in the area of new construction site, lack of awareness among livestock owners on the risk of ingestion of these foreign materials. Shortage of feed during the long dry season increases the ingestion of foreign bodies which is also associated with a shortage of feed specifically of minerals and vitamins origin. The finding of this study could help environmental activists, veterinarians and livestock owners to recognize the impact of foreign bodies on cattle's health and productivity in this area.

CONCLUSION AND RECOMENDATIONS

The present study revealed an overall prevalence of 12.24% (N=47) of rumen and reticulum foreign body in the study areas, though rumen and reticulum foreign bodies have great economic significance associated with reduced production and productivity of animal. It is common in developing countries where the standard of animal management is unsatisfactory. Old, cross breed and animal with poor body condition score are the most affected group compared to that of young cattle, local breed and good body condition score animal. Hence, age, breed and body condition considered the potential risk factors for occurrence of rumen and reticulum foreign body and degree of association found highly statistically significant ($p < 0.05$). Rumen harbored mostly non-metallic foreign bodies while reticulum was the major site for the retention of metallic objects. Plastic was recovered as the most common foreign bodies in the study area followed by cloth, leathers, rope, wire, needle and nail. The most common problem encountered in cattle due to the ingestion of the metallic and non-metallic foreign bodies are traumatic reticulo-peritonitis/pericarditis (hardware disease). Therefore, based on the above conclusion the following recommendations are forwarded:

- In order to save the life of animals, residents should not pack and throw the food items, plastics, cloth, rope and leather or other materials in plastic bags.
- The cattle owners may be advised not to allow their cattle to freely wander in streets especially in the cities and populated towns and keeping their cattle in intensified manner so that the owners could easily control their accessibility to foreign bodies.
- Keeping cattle away from the site of new construction and from old and unclear grazing sites and periodical cleaning of the wastes in the grazing area.
- Providing adequate nutrient to meet mineral and vitamin requirements of the animals.

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Annex 1: Body Condition Scores

Score	Condition	Feature
1	P ⁻	Marked emaciation (animal condemned at ante mortem examination)
2	P	Transverse process project prominently, neural appear sharply
3	P ⁺	Individual dorsal spines are pointed to the touch, hip pins, tail, head ribs are prominent. Transverse process visible , usually common
4	M ⁻	Ribs, hip and spins clearly visible muscle mass between hook spines slightly concave and slightly more fleshy
5	M	Ribs usually visible little fat cover dorsal spines barely visible
6	M ⁺	All smooth and well covered dorsal spines cannot be seen , but are easily felt
7	G ⁻	All smooth and well covered, but fat deposition are not marked, dorsal spins can be felt with firm pressure but rounded rather than sharp
8	G	Fat cover in critical area can be seen and felt transverse process cannot be seen
9	G ⁺	Heavy deposited of fat clearly visible on tail, head, brisket and dorsal spines, ribs, hook and fully covered and cannot be felt even with firm pressure

Source: Nicholson and Butterworth (1986).

Note: body condition scores;

- ▶ 1, 2 and 3 are poor body condition
- ▶ 4, 5 and 6 are medium body condition
- ▶ 7, 8 and 9 are good body condition