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# Study on Rumen and Reticulum Foreign Bodies in Cattle Slaughtered at Elfora Export Abattoir, Bishoftu Town, Ethiopia

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**Abstract:** This cross-sectional study was conducted from November, 2017 to March, 2018 at Elfora Export Abattoir, Bishoftu town, Ethiopia, with the objectives to assess the prevalence of rumen and reticulum foreign bodies, identify the types of foreign bodies and the associated risk factors for the occurrence of foreign bodies. A total of 500 male and local breed cattle were examined, from which 17.2% (86/500) were found positive for foreign bodies during postmortem examination of the study. Among the types of foreign bodies detected, plastics and ropes were the most common types of foreign bodies observed in 21 (4.2%) and 18 (3.6%) of the positive cases, respectively. Among the metallic substances recovered from the reticulum, needles and nails were the main foreign materials by having individual occurrence in 7 (1.4%) and 5 (1.0%) of the positive cases, respectively. The study indicated that most of the foreign bodies occurred in the rumen (12.8%). When the prevalence was compared among different age groups and among different body condition scores, higher prevalence of foreign body was observed in cattle older than 10 years and in animals having poor body condition score as 28 (45.16%) and 31 (70.45%), respectively. Based on origins of the study animals, the highest prevalence of foreign body was observed in animals' originated from Metema (23.88%) and the lowest was in those originated from Gonder (10.95%). Except origin of the animals, the other associated risk factors are significantly associated ($P<0.05$) with the occurrence of the foreign bodies. To conclude, the present study revealed that inappropriate solid wastes disposed in the study areas or origins of the animals not only pollute the environment but also have adverse effects on the health of the ruminants. Therefore; appropriate solid waste disposal system need to be implemented in the study areas to prevent the health risks of the ruminants and also to protect the environment.

**Key words:** Abattoir · Cattle · Foreign Body · Bishoftu · Reticulum and Rumen

## INTRODUCTION

Cattle play significant contribution in Ethiopian economy as source of meat, milk, drought prowler, income and foreign exchange. However, as other livestock in the country their contribution is below their expected potential due to prevalent livestock diseases, poor management system and poor genetic performance [1]. Gastrointestinal foreign bodies are among the most common surgical emergency in veterinary medicine. 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; lack of oral discrimination in cattle may lead to ingestion of foreign bodies would be rejected by other species [2]. Ingestion of foreign body in cattle is a condition of great economic importance and causes severe loss of production and high mortality rate. The ingestion of foreign body is mainly related with nutritional deficiencies and feeding management and cause various problem in different organ of the animal, mainly in rumen and reticulum. The problems that are caused vary with the duration that the foreign body has been present, the location of the foreign body, the degree of obstruction that is caused as well as problems associated with the material of the foreign body. Ruminant are notorious for ingestion of foreign bodies. The disease of rumen and reticulum are great economic importance because of severe losses on productivity of the animals sometimes leading to the death of the animals [3].

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Entrance and migration of foreign bodies through the body tissues lead to many complications that differ according to the nature of the foreign body and the way of its entrance in to the tissues. Traumatic reticulo-peritonitis (TRP) is relatively a common disease in cattle 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 in to the cranio-ventral part of the reticulum [4]. The perforation of the wall of the reticulum allows leakage of ingesta and bacteria which contaminates the peritoneal cavity, resulting in local or diffuse peritonitis is the swallowed objects can also penetrate pleural cavity causing pleuritis and pneumonitis and into the pericardial sac causing pericarditis [5].

The majority of affected cattle (87%) are dairy cattle and 93% are older than 2 years of age. It has been hypothesized that dairy cattle are more commonly affected than beef cattle since they are more likely to be fed a chopped feed, such as silage or hay [6]. Non-metallic foreign bodies in the reticulo-rumen cause recurrent rumen tympany in adult dairy cattle, over a period of time, these materials, form large tight balls inside the rumen leading to anorexia decreased production and progressive loss of body condition [7].

The problem is serious usually in the urban and peri-urban areas where there are extensive buildings constructions are carried out and where there are improper plastic materials disposal. These materials are thrown on the roads and near the fences or anywhere and this is the way or the main cause of dying mainly due to the foreign bodies [8]. The fact that rumen impaction by those foreign bodies is mainly asymptomatic in nature and only diagnosed in live animals if the material is accumulated in large amount and thus, it can be adequately studied during postmortem examinations in the abattoirs [2].

In Ethiopian, information regarding the magnitude and occurrence of foreign bodies in the rumen and reticulum of cattle is very limited. Therefore, the objectives of this study were:

- To assess the prevalence of rumen and reticulum foreign bodies in cattle slaughtered at Elfora Export Abattoir, Bishoftu, Ethiopia.
- To identify the types of foreign bodies and the risk factors that are associated with the occurrence of the foreign bodies in the study animals.

## MATERIALS AND METHOD

**Study Area:** The study was conducted in Bishoftu, East Shoa Zone of Oromia Regional State, Ethiopia, from November, 2017 to March, 2018 at Elfora Export Abattoir. Bishoftu is a town which is located at 9°N and 40°E with an altitude of 1880 meters above sea level in the central highlands of Ethiopia 47 km South East of Addis Ababa. It has annual rainfall of 1151.6 mm of which 84% falls down during the long rainy season that extends from June to September and the remaining during the short rainy season that extends from March to May. The mean annual minimum and maximum temperatures is 8.5°C and 30.7°C, respectively and the mean humidity is 61.3% [9]. In this study, animals for slaughter were originated from nine different areas or origins of the country, namely Bersheleko, Borena, Gonder, Metema, Raya, Sendafa Bake, Wollega, Wollo and Sululta, which have different agro-ecological features.

**Study Population:** The study was conducted on 500 local breed male cattle that were slaughtered at Elfora Export Abattoir. The age of the study animals ranged from young (< 5 years) to old (> 10 years) and all of them were appeared apparently healthy during the pre-slaughter inspection and they had good, medium and poor body condition scores.

**Study Design:** A cross sectional study was conducted from November, 2017 to March, 2018 at Elfora Export Abattoir in Bishoftu to assess the prevalence of rumen and reticulum foreign bodies and to identify the type of foreign bodies and their associated risk factors for occurrence in the rumen and reticulum of cattle presented for slaughter.

**Sample Size and Sampling Method:** A total of 500 heads of cattle were included in this study using systematic random sampling method with regular intervals.

**Data Collection:** Antemortem examination was done for the assessment of age, breed and body condition of each animal. Age was categorized into young (<5 years), adult (5-10 years) and old (>10 years) based on the dentition pattern and recorded according to Johnson [10]. Body condition score was categorized into poor, medium and good and recorded based on Heinonen [11]. Before slaughter, all cattle at the lairage were physically examined

for any abnormalities. Each animal selected for the study was further indentified by providing a unique identification number for both ante-mortem and postmortem examinations of the animal.

In the postmortem examination rumen and reticulum were examined immediately after slaughter in the evisceration stage, the stomach of each animal was carefully removed from the abdominal cavity and rumen and reticulum were thoroughly examined by visual inspection and palpation for the presence of any foreign and non-dietary material. All the contents were examined thoroughly for the presence of foreign bodies. Any foreign body which was obtained by the inspection and palpation was washed with water to remove any adhering feed material and its type was identified and recorded along with its location. Generally, when the finding was positive, the location and type of the foreign body were recorded accordingly, otherwise recorded as negative in the postmortem record sheet.

**Data Management and Statistical Analysis:** The data collected were entered and scored in the Microsoft Excel 2007 worksheet. Before the statistical analysis, the data were thoroughly screened for errors and properly coded. For analysis, SPSS Version 20.0 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 were calculated as percentage by dividing the total number of cattle positive for foreign bodies to the total number of cattle examined. Pearson's chi square ($X^2$) test was employed to assess the existence of association between the prevalence of the foreign bodies and the different potential risk factors considered. For the $X^2$ test, P-value < 0.05 was considered as significant where as P-value > 0.05 as non-significant.

## RESULTS

**Overall Occurrence of Foreign Bodies:** From the total of 500 male apparently healthy local breed cattle that were slaughtered and examined at the Bishoftu Elfora Export Abattoir for the presences of any foreign body in their rumen and reticulum, 17.2% (86/500) of them were found positive. The types of foreign bodies were plastics, ropes, needles, leathers, nails, wires and clothes. From the non-metallic substances, plastics and ropes were the most common type of foreign bodies observed individually in the 21 (4.2%) and 18 (3.6%) of the positive cases, respectively. Among the metallic substances recovered from the reticulum, needles and nails were the main foreign materials by having individual occurrence in the 7 (1.4%) and 5 (1.0%) of the positive cases, respectively (Table 1).

Table 1: The frequency and distribution of the different types foreign bodies observed in the rumen and reticulum of the slaughtered cattle.

| Type of Foreign Material | Frequency | Percent |
|---|---|---|
| No foreign body | 414 | 82.8 |
| Plastic | 21 | 4.2 |
| Rope | 18 | 3.6 |
| Rope and plastic | 7 | 1.4 |
| Needle | 7 | 1.4 |
| Plastic and rope | 6 | 1.2 |
| Leather | 6 | 1.2 |
| Nail | 5 | 1.0 |
| Wire and plastic | 4 | 0.8 |
| Wire | 4 | 0.8 |
| Cloth | 3 | 0.6 |
| Rope and cloth | 2 | 0.4 |
| Cloth, rope and plastic | 1 | 0.2 |
| Cloth and wire | 1 | 0.2 |
| Nail and wire | 1 | 0.2 |
| Total | 500 | 100.0 |

**Occurrence of Foreign Bodies with Regard to Age:** The study animals were grouped into three age groups as young (< 5 years), adult (5-10 years) and old (> 10 years). From 221, 217 and 62 animals examined, 22 (9.95%), 35 (16.12%) and 28 (45.16%) of them were found positive, respectively. Foreign bodies were more frequently encountered in old animals more than the animals in the other two groups. The statistical analysis also showed that there was a highly significant differences among the three age groups (P<0.05) in the occurrences of foreign bodies (Table 2).

**Occurrence of Foreign Bodies with Regard to Body Condition Score:** The animals brought to the abattoir to be slaughtered were comprised of 252 good, 204 medium and 44 poor in body condition score. From those animals examined with good, medium and poor body conditions, 10 (3.97%), 45 (22.05%) and 31 (70.45%) were positive for foreign bodies, respectively. There was statistically significant difference (P<0.05) between different body condition scores and foreign body distribution in the rumen and reticulum of the study animals (Table 3).

**Occurrence of Foreign Bodies with Regard to Lodgment Site:** From the 86 positive cases of foreign body in the examined animals, 64 (74.41%) of them were positive by

Table 2: The distribution of the rumen and reticulum foreign bodies in the different age groups of cattle slaughtered at the Bishoftu Elfora Export Abattoir.

| | Age | | | |
|---|---|---|---|---|
| Type of Foreign Body | Young | Adult | Old | Total |
| Negative for foreign bodies | 198 (89.59%) | 182 (83.87%) | 34 (54.83%) | 414 |
| Rope and plastic | 2 (0.90%) | 5 (2.30%) | - | 7 |
| Leather | - | 4 (1.84%) | 2 (3.22%) | 6 |
| Plastic | 7 (3.16%) | 7 (3.22%) | 7 (11.29%) | 21 |
| Cloth | 1 (0.45%) | - | 2 (3.22%) | 3 |
| Needle | 1 (0.45%) | 2 (0.92%) | 4 (6.45%) | 7 |
| Rope | 8 (3.61%) | 7 (3.22%) | 3 (4.84%) | 18 |
| Plastic and rope | 3 (1.35%) | 1 (0.46%) | 2 (3.22%) | 6 |
| Nail | - | 2 (0.92%) | 3 (4.84%) | 5 |
| Wire and plastic | - | 2 (0.92%) | 2 (3.22%) | 4 |
| Wire | 1 (0.45%) | 1 (0.46%) | 2 (3.22%) | 4 |
| Rope and cloth | - | 2 (0.92%) | - | 2 |
| Cloth, rope and plastic | - | 1 (0.46%) | - | 1 |
| Cloth and wire | - | - | 1 (1.61%) | 1 |
| Nail and wire | - | 1 (0.46%) | - | 1 |
| Total | 221 | 217 | 62 | 500 |

Chi-square $(X^2)$ = 83.929 and P-value = 0.000

Table 3: Association of body condition score and rumen and reticulum foreign bodies in cattle slaughtered at the Bishoftu Elfora Export Abattoir

| | Body Condition Score | | | |
|---|---|---|---|---|
| Type of Foreign Body | Good | Medium | Poor | Total |
| No foreign body | 242 (96.03%) | 159 (77.94%) | 13 (29.55%) | 414 |
| Rope and plastic | 2 (0.79%) | 4 (1.96%) | 1 (2.27%) | 7 |
| Leather | 1 (0.39%) | 3 (1.47%) | 2 (4.55%) | 6 |
| Plastic | 2 (0.79%) | 12 (5.88%) | 7 (15.90%) | 21 |
| Cloth | 1 (0.39%) | 2 (0.98%) | - | 3 |
| Needle | 1 (0.39%) | 1 (0.49%) | 5 (11.36%) | 7 |
| Rope | 2 (0.79%) | 13 (6.37%) | 3 (6.81%) | 18 |
| Plastic and rope | 1 (0.39%) | 4 (1.96%) | 1 (2.27%) | 6 |
| Nail | - | 2 (0.98%) | 3 (6.81%) | 5 |
| Wire and plastic | - | 1 (0.49%) | 3 (6.81%) | 4 |
| Wire | - | 2 (0.98%) | 2 (4.55%) | 4 |
| Rope and cloth | - | 1 (0.49%) | 1 (2.27%) | 2 |
| Cloth, rope and plastic | - | - | 1 (2.27%) | 1 |
| Cloth and wire | - | - | 1 (2.27%) | 1 |
| Nail and wire | - | - | 1 (2.27%) | 1 |
| Total | 252 | 204 | 44 | 500 |

Chi-square $(X^2)$ = 185.075 and P-value = 0.000

harboring foreign bodies in their rumen, while 14 (16.27%) in their reticulum and 8 (9.30%) of them were positive in their sites, rumen and reticulum. Statistically, it was revealed that the prevalence of those foreign bodies identified to these sites had significant differences (P<0.05) (Table 4).

**Prevalence of Foreign Bodies with Regard to Animal Origin:** Animals slaughtered in the abattoir were originated from nine different areas of the country (Beresheleko, Borena, Gonder, Metema, Raya, Sendafa Bake, Sululta, Wollega and Wollo). The highest and the lowest frequent foreign bodies observed in the rumen and reticulum of cattle were brought to the abattoir from Metema and Gonder, respectively. The result revealed that statistically there was no significant difference (P>0.05) in the prevalence or occurrence of the foreign bodies in the study animals that were brought from the different areas or origins of the country (Table 5).

Table 4: The occurrence or distribution of the foreign bodies in the rumen and reticulum of cattle slaughtered at the Bishoftu Elfora Export Abattoir.

| | Location (Site of Material Lodgment) | | | | |
|---|---|---|---|---|---|
| Type of Foreign Body | No | Rumen | Reticulum | Rumen and Reticulum | Total |
| No foreign body | 414 | 0 (0%) | 0 (0%) | 0 (0%) | 414 |
| Rope and plastic | - | 5 (7.81%) | - | 2 (25%) | 7 |
| Leather | - | 6 (9.38%) | - | - | 6 |
| Plastic | - | 21 (32.81%) | - | - | 21 |
| Cloth | - | 3 (4.68%) | - | - | 3 |
| Needle | - | - | 7 (50%) | - | 7 |
| Rope | - | 18 (28.12%) | - | - | 18 |
| Plastic and rope | - | 5 (7.81%) | - | 1 (12.5%) | 6 |
| Nail | - | - | 5 (35.71%) | - | 5 |
| Wire and plastic | - | 1 (1.56%) | - | 3 (37.5%) | 4 |
| Wire | - | 2 (3.13%) | 2 (14.28%) | - | 4 |
| Rope and cloth | - | 2 (3.13%) | - | - | 2 |
| Cloth, rope and plastic | - | 1 (1.56%) | - | - | 1 |
| Cloth and wire | - | - | - | 1 (12.5%) | 1 |
| Nail and wire | - | - | - | 1 (12.5%) | 1 |
| Total | 414 | 64 | 14 | 8 | 500 |

Chi-square $(X^2)$ = 1235.495 and P-value = 0.000

Table 5: Distribution of the rumen and reticulum foreign bodies in cattle that were brought to the abattoir from different origins or areas of the country.

| | Origin of animals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type of Foreign Body | Bersheleko | Borena | Gonder | Metema | Raya | Sendafa Bake | Sululta | Wollega | Wollo | Total |
| No foreign body | 43 (87.75%) | 53 (80.30%) | 65 (89.04%) | 51 (76.11%) | 45 (77.58%) | 57 (85.07%) | 42 (82.35%) | 24 (82.75%) | 34 (85%) | 414 |
| Rope and plastic | 2 (4.08%) | 1 (1.51%) | 1 (1.36%) | 1 (1.49%) | 1 (1.72%) | - | - | - | 1 (2.5%) | 7 |
| Leather | 1 (2.04%) | 1 (1.51%) | 2 (2.74%) | 1 (1.49%) | 1 (1.72%) | - | - | - | - | 6 |
| Plastic | - | 4 (6.06%) | 2 (2.74%) | 4 (5.97%) | 3 (5.17%) | 2 (2.98%) | 2 (3.92%) | 3 (10.34%) | 1 (2.5%) | 21 |
| Cloth | - | 1 (1.51%) | - | - | 1 (1.72%) | - | - | - | 1 (2.5%) | 3 |
| Needle | - | - | 1 (1.36%) | 3 (4.47%) | 1 (1.72%) | 1 (1.49%) | 1 (1.72%) | - | - | 7 |
| Rope | 3 (6.12%) | 2 (3.03%) | 1 (1.36%) | 4 (5.97%) | 1 (1.72%) | 1 (1.49%) | 3 (5.17%) | 1 (3.44%) | 2 (5.0%) | 18 |
| Plastic and rope | - | 3 (4.54%) | 1 (1.36%) | - | - | 2 (2.98%) | - | - | - | 6 |
| Nail | - | 1 (1.51%) | - | 1 (1.49%) | 1 (1.72%) | 1 (1.49%) | 1 (1.72%) | - | - | 5 |
| Wire and plastic | - | - | - | 1 (1.49%) | 1 (1.72%) | 2 (2.98%) | - | - | - | 4 |
| Wire | - | - | - | 1 (1.49%) | 1 (1.72%) | - | 1 (1.72%) | - | 1 (2.5%) | 4 |
| Rope and cloth | - | - | - | - | 1 (1.72%) | - | - | 1 (3.44%) | - | 2 |
| Cloth, rope and plastic | - | - | - | - | 1 (1.72%) | - | - | - | - | 1 |
| Cloth and wire | - | - | - | - | - | 1 (1.49%) | - | - | - | 1 |
| Nail and wire | - | - | - | - | - | - | 1 (1.72%) | - | - | 1 |
| Total | 49 | 66 | 73 | 67 | 58 | 67 | 51 | 29 | 40 | 500 |

Chi-square $(X^2)$ = 97.804 and P-value = 0.828

## DISCUSSION

The present study revealed an overall prevalence of 17.2% (86/500) of rumen and reticulum foreign body in cattle slaughtered at the Bishoftu Elfora Export Abattoir, Ethiopia. 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. Most of the studies on foreign bodies were case reports and their prevalence of foreign bodies is mainly referring sick cattle presented to the clinics with clinical signs that leads to suspicion for foreign bodies [2]. The present prevalence rate of foreign bodies is higher than the report of Rahel [12] and Desiye and Mersha [2] with 17.07% prevalence of fore-stomach foreign bodies in the Hawassa Municipal Abattoir and with 13.22% prevalence in Cattle slaughtered at the Jimma Municipal Abattoir, Ethiopia, respectively. In the contrary, significantly higher prevalence (77.41%) was reported by Ismael *et al.* [13] of adult dairy cattle cases having indigestible foreign bodies and suffering from recurrent rumen tympany in Jordan.

The types of foreign bodies detected in this study were plastics, ropes, needles, leathers, nails, wires and clothes. Hailat *et al.* [6] and Khurshaid *et al*. [14] also found plastic bags, pins, nails, hair balls, ropes and leather occurring as indigestible foreign bodies. The result of the current study indicated that plastics were the most common foreign materials found in 4.2% of the cases in the rumen. This is in accordance with the reports of Hailat

*et al*. [6], Khurshaid *et al*. [14], Roman and Hiwot [15], Igbokwe *et al*. [16] and Remi- Adewunmi *et al.* [17]. This could be due to improper disposal of plastics and other ingestible foreign materials in the urban and peri-urban areas of the study areas.

In this study, the highest prevalence (45.16%) of foreign bodies was detected in cattle greater than10 years old. This finding is almost in agreement with the work of Khurshaid *et al*. [14] who recorded a prevalence of 68.47% indigestible rumen and reticulum foreign bodies in Achai cattle with the age of 7-11 years old. It is also in agreement with the work of Abebe and Nuru [18] who recovered plastics, leather, clothes and ropes at highest prevalence from the rumen and reticulum of old sheep and goats. Rahel [12] also reported 17.85% of the animals had higher frequency of foreign bodies in rumen and reticulum in their old age and Radostitis *et al*. [19] indicated that old dairy cattle are the most commonly affected group. Ismael *et al*. [13] from Jordan also reported the metallic foreign bodies were found in 10 (32.25%) of the cows from medical records of 31 old dairy cows suffering from the recurrent rumen tympany. This might be associated with increase of exposure through life and many were found accumulate and lead the undead animals to be positive [2]. This study revealed that except origin of the animals, the other associated risk factors are significantly associated ($P<0.05$) with the occurrence of the foreign bodies.

Based on the body condition scores of the study animals, the highest frequency of occurrence of rumen and reticulum foreign bodies was detected in animals with poor body condition score with the prevalence of 70.45%, followed by medium body condition score as 22.05% and lastly in good body condition score as 3.97%. This finding is in agreement with the work of Rahel [12] who reported a higher prevalence of foreign body was detected in the fore-stomach of cattle having poor body condition. Poor body condition by itself might be due to the contribution of the foreign body that is the animal loss 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) and thus causes reduced weight gain [12,13,17]. Hairball sometimes occur in ruminant in fore-stomach and abomasums and over long period of time, these materials form large tight balls inside the rumen leading to anorexia, decreased production and loss of body condition as such foreign bodies hinders the process of fermentation and mixing of contents leadings to poor body condition [20, 21].

This study indicated that most foreign bodies occurred in the rumen (12.8%) than reticulum (2.8%) and in both, rumen and reticulum (1.6%) of the cattle. This may be due to the fact that many ingested feed goes to the rumen [14]. In the current study, metallic foreign bodies were most frequently recovered from reticulum of the study animals. Radostits *et al.* [3] reported that in industrialized countries, metallic foreign bodies present in the reticulum up to 90% of normal animals. The reason might be due to retention of these foreign bodies by the honey comb structure of the reticular mucosa and their heavy weight give chance to be attracted to the lumen of the reticulum due to gravitational attraction force of these heavy foreign bodies to the ventral part of the fore-stomach [2].

In this study, the highest prevalence of foreign body was observed in animals that were originated from Metema (23.88%) and the lowest was in those originated from Gonder (10.95%). Igbokwe *et al*. [16] from Nigeria reported a much higher prevalence rate (97%) of rumen foreign bodies in sheep and goats brought from urban areas for slaughter. Rahel [12] also recorded a higher prevalence rate of 30.5% in Hawassa which is again from urban areas. The differences in the prevalence rate might be due to the differences in the origins of the animals presented for slaughter and the types of waste management systems between the sites (Urban and rural). In urban areas, pieces of metallic materials from old fences, from construction of buildings and also materials used for packaging of commodities are usually left or disposed unwisely. Thus animals in such areas have more chance of acquiring foreign bodies than the rural ones. Ingestion and lodgment of foreign bodies are common in the bovine primarily due to their indiscriminate feeding habits [22].

## CONCLUSION AND RECOMMENDATIONS

The present study revealed the highest prevalence rate of rumen and reticulum foreign bodies in cattle of Ethiopia. Rumen and reticulum foreign bodies have great economic significance and associated with reduced production and productivity of animals suffering from them. Ingestion of metallic and non-metallic foreign bodies by cattle is important not only because of its mortality impact but also it contributes a lot for the animals' output. Both old and poor body conditioned cattle are the most affected groups when they are

compared to that of the young and adult and to that of the animals with good and medium body condition scores, respectively. Hence, age and body condition score of the animals are the considered risk factors for the occurrence of foreign bodies. Most of the non-metallic foreign bodies were lodged in the rumen while the metallic foreign bodies were in the reticulum. Finally, the present study revealed that inappropriate solid wastes disposed in the study areas or origins of the animals not only pollute the environment but also have adverse effects on the health of the ruminants. Thus, based on the above conclusion the following are recommended:

- Awareness creation programs for the general public (Including for animal owners) should be implemented on the occurrence and impact of the problem to avoid the risk of foreign body ingestion by the animals.
- Residents should not pack and throw the food items or other materials in plastic bags or people should practice appropriate solid waste management systems.
- The cattle owners should not allow their cattle to freely wander in the construction sites, garbage areas and streets especially in the cities and populated towns.
- Since previous studies about the problem in the study areas are very limited, further advanced research should be made to emphasize the importance of the problem and to set its appropriate prevention and control mechanisms to reduce its negative impacts.

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