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Ruminal and reticular foreign bodies in cattle slaughtered at bodit municipal abattoir

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Abstract

A cross-sectional study was conducted from November, 2017 to April, 2018 at Bodit Municipal Abattoir, in Wolaita zone, Southern Ethiopia. With the objectives of to assess the prevalence and type of ruminal and reticular foreign bodies in cattle slaughtered at Bodit Municipal Abattoir and to correlate the frequency of foreign bodies with animal factors such as age, breed, body condition and origin of animals. Both ante mortem and postmortem examinations were employed to examine the live animal and for the recovery of foreign body from rumen and reticulum after slaughter respectively. The study animals were selected by using systematic random sampling method from the total slaughtered animals. The species of animals slaughtered in this abattoir is bovine and only male animals are slaughtered in the abattoir. From the total of 514 male animals are examined and from them (107/514) 20.8% were positive for the occurrence of indigestible rumen and reticulum foreign bodies. The rumen harbored mostly nonmetallic materials while reticulum was the major site for the retention of metallic objects. The prevalence of foreign bodies detected from the slaughtered animals with their age group are young 3(5.2%), adult 34(17.1%) and old 70(27.2%) from the total examined animals are 58, 199 and 257 respectively. The prevalence of rumen and reticulum foreign bodies are higher in cross breeds (39.6%) than local breeds (16.5%). The overall prevalence of foreign bodies in these study animals with low body condition (40.1%) was significantly higher ($\chi^2=72.129$, $p<0.05$) than in those with medium (14.1%) and fat body condition (3.1%). The higher prevalence of foreign bodies were observed in animals originated from Sodo (26.1%) while the lowest from Gesuba (15.7%). The types of foreign bodies encountered in rumen and reticulum were plastics, metals, fabric, leather and others such as hair ball, stone and bone. Out of 107 positive cases of rumen and reticulum foreign bodies (75.7%) were occurred in rumen while (22.4%) in reticulum and the rest present in both. Plastic was the most commonly encountered (30.8%) foreign body. Due to lack of a plastic waste disposal system in the area as well as free grazing of livestock in highly waste-polluted areas seemed to be major factors in the high occurrence of foreign bodies in ruminants. Therefore, appropriate solid waste disposal system need to implement in the study area to prevent health risk of ruminants and also to protect the environment.

Keywords: *Abattoir*, cattle, foreign bodies, reticulum, rumen

Introduction

Livestock are a source of high-quality protein (meat, milk and eggs) and also contribute to the economic welfare of people by providing hides, skins, fertilizer and power of traction for agricultural purposes, increasing the productivity of small holdings [1]. They are also a 'living savings bank', serving as a financial reserve for periods of economic distress and crop failure and as a primary source of cash income [2]. In many developing countries, Like Ethiopia, domestic animals play a crucial role in they constitute as source for traction power, income, in provision of meat, milk, honey, eggs, cheese and butter supply provide mainly the needed animal protein that contributes to the improvement of the nutritional status of the peoples [3]. Ethiopia is known for its high livestock population, being the first in Africa and tenth in the world [4].

Ethiopia has an enormous and diverse livestock population that plays an important role in the economy and livelihoods of farmers and pastoralists with a total contribution of 15% of Gross Domestic Product (GDP) and 33% of the agricultural output. Current estimates of livestock population show that the total cattle population for the country is estimated to be about 57.83 million, 28.89 million sheep, 29.70 million goats, 2.08 million horses, 7.88 million donkeys, 1.23 million camels in Ethiopia [5].

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Ethiopia is one of the countries with the largest number of livestock in Africa and livestock production plays a major role in the development of Ethiopia's agriculture. And it has great potential for increased livestock production, both for local use and for export. However, expansion was constrained by inadequate nutrition, improper management, nutritional deficiencies, disease, lack of support services and inadequate information on how to improve animal breeding, marketing and processing ^[6].

The ingestion of indigestible foreign bodies in cattle is a pathological condition of economic importance which leads to severe economic losses as a result of high morbidity and mortality rates ^[7, 8]. Because of their indiscriminate feeding habits, cattle are known to ingest and, at times, choke because of ingestion of different types of indigestible materials referred to as foreign bodies ^[9]. Gastrointestinal foreign bodies are among the most common cause of death in veterinary medicine. Sheep and goats are highly selective feeder and ingest significantly less amount of foreign bodies as compared to cattle ^[10].

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 specie ^[11]. Animals with nutritional deficiencies and unbalanced dietary habits lead to ingest various types of foreign bodies deliberately. The indiscriminate feeding habits and mineral deficiency makes them susceptible to inadvertent ingestion of foreign materials. They are the root causes for various problems in different organ of the animals, mainly in rumen and reticulum ^[12]. The Industrialization and mechanization of agriculture have further increased the incidence of foreign bodies in the animals ^[13]. 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 ^[7, 8].

The ingestion of indigestible materials has been associated with feed scarcity ^[14]. The ingestion of materials other than normal feed gets lodged in the rumen and compromising the ruminal space and interfering with the normal physiological functions of the rumen ^[15]. This indigestible material hinders the process of fermentation and mixing of contents leading to indigestion ^[16]. The presence of foreign bodies in the rumen and reticulum also hampers the absorption of volatile fatty acids and consequently reduction in the rate of animal fattening ^[17, 18]. Traumatic reticulo peritonitis develops as a consequence of perforation of the wall of reticulum ^[19] and it 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 ^[20].

The condition is serious in our country usually in urban and peri-urban areas where extensive building are carried out and proper plastic material disposal is no conditioned and so thrown on roads and near the fence or anywhere and that is way our dairy cattle are dying mainly associated with foreign bodies ^[21]. In Ethiopian information regarding the magnitude and occurrence of fore stomach foreign bodies is very limited and the ruminants are kept under poor extensive farming system and they are more likely to be exposed to ingestion of indigestible materials from different sources due to high environmental contamination with plastic bags and other materials. 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 amount and thus, it can be adequately studied in abattoirs. Therefore, the objectives of this study are:

- To assess the prevalence and type of ruminal and reticular foreign bodies in cattle slaughtered at Bodit Municipal Abattoir.
- To correlate the frequency of foreign bodies with animal factors such as age, breed, body condition and origin of animals.

Materials and Methods

Description of the study area

The town has a latitude and longitude of 37°52'E and 6.967°N, respectively, with an elevation of 2050 meters above sea level. It the administrative center of Damot Gale woreda, one of the twelve woredas (districts) in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia. As part of the Wolayita zone, Damot Gale is bordered on the southwest by Sodo Zuria, on the northwest by Boloso Sore and Damot Pulasa, on the north by the Hadiya zone, on the east by Diguna Fango, and on the southeast by Damot Weyde. The administrative center of Damot Gale is Boditi. The area is divided into three ecological zones: Kola (lowland<1500m), Woina Dega (mid-altitude1500-2300m) and Dega (highland >2300m).

Most of the area lies within the mid altitude zone. Rainfall is bimodal, with an average amount of about 1000mm (lower in the lowlands and higher in the highlands). Mean monthly temperature vary from 26 °C in January to 11 °C in August. Primary occupation of the zone is farming. Mixed crop-livestock production predominates, but there are some pastoralists in the lowlands. Generally, the climatic condition is conducive to livestock production. The Damot Gale woreda has a number of livestock populations; in the area is estimated to be 77793 cattle, 27591 sheep, 6095 goats, 6139 equines and 89465 chickens ^[22].

Study population

The study was conducted on apparently healthy slaughtered cattle at Bodit Municipal Abattoir from November, 2017 to April, 2018. The animals will originate from different agro ecological zones which have different management system. Animals are 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 grass land and supplementary feedings of crop residue when pasture is scarce especially during long dry season. Animals for slaughter are brought on their foot by attendants from local market and by vehicle from far areas.

Study design

A cross-sectional study was conducted from November, 2017 to April, 2018 at Bodit Municipal Abattoir to assess the prevalence of rumen and reticulum foreign bodies and to identify the type of foreign bodies and their risk factors in rumen and reticulum of cattle presented for slaughter. Cattle presented for slaughter was identified by sex, age, origin and body condition score prior to slaughter. Age was determined based on dental eruption as previously described by ^[23] Body condition was evaluated based on scores ranging from Score 1 (physically thin), 2 (medium) and 3 (fat) were described by ^[24]. After slaughter the rumen and reticulum was removed carefully from the abdominal cavity and opened, and any

foreign body obtained was washed, dried and identified accordingly.

Sampling method and sample size

The animals was selected using systematic random sampling using regular interval to study the prevalence and types of the foreign bodies in the rumen and reticulum of cattle presented for slaughter in the abattoir. The required sample size for this work was determined according to [25] using a formula for an infinite population size, and with 95% confidence level, 5% desired absolute precision by considering a 50% expected prevalence of the rumen and reticulum foreign bodies in cattle in the area.

Study methodology

Ante mortem examination

Ante mortem examination on individual animals was done for assessment of sex, age, breed, body condition and their place of origin (Sodo, Humbo, Gasuba and Bodit). Epidemiological data is also determined including, the main categorization of the animals in the study area; sex (female and male) and age is categorized into young (<5 years), adult(5-10 years) and old(>10years) based on dentition pattern and body condition also low, medium and fat with breed differentiation(cross and local). 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 and each animals mark for the identification by writing a code on its gluteal muscle by using ink.

Postmortem examination

In the postmortem examination rumen and reticulum was examined immediately after the animal is slaughtered in the evisceration stage, the stomach is carefully removed from the abdominal cavity and opened for the prevalence 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 were obtained during inspection washed with water to remove adhering feed material and identify type of foreign bodies. When the finding was positive, the location and type of the foreign bodies was recorded otherwise recorded as negative in postmortem record sheet.

Data management and statistical analyses

The data collected were entered and scored in Microsoft Excel worksheet. Before subjected to statistical analysis, the data were thoroughly screened for errors and properly coded. For data analysis IBM® SPSS® statistics 21(IBM® Corporation, 2012) was used. Descriptive statistical analysis such as calculation of percentage 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 cattle examined. Pearson's 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. For a Chi square (χ^2) test, P-value < 0.05 was considered significant whereas p-value > 0.05 considered non-significant.

Results

The prevalence of rumen and reticulum foreign body based on associated risk factors

The Study animals were grouped into three as young (≤ 5 years), adult (5-10 years) and old (≥ 10 years), from them 58, 199 and 257 animals were examined with age in these age groups, 3(5.2%), 34(17.1%) and 70(27.2%) were found positive, respectively. The foreign bodies were more frequently encountered in old animals than 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. From the total 514 animals there are 418 local breeds and 96 cross breeds were examined; from them 69(16.5%) and 38(39.6%) of foreign bodies were detected in both breeds respectively. So the prevalence of rumen and reticulum foreign bodies was higher in cross breeds than local breeds. The statically analysis also showed that there exist significant differences among different breed ($p = 0.00$) which is $P < 0.05$ in the occurrences of foreign bodies.

In the Bodit Municipal Abattoir most of the animals brought to be slaughtered were comprised fat, medium and low body conditions. From them 129, 198 and 187 animals examined with fat, medium and low body conditions respectively. The overall foreign body prevalence in the fat, medium and low body conditioned animals was 4(3.1%), 28(14.1%) and 75(40.1%) respectively. There was statistically significant differences ($P < 0.05$) between different body condition scores and foreign body distribution in rumen and reticulum.

The Animals slaughtered in Bodit municipal abattoir were come from four different origins like Sodo, Bodit, Humbo and Gesuba. There are 119, 138, 130 and 127 animals were examined from Humbo, Sodo, Bodit and Gesuba respectively. From the examined cattle's 27(22.7%), 36(26.1%), 24(18.5%) and 20(15.7%) respectively were positive to the occurrence of rumen and reticulum foreign bodies. The highest frequencies of rumen and reticulum foreign bodies observed in cattle originated from Sodo (26.1%) while the lowest from Gesuba (15.7%). There was not statistically significant differences ($p = 0.172$) among the origin of animals.

Prevalence of foreign bodies with regard to their site of location

From the total of 107 positive cases of foreign body, 81(75.7%) were occurred in rumen while 24(22.4%) in the reticulum and only 2(1.86%) were found in the rumen and reticulum. Most of plastic materials were found in the rumen; while reticulum was the major site for the retention of metallic objects. The statically analysis also showed that the Occurrence of foreign body was highly significant difference ($p = 0.00$) in rumen and reticulum. The Plastics were the most frequently encountered (30.8%) foreign body type in the fore stomach of slaughtered animals.

Table 1: The prevalence and risk factors associated with rumen and reticulum foreign body in cattle slaughtered at bodit municipal abattoir

	Risk Factors	No. of examined animals	No. of positive Animals	Prevalence (%)	Chi square(χ^2)	p-value
Age	Young (<5year)	58	3	5.2%	16.72	0.00
	Adult (5-10year)	199	34	17.1%		
	Old (>10year)	257	70	27.2%		
Breed	Local	418	69	16.5%	25.221	0.00
	Cross	96	38	39.6%		
BCs	Fat	129	4	3.1%	72.129	0.00
	Medium	198	28	14.1%		
	Low	187	75	40.1%		
Origin	Sodo	138	36	26.1%	4.995	0.172
	Bodit	130	24	18.5%		
	Humbo	119	27	22.7%		
	Gesuba	127	20	15.7%		

Discussions

Ingestion of indigestible foreign materials by ruminants is a common worldwide problem previously reported from Nigeria [14, 18] Jordan [10] Sudan [26, 27, 28, 29] and Pakistan [30]. This study showed an overall foreign body prevalence of 20.8% (107/514) in cattle slaughtered at Bodit municipal abattoir. The occurrence rate of IFB in cattle obtained during this study is higher than the previous report of in Rwanda; reported from [31] (17.4%) foreign bodies in the fore-stomach of cattle at Rwanda, [32] 17.16%, of rumen and reticulum foreign body in cattle slaughtered at Wolaita Sodo Municipal abattoir and the report of [33] 17.07% of prevalence of fore stomach foreign bodies in Hawasa Municipal Abattoir, Ethiopia.

The present study is far higher than the reports of [34] 13.22% of rumen and reticulum foreign body in cattle slaughtered at Jimma Municipal Abattoir and also the report from [35] an overall prevalence of 14.8% of rumen and reticulum foreign body in male cattle slaughtered at Gondar Elfora abattoir. However, in contrast to this finding, is slightly lower than the study conducted on cattle at Hirna municipal abattoir the prevalence of rumen and reticulum foreign bodies (23.9%) reported by [36] and similarly lower than the occurrences of indigestible foreign bodies in cattle slaughtered at Morogoro Municipal abattoir in, Tanzania, the prevalence (24.03%) have been reported by [37]. This finding is significantly lower than the prevalence 59.14% reported by [30] prevalence of indigestible rumen and reticulum foreign bodies in Achaia cattle in Pakistan and significantly lower than the prevalence reported that (77.41%) in Jordan, [38] the cases of adult dairy cattle suffering from recurrent tympany had indigestible foreign bodies.

In present study, the higher prevalence of foreign bodies was detected in cattle greater than (old) 10 years age (27.2%) followed by adult cattle 5-10 years (17.1%) and young cattle (5.2%). This study shows that the older animals were more frequently affected with indigestible materials than the younger ones. This study is in agreement with [27, 39] who recovered plastics, leather, clothes and ropes at higher prevalence from the rumen and reticulum of old small ruminants. Again this study is similar to the report from [34] who found (81.25%) of foreign bodies in cattle greater than 10 year age and [33] also reported (17.85%) of the animals had higher frequency of foreign bodies in rumen and reticulum in the old age. This study agrees with [7] reported old dairy cattle are the most commonly affected group [38] 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. The similar finding was reported from Rwanda by [40] more

foreign bodies (29.5%) were found in older animals (10 years and above) than in younger and middle-aged animals. This might be associated with increase of exposure through life and many were found accumulate and lead the undead animals to be positive. So the animals with old age are more affected than other age groups. This is due to the more foreign bodies in older animals may be a result of the gradual accumulation of indigestible materials ingested over a prolonged period of time.

The prevalence was higher in the cross breed cattle (39.6%) than local breeds (16.5%). It is agree with the work of [33] who reported fore stomach foreign bodies with the high prevalence of (58.82%) in cross breeds. It is also agreed with the work of [34] who found 70% in cross breed and 10.77% in local breed. This might be due to associated with the level of body size, production and drought power which requires high demand of energy and nutrition, hence increase exposure for foreign bodies.

In this study the animals with low body condition were found to be most affected with indigestible foreign bodies. The prevalence of foreign bodies in present study of cattle with low body condition is 75(40.1%), medium 28(14.1%) and fat body condition 4(3.1%). This finding is in agreement with the reports of [27, 11]. The low 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. Hairball sometimes occur in ruminants fore stomachs 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 [39]. The results of this study are in agreement with those of g [41] in Jimma, South-west Ethiopia, [33] in Hawassa municipal abattoir, [18] in Nigeria and [42] in East Shoa, Ethiopia.

The types of foreign bodies in this study were plastics, metallic, fabric, leather and others such as hair ball, stones and bones. From this result, plastics 33(30.8%), fabric 29(27%), metals 23(21.5%), leather 7(6.5%) and others 15 (14%) were encountered positive cases in the rumen and reticulum of slaughtered animals. From them plastics were the most frequently occurred rumen foreign body in cattle slaughtered in Bodit municipal abattoir. The result agrees with the reports of [43] the indigestible foreign bodies in the rumen and reticulum in Haramaya abattoir, the prevalence of plastics was (79.2%). Because of the wide spread use; improper disposal of plastic bags and lack of awareness among livestock owners on the risk of ingestion of these

materials on the health of their animals also contributed to the high prevalence of rumen impaction in this species. Shortage of feed during the long dry season increase the likelihood of ingestion of plastic foreign bodies which is also associated with a shortage of feed specifically of minerals and vitamins origin.

The reports from ^[17,14] cattle and sheep reared within urban and sub-urban environments indicates that impaction of the rumen resulted from the accumulation of foreign bodies such as plastic bags interfered with flow of ingesta leading to the distention of rumen. This finding is in general agreement with various reports from different countries like Nigeria showed an overall prevalence of 81.6% ^[18] and Jordan (85%) ^[44,45] also reported that plastic bags were the most common cause of rumen impaction that were found in all of the animals examined at Addis Ababa municipal abattoir. Similar study in Jordan by ^[44], revealed 74% plastic foreign body prevalence. This study indicated that larger number of foreign bodies occurred in the rumen (75.7%) than reticulum (22.4%) of the examined animals. This may be due to that the larger size of rumen as compared to that of reticulum.

Rumen and reticulum foreign bodies can significantly affect the digestion process by occupying space and blocking ingesta movement which ultimately impair the health and productivity of animals. This finding is agreed with the report of ^[46, 43, 45] also have reported higher frequency of foreign bodies in the rumen than in the reticulum. This study also indicated that metallic foreign bodies were most frequently recovered from reticulum, while nonmetallic foreign bodies were detected from rumen. The metallic foreign bodies were most frequently recovered from reticulum due to retention of foreign bodies by the honey comb structure of the reticular mucosa and their heavy weight result in gravitational attraction force of these heavy foreign bodies to the ventral part of the fore stomach. Again this finding was in general agreement with the findings of ^[27, 39, 47], and may be attributed to the larger rumen volume, the cumulative size and material composition of the foreign bodies, and the types of materials, with metals and sharp objects tending to localize preferentially in reticulum ^[7]

The highest prevalence of foreign body was observed in animals originated from Sodo (26.1%) and the lowest in those originated from Gesuba (15.7%). In Nigeria, prevalence of foreign bodies was observed to be higher in animals originating from urban settings than from rural areas revealing that management of animals plays a crucial role for the occurrence of foreign bodies. In urban areas, the land available for grazing is generally smaller and animals that are kept under extensive system in urban areas are to graze the refused dumps generated from households and factory wastes. It has been reported that ingestion of foreign bodies is associated with shortage of forage and increased pollution of grazing land with indigestible foreign bodies ^[44, 48]. The impaction resulting from the accumulation of indigestible foreign bodies in the rumen interferes with the flow of ingesta leading to distension of the abdomen and passage of scanty feces ^[14, 33] reported a prevalence rate of 30.5% in Hawassa which is again from urban area. The difference in the prevalence rate might be due to difference in the origin of animals presented for slaughter and types of waste management system 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 rolling and packaging of commodities are left unwisely. So they have more chance of acquiring foreign bodies than rural areas.

Ingestion and lodgment of foreign bodies are common in the bovine primarily due to indiscriminate feeding habits. Industrialization and mechanization of agriculture has further had increased the incidence of foreign bodies in these animals ^[49].

In free grazing system, livestock reared in urban and peri-urban areas often left in market place, road side and near chicken waste. ^[33, 27] had stated that urban and semi-urban areas are polluted with plastics, ropes, hairs, wool and metals are growing problem for grazing animals because of the poor management system and inadequate availability of feed especially during long dry seasons. The animals near to urban areas were more easily accessible to ingestion of indigestible foreign bodies and they are commonly seen grazing along major roads where there are many plastics and other waste products. This indigestible foreign bodies and waste products are leading to a high number of mortalities, loss of production and non-digestible foreign bodies in cattle stomach.

Conclusion and recommendation

The ingestion of metallic and nonmetallic foreign bodies are most common problem encountered in cattle not only because of its mortality and morbidity but also it causes decrease in production and productivity of animals suffering from them. The ingestion of indigestible foreign materials could pose serious health risks for free-grazing ruminants. It is common in developing countries like Ethiopia where the standard of animal management is unsatisfactory. This study revealed an overall prevalence of 20.8% of foreign bodies in the fore stomach of cattle slaughtered at Bodit Municipal Abattoir. This study showed that there is association between age and prevalence of foreign bodies. Most of animals with the age greater than 10 years were more affected than adult animals. Both cross breed and cattle with low body condition are the most affected groups compared to that of local breed cattle and medium body condition respectively.

The types of foreign bodies detected in this study are plastics, fabric, metals, leathers and others such as hair ball, stone and bone. From them the plastics were most commonly encountered foreign material followed by fabric and metallic. More indigestible foreign bodies were found in the rumen (75.7%) than the reticulum (22.4%). Most of the nonmetallic foreign bodies were found in the rumen while metallic foreign bodies were in reticulum. The animals were originated from Sodo has highest prevalence of foreign bodies were detected and lowest the animals originated from Gesuba. Therefore, this study suggests that metallic and non-metallic indigestible materials could lead to poor body condition of the study cattle, which is a consequence of its interference with digestion of food. The presence of metallic and non-metallic objects in cattle stomach may have direct and indirect effects on livestock productivity which could further hinder the sustainable production and economic losses due to severe loss of production and increased mortality rates.

Thus, based on the above conclusion the following recommendations are forwarded.

- The grazing animals should be kept away from urban garbage and dumping places.
- Animals should be supplied with sufficient feed in order to mitigate the problem of ingestion of foreign bodies.
- The awareness and education should be created at different community levels on careless disposal of plastic bags (indigestible foreign bodies) and as well as the periodical cleaning of these wastes in the grazing area of animals.

- The appropriate solid waste disposal system should be practiced and protect the environment from pollution.
- The further research should be made to emphasize the important of the problem and address the prevention and control measure.

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