

# Occurrence, Gastro Intestinal Tract Distribution and Types of Foreign Bodies in Sheep and Goats Slaughtered at Abyssinia Export Abattoir, Bishoftu, Ethiopia

Tolesa T<sup>2</sup>, Abdi Feyisa<sup>1\*</sup>, Jirata S. Abose<sup>1</sup> and Yaikob H Tolosa<sup>1</sup>

<sup>1</sup>College of Veterinary Medicine and Agriculture, Addis Ababa University, Bishoftu, Ethiopia

<sup>2</sup>College of Veterinary Medicine and Animal Sciences University of Gondar, Gondar, Ethiopia

## Abstract

**Objectives:** Shoats (sheep and goats) are selective feeders; however, indigestible foreign bodies are ingested mostly as a result of long-term feed shortages, mineral and nutritional deficits. In developing countries like Ethiopia, sheep and goats are commonly kept extensively and they have easy access to household wastes, rubbish on the roadsides, residential and market places. As a result, evidence-based interventions are needed to lessen the effects of foreign bodies on the production efficiency of the small ruminants. The aim of this study was to determine the frequency of foreign bodies in sheep and goats, as well as their gastrointestinal distributions and types.

**Result:** Foreign bodies were found in the stomachs of 89 (22.08%) of the 403 small ruminants (192 sheep and 211 goats) examined during the study period. Of them, 44 sheep (22.91%) and 45 goats (21.32%) were found to have different types foreign bodies. Plastic 47 (46.0%) was the most frequent foreign body discovered, while mixed plastic and cloth 1 (0.98%) was the least common. The rumen had the largest percentage of foreign bodies (69.6%), followed by the reticulum (16.7%), and the abomasum (13.7%). The prevalence of foreign body recorded in less than 2 years, 2-3 years and greater than 3 years old were 15.73% (28/178), 25.88% (44/170) and 30.9% (17/55), respectively. Besides, 15.58% (31/199), 28.14% (56/199) and 40% (2/5) prevalence of foreign bodies were recorded in good, medium and poor body conditions, respectively. There was a statistically significant variation in prevalence of foreign bodies between age groups and body conditions ( $p < 0.05$ ).

**Conclusion:** According to this study, the presence of various types of indigestible foreign bodies in three main compartments of the shoats' stomach (rumen, reticulum, and abomasum) has a significant impact on the animals' production. Appropriate waste management and husbandry methods should be designed and executed to reduce the risk of ingestion and the impact of indigestible foreign bodies on small ruminant production.

**Keywords:** Foreign bodies • Goats • Occurrence • sheep • Bishoftu

## Introduction

Shoats, sheep and goats, are known to play a very important role in food security in developing countries like Ethiopia. This is associated with their small litter size as it favors low investment, a small risk of loss and their reproductive efficiency or rapid return [1]. Of the world's 1.6 billion sheep and 475 million goats, 65% and 75% respectively are located in developing countries [2]. However, the productivity from the sector is still minimal due to either husbandry limitations or non-infectious and infectious diseases of the animals. The presence of foreign bodies in different sections of the stomach of sheep and goats is one of the noninfectious constraints that could affect the health and productivity of the animals [3].

Gastrointestinal Tract (GIT) foreign body is any item that is present in the GIT, indigestible and does not excrete [4]. Ingestible foreign body predisposed by environmental pollution is currently becoming a global health concern and have been implicated as among common causes of sudden death in ruminants [5]. Ingestion of foreign bodies by ruminants is extremely common especially in

developing countries, like Ethiopia, where the standard of animal management is unsatisfactory and scarcity of feeds to ruminants have forced them to scavenge wastes [6]. The condition is serious in urban and peri-urban areas of these countries, where extensive buildings are carried out and household wastes are not properly disposed of. Additionally, industrialization and mechanization of agriculture have further increased the incidence of foreign bodies in ruminants. Furthermore, the animals in these areas are left to stray and seek their feed as the husbandry system is a mainly extensive type [7]. On the other hand, ruminants consume indigestible material such as plastic bags and metallic objects if their diet is deficient in essential minerals [8].

Small ruminants are highly selective feeders and ingest a significantly fewer amount of foreign bodies as compared to cattle. However, the ingestion of indigestible materials may occur during long periods of feed scarcity, mineral and nutritional deficiencies and depraved appetite [9]. In Ethiopia, small ruminants are exposed to various infectious diseases and to the ingestion of indigestible materials of various sources as they are mainly kept under an extensive type of management.

Sheep and goats fore stomach are affected highly due to ingested foreign bodies which have major economic importance due to severe loss of production and production ability and sometimes death of the animal [10]. These indigestible materials hinder the process of fermentation and mixing of contents and leading to indigestion. They also obstruct the orifice between the reticulum and omasum and if not removed through surgery, it can be fatal. The presence of foreign bodies in the rumen and reticulum also hampers the absorption of Volatile Fatty Acids (VFA) and consequently a reduction in the rate of body weight gain [11]. Furthermore, the presence of large amounts of foreign bodies in the reticulo-rumen may lead to alterations in the microbial

\*Address for Correspondence: Abdi F, College of Veterinary Medicine and Agriculture, Addis Ababa University, Bishoftu, Ethiopia, E-mail: abdi.feyisa@aau.edu.et

**Copyright:** © 2021 Tolesa T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Received** 21 October 2021; **Accepted** 22 November 2021; **Published** 29 November 2021

populations of these digestive chambers, worsening the pathogenesis of the condition [12]. Hairballs sometimes occur in small ruminants fore stomachs and abomasum. Consequently, these materials, form large tight balls inside the rumen leading to anorexia, decreased production and progressive loss of body condition.

Information on the occurrence, types, and GIT distribution of foreign bodies in small ruminants in Ethiopia is limited. Furthermore, because the disease is seldom identified in live animals, the influence on animal production and productivity is unknown. As a result, it's critical to investigate the occurrence and characterize the foreign bodies at the abattoir level (during postmortem). Thus, the current investigation offers data on the presence, type, effect, and GIT distribution of foreign bodies in small ruminants (sheep and goats) slaughtered at the Abyssinia Export Abattoir in Bishoftu, Ethiopia, from various origins.

## Materials and Methods

### Study area

The study was conducted at Abyssinia export abattoir which is located in Bishoftu town. The town is located in the Oromia Regional State of Ethiopia at the eastern Shoa zone of Ada district, which is 48 km southeast direction away from the capital city, Addis Ababa. It is located between the latitude of 8°45' N and longitude of 38°59' E, with an altitude of 1880 m above sea level. The area receives a mean annual rainfall of 850 mm in a bimodal distribution with an average temperature of (14-26°C in September followed by a dry season ranging from October to February. The short rainy season lasts from March to May [13].

### Study animals

The study was conducted on 403 apparently healthy slaughtered sheep and goats of local breeds at Abyssinia Export Abattoir. Study animals were sheep and goats of different age groups and males in sex. The animals were, originated from different parts of the country, mainly from Bale, Borena, Babile and Jinka. During the study time the animals were categorized into three based on age <2 years (young), 2-3year (adult) and >3 years (old) [14], also grouped based on body condition as poor, moderate and good [15].

### Study design

A cross-sectional study was conducted from November 2019 to March 2020 to characterize and assess the occurrence, GIT distribution and types of indigestible foreign bodies in small ruminants. Species, age, body conditions, and origin of the studied animals were considered as risk factors for the occurrence of foreign bodies. During the study time, the animals were categorized into three as young, adult and old, and the age of the studied animals was estimated based on dentition pattern while their body condition scoring was made based on observation of parts of the body.

### Sampling technique and sample size determination

A simple random sampling technique was employed to select the study animals and the body conditions and age of those animals were recorded during the ante mortem examination. The sample size required for this study was determined based on sample size determination in random sampling for inference in a population using the expected prevalence of gastrointestinal tract indigestible foreign bodies in sheep and goats and the desired absolute precision according to Thrusfield M [16]. As follows:

$$n = (1.96)^2 p_{exp} (1 - p_{exp}) / d^2$$

Where n = required sample size

$P_{exp}$  = expected prevalence

d = desired absolute precision

There was no previous study on the prevalence of gastrointestinal tract foreign bodies of small ruminants slaughtered at Abyssinia export abattoir. The sample size for this study was determined using 50% expected prevalence.

Therefore, using 50% expected prevalence and 5% absolute precision at 95% confidence level using the above formula, a minimum of 384, 403 with the precision, animals were sampled.

### Study methodology

**Ante mortem examination:** Ante mortem examination on individual animals was done for assessment of species, age, origin, and body condition. Age was categorized into young, adult and old based on dentition pattern and body condition also thin, medium and good with species differentiation (caprine and ovine). 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 animal's mark for the identification by writing a code on its gluteal muscle by using a marker.

**Post-mortem examination:** In the post-mortem examination, the fore-stomach (comprising rumen, reticulum and omasum) and the true stomach (abomasum) was examined immediately after slaughter in the evisceration stage, the stomach was carefully removed from the abdominal cavity and rumen, reticulum, omasum and abomasum were thoroughly examined by visual inspection and palpation with open and explore 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 the type of foreign bodies. When the finding was positive, the location and type of the foreign bodies were recorded otherwise recorded as negative in the post-mortem record sheet.

### Data management and analysis

The data obtained was coded in Microsoft excel and subjected to descriptive statistics and chi-square to assess the magnitude of the difference of comparable variables using SPSS version 20.0 software. The prevalence of indigestible foreign bodies was expressed as a percentage by dividing the total number of animals positive for indigestible foreign bodies by the total number of animals examined. Descriptive statistical analysis such as a table was used to summarize and present the data collected. Pearson chi-square ( $\chi^2$ ) test was employed to assess the existence of an association between the prevalence of the foreign bodies and different potential risk factors considered. Significance was considered when the P value was <0.05.

## Results

### Frequency of the foreign bodies found in slaughtered sheep and goats

From the total of 403 sheep and goats examined for the presence of indigestible foreign bodies in their rumen, reticulum and abomasum, 89(22.08%) were found positive. Representative images of foreign bodies recovered from rumen, reticulum and abomasum of sheep and goats are shown. Different types of foreign bodies were detected during this study as indicated in Table 1. Plastic materials 47(46.0%) were among the most frequently recovered while mixed plastic and cloth 1 (0.98%) were the least.

### GIT distribution of foreign bodies

From a total of 22.08% positive cases, 69.6% of the foreign materials were recovered from rumen followed by 16.7% and 13.7% from reticulum and abomasum, respectively indicated in the Table 2.

### Overall prevalence and associated risk factors for foreign body occurrence

Out of 89 (22.08%) small ruminants found positive for different kinds of foreign bodies during this study, 44 (22.91%) of them were sheep while 45 (21.32%) were goats. There was no significant difference ( $p > 0.05$ ) in the frequency of occurrence of foreign bodies between species. Age of examined animals was tested as risk factor for occurrence of indigestible foreign bodies, and there was statistically significance difference ( $X^2 = 8.091$ ;  $P = 0.018$ ) between frequencies of occurrence of foreign bodies among the different

**Table1.** Frequencies of different foreign bodies found in small ruminants from slaughter house.

Types of Foreign Body	Total	Positive Proportion
Plastic	47	46.00%
Hair ball	19	18.60%
Cloth	11	10.80%
Rope	4	3.92%
Leather	9	8.82%
Mixed plastic rope	2	1.96%
Mixed plastic cloth	1	0.98%
Wire	2	1.96%
Sand	3	2.94%
Bone	4	3.92%
Total foreign bodies	102	100%
Total positive cases	89	-

**Table 2.** Types and proportions of foreign bodies in different stomach compartments of small ruminants.

Stomach Compartments	Types of Foreign Bodies	Frequency (%) in Species		Total (403) Frequency (%)
		Caprine (211)	Ovine (192)	
Rumen	Plastic	25(11.84)	22(11.45)	47(46.07)
	Hair ball	6(2.84)	3(1.56)	9(8.82)
	Cloth	2(0.94)	3(1.56)	5(4.90)
	Rope	2(0.94)	2(1.04)	4(3.92)
	Leather	0	3(1.56)	3(2.94)
	Mixed Plastic rope	2(0.94)	0	2(1.96)
	Mixed Plastic cloth	0	1(0.52)	1(0.98)
	<b>Total</b>	<b>37(17.5)</b>	<b>34(17.70)</b>	<b>71(69.60)</b>
Reticulum	Wire	0	2(1.04)	2(1.96)
	Cloth	2(0.94)	4	6(5.88)
	Leather	4(1.89)	2(1.04)	6(5.88)
	Sand	0	3(1.56)	3(2.94)
	<b>Total</b>	<b>6(2.84)</b>	<b>11(5.72)</b>	<b>17(16.67)</b>
Abomasum	Hair ball	4(1.89)	6(3.13)	10(9.80)
	Bone	4(1.89)	0	4(3.92)
	<b>Total</b>	<b>8(3.79)</b>	<b>6(3.13)</b>	<b>14(13.72)</b>

age groups. The highest frequency, 30.90% was observed in small ruminants greater than three years while 25.88% was found between 2-3 years old and the lowest 15.73% was observed in small ruminants of age less than two years old. Animals slaughtered in the abattoir were come from four different origins (Bale, Borena, Jinka and Babile). The highest frequencies of foreign bodies observed in sheep and goats originated from Bale (25.75%) while the lowest from Jinka (18.42%). The result also revealed there was no significant differences ( $p>0.05$ ) in the prevalence among the origin of animals (Table 3).

### Frequency and prevalence of foreign bodies with regard to body condition

The animals brought to the abattoir to be slaughtered were comprised of 199 good, 199 medium and 5 poor in body condition score. From those animals examined with good, medium and poor body conditions, 31 (15.58%), 56 (28.14%) and 2 (40%) were positive for foreign bodies, respectively. There was statistically significant difference ( $X^2=8.423$ ,  $P=0.015$ ) between different body condition scores (Table 4).

## Discussion

This study uncovered an overall foreign body prevalence of 89(22.08%) in shoats slaughtered at Abyssinia export abattoir. This is closely related with the previous report of Tiruneh R and Yesuwork H. [17] and Dawit A [18] which was computed 23.2% and 25.8% overall prevalence of foreign bodies in small ruminants slaughtered at Addis Ababa and Adama municipal abattoir, respectively. Other researchers were reported a higher overall prevalence of foreign bodies in shoats than the recent report in Jijiga municipal abattoir

(30.73%) and Maandeeq abattoir in Somalia (33%) [19,20]. There was also the highest prevalence rate of 58.1% by Negash S, et al. [21] from Eastern Ethiopia. On contrary, other authors were reported a low (6.1%) overall prevalence of foreign body in small ruminants slaughtered at Lunna Export Abattoir [22]. In this study, all the four compartments of the stomach were examined so this may contribute to variation in the prevalence of foreign body from other studies. Also, differences in the prevalence of foreign bodies between various areas may be attributed to differences in animals' management system, age of animal slaughtered, sex and the extent of foreign body management between different study areas [23].

In the present study, plastic types of the foreign body have the highest proportion 46.0% followed by hairball (18.6%), cloth (10.8%), and the least encountered were wire (1.96%) and plastic with cloth (0.98%). This result is closely related with a report of Anwar K, et al. [5] which was 59.14% prevalence rate of a plastic bag recovered from ruminants' stomach in Pakistan. Another report by Singh B [24] also stated the highest proportion 90% of plastic bags foreign bodies recovered from cattle stomach. This highest proportion of plastic bags in the current and previous reports are associated with improper disposal of plastics that are used for the packing of goods in grazing areas and roadsides of urban and peri-urban areas. In addition, lack of awareness among livestock owners and the whole community on the risk of ingestion of these foreign materials by small ruminants may also contribute to the occurrence of the plastic types of foreign bodies. Moreover, most owners do not provide supplementary feed to animals particularly to sheep and goats. This means, if there is a shortage of feed in the area this may predispose the animals to negative energy balance and force them to feed on unusual materials including plastics, clothes, ropes and even metallic substances [25].

**Table 3.** Prevalence and associated risk factors of foreign bodies from slaughtered sheep and goats.

Risk Factors	Categories	Number of Samples	Existence of foreign body (%)	X <sup>2</sup>	Df	P-value
Species	Caprine	211	45 (21.32)	0.148	1	0.701
	Ovine	192	44 (22.91)	-	-	-
Age(Years)	<2	178	28 (15.73)	8.091	2	0.018
	2-3	170	44 (25.88)	-	-	-
	>3	55	17 (30.90)	-	-	-
Origin	Bale	132	34 (25.75)	1.811	3	0.613
	Borena	169	36 (21.30)	-	-	-
	Jinka	76	14 (18.42)	-	-	-
	Babile	26	5 (19.23)	-	-	-
<b>Total</b>		403	89 (22.08)	-	-	-

**Table 4.** Effects of foreign bodies on body conditions of sheep and goats slaughtered at Abyssinia export abattoir.

Effect	Categories	Number of Samples	Existence of Foreign Body (%)	X <sup>2</sup>	Df	P-value
Body condition	Good	199	31(15.58)	8.423	2	0.015
	Medium	199	56(28.14)	-	-	-
	Poor	5	2(40)	-	-	-
<b>Total</b>	-	403	89(22.08)	-	-	-

In Ethiopia, the previous abattoir-based studies on foreign bodies were done on rumen and reticulum only, however; the present report is the first of its kind on addressing the whole compartments of stomach for foreign bodies. Accordingly, the highest proportion 69.6% occurred in the rumen followed by 16.7% in the reticulum and 13.7% in the abomasum, while no foreign bodies were recovered from the omasum. The recovery of the highest foreign bodies in the rumen is closely related to the previous 77.1% report in small ruminants by Teshome E, et al. [26]. This may be because almost all ingested feed goes to the rumen and most indigestible materials do not progress to other stomach chambers [22]. In addition, the larger rumen volume, the cumulative size/s and material composition of the foreign bodies may also contribute to the abundance of foreign body in the rumen. The presence of foreign bodies in the rumen has an impact on the productivity and health of the animals, and thus resulted in a great economic loss to the country. These losses could be attributed to reduced fattening rates and the death of the animals from rumen impaction.

The absence of a foreign body in the omasum in this study agreed with the finding of Mushonga B, et al. [27] that found no indigestible objects in the omasum of cattle slaughtered at two abattoirs in South Africa. In the present study, soft hairballs and bone were found from abomasum whereas sand recovered from the reticulum of the study animals. This may be induced by either pica or overgrazed pasture that grass tends to be shorter in which sheep and goats can be exposed to the ingestion of small stones and sand located at the grass base. Depending on its small size, bones can be transported along with ingested feed to the abomasum. Hairballs resulted from ingestion of hair as a result of excessively licking themselves or persistent sucking of pen mates. Excessive licking may be due to a skin disease characterized by itching such as pediculosis or scabies. In small ruminants, swallowed hairs are formed into oval bodies as a result of churning and rolling movements of the rumen once ingested [28].

Although statistically insignificant, there was a slight increase in the prevalence of foreign bodies in sheep (22.91%) than goats (21.32%) in the current study. This is in agreement with the study conducted by Fasil N [19] who reported a prevalence of 34.40% in sheep and 27% in goats at Jigjiga, Eastern Ethiopia with no statistically significant difference. On the contrary, the study by Mohamoud OA [20] was reported a higher prevalence of foreign bodies in goats 40% (78/195) than sheep 28.52% (87/305) at Maandiq abattoir Hargeysa Somalia. On the other hand, the prevalence report of the present findings is much lower than the higher prevalence rate 56.5% in sheep and 59.5% in goats reported by Negash S [21] from Haramaya municipal abattoirs, Eastern Ethiopia. This disparity in the prevalence of foreign bodies between sheep and goats may be due to the variation in the origin of studied animals, as some areas may have excess feed for both species while others may lack feed

for either of the species. In the case of the present study, the relatively lower feed sources for goats probably forced them to graze on the pasture making them equally exposed to foreign bodies.

The current study shows that shoats aged greater than 3years are more frequently affected with indigestible materials than the animals aged less than 2 years. There was a statistically significant difference between the age categories of the animals though old age (>3 years) had a higher prevalence (40%), followed by sheep and goats 2-3 years old (28.56%) and lowest in young age (15.6%). This finding is in agreement with the report of Mekuanint S, et al. [3] that showed the highest frequency (46.7%) in ruminants greater than four years, 23.0% between 2-4 years old and the lowest (12.9%) in ruminants of age less than two years old. The highest prevalence in an old animal might be associated with an increase of exposure through life and gradual accumulation of foreign bodies in the gastrointestinal tract. Conversely, Otsyina HR, et al. [29] reported higher prevalence in sheep and goats of 2-3 years old age group (37.5%) followed by those in the 1-2-year-old age group (24.1%) and absence of foreign material in animals older than 4 years in Kenya.

The highest frequency (40%) of gastrointestinal tract foreign bodies was detected in shoats with poor body condition scores. Likewise, Fasil N [19] reported a higher prevalence (40%) in small ruminants having poor body conditions. Overall, the current study revealed that the difference in the prevalence of foreign body between different body condition scores was statistically significant ( $P < 0.05$ ). This may be due to interference of indigestible foreign bodies in the rumen with the flow of ingesta and with absorption processes [12]. Additionally, the indigestible foreign body may also be associated with the reduction in volatile fatty acids absorption from the rumen, which will results in inappetence, abdominal distention, reduced weight gain, lack of defecation with consequent emaciation and recumbence [11].

## Conclusion and Recommendations

In developing countries like Ethiopia, sheep and goats are commonly kept extensively and they have easy access to household wastes, rubbish on the roadsides, residential, and market places. The present study revealed a higher prevalence of foreign bodies in the stomachs of sheep and goats slaughtered at Abyssinia export abattoir. The majority of non-metallic foreign bodies were found lodged in the rumen and abomasum, whereas metallic foreign body wires were found lodged in the reticulum. Plastics were the most commonly encountered foreign body, while plastic mixed with cloth and wire was the least. The occurrences of the foreign bodies were higher in animals greater than three-year-old, sheep (when compared to goats), and animals with poor body conditions.

Based on the above conclusion, the following recommendations are forwarded.

- Control strategies for foreign bodies, particularly plastics, disposal should be implemented properly by concerned bodies.
- Intensive small ruminant management system with sufficient supplement feeding of the animals need to be practiced.
- Advanced diagnostic tools like diagnostic imaging should be available at animal diagnostic centers.

## Acknowledgments

The author acknowledges Addis Ababa University, Directorate for Research and Technology Transfer for funding the cost of this research work through thematic research project “ Improving meat and carcass quality: Identification and characterization of major pathological lesions, pathogens and foreign bodies causing organ/carcass condemnation, assessing economic impacts and public health risks and devising interventional strategies in central Oromia (FAP-TR)”.

## References

1. Bwala, Diana, Innocent Damudu Peter, Chinedu Athanasuis Eze, and Yachilla BukarKolo. A study on rumen foreign body impaction in sheep slaughtered at the Maiduguri Metropolitan Abattoir, Maiduguri, Nigeria. *Int J Livestock Res* 6(2016):16-23.
2. Tesfaye, Desiye, Yismaw S and Demissie T. Ruminant and reticular foreign bodies in small ruminants slaughtered at Jimma Municipal abattoir, Southwestern Ethiopia. *J Vete Adv* 2(2012): 434-439.
3. Mekuanint, Sitotaw, Tewodros Alemneh and Tsegaye Asredie. Indigestible rumen foreign bodies - Causes of rumen impaction in cattle, sheep and goats slaughtered at Addis Ababa Abattoir Enterprise, Ethiopia. *J Veter Sci Med* 5(2017): 5.
4. Makhdoomi, Dil Mohd, Mohsin Ali Gazi and Jalal Din Parah. Foreign body syndrome: Etiology, clinical symptoms, diagnosis and treatment. *Int J Livest Res* 2(2012): 48-52.
5. Anwar, Khurshaid, Ikhwan Khan, Asim Aslam and Muhammad Mujtaba, et al. Prevalence of indigestible rumen and reticulum foreign bodies in Achai cattle at different regions of Khyber Pakhtunkhwa. *Asian Res Public Net* 8(2013): 580-586.
6. Misk, Nabil A and Semieka MA. The radiographic appearance of reticular diaphragmatic herniation and traumatic pericarditis in buffaloes and cattle. *Vet Radiol Ultrasound* 42(2001): 426-430.
7. Ramaswamy, V and Hardeep Rai Sharma. Plastic bags-threat to environment and cattle health: A retrospective study from Gondar City of Ethiopia. *IIOAB J* 2(2011): 7-12.
8. Kojouri, GA and Shirazi A. Serum concentrations of Cu, Zn, Fe, Mo and Co in newborn lambs following systemic administration of Vitamin E and selenium to the pregnant ewes. *Small Ruminant Res* 70(2007) 136-139.
9. Vijaya, Bhaskara Reddy M and Sasikala P. A review of foreign bodies with special reference to plastic pollution threat to livestock and environment in Tirupati rural areas. *Int J Sci Res Pub* 2(2012): 1-8.
10. Ramprabhu R, Dhanapalan P and Prathaban S. Comparative efficacy of diagnostic tests in the diagnosis of TRP and allied syndrome in cattle. *Israel J Vet Med* 58(2003): 2-3.
11. Onyebuchi, Igbokwe Ikechukwu, Kolo YM and Godwin Onyemaechi Egwu. Rumen impaction in sheep with indigestible foreign bodies in the semi-arid region of Nigeria. *Small Ruminant Res* 49(2003): 141-146.
12. Bani, Ismail Zuhair, Ahmad Al-Majali and Khaled M Al-Qudah. Clinical and surgical findings and outcome following rumenotomy in adult dairy cattle affected with recurrent rumen tympany associated with non-metallic foreign bodies. *Am J Anim Vet Sci* 2(2007): 66-71.
13. NMSA (National Meteorological Services Agency). Annual report on temperature and rainfall distribution for Eastern Shoa Zone, Regional Metrological Office, Adama, Ethiopia. (2014).
14. Pasquini, Chris, Tom Spurgeon and Susan Pasquini. Anatomy of domestic animals. Systemic and regional approach. (10<sup>th</sup> edn) USA: Sudz Publishing (2003): 677.
15. Thompson, James M and Meyer H. Body condition scoring of sheep. Western section, *Am Soci Anim Sci* 43(1994): 175-177.
16. Thrusfield, M. Veterinary epidemiology. (3<sup>rd</sup> edn), UK: Blackwell Publishing. (2013):182-189.
17. Tiruneh, Roman and Hiwot Yesuwork. Occurrence of rumen foreign bodies in sheep and goats slaughtered at the Addis Ababa Municipality Abattoir. *Ethiopian Vet J* 14(2010): 91-100.
18. Dawit, A. A study on rumen foreign bodies in small ruminants at Adama municipality abattoir. DVM theses, Faculty of Veterinary Medicine Addis Ababa University, Debrezeit, Ethiopia. 2010.
19. Fasil, Nigussu. Assessment of sheep and goat foreign bodies in rumen and reticulum in the Jigjiga Municipal Abattiar. *J Adv Dairy Res* 4(2016): 1-6.
20. Mohamoud, Omer Ahmed. Ingestion foreign bodies in rumen and reticulum of shoats in Hargeisa, Somalia: Prevalence and the associated risk factors. *J Dairy Vet Anim Res* 7(2018): 67-71.
21. Negash, Seifu, Berhanu Sibhat, and Desie Sheferaw. A post-mortem study on indigestible foreign bodies in the rumen and reticulum of ruminants, Eastern Ethiopia. *Onderstepoort J Vet Res* 82(2015): 881.
22. Fromsa, Abebe and Nuru Mohammed. Prevalence of indigestible foreign body ingestion in small ruminants slaughtered at Luna export abattoir, East Shoa, Ethiopia. *J Anim Vet Adv* 10(2011): 1598-1602.
23. Jebessa, Desalegn, Fethu Lemma, Tadele Kabeta and Berhanu Sibhat Terefe. Survey on indigestible foreign bodies in the rumen and reticulum of cattle slaughtered at Nekemte Municipal Abattoir, Nekemte, Ethiopia. *Ethiop Vet J* 22(2018): 11-25.
24. Singh, B. Harmful effect of plastic in animals. *Indian Cow* 4(2005): 10-18.
25. Bwatota, Shedrack, Modesta Makungu and Nonga HE. Occurrences of indigestible foreign bodies in ruminants slaughtered at Morogoro Municipal Slaughterhouse, Tanzania. *J Vet Med* 3(2018): 1-6.
26. Teshome, Endale, Nejash Abdela and Abdi Hassan. Post-mortem study on indigestible foreign bodies in rumen and reticulum of Ruminants Slaughtered at Asella Municipal Abattoir, Southeastern Ethiopia. *J Vet Sci and Technol* 8(2017): 436.
27. Mushonga, Borden, Gervais Habarugira, Aline Musabyemungu and Jean C Udahemuka, et al. Investigation of foreign body in the fore stomach of cattle at Ngoma slaughterhouse, Rwanda. *J S Afr Vet Assoc* 86(2015): 12-33.
28. Abutarbush, M Sameeh and Otto M Radostits. Obstruction of the small intestine caused by a hairball in 2 young beef calves. *Can Vet J* 45(2004): 324-325.
29. Otsyina, HR, Nguhiu-Mwangi J, Mogoia, EGM and Mbutia PG, et al. Prevalence of indigestible rumen foreign bodies in sheep and goats at Dagoretti and Kiserian Abattoirs, Kenya. *Inter J Vet Sci* 4(2015): 75-80.

**How to cite this article:** Tolesa T, Abdi Feyisa, Jirata S. Abose and Yaikob H Tolosa. "Occurrence of Gastro Intestinal Tract Distribution and Types of Foreign Bodies in Sheep and Goats Slaughtered at Abyssinia Export Abattoir, Bishoftu, Ethiopia." *Clin Case Rep* 11(2021): 1478.