



Indigestible Foreign Bodies in the Rumen-reticulum of Cattle Slaughtered at Batna Slaughterhouse, Algeria: A Postmortem Study

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10.18805/ag.RF-222

ABSTRACT

Background: To determine the prevalence of indigestible foreign bodies in rumen-reticulum of cattle and identify the types and the common diseases associated with their occurrence. A total of 289 cattle were examined at Batna (Algeria) municipal abattoir.

Methods: About 289 cattle were examined immediately after slaughtering to determine the presence or absence of the foreign bodies in their rumen-reticulum and different lesions were recorded.

Result: From total of 289 cattle examined, 151 (52.24%) were found positive for various types of foreign bodies in their rumen and/or reticulum. From these, 56 (19.37%) were positive for vulnerable bodies and 95 (52.24%) were positive for non-vulnerable foreign bodies. The types of foreign bodies detected were: wire segments, needles, nails, hair clips, coins, corks, ropes, cloth, pebbles, sand, glass pieces, trichobezoar, plastic bags. The plastics were the most common found in 61 (23.92%) males and 34 (79.06%) females. The most common lesions in rumen of cattle with foreign bodies were traumatic reticuloperitonitis (3.79%), perirecticular abscess (12.65%), esophageal obstruction (1.26%), non-penetrating reticulum and/or ruminal foreign bodies (82.27%).

Key words: Cattle, Foreign bodies, Lesions, Prevalence, Traumatic reticuloperitonitis.

INTRODUCTION

The ingestion of foreign bodies is mainly related to nutritive deficiency and feeding management of the animals and causes various problem such as; glossitis, esophagitis, ruminitis, impaction of rumen, traumatic pericarditis (TP) and traumatic reticulo peritonitis (TRP) are the possible health problems can be caused by the ingestion of foreign bodies by ruminants. Among these, disease of rumen and reticulum are of great economic importance because of severe losses on productivity of the animals sometimes leading to the death of the animals (McCurin and Bassar, 2006; Tesfaye and Mersha, 2012; Abu-Seida and Al-Abbadi, 2016).

Entrance and migration of foreign bodies through the body tissues lead to many complication that differ according to the nature of the foreign body and the way of its entrance in to the tissues (Semieka, 2010). Traumatic reticulo peritonitis (TRP) relatively common disease in cattle caused by the ingestion of vulnerable objects such as nail or pieces of wire who fall directly on the reticulum or pass into the rumen and subsequently carried over the rumeno-reticular folds into the cranioventral part of the reticulum (McCurin and Bassar, 2006; Braun *et al.* 2007). Non-vulnerable foreign bodies in the reticulo-rumen cause recurrent rumen tympany in cattle, trichobezoars (a mass found trapped in the gastrointestinal system) have been found associated with acute rumen tympany in calves and young cattle (Maxie, 2007; Vanitha *et al.* 2010). Over a period of time, these materials form large tight balls inside the rumen lead to anorexia, decreased production and progressive loss of body condition (Tyagi and Singh, 1993). It was reported that a large proportion of cattle with non-vulnerable foreign bodies (plastics) in the rumen had displacement of abomasum and a decrease in milk production (Al-Majali *et al.*

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How to cite this article: Rouabah, Z., Tlildjane, M., Hafid, N. (2022). Indigestible Foreign Bodies in the Rumen-reticulum of Cattle Slaughtered at Batna Slaughterhouse, Algeria: A Postmortem Study. *Agricultural Reviews*. 43(2): 260-263. DOI: 10.18805/ag.RF-222.

Submitted: 10-09-2021 **Accepted:** 25-11-2021 **Online:** 22-12-2021

1995), rumenitis, erosion and focal hyperplasia (Hailat *et al.* 1998).

In Algeria, extensive and semi-intensive livestock management systems are mostly practiced in both rural and urban areas. This makes the livestock prone to refuse-dumping areas where they have access to polythene and other indigestible materials. Deficiency of some minerals led these animals to pick up these materials, probably containing some food materials, in other to make up for deficiencies or satisfy their hunger (Misk *et al.* 1984). This study was carried out in order to study a postmortem on indigestible foreign bodies and the associated lesions in the rumen and reticulum of cattle.

MATERIALS AND METHODS

Study area

The study was conducted in Batna City, north eastern Algeria, Batna is located between the north and south Atlas Mountains which rise on either side to form a sort of naturally

protective passage over the province. The climate tends to vary quite widely; with extreme heat during the summer and snow and cold during the winter. The latitude and longitude of Batna City are 7°- 4°N and 35°- 36°E, respectively. The average altitude of the city is 1,048 meters above sea level with a temperature range of 4° to 35°C according to the management of agricultural services (2021). Batna has livestock population of 65052 cattle, 275664 goats, 1137361 sheep.

Animals

The study was conducted on 298 apparently healthy cattle (245 males and 43 females), slaughtered at Batna Municipal Abattoir between January and July 2021. The animals for slaughter were coming from different areas surrounding the town. Cattle presented for slaughter were identified by sex, age and race. Age was determined based on dental eruption as previously described by Otesile and Obasaju (1982). After slaughter of the animals the rumen and reticulum were examined in the evisceration stage, they were opened and any foreign bodies were washed with water to removing adhering feed material and identified. The plastics and/or other foreign bodies collected from each animals were separated into different types and different lesions were recorded.

RESULTS AND DISCUSSION

Prevalence of foreign body in cattle

A total of 151 out of 298 animals (50.67%) examined were found to be positive for different types of foreign bodies. The extracted foreign bodies were categorized into two main groups: vulnerable foreign bodies (VFB) (n=56, 19.19%) and the non-vulnerable foreign bodies (NVFB, n=95, 21.87%) (Table 1).

Cattle with foreign body is one of the most commonly occurring problems of the digestive tract of ruminants (Aref and Abdel-Hakim, 2013) and reported from Jordan, (Majali *et al.* 1995) Pakistan (Jan Mohammad Khan *et al.* 1999), Nigeria (Igbokwe, 2003; Remi-Adewunmi *et al.* 2004), Sudan (Mohammed *et al.* 2006; Ghurashi, 2009; Khurshaid *et al.* 2013), India (Vanitha *et al.* 2010; Hussain and Uppal, 2012; Rajput *et al.* 2018), Germany (Bhatt *et al.* 2011) Rwanda (Mushonga *et al.* 2015), Iraq (Abu-Seida, 2016) and Algeria (Rouabah *et al.* 2017). More or less consistent overall foreign body prevalence of 59.14% was reported by Khurshaid *et al.* (2013) in Pakistan, 43.4%, 41.8% and 23.9% were reported by Sheferaw *et al.* (2014), Negash *et al.* (2015), and Dawit *et al.* (2012) in Ethiopia respectively, 38.6% and 12% were reported by Ngoshe (2012) and Akinbobola *et al.* (2016) in Nigeria and 17.4% by Mushonga *et al.* (2015) in Rwanda. The present study revealed an overall prevalence of 50, 67% (n=298) of foreign bodies, consisting mainly of plastics, in rumen and reticulum of cattle slaughtered at Batna municipal abattoir. The prevalence of rumen-reticulum foreign bodies in the current study is substantially higher in the cattle population (Hussain and Uppal, 2012) compared to results published in other countries (Fraser and Broom, 1990). The higher prevalence

of foreign bodies in the current study probably is related to the unrestricted and increased use of plastic bags and their improper disposal. Ingestion of foreign bodies is associated with a shortage of forage (Hailat *et al.* 1996) as well as increased pollution of grazing lands with indigestible materials (Tesfaye *et al.* 2012). If owners do not provide supplementary feed during feed shortages, their animals are likely to face a negative energy balance that will force them to ingest unusual materials including plastic, cloth, rope and even metallic objects (Negash *et al.* 2015). Ingestion of foreign bodies is common in cattle because of indiscriminate feeding habits and the anatomical features of the buccal cavity. Both hard and soft objects are ingested accidentally by cattle; the hard objects usually go straight into the reticulum while the soft ones find their way to the rumen (Misk *et al.* 1984).

From 255 males and 43 females animals examined, foreign body was found in the rumen of 114 males (75.49%) and 37 females (24.50%) (Table 2). The incidences of ingestion of foreign bodies were low in females compared to males and this may be due to the low number of females slaughtered than the males (Rouabah *et al.* 2017). Further, the females generally have a longer lifespan than males and livestock farmers normally do not sell females because they reproduce and increase the herd size. The findings of the present work are in agreement with the earlier report published wherein the differences in prevalence rates observed in males 155 (23.8%) and females 114 (22.7%) cattle (Mekuanint *et al.* 2017) and not in agreement with the results published by Mushonga *et al.* (2015), Akinbobola *et al.* (2016), Kassahu and Tesfaye (2017) who reported foreign bodies more in female cattle (20.0%), (18.42%), (17.22%) than males. (15.7%), (8.06%) and (17.15%) respectively.

Particulars of foreign bodies found in the rumen-reticulum

The first category of encountered foreign bodies is foreign bodies of metallic origin and their frequency of occurrence

Table 1: Prevalence of different types of foreign bodies extracted from positive animals slaughtered at Batna Municipal Abattoir.

Animals examined	Positive animals with foreign bodies	Positive animals with VFB	Positive animals with NVFB
298	151	56	95
Prevalence (%)	50.67%	18.79%	21.87%

Table 2: Sex distribution of rumen FBs in cattle slaughtered at Batna Municipal Abattoir.

Sex of animals	Number of examined animals	Number of positive animals With foreign bodies	Prevalence (%)
Male	255	114	75.49%
Female	43	37	24.50%
Total	298	151	50.67%

are presented in Table 3. The foreign bodies detected were nails (26.79%), wire segment (25%), non-differentiated foreign bodies (17.85%), magnet (14.28%), bottle caps (10.71%), needles (3.58%) and hair clips (1.79%).

The second category is foreign bodies of non metallic origin such as plastic bags (54.73%), glass (10.53%), rope (9.47%), caps (8.42%) and piece of cloth (45.27%) were the most frequent encountered foreign body types (Table 4).

Most of them are ingested accidentally but sometimes animals intended toprehend them to overcome nutritional deficiencies they suffer. Varieties of foreign bodies depend

Table 3: Frequency of occurrence of rumen vulnerable foreign bodies (VFB) encountered in cattle.

Type of FB	Number of VFB	Frequency of occurrence (% of animals)
Wire segment	20	14 (25%)
Needles	02	02 (3.58%)
Nails	15	15 (26.79%)
Hair clips	02	01 (1.79%)
Bottle caps	06	06 (10.71%)
Non differentiated foreign bodies	10	10 (17.85%)
Magnet	08	08 (14.28%)
Total	63	56

Table 4: Frequency of occurrence of rumen non-vulnerable foreign bodies (NVFB) encountered in cattle.

Type of FB	Number of NVFB	Frequency of occurrence (% of animals)
Plastic bags	50	52 (54.73%)
Rope	10	09 (9.47%)
Piece of cloth	05	05 (5.27%)
Caps	08	08 (8.42%)
Stones	03	03 (3.16%)
Sand	02	04 (4.21%)
Glass	10	10 (10.53%)
Trichobezoar	03	04 (4.21%)
Total	81	95

Table 5: Illustration of different diseases caused by foreign bodies and number of affected cattle.

Type of diseases	Number of examined female	Number of examined male	Total	Prevalence (%)
Traumatic reticuloperitonitis (TRP)	03	-	03	3.79%
Perireticulare abscess	10	-	10	12.65%
Œsophageal obstruction	-	01	01	1.26%
Non-penetrating reticular and/or ruminal foreign bodies	15	50	65	82.27%
Total	28	51	79	%

mainly on the surrounding environments where the animals were raised. Igbokwe *et al.* (2003) indicated that the metallic objects, dry seeds and ropes might be indiscriminately ingested when imbedded in other available palatable foods. Plastic was the most commonly encountered foreign material in all study animals, followed by cloth and ropes (Tesfaye *et al.* 2012; Sheferaw *et al.* 2014; Negash *et al.* 2015 ; Igbokwe *et al.* 2003; Remi-Adewunmi *et al.* 2004, Akinbobola *et al.* 2016) and Hailat *et al.* 2016).

This indicates the widespread use of plastic bags in these areas leading to environmental pollution due to their improper disposal are non-biodegradable and are the most improperly disposed waste materials in the urban and suburban area (Akinbobola *et al.* 2016). The present study is contrary to the report of Ngoshe (2012) in Nigeria, who reported polythene bag as the only indigestible foreign material seen in cattle and of Khurshaid *et al.* (2013) in Pakistan who reported clothes have higher frequency of occurrence followed by plastics and nails.

Different diseases caused by foreign bodies

In the present study we found traumatic reticuloperitonitis (3.79%) (TRP) perireticulare abscess (12.65%), œsophageal obstruction (1.6%) and reticular and/or ruminal foreign bodies (82.27%).

TRP is relatively common disease in cattle caused by the ingestion and migration of vulnerable foreign bodies in the reticulum. This study was consistent with (Misk *et al.*, 2001) who reported 32 cases of reticuloperitonitis (TRP), 6 perireticulare abscess and 32 reticular and /or ruminal foreign bodies (Table 5).

CONCLUSION

It is concluded that ingestion of foreign bodies is common in cattle slaughtered at Batna Municipal Slaughterhouse and play an important role not only in loss of cattle because of its high mortality and morbidity rates but also it contributes for reduced production and productivity. In order, to save the environment and free grazing ruminants, an appropriate solid waste disposal system need to implement to reduce the prevalence of foreign bodies in cattle and also to protect the environment. We concluded also that the presence of foreign bodies in the rumen-reticulum of cattle, depending on the quantity and duration, caused several complications mainly the rumen impaction, perireticulare abscess and traumatic reticuloperitonitis (TRP).

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