

Original Research Article

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Investigations of Foreign Bodies in Camel (*Camels dromedaries*) Fore Stomach at Tamboul Slaughterhouse, Eastern Gezira, Gezira State, Sudan

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ABSTRACT

A cross sectional study was conducted on one hundred camel slaughtered at Tamboul slaughterhouse from January to March 2021. The study was carried out to determine the prevalence and type of foreign bodies in rumen and reticulum of camel and to assess the association of risk factors with the occurrence of foreign bodies. Postmortem examination was employed for the recovery of foreign body from rumen and reticulum. A total of one hundred camels were examined using systematic random sampling method. 12% of the examined animals were found positive for indigestible foreign bodies in their rumen and/or reticulum. Risk factors such as age, sex, physiological status and nature foreign bodies were taken into consideration. There was statistical significance difference between prevalence recorded in pregnant animals with prevalence of 87.5% of foreign bodies than empty animals with prevalence of 12.5% of the affected animals. Statistical significant difference were recorded in old animals (>6 years) with prevalence of 75% than adult (1-6 year) with prevalence of 25% ($p \leq 0.05$). Prevalence based on sex was showed that 33.3% positive cases observed in male and 66.7% in female individuals. Taking the nature of foreign bodies in consideration 41.7% of them were plastic bags, 33.3%, cloth, and 25.0% were robe. In conclusion, this study proved that the foreign body ingestion found in camel grazing in open areas were contaminated with clothes, plastic material, robes, nails and other indigestible materials could cause serious health problem for free grazing animals.

Keywords

Tamboul, slaughterhouse, camel, foreign bodies, rumen, prevalence

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Introduction

Foreign body ingestion syndrome is a common pathological condition in ruminants that is generally attributed to the indiscriminate feeding conduct of those animals. It leads to numerous serious effects on animal health and economy, such as decreases in the production and reproduction of the affected animals (Radostits *et al.*, 2007; Ramin *et al.*, 2008; Smith, 2015).

Trace element deficiency would possibly play an essential role in the incidence of foreign body ingestion syndrome in dromedary camels (Sadan *et al.*, 2020). Foreign body ingestion syndrome has been related to nutritional deficiency and imbalances in animal nutrients, especially minerals and trace elements such as copper, iron, cobalt, and manganese in addition to selenium (Braun *et al.*, 2018).

The foreign bodies clinical signs include reduced appetite and milk yield, tympani, and gradual body weight loss. Foreign bodies of different types have been found in the camels that underwent surgery, including clothes, plastic bags, and pieces of wood, sand, hair balls, ropes, and leather (Sadan *et al.*, 2020).

In cattle, most of the removed foreign bodies were plastic bags, clothes pieces and plastic bags mixed (Shawaf *et al.*, 2017). Studies have proven that the non-penetrating foreign bodies commonly recovered in bovine stomachs are plastic bags, sack thread, ropes, leather, rubber, mattress linen, pieces of lead pipe, straw baskets, hair and plant fibers (Anwar *et al.*, 2010).

The major penetrating foreign bodies include metal pieces of wire, needles, nails and stones (Ramaswamy and Sharma, 2011; Semieka, 2010).

Braun *et al.*, (2018), who suggested that the surgical management of foreign body impaction in a goat: A case report, aiming at surgical treatment of impaction because of a foreign body, rumenotomy

was performed according to the standard technique and the foreign body cloth weighing over 800 grams which included cloth pieces, plastic, small barb wires and some undigested materials was evacuated from the rumen.

Depending on the nature of the ingested foreign bodies and the diagnostic facilities, the detection of foreign bodies in ruminants' stomachs is automatically executed with the aid of using exploratory surgery and, occasionally, with the aid of using ultrasonography (Radostits *et al.*, 2007; Ramin *et al.*, 2008; Semieka, 2010).

However, some of the cases are diagnosed with the aid of using radiology and by necropsy (Mozaffari *et al.*, 2009; Ramaswamy and Sharma, 2011; Nugusu *et al.*, 2013). Moreover, clinical, ultrasonographic, hematological, and biochemical examinations are considered as tools supporting the correct diagnosis, prognosis, and treatment strategy for rumen-reticulo foreign bodies in camels (Sadan *et al.*, 2020). Most of those foreign bodies have been observed, especially in the fore stomachs, and they're liable for most pathological conditions affecting this area (Tehrani *et al.*, 2012). The presence of foreign bodies in the fore-stomachs of ruminants has received interest in current years and is a topic of interest worldwide, because it has effects on decreased production and in some cases, death of animals (Igbokwe *et al.*, 2003; Remi-adewunmi *et al.*, 2004). In developed countries, industrialization and agricultural mechanization have in addition increased the incidence of foreign bodies in ruminants, even as in developing countries the high rate of incidence is associated with poor farming management (Misk *et al.*, 2004; Semieka, 2010).

The foreign bodies investigated in Saudi Arabia discovered that seven out of the 8 examined animals were younger than 3 months and showed complete obstruction in the cervical oesophagus (Abualenain *et al.*, 2018). With regard to incidence of foreign bodies in association with gender, 20% of female cattle examined had been observed positive even as

the incidence in adult males was 15.7%. Statistical analysis showed that the incidence of foreign bodies is not considerably related to gender. The incidence of foreign bodies was inversely proportional to body condition.

The highest occurrence was found in animals in the worst body condition (thin category) with 38.6% of foreign bodies, even as the fattest animals had the lowest incidence, namely, 3% statistically, there has been a significant difference between the two species in the occurrence of rumen and reticulum foreign bodies.

Olatunji-Akioye *et al.*, (2019), who carried out a study on the occurrence and outcome of surgical removal of gastric foreign bodies in West African dwarf goats in Ibadan to assess the occurrence and effects of surgical removal of gastric foreign body in West African dwarf goats, who observed that the out of 809 goats (ambulatory cases 348(43%) had gastric foreign bodies, while 72(21%) had nylon gastric foreign bodies, out of 70 goats cases presented to Veterinary Teaching Hospital, 51(73%) had gastric foreign bodies, while 37(73%) had nylon gastric foreign bodies. Similarly, all of the 19 goats (bought for the study) had nylon gastric foreign bodies.

Sadan *et al.*, (2010), who suggested the diagnosis and treatment of foreign body swallowing syndrome in camels (*Camelus dromedarius*) with special reference to the role of mineral deficiency. This study describes the clinical presentation of ruminal and reticular foreign body syndrome, and evaluates the effect of mineral deficiency on its occurrence in dromedary camels. Ultrasonographic examinations found the presence of hyperechoic fabric with variable degrees of shadowing, hematological evaluation confirmed a significant.

This study aimed to determine the prevalence and type of rumen and reticulum of foreign bodies in camels and to assess the association of the risk factors with the occurrence of foreign bodies in Tamboul slaughterhouse.

Materials and Methods

Study technique and design

Study area

The study was performed in Tamboul area that is located on the coordinate's 14°56'0" North and 33°24'0" East in Eastern Gezira locality, Gezira State. The samples for this study were collected from Tamboul slaughterhouse that is located close to the market, on every Saturday and Tuesday each week.

Experiment animals

A hundred camel slaughtered at Tamboul slaughterhouse have been used on this study. The camel production system is open grazing and nightkraaling. At the slaughterhouse, an ante-mortem exam was performed with emphasis on assessment of body condition.

It was evaluated based on a five-point scale ranging from 1–5, representing emaciated, poor, acceptable, fats or obese animals, respectively, as described by (Roche *et al.*, 2004; Heinrichs and ishler, 1989).

Study design

A cross-sectional study was carried out at Tamboul slaughterhouse, Eastern Gezira in Gezira state, Sudan. The study was performed over duration of three months from January to March 2021. The sample consisted of all camel that came to the slaughterhouse during the period of the study.

Study procedure

After slaughter, the rumen and reticulum have been carefully removed from the abdominal cavity and located in a box in one of this way as to minimize spillage of contents from the different chambers.

Each rumen and reticulum was opened individually through a longitudinal incision and given a thorough

macroscopic examination of the content through visible inspection and palpation for the presence of foreign materials. All contents in each chamber have been examined thoroughly and foreign materials (bodies) in every chamber noted and recorded.

Statistical analysis

The accumulated data was analyzed using Computer Software Statistical Package for Social Science (SPSS) version 16. Descriptive statistics including frequencies as follows (mean, standard deviation, and percentage), effect of age, sex, breed, and physiological status have been analyzed by use of the Ratio Statistics.

Results and Discussion

Overall occurrence of foreign bodies

As a result of the examination procedure described above, 12% of the a hundred camels slaughtered at Tamboul slaughterhouse were found to have foreign bodies of their fore stomach. The types of foreign bodies were Plastic bags, Robs and Cloth.

Occurrence of foreign bodies according to age group

As indicated in (Table 1), the highest prevalence of 58.3% (7/12) was observed in animals aged 6-9 years old. The no incidence was observed in animals aged between 1-3 years old. The difference of occurrence of foreign bodies between age groups was statistically significant ($p \leq 0.05$).

Occurrence of foreign bodies according to sex

With regard to incidence of foreign bodies in association with sex Table (2) 66.7% of the positive cases (8/12) examined were found to be females, while the rest of the positive cases 33.3% (4/12) were found to be males (Table 2). Statistical analysis showed that the incidence of foreign bodies is not significantly associated with gender ($p \leq 0.05$).

Occurrence of foreign bodies according to physiological status

The prevalence of foreign bodies was inversely proportional to physiological status (Table.3). The maximum incidence was observed in pregnant animals with 87.5% (7/8) of foreign bodies, while the empty animals had the lowest incidence, namely, 12.5% (1/8). Statistically, there is significant difference ($p \leq 0.05$) between the physiologically different individuals (pregnant or empty).

Occurrence of foreign bodies according to their nature (type)

Table (4) showed that the plastic bags had been the most prevalent foreign body type 41.7%, followed by cloth 33.3%. The least prevalent had robe which resemble 25.0% of the foreign found in the stomach.

This study revealed an overall incidence of 12% of foreign bodies, in the stomach of camel slaughtered at Tamboul slaughter house in Eastern Gezira, Gezira state. These results are similar to those of Mushonga *et al.*, (2015) who defined the overall incidence of 17.4% foreign bodies in cattle. The highest incidence 25.3% was recorded in June (the driest month). Also Nebebe (2015), who mentioned that a total of 384 cattle selected using systematic random sampling method and 88 (22.9%) of them have been observed positive for indigestible foreign bodies of their rumen and/or reticulum.

And Rabana *et al.*, (2022), said that the out of 1730 examined small ruminants, 1167 (67.46%) have been determined to have various types of indigestible foreign body of their gastrointestinal tracts. The frequency was significantly higher in goats (38%) than sheep (23.7%). The lower incidence rate of foreign body occurrence between camels and other species may be due to grazing habit, camel graze in open pasture areas while other species kept near to the town of villages where causative agents of foreign bodies are more available.

Table.1 Occurrence of foreign bodies according to age group among the positive group (12)

Age group	Positive case	Occurrence (%)
1-3	0	0
3-6	3	25
6-9	7	58.3
9 and over	2	16.7
Total	12	100

Table.2 Occurrence of foreign bodies according to sex among the positive group (12)

Sex	Positive case	Occurrence (%)
Male	4	33.3
Female	8	66.7
Total	12	100

Table.3 Occurrence of foreign bodies according to physiological status among the positive group (8)

Physiological status	Positive case	Occurrence (%)
Pregnant	7	87.5
empty	1	12.5
Total	8	100

Table.4 Occurrence of foreign bodies according to their nature among the positive group (8)

Foreign bodies nature	Positive case	Occurrence (%)
Plastic	5	41.7
Robe	3	25.0
Cloth	4	33.3
Total	12	100

The present study was showed the strong association between prevalence of foreign body and animal age and they were found to be positively proportional.

This finding is in line with the results obtained by Mushonga *et al.*, (2015)who mentioned that the highest occurrence of foreign bodies had been observed in older animals (5 years and above) than in younger and middle-aged animals.

Also Nebebe (2015), who mentioned statistical significant difference, had been recorded occurrence of foreign bodies between different ages. Also Rabana *et al.*, (2022), suggested the prevalence was found to be significantly higher in adult than young case.

The highest prevalence of foreign bodies in older animals may be due to the longer duration of time

needed for the foreign body to be formed in the stomach

The significantly high prevalence of foreign bodies in males compared to females, and in pregnant females compared to empty ones which supported by the finding of (Mushonga *et al.*, 2015; Rabana *et al.*, 2022; Nebebe, 2015), may be attributed to the fact that pregnant animals have an increased needs for minerals which make them to seek their source everywhere in term of scavenging grazing causing foreign bodies.

The study showed the plastic bags had been the most prevalent foreign body type which supported by findings of (Mushonga *et al.*, 2015; Sadan *et al.*, 2020; Anwar *et al.*, 2010), this may be due to the presence of plastic bags compared to other causes of foreign bodies bearing in mind the increased usage of plastic bags by humans and the absence of popper collection of the and absence of clear recycling policies.

The present study concluded that, due to the changes in human being habits, and due the absence of recycling policies, foreign bodies occurrence may become a risk for camels in areas near owns or cities in Sudan.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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