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A Retrospective Study on The Prevalence of Foreign Body in Goat, Sheep and Cattle in Different Seasons in Khartoum State, 2001-2011

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Abstract: This study aimed to highlight different forms of environmental pollution in animal environment and induces FB occurrence and to compare between the incidence of FB in goats, sheep and cattle in different seasons in Khartoum state. A survey was made to cover some urban areas where goats, sheep and cattle were raised. Number of goats, sheep and cattle cases admitted to the Central Veterinary Hospital of Khartoum (CVHK) with the history of impaction and bloat diagnosed as FB and confirmed by rumenotomy operations were obtained from the records throughout the period of 2001-2011. The surveillance performed during the study revealed that the major hazard to animal health and production came from human miss management to environmental resources. Part of this miss management was reflected in the form of FB in livestock animal. The prevalence of FB was significantly higher in goats compared to the other studied species in all seasons. It was significantly higher during winter and summer in goats compared to autumn. In sheep, the prevalence of FB was significantly higher in winter compared to summer and autumn seasons. The environmental pollution with plastic bags carelessly discarded and the ignorance of the importance of keeping animals in clean and save environment are the main causes for foreign body occurrence. Environment protection and animal welfare and health need Joint efforts between the authorities concerned with public and animal health to state restrict rules to deal with wastes and establishing a system of recycling.

Key words: Foreign Body · Goat · Sheep · Cattle · Seasons · Khartoum

INTRODUCTION

In the Sudan goats and sheep are widely distributed, they are characterized by high adaptive capabilities to different climatic and ecological conditions. In the tropics,small ruminants are raised for milk, meat skin and wool production [1,2] They are mainly raised by nomads and most of them have a semi-residential system [3], while small flocks are kept inside houses. In the wet season, small ruminants utilize the natural pastures and during the dry season they are in pursuit of grazing areas [4]. Generally, small ruminants are raised in the urban and sub-urban areas. In Sudan small ruminants namely goats are raised in small numbers inside houses for milk and meat production. They constitute the main core for their economical support, but they do suffer from environmental pollution with plastic bags. Compared to cattle, goats and sheep are selective feeders and the prevalence of foreign body is said to be of less amount [5]. However; cattle are more likely ingest foreign bodies as they do not use their lips in food prehension [6,7]. All the previous studies related the occurrence of ruminal foreign body to the scarcity of food and poor pasture during the dry season [8] and consequently feeding of animals on polluted environment with plastic bags [9] or other materials [10,11].

This experiment was designed to draw attention to the role of the environmental pollution on the prevalence of FB in livestock in Khartoum state and it occurrence in different seasons.

MATERIALS AND METHODS

Study Area and Data Collection: Khartoum State is located at 15° 33´N, 32° 31´E. The Central Veterinary Hospital of Khartoum (CVHK) located South Khartoum and provides veterinary services to the southern, eastern and western southern areas of Khartoum and sometimes other far areas. From the records, cases of goat, sheep and cattle admitted to CVHK from2001 to2011, diagnosed for

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the prevalence of foreign body and confirmed by operation were reported. A survey was made to different areas in Khartoum State streets and some farms, pictures of plastic bags and other materials present in animals´ environment were taken for documentation.

Statistical Analysis: The data obtained during the survey were evaluated by two way ANOVA [12]. The results were presented as mean ± SE

RESULTS AND DISCUSSION

During this investigation, observations revealed that the man made miss use of the available environmental resources came to be the main cause for FB in domestic animals of Khartoum State. Environmental pollution by garbage, which is composed mainly of polythene bags, was regarded as the main cause of FB prevalence in goats, sheep and cattle. People are directed by the authorities to gather their garbage in big polythene bags in front of their houses so as to be collected latter (Fig. 1). Also the use of polythene bags as containers for shopping instead of paper packaging followed by the careless release of them, formed another source of hazard for wandering goats and sheep (Fig. 2a,b) seeking for areas rich in bushes and water (Fig. 3). In some small farms the very poor design of housing enhances the occurrence of FB, when animals residence is surrounded by thorny walls with flying plastic bags attached to it (Fig. 4a,b). Moreover, sometimes shading is made from plastic mats and cloths which tear out by time and fall down and animals may feed on them without observation (Fig. 5,a,b). In cattle farms, sometimes for easy control during milking or pulling, laboures tie a piece of cloth around the neck or horns by time cattle eat the free part (Fig. 6) as well as the eight shaped rope knot used to control the hind limbs during milking, when released and left on the ground carelessly (Fig. 7a,b). In Khartoum

Fig. 1:

Fig. 2a:

Fig. 2b:

Fig. 3:

Fig. 4a:

Fig. 4b:

Fig. 5a:

Fig. 5b:

Fig. 6:

Fig. 7a:

Fig. 7b:

Fig. 8:

Province farms, cattle are sometimes left to graze in harvested lands or on bushes near by after rainy season. They are usually fed on green fodders and formulated rations which are brought in sacks which are thrown after evacuation and left for cattle to eat while unsupervised (Fig. 8).

Table 1 shows that the total number of cases admitted to the CVHK throughout the observation period with the history of bloat, tempany or being off food and reported as FB was 252. Out of this number, 223(88.49%) were goats compared to 16(5.16%) and 13(6.35%) sheep and cattle respectively. This high number of FB cases reported in goats was significantly ($p<005$) higher (Table 2) in all seasons.

Table 1: Number of cases admitted to the Central Veterinary Hospital of Khartoum /2001-2011

	Species		
Years	Goats	Sheep	Cattle
2001	54	0	0
2002	33	0	0
2003	19	1	4
2004	27	1	3
2005	13	3	0
2006	15	1	1
2007	9	5	1
2008	13	1	1
2009	18	2	2
2010	6	1	3
2011	16	1	0
Total	223	16	13

Table 2: The prevalence of foreign body in goats, sheep and cattle in different seasons

	Season		
species	Winter	Summer	Autumn
Goat	1.82 ± 1.23^{Aa}	1.67 ± 1.38^{Aa}	1.59 ± 1.15^{Ab}
Sheep	0.18 ± 0.32^{Ba}	0.11 ± 0.23^{Bb}	0.07 ± 0.12^{Bb}
Cattle	0.11 ± 0.13^{Ba}	0.07 ± 0.12^{Ba}	0.11 ± 0.21^{Ba}

Values (mean ± SE), for each parameter, with different lower case letters in the same row and with different upper case letters in the same Column differ significantly ($P < 0.05$)

This finding could be related to the dominance of goats amongst the house reared animals. Goats are released every morning from houses to graze freely nearby in the surrounding polluted environment as some people cannot afford feeding them berseem(*Medicago Sativa*) every day. Compared to other ruminants, the increased browsing behavior during dry season and the bipedal stance during feeding in goats [13] may play great roles in the high incidence of FB. Moreover, goats as browsers have small and less complex rumen with rapid consumption of digested food [14] which make them pursuit food any where. Also this noticeable FB cases in goats, could be associated with the very poor housing designs they are kept in, which render them more susceptible. However; sheep are reared in small scaled farms in the town or in small numbers in houses and not left to graze without supervision, most of them are reared for months only and fattened for slaughtering. Similar findings reported high prevalence of FB in live goats [15,16] and was attributed to ingestion of plastic bags from polluted environment. The inconsistency in number of goats suffering from FB observed during the study (Table1) could be associated with people reduced desire to keep goats as the authorities catch and keep wandering goats in the Stray Animals Farm to keep the city green. Nowadays people socially tend to prefer flat residence instead of floor houses, which makes small ruminant rearing difficult. In addition to this, the cost of feeding and providing veterinary services formed an extra burden to people. Similar reduction in FB cases since 1999 was observed [15]. The rate of cattle exposure to FBS is also accidental as they are supervised when grazing outside and FB prevalence is related mostly to their confined environment pollution. The low prevalence of FB in cattle could also be related to the a symptomatic impaction in small size FB. The late discovery of FB in cattle is also associated with the occurrence of rumen impaction when small FBs, trapped in the rumen, pass the rumeno-reticular folds to the reticulum and accumulate in large amounts [7]. However,sharp FBs penetrate the reticular mucosa resulting in traumatic pericarditis and reticulitis [17] noticed mainly in old dairy cows [18]. High prevalence of FBS were reported after many rumenotomies in cattle wandering in the street [9].

Mostly all reported cases showed a high prevalence of FB during winter, which could be attributed to the availability of food following autumn and increased food intake during winter. Food availability and consumption are influenced by seasonal changes and food intake is regulated by a thermostatic mechanism [19]. Food intake increases during winter for the increased requirement of energy budget and thermoregulation [20]. The significantly ($p<005$) higher cases of FB reported in goats during winter compared to autumn and that reported in sheep during winter compared to summer and autumn could be related to the increased food intake and demand of suckling kids born during autumn or at the beginning of winter. Animals may ingest FB while feeding in pastures or may tend to eat other materials nearby to maintain their vital physiological responses [21]. In case of already formed FB, the ingested food will not be able to move to the next ruminal compartment and stasis resulting in accumulation of ruminal fermented gases causing tempany. FB causes indigestion and increases the intra-ruminal pressure [22] leading to poor condition [15].

The significantly ($p<005$) higher incidence of FB observed in goats during summer compared to autumn could be attributed to drought condition and food scarcity. During this period goats ingest indigestible substances and FB is formed [8] resulting in emaciation with FB mass being clear and heavy [23]. Emaciation and loss of body condition is related to the gain of energy requirements from mobilization of protein and fats [24] without any replacement.

The extensive type of rearing of small ruminants in Sudan exposes them to the widely spread indigestible garbage, plastic bags or other materials. Governmental policies and awareness of the importance of clean and healthy environment for animals are needed. Institutions for protection of the environment are active in some aspects, but not namely in FB occurrence control and its economical losses. Food supplying during dry seasons is necessary with the close supervision of animals chasing for it. Further studies are needed to fill the gap in the effects of FB on meat quality, blood metabolites and fertility of both sexes.

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