

## Traumatic indigestion in dairy cattle in rural Kisoro district

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### Abstract

Cattle (*Bos* sp.) are not selective feeders and often ingest foreign objects that cause traumatic injury in their forestomachs that result in indigestion, loss of production and death. However, the prevalence of this problem especially in rural areas is largely unknown. Traumatic indigestion, is frequently encountered in industrialised countries and is a major disease in intensively kept dairy cattle. There was need to investigate the prevalence of traumatic indigestion in rural areas. A study relying on clinical examination and use of a metal detector was conducted on herds under semi-zero grazing, zero grazing and open grazing systems in Kisoro district. Results showed that 24% of the dairy cows sampled had ingested metals with some degree of indigestion. Prevalence of metal ingestion was 61% in semi-zero grazed, 57% in zero grazed and 12% in open grazed cows. Fifteen cows received rumen magnets orally administered by a balling gun. Ten cows were operated upon with removal of various metals and other foreign objects, most spectacular being a two by two meter cotton cloth. Agricultural extension workers, farmers and veterinarians need to emphasize the importance of preventive procedures such as sorting out cattle feeds carefully, provision of mineral salts and administration of rumen magnets to minimise occurrence of traumatic indigestion and subsequently optimum production.

Key words: *Bos* sp., *reticuloperitonitis*, rumenotomy, zero grazing

### Introduction

One of the tenets of modernising agriculture in developing countries is to encourage change in norms and culture to fit with changes in the global world (GoU, 2000). Kisoro district, in southwest Uganda bordering Congo to the West and Rwanda to the South, has been a region of peasant hoe cultivators keeping goats and few zebu cattle. In 1992, Muhabura Diocese (Church of Uganda) introduced dairy cattle farming. The dairy drive got further boost from European Development Fund and the Presidential donations of in-calf heifers largely to women groups. Zero grazing has been the main system of management due to land shortage. In this system animals are confined in stalls or kraals and are hand fed with chopped herbage, fodder and household feed remains.

Cattle are careless feeders and do not discriminate against non-feed materials (Reaves and Henderson, 1963). Therefore, they often ingest foreign objects like nails, metallic wire, plastics and clothing that cause traumatic injury to their forestomachs leading to indigestion, gastritis, peritonitis or even death (Bosshart, 1926; Begg, 1950; Radostitis *et al.*, 1994) depending on how sharp they are and on how deep they perforate the internal organs. Traumatic indigestion, a complex syndrome, is an important disease in developed industrialised countries where it is responsible for great loss of production and high mortality (Frazer *et al.*, 1991; Radostitis *et al.*, 1994). Various descriptive terms such as traumatic gastritis (Bosshart, 1926), traumatic reticulitis (Hansen, 1953) hardware disease (Wrinkler, 1982) or traumatic reticuloperitonitis (Frazer *et al.*, 1991) have been used synonymously with traumatic indigestion.

Preliminary work on hardware disease in Uganda has been carried out around Kampala and in central areas of Uganda, and established that dairy cows were more prone compared to free range local cattle

(Mwanani, 1998; Bizimenyera *et al.*, 2000a, b). Since dairy farming and especially zero grazing is recent in rural Kisoro district, cases of traumatic indigestion were likely to go unnoticed and would most likely result in cattle death. Some of these animals are given to farmers on condition that they give out the first calves to other women. There was need to investigate the prevalence of traumatic indigestion in dairy cattle in rural Kisoro that had recently been introduced to dairy farming to make sure that corrective measures are taken as fast as possible.

### Materials and methods

A clinical study employing stratified random sampling of herds kept on zero grazing, semi-zero grazing and open grazing in each of the three sub-counties of Kisoro district was undertaken. Using cluster sampling, taking a herd as a unit, all animals within a herd were clinically examined. Eighty four (84) herds were chosen as sampling number (n) using the following formula formula:

$$n = \frac{4PQ}{L^2} \text{ (Martin } et al., 1987).$$

where:

P	=	suspected prevalence of the condition	=	30%
L	=	allowable error (diagnosis difficult)	=	10%
Q	=	L-P		

Of the 84 herds selected, 30 were on zero grazing, 30 on semi-zero grazing and 24 on open grazing. Semi-zero grazing was where cows were partially confined in stalls and partially let out on paddocks.

The study relied on clinical examination and use of a metal detector (Vet-Tec ®, Alfred & Cox). Clinically, diagnosis of traumatic indigestion was based on depressed appetite, low production, loss of condition, diarrhoea and abdominal pain (Bizimenyera *et al.*, 2000 a). The metal detector screened cows for presence of metals and was applied around the xiphoid region. Clinically sick cases associated with severe loss of production or presence of metals were subjected to rumenotomy operations. The operations were carried out on the farm using a technique described by Turner and McIlwraith (1989) as modified by Bizimenyera *et al.* (in press). In this modification 15-20 ml of local anesthesia was used to block all the T13, L1 and L2 paravertebral nerves in a standing and feeding animal. Some other cows, depending on cooperation of the owner received a rumen magnet (BOVIVET ®, Kruuse) each, orally administered by a balling gun.

### Results

Of the 300 cows examined, 72 (24%) were found to have ingested metals and other foreign materials with some varying degree of indigestion (Fig. 1). Metal ingestion was 61% in semi-zero grazed animals, 57% in zero grazed and 12% in open grazed animals (Fig. 2). Foreign materials recovered from operated animals included stones, plastics, nails, pieces of metallic wire, textile items, pieces of fishnet and a two by two meter cloth, the type worn by women in Kisoro (Fig. 3).

Rumen magnets were administered to fifteen cows. One of the cows doubled production from 8 liter to 16 liter of milk per day within five days of receiving the magnet. All the ten operated animals recovered well and registered improved production and condition. The cow that had ingested cloth was 8 months pregnant at the time of operation.

### Discussion

The prevalence of metal ingestion of 24% in rural Kisoro was lower than 56% reported in a previous study in central (urban)-areas of Uganda (Bizimenyera *et al.*, 2000 a). Developed countries report

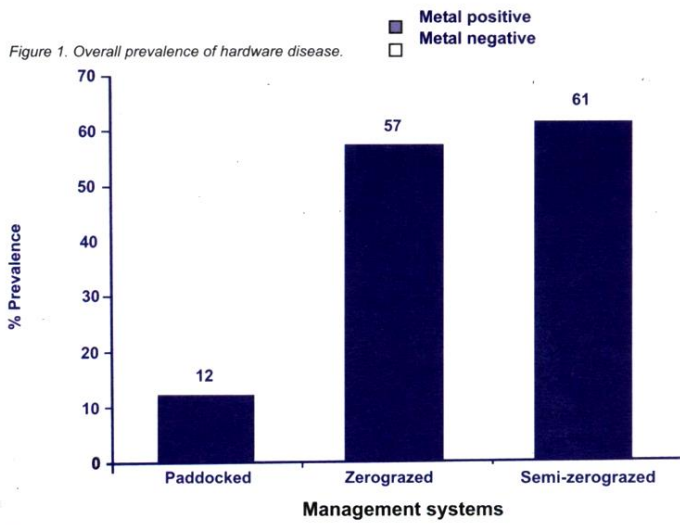
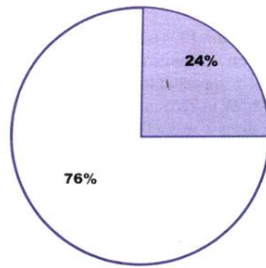


Figure 2. Prevalence of hardware disease per management system.



Figure 3. 2x2 meter cloth removed from 8 month pregnant cow by rumenotomy operation.

prevalence of 70 - 90% (Radostitis *et al.*, 1994). This indicated that traumatic indigestion or hardware disease is a widespread disease even in remote rural areas.

Zero grazing management system appeared to be a risk factor in traumatic indigestion. Mwanani (1998) reported prevalence of 82.5% in zero-grazed herds around Kampala and Bizimenyera *et al.* (2000 b) reported that hardware disease was a big problem among zero-grazed dairy cows. It would appear that in the process of gathering feed materials from household food remains, markets and restaurants, some foreign materials get carried along and accidentally are put into feed troughs. Felony or malice by neighbours has been cited also as a source of foreign objects.

Clinical diagnosis of traumatic indigestion or hardware disease has been a difficult subject since there are no pathognomonic signs (Hofmeyr, 1957; Pinsent, 1962; Bizimenyera *et al.*, 2000a). Most affected animals depict depressed or low appetite, loss of production and loss of condition (as a result of low feed intake), diarrhea and abdominal pain. Where perforating metals or sharp objects are involved, there is in addition grinding of teeth (sign of pain), rough hair coat, recurrent fevers (from peritonitis) and neutrophilia. Radiological diagnosis has been described to be useful (Durchame *et al.*, 1983). Metal detectors do not tell the size or shape of the object or whether it has perforated internal organs or not. Moreover, occasionally there are metals lying harmless in the reticulum without any obvious abnormality in the animal.

Control of traumatic indigestion is as difficult as its diagnosis; both metallic and non-metallic objects cause similar signs of disease. Many methods of control have been devised with limited success. Sorting out of cattle feeds manually to remove foreign objects is the first approach. But the method is cumbersome and prone to human error and fatigue especially where there is a large number of animals. Provision of mineral salts tends to limit the depraved appetite that is licking or ingesting foreign bodies (Poulsen, 1976). Rumen magnets have proved useful in preventing traumatic injury by ferrous metals (Carrol, 1956; Lundvall, 1957) and have been administered to 90% of breeding age heifers in developed countries. However, magnets are less effective when the offending metal is non-ferrous, longer than 3 inches (the size of rumen magnet), crooked or where there are many of them at the same time. Rumenotomy operations, carefully carried out have been reported successful (Michael and McKinley, 1954; Williams, 1955; Bizimenyera *et al.*, 2000a). Bizimenyera *et al.* (in press) have reported a cost - effective operation carried out at farm premises costing \$70.0 as compared to developed countries where similar operation costs \$400.0. Furthermore, although some operations have failed to access foreign objects, operations, generally provide definitive diagnosis. Therefore, an appropriate combination of some of the methods of control outlined may prove more useful in practice.

In conclusion, traumatic indigestion should not be looked on as a disease of cattle in developed industrialised countries only; it is found in all intensive management systems like zero grazing even in rural areas. Agricultural extension workers, farmers and veterinarians need to emphasize the importance of preventive procedures such as sorting out cattle feeds carefully, provision of mineral salts and administration of rumen magnets for optimum production. Carefully performed rumenotomy operations are safe and can save valuable animals.

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### References

- Begg, H. 1950. Diseases of the stomach of the adult ruminant. *Veterinary Record* 62:797 – 863.
- Bizimenyera, E.S., Mwanani, D. and Tweyongyere, R. 2000a. Hardware disease in dairy cattle in Uganda: a retrospective account as seen in general practice. *Uganda Veterinary Journal* 6:51 – 55.
- Bizimenyera, E.S., Tweyongyere, R. and Mugisha, A. 2000 b. Hardware disease: a problem among zero-grazed dairy cattle. *Tanzania Veterinary Journal* 19:107 – 112.
- Bosshart, J. R. 1926. The early diagnosis and treatment of traumatic gastritis. *Cornell Veterinarian* 16:257 – 260.
- Carroll, R. E. 1956. Use of reticular magnets in the control of traumatic gastritis. *Journal of American Veterinary Medicine Association* 129:376 – 378.
- Durchame, N.G., Dill, G.S. and Rendano, V.T. 1983. Reticulography of the cow in dorsal recumbency: an aid in the diagnosis and treatment of traumatic reticuloperitonitis. *Journal of American Veterinary Medical Association* 182:585 – 589.
- Frazer, C.M., Bergeron, J.A., Mays, A. and Aiello, S.E. 1991. Traumatic reticuloperitonitis. In: *The Merck Veterinary Manual 7<sup>th</sup> Edition*. Merck and Co. Inc. Rahway, New Jersey. pp. 224 – 225.
- Government of Uganda (GoU), 2000. Plan for Modernisation of Agriculture: Eradicating poverty in Uganda. Final Draft, April, 2000. Entebbe and Kampala. Government of the Republic of Uganda.
- Hansen, A.G. 1953. Traumatic reticulitis. *Journal of American Veterinary Medicine Association* 122:290-293.
- Hofmeyr, C.F.B. 1957. The diagnosis and differential diagnosis of traumatic reticulitis in the cow. *Journal of American Veterinary Medicine Association* 130:183-186.
- Lundvall, R.L. 1957. Preventing traumatic gastritis with bar magnets. *Journal of American Veterinary Medicine Association* 131:471-476.
- Martin, S.W., Meek, A.H. and Willeberg, P. 1987. Sampling Methods. In: *Veterinary epidemiology*. Iowa State University press. 1<sup>st</sup> Edition, Ames. pp. 22 – 47.
- Michael, S.J. and McKinley, R.E. 1954. Runenotomy simplified. *Journal of American Veterinary Medicine Association* 124:26-27.
- Mwanani, D. 1998. Investigation of prevalence of hardware disease in cattle in and around Kampala district. Special Project Report, Makerere University, Kampala, Uganda.
- Pinsent, P.J.N. 1962. The differential diagnosis of abdominal disorders of the bovine animal. *Veterinary Record* 74:1282 – 1291.
- Poulsen, J.S.D. 1976. Prevention of traumatic indigestion in cattle. *Veterinary Record* 98:149 – 151.
- Radostits, O.M., Blood, D.C. and Gay, C.C. 1994. Diseases of the rumen, reticulum and omasum. In: *Veterinary Medicine, 8<sup>th</sup> Edition*. Bailliere Tindall. London. pp. 259 – 291.
- Reaves, P.M. and Henderson, H.O. 1963. Dairy Cattle Management and Feeding. In: *A Textbook of Dairy Feeding and Management, 5<sup>th</sup> Edition*. John Wiley and Sons. New York. pp. 319 – 321.
- Turner, A.S. and McIlwraith, C. 1989. Techniques in Large Animal Surgery. 2<sup>nd</sup> Edition. Lea and Febiger. Philadelphia. pp. 9-32.
- Williams, E.I. 1955. A study of reticulo-ruminal motility in adult cattle in relation to bloat and traumatic reticulitis with an account of the latter condition as seen in general practice. *Veterinary Record* 67:907 – 922.
- Wrinkler, J.K. 1982. *Farm animal Health and Disease Control*. 2<sup>nd</sup> Edition. Lea and Febiger. Philadelphia. pp. 61 – 62.