

ABATTOIR SURVEY OF FOREIGN BODY RUMEN IMPACTION
SMALL RUMINANTS

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SUMMARY

A survey was carried out on 800 small ruminants slaughtered at Zaria abattoir over a 3 month period. Of these 187 were sheep and 613 were goats. Seventy-seven percent (144 out of 187) of sheep and 20.7% (127 out of 613) of goats were found to have indigestible garbage weighing 0.3 to 2.5kg in their rumen. Sex and age were found to have significant ($P<0.05$) interaction with rumen impaction (RI), occurring more in females of over 30 month of age. Breed distribution of RI in sheep was significantly ($P< 0.05$) higher in Yankasa (81.9%) than in other breeds. Plastic bag was the most prevalent material recovered as observed in 85% of cases. Other materials such as pieces of cloth and leather, shreds of twine and other ropes woven together into various patterns and mango seeds were also recovered. Animals with RI had a poor body condition.

KEYWORDS: Rumen, impaction, foreign, body, small ruminants

INTRODUCTION

The small ruminant industry in Nigeria represents a very important national resource, contributing considerably to the national wealth, supply of protein, raw materials for industries and for festive and religious occasions. Despite the importance of these small ruminants, research efforts to increase the productivity of these species never received desired attention in the early days of livestock research in Nigeria compared with the exotic breed (Nuru, 1985). When the limitations of the performance of the introduced exotic breeds in the 1950s and early 1960s became obvious, it became necessary that the genetic potential of the indigenous breeds

must be evaluated to enhance their productivity.

The earliest research efforts in the 1970s focused on cross breeding of local ewes to improve the indigenous breed of sheep in Nigeria (Nuru, 1985). The research efforts utilized industrial by-products as well as increased production of cereal grains and residues from crops to improve the nutritional level of the animals (Adu *et al.*, 1990). This has helped greatly to solve the problems of poor nutrition in semi-intensive and intensive farming systems but with little impact on the extensive system to which a high proportion of our livestock population belong (Adu *et al.*, 1990).

Apart from inadequate and unbalanced feeding, high disease prevalence and the

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associated neonatal mortality rate, constitute a major problem to small ruminant production. Contributing factors to sheep and goat production also include low level of literacy among owners and poor methods of animal husbandry (Sanni *et al.*, 1995). For instance, small ruminants raised in rural households; nomadic and semi-nomadic; and urban households are raised under the extensive husbandry system. These systems lead to low productivity as a result of low levels of nutrition and high exposure to diseases and the ingestion of garbage from the numerous refuse dumps in our cities (Plate I and II).

Earliest reports of rumen impaction with indigestible plastic garbage were by Abdullahi and Muhammed (1981); Abdullahi *et al.*, (1984) and Otesile and Akpokodje (1991). The condition which was relatively low in the early 1970s in now fast becoming a major problem to sheep production due to the widespread use of polythene bags, lack of adequate and proper legislations on waste disposal and inadequate availability of feed for the animals (Sanni *et al.*, 1998). In the urban areas small ruminants are left to roam and seek their own food (Garba *et al.*, 1994). The area available for them are the refuse dumps generated from the careless manners of household and factory waste disposal. A variety of toxic and non-biodegradable, especially synthetic materials abound in such places. Ingestion of such materials by the animals result into impaction of the rumen (Otesile and Akpokodje, 1991) and reticulum. The presence of these foreign materials in the rumen and reticulum hampers the absorption of the volatile fatty acids and consequently reduction in the rate of animal fattening. The aim of this study is

to assess the prevalence rate of rumen impaction in small ruminants raised in Zaria and environ and problems encountered in the diagnosis and treatment of the condition.

MATERIALS AND METHODS

This study was conducted by carrying out an abattoir survey of rumen impaction with indigestible garbage in small ruminants. Daily visits were made to two slaughter slabs at the Zaria abattoir, Kaduna State, to study the prevalence of rumen impaction with indigestible garbage in sheep and goat from October–December, 1994.

At slab A, most of the animals slaughtered are from the urban area of Zaria and such animals were slaughtered and flayed. At slab B, the animals were from villages and they are usually slaughtered and the hairs removed by burning leaving the skin to be cut along with the muscles.

The sex, age, breed, weight, and body condition scores as described by Russel (1978) were recorded. The rumen was also palpated prior to slaughter. After slaughter, the rumen contents were examined, abnormal materials were removed, washed, dried and weighted.

RESULTS

A total of 800 sheep and goats were slaughtered with 440 in slab A and 360 in slab B. Of these, 187 were sheep and 613 were goats. Of this 77.0% (144 out of 187) of sheep and 20.7% (127 out of 613) of goats had indigestible garbage in their rumen (Table I).

TABLE I: Rumen impaction in small ruminants (sm) slaughtered at Zaria abattoir

SM TYPES	SLAB A		SLAB B		Total
	Garbage Present	Absent	Garbage Present	Absent	
Sheep	136(17.0)	41(5.1)	8(1.0)	2(3.0)	187(23.4)
Goats	82(10.3)	181(22.6)	45(5.6)	305(38.1)	613(76.6)
Total	218(27.3)	222(27.7)	53(6.6)	307(38.4)	800(100)

*Percentages in Parenthesis

Case of RI in sheep was significantly higher $P < 0.05$ in females (84.0%) than in males (16.0%). Similar observation was recorded in goats (Table II). Breed distribution of RI in sheep was significantly higher $P < 0.05$ in Yankasa (81.9%) than in other breeds (Table III). Age distribution of RI in sheep and goats was significantly higher $P < 0.05$ in older animals than younger animals (Fig. 1).

TABLE II: Sex distribution of rumen impaction in sheep slaughtered in slabs A and B at Zaria abattoir

Sex	Frequency	Percentage
Male	23	16.0
Female	121	84.0
Total	144	100

TABLE III: Breed distribution of rumen impaction in sheep slaughtered (slab A & B), Zaria abattoir

Breed	Frequency	Percentage
Yankasa	118	81.9
Uda	21	14.6
Balami	5	3.5
Total	144	100

The garbage recovered per animal weighed between 0.3 to 2.5kg with an average weight of 116gm. Some of the materials recovered from the rumen of sheep and goats examined are shown in Figs. 2, 3 and 4. Plastic bags were the most prevalent material recovered and was observed in 85% of cases.

Body condition score of animals with rumen impaction ranged between 0 and 2 (Table IV).

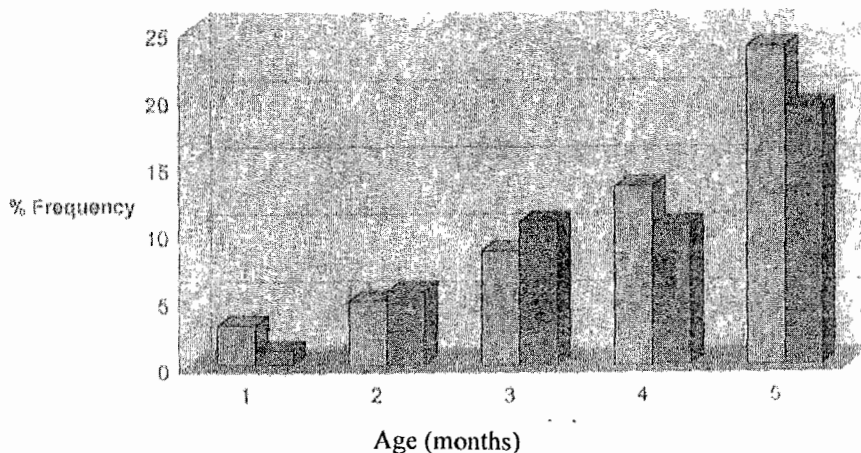


Fig. 1: Age distribution of rumen impaction in sheep and goat slaughtered in Zaria abattoir

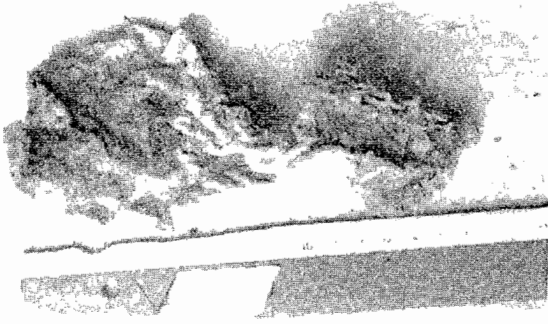


Fig. 2: A piece of leather removed from a 5-year old Yankasa ewe at Zaria abattoir

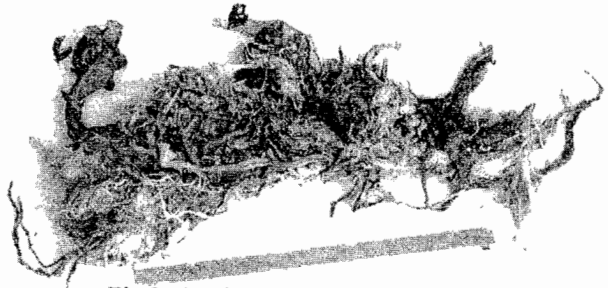


Fig.3: A mixture of white (B) and carbon filled grades (C) of polythene bags woven into a strand, removed from a Balami ewe at Zaria abattoir



Fig.4: Interwoven Light white polythene (D), shreds of ropes and bags (E) and Mango seeds (F) recovered from a 12-month old ewe at Zaria abattoir

TABLE IV: Mean body condition score and garbage weight difference sexes of small ruminants with rumen impaction

	SLAB A			SLAB B		
	Male	Female	SE	Male	Female	SE
Total Animals	115	325		182	178	
Body weight (kg)	15.97 ^b	22.07 ^a	1.17	18.16 ^a	18.37 ^a	0.88
Body condition score	1.75 ^b	1.98 ^a	0.15	2.36 ^a	2.05 ^b	0.14
Weight of Garbage (gm)	15.35 ^b	87.20 ^a	2.90	0.68 ^a	3.25 ^a	2.72

SE: Standard error of means; abc: Means bearing different superscript are significantly different (P<0.5).

Rumen impaction occurred more in sheep and goats slaughtered at slab A with 49.5% (218 out of 440) while only 14.7% (53 out of 360) was observed at slab B. Most of the animals slaughtered at slab A were from the urban area of Zaria, while those slaughtered at slab B were from villages and were younger animals mainly bucks consisting 97% (350 out of 360) of the total number of small ruminants. Only 35% of RI were

diagnosed ante mortem through abdominal ballotment and palpation.

The animals slaughtered in slab A had poorer body condition score and more garbage in their rumen (Table V). The weight of garbage recovered was significantly higher in older animals slaughtered in slab A (Table VI).

TABLE V: Mean body weight, body condition score and garbage weight of small ruminants with rumen impaction

SLAB A	OVINE			CAPRINE				
	I	II	III	I	II	III	IV	V
Total No. of animal	153	19	2	182	67	2	4	11
Body weight(kg)	22.02 ^b	32.32 ^a	21.65 ^b	21.65 ^b	19.36 ^b	16.50 ^b	16.77 ^b	19.64 ^b
Body condition score	1.78 ^a	1.74 ^a	1.50 ^a	2.01 ^a	2.09 ^a	2.00 ^a	2.00 ^a	1.82 ^a
Garbage weight (gm)	114.0 ^{ba}	274.4 ^{ab}	362.5 ^a	25.0 ^c	18.7 ^{cb}	105.2 ^{bc}	81.6 ^{bc}	35.5 ^c
SLAB B	I	II	III	I	II	III	IV	V
Total No. of animals	10	3	0	275	72	0	0	0
Body weight (kg)	18.73 ^b	24.77 ^a	0.00	17.98 ^b	19.8 ^b	0.00	0.00	0.00
Body condition score	1.16 ^c	3.33	0.00	2.18 ^{cb}	2.37	0.00	0.00	0.00
Garbage weight (gm)	20.14 ^a	0.00	0.00	1.81 ^b	0.01	0.00	0.00	0.00

	OVINE			CAPRINE				
I.	Yankasa			I.	Sokoto Red		II	Kano Brown
II.	Balami			III.	West African Dwarf		IV	Borno White
III.	Uda			V	Crosses			

abc= Means bearing different superscript are significantly different (P<0.05)

TABLE VI: Mean body weight, body condition and garbage weight of small ruminants by age

SLAB	AGE (Months)					SE
	<12	13-18	19-24	25-30	>30	
SLAB A						
Total no. of Animals	98	78	28	63	173	
Body weight (kg)	12.67 ^b	18.41 ^c	20.92 ^b	22.68 ^b	24.96 ^a	5.43
Body condition	1.72 ^b	1.88 ^{ab}	1.75 ^b	2.0 ^{ab}	2.06 ^a	0.17
Garbage weight (gm)	2.78 ^c	39.87 ^{bc}	90.61 ^{ab}	52.61	120.65 ^a	1.00
SLAB B						
Total no. of Animals	147	85	27	24	77	
Body weight (kg)	16.70 ^b	19.68 ^a	18.41 ^b	17.6 ^b	19.83 ^a	4.22
Body condition	2.31 ^{ab}	2.37 ^a	2.04 ^b	1.67 ^c	2.09 ^{ab}	0.66
Garbage weight (gm)	0.00 ^b	0.025 ^b	1.28 ^b	4.73 ^{ab}	7.16 ^{ab}	0.03

SE: Standard error of means

abc, Means bearing different superscript are significantly different (P< 0.05)

DISCUSSION

The significantly higher incidence of RI in females may be associated with hormonal changes during pregnancy (Russel, 1978), especially in ewes carrying twin pregnancy. The gravid uterus which reduce the rumen space by the weight of the foetus. Another reason could be due to ingestion of non-biodegradable plastic materials which gets lodged in the rumen thereby compromising the ruminal space and interfering with the normal physiologic functions of the rumen hence the weight loss in animals with RI (Sanni *et al.*, 1998).

The significantly higher occurrence of RI in Yankasa breed could be attributed to its larger population in the area of study as reported by the national livestock statistics (FLDPCS, 1991).

The observed difference in age distribution of RI in sheep may be due to the gradual ingestion of indigestible materials which accumulates in the rumen as the animal age (Sanni *et al.*, 1995).

The significantly higher occurrence of RI in sheep than in goats observed in this study could be due to the highly selective nature of goats while grazing (Murray, 1980). The clinical signs observed in this study are similar to those earlier reported by Abdullahi and Muhammed (1981) and Crichelow and Leeh (1986). This similar findings maybe a pointer to the presence of RI in small ruminants. The diagnosis of RI has been based on abdominal ballotment which is inconclusive (Abdullahi *et al.*, 1984) because masses of these impacted foreign materials may be mistaken for a foetus during ballotment as observed by Garba and Abdullahi (1995).

CONCLUSION

The results of this survey indicates that rumen impaction is very common in our small ruminants and it is an important management and environmental problem. The resultant loss of weight, and loss through death or premature culling and high cost of surgical treatment due to rumen impaction may constitute a major economic loss to small ruminant producers in Nigeria. The live weight of small ruminants may be affected by rumen indigestible garbage giving a false increase of up to 2.5kg.

REFERENCES

- ABDULLAHI, U.S. AND MUHAMMED, G.S.A (1981). Rumen impaction with indigestible garbage (A taste of bad management and enigma to clinical diagnosis). 7th Annual Conference of the Nigerian Society for Animal Production, Jos. Abstract pp 12.
- ABDULLAHI, U.S; MUAHMED, G.S.A. AND MSHELIA, T.A. (1984). Impaction of the rumen with indigestible garbage in cattle and sheep reared within urban and Sub-urban environment. *Nig. Vet. J.*, 13: 89-95.
- ADU, I.F; GEFU, J.O; TAIWO, B.B.A; MAGAJI, S.O; OCHE, M.O. AND OTARU, S.M. (1990). Improved systems for small ruminant production in southern Nigeria. Report of phase I brown utilization survey in southern Nigeria. National Livestock Project Department, Kaduna. Nigeria.

- CRICHLAW, E.C AND LEEH, B.F. (1986). Forestomach epithelial receptor activation by rumen fluids from sheep given intra ruminal infusions of volatile fatty acids. *Am. J. Vet. Res.*, **47**: 1015-1019.
- FLDPCS (1991). Nigerian National Livestock Survey. Federal Livestock Department and Pest Control Services, Abuja, Nigeria. Volume 2. pp 289.
- GARBA, H.S AND ABDULLAHI, M.Z. (1995). Problems associated with pregnancy diagnosis by abdominal ballotment in small ruminants in Nigeria. 30th Annual Conference of the Nigerian Society for Animal Production, Minna, Abstract pp 54.
- GARBA, H.S.; DANGI, A.I AND BAKO, A. (1994). Survival of small ruminant on refuse dumps in Sokoto metropolis. 19th Animal Conference of the Nigerian Society Animals Production, Benin. Abstract pp 42.
- MURRAY, R.A. (1980). Nutrition in ewes and rams. In Digestive Physiology and Nutrition. Volume 3 – Practical Nutrition. Editor D.C. Church. 2nd Edition pp 184 – 206.
- NURU, S.(1985). Trends in small ruminant production in Nigeria. In: Small ruminant production in Nigeria. In Proceedings of National Conference on Small Ruminant Production, Zaria – Nigeria. pp 35 – 50.
- OTESILE, E.B. AKPOKODJE, J.U. (1991). Fatal ruminant impaction in West African dwarf goats. *Trop. Vet.*, **9**: 9 – 11.
- RUSSEL, A.J.F. (1978). The nutrition of the pregnant ewe. In: Management and Diseases of Sheep. Paper presented at a British Council Speech Courses, Edingurgh. 5th – 17th March, 1978. pp 238 – 239.
- SANNI, B.D.; GYANG, E.O; OSINOWO, A.O; AND EMA A.N. (1995). Studies on plastic bag rumen impaction in sheep. 20th Annual Conference of the Nigerian Society Animal Production, Minna.
- SANNI, B.D; GYANG, E.O AND OSINOWO O.A (1998). Polythene bag induced rumen impaction in small ruminants: An environmental hazard. In: Proceedings of the Silver Anniversary Conference of the Nigerian Society for Animal Production and the Inaugural Conference of the West African Society for Animal Production. Abeokuta. pp 97 – 98.