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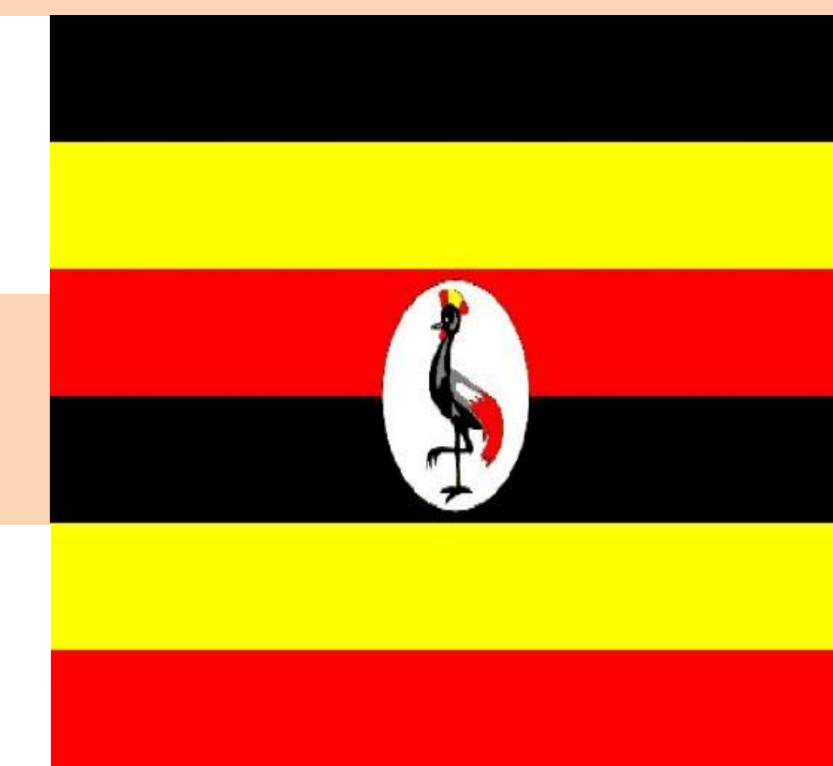


Subclinical Mastitis (SCM) in dairy cattle in Kiboga district (Uganda): Burden, causes and choice of antibacterial drug for effective control

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Introduction and significance of study

Previous studies (Byarugaba *et al.*, 1998, Kintu *et al.*, 2000) indicate that the prevalence of mastitis in Uganda has been well over 60% since the 1970s up to the present. The persistence of such high burden of the disease has been perpetuated by poor management and hygiene as a result of low adoption of appropriate control methods by dairy farmers (Anri, 2012).

This study aimed at identifying current practices in dairy farms that perpetuate SCM and to determine the causative pathogens which will indicate to us the control measures by the nature of the isolates with some extent to potent antibacterial drug suitable for control of *Staphylococcus aureus* (SA) related to SCM.

Materials and Methods

A total of 124 cows were sampled from 12 farms, in 3 sub-counties, based on accessibility, district veterinary records and herd structure after stratifying them in August 2012. All the animals on the farms visited were not on antibiotic treatment and without a history of clinical mastitis in the last 3 months were all included

Bacteriological examinations were performed with a 50µl of composite milk sample, placed on each half of the demarcated 5% sheep blood agar plate. A 100µl sample of transportation can milk (TCM), calf saliva, teat-washing bucket water and milking salve were spread and cultured too. The bacterial colonies cultured were identified based on the simplified identification methods (Anri 2012).

As to SA infected herds, representing isolates were submitted to CDL for antibiotic susceptibility tests using Muller Hilton Agar (MHA) and antibiotics.

Results and Discussion

Predisposition to SCM: Hygiene

Farm (F)	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	F ₈	F ₉	F ₁₀	F ₁₁	F ₁₂
Rank (TCM)	6	6	6	5	6	5	6	6	5	5	6	6
water	5											
C. saliva	4											
M.salve	Absent		2		Absent		3		Absent			

Rank: 1-very clean, 2-clean, 3-dirty, 4-very dirty, 5-very very dirty, 6-extremely dirty



Unhygienic personnel, environment & milking materials; lack of knowledge on SCM & poor milking practices lead to high SCM prevalence.

The herd hygiene was found to be very very dirty (rank 5) and extremely dirty (rank 6) from the TCM results. Teat-washing water was contaminated with rank 5 and the calf saliva was found to be equally dirty. Milking salve was found at selective farms and the farms that had it, it was found to be contaminated.

Majority of farms (90%) had mixed infections

Sub-county	Farm	No of Cow	No. of Quarters affected (CMT)				Bacteria spp* Isolated						
			0	1	2	3	4	SA	CNS	SAG	OS	CB	CO**
Kapeke	F 1	17	0	0	1	3	13	5	12	2	3	0	3
	F 2	20	0	0	3	8	9	11	18	3	2	0	1
Town Council	F 3	3	0	0	0	0	3	0	3	0	0	0	1
	F 4	5	0	0	0	1	4	2	5	0	1	0	0
	F 5	8	0	1	4	1	2	1	8	0	0	0	0
	F 6	4	0	0	2	1	1	0	4	0	0	0	0
	F 7	4	0	0	0	1	3	1	4	0	0	0	0
	F 8	4	0	0	0	1	3	0	4	0	0	0	0
	F 12	9	1	1	1	2	4	0	7	0	0	0	0
	F 9	30	2	4	1	7	16	6	20	0	2	10	1
Lwamata	F 10	8	1	0	1	1	5	1	8	1	1	0	0
	F 11	12	1	2	4	0	5	0	12	0	0	0	0
Total		124	5	8	17	26	68	27	105	6	9	10	6
(%)			4	6.5	13.7	21	54.8	21.8	84.7	4.8	7.3	8.1	4.8

*SA: *Staphylococcus aureus*; CNS: Coagulase-negative staphylococci; SAG: *Streptococcus agalactiae*; OS: Other streptococci; CB: *Corynebacterium bovis*; CO: coliforms

**considered to be contaminants during sampling

The prevalence of SCM in the current study (87.9%) is higher than what was previously reported by Byarugaba *et al.*, (2008) and Abrahmsen (2012) at 61.3% and 86.2% resp.

Choice of Antibacterial against SA

Location	Farm (F)	Penicillin	Tetracycline	Gentamicin	Cloxacillin	Trimethoprim-sulfamethoxazole	Neomycin	Streptomycin	% RF
Kapeke	F ₁	R	R	S	R	S	S	S	42.6
	F ₂	R	R	S	R	S	R	S	57.1
Town Council	F ₄	R	R	R	R	S	R	R	85.7
	F ₅	R	R	S	R	S	R	R	71.4
	F ₇	R	R	R	R	S	R	S	71.4
Lwamatta	F ₉	R	S	S	R	S	R	S	42.6
	F ₁₀	R	S	S	R	S	R	R	57.1
%RD		100	71.4	28.6	100	0	85.7	42.6	

Wide spread resistance against Beta-lactam, tetracycline & aminoglycoside leaves only potentiated sulfonamide as the suitable drug of choice. Irrational drug use were likely causes of resistance as majority of farmers were their "vets"

- Results of CMT score indicate that over 60% of the cows tested had somatic cells ranging from 900,000 to 2,700,000 counts per ml of milk.
- 55% of cows had all the 4 quarters diagnosed with SCM
- 75% of them had more than 2 quarters affected.

In-vitro results show marked resistance of SA to common affordable antibiotics thus drug resistance

Bacterial culture results indicate that the most prevalent isolates were environmental pathogens such as CNS (84.7%) which demonstrates the milking hygiene is very poor in the tested farms.

However, incidence of SA (21.8%) is not negligible, because of its zoonotic involvements and difficulty of control. Since coliforms (CO) are usually associated with clinical mastitis, this proportion was due to the contamination of the milk samples during sample collection (Anri, 2012).

Conclusion and recommendations

Improving farm hygiene: The very poor hygiene of cow's resting area and personnel who milk the cows were perhaps the biggest contributor to the spread of SCM.

Improving farmers' knowledge on SCM: Creation of awareness among farmers through training and provision of simple extension materials on SCM will help in uptake methods that reduce the burden of the disease.

In such SA infected herds, practices of the isolation of SA infected cows and the teat-dipping using a Iodine solution are strongly recommended for the prevention of further infection.

Introduction of dry cow therapy: Lack of knowledge on dry cow therapy was reported in all the farms yet this is one of the efficient ways of overcoming SCM with the use of effective drugs. Selection of antibiotics in DCT of SA infected cows should be based on susceptibility tests.

Improvement of extension service: veterinarians, students and other stakeholders have to be trained adequately so that they are equipped to offer the highly needed practical services to the farmers and other clients in the industry.

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