Research Application Summary

Milking procedures and prevalence of mastitis and mastitis specific-pathogens in selected smallholder dairy herds in Zimbabwe

Simbarashe Katsande[1], Matope, G.[2], Pfukenyi, D.M.[3] & Ndengu, M.[3]

[1]Department of Animal Science, Faculty of Agriculture and Veterinary Sciences, P. O. Box MP 167 Mt. Pleasant, Harare, Zimbabwe

[2] Department of Paraclinical Veterinary Sciences, P. O. Box MP 167 Mt. Pleasant, Harare, Zimbabwe

[3]Department of Clinical Veterinary Sciences, Faculty of Veterinary Sciences, P. O. Box MP 167 Mt. Pleasant, Harare, Zimbabwe

Corresponding author:

Abstract

A cross-sectional study was carried to collect milk samples for bacteriological examination and somatic cell counting in diary cows in Zimbabwe. Of the total animals tested, 172 (29.5%) had mastitis with 84% (144/172) of them having subclinical and 16% (28/172) clinical mastitis. The mean somatic cell count for culturally positive samples ($738.1x10^3 \pm 58.1$) was significantly higher compared to that of negative samples ($34.7x10^3 \pm 2.8$). Most of the farmers practiced normal milking routine although a few occasionally did not follow routine milking practices. Thus, the control of this type of mastitis should focus on measures to prevent animal-to-animal transmission.

Key words: Mastitis, somatic cell counting, Zimbabwe

Résumé

Une étude d'échantillons représentatifs a été portée pour rassembler des échantillons de lait pour un examen bactériologique et un comptage de cellules somatiques des vaches laitières au Zimbabwe. De l'ensemble d'animaux examinés, 172 (29.5%) ont eu la mastite avec 84% (144/172) d'entre eux ayant la mastite sub-clinique et 16% (28/172) ayant la mastite clinique. Le compte moyen de cellules somatiques pour les échantillons culturellement positifs ($738.1x103 \pm 58.1$) était sensiblement plus haut comparé à celui des échantillons négatifs ($34.7x103 \pm 2.8$). La plupart des fermiers ont pratiqué la routine de traite normale bien qu'un petit groupe d'entre-eux parfois n'aient pas suivi de pratiques de traite routinières. Ainsi, la surveillance de ce type de mastite devrait se concentrer sur des mesures d'empêcher la transmission d'un animal à l'autre.

Mots clés: Mastite, comptage de cellules somatiques, Zimbabwe

Background

Bovine mastitis is an inflammation of the mammary glands of dairy cows accompanied by physical, chemical, pathological

and bacteriological changes in milk and glandular tissue (Hurley and Morrin, 1997; Shitandi *et al*., 2004). An important factor in mastitis is the high cost of control due to antibiotic treatment, discarded milk, financial penalties and reduced lactation yield, often resulting in culling. This often amounts to significant annual losses (Mungube *et al*., 2005). The mastitis situation could be managed by improving milking procedures and hygiene in the herd (Haltia *et al*., 2006). The general objective of the study was to determine the prevalence of mastitis and specific-pathogen mastitis and somatic cell counts in the smallholder dairy sector in Zimbabwe.

Literature Summary

In Tanzania, the prevalence of mastitis was significantly higher in dairy animals at both herd and animal levels than in traditional animals (Mdegela *et al*., 2005). In Zimbabwe, smallholder dairy enterprises are still characterized by low productivity and relatively small herds. However, there is great potential for improving productivity even under smallholdings (Hanyani-Mlambo, 2000).

Study Description

A cross-sectional study was done to collect milk samples aseptically before milking from 584 cows in four dairy schemes in different agro-ecological regions of Zimbabwe for laboratory tests on specific-mastitis pathogens and somatic cell counts. Clinical mastitis was identified on the basis of clinical signs, including abnormal milk and/or a hard or swollen udder. Laboratory tests were carried out to culture likely pathogens using the procedures described by Haltia *et al.* (2006). A standardized questionnaire was used to obtain data on the hygienic procedures used by the smallholder dairy farmers in Zimbabwe using the Snowballing sampling technique.

Research Application

Most farmers (58%) milked cows in parlors, 31.2% outside the kraal, 6.8% in the kraal and 4% either in the kraal or outside. All interviewed farmers used hand milking with most milking (67.1%) being done by family members. Relatively low percentages of the farmers used dry or wet cloth for cleaning udders. For drying of the udders, 54.2% used separate clothes but a relatively higher percentage (31.5%) used the same cloth for drying udders from different cows. A few farmers (5.5%) responded that they used the cow's tail for drying the udder. Relatively high mastitis prevalence was recorded in this study. *Staphylococcus* spp*., Escherichia coli* and *Klebsiella* spp. were the most common bacterial isolates. Of the total animals tested, 172 (29.5%) had mastitis with approximately 84% (144/

172) of them having subclinical and 16% (28/172) clinical mastitis. The prevalence of mastitis varied significantly (P<0.01) with breed. Pure dairy breeds and dairy crosses recorded a significantly higher prevalence compared to the indigenous beef breed and beef crosses. The mean somatic cell count for culturally positive samples ($738.1 \times 10^3 \pm 58.1$) was significantly (P < 0.001) higher compared to that of negative samples ($34.7 \times 10^3 \pm 2.8$). The variation in SCC and mastitis prevalence resulted from the presence or absence of an infection, parity, area and breed.

Table 1. Mean (±s.e.) somatic cell counts (x 10^3 cells/ml) for culture positive and negative milk samples from cows from selected smallholder dairy farms of Zimbabwe (2009 – 2010).

Breed	Positive milk samples	Negative milk samples
Indigenous beef (Mashona)	$492.7^a \pm 73.6$	$30.2^c \pm 2.9$
Pure dairy	$635.6^b \pm 159.8$	$44.7^d \pm 24.4$
Holstein/Friesian crosses	$962.7^b \pm 134.4$	$30.2^c \pm 5.0$
Jersey crosses	$852.7^b \pm 179.1$	$34.8^c \pm 6.4$
Red Dane crosses	$798.3^b \pm 152.7$	$41.4^d \pm 6.8$
Beef crosses	$626.1^b \pm 99.6$	$57.2^d \pm 21.4$

Figures with a different superscript in a row or column are significantly different at P < 0.05.

Recommendation

The control of this type of mastitis should focus on measures to prevent udder-to udder transmission by improving milking procedures and hygiene.

Acknowledgement

References

Haltia, L., Honkanen-Buzalski, T., Irina Spiridonova, I., Arvi, O. and Myllys, V. 2006. A study of bovine mastitis, milking procedures and management practices on 25 Estonian dairy herds. *Acta Veterinaria Scandinavica* 48:1-6.

Hurley, L. and Morrin, E. 1997. Introduction to mastitis. In: Hurley (Ed.) Lactation. University of Illinois, Urbana, USA.

Mdegela, R.H. *et al*., 2005. Mastitis in smallholder dairy and pastoral cattle herds in the urban and peri-urban areas of the Dodoma Kabula, municipality in central Tanzania. *Livestock Research for Rural Development* 17.

Hanyani-Mlambo, B.T. 2000. Integrated livestock- crop production systems in the smallholder farming systems in Zimbabwe. In: Proceedings of a review workshop held in 10-13 January 2000, Harare, Zimbabwe.

Mungube, E. O. *et al.* 2005. Reduced milk production in udder quarters with subclinical mastitis and associated economic loss in crossbred dairy cows in Ethiopia. *Tropical Animal Health and Production* 37:503-512.

Shitandi, A., Anakalo, G., Galgalo, T. and Mwangi, M. 2004. Prevalence of bovine mastitis amongst small holder dairy herds in Kenya. *Israel Journal of Veterinary Medicine* 59:1-2.