

Dynamics of mastitis and its control in the smallholder dairy system in Jinja District, in Uganda

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Summary

A study was conducted in Jinja district to collect data on the occurrence, risk factors, current control methods of mastitis, drug resistance patterns of bacteria isolates, and also to establish the farmers' knowledge and attitudes towards mastitis and its control. Both qualitative and quantitative methods were used to obtain data and milk samples screened for mastitis and microbiologically examined for the causative agents and their susceptibility to a selected panel of antibiotics. Mastitis was confirmed as a problem with a high prevalence (61%). A high level of resistance was also found among the isolates. The study revealed that sub-clinical mastitis is the biggest problem, which is reflected in very low milk yields and there are individual farmer variations concerning farming systems, management factors, conditions and possibilities for solutions and control.

Introduction

Studies in Uganda indicate that the prevalence of mastitis is well over 60% since the 1970s up to the present and is related to poor management and hygiene as a result of low adoption of appropriate control methods by dairy farmers (Okello-Uma 1974, Byarugaba *et al.*, 1998, Kintu, *et al.*, 2000). Drug resistance is also reported as a big problem in other areas of the country (Nakavuma, *et al.*, 1994, LIRI, 1996, Kintu, *et al.*, 2000) and this further complicates the matter calling for more effective preventive measures. A cross-sectional study was therefore conducted to estimate the levels of mastitis as well as the pertaining conditions in terms of management, farming systems, risk factors, etc that influence the occurrence of mastitis in order to design the appropriate interventions for further study.

Materials and methods

Study area and population: The study was conducted in Jinja district, and on the basis urbanization, three areas were randomly selected for the study to represent the urban (Jinja Municipality) sub-urban (Mafubira, Kakira, Mpumudde) and rural (Budondo and Butagaya sub-counties). The study targeted small holder dairy farmers, which means 1-20 dairy cows, which were kept under different conditions.

Data collection and analysis: Farms were stratified by herd size (small 1-5, medium 6-10, large 11 – 20). At an estimated prevalence of 70% (Okello-Uma 1974, Byarugaba *et al.*, 1998, Kintu, *et al.*, 2000) and at 95% confidence interval, 210 cows were selected from 60 farms (convenience sampling), using EPI INFO package. Data on cattle breed, parity, age, teat and udder situation as well as the mastitis history of the cows were collected on designed forms. Hygiene assessment of the different farms

was also assessed. Qualitative research methods (group focus and individual interviews) were used to determine the farmers' knowledge on mastitis and their perception of their own strategies. The occurrence of mastitis was determined by the prevalence of the disease in the study area. The selected cows were subjected to a clinical udder examination. CMT and visual milk inspection was made, and samples taken for bacteriological culturing and resistance patterns for antibiotic resistance. After data editing, descriptive analysis was performed using EPI-INFO and SPSS software.

Results

Household characteristics: In 53.3% of the herds, male farmers had the responsibility for the herd, and 55% of the farmers were peasants, whereas 18 % were civil servants beside the farming business. Fifty percent of the farmers had an education level of secondary school.

Farm characteristics: In 75% of the herds, temporary shelters were used as the main housing facility. Barbed wire was used as fence in 60.4 % of the herds , and 75% of the units had concrete floor. In 55% of the farms, zero-grazing was practiced, and cut and carry fodder was practiced by 95% of the farmers, and supplementary feed of some kind by 90% of the farmers. Elephant grass was provided as 50% of the feed, and maize bran as 40.4% of the supplementary feed.

Milking: All farmers hand-milked their cows. One farmer (1.7%) reported a frequency of once, 96.6% of the farmers did so twice and one farmer milked thrice a day. Only 66.1% of the farmers followed a particular order of milking the cows. The order followed by the various farmers is presented in Table 3 below. The milking place was cleaned by 96.5% of the farmers. The animals are milked by employees (52.5%), by family members (30.5%) or by a combination of the two (16.9%). The milking hygiene in many herds were – by observation – estimated as critical.

Occurrence of Mastitis: Using CMT the prevalence of mastitis was 61% of the cows, of which 0.7% was clinical mastitis and 60.3% was subclinical mastitis. Farmers expressed generally no awareness of the presence of sub-clinical mastitis. All the clinical cases were due to bacteria pathogens. The distribution of cases by number of CMT positive quarters and stage of lactation is shown in Figure 1. In 44% of the cases, single organisms were isolated while 56% of the infections were found mixed. *Staphylococci* were the most isolated organisms. The organisms showed high resistance to the commonly used antibiotics, Penicillin and Tetracycline (90-100%).

Risk Factors: Several risk factors were attributed to mastitis such as soiling of the teats, parity, and high milk production. Of all the soiled cows, 80% were CMT positive as compared to 61% of the clean ones. Of the cows in the first lactation only 54% were CMT positive compared to those in their fourth lactation (63.5% CMT positive)

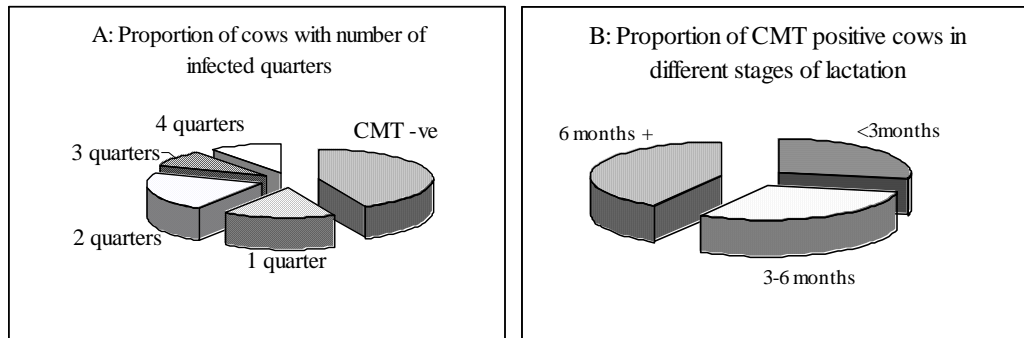


Fig.1. Distribution of cases by number of CMT positive quarters and stage of lactation

Farmers' knowledge on Mastitis: Of the 60 respondents, 83.3% had prior knowledge of the disease and 71.2% reported it as a major constraint. Mastitis was ranked as the second important animal health constraint after East Coast Fever. The majority of the farmers (79.7%) had various means of checking for mastitis like from clinical picture, or change in milk production in a cow. Checks at every milking are performed by 83.3% of farmers. The majority of farmers (98.3%) were aware of the losses caused by mastitis and the losses included reduced milk production (52.6%), treatment costs (16.5%), low income realized (13.4%), death (72%), low milk quality (8.2%) and deformed udder (2.1%). The major constraints to mastitis control included high treatment costs (60.8%) and insufficient or lack of veterinary services (17.6%).

Discussion and conclusions

A high prevalence of mastitis was established, despite the knowledge on the risks associated with occurrence of mastitis. A high level of antibiotic resistance was found and must raise major concern. Hence, there is need to identify the most appropriate control strategies for mastitis, which are cost effective, easily adopted by farmers and are sustainable. The biggest problem identified is subclinical mastitis. Development of strategies to control it and thus reduce the losses due to reduced milk production. The findings emphasize the fact that mastitis is one of the major diseases, and suggest that it may be a major factor in limiting milk production. It is a disease complex which causes high economic losses to the dairy farmer in terms of extra labour, losses of milk and involuntary cullings, and in terms of direct treatment costs. Farmers knew some of the important mastitis control methods and had some other additional control strategies in place. These methods are either inadequate or are not strictly followed, as evidenced by the high prevalence established by the microbiological analyses. Considering the constraints to mastitis control, improving hygiene, improvement of access to veterinary services and educating of the farmers are suggested to be major ways forward in reduction of the prevalence of mastitis.

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