Reduced Milk Production in Udder Quarters with Subclinical Mastitis and Associated Economic Losses in Crossbred Dairy Cows in Ethiopia

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ABSTRACT

The objective of the study was to estimate the losses associated with subclinical mastitis (SCM) in crossbred dairy cows in the Central Highlands of Ethiopia. A split udder investigation was performed with 30 cows to determine production losses associated with SCM. Each quarter of the study cows was examined using the California Mastitis Test (CMT) and quarter milk production was measured over a period of 8 days. Production losses were determined for different CMT scores by comparing production of quarters with CMT score 0 to quarters with CMT scores trace, 1, 2 and 3, respectively. Using data from a recently published study, economic losses were determined for different farm sizes and production subsystems by multiplying the prevalence of the respective CMT scores with the production losses associated with these CMT scores. Mean quarter milk production was 0.82 ± 0.40 kg per milking in the split udder trial. Milk production was reduced by 1.2%, 6.3%, and 33% in quarters with CMT scores 1+, 2+, and 3+, respectively. Using data from the published study, a quarter with SCM lost an average of 17.2% of its milk production. Production losses associated with SCM were estimated at 5.6% for the Addis Ababa Milk Shed. Stratified losses were highest (9.3%) in urban dairy farms (UDF) and small-scale farms (6.3%). The estimates of the financial losses ranged from US$29.1 in dairy herds in secondary towns (DHIST) to US$66.6 in UDF. A total loss of US$38 was estimated for each cow per lactation. Reducing mastitis in UDF (highest prevalence) to the level of DHIST (lowest prevalence) could reduce the loss by US$35. As this does not include costs associated with treatment or culling of diseased cows, this figure probably underestimates the possible benefits of control measures.

Keywords: California Mastitis Test, economics, Ethiopia, milk production, subclinical mastitis

Abbreviations: CMT California Mastitis Test; DHIST, dairy herds in secondary towns; PUDF, peri-urban dairy farms; SCM, subclinical mastitis; UDF, urban dairy farms
INTRODUCTION

Bovine mastitis, especially the subclinical form, is widely considered to be the most costly disease facing the dairy industry (Blosser, 1979; Raubertas and Shook, 1982; Schepers and Dijkstra, 1991). Estimates of the economic impact of mastitis and mastitis control measures vary widely (McDermott et al., 1983; Rivard et al., 1986; Goodger and Ferguson, 1987; Bartlett et al., 1990; Schepers and Dijkstra, 1991). The variation in impact may result from differences in the farming system and in levels of production, assessment methods and scope of the impact assessed (Omore et al., 1999). Economic analysis of mastitis is required to balance the cost of instituting a control programme against the losses attributable to this disease. This is an essential component of most modern planned animal health programmes (Thrusfield, 1995).

Mastitis losses include reduced milk production, cost of treatment, and culling (Houben, 1995). They account for 78%, 8% and 14% of the total losses, respectively (Schepers and Dijkstra, 1991). Significant losses in milk production from individual cows have been shown to be associated with elevated somatic cell counts; higher cell counts mean greater loss and vice versa (De Graves and Fetrow, 1993; Houben, 1995). Subclinical mastitis (SCM) accounts for over 90% of the total loss in milk production (Schepers and Dijkstra, 1991).

Very limited, if any, published data are available to quantify milk production losses associated with SCM in crossbred dairy cows under tropical conditions. To expand this limited database, this study was designed to estimate production losses associated with subclinical mastitis in crossbred dairy cows under tropical conditions.

MATERIALS AND METHODS

A split udder trial was undertaken to obtain data on quarter milk losses in crossbred cows under tropical conditions, rather than using the findings published for Western Europe and North American conditions (Dobbins, 1977; De Graves and Fetrow, 1993; Houben, 1995). This trial was carried out in 30 crossbred dairy cows (Friesian × indigenous breeds) at the Holetta Agricultural Research Centre, Ethiopia. All the cows were managed similarly. Each cow was hand milked over an 8-day period and the milk from each quarter was put separately in a bucket. Although cows were milked twice daily, only the late-afternoon milking was used for the study.

The California Mastitis Test (CMT) was used to diagnose subclinical mastitis. This approach was chosen to determine the quarter milk production with/without subclinical mastitis. In this split udder trial, the inclusion criterion was that a cow had to have at least one healthy quarter (CMT score 0). CMT scores were determined prior to the onset of the investigation and were assumed to be constant throughout the 8-day study period. Quarters that scored trace, 1+, 2+ and 3+ were considered positive for subclinical mastitis; otherwise negative (Dobbins, 1977).

To estimate economic losses to dairy farms with different production systems in the Addis Ababa Milk Shed, data from a recently published cross-sectional study were used (Mungube et al., 2004). Briefly, 363 cows from three production systems (Addis