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The cost of clinical mastitis in the first 30 days of lactation: an economic modeling tool

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Introduction

Mastitis is arguably the most common disease of dairy cattle worldwide. It may result in many negative outcomes for the cow, including pain, decreased production, premature culling, and death. The dairy producer incurs the cost of these negative outcomes through reduced quality and quantity of milk and increased production costs. The highest risk period for the detection of clinical mastitis (CM) is in early lactation, and includes the detection of infections acquired during the dry period, as well as infections occurring in early lactation. Clinical mastitis in the early postpartum period can have an impact on lactation performance, affecting both the mammary gland and the overall health of the cow. The dry period and the early fresh period represent the greatest opportunity for management interventions to improve, or potentially worsen, the health of the udder and its ability to produce quality milk throughout lactation. The purpose of this study was to create an accurate and customizable tool to be used by dairy veterinary consultants to help their clients assess the economic effects of CM during the first 30 days of lactation (DIM), in order to better guide decision making and management interventions during the transition period.

Materials and Methods

A deterministic partial budget was created to estimate the economic impact of CM occurring within the first 30 DIM. Model inputs were selected from the available literature and recent market reports, or, when none were available, from clinical experience with actual herd data. Major model inputs included a milk price of $0.21/lb ($0.46/kg), replacement heifer cost of $2073, market value of culls of $0.83/lb ($1.84/kg), overall lactational culling risk of 30% for primiparous and 40% for multiparous animals, incidence of CM in the first 30 DIM of 10%, and the use of non-saleable milk to feed calves. The economic impact/case of CM was divided into direct and indirect costs. Direct costs included diagnostic test-ing, therapeutics, non-saleable milk, veterinary service, labor, and death loss. Indirect costs included future milk production loss, premature culling cost, and future reproductive loss.

Results

Based on the model inputs, the overall cost/case of clinical mastitis during the first 30 days in lactation was $439. Direct costs accounted for only 27% of the total costs of a case ($119) when non-saleable milk is used to feed calves, whereas indirect costs accounted for the remaining 73% ($320). The category that had the greatest economic impact was the cost of premature culling for cows with mastitis, which represented $173, or 39% of the total cost/case. Future milk production losses accounted for 30% of the cost/case, or $132/case of clinical mastitis. Future reproductive losses accounted for only 4% of the total cost, or $15. The economic impact of direct costs included diagnostics ($10, or 2% of total), therapeutics ($36, or 8% of total), non-saleable milk ($18, or 4% of total), veterinary service ($4, or 1% of total), labor ($21, or 5% of total), and death loss ($29, or 7% of total).

Significance

The findings showed that a majority of the costs associated with clinical mastitis in early lactation were indirect costs that occur over the remainder of that lactation. There is a large opportunity to mitigate these costs by managing udder health during the transition period to prevent clinical mastitis in early lactation. This method of cost estimation is highly adaptable to individual farms and allows for evaluation of management interventions. The model inputs can be customized to specific situations and updated to current economic data. The model structure also allows for future adjustment of the effects of mastitis as more data become available.