

# Promoting prudent use of antimicrobials on moderate-sized dairies: use of pathogen-based protocols for the treatment of nonsevere clinical mastitis in 8 New York herds

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## Introduction

Selective treatment strategies for clinical mastitis (CM) promote targeted treatment of cases that will benefit from antibiotics, such as quarters infected with gram-positive organisms. A published trial by our group evaluated outcomes for the use of 24 h turnaround of culture results 7 d/wk to guide treatment decisions. In that study, cultures were performed at a certified diagnostic laboratory allowing for accuracy of results and confirmation of contagious and more obscure organisms. However, many dairies may not have access to a reference laboratory with a 24 h turnaround. The purpose was to determine if a selective treatment protocol for non-severe CM could be effectively implemented on the moderate-sized dairies of NY (500 to 1000 cows) that might not have daily access to a professional diagnostic laboratory.

## Materials and Methods

Two scenarios were investigated: use of on-farm culture (OFC), which has been assessed as a rapid and reliable way of diagnosis, or 5 d/week sample pickup, simulating a veterinary facility or diagnostic lab with the capacity to culture less frequently. The study was conducted at 8 farms in NY. Two different diagnostic groups were investigated. Dairies in the OFC group (n=2) were trained to use Minnesota triplates to diagnose etiology of non-severe CM. Dairies in the 5-day pickup group (n=6) submitted milk samples from all non-severe CM cases to Quality Milk Production Services 5 d/wk and waited 24 h for diagnostic results prior to the treatment of CM cases. Upon receipt or interpretation of results, dairies followed a treatment protocol decided upon by management and the herd veterinarian. Due to inconsistencies in event and treatment recording, lack of established protocols, and/or redundant or overlapping protocols, interpretation of mastitis incidence, number of CM cases, and chronicity of CM cases before the start of the trial was likely inaccurate; statistical comparisons for these benchmarks were not performed. Compliance, antimicrobial use, and chronicity of cases during the trial were calculated. Bulk tank somatic cell counts (BTSCC) and mature equivalent milk production

(ME305) were also assessed. Percent agreement and kappa statistics were used to compare OFC results with diagnostic laboratory results for the appropriate herds. Satisfaction and monetary savings were determined using a questionnaire.

## Results

A total of 1,031 cases of non-severe CM were enrolled: 34.4% of cases were no-growth, 27.3% were gram-positive organisms, and 30.9% of cultures were gram-negative pathogens. Three of the 6 dairies in the 5 d pickup group elected to extend their “wait-to-treat” period over the days when samples were not retrieved. On average, 82.5% of cows were treated according to the established protocol (n=851 cases). Compliance to the protocol ranged from 59% to 96%, and was higher for the dairies in the 5-day-pickup group. BTSCC was also similar before and after the study for 7 dairies. One dairy experienced a drop in the BTSCC of 100k cells/mL, which can be explained by their apparent increase in monthly CM incidence. This suggests improved proficiency in mastitis detection. No changes in ME305 were observed for the 8 dairies. The number of correct diagnoses for OFC herds was 188/304, or 61.8% agreement. Kappa statistics were 0.42 and 0.48, falling within the “moderate” category of strength of agreement. Overall, inconsistencies and irregularity of data recording with respect to mastitis events and treatments was drastically improved with implementation of the program. Reductions in antimicrobial usage ranged from 6.8% to 92.5%, dependent on farm protocol and pathogen profile. Accounting for the cost of cultures, savings on antibiotics alone was between \$2,200 and \$4,600 projected over the course of 1 year.

## Significance

Use of a pathogen-based treatment protocol based on 5-day per week results or OFC results is effective on moderate-sized dairies and has the potential to decrease antimicrobial use.