

Pasteurization Effects on *Mycobacterium paratuberculosis*, *Escherichia coli* 0157:H7, *Salmonella* spp, *Listeria monocytogenes*, and *Staphylococcus aureus*

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Introduction

This study evaluated the efficacy of on-farm commercial pasteurization units and their effectiveness in destroying *Mycobacterium paratuberculosis*, *Escherichia coli* 0157:H7, *Salmonella* spp, *Listeria monocytogenes*, and *Staphylococcus aureus* in saleable bulk-tank milk inoculated with both a low inoculum level (between ~102 and 103 CFU/ml) and a higher inoculum (between ~105 and 106 CFU/ml).

Materials and Methods

The pasteurizers (batch/vat and continuous-flow) used in this study were made for on-farm commercial use. Saleable bulk-tank milk was obtained from the University of Minnesota campus dairy farm. In a series of experiments, batches of milk were put into the respective pasteurizers and inoculated with the appropriate level of pathogens. The pasteurizers were heated to the specific time and temperatures: 145°F (62.7°C) for

30 minutes for the batch/vat pasteurizer and 161°F (71.6°C) for 15 seconds for the continuous-flow pasteurizer. Pre- and post-pasteurization (0, 24, and 48 h) samples were taken from each of the triplicate runs performed for each of the two pasteurizers. Milk samples were plated onto selective media for each pathogen and incubated at 98.6°F (32°C) for the appropriate time.

Results and Conclusions

All of the post-pasteurization samples showed no growth for *E. coli* 0157:H7, *Salmonella* spp, *L. monocytogenes*, and *S. aureus*. The HEYM/ Mycobactin J slants from the milk samples for the *M. paratuberculosis* are in week 5 of incubation. From the results obtained, pasteurization with both on-farm units (batch/vat and continuous flow) was shown to destroy *E. coli* 0157:H7, *Salmonella* spp, *L. monocytogenes*, and *S. aureus* effectively. Because it will take 16 weeks to determine a true negative for *M. paratuberculosis*, results are still pending.