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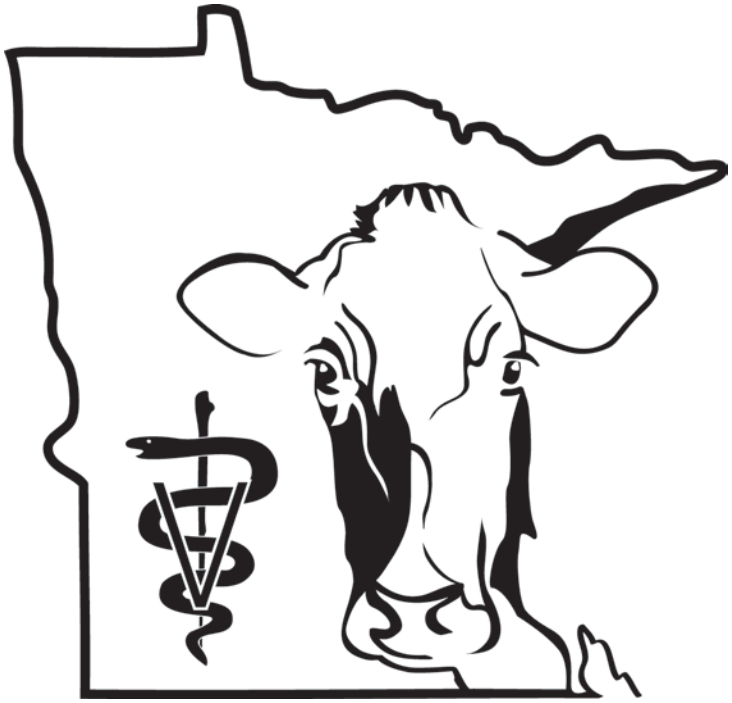

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Controlling Bacterial Contamination and Proliferation in Fresh Bovine Colostrum

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Introduction

An unacceptably high mortality rate (8.4% to 10.7%) exists among preweaned heifers on U.S. dairy farms according to the National Animal Health Monitoring System. Key risk factors contributing to these high mortality rates are suboptimal colostrum management resulting failure of passive antibody transfer. Factors associated with successful colostrum management must include quality of colostrum fed (immune globulin concentration), how quickly the first feeding occurs and quantity provided at first feeding. To achieve the essential factors hand feeding the calf and larger volume at first feeding are recommended by the National Animal Health Monitoring Service. Despite these recommendations an unacceptably high preweaning dairy heifer mortality rate remains. Thus, the need for colostrum improvement and calf management remains. Controlling bacterial contamination in colostrum may be one area for quality improvement.

Objectives

The objectives of this study were to identify points where bacterial contamination of bovine colostrum occurs during the harvest and feeding processes, and to describe the effect of refrigeration and use of potassium sorbate preservative on bacteria counts in stored fresh colostrum.

Methods

First-milking colostrum samples were collected directly from the mammary gland, of 39 cows, from the milking bucket, and from the esophageal feeder tube. Aliquots (15 ml) of colostrum were collected from the milking bucket and allocated to one of four treatment groups: i) refrigeration, ii) ambient temperature, iii) refrigeration with potassium sorbate preservative, and iv) ambient temperature with potassium sorbate preservative. Subsamples from each treatment group were collected after 24, 48, and 96 h of storage. All subsamples underwent bacteriological culture for total plate count and coliform count determinations.

Results

Bacteria counts were generally low in colostrum collected directly from the gland. However, significant bacterial contamination occurred during the harvest process. No additional bacterial contamination occurred between the bucket and the esophageal feeder tube. Storing colostrum at warm ambient temperatures resulted in the most rapid increase in bacteria counts, followed by intermediate rates of growth in non-preserved refrigerated samples or preserved samples stored at ambient temperature. The most effective treatment studied was the use of potassium sorbate preservative in refrigerated samples. In these samples the total plate count and total coliform counts dropped significantly and then remained constant during the 96-h storage period.