Split Udder Comparison of Teat Disinfectants on Skin Toleration During Winter and Spring

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Summary and Implications

The purpose this trial was to evaluate the skin toleration of a new experimental acidified sodium chlorite (ASC) barrier teat disinfectant compared to a standard non-barrier chlorhexidine product with emollients (winter) and a high emollient, iodine barrier (spring) using a split-udder study to focus on the disinfectant effects as well as barrier teat dip issues in winter. Teat skin and end scores were similar between dips as long as the experimental dip was removed with good udder preparation prior to milking. Failure to remove the barrier dip resulted in poorer teat skin and end scores. This points out the necessity for good proper udder preparation premilking when barrier dips are used post milking.

Introduction

The development of a new teat disinfectant requires thorough research including demonstrating that the product is efficacious and well tolerated on skin. Measuring skin toleration can be challenging because many factors other than the disinfectant can influence teat skin health such as environmental conditions, bedding, and operational parameters of the milking systems. Typical methods of monitoring skin toleration during commercial use cannot account for these factors, which often limit researchers to seek to only confirm a lack of negative effects. The purpose of this research was to evaluate the skin toleration of a new experimental acidified sodium chlorite (ASC) barrier teat disinfectant compared to a standard non-barrier chlorhexidine product with emollients (winter) and a high emollient, iodine barrier (spring) using a split-udder study to focus on the disinfectant effects.

Methods and Materials

A research herd of 170 cows were graded on a weekly basis from December to May for teat skin and teat end scores on a 1 to 5 scale using standard methods . Animals were housed in 3 separate barns (2 tie stalls and 1 free stall) with early-mid lactation animals in the tie stalls. Animals were milked 2X at 4 am and pm. Cows in free stalls would have exposure to environmental temperatures at all times but milking. Cows in tie stalls were exposed to external temperatures going to the holding area for milking, up to 1 hr. in the holding area, and return to the tie stall barn post milking (5-45 minutes). Cows also had 4 additional hours of exposure (10 am – 2 pm daily) when winds chills were > 0^{o}F. Baseline scores were established for the first 5 weeks in which both halves of the udder were dipped in a non-barrier 0.35% chlorhexidine (CHX) teat dip containing 2.5% glycerin commonly used during winter (Pro-Tek, Monarch, Ecolab). The experimental acidified sodium chlorite barrier teat dip comprised two-parts mixed fresh prior to each milking containing a combination of lactic acid and mandelic acid, the humectant glycerin, and emollient and film-forming polymers manufactured by the Alcide Corporation. Starting in January, half the udder was dipped in the experimental ASC barrier teat dip, and the other half was dipped with the non-barrier chlorhexidine product. Control teat ends were blotted dry with a cloth towel before parlor exit if wind chills were < 0^{0}F. During the last week of March (week 16), control dip was changed to a high emollient (12%), iodine (I2) barrier dip (I-O Block, Klenzade, Ecolab). Pre-milking preparation involved dipping with 0.25% iodine dip (Predine, Monarch, Ecolab), wiping with individual terry cloth towels and fore-stripping before milker unit attachment. Average teat skin and teat end scores were calculated and the test for significant differences used the non-parametric Mann-Whitney U Test ($P < 0.05$).

Results & Discussion

The baseline grading using the non-barrier chlorhexidine product on both halves of the udder demonstrated the improvement in precision for the split udder design. While weekly teat score averages varied by as much as 0.09 over the 5 week period, differences in split udder grade averages were no greater than 0.02. The comparison of the ASC barrier teat dip to the non-barrier chlorhexidine product over 16 weeks, showed a period of increasing teat end and teat skin scores during week 3-5 for the barrier dip that coincided with observations that the barrier film was not being fully removed during pre-milking cleaning. Milkers were instructed to pay greater attention to the pre-milking barrier removal and teat skin and teat end subsequently matched that of the non-barrier winter teat dip for the remainder of the study. Data from weeks 16- 20 (spring) comparing ASC experimental barrier and high emollient iodine control dips showed no significant differences on teat skin or ends. Data from one farm on a field trial with this barrier product showed some severe teat damage due to freezing when cows were exposed immediately postmilking to severe cold wind chill (data not shown). This study confirmed that the barrier disinfectant, if

used properly, is equivalent to a non-barrier and barrier high emollient teat dips under winter and spring conditions for skin toleration, that good pre-milking practices are important, and barriers should be discontinued when potential conditions exist postmilking that can lead to freezing before the dip dries.

Baseline Teat Skin and Teat End Scores with Non-Barrier CHX Teat Dip

	Average Scores	Range	Largest Split UDDER Differences
Teat Skin	1.04	1.00-1.09	0.01
Teat End	1.87	1.82-1.94	0.02

Split Udder Comparison: ASC Barrier Teat Dip vs Control Teat Dips During Winter-Spring