Research Notes

Arm & Hammer Animal and Food Production

CERTILLUS shifted total *Clostridia* and *C. perfringens* counts on U.S. dairy operations toward a lower-risk microbial makeup.

INTRODUCTION

Clostridia are prevalent in feed, soil and the cow's digestive tract. In a pathogenic form, they are a known contributive cause of Hemorrhagic Bowel Syndrome (HBS), while non-pathogenic strains have been shown to negatively impact productivity and efficiency in the rumen, even when clinical signs are not present.

ARM & HAMMER™ utilizes the Microbial Terroir™ process to design Targeted Microbial Solutions™—proprietary strains of *Bacillus* selected to combat dairy-specific challenges (CERTILLUS™).

STUDY OVERVIEW

A study[1] was conducted to assess the clostridial biodiversity of thirty-two U.S. dairy operations (approximately 90,000 cows) across 10 states. Fecal samples were collected both prior to and after the use of CERTILLUS for 90 to 200 days. *Clostridia* and *Clostridium perfringens* populations were quantified and sorted into low-, moderate- and high-risk categories.

RESULTS

U.S. dairies were sampled and total *Clostridia* and *C. perfringens* counts were shifted in all herds, with an overall reduction in counts within the high-risk group (Figures 1 and 2).

Across dairies sampled, on-farm observations before and after feeding CERTILLUS included:

- More consistent manure
- More consistent intakes
- Fewer off feed events
- Fewer GI-related deaths
- Fewer cows in sick pen
- Positive energy corrected milk response
- Smoother transition
- Increased rumination

FIGURE 1: Shift in risk before and after feeding CERTILLUS

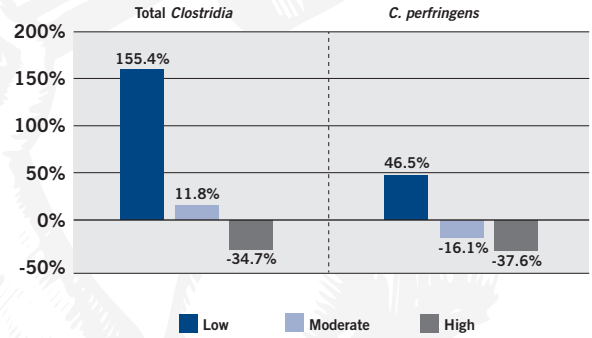
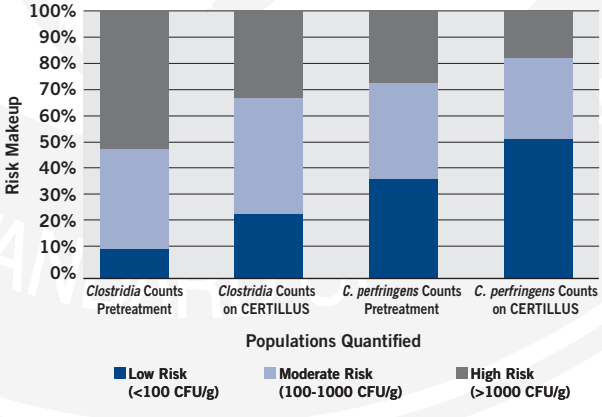


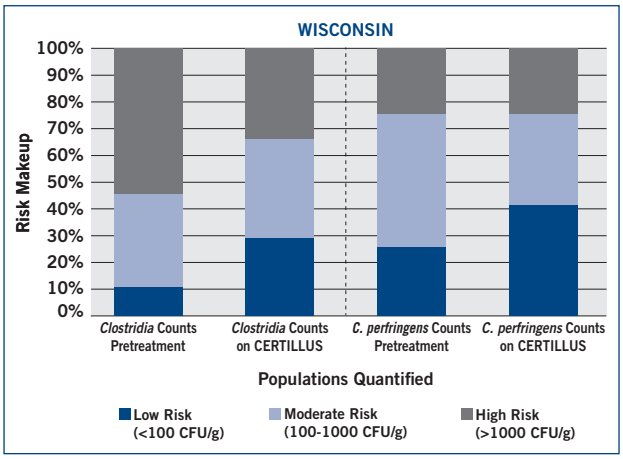
FIGURE 2: Shift in risk before and after feeding CERTILLUS

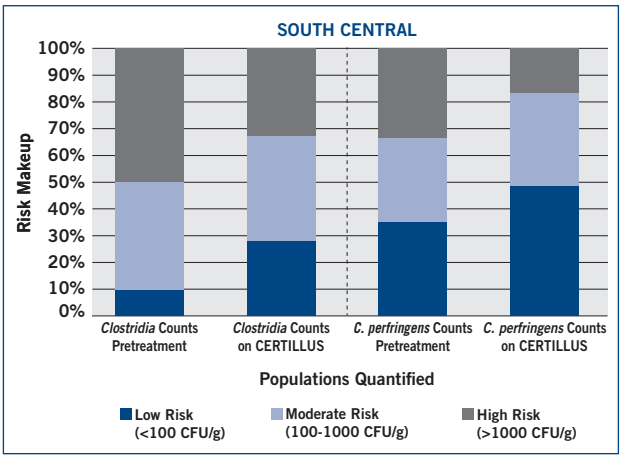


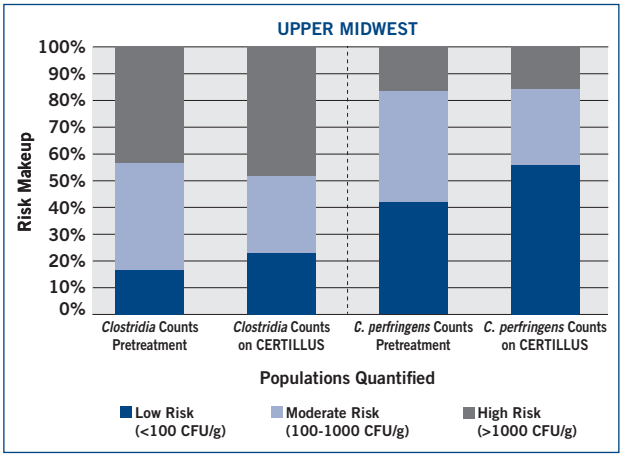
CONCLUSION

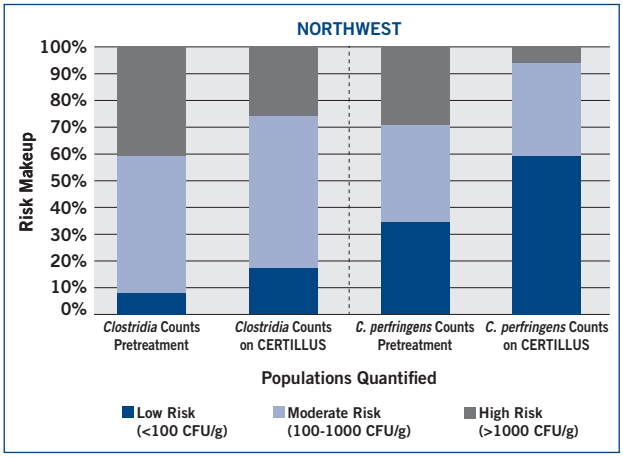
Across the dairies sampled, the addition of CERTILLUS™ repeatedly changed the clostridial biodiversity, regardless of region, moving cows toward a lower risk of disease irrespective of herds' microbial makeup before feeding the product.

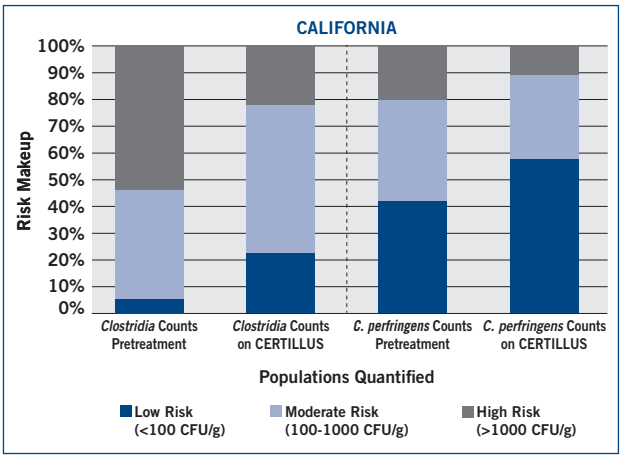
APPENDIX – SHIFT IN RISK BEFORE AND AFTER FEEDING CERTILLUS BY U.S. REGION

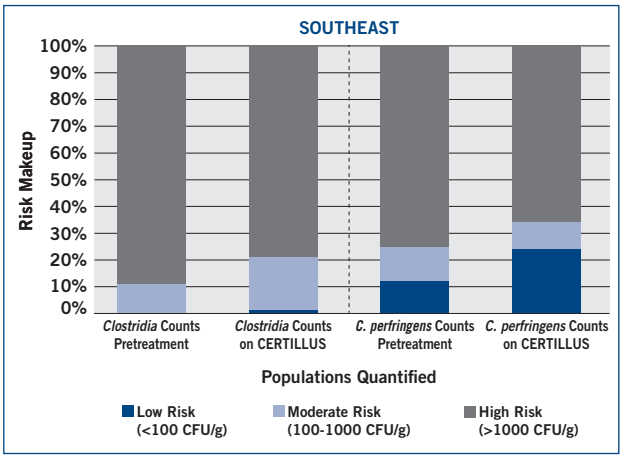












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1 *Clostridia* Population Assessment in Dairy Herds After the Use of CERTILLUS. ARM & HAMMER, 2019. Data on file.