Technical Bulletin

Arm & Hammer Animal and Food Production

CERTILLUS Prime inoculant for *Clostridia* control.

INTRODUCTION

CERTILLUS™ Prime is an inoculant that includes scientifically selected lactic acid producing bacteria, formulated to drive an efficient fermentation to retain crop nutrients and *Bacillus subtilis* bacteria to help manage *Clostridia* growth in forage. When forage, mostly alfalfa haylage, is ensiled at a high moisture level (>65% moisture) there is a risk the natural *Clostridia* bacteria in the forage could dominate the fermentation and produce butyric acid as a by-product.

Haylage with a clostridial fermentation can be identified by high moisture content, dark green appearance and a strong offensive butyric odor. Since the production of butyric acid by the *Clostridia* is inefficient, dry matter losses tend to be high, and poor palatability makes it difficult to meet the energy requirements of early lactating cattle. To compensate for this energy deficit the cow may mobilize large quantities of body fat, making them prone to ketosis.

To observe the effectiveness of the CERTILLUS Prime inoculant, *Clostridia* challenged alfalfa was packed in mini silos—one batch was treated with CERTILLUS Prime and one batch served as a control (no treatment).[1] Fermentation was monitored over several weeks after ensiling, and *Clostridia* levels were quantified after approximately 140 days. After approximately 140 days of fermentation the haylage was exposed to aerobic conditions to simulate the feed out phase; *Clostridia* levels were then monitored.

FIGURE 1: pH level.

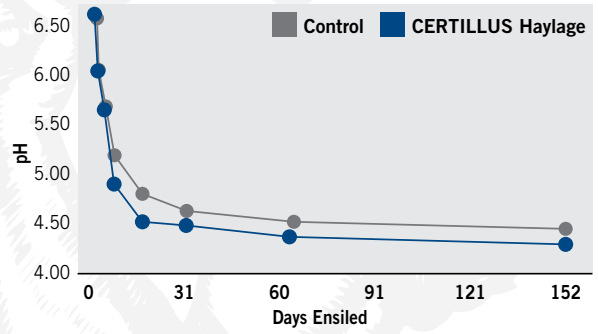
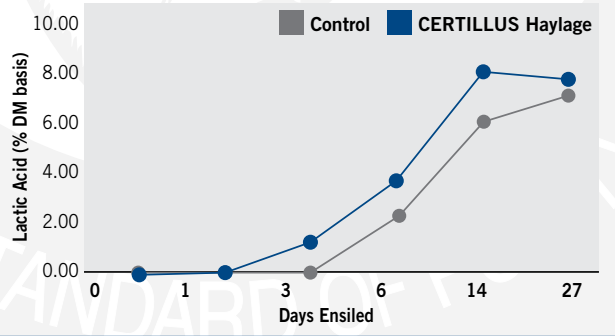


FIGURE 2: Lactic acid.

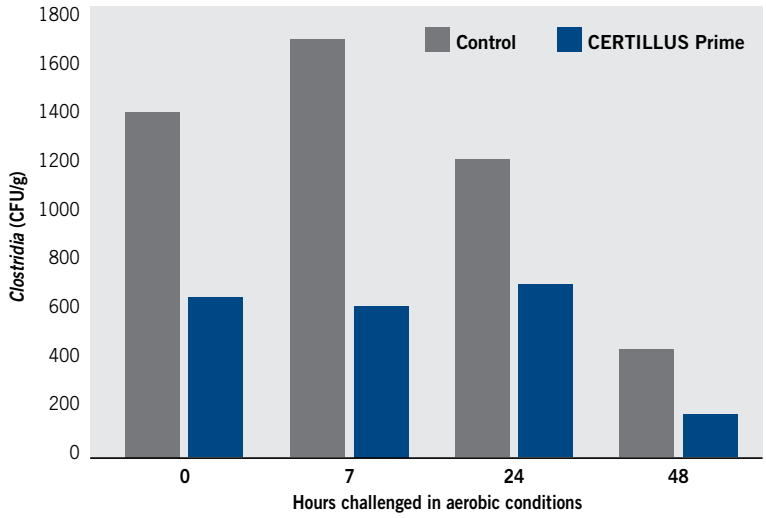


RESULTS

- The pH of the Certillus Prime inoculated alfalfa dropped more rapidly compared to the control alfalfa and remained at a lower level during all sampling points (Fig. 1).
- An increased level of lactic acid was detected in the CERTILLUS Prime inoculated alfalfa during the fermentation (Fig. 2).

- *Clostridia* loads were observed 42-64% lower in the CERTILLUS™ Prime treated alfalfa compared to the control during the four feed out phase sampling points (Fig. 3).

FIGURE 3: *Clostridia* loads.



SUMMARY

The results indicated that CERTILLUS Prime had a more efficient fermentation, dropping the pH faster through increased production of lactic acid. Although no butyric acid was detected during this fermentation, CERTILLUS Prime was able to lower the levels of *Clostridia* in the haylage compared to the control. This reduced the risk of pathogenic and non-pathogenic *Clostridia* and maintaining animal health, in addition to improving nutrient retention due to a faster pH decline and a lower final pH.

To learn more about CERTILLUS contact your nutritionist, veterinarian or ARM & HAMMER™ representative or visit AHfoodchain.com.

1 ARM & HAMMER Report, 2020. Data on file.