Technical Bulletin

Arm & Hammer Animal and Food Production

CERTILLUS improved milk yield, ECM, and 305ME in lactating cows.

STUDY OVERVIEW

Previous research[1-4] has shown CERTILLUS™ can beneficially affect the Microbial Terroir,™ gut health, resiliency, and productive performance of dairy cows. Thus, a study[5] was conducted to evaluate the effect of feeding CERTILLUS to lactating cows in a side-by-side commercial dairy in California with low pathogen challenge. The trial was conducted over a 23-week period from March to August. A total of approximately 760 animals were enrolled for each treatment.

- The treatment group consisted of 769 lactating cows who were fed 14 g CERTILLUS/cow/day for 23 weeks.
- The control group consisted of another 762 lactating cows fed the same ration without the inclusion of CERTILLUS.
- All cows followed the dairy's routine daily protocol regarding feeding, care, and disease treatment.

Throughout the study, test date (TD) milk, TD components, TD calculated energy-corrected milk (ECM), 305 mature equivalent (ME) milk, daily metered milk, feed intake by pen (DMI), and fecal counts of total clostridia and *Clostridium perfringens* were monitored. All milk production results were recorded and adjusted based on days in milk (DIM) differences between the treatment and control groups. Fecal samples (n=40 random cows for each treatment) were collected before the start of the trial and resampled after 160 days feeding CERTILLUS to evaluate counts of total clostridia and *C. perfringens*.

FIGURE 1: Clostridia levels by risk group.

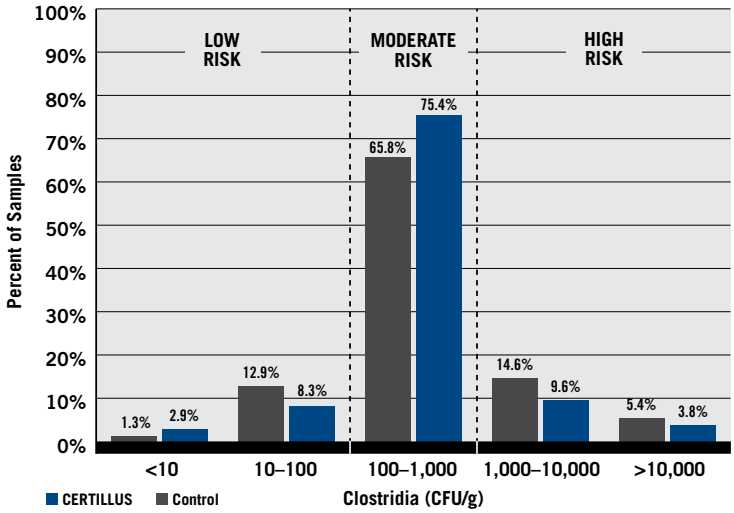
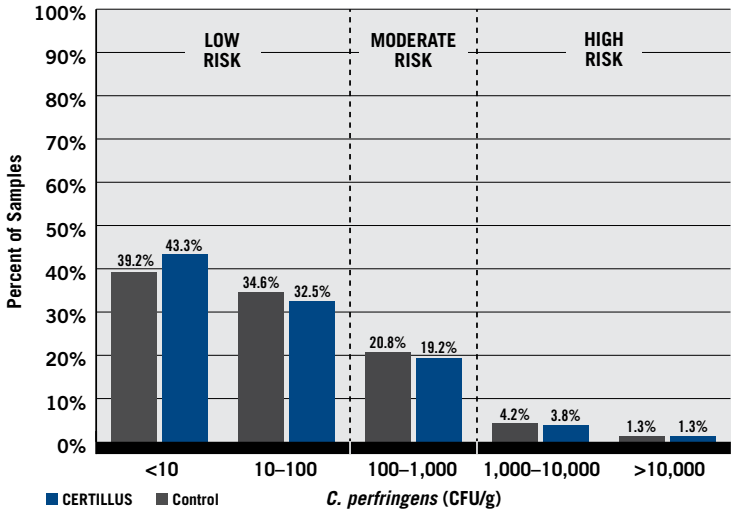


FIGURE 2: *C. perfringens* levels by risk group.



RESULTS

Fecal Clostridia Response

- Due to the low pathogen challenge and low rates of GI and metabolic disease in the herd, there were no statistical differences in fecal total clostridia and *C. perfringens* counts between the control and CERTILLUS-fed cows (Figs. 1 and 2).

Milk Response

- CERTILLUS™ statistically ($P<0.05$) increased yields of TD milk, ECM, and 305ME milk by 2.8 lbs., 2.5 lbs., and 782 lbs., respectively. No difference was observed for DMI. Calculated feed efficiency improved 4.8% due to the TD milk yield increase (Table 1).

TABLE 1 Production response.

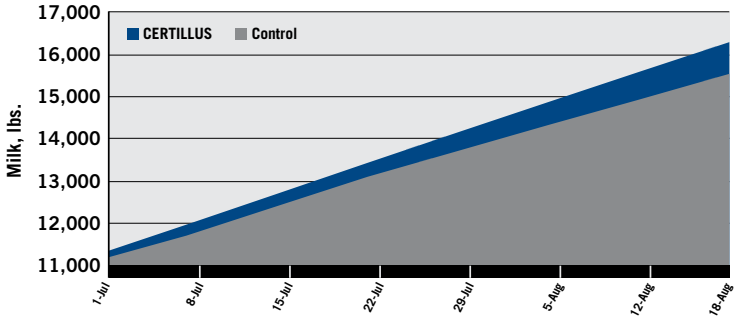
	Control	CERTILLUS	SE	*P*-Value
TD milk yield	-0.20	2.59	0.08	0.03
TD milk fat %	3.86	3.79	0.18	0.25
TD milk protein %	3.12	3.14	0.11	0.29
TD calculated ECM	-0.20	2.34	0.09	0.02
Ave DMI (lb./d)	58.85	58.43	0.28	0.58
Calculated FE (not statistically analyzed)	No diff on DMI, calculated FE increase: 4.8%			
305ME milk	32,020	32,802	32.97	0.04
305ME milk CERTILLUS – Control	782 lbs over 305 days, Avg daily 2.6 lb advantage			

- Cumulative daily metered milk was calculated and CERTILLUS increased milk yield by 3 lbs. after adjustment for the DIM difference between the treatment and control groups.

Revenue Response

- ROI was calculated as 7.5:1 based on revenue:
  - 3 lbs. *$20/100lbs. = $0.60/cow/day vs. cost of CERTILLUS as $0.08/cow/day.

FIGURE 3: Daily cumulative milk (summer months).



CONCLUSION

Feeding CERTILLUS statistically increased milk yield, ECM, and 305ME milk yield. This milk production advantage also persisted through summer months. The calculated ROI for cows fed CERTILLUS was 7.5:1.

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

1 CERTILLUS New York Trial Technical Bulletin. ARM & HAMMER. 2022. Data on file.
2 Maylem, E. R. S., Vargio M, Melton C, Thompson J, O'Neill J, Rehberger TG, Foote AP and Spicer LJ. PSVIII-14. Effect of CERTILLUS, a direct-fed microbial, on milk yield, milk components, and feed intake in primi- and multiparous lactating Holstein cows. *J Anim Sci* 99(Suppl. 3):in press, 2021.
3 Smith AH, Thompson JS, Griffin MN, Schissel J, O'Neill JP, Rehberger T. The Effect of a Bacillus Probiotic on Herd- Health, Milk Production and Clostridium Populations on a Dairy Farm in Wisconsin. In: 7th Conference on Beneficial Microbes, (Madison, WI), 2018. p. #104.
4 Assessing Clostridia Populations in Dairy Herds After the Use of CERTILLUS. ARM & HAMMER Data Summary, Data on file, 2020.
5 CERTILLUS California Field Trial. ARM & HAMMER. 2022. Data on file.