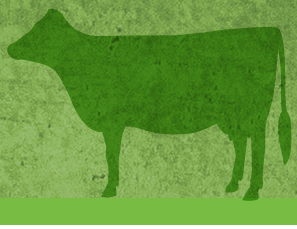


CERTILLUS™

Are your animals as resilient as they can be ahead of challenges?

#ScienceHearted

At ARM & HAMMER™ we think big on a microscopic level to deliver solutions for resilient animals and safe food that drive business forward. We're your #ScienceHearted, local-and-global, animal and food production team.

Even under normal conditions, 30% of all cows have suboptimal rumen function.[1]

Unfortunately, suboptimal rumen function means even your best efforts to formulate a health-optimizing ration could fall short of the goal.

And since unhealthy cows produce less, your pain is compounded, continuing a spiral where ongoing changes intensify issues, create inconsistency for cows and negatively impact production and overall performance. Ultimately, you could spend costly time and resources trying to solve these mysteries.

What if you could remove uncertainty and develop a more resilient herd?

IMPROVED RUMEN FUNCTION.

What if you could maximize the rumen function to get the most out of the ration?

CONSISTENT MILK PRODUCTION.

What if cows were ready to face hidden challenges?

WITHSTAND CHALLENGES.

What if you could improve hind gut integrity?

Only with CERTILLUS™ can you:

- ✓ Move quickly and accurately toward a lower risk of challenges and provide faster solutions
- ✓ Take informed action by identifying microbial challenges to address herd issues
- ✓ Create a more resilient herd able to consistently withstand challenges and maintain performance

The beauty of certainty.

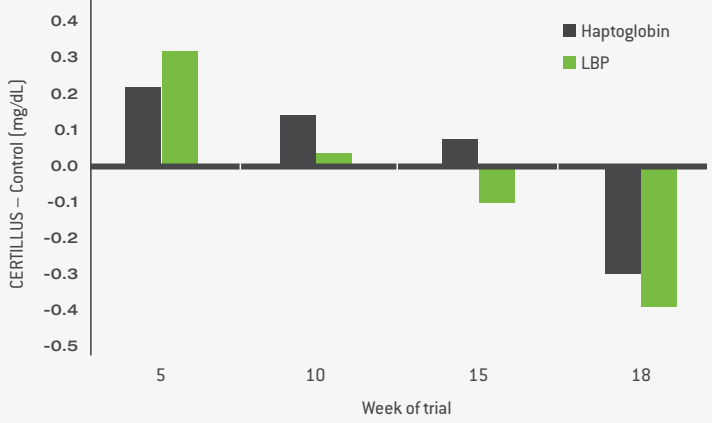
In one study, CERTILLUS had a positive impact on ECM production and efficiency. Cows fed CERTILLUS produced 4.1 lbs. more ($P<0.05$) ECM than control cows, driven by an increase ($P<0.05$) in milk fat percentage by 0.39 points (4.02% for control and 4.41% for CERTILLUS-fed cows). Cows fed CERTILLUS also experienced a moderate but significant reduction in feed intake. The result was a significant increase in efficiency for CERTILLUS-fed cows (16.9% greater feed efficiency than the control group at the beginning of the study, and 14% greater efficiency at the end of the study).[2]

In a separate study, CERTILLUS supported production and immune response in lactating cows. The accompanying table and figure show the effect of CERTILLUS feeding on cumulative milk yield and concentrations of blood inflammatory markers.[3]

Average cumulative milk yield.

Duration	(CERTILLUS-Control)	SE	*P*-Value
First 30 days	29.3	32.2	0.363
First 60 days	128.2	63.1	0.042
First 90 days	206.1	93.9	0.028
First 120 days	259.3	124.7	0.038
First 150 days	323.7	155.3	0.037

DIFFERENCES BETWEEN CERTILLUS AND CONTROL-FED COWS FOR HAPTOGLOBIN AND LIPOPOLYSACCHARIDE BINDING PROTEIN OVER THE TIME OF THE TRIAL.

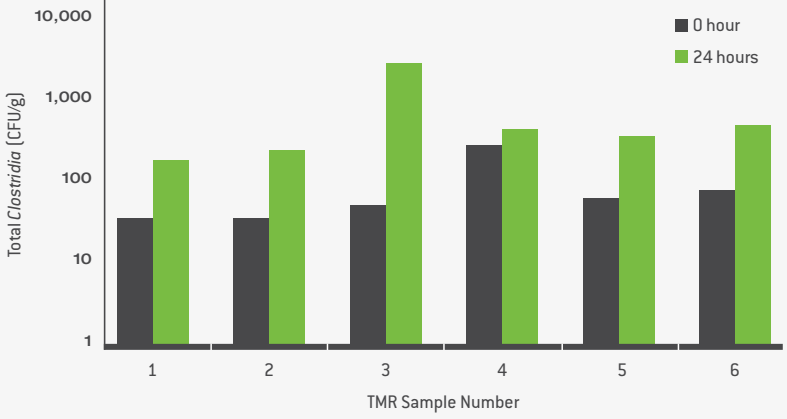


Faced with everyday challenges.

A diverse clostridial community, including species like *C. perfringens, C. beijerinckii* and *C. bifermentans*, is commonly found in fermented feeds and TMR samples. In an assessment of clostridia counts from TMR samples, results indicated that clostridia are capable of growing in a feed matrix.[4]

High levels of these populations have been shown to negatively impact rumen function and hindgut health. Given a modern dairy cow's high level of intake, even low clostridia counts on a per-gram basis in the TMR can pose a threat to health and performance.

TOTAL *CLOSTRIDIA* ENUMERATION RESULTS FROM TMR SAMPLES.[4]



CERTILLUS delivers Targeted Microbial Solutions.

Targeted Microbial Solutions™ use proprietary strains of *Bacillus* selected to combat the specific challenges in your Microbial Terroir™—which includes the environment, soil and animals unique to a farm's geography. The beneficial strains of bacteria help combat harmful pathogens impacting animal performance and support overall gut function and health for improved productivity and resilience.

Getting started.

Contact your ARM & HAMMER™ representative to unlock the potential of your herd.

We're #ScienceHearted and we're here for you.
We're ever-curious farm kids turned nutritional innovators, microbial pioneers and food safety game changers. We use scientific research to unlock the power of nature to create products that focus on you, your animals and worldwide food security. To learn more about CERTILLUS™ ask your nutritionist, veterinarian or ARM & HAMMER representative or visit AHfoodchain.com

1 Bramley et al. The Definition of Acidosis in Dairy Herds Predomin. 2008.
2 CERTILLUS supports improved production response in dairy cattle. ARM & HAMMER CERTILLUS Field Trial. 2022. Data on file.
3 CERTILLUS supported production and immune response in lactating cows. ARM & HAMMER CERTILLUS Field trial. 2022. Data on file.
4 Analysis of clostridia populations in feed samples. ARM & HAMMER Research Notes. 2020. Data on file.