



**Build resilience
and efficiency.**



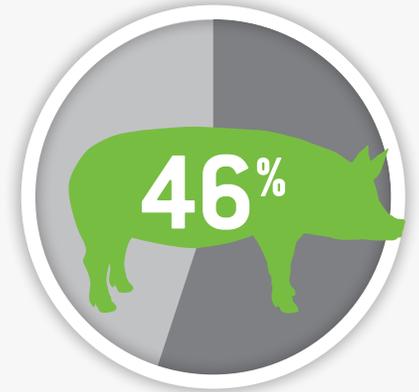
#ScienceHearted

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.

***E. coli* could be harming your ROI.**

46% of pigs tested positive for enterotoxigenic *E. coli*.¹

E. coli infection, also known as colibacillosis, can lead to reduced feed intake, permanent stunting and mortality rates as high as 70% in piglets affected in the first days of life.²



What if you could foster a microbial environment unfavorable to *E. coli*?



BOOST HERD HEALTH.

What if you could maintain sow and piglet health?



MAINTAIN CONSISTENCY.

What if your pigs could consistently meet target weight goals?



IMPROVE PRODUCTIVITY.

What if you could get your pigs to market more quickly?

Only CERTILLUS™ Targeted Microbial Solutions™ can:

- Use a Microbial Terroir™ Assessment to uncover the challenges your pigs face.
- Use *Bacillus* strains targeted to the specific challenges on your farm to ensure nothing slows down herd performance.

Why your Microbial Terroir matters.

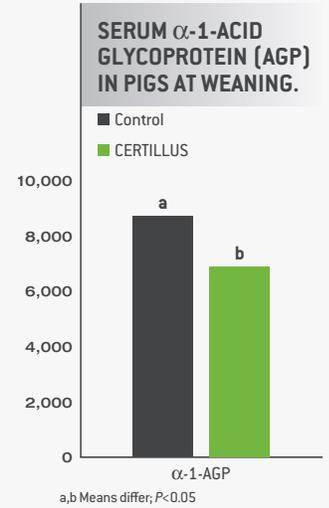
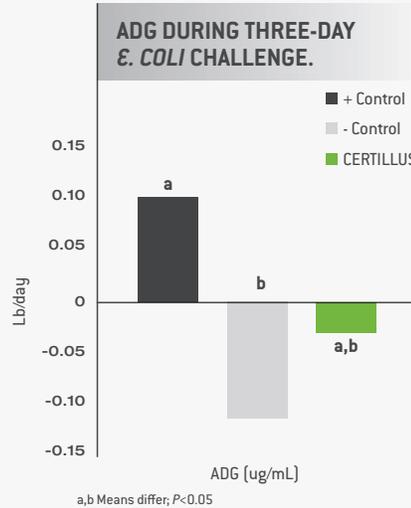
Your Microbial Terroir is the microbial makeup of your environment, feed, flooring, water and the weather. Only ARM & HAMMER™ can assess the positive and negative components of your Microbial Terroir and reveal how you can address harmful pathogens slowing down your animals' productivity.

Resilient to challenges.

In a study³ of weanling pigs, those fed CERTILLUS for five days prior to an *E. coli* F18 challenge lost less weight and had less diarrhea than challenged pigs fed an unsupplemented control basal diet.

Another study⁴ showed CERTILLUS fed to sows from three weeks after breeding through lactation resulted in pigs with improved performance-associated immune factors. High concentrations of the acute phase protein, alpha α -1-acid glycoprotein (AGP), is associated with reduced growth performance in pigs. Pigs weaned from sows fed CERTILLUS had lower serum AGP compared to pigs from control sows.

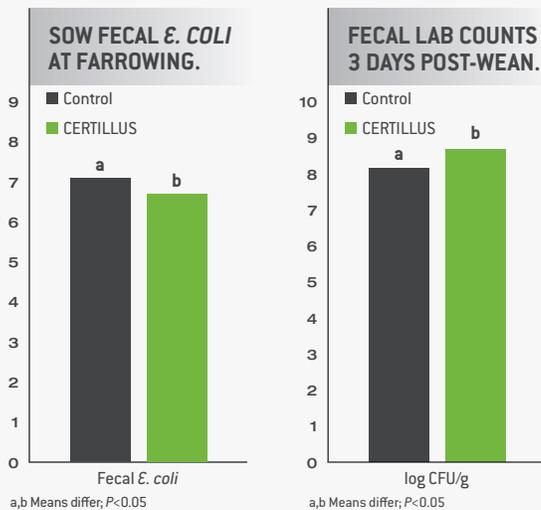
Data⁵ collected in our lab showed CERTILLUS controlled >90% of pathogenic *Clostridium* and *Streptococcus suis* isolated from U.S. swine herds.



Healthy sows breed productive pigs.

One study⁶ of a commercial swine facility including 500 sows and 1100 weaned pigs showed CERTILLUS fed to sows reduced *E. coli* in the farrowing environment and enhanced colonization of beneficial lactic acid bacteria in the pigs, supporting enhanced health. Pigs averaged an additional 2 lbs. of body weight at the end of the nursery, which is directly correlated to fewer days to market.⁷

FECAL MICROBIAL COUNTS (LOG CFU/G) OF *E. COLI* AND LACTIC ACID BACTERIA (LAB)



NURSERY GROWTH PERFORMANCE OF PIGS WEANED FROM SOWS FED CERTILLUS COMPARED TO PIGS WEANED FROM CONTROL SOWS.

	Control	CERTILLUS	%Diff	P=
Phase 1, day 0-11				
ADG, lb	0.15	0.20	+33%	<0.01
ADFI, lb	0.46	0.47		0.45
G:F	0.33	0.41	+24%	<0.01
BW, lb (d11)	14.0	14.4	+3%	<0.01
Phase 1-4, day 0-51				
ADG, lb	0.90	0.93	+3%	0.02
ADFI, lb	1.37	1.42	+4%	0.03
G:F	0.66	0.66		0.70
BW Gain, lb	45.8	48.1	+5%	<0.01
BW, lb (d51)	58.3	60.2	+3%	<0.01

Recommended feeding rates.*

	CERTILLUS		
	Sow	Nursery	Grow/Finish
Inclusion rate (lb/ton)	1	0.5	1
Inclusion rate (kg/mt)	0.5	0.25	0.5
Dose (CFU/g of feed)	3.75×10^5	1.8×10^5	3.75×10^5

* Consult your nutritionist for your optimum feeding rates.



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 Mohlatlole RP, Madoroba E, Muchadeyi FC, et al. Virulence profiles of enterotoxigenic, shiga toxin and enteroaggregative *Escherichia coli* in South African pigs. *Trop Anim Health Prod* 2013;45:1399–1405.

2 <https://www.farmhealthonline.com/US/disease-management/pig-diseases/colibacillosis-in-pigs/>

3 Research Notes – CERTILLUS Microbial Terroir Controls *E. coli* Populations in Pigs.

4 Research Notes – CERTILLUS Fed to Sows Influences Immune Development in Their Offspring.

5 Data on file.

6 Research Notes – CERTILLUS Fed to Sows Improves Subsequent Growth Performance and Health of Their Offspring.

7 <https://www.nationalhogfarmer.com/nutrition/maximum-profit-starts-weaning>.