



**Resiliency ahead of
costly challenges.**



#ScienceHearted

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

Salmonella could be costing you more than you think.

Salmonella contributes to an estimated \$2.8 billion in losses for the poultry industry every year.¹ And it's just one of several significant challenges—everything from mycotoxins to *Campylobacter*—that threaten your bottom line.



\$2.8 BILLION

What if your flock could build resiliency *ahead* of their greatest challenges?



SALMONELLA CHALLENGE MET.

What if you could minimize the prevalence of *Salmonella* in your complex?



ON-TARGET GAINS.

What if you could consistently meet target weight goals by minimizing risk of feed quality variation?



IMPROVE YOUR COCCIDIOSIS PROTECTION.

What if your flock could maintain health in the face of coccidiosis?

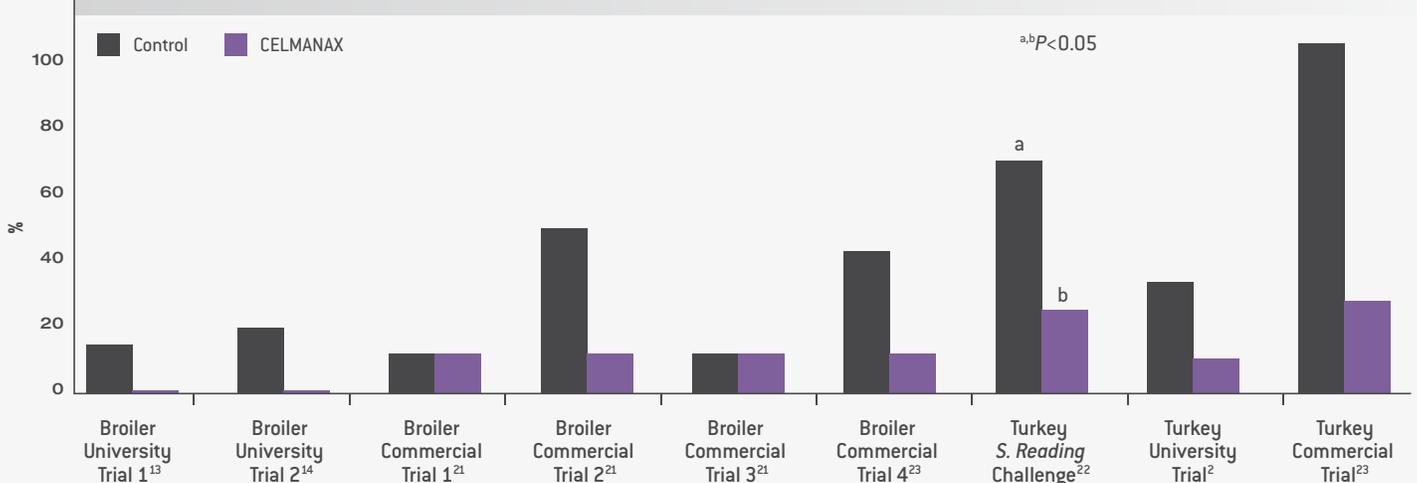
ONLY CELMANAX™:

- ✓ Delivers A-MAX™ yeast culture plus highly bioavailable Refined Functional Carbohydrates™ (RFCs™) to help prepare the immune system ahead of a challenge so your animals can respond quickly.
- ✓ Offers the advantages of its unique formulation as an alternative to antibiotic growth promoters (AGPs).
- ✓ Provides the benefit of multiple feed additives in one consistently high-quality formula.

Manage *Salmonella*.

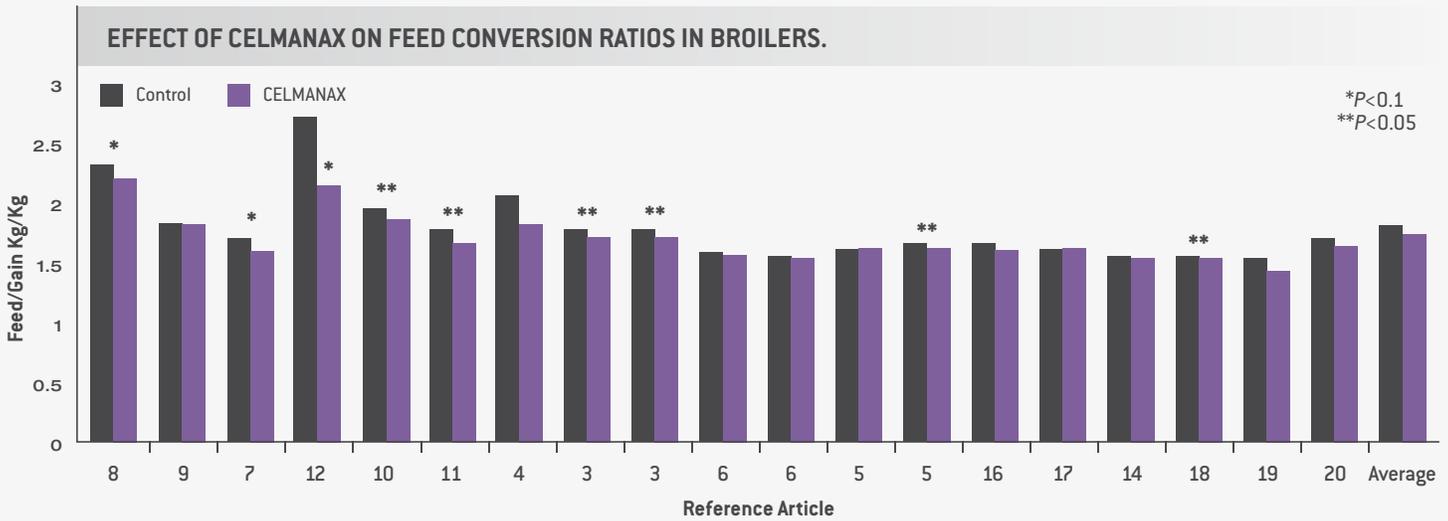
Across multiple university and commercial trials, CELMANAX reduced *Salmonella* prevalence in broilers and turkeys.^{2,13,14,21-23}

CELMANAX SUPPLEMENTATION REDUCED *SALMONELLA* PREVALENCE IN THE CECA IN MULTIPLE STUDIES.



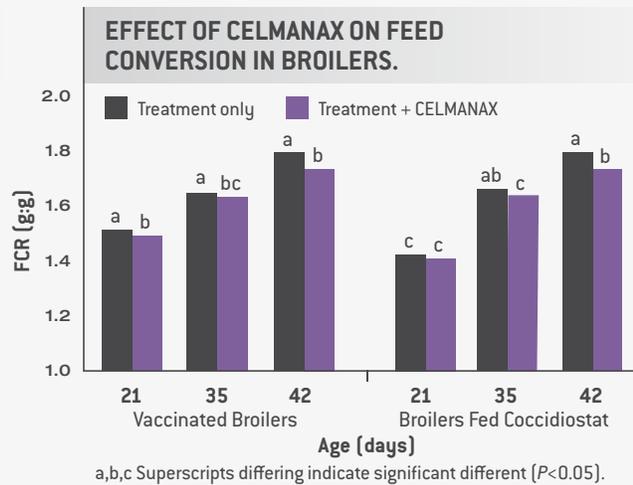
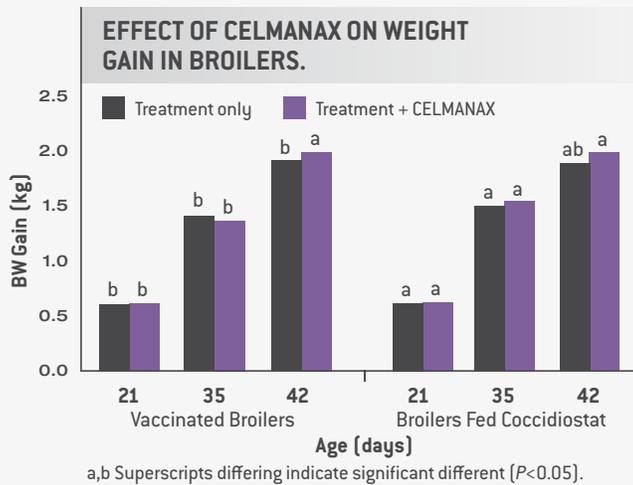
Consistently maintain feed conversion ratios.

Across numerous studies CELMANAX improved feed conversion ratio (FCR) by 8 points in broilers.^{3-12,14,16-20}



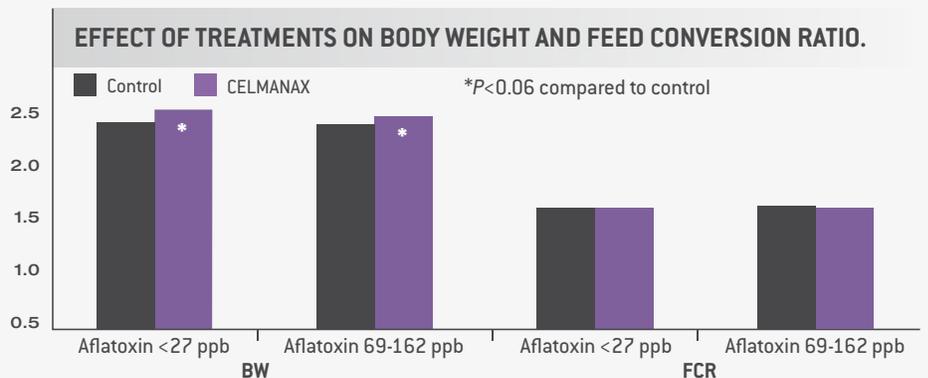
Strong defense against coccidiosis.

Under a standard coccidiosis management program, CELMANAX improved broiler performance.³ Feeding CELMANAX effectively enhanced bird performance by improving weight gain and lowering feed conversion ratio in coccidiosis-vaccinated and coccidiostat-fed broilers.



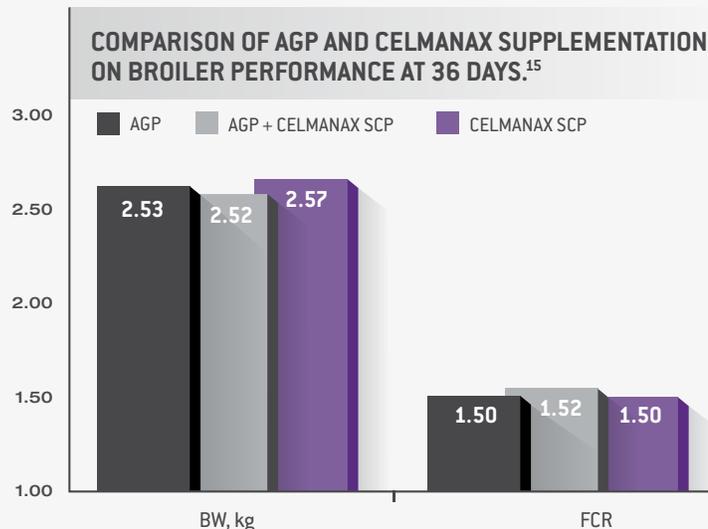
Minimize feed quality variation.

Supplementing CELMANAX to aflatoxin-contaminated broiler diets significantly improved body weight (P<0.06) and numerically improved feed conversion ratio (P>0.06) compared to the control.⁶



An alternative to antibiotics.

In a study conducted under commercial conditions, the effect of CELMANAX™ supplementation was compared to antibiotic growth promoter (AGP) Bacitracin on broiler performance. Broilers on CELMANAX SCP finished with 42 g higher BW compared to AGP-supplemented birds ($P>0.05$).¹⁵



Recommended feeding rates.*

	CHICKENS						TURKEYS					
	Chickens (kg/MT)			Chickens (lbs/ton)			Turkeys (kg/MT)			Turkeys (lbs/ton)		
	Layer	Broiler	Broiler/Breeder	Layer	Broiler	Broiler/Breeder	Breeder	Poults	Grow/Finish	Breeder	Poults	Grow/Finish
CELMANAX	0.5	0.5	0.5	1	1	1	0.5	0.5	0.5	1	1	1
CELMANAX SCP	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.05	0.05	0.1	0.1	0.1
	ml/L						ml/L					
CELMANAX Liquid	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

*Consult your nutritionist for your optimum feeding rates.



We're your global to local animal and food production team.

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 CELMANAX contact your nutritionist, veterinarian or ARM & HAMMER™ representative or visit AHfoodchain.com.

1 Scharff RL. Food Attribution and Economic Cost Estimates for Meat- and Poultry-Related Illnesses. *J Food Prot* 2020 (Jun 1);83(6):959-967.

2 Huff GR, et al. The effects of yeast feed supplementation on turkey performance an pathogen colonization in a transport stress/*Escherichia coli* challenge. *Poultry Science* 2013;92(3):655-662. Research Bulletin P-82.

3 Mathis G, Lumpkins B, Jalukar S. Effect of CELMANAX SCP feed supplementation on performance of broilers either fed an anticoccidial drug or vaccinated. 2011. Presented at IPSF in Atlanta, Ga.

4 Adaiel SA, El-Shafei AA, Jalukar S. Effect of CELMANAX on performance, immune function and health of broilers challenged with *E. coli* 078. 2011. Presented at IPSF in Atlanta, Ga. Research Bulletin P-67.

5 Brake, et al. Coccidiostat withdrawal from broiler diets containing Refined Functional Carbohydrates™ (RFC™) from enzymatically hydrolyzed yeast. 2015; Abstract M3. Presented at IPSF, Atlanta, GA. Research Bulletin P-88.

6 Report on file. Research Bulletin P-78.

7 Gómez S, Angeles ML, Mojica MC, Jalukar S. Combination of an Enzymatically Hydrolyzed Yeast and Yeast Culture with a Direct-fed Microbial in the Feeds of Broiler Chickens. *Asian-Aust J Anim Sci* 2012;25(5):665-673. Research Bulletin P-47.

8 Gómez S, Angeles M. Effects of CELMANAX combined with flavomycin and monensin on finishing broiler. *International Journal of Poultry Science* 2011;10(6):433-439. Research Bulletin P-22.

9 Effect of CELMANAX supplementation in broiler diets on production performance of broilers, Research Bulletin P-27.

10 Report on file. Research Bulletin P-57.

11 Report on file. Research Bulletin P-58.

12 Gómez, et al. Effects of the protein source and the inclusion of cell wall components plus a yeast culture in the diet of broiler chickens. World Poultry Congress, 2008; Abstract 111. Research Bulletin P-48.

13 Walker, et al. Effect of refined functional carbohydrates from enzymatically hydrolyzed yeast on the presence of *Salmonella* spp. in the ceca of broiler breeder females *Poult Sci* 2017;96(8):2684-2690.

14 Walker, et al. The effect of refined functional carbohydrates from enzymatically hydrolyzed yeast on the transmission of environmental *Salmonella Senftenberg* among broilers and proliferation in broiler housing. *Poultry Science* 2018;97:1412-1419.

15 Jalukar S, Dippy J, Robinson D, Ritchie S. CELMANAX SCP application in broiler diets: Synergism or alternative to antibiotic growth promoter effects. 2014; Abstract P-242. Presented at IPSF, Atlanta, Ga. Research Bulletin P-80.

16 Froebel, et al. Administration of dietary prebiotics improves growth performance and reduces pathogen colonization in broiler chickens. *Poultry Science* 2019;98:6668-6676.

17 Caraway CT, Walker GK, Brake J. The effects of coarse corn and refined functional carbohydrates on the live performance and cecal *Salmonella* prevalence in coccidiosis-vaccinated broilers. *Poultry Science* 2019;98:4565-4574.

18 ARM & HAMMER field trial. Report on file.

19 ARM & HAMMER field study. Report on file.

20 ARM & HAMMER study. Report on file.

21 Composite data from three commercial farms. Data on file. 2019.

22 Jalukar, et al. IPSF Poster #P289. 2020.

23 Lavergne, et al. PSA Abstract #204. 2019.