



#ScienceHearted

# Protection at the cellular level.

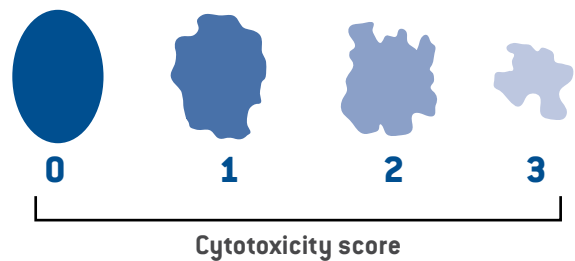


## PROTECTION AT THE CELLULAR LEVEL.

By damaging the cell wall of the gastrointestinal tract, cytotoxicity compromises each animal's ability to block mycotoxins from entering its tissues and to defend itself from harmful pathogens. Worse, global surveys have revealed that 85% of harvested feedstuffs contain one or more cytotoxicity-causing mycotoxins.<sup>1</sup>

## TESTING FEEDSTUFFS HAS ITS LIMITS.

Until now, testing feedstuffs and monitoring animal health were the only ways to identify mycotoxin challenges. As a result, the harmful effects of these challenges at the cellular level, and how to prevent them, have not been well understood. Now, however, a cytotoxicity analysis scan can show the degree of intestinal cell destruction. .



## UNDERSTANDING CYTOTOXICITY ANALYSIS.

Cytotoxicity analysis is an *in vitro* test to measure the damage done to cells by a toxic agent, such as mycotoxin. Using special dyes, lab analysis can measure the damage done on a scale of 0-3 with 0 being a healthy cell and 3 being a dead cell. A healthy cell with a round margin gets stained blue, indicating a score of 0. A damaged cell, on the other hand, has jagged edges with compromised membrane integrity, causing dye to leak. And a dead cell is completely colorless with the dye leached out, resulting in a score of 3. While cell damage and death can threaten the entire gut lining, protecting that lining with superior technology can create strong, resistant cells that reduce mycotoxins from translocating and the threat of attack by opportunistic pathogens.

### REDUCING THE THREAT OF CYTOTOXICITY CAN MAKE ALL THE DIFFERENCE FOR BOTH PRODUCTIVITY AND PROFITABILITY. WHAT IF YOU COULD:



#### SPEND LESS TIME AND MONEY ROUTINELY TESTING FEEDSTUFFS.

While testing a new batch of ingredients can still help determine the degree of contamination, avoiding the need for *routine* testing would save time and money.



#### PREVENT THE NEXT CYTOTOXICITY THREAT.

With more than 300 known mycotoxins out there, threats could emerge even after you complete routine testing.



#### PROTECT YOUR ANIMALS AND CREATE RESILIENCY.

Reducing the risk of cytotoxicity will help your animals meet their production potential and improve your profitability.

## WITH REFINED FUNCTIONAL CARBOHYDRATES™ (RFCs™), YOU CAN:

**Help animals win against mycotoxins, regardless of feed source.**

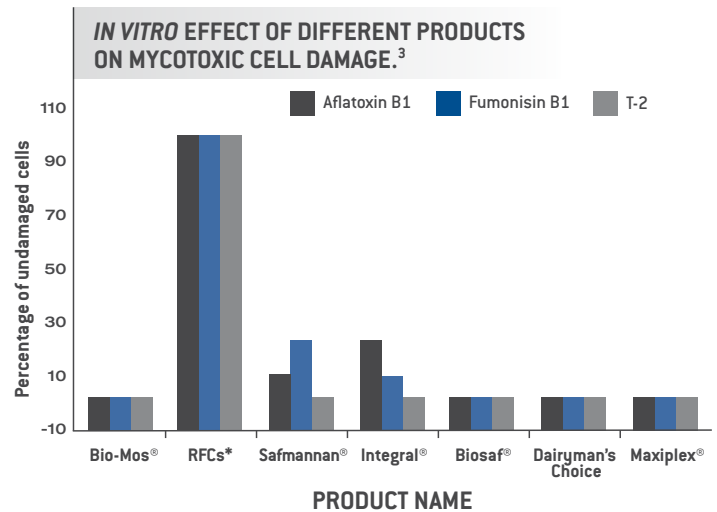
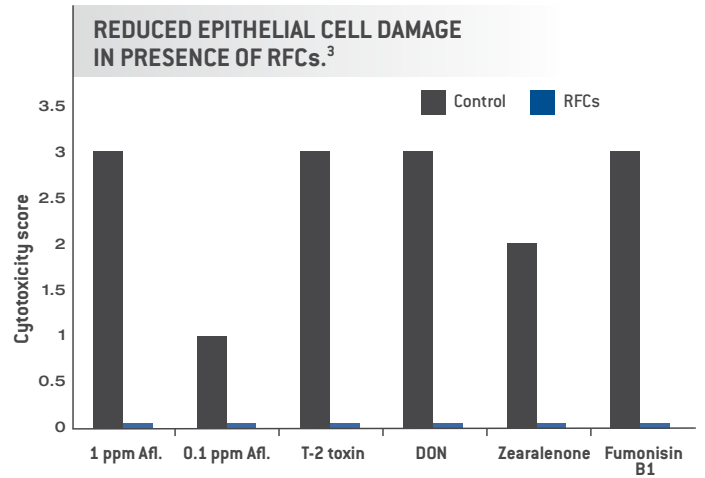
*In vitro* studies have demonstrated that RFCs can prevent gut cytotoxicity caused by a variety of mycotoxins, as well as forage extracts containing them.<sup>2</sup>

**Protect against gut damage.**

Studies show RFCs protect in ways that work better than other tested yeast products.<sup>3</sup>

**Protect at the cellular level.**

Unlike binders typically used in controlling mycotoxins, commercial research and university trials show how RFCs protect the cells and prevent toxins from becoming systemic.<sup>3</sup>



\*RFCs from CELMANAX



To learn more about RFCs and how they can protect against the threat of cytotoxicity caused by mycotoxins, contact your nutritionist, veterinarian or ARM & HAMMER™ representative or visit [AHfoodchain.com](http://AHfoodchain.com).

1 Gruber-Dorninger, et al. Global Mycotoxin Occurrence in Feed: A Ten-Year Survey. *Toxins* 2019; 11: 375.

2 Baines, et al. A prebiotic, CELMANAX, decreases *Escherichia coli* O157:H7 colonization of bovine cells and feed-associated cytotoxicity *in vitro*. *BMC Research Notes*, 2011; 4:110.

3 Baines. Evaluation of prebiotics and probiotics to reduce toxicity of pure and mixed-feed mycotoxins *in vitro* and to prevent carry-over of aflatoxin B1 in dairy cows. 2014. Abstract #202 Gut Health Symposium, St. Louis, USA.