

ENGAGE-M

Managing Your Risk Associated with Mycotoxins in Swine

Technical Note

SWINE

Introduction

Every new crop year poses the threat of mycotoxins in your grain. This year's crop is no different, as swine producers could be faced with this challenge once again. How will you manage this risk?

Mycotoxins, from even low levels of toxin contaminated feed, has the tendency to reduce body weight gain, cause a decreased absorption of nutrients and impairs immune function. All of these challenges have the potential to rob you of profit.

Mycotoxin Effects on Animal Performance

- 20-40% reduction in body weight gain
- 15-35% decrease in feed intake
- Compromise gut health
- Impaired immunity
- Potential for damaged liver

About Engage M™

Engage M™ is a revolutionary Hydrated Sodium Calcium Aluminosilicate technology; **Engage M's™** unique binding capacity is developed through a patented manufacturing process that provides for an increase in binding surface per gram of material.

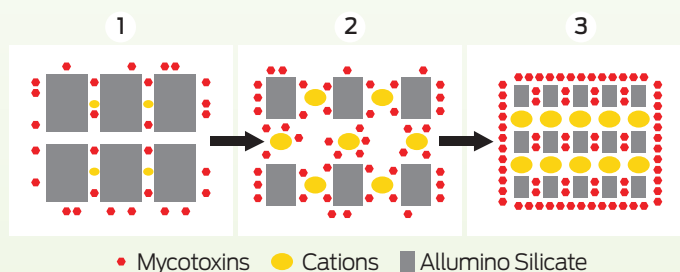
Not all clay binders are created equal and this specific clay source exhibits a three dimensional molecular structure that possesses a stable hydrogen bonding pattern capable of binding multiple mycotoxins, including Vomitoxin.

Due to this unique manufacturing process, **Engage M™** is most effective when included in complete feed at one pound per ton.

Product Message

Novel Binding Capacity:

Patent technology is applied through manufacturing of the **Engage M™** material via thermal activation and ionic exchange process.



The technology allows for a lower inclusion rate with superior toxin binding capability.

In vitro binding studies from three independent labs

Location	Mycotoxin Concentration	% Binding Capacity
Lab A	AFB1 – 250 ppb	92%
	DON – 1.3 ppm	85%
	Fumonisin B1 - 2ppm	83%
Lab B	AFB1 – 140 ppb	91%
	DON – 3.0 ppm	78%
	Fumonisin B1 - 2ppm	79%
Lab C	AFB1 – 200 ppb	95%
	DON – 2.0 ppm	53%
	Fumonisin B1 - 2ppm	79%
	T2 – 0.6 ppm	74%

As table illustrates, in-vitro binding studies with **Engage M™**, show a high affinity for binding both Aflatoxin and Vomitoxin.

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Sound Science and Proven In the Industry

Engage M™ has been validated through animal model testing and proven through industry experience. This unique technology will assist in managing your risk associated with mycotoxins by applying a predictable, proactive, and practical approach.

Research Model

United Animal Health's proprietary research approach incorporates the use of known mycotoxin contaminated grains for testing in pigs. This provides you confidence that a real-world response is achieved. When incorporating this model, we can reduce variability and increase the sensitivity to testing of novel ingredients as an effective screening tool for technologies.

We test our products at the same inclusion rates we recommend to our customers.

The two trials presented demonstrate that **Engage M™** is proven to be a cost effective solution when managing your risk associated with mycotoxin contaminated grains.

Scientific Animal Trials

The graphs below highlight the response to body weight gain, after pigs were supplemented with **Engage M™** at one pound per ton of complete feed.

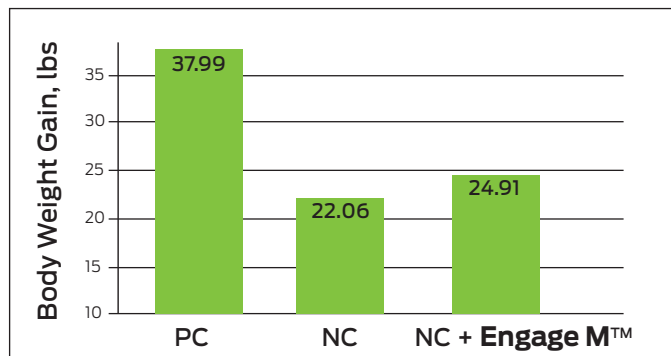
Engage M™ was evaluated in both nursery and finishing pigs. Animals were fed naturally contaminated grain, positive for both Vomitoxin and Zearalenone.

Measurements recorded include pig weights, feed disappearance, and efficiency parameters for the duration of the trial.

Results

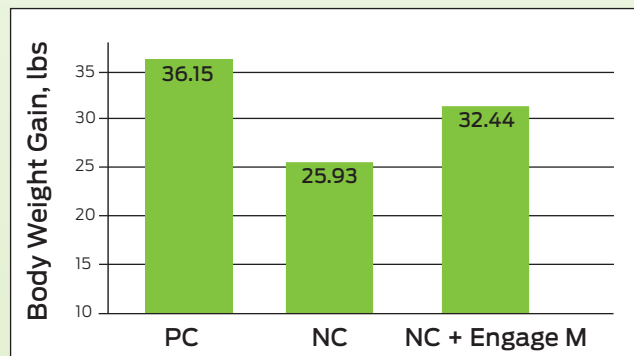
- Improvements in body weight gain were 18% in nursery pigs and 64% in finishing pigs.
- Morbidity improved 45% when nursery pigs were treated with **Engage M™**.
- Research demonstrates that **Engage M™** is an effective solution when preventing the negative effects from Vomitoxin contaminated feedstuffs.

Graph 1: Body Weight Gain Effects in Nursery Pigs



Trial duration: 21 days, start wt. 32 pounds
Engage M™ dosage: 1.0 lb/ton of feed
NC (5.5 ppm DON - .60 ppm Zearalenone)

Graph 2: Body Weight Gain Effects in Finishing Pigs



Trial duration: 14 days, start wt. 136 pounds
Engage M™ dosage: 1.0 lb/ ton of feed
NC (4 ppm DON - 1.0 ppm Zearalenone)

P = 0.08