

Milbond[®]-TX Supports Intestinal Integrity by Preserving Mucosal Thickness in Piglets



PROVEN INTESTINAL PROTECTION WITH MILBOND[®]-TX

MILBOND[®]-TX (0.5%) effectively counteracts this damage, helping preserve intestinal structure.

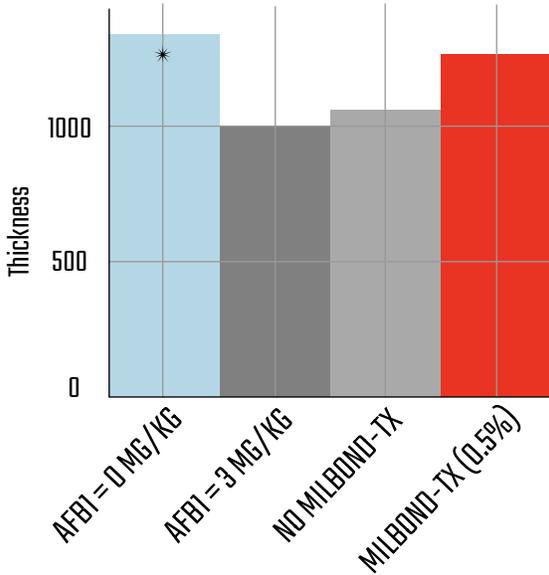
Results Across Three Small Intestine Segments (Pigs):

- Duodenum: MILBOND[®]-TX restores mucosal thickness to levels comparable to the non-AFB1 group.
- Jejunum: Shows recovery from AFB1-induced damage, approaching normal values.
- Ileum: Significant improvement in mucosal integrity, indicating broad protective action.

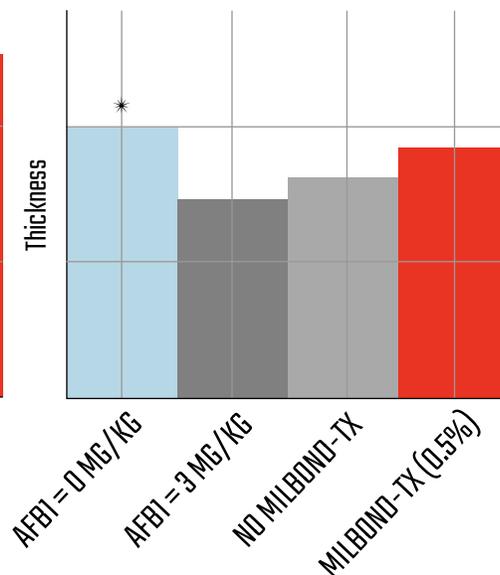
✓ Key Benefits:

- Reduces structural damage from toxins
 - Enhances nutrient absorption
 - Strengthens the gut barrier against pathogens

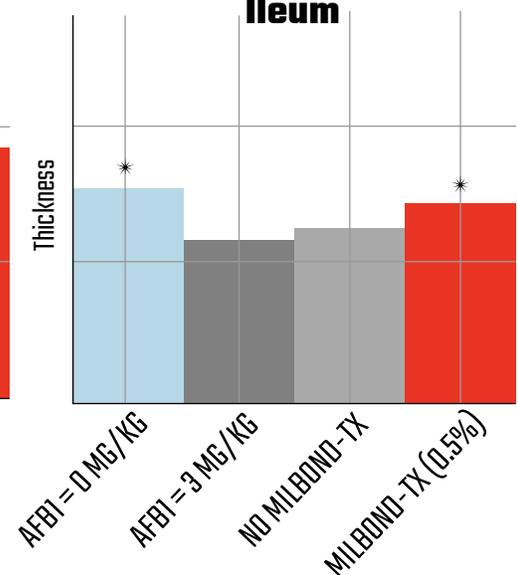
Mucosal Thickness Duodenum



Mucosal Thickness Jejunum



Mucosal Thickness Ileum



Graph based on data published (Ledoux et al., 2005)

Milbond[®]-TX was effective enough to bring mucosal thickness back to levels statistically similar to healthy, unexposed animals, supporting its protective role against aflatoxin - induced intestinal damage.

Reference: Ledoux, D. R., Rottinghaus, G. E., Veum, T. L., & Turk, J. R. (2005). Evaluation of the efficacy of improved Milbond-TX to ameliorate the toxic effects of aflatoxin in weanling pigs: Field study. University of Missouri.



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MILBOND[®]-TX



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MILPRO[®]-TX Fortifies the Mucosal Barrier: Goblet Cell Activation and RELM β Secretion Enhanced

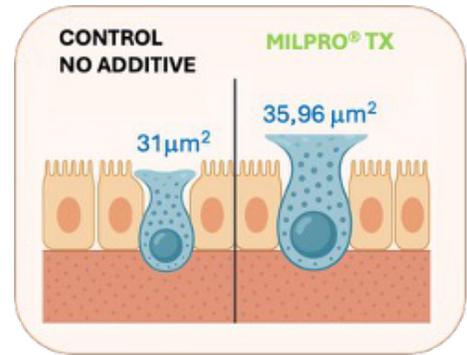


MILPRO[®]-TX strengthens intestinal defense by enhancing goblet cell function and stimulating the expression and secretion of RELM β , a key antimicrobial protein.

In vivo data showed a trend toward increased goblet cell size in supplemented piglets ($35.96 \mu\text{m}^2$ vs. $31 \mu\text{m}^2$; $p = 0.07$), suggesting enhanced mucus production and mucosal protection.

Complementary in vitro assays demonstrated that **MILPRO[®]-TX** upregulates RELM β gene expression (RT-PCR) and significantly increases RELM β protein secretion into the extracellular medium, as confirmed by Western blot analysis ($p < 0.001$), particularly at 0.05% concentration.

Figure 1. Effect of MILPRO[®]-TX on Goblet Cell Area in the Ileum of Weaned Piglets.



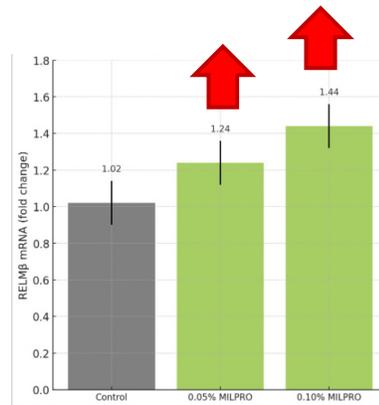
In challenged piglets, diets supplemented with clays like **MILPRO[®]-TX** showed a trend toward increased goblet cell size in the ileum ($p = 0.07$), suggesting enhanced mucus production and improved intestinal barrier function

Figure 2. Effect of MILPRO[®]-TX on RELM β gene expression and protein secretion in LS174T intestinal cells.

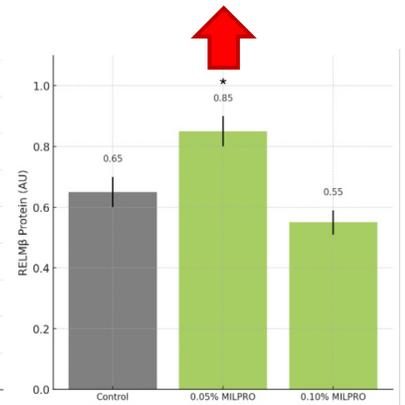
(A) RT-PCR analysis shows a significant increase in RELM β gene transcription with **MILPRO[®]-TX** supplementation.

(B) Western blot analysis indicates elevated RELM β protein secretion, particularly at the 0.05% inclusion level.

A. RELM β gene expression (RT-PCR):



B. RELM β protein level (Western blot)



CONCLUSION:

By boosting goblet cell activity and promoting RELM β -mediated mucosal defense, **MILPRO[®]-TX** helps reinforce the intestinal barrier, offering protection against microbial challenges and contributing to better systemic health.

Citation:

1) 29. Song, M., Liu, Y., Soares, J. A., Che, T. M., Osuna, O., Maddox, C. W., & Pettigrew, J. E. (2012). Dietary clays alleviate diarrhea of weaned pigs. *Journal of Animal Science*, 90(1).



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