# TARGET ORGANS

The key to an effective mycotoxins adsorbent

SPECIAL NUTRIENTS
THE MYCOTOXINS SPECIALIST
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Few products have scientific trials showing a positive effect on target organs to support their claims. The following table shows a list of the scientific trials performed with **MYCOAD** and **MYCOAD AZ** by independent Universities and Research Centers around the world.

Trilogy = Trilogy Analitycal Lab,USA.

Lamic = Laboratorio de Analisis Micotoxicologico, Brazil .(UFSM)

IIIA = International Animal Research Institute, Mexico.

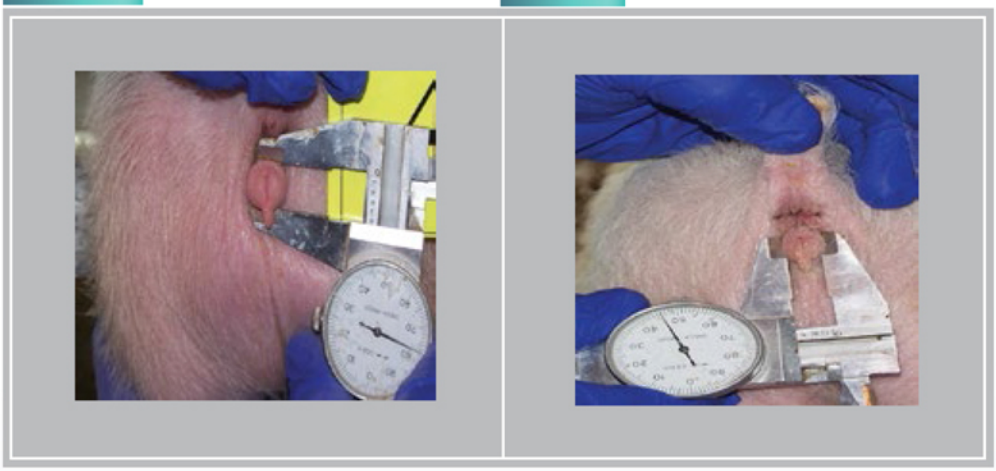
VMI = Veterinary Medicine Institute, Hungary.

| MYCOTOXIN | PRODUCT | STUDIES PER SPECIE | INSTITUTIONS |
|---|---|---|---|
| Aflatoxin | MYCOAD | 2 in poultry<br>1 in swine | IIIA - Lamic<br>Lamic |
| Ochratoxin | MYCOAD | 1 in poultry | IIIA |
| T-2 Toxin | MYCOAD<br>MYCOAD AZ | 2 in poultry<br>1 in poultry | IIIA - VMI<br>IIIA |
| Zearalenone (ZEA) | MYCOAD AZ | 3 in piglets | Lamic - Trilogy |
| Vomitoxin (DON) | MYCOAD AZ | 1 in piglets | Trilogy |
| Fumonisin (FUM) | MYCOAD AZ | 1 in piglets<br>2 in finishing pigs | Lamic<br>Lamic |

# ZEARALENONE

**HEIGHT**

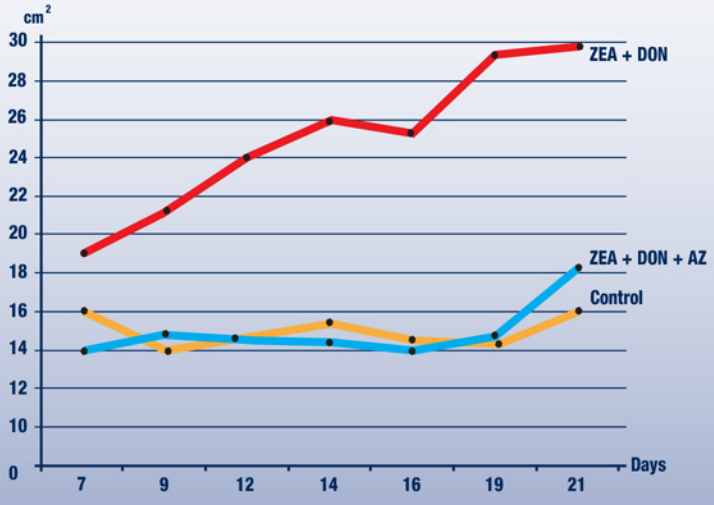
**WIDTH**



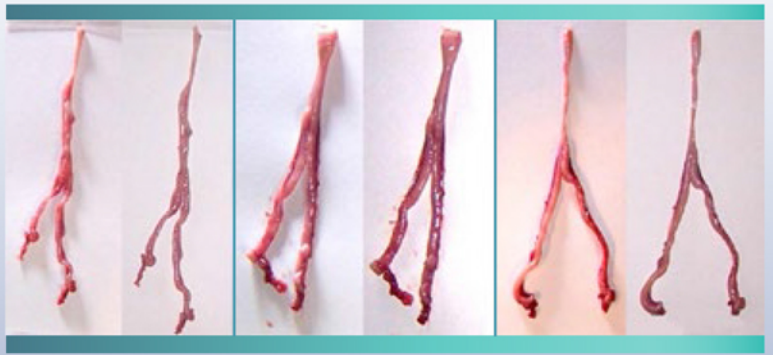
**MYCOAD AZ** effect on vulva size and reproductive organs of gilts fed 1.2 ppm of Zearalenone + 6 ppm of DOM.

Ref. Trilogy Analitycal Lab, USA.

## Vulva size (width x height)




## Reproductive organs

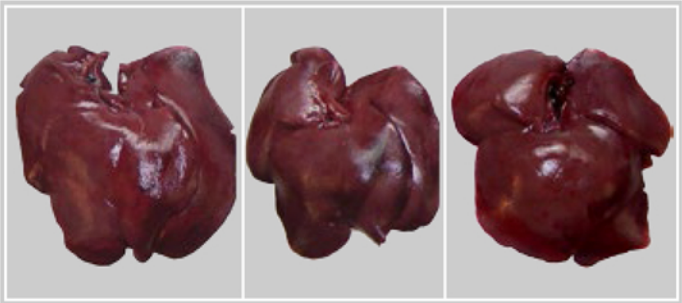


Control | ZEA + DON | ZEA + DON 1 kg MYCOAD AZ

# VOMITOXIN

Effect of **MYCOAD AZ** on liver and body weight of gilts fed 6 ppm of DON and 1.2 ppm of Zearalenone for 21 days.

Ref. Trilogy Analitycal Lab, USA.



Control | 1.2 ppm ZEA 6.0 ppm DON | 1.2 ppm ZEA 6.0 ppm DON + **MYCOAD AZ**

| TREATMENT | Body Weight Gain kg | LIVER g/100 g of Body Weight | REPRODUCTIVE SYSTEM |
|---|---|---|---|
| Control | 2.95 a | 3.76 a | 53.9 a |
| 1.2 ppm ZEA + 6 ppm DON | 1.46 b | 2.91 b | 104.5 b |
| 1.2 ppm ZEA + 6 ppm DON + 1 kg MYCOAD AZ | 2.23 c | 3.12 c | 89.5 c |

a.b.c Values within one column with different letters are significantly different (P<0.05)

# FUMONISIN

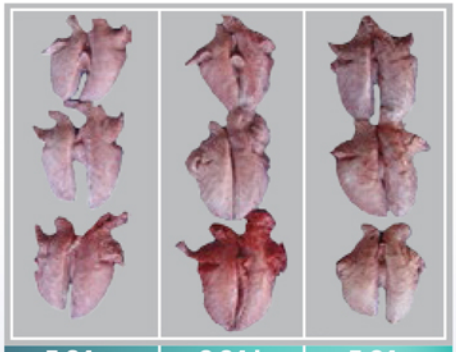
Effect of **MYCOAD AZ** on the lungs and productivity parameters of finishing pigs fed 25 ppm of fumonisin for 56 days.

Ref. Laboratorio de Análisis Micotoxicologico, Brazil.

| TREATMENT | AVERAGE DAILY GAIN G | AVERAGE DAILY INTAKE G | FCR |
|---|---|---|---|
| Control | 1076 a | 2979 a | 3.23 a |
| 25 ppm Fumonisin | 996 b | 2810 b | 3.46 b |
| 25 ppm Fumonisin + 4 Kg/mt MYCOAD AZ | 1084 a | 2948 a | 3.21 a |

a.b Values within one column with different letters are significantly different (P<0.05)

**Lung weight (g/kg)**



| 5.84 a Control | 6.34 b Fumonisin | 5.94 a Fumonisin + AZ |
|---|---|---|

**MYCOAD AZ** has been tested and approved by Lamic for the control of Zearalenone and Fumonisin.

## The key to an effective mycotoxins adsorbent

Poultry, swine and dairy producers admit today that the presence of mycotoxins in the feed is one of the main factors affecting animal production. As a result of the higher prices of feed ingredients, their quality is getting worse, with some grains showing higher levels of mycotoxins. High contamination levels can also be found in distillers grains, an ingredient in increasing supply, originated from the use of corn in ethanol production in the US.

Some producers consider that mycotoxins are becoming as important as bacterial and viral diseases. This attitude represents a completely different approach to the importance given to mycotoxins in 1987 when we worked with the group lunching the first mycotoxins adsorbent into the global market. At that time most growers considered that mycotoxins did not represent a serious problem.

We should point out that nowadays there are still some producers that confuse mycotoxicosis with viral and bacterial diseases. Part of this problem is due to the lack of access to good diagnostic techniques like histopathology, an excellent tool for the confirmation of the diagnosis. It is important to emphasize that as part of the evaluation of the first absorbents, a key factor in that evaluation was to demonstrate **Target Organ Protection (TOP)**. Table 1 shows the organs affected by different mycotoxins.

In today's market there has been an influx of products claiming to be effective in controlling the deleterious effects caused by mycotoxins. Some of these products base its effectiveness on marketing campaigns without showing in vitro and/or in vivo results to backup their claims. Some base their efficacy only on in vitro tests or on a positive effect on performance (often without any statistical significant differences) and others on some improvement of the immune response.

Sometimes these positive effects are obtained because of the presence of yeast, beneficial bacteria, enzymes and/or immuno-modulators that are added to the mycotoxins absorbents. These ingredients act to alleviate the secondary effects caused by mycotoxins but have little or no effect on the target organs **(TOP)**. Unfortunately few products in the global market have a proven efficacy on the main target organs affected by the mycotoxins against which they are tested.

For the last 2 years the Brazilian government has taken a scientific approach on the approval of mycotoxin binders by evaluating the presence or absence of a statistically significant effect on target organs. LAMIC (Laboratorio de Analisis Micotoxicologicos), under the direction of Dr. Carlos Mallmann, is one key laboratory in charge of this type of tests. So far, few products have passed this strict test (most for aflatoxin) which must be repeated every two years, to demonstrate the product maintains its efficacy. As a result of this novel approach by the Brazilian government, companies are obliged to test their products at LAMIC which now has become one of the top reference laboratories in the world.

If a company claims this marketing campaign that any of his products has been tested by LAMIC, it does not mean that the absorbent has been approved. Sometimes the results obtained show an improvement in performance; but it is not necessarily related to the protection of the target organs. If any product indicates or suggests a LAMIC approval, it is highly recommendable that you ask for the original study and look at the end of it for a written statement in Portuguese indicating that the product is approved for a 2 year period.

| MYCOTOXIN | TARGET ORGAN | DAMAGE CAUSED |
|---|---|---|
| Aflatoxin | Liver (Poultry & Swine) | Yellow, pale, Enlarged and friable |
| Ochratoxin | Kidney (Poultry) | Enlargement, inflammation, Urate deposits |
| T-2/DAS | Mouth (Poultry)<br>Gizzard (Poultry) | Ulcers Erosion |
| Zearalenone | Uterus, Ovary (Swine)<br>Vulva (Swine) | Enlargement, inflammation<br>Enlargement, inflammation |
| Vomitoxin (DON) | Liver (Swine) | Size reduction |
| Fumonisin | Lungs (Swine)<br>Heart (Swine) | Enlargement<br>Enlargement |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For additional information and a complete list of references please contact us.

Tel (1) (305) 857-9830 Fax (1 305) 857-6973 worldwide@specialnutrients.com