

BRAZIL: Taking action on the mycotoxins problem



Brazil has set another example of leadership in the world. Twenty five years ago they decided not to be dependent on oil and began to produce ethanol from sugar cane; which is approximately 5 times more efficient than producing it from corn and does not affect feed or food prices all over the world. This time the leadership is on the mycotoxin problem.

Brazil is one the largest grain producers and exporters of poultry and swine meats in the world. For many years grain growers were very fortunate because the only mycotoxin problem they had was aflatoxin. In the last 4 years this picture has dramatically changed.

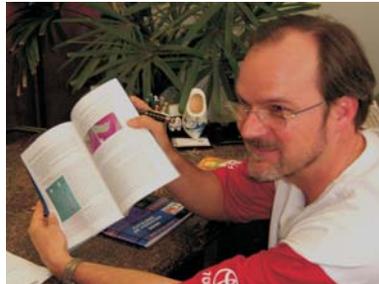
Fumonisin, Zearalenone and Vomitoxin started to be detected at high concentrations in corn, wheat and soya affecting animal production.

A sudden influx of mycotoxin binders began to appear offering all kinds of solutions based more on marketing than on accurate results. The Brazilian Government facing the mycotoxin problem and this abundance of products, decided to take drastic action to provide real solutions to this major problem.

Unlike the USA, where mycotoxin binder approval does not exist because carcinogens are not allowed in feed, and the European Union where mycotoxins are controlled by regulations only allowing very low levels in the feed, Brazilians are approaching the situation in a very efficient and practical way. They recognized they have a mycotoxin problem; therefore they formed a committee of scientists and experts in the field of mycotoxins to create and develop the methodology and regulation for the approval of anti-mycotoxin additives (adsorbents / detoxifiers).

The conclusion of the committee was to implement a program consisting of a three stage process for the approval of anti-mycotoxin additives, conducted in a Brazilian university recognized for being a leader in the mycotoxin field. The university assigned for this project was Universidade Federal de Santa Maria, Departamento de Medicina Veterinaria Preventiva, Laboratorio de Análises Micotoxicológicas – LAMIC, under the

direction of Dr. Carlos Mallmann.



LAMIC was founded 15 years ago and it is now one of the top five independent mycotoxins laboratories in the world. This laboratory has nine HPLC equipments and a MS/MS spectrophotometer dedicated exclusively to mycotoxins analyses. It also has its own swine and poultry research center for *in vivo* studies. LAMIC is economically self-sufficient and its main function is to **provide services to the farmers, not the manufacturers** of mycotoxin binders.

in vitro study

The process of approval starts with an *in vitro* study done at different pH using several levels of the mycotoxin binder and - depending on



the mycotoxin tested - the mycotoxin level can vary from 1,000 ppb to 2,500 ppb. If the product has an acceptable performance of better than 80% efficacy, then it can enter into the second phase.

in vivo study

The second phase is an *in vivo* study that must be performed with only one mycotoxin at a time from 1,000 ppb to 50,000 ppb, depending on the mycotoxin, and tested on a specific type of animal at a time.

Target organ

The key part in this study is that the anti-mycotoxin additive must show a statistically significant beneficial effect on the target organ. For Aflatoxin is liver; for Fumonisin is lungs; for

Zearalenone is reproductive organs; for T-2 toxin oral lesion, and so on. Therefore, this approval is not based just on the improvement of the immune system or recovering an enzyme affected by the mycotoxin; but the product must prove to have a direct beneficial effect on the target organ. In addition, on Aflatoxins and Fumonisin trials, the anti-mycotoxin additives must show statistically significant benefits on body weight and feed intake, leaving no doubt that the product is working.

The third phase consist on retesting the mycotoxin binder *in vitro* every 6 months and *in vivo* every 2 years to reassure that the manufacturers are selling the same product than originally approved.

Few products approved

This program was implemented about a year ago and only few products have been approved; all are clay based products: 15 for the prevention of aflatoxin toxicity, 3 for zearalenone and only 1 for Fumonisin.

Myths are broken

Through this approval process, two myths have been broken, confirming other recent results published in Poultry Science and Animal Science meetings in the USA and presented in the World Mycotoxin Forum 2006

- 1) Clays only work against aflatoxin.
- 2) All clays (HSCAS) are equal.

There are a few clays that are very effective against several mycotoxins including Zearalenone and Fumonisin as proven by LAMIC.

The Brazilian producers should be very proud of LAMIC for its professional work and grateful for the government's action of preventing the sale of anti-mycotoxin additives based on marketing instead of serious scientific evaluation. For the rest of producers in the world, where governments have not taken a scientific approach to approve mycotoxin binders, they can have now some protection from frivolous marketing by requesting if the product offered has been tested and approved by LAMIC.

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