

Mycotoxin risks are real!

Changing climates, coupled with changes in feed harvesting and storage, have revived the mycotoxin problem. The food and feed chain has to be aware of the risks, as was expressed by scientists at the IVth World Mycotoxin Forum, held from 6-7 November, 2006.

By Wiebe van der Sluis



Mycotoxins are a real threat in moist grains, prior and post harvesting.

The World Mycotoxin Forum, held in November in Cincinnati, USA, as a unique platform where feed and food industries from all over the world met. This forum presented an opportunity to exchange information and experiences on the various aspects of mycotoxins. Participants could review current knowledge related to mycotoxins and discuss strategies for prevention and control of contamination to ensure the safety of food and feed supply.

The risks are real and the risks are there: "Over 25% of the world crop of grain is affected," said Gerardo Morantes from Cargill, USA. Kyle E. Newman from Venture Laboratories, USA, confirmed this and commented saying, "50% of the hay analyses had a higher level of mycotoxins than normal."

Science leads regulations

Two long keynotes of introduction were presented by Dr Merle D. Pierson from the US Department of Agriculture and Frans Verstraete from the European Commission, Health and Consumer Protection, confirming the connection between science and regulation and that science will lead regulations. Today, regulations exist for 13 different mycotoxins in 100 countries. These regulations have an impact on the international trade of goods for feed and food industries. In 2007, new mycotoxin regulations will be implemented in the European Economic Community.

A real threat for all species

Mycotoxins result from a fungal infection of the crop. Most fungi grow on a plant. There are interactions between plant and fungus for both development of fungus and production of the toxin. Specific moulds produce specific toxins. Weather conditions will also lead to specific mycotoxin production.

The effects of mycotoxins on animals

are not easily elucidated. The modes of action of mycotoxins are very diverse and often occur as a cascade of events modulated by various environmental factors. Main observable effects to date are:

- Net reduction of animal immunity (vacations and acquired immunity)
- Reduction of animal performances (inhibition of protein synthesis)
- Reduction of feed intake
- Increased sensibility to diseases
- Reactivate chronic infection
- High reproduction impairment: zearalenone binds oestrogen receptors initiating the Oestrogenic response
- Reduction of nutrients available in the grains
- Reduction of enzyme functions
- Effect semen quality

Sampling and analysis is a major problem

Now that the presence of mycotoxins is certain and the effect on the animals is better known and recognised, both sampling and methods of analysis requires progress and harmonisation. As mycotoxins are not uniformly distributed in the feed (more present under "hot spots" and most grains are moved numerous times from farm to feed mill), the risk of a sampling error is high. There is a worldwide need for standardised and validated methods for the detection of mycotoxins. Significant effort has been made to validate methods of analysis and to harmonise methods internationally. What was right yesterday may not be completely accurate today.

Prevention is the first key point

It is not recommended to buy contaminated grain or hay and to use anti-mould - this will not reduce the mycotoxins present. Intervention at different points in the chain is limited by costs and the time required for the analysis (only a

few laboratories worldwide are recognised)

Prevention does not guarantee the absence of a risk. That's why the addition of mycotoxin deactivators to the animal feed in order to reduce the absorption of mycotoxins from the digestive tract remains.

Some clays have proven to be very efficient mycotoxin binders. These mycotoxin binders are used at a low dosage rate as an insurance in the feed, or at higher levels for special feeds used during higher risk period of the animal's life.

Not all clays are alike, say the experts. A highlight at the forum, gathering huge interest from the feed industry and specialists, was the presentation of the efficiency of a new process using modified clay with nanotechnology, resulting in a nanoclay ingredient (pillar interlayered clay/Amadeite). This nanoclay made of fully natural products, such as clay and seaweed extracts, significantly increases the capacity of adsorption of mycotoxins. Results of this nanoclay Amadeite presented at the forum by DVM Hervé Demais, head of Research and Development at Olmix France, showed similar results of adsorption with a group of mycotoxins (DON, Fumonisin) as activated carbon (the reference) at an inclusion rate into the feed 20 times lower than activated carbon. The trials were performed under the standard physiological conditions of the gastro intestinal tract of young adult pigs at TNO Holland. If pigs are more sensitive, mycotoxins will impair many vital organism functions in other species, such as poultry, ruminants, horses, fish, pets and humans (species covered at the World Forum).

Mycotoxins can't disappear from the feed and food chain but prevention must take place. Research must carry on, forums must take place to share knowledge and experiences and actions must take place in short term, middle term and long term. ■