A Comprehensive Approach To Prevent Mould Growth & Mycotoxicosis

In many parts of Asia Pacific, sun drying is still the main method to dry harvested grains before keeping them in storage.

However, sun drying is inefficient and may not reduce moisture in a uniformed manner. All it takes is one poorly dried kernel to promote mould growth. With time, it would spread to other grains and form a mouldy cluster.

The most effective method to prevent spoilage and reduce mould growth is a proper mould inhibitor programme implemented in the storage silo.

Kemin's Myco CURB™ Extend Liquid contains a synergistic blend of propionic acid and other organic acids that can help achieve mould inhibition. The blend also has low corrosivity.

With the right data at hand, producers can be empowered to make better management decisions and take remedial actions.

In a trial evaluating Myco CURB™ Extend Liquid's efficacy, a batch of corn was treated with the product. The test measured the carbon dioxide released in a closed system where samples were incubated. As mould produces carbon dioxide during metabolism, the carbon dioxide released served as an indicator of mould activity in the samples.

The CO_2 test results are shown in Figure 1. With a dose of 1 to 1.5 kg/tonne of Myco CURB™ Extend Liquid, corn is protected from mould growth for two months. A higher dosage may be required depending on the moisture and

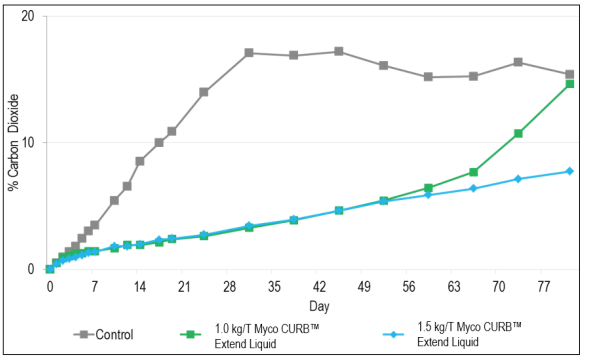

Figure 1. Carbon Dioxide (CO_2) test results for Myco CURB™ Extend Liquid.

storage duration of the corn.

Myco CURB™ Extend Liquid is optimised and buffered such that it has a near neutral pH level. This allows safe handling and prevents corrosion to silos and equipment. An experiment was done by partially submerging galvanised metal strips in unbuffered propionic acid-based mould inhibitor and Myco CURB™ Extend Liquid. Table 1 shows the percentage of weight loss due to accelerated corrosion at 65°C for 11 days.

Table 1. Weight loss (%) of galvanised strips comparing control and Myco CURB™ Extend Liquid

Treatment	Percentage Weight Loss
Unbuffered propionic acid-based mold inhibitor	54.58 %
Myco CURB™ Extend Liquid	11.87 %

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Currently, more than 500 types of mycotoxins have been identified. A few, like aflatoxin, trichothecene, zearalenone, fumonisin, deoxynivalenol, citrinin and ochratoxin, were found to cause considerable deterioration of animal health, potentially resulting in high economic losses.

Moulds do not automatically produce mycotoxins whenever grains become mouldy. However, the likelihood of mycotoxin contamination is greater in sub-optimal storage conditions. Mycotoxins are also relatively heat-stable; aflatoxins could resist temperatures of up to 260°C. Heating feed to such a temperature could destroy the feed's nutrient content, thereby, making it difficult to neutralise mycotoxins.

A broad-spectrum mycotoxin binder

Applying a broad-spectrum toxin binder to feed is one of the best solutions to prevent mycotoxicosis. TOXFIN™ contains proprietary activated minerals for the protection of all animal species. It is made up of a carefully selected blend of unique activated adsorbents that bind a broad range of mycotoxins. It reduces the bioavailability of feed mycotoxins in the gastrointestinal tract and promotes mycotoxin excretion from the animal.

In an *in-vivo* broiler trial, birds were fed with contaminated feed and feed mix with TOXFIN™ Dry. The fecal matters of the birds were later tested for mycotoxins. It was found that in the group mix with TOXFIN™ Dry, close to 80% of the mycotoxins were recovered.

The physical appearance of the birds' livers showed a remarkable difference. In the group fed with mycotoxin-contaminated feed, the livers exposed to mycotoxins were shown to be enlarged, pale and friable. In the group fed with contaminated feed mix with TOXFIN™ Dry, the livers had the same appearance as the livers from the healthy control group.

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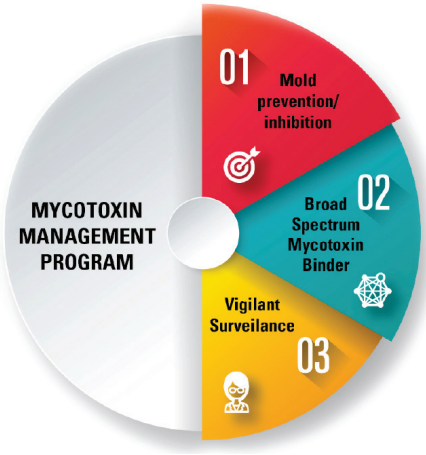
Hence, this confirmed that the TOXFIN™ group successfully avoided mycotoxicosis. The mycotoxins were bound by TOXFIN™ and excreted, making them unavailable for absorption through the gut wall.

Vigilant surveillance

Vigilant surveys of mould growth and mycotoxin contamination need to be constantly conducted. For this purpose, Kemin offers laboratory services to help producers better understand raw materials. Upon receiving the samples from customers, Kemin's Customer Laboratory Services (CLS) will analyse for mycotoxins using either High-Performance Liquid Chromatography (HPLC) or MYCOSCAN™, one of Kemin's latest innovation that leverages on the lateral flow assay technology to quickly quantify mycotoxins in the sample.



Conclusion

Judicious use of broad-spectrum mycotoxin binder ensures maximum excretion of mycotoxins from animals in order to curtail symptoms of mycotoxicosis.

Risk assessments of mycotoxins are achieved through constant surveillance, utilising advanced laboratory methods.

With the right data and information at hand, producers can be empowered to make better management decisions and take remedial actions when needed.

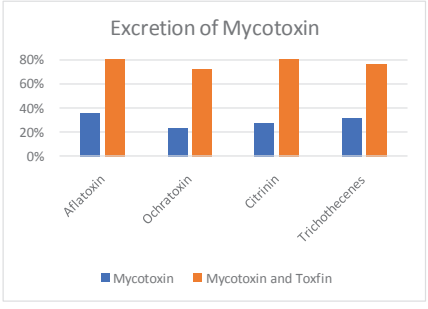
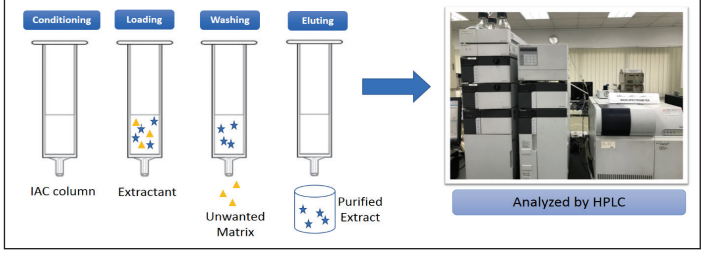


Table 3: Percentage of mycotoxins that were excreted

Figure 1. Schematic diagram of the mycotoxin analysis



- CHEW KIN KEN, Kemin Animal Nutrition and Health, Asia Pacific