

Molds, Mycotoxins and Feeds: A Brief Summary

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Mold growth in feed is always a major concern to animal owners. Moldy feed is usually the result of improper storage. Molds can grow on any type of feed provided that it receives adequate amounts of water, oxygen and warmth. Eliminating any one of these necessities will suppress the growth of molds.

Molds by themselves can cause problems in palatability and allergies. Certain molds produce metabolites that are extremely toxic to animals. Molds of the species *Fusarium*, *Aspergillus*, *Penicillium* and *Claviceps* under certain conditions will produce mycotoxins. Many mycotoxins exist but aflatoxin B1, fumonisin B1, ochratoxin A, vomitoxin, zearalenone and ergot alkaloids are the most dangerous to livestock and companion animals.

Most feed manufacturers go through painstaking efforts to prevent the growth of molds in feeds. Products are dried to have moisture contents less than 12% to prevent mold growth. Mold growth is prevented in coarse texture feeds and other high moisture feeds by the addition of propionic acid derivatives or calcium propionate. However, improper storage of feed or feed left in the bunk, pail or bowl for an excessive time during hot weather can result in mold growth and subsequent formation of mycotoxins. In addition, hay, pastures and silages can become sources of mycotoxins because these feeds are never free of mold spores.

Several steps can be taken to limit mold growth in feed:

- Store in a cool and dry place
- Limit exposure to air and moisture
- Put only the amount of feed in the bunk that can be consumed in a reasonable time during hot, humid days.
- Keep residue from building up in the feed bunk
- Use proper harvesting techniques

However, there are times when the feed may contain mycotoxins even when proper handling techniques are used. Molds produce spores when exposed to inclement conditions. A spore is like a bomb shelter for the mold. The spore keeps the mold viable and able to regenerate and reproduce when conditions are no longer hostile.

In addition, mycotoxins are very stable compounds that are resistant to temperature, drying, light and other variables that can destroy other organic compounds. Consequently, molds may have produced mycotoxins and died leaving no evidence of existence except for the mycotoxins that cannot be seen. The presence of molds does not always imply that the feed is contaminated with mycotoxins. Only certain types of molds make mycotoxins. On the other hand, there is no guarantee that the feed is free

of mycotoxins if there are no molds present. Somewhere in the history of the feed, molds could have grown leaving no evidence of existence except for mycotoxins.

Adding certain ingredients into the feed may help if one suspects mycotoxins contamination. It is believed that these ingredients bind the mycotoxins in the gut of the animal and prevent these toxic substances from being absorbed and harming the animal. There are some ingredients that have been considered good for binding mycotoxins that include:

- Activated charcoal
- Clays that include bentonite, montmorillonite, zeolite
- Hydrated calcium aluminosilicates
- Yeast cell walls (*Saccharomyces cerevisiae* fermentation solubles)

Results from research involving the use of these ingredients for neutralizing the effects of mycotoxins have not been consistent. Studies have shown that certain binders have a greater affinity for certain mycotoxins. There also have been studies that showed certain binders capable of binding essential dietary minerals. A number of studies have showed no benefits from the addition of these binders to feeds contaminated with mycotoxins. Consequently, it has been difficult to judge which binder is superior under any given condition. Thought must be given to the type of binder to match a certain mycotoxin and to possible modifications needed to dietary minerals and other nutrients. FDA has not approved the use of these ingredients for the purpose of binding mycotoxins because of the unpredictable nature of the action of these substances under any given situation. However, binders are commonly and legally added to feeds suspected of being contaminated with mycotoxins provided no claims are made with respect to mollifying problems associated with mycotoxins.

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