

Managing Cattle Feed Contaminated with Mycotoxins

Mycotoxins are the metabolic by-products of fungi. They can cause serious health problems in cattle and other animals, including reduced weight gain, capillary fragility, reduced fertility, suppressed disease resistance and even death.

Mycotoxins can interfere with many of the digestive enzymes, causing impaired growth and muscle formation, as well as damaging reproductive hormones resulting in impaired fertility and decreased milk production.

Allowing fungal invasion and toxin formation in feed in the field or in storage will increase the risk of adverse health effects and economic loss. Producers can minimize this risk by:

- reducing the amount of mycotoxins in feed before the crop is harvested
- effective feed testing
- treating and/or managing the affected feed

Control of mycotoxins

The first step to avoiding feed contamination is to minimize the production of mycotoxins. Here are some methods that can help achieve this objective:

- plant and harvest early to lower mold activity in the crop; less mold means fewer mycotoxins
- harvest at maturity as soon as the moisture content allows minimum grain damage
- adjust machines and equipment for minimum seed or kernel damage and maximum cleaning
- dry all grain to at least 15 per cent moisture as soon as possible. Grain can be safely stored for long periods once it reaches a uniform moisture level of 13 per cent or below

- cool the grain after drying
- maintain dry storage conditions and temperatures of 36 to 41 degrees Fahrenheit
- thoroughly clean the grain and all bins before storage
- store in watertight, insect- and rodent-proof structures. The grain quality will not increase, but can be maintained at the same level with good storage
- continue periodic aeration and probing for "hot spots"
- prevent fungi growth by applying propionic acid or a mixture with ammonium isobutyrate as registered for high-moisture stored grain

- choose varieties of grain resistant to insects, diseases and mechanical damage. Any damage to the grain provides a route of entry for toxin-forming fungi
- know how the grain was grown; mold spore levels may be higher with no-till soil management
- silo management to promote optimal fermentation will minimize mold and mycotoxins during silage storage

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Feed testing

It is important to have feed tested in the following situations:

- moldy feeds are being fed
- substantial changes in health or production are seen
- there is a decline in performance and health

Obtaining proper feed samples can be difficult because mycotoxins present several challenges:

- are present at very small amounts
- are not evenly distributed

- continue to be produced in storage
- are not numerically related to the amount of mold present

When taking a feed sample, include individual suspect ingredients, concentrates and total mixed ration in the sample. While the sample must be random, be sure to include material from the sides of the bin, where molds tends to gather.

To do effective dry sampling:

- take 8-12 sub-samples at each of 3-5 feedings or feed removed from storage
- mix the sub-samples well
- take a 500g composite, and store in a cool, dry place
- combine the 3-5 composite samples, mix well and take a 1 kg sample for submission to the lab
- store in a clean paper or cotton bag; do not use plastic bags with dry samples
- keep an additional 1kg sample for confirmation or for another analysis

Another method to take dry samples is to take 12-20 stream samples from the entire delivery or 12-20 deep probe samples from a bin. Mix in the same way as just described.

To do effective wet sampling:

- take 8-12 sub-samples at each of 3-5 feedings
- mix sub-samples, and then take a 1kg composite sample
- store the composite sample in a tightly packed plastic bag and freeze
- combine the 3-5 composite samples and thoroughly mix them
- take a 1kg sample for mycotoxin analysis, another 1kg sample for moisture analysis, and a third 1kg sample for confirmation or other analysis.

Treatment and management of contaminated feed

Contaminated grains may be controlled in several ways:

- direct flaming
- anhydrous ammonia
- sodium bicarbonate

Unfortunately, none of the above techniques work on mycotoxin-contaminated forages. The best strategy when dealing with contaminated forages is to dilute the affected feedstuffs with clean feed; this approach will help minimize livestock problems.

Consult a nutritionist to help neutralize the effect of toxins, including increasing the ration level of energy, protein, vitamins (A, E, B) and minerals, selenium, zinc, copper and manganese (Se, Zn, Cu, Mn).

Healthy, well-conditioned animals will be better at dealing with contaminated feed than will sick, pregnant, young or stressed animals. A balanced nutritional program and adequate facilities that provide an environment conducive to health will help control losses.

For more information, contact:

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