

Mycotoxins in Dairy Feeds

Tom Wright, OMAFRA, Dairy Cattle Nutritionist

Infosheet

June 2011

If you've ruled out other causes for off-feed or low milk production in your herd, mycotoxins may be a factor.

When weather conditions are right for the growth of moulds it can potentially lead to high levels of mycotoxins in corn grain and corn silage. That makes caution the watchword when it comes to nutritional management of your herd.

Mycotoxin contamination can be a concern in many crops when conditions are right to promote mold growth. Produced by a fungus, mycotoxins can impair animal performance and change their normal metabolism even when consumed at extremely low levels.

Although researchers have known about mycotoxins for decades, they continue to pose a challenge to the livestock industry. As knowledge about mycotoxins increases, more questions are raised.

Corn grain or silages suspected of contamination that are intended as dairy cattle feed are typically tested for zearalenone and deoxynivalenol [DON], commonly known as vomitoxin because it can cause vomiting in pigs. However, researchers now believe there are numerous mycotoxins that have not yet been detected, let alone studied.

Experiments with purified mycotoxins have been less likely to produce the same negative effects seen when grains naturally contaminated with

mycotoxins are fed. It is thought that undetected mycotoxins in naturally contaminated feed cause those effects. A fairly safe assumption when lab analysis detects zearalenone or DON is that other mycotoxins are likely present as well.

Recent research conducted by Dr. Trevor Smith's lab at the University of Guelph's department of animal and poultry science examined the effects of feeding a mycotoxin-contaminated total mixed ration [TMR] to lactating dairy cattle. The experiment fed three diets, all formulated with wheat, corn and hay, to six cows per treatment for 56 days:

- a control diet without mycotoxin-contaminated grains;
- a similar diet with contaminated grains;
- a contaminated diet plus a polymeric glucomannan, commercially available as a product made from yeast that the researchers thought would counter the effects of mycotoxins.

The primary mycotoxin in the diet was vomitoxin produced by *Fusarium* molds and present at levels up to 3.6 parts per million (ppm) as measured in the TMR dry matter. Researchers measured feed intake and milk production, and took blood samples to monitor the cows' immune status.

The experiment showed no effect of diet on feed intake, milk production or somatic cell counts. After only 36 days of feeding, however, cows fed the contaminated diet had significantly reduced blood serum concentrations of IgA-indicating

suppressed immune systems—compared with animals fed the uncontaminated control diet or the diet with the polymeric glucomannan added. The researchers noted that immune system suppression has also been reported in non-ruminants such as pigs and poultry when they have been fed contaminated grain.

Results indicate that mycotoxins in feed can negatively affect the immune system even before obvious problems like reduced feed intake or milk production occur. That puts animals getting this feed potentially at higher risk for health problems—especially high-producing and transition cows, which are already under greater stress.

If you've ruled out other causes for off-feed or low milk production, mycotoxins may be a factor. Lab testing of all individual ingredients for mycotoxins is a useful step to determine levels of total dietary mycotoxins and assessing potential problems. If mycotoxins are present, an effective solution is to dilute contaminated grains and silages with uncontaminated ingredients when mixing feed for your herd.

The results from Smith's study indicate another potential solution to alleviate the effects of mycotoxin contamination of feeds. Research over the years has shown numerous products, such as the polymeric glucomannan, bentonite clay or even activated charcoal, can reduce problems associated with mycotoxins. Each has its own advantages and disadvantages.

As well as having feed ingredients analysed, consult your veterinarian and nutritionist. They can help you determine an appropriate management strategy to work through your mycotoxin situation.

Reference:

Smith, T.K., G. Diaz-Llano, S.N. Korosteleva, and M. Yegani. 2006. The effect of feed-borne *Fusarium* mycotoxins on the reproductive efficiency in dairy cows, sows and broiler breeders. In *Nutritional Biotechnology in the Feed and Food Industries*. Nottingham University Press, United Kingdom.

A version of this article first appeared in the *Milk Producer Magazine*, December, 2006.

For more information:
Telephone: 1-877-424-1300
E-mail: ag.info.omafra@ontario.ca
www.ontario.ca/livestock