One of the menacing challenges faced by livestock producers is the presence of molds and mycotoxins in feedstuffs. Production and reproduction problems can be related to the ingestion of feedstuffs contaminated by molds, molds and mycotoxins, or mycotoxins by themselves.

The three primary toxin-producing molds we deal with in agriculture are the *Aspergillus*, *Penicillium* and *Fusarium* molds. Molds may be formed in the field under growing conditions or in storage of commodities and fermented feedstuffs such as silage, high-moisture corn, haylage and baylage. Mycotoxins are secondary metabolites of molds and may be formed in the field or in storage. These toxic compounds are very unpredictable in nature and may...
cause a wide variety of physiologic and health problems in livestock. The negative effects can be economically devastating to producers.

It is important to keep in mind that ruminant animals have a population of protozoa and bacteria in the rumen that are provided by nature to detoxify the animal. However, extremely high mold and mycotoxin levels can overwhelm the ruminal ecosystem. Feeding practices, diet formulation and rate of passage can alter the animal’s ability to cope with the problem. It is also common for animals in high-stress environments to exhibit more clinical observations than non-stressed animals.

FEEDING MOLDY FEEDS
When feedstuffs that contain high levels of molds and yeasts are fed, they destroy the fiber mat in the rumen, decrease the fiber digestibility and reduce the nutrient value of the feedstuffs. Beef producers must be aware that the energy levels of these affected feedstuffs may be reduced from 5 to 10 percent, depending on the severity of the contamination.

Moldy and musty-smelling feeds are also less palatable to livestock, resulting in decreased dry-matter intakes, lower average daily gains and poor feed conversions. In addition to loss of efficiency, there are health problems. Since the molds causing problems are not visible to the naked eye, it is common for producers with mold-based performance losses to blame the losses on management factors or breed and background influence.

THE ADDITIVE EFFECT OF MULTIPLE MYCOTOXINS
Health and production problems associated with the ingestion of mycotoxins vary widely due to several factors. In most cases of mycotoxicosis, there is generally more than one particular mycotoxin involved. Multiple toxins create an “additive effect,” where more than one or two clinical signs or observations may be involved. The severity of a mycotoxin challenge is based upon the following:

1. The specific toxin or toxins involved.
2. The level of mycotoxin contamination (in ppm or ppb).
3. Length of exposure to the contamination.

Many times it is not an acute case that can be readily identified but a chronic situation associated with the ingestion of low levels of mycotoxins over an extended period of time. This results in a wide array of subclinical symptoms that slowly reduce performance, eat away at the producer’s bottom line and compromise herd health.

ALTERED REPRODUCTIVE PERFORMANCE IN BROOD COWS
Reproductive performance that has been altered due to the negative effects of molds and mycotoxins may
manifest itself in a variety of ways. Look for the following observations in a population of cows and/or heifers:

1. Irregular cycles
2. Repeat breeders
3. Non-breeders
4. Nymphomaniac cows
5. Excessive cases of early embryonic mortality
6. Constant vaginal discharges
7. Animals that do not exhibit signs of heat
8. Abortions

Mycotic abortions may be caused by toxin-producing molds such as the Aspergillus spp. or by the non-toxin-producing mold known as Mucor spp. The Mucor molds are considered storage molds and are abortive in nature at high levels. They grow well in stored feedstuffs including dry hay. Abortions associated with these two molds are generally in the second and third trimester.

Fermented feedstuffs that have a pH higher than normal due to incomplete fermentation may be infested with the bacterium Listeria monocytogenes. This bacterium survives well in higher-than-normal pH environments and may survive freezing temperatures. Caution is advised when feeding moldy, fermented feedstuffs that may have high pH ranges.

Vitamin A deficiencies can be associated with feeding moldy feedstuffs over an extended period of time. Look for an increase in abortions, blind calves at birth and/or an increase in the number of cases of retained placentas.

Poor reproductive performance may be a result of grazing pastures containing endophyte-infected fescue (fescue toxicity). Poor reproductive performance may be accompanied by weight loss, decreased feed intakes, lack of blood flow to extremities and a rough, dull hair coat giving the animal a very unthrifty appearance.

Observations Associated with Mycotoxicosis

Mycotoxins are capable of affecting every organ in the body, depending on the toxin and/or combination of toxins present in the diet. The immune system is often down-regulated due to the inhibition of RNA and DNA synthesis in the body. An increase in the incidence of disease challenges within a herd should lead one to the examination of feedstuff quality. In cases where the immune system has been challenged by a bacterial infection (i.e., Salmonella, E. coli, etc.), the animals tend not to respond well to veterinary therapy.

Mycotoxins in diets for feedlot cattle are generally not a problem for heavier cattle that have been on feed for an extended period of time (e.g., animals in the 700-pound and above weight range). These animals have a tendency to be able to cope with higher levels of mycotoxins than young animals and calves, which are considered high risk and are most susceptible to the negative effects of mycotoxins.

Below is a list of observations associated with animal populations undergoing mold and mycotoxin insults:

1. Reduced feed intakes or off feed completely
2. Low average daily gains in growing cattle
3. Poor feed conversion in preconditioning yards and feedlots
4. Rough, dull hair coat
5. Stiff joints and/or lameness
6. Ulcers, abscesses, lesions out of the norm
7. Compromised immune system
8. Poor reproductive performance
9. Abortion
10. Birth of weak calves
11. Deformities at birth
12. Increases in the incidence of calving-related disorders
13. Increase in respiratory-related incidences
14. Lack of response to veterinary therapy

Troubleshooting the Problem

It is always a good idea to employ the use of a quality-control program for incoming feedstuffs. Test all fermented feedstuffs and forages for molds and mycotoxins if you suspect a problem. Many producers have their feedstuffs and forages tested at laboratories, such as the Alltech 37+ laboratory, to determine mycotoxin prevalence before feeding any silages and hay. Try to discard any feed ingredients that are moldy and musty smelling.

The use of a sequestering agent (toxin binder) in the ration at all times will help prevent and/or offset the negative effects of molds and mycotoxins. Keep in mind, we are dealing with a challenge based upon the amount of and combination of mycotoxins. Take into consideration the additive and synergistic effects of multiple mycotoxins in feedstuffs. Therefore, be willing to utilize higher than normal rates of these products if needed.

Give consideration to what is going on in the GI tract. Any damage done to the GI tract by molds and mycotoxins may alter the beneficial microflora and immune system enough to make an animal more susceptible to infection by pathogenic organisms. It is a good idea to feed prebiotics and probiotics to help restore the gut and optimize performance.

If the immune system has been compromised, look at adjusting the diet in a fashion that will help restore maximum immune function. It may be necessary to adjust vitamin and trace mineral levels for a period of time. Products such as organic trace elements, selenium yeast, higher vitamin E levels and the addition of supplemental yeast culture to the diet should be considered.

If you suspect molds and mycotoxins are hindering performance in a client’s herd, work with the producer, and nutritionist if applicable, to formulate a management plan for improving feedstuff quality and herd health.