

MANAGING **MOLDY HAY** LESSENS FEEDING DANGERS

Plan ahead, blend, control dust, avoid feeding to pregnant or lactating animals, feed in ventilated areas

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Many Wyoming producers, blessed with an abundance of spring and summer moisture, are quickly discovering that this year's hay crop has a little more mold growth than usual.

While above-average precipitation is a good problem, there are additional management concerns after opening a bale pile and discovering some spoilage.

Source of the mold: Although excess moisture is typically the cause of mold, it can be created by either of these two situations. Hay that is baled too wet can have mold throughout the bale, while bales that have been exposed to moisture after being stacked may have mold on the

outside layers. So examine the hay to identify the source and extent of the mold.

Testing for mycotoxins and mold: Though there are good testing procedures for the limited number of molds found in grain, testing for molds in forages is quite difficult. There are dozens of mold types that may affect forages and very few tests that evaluate forage-specific molds. Most feed labs offer an overall mold count, or estimate of the mold contamination that may be useful when determining the severity of the problem, especially if contemplating purchase. If hay has already been purchased or put up on the property, look for visual cues to determine severity. White, grey, and black molds are typical. Large mold problems that have unusual mold colors are more cause for concern as

they may potentially produce mycotoxins (see sidebar page 24).

Mold vs. Heat-damaged Hay

Hay baled when slightly wet can either form mold, go through a heating process, or both. Heat damage has different implications for hay quality than mold. When the internal temperature of a bale stays in the 125 to 150 F range, mold spoilage typically results. Heat damage, also known as the Maillard reaction, occurs if the bale temperature exceeds 150 degrees. Protein and carbohydrates in the hay begin to react to the high temperatures, going through a browning process - the Maillard reaction. Although we actually want the Maillard browning reaction to occur when we are cooking hash browns in a skillet, heat-damaged forage, although often tasty to cattle, has a dramatically reduced feed value.

The browning





reaction occurs within weeks of baling and essentially makes the nutrients unavailable to the animal, dramatically reducing the feed value of the forage.

Moldy hay effect: Dust. Often the dark, almost black, dust associated with the mold is the biggest health issue. The dust is decomposed forage particles, mold organisms, and, most importantly, mold spores. Some potential effects of feeding moldy, dusty hay include reduced intake and respiratory health responses associated with inhaling the spores. If possible, feed the hay in a well-ventilated area. Control dust by mixing hay with wet feeds such as silages, beet pulp, wet distiller's grains, or even liquid feed supplements.

Moldy hay effect: Spores. An immune response to the inhaled and consumed mycotoxins can produce adverse hormonal and endocrine effects in the animal. Inhaling the dust,

mold, and spores should be minimized for humans and animals, especially when feeding to horses and freshly weaned calves. Diluting moldy hay with other forages will reduce exposure. Start at a half-and-half dilution ratio and add a higher proportion of good-quality hay with higher mold counts. This will improve the overall safety of feeding moldy forages.

Cattle have ruminal microbes that destroy a high number of mycotoxins associated with molds, while horses and swine are more susceptible to mold problems. Pregnant and lactating animals are at higher risk than feeder cattle and non-pregnant animals.

Some indicators that mold levels are too high include dramatically lower appetite and pneumonia-like respiratory issues such as hacking/coughing.

Heat-damaged hay effect: Poor nutrition. Forage testing may reveal

high protein levels immediately after hay is harvested; however, the Maillard reaction will change the nutrient availability. Take a forage sample after the hay has been stored for at least a month and request an available protein test if heat damage is suspected. Because of the reduced quality and unavailable nutrients in heat-damaged hay, make sure animals are supplemented with higher quality forages or grains.

Final thought: While there are some risks associated with feeding moldy forages, planning ahead, blending, controlling dust by including wet feeds or liquid supplements to condition or dampen the hay, avoiding feeding to pregnant or lactating animals, and feeding in a ventilated area can all help reduce impacts.

MYCOTOXINS

Toxic compounds produced by certain species of fungi (molds) including *Aspergillus*, *Fusarium* and *Penicillium*. These toxins can cause livestock health problems and reduced performance when consumed (eaten) or inhaled. While hundreds of mycotoxins have been identified, the five major mycotoxins in the U.S. include aflatoxins, fumonisins, vomitoxin, ochratoxin A, and zearalenone.

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