



**GUT HEALTH**  
SOLUTIONS

CLEAN UP

# MAINTAIN FEED QUALITY

A BIG PART OF GUT HEALTH





## WHAT IS FEED QUALITY?

For dairy and beef cattle producers, the challenge of maintaining high-quality feed starts at harvest and continues throughout the year. Ruminant feed quality is much more complex than visual appearance, aroma or a lab test.

Maintaining cattle feed's nutritional value and quality from harvest to feeding, takes more than just good handling and storage practices. Producers must look for additional solutions to protect their feed quality. Producers should look for solutions to preserve the quality of their hay, the forages they harvest, commodities purchased and their grain.

Only by addressing each component of the final ration, can producers ensure total feed quality.



## HAY The Importance of Hay Preservation

Harvest and storage losses for hay can represent a significant source of economic loss. As soon as hay is cut and placed in a windrow, quality and nutritional value degrade. Quality hay should meet the maximum levels of digestible energy and protein to satisfy the needs of high producing livestock, while maintaining low to negligible amounts of mold and other possible contaminants.

Research has demonstrated the application of forage additives before hay is baled and stored can result in a good return for a producer's investment. Acid-based preservatives for hay, baleage or haylage, can reduce losses from molds, wild yeast and certain bacteria. Acid-based preservatives are especially effective when the hay is not harvested at ideal moisture levels. Excessive microbial growth can cause hay bale heating, increasing dry matter loss and producing Maillard reactions, which reduces dry matter and crude protein digestibility.

To combat these issues, Kemin has worked to create several effective solutions for high moisture hay, such as organic acid blends to reduce mold growth in hay and inhibit microbial growth in silage.

### **PRESERVATION OF HIGH MOISTURE HAY**

Baling hay at higher moisture levels reduces leaf loss and field curing time. By retaining the protein-rich leaves, producers harvest more protein per acre. Reducing field curing time allows for earlier hay regrowth, and this regrowth is less subject to damage by equipment. On irrigated hay fields, earlier baling allows quicker irrigation, allowing regrowth to begin sooner. However, in order to bale hay at moisture levels above 15 percent, treatments are recommended to prevent deterioration and heating during storage.

### **KEMIN SOLUTIONS**

#### **FRESH CUT® Plus Liquid**

A blend of organic acids designed to control mold growth and bale heating when hay is baled with moisture levels over 15% but under 27%.

#### **Silage SAVOR® Plus Liquid**

A liquid preservative for all ensiled crops, including baleage and haylage, to improve silage quality by increasing the retention of nitrogen and inhibiting microbial growth.



# SILAGE

## Silage Quality Begins at Harvest

Silage is the foundation of nearly every ruminant diet. Whether the silage is made from legumes, small grains, sorghum or corn, quality silage is critical to ensuring profitable production. Making quality silage is a battle against the clock as quality and nutrition degrade very quickly. Producers need to consider crop maturity, chop length, packing density and a whole host of other factors when making high quality silage. The goal of all these steps is to preserve these forages free from mold, wild yeast and bacterial contamination and keeping them preserved for a year or even longer.

Producers have several choices to help increase the storage time of forages. Silage inoculants are bacteria which produce large quantities of lactic acid. The acid produced by these bacteria rapidly drop the pH of silage. Because these bacteria work in a very narrow moisture range, producers who use inoculants must carefully monitor crop maturity and moisture to optimize inoculant performance.

### ORGANIC ACIDS AND SILAGE PRESERVATION

Another tool used for silage preservation are acid-based preservatives. These organic acids are especially effective when the forage is not harvested at ideal moisture levels. By reducing the growth of non-beneficial fungi, organic acid blends help natural silage bacteria work more effectively to drop the pH of silage. Organic acids work well on all silages but are particularly effective on silages which are either too dry or too wet. By treating silage with an organic acid blend to help control the growth of mold and wild yeast, producers have one more tool to help make quality silage no matter the conditions.

Over the years, Kemin researchers have developed blends of organic acids ideally formulated to work with forages. In addition, Kemin utilizes buffering technology to reduce metal corrosion often associated with unbuffered propionic acid. These buffers reduce equipment damage and increase worker safety without reducing the efficacy of the organic acid.

### KEMIN SOLUTIONS

#### Kem LAC<sup>®</sup> HD Silage Inoculant

This powerful blend of three lactic acid producing bacteria works to rapidly drop pH in all types of silage. This rapid pH drop helps preserve dry matter loss and guard against the growth on mold and wild yeast.

#### Kem LAC<sup>®</sup> LB 500 Silage Inoculant

A blend of *Lactobacillus plantarum* and *Lactobacillus buchneri*, this combination rapidly drops silage pH, while also aiding in aerobic stability. During feed out, silages treated with Kem LAC LB 500 experience less heating than untreated silage.

#### Silage SAVOR<sup>®</sup> Plus Liquid

A liquid preservative for all ensiled crops, including baleage and haylage, to improve silage quality by increasing the retention of nitrogen and inhibiting microbial growth.

#### Silage SAVOR<sup>®</sup> Dry

A dry preservative for all ensiled crops, including baleage and haylage, to improve silage quality by increasing the retention of nitrogen and inhibiting microbial growth.

# BYPRODUCTS

## A great way to save feed costs

Because cows are ruminants, they are the ultimate recyclers! Feeding byproducts to cattle as a source of nutrients is a common practice. Byproducts come from a variety of sources, including grain processing, production of human foods and beverages, and manufacturing of fiber products. Research has been conducted on most by-product feeds, and the guidelines for their use are well documented.

The primary reason producers feed byproducts are to reduce feed cost. Feed is the largest cost associated with growing replacement heifers and producing milk, so cheaper feeds offer the potential to lower feed cost. When forage supplies are limited (i.e. during a drought or when animal numbers are increased but forage production is down), other high-fiber byproduct feeds may be used to extend forage supplies.

### CONTROLLING THE UNCONTROLLABLE

There are disadvantages of byproduct feeding which producers should consider as well. Additional time may be required to purchase, arrange delivery, formulate and mix rations. Specialized storage and feeding facilities are needed for certain byproduct feeds and may require construction of additional buildings or equipment. If a byproduct feed is only available seasonally or in insufficient amounts, this factor must be taken into consideration before using byproducts.

Because byproducts are not the primary product produced, processing facilities give little consideration to contaminants in byproducts. The less processors spend, the faster the waste stream is removed, bettering the operation. Because the quality of byproducts is uncontrollable, the sooner producers can introduce preservatives, such as organic acid blends, the better. By introducing organic acid blends early, this extends potential shelf-life and quality of the commodity destined for the cattle.

### KEMIN SOLUTIONS

#### Ultra CURB<sup>®</sup> Liquid and Dry

Liquid and dry blends of four powerful organic acids formulated to inhibit mold and wild yeast growth in feed and feed ingredients.

#### Myco CURB<sup>®</sup> Liquid and Dry

Liquid and dry blends of buffered organic acids formulated to inhibit mold growth in livestock feeds.

#### Ammo CURB<sup>®</sup> 65 & 75 Liquid and Dry

Liquid and dry blends of buffered organic acids formulated to inhibit mold growth for processed feed ingredients and livestock feeds.

#### KALLSIL<sup>™</sup> Dry

An enhanced zeolite flow agent for broad-spectrum fungal metabolite control to improve feed quality.







# GRAIN

## Grain Storage Treatments

Preventing mold growth during storage and feed processing, is essential to retaining grain quality and maintaining nutritional value of the final feed. Nothing can be done to improve the actual quality of grain in storage, so maintaining the quality at the time of harvest is the goal. Preventing mold growth not only helps preserve nutrients, but it can also help reduce the formation of harmful mycotoxins.

To combat these issues, Kemin has developed cost-effective solutions for grain treatments and grain storage to prevent mold growth. Kemin is recognized in the feed industry for pioneering the use of blended organic acids to control mold and wild yeast growth. Over the years, Kemin has thoroughly tested, evaluated and perfected various combinations of organic acids and buffering compounds to arrive at cutting-edge products like Myco CURB® and Ammo CURB®.

Treating crops with a blended organic acid before short- and long-term storage helps prevent grain mold and bridging of the grain. Grain treated before loading into ships at port location helps the grain arrive in better condition. Additionally, treated grain often receives a premium price when sold in international markets.

### KEMIN SOLUTIONS

#### Myco CURB® Liquid and Dry

Liquid and dry blends of buffered organic acids formulated to inhibit mold growth in livestock feeds.

#### Ammo CURB® 65 & 75 Liquid and Dry

Buffered liquid and dry mold inhibitors for processed feed ingredients and livestock feeds.

# TOTAL MIXED RATION (TMR)

## Complete Feed

When feed ingredients are mixed in the total mixed ration (TMR), a new series of concerns can arise. The reintroduction of oxygen into ensiled feed and forages during processing and mixing can promote oxidation, increase vitamin susceptibility to degradation and enhance the environment for mold and wild yeast growth. The growth of these microbes can lead to a cascade of events resulting in ration heating and ultimately causing massive spoilage of the feed. The growth of mold can also lead to formation of mycotoxins – damaging secondary metabolites produced by certain species of fungi. According to research, molds and mycotoxins can decrease TMR nutritional value between 5% and 10%.<sup>1</sup>

To help prevent ration heating and microbial growth from occurring, organic acids may be added to the TMR during mixing. For best results, use a blended acid with multiple acids to act on numerous mold and wild yeast species to lessen their impact on your ration and ultimately on animal performance. In addition, to prolong feed shelf-life and save on costs, producers should consider use of feed storage enhancers, oxidation control solutions, flow-agents and more.

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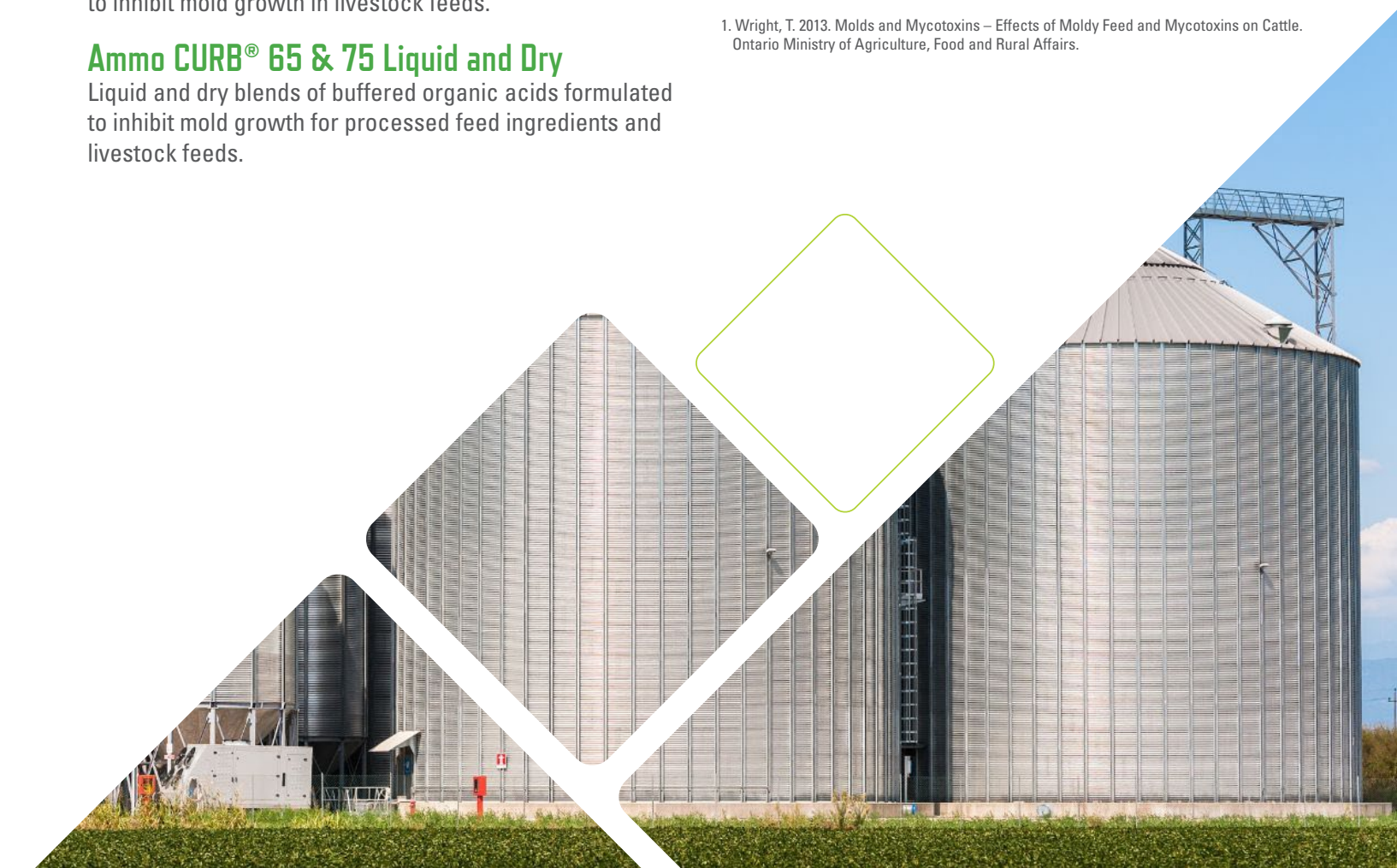
#### KALLSIL™ Dry

An enhanced zeolite flow agent for broad-spectrum fungal metabolite control to improve feed quality.

#### ENDOX® Dry and ENDOX® 5X Concentrate Dry

Complete antioxidant systems formulated specifically to stabilize final feeds and protect fat-soluble vitamins in concentrated mineral premixes.

1. Wright, T. 2013. Molds and Mycotoxins – Effects of Moldy Feed and Mycotoxins on Cattle. Ontario Ministry of Agriculture, Food and Rural Affairs.



# A COMPREHENSIVE APPROACH TO GUT HEALTH

Our Gut Health Triple Check program serves as a support system to **CLEAN UP** contaminants in feed and water prior to animal exposure, **BUILD UP** intestinal strength to reduce leaky gut and **KNOCK OUT** harmful pathogens for healthier livestock and poultry.



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LEARN MORE AT

**1-800-752-2864**

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