CRYSTAL CREEK NEWSLETTER

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APRIL 2016

WHAT'S NEW FOR 2016

Crystal Creek® 2016 Product Catalog

The 2016 catalog debuts a new, fresh look. Each species or category is prefaced with a two page introductory spread presenting our various product lines and showing a preview of products in that group.

Color-coordinated page headers and side tabs help designate product sections and product purposes while the new "Vet Tip" pages provide helpful information for producers. Crystal Creek® is dedicated to providing you with the best products and customer service possible to make your operation efficient and profitable.

NOW ON PINTEREST

Crystal Creek® is pleased to provide our online followers with an additional venue to view new services and products. Follow us on Pinterest at: https://www.pinterest.com/crystalcreeknat/

Breaking News in Calf Barn Ventilation

Flip Duct®: A Revolutionary New Concept in Calf Barn Ventilation

Since its introduction into the market in the fall of 2015, FLIP DUCT® has turned the calf barn ventilation industry on its head, literally. Calf raisers everywhere are saving money by installing single fan and duct systems for year-round ventilation. Feedback from the field shows that the fast, cooling air speeds delivered by FLIP DUCT® during hot weather helps alleviate fly stress and has shown to keep bedding drier, longer. In cold weather, the small holes in FLIP DUCT® are designed to deliver slow, low volume air to calves, making it the ideal winter ventilation system. Multiple aspects of the FLIP DUCT® design are patent pending and this new, exciting product is available only through Crystal Creek®. Visit our website today to learn more about this innovative technology!

IN THIS ISSUE:

Managing Mycotoxins In Feedstuffs: Mycotoxin Binder Strategies

By Dan Leiterman

Mycotoxins are highly poisonous compounds produced by molds that can grow on livestock feeds both in the field and in storage. Mycotoxins can seriously reduce production in livestock and can negatively affect the health of both livestock and humans alike. Stressful growing and harvesting conditions, such as drought or very wet weather, are conducive to higher mold growth resulting in more mycotoxins in the feed. Mycotoxins are common in livestock feedstuffs and it has been estimated that over one third of the global grain supply has mycotoxin contamination. Poor storage conditions, post-storage mishandling of feedstuffs and poor bunk management may encourage further mold growth once the crop is out of the field.

There are over 300 different types of mycotoxins. At least 30 of these mycotoxins can be prevalent in livestock feedstuffs and several are highly toxic. Some of the more prevalent mycotoxins in livestock feeds are aflatoxin, deoxynivalenol (DON or vomitoxin), zearalenone, fumonisin, T2 toxin and ochratoxin.

Effects Of Mycotoxins On Livestock

Mycotoxins can have significant negative effects on the health, productivity and profitability of livestock. There are several points to consider when dealing with mycotoxins.

1. Mold and mycotoxins reduce the nutritive value and palatability of feeds.

   Also, mold growth is often accompanied by high levels of yeast growth, both of which reduce nutrient quality and values (protein and energy) of a feed.
2. Mycotoxins (deoxynivalenol (DON) or vomitoxin) reduce the animal's ability to utilize fats, carbohydrates, proteins, macro-minerals, trace minerals and vitamins in the diet.
3. Mycotoxins (DON, afaltoxin, ochratoxin and fumonisin) damage vital organ tissue such as the rumen lining, intestinal tissue, kidney and liver tissue. These mycotoxins will damage the DNA of the liver cells, which can significantly reduce the animal's ability to process and utilize the nutrition of the diet. Mycotoxins can also predispose cows to a higher risk of metabolic conditions such as ketosis.
4. Mycotoxins (zearalenone) compromise reproductive function. Many molds and mycotoxins are estrogenic and can disrupt normal ovary function.
5. Mycotoxins in general are known to suppress immune function, which can reduce the animal's resistance to disease and compromise the animal's ability to properly respond to vaccination programs.
6. Mycotoxins (ochratoxin) are carcinogenic and can seriously affect poultry health and production, especially in layers and broilers.

Monitoring For Symptoms Of Mycotoxin Exposure In A Dairy Herd

Through my years of working as a livestock nutritionist, I have learned that there are some situations that would indicate the need for an immediate investigation into the possibility of a mycotoxin exposure. For example:

1) **Milk Production Drop:** A significant drop in production (3 to 20 lbs./hd/day) in a relatively short time (1 to 14 days). This drop may happen in conjunction with feeding a new forage or grain. However, there can be pockets of mold growth/mycotoxins within a bunker, pile or silo which can unexpectedly cause a major drop in production without a change in feedstuffs.

2) **High Intake Of Free Choice Mineral Or Salt:** I recommend that cows should always have free choice mineral available (a complete mineral blend, that does not contain salt or any flavoring agents, offered next to a bin of free choice loose salt). Even when the ration is balanced and all of the mineral requirements are hopefully met in the TMR or ration, it is important to offer free choice mineral and free choice loose salt. The intent is to have the free choice mineral available as a safety net for cows that may need a little extra and to act as an indicator (a canary in the mine so to speak) of a possible problem with mineral utilization, or with the ration utilization in general. I have found many times that if the cows suddenly go from very little free choice mineral intake to

a significant free choice mineral (or salt) intake, that mycotoxins have become a problem in the ration and a mycotoxin binder strategy should be implemented. The value of using free choice mineral as an early alert tool is only valid if a baseline of free choice mineral intake has been established for the cows prior to the intake spike.

3) **Abnormal Dry Matter Intakes:** Some mycotoxins are well known for reducing dry matter intake (DMI) in dairy cows. For instance, vomitoxin can significantly reduce DMI in lactating and dry cows. However, I have also experienced situations where mycotoxins caused dry cows to have abnormally high DMI as well. For example, Holstein far-off dry cows normally have a daily DMI of approximately 30 lbs. In one of these incidences, the dry cows DMI increased to 40 lbs. or more. When a good mycotoxin binder was added to the dry cow ration the DMI promptly went back to normal levels.

Is There Merit In Testing Feedstuffs For Mycotoxins?

As the awareness of mycotoxins in livestock feeds increases, the willingness to test feedstuffs for mycotoxins is also increasing. Testing individual feedstuffs, or the overall TMR can be a helpful tool in determining mycotoxin exposure to livestock. However, it is important to be aware there are some significant limitations to the amount and value of information provided by many of the current mycotoxin testing labs that prevent them from being the absolute determination of a mycotoxin problem in the feeds. Consequently, a lab analysis for mycotoxins should only be one part of an overall checklist to determine the degree of mycotoxin exposure to the livestock and the need for a plan of action. Here are some points to consider when assessing the value of a lab analysis for planning a strategy to address a suspected mycotoxin issue.

1. There are over 300 molds that produce mycotoxins and typically most lab analysis only analyze for 4 or 5 mycotoxins.
2. The sensitivity of a typical mycotoxin analysis in the industry is limited. When most test results state 'none detected' a question should remain. Mycotoxins are known to attach to other nutrients such as carbohydrates and can become masked from detection by standard laboratory analysis (Lateral Flow, ELISA, HPLC and TLC). As long as the mycotoxin is masked by the carbohydrate it is still a problem to the animal. However, the analysis may not be able to detect it properly. There is a lab analysis called LC-MS-MS that separates/unmasks the mycotoxin from the carbohydrate matrix for a higher sensitivity and more accurate test result on mycotoxins but not all labs are doing this type of analysis. When the mycotoxin is not separated from the carbohydrate, the standard deviation, or rate of error in detection for the test may be very high. These lower sensitivity analysis' may report back "none-detected" on the whole report and yet there still could be a significant mycotoxin challenge to the livestock.

Assessing Tolerance Levels Of Mycotoxins

When considering the published industry standards for the tolerance level of each individual mycotoxin, keep in mind that the tolerance level is determined in an isolated setting with no other mycotoxin influence. There is the issue of synergy (two together act worse than the sum of each individual) between mycotoxins that comes into play and needs to be understood when assessing risk and strategy development. For example, if the animal is exposed to just one mycotoxin and the level in the ration is below an industry accepted tolerance level, then the impact on health and production may be low. This situation would not require a mycotoxin binder in the ration. *However, a significantly different situation occurs if there are two mycotoxins in the ration. Even if both mycotoxins are well below their individual tolerance level, two mycotoxins can act synergistically and the impact on the animal can be as negative, or worse, than having one mycotoxin well over the tolerance threshold.* Having more than two mycotoxins in the ration (even if below tolerance levels) presents an even higher risk.

What this means is that it is possible to have a lab analysis report for five mycotoxins, that found a detectable level of two mycotoxins, both below tolerance level and still have the cows demonstrate serious health and production problems due to mycotoxin exposure. It is also possible to have a lab analysis report that no mycotoxins were detected and there can still be a significant challenge to the animals from mycotoxins that were not detected or not analyzed for. That is why it is important to consider the lab analysis for mycotoxins in context with other herd production and health observations when determining a mycotoxin risk assessment and action plan.

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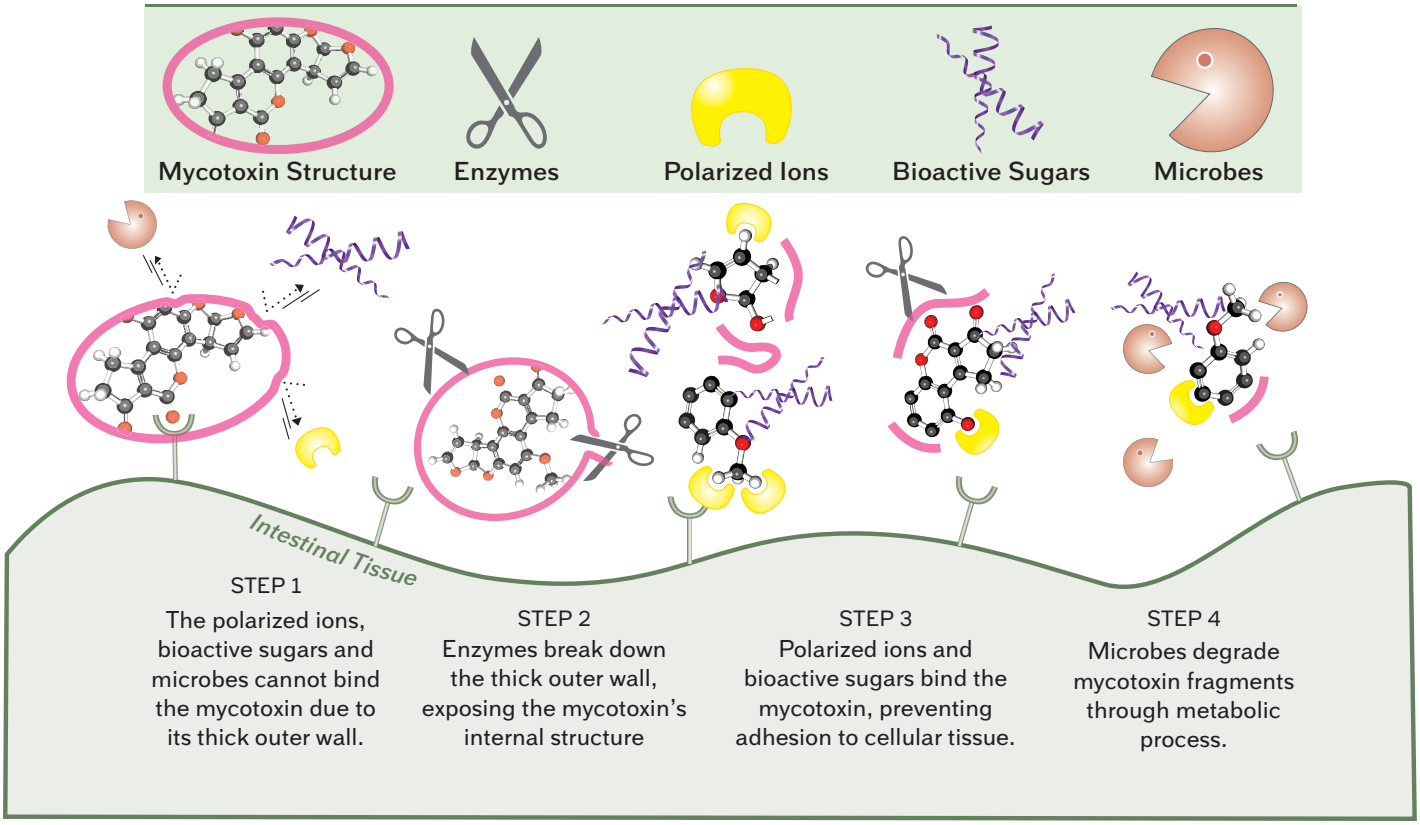
HOW CRYSTAL CREEK™ MYCOTEX WORKS



What Is A Good Mycotoxin Binder Strategy?

Develop a mycotoxin assessment checklist for your herd incorporating the points outlined in this article. Assess the risk factor of new feedstuffs to be fed based on cropping and storage conditions. For example, if the corn silage dry matter is high (45% or higher) then the risk of poor fermentation is also high and conditions for mold growth mycotoxins are likely. If the affected feedstuff cannot be reduced or eliminated from the ration, then an effective mycotoxin binder should be fed.

Crystal Creek® Fuse 207™: Fuse 207 has both yeast cell wall glucans and polarized clays that have been shown to provide effective mycotoxin binding for a wide range of mycotoxins that are prevalent in the livestock industry such as aflatoxin, zearalenone, fumonisin, T2 and ochratoxin.

Dealing With Vomitoxin Needs A Two Step Strategy: Vomitoxin, in its unaltered state, cannot be bound by any mycotoxin binder. Vomitoxin needs to be reconfigured (opened up to expose attachment sites) in order for mycotoxin binders to effectively bind up vomitoxin. That is why Crystal Creek® offers a strategy for dealing with vomitoxin, using either Crystal Creek® Mycotex or UltraSorb R in conjunction with Fuse 207 (see Figure 1).

Crystal Creek® Mycotex: Provides enzymes specific to opening up the vomitoxin molecule so that it can be bound by the Fuse 207™. Crystal Creek® Mycotex is allowed for use in organic herds. Crystal Creek® Mycotex can be used in all species including ruminant, swine and poultry.

Crystal Creek® UltraSorb R: Provides a specific blend of enzymes designed to reconfigure the vomitoxin molecule so that the Fuse 207™ can properly bind with the vomitoxin. Crystal Creek® UltraSorb R is designed specifically for use in ruminant animals and is allowed for organic use. There is an UltraSorb P and an UltraSorb S available that are designed specifically to function in the unique digestive conditions of poultry and swine respectively when dealing with vomitoxin in these species.

Length Of Exposure To Mycotoxins Can Impact Strategy And Response

It is important to understand that the longer animals have been exposed to mycotoxins without the benefit of an effective mycotoxin binder in the ration, the more potential there is for damage to vital organs such as the digestive tract, kidneys, liver and immune system. If a new feedstuff is introduced to the ration, the cows drop significantly in production due to mycotoxins, and the animals are fed an effective mycotoxin binder within a couple of days, the animals many times will recover much of the lost production in a short time. However, if the animals are exposed to the mycotoxins for a longer period of time (two weeks or more) then the risk of organ damage is higher and the recovery will be slower relative to the length of time the animals have been exposed to mycotoxins. It is also important to note that when vital organs are overexposed to mycotoxins, production may not return to normal even when an effective mycotoxin binder is put into the ration. It is possible to have some indicators, such as DMI, return to normal and still have production lag. At that point, the cows need to remain on the mycotoxin binding strategy. A short-term ration adjustment of 3 to 7 days for the whole herd (or especially for cows under 150 days in milk) may be required to kick-start a production recovery. In these situations it is recommended that you call your Crystal Creek® nutritionist and discuss which short-term ration strategy options would be best for your herd.

Feedstuffs containing mycotoxins are a fact of life that should not be ignored. They can be managed effectively with a proper strategy. Crystal Creek® partners with some of the most innovative companies in the mycotoxin binder industry and is able to take advantage of their technical expertise to bring advanced, effective products to our clients. Take advantage of the technical innovations and experience that Crystal Creek® offers to protect your bottom-line.

Figure 1: **Dairy Cow (Lactating and Dry Cow) Feeding Options**

	Fuse 207™	**CC Mycotex**	**CC UltraSorb R**
Target Mycotoxin	Broad Spectrum	Vomitoxin	Vomitoxin
Target Animal Species	All Species	All Species	Ruminants
Target Feeding Rate	2 oz./hd/day	2 oz./hd/day	1 oz./hd/day
Range: (oz.)	1 to 2 oz./hd/day	1 to 2 oz./hd/day	1/3 to 1 oz./hd/day
Range: (g)	29 to 58 g/hd/day	29 to 58 g/hd/day	10 to 30 g/hd/day
Feed w / Fuse 207		Yes	Yes
Allowed For Organic	Yes	Yes	Yes
Bag Size	50 lbs.	50 lbs.	55 lbs.
Cost / Bag (discounts available)	$78.95	$254.25	$217.00
Cost / lb. (discounts available)	$1.58	$5.09	$3.95
Cost / Target Feeding Rate	$0.198	$0.636	$0.247
Cost / Feeding Range	0.099 to 0.198	$ 0.318 to 0.636	0.124 to 0.247
Milk Needed (lbs./hd/day) For Breakeven: **Conventional $13.50/cwt**	0.74 to 1.47 lbs.		0.92 to 1.84 lbs.
Organic $35.00/cwt	0.28 to 0.57 lbs.	0.91 to 1.82 lbs.	0.35 to 0.70 lbs.

Evaluating Dry Matter Intake From Pastures

By Erik Brettingen, B.S.

Many producers we work with at Crystal Creek® utilize pasture as a valuable feedstuff in their ration during the grazing season. Pasture is a cost effective feed that provides great nutrition, supports rumen microbes, promotes animal health, and improves the profitability of many operations when utilized properly. While pasture as a feed can be very beneficial, it has one downfall. It is difficult to measure the dry matter intake (DMI) of your animals when they are on pasture. Dry matter intake is a crucial piece of information for nutritionists when balancing a ration. A balanced ration is essential for optimal production, reproduction, animal health and ultimately profitability.

One crucial aspect of a well balanced ration is meeting the vitamin and mineral requirements of your animals while they are on pasture. While pasture is a great feed that supplies livestock with many of the nutrients they need, it is not uncommon for pastures to be deficient in vitamins and minerals which directly affect your profitability. Pastures can vary in mineral content from paddock to paddock as it is largely the soil quality that determines this. Crystal Creek® has a high-quality pasture mineral designed specifically for those producers who utilize pasture as the main feedstuff in their ration. Please contact a Crystal Creek® nutritionist with any questions about incorporating Crystal Creek® mineral into your program for increased animal performance and profitability.

While it is great that many producers utilize pasture, it is important to know how much dry matter (DM) is available for your animals to graze. It is impractical to measure the exact amount of pasture that each cow is consuming. There are three crucial pieces of information needed to monitor the DMI the animals are getting from pasture:

1. The available DM in the pasture
2. Size of the paddock being grazed
3. Number of animals in the paddock

There are tools and strategies that producers can use to measure the DM available in pastures. Taking pasture clipping samples, using pasture plates and utilizing pasture sticks are all methods of measurement that producers can use. Measured

Figure 1: **Methods of Pasture Dry Matter Measurement**

	Clipping Samples	Falling Pasture Plate	Pasture Stick
			
Cost	$5.00-$10.00	$20.00-$40.00	$12.00
Accuracy	+++	++	+
Ease of Use	+	++	+++
Additional Information	Very accurate but only practical to do a few times/year	Professionally manufactured plate meters available for extra cost	Erik's choice for ease of use and consistent DMI measurement

Sources: Image 1.) Ohio State University: http://ohioline.osu.edu/factsheet/11-HCS-868 Image 2.) West Virginia University Extension Service: https://www.wvu.edu/~agexten/pubnwsltr/TRIM/5022.htm Image 3.) South Dakota State University: https://i.ytimg.com/vi/c9CylrlqVvI/maxresdefault.jpg

pasture can then be properly allocated depending on DMI need, allowing a more accurate ration to be balanced by your Crystal Creek® nutritionist. Understanding the benefits of each method will help you make the best choice for your operation. (See Figure 1).

Clipping Sample Method

Measuring pasture clippings is one way of monitoring pasture that is exceptionally accurate. However, it is not overly practical as it is time consuming and labor intensive. In order to take an accurate sample, walk through the pasture or paddock you plan to graze in a "W" shaped pattern taking a variety of samples from different points in the pre-grazed paddock. To take the sample, clip the pasture grass out of a 1 foot square area. When clipping, take the grass down to a level of 3 inches. This represents the actual DM available for the grazing animals. Pastured animals should be moved to a new paddock once the pasture has been grazed to a 3 inch level. Place the clippings from each square foot sample into its own designated bag. After taking several of these samples from the pre-grazed paddock, one more sample is needed for determining the dry matter percentage of the pasture. For this sample, clip 100 grams of pasture from a random area in the same pasture where the previous samples were taken. Use a Koster tester or microwave to dry down the 100 grams of pasture. If using a microwave, reweigh the sample after one minute of drying, then dry again for 30 seconds and reweigh. Repeat this process until the sample weight does not change, indicating that no moisture is left in the sample.

By dividing the dried weight by the 100 grams of fresh pasture you will have the DM percentage of your pastures (See Figure 2). Weigh each clipping that was taken from the paddock separately. Record each weight individually. Add up all the weights and average them. Take that number and multiply by the percent DM of the pasture. This calculates the average DM available in 1 square foot of pasture. You will now need to multiply that number by 43,560 (the number of square feet in an acre). This procedure, although time consuming and labor intensive, will deliver exceptionally accurate results and should ideally be done once every month to measure DM as the grazing season progresses and pasture DM yields fluctuate.

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Figure 2: **Dry Matter Available Per Acre of Pasture**

Pasture Location (1 foot squared)	**Weight of Clipping As Fed** (lbs.)	**DM %** (from drying and weighing)	**Weight of Clipping** (DM Weight)
A	0.300	28	0.084
B	0.240	28	0.067
C	0.432	28	0.121
D	0.500	28	0.140
E	0.232	28	0.065
F	0.211	28	0.059
G	0.346	28	0.097
H	0.293	28	0.082
Average	0.317	28	0.089

Avg. DM: 0.089 lbs. x 43,560 sq. ft./acre = 3,877 DM pounds available per acre

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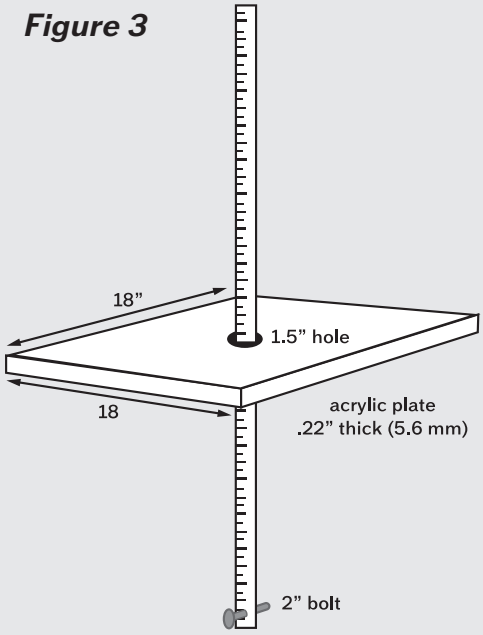
Pasture Plate Method

A more convenient method of pasture measurement that can be carried out frequently is the pasture plate. It is a faster (but still accurate) alternative to the clipping sample method. There are various styles and models of pasture plates. A pasture plate can easily be made by cutting a piece of acrylic (Plexiglas) in an 18 x 18 inch square. Cut a 1.5 inch hole in the center of the plate and place a yardstick through the hole with the "zero" end down (See Figure 3).

For the most accurate use of a pasture plate, it will need to be calibrated periodically throughout the year using the clipping method described earlier. To do this, raise the pasture plate to the top of the forage canopy. Let the plate fall on the forage until the point at which the forage is supporting the weight of the plate. Record the height at which the plate is resting on the yardstick. Now take the square foot clipping sample from within the 18x18 inch square where the plate was placed. After you have taken the clipping samples and measurements with the plate, the plate can be calibrated by correlating the heights measured by the plate with the clipping weights from the sample areas using the calculations in Figure 2.

Once the plate has been calibrated, it can then be used to make DM estimates without any need for clipping as you now know how much DM is available based on the measurements from the stick. For a faster and more convenient measurement, raise the plate to the top of the forage canopy and release it just as stated before. If the plate has not been calibrated, a constant of "390" has been derived through research trials carried out by

Figure 3



http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1097378.pdf

university professors and published in "Pastures for Profit."[1] Simply multiply the inches measured by the plate by 390 to calculate an estimate of the DM available. This is not as accurate as properly calibrating the plate 3 times a year using the clippings, but it is an option if calibration is not possible and strongly preferred over choosing no method of pasture DM measurement.

Pasture Stick Method

The most convenient way to measure pasture quickly, accurately and efficiently on a regular basis, is the pasture stick. Although not as accurate as the clippings, the pasture stick allows for pastures to be measured on a daily basis, which is crucial for adequate DMI monitoring.

To use the pasture stick, simply place the "zero" end of the ruler completely down to the soil and measure the height of the pasture canopy (not the tallest plant). Once the height is recorded, slide the stick horizontally, with the dots facing up, along the ground under the forage layer. Without moving or straining to see the dots on the stick, count the number of dots that are visible through the pasture grasses. The number of dots seen will represent the estimated DM per acre inch. This is portrayed as a chart on the stick. With the measurement of the pasture height (in inches) and the DM per acre inch as represented by the dots, multiplying the numbers will equate to the DM available per acre of your pasture.

Figure 4: Pasture Allocation Equation

(Measured Avg. DM Yield of Pre-Grazed Pasture Acre) x (Size of Pasture in Acres)

=

Total DM available of Pasture

$$\frac{\text{Total DM Available of Pasture}}{\text{Number of Animals in Pasture}} = \text{Pounds of DM Consumed Per Animal}$$

**It is important to note that animals must be moved when pasture is grazed down to 3 inches; this ensures accurate DMI amounts from measurements and provides pasture health and persistence.*

Like the alternative methods, multiple samples are needed for each pre-grazed paddock and then averaged for optimum accuracy and representation of the DM available. This method is quick, efficient and practical as it can easily be carried out while moving cows to a new paddock and the correct amount of pasture can be allocated in minutes with the help of the pasture allocation equation in Figure 4. The pasture stick is a very useful tool that can help graziers measure pasture on a regular basis to increase pasture utilization and ultimately profitability. To order your own pasture stick, visit Grassworks online at: http://grassworks.org/?110700 and click on "Grazing Stick Order Form".

Figure 5: Dry Matter Need

Animal	As % of Body Weight
Dry Cow	1.5-2.3 %
Lactating Cow	3.5-4.5%
Beef Animal	2.5-3.5%
Horse	2-3%
Sheep & Goats	3.5-4%

Developing A Pasture Rotation Strategy

With the available DM in the pasture accounted for, it is then important to know the size of the paddock that the animals are grazing. When the available DM and paddock size are known, use of the allocation equation (Figure 4) will allow for an accurate and rapid calculation of how much DM the animals are eating based on paddock size, available DM per acre and number of animals. When you know what the animals are consuming from pasture, it is then important to understand if this is an adequate DMI. With the help of your Crystal Creek® nutritionist, the needed DMI can be calculated based on the current ration, other feeds the animals are consuming, animal species, and energy needs based on stage of life. If communication with a Crystal Creek® nutritionist is not possible, the percentages in Figure 5 are general guidelines for varying species at different energy needs.

Pasture is a very beneficial way to raise your animals. With proper management, pasture is extremely cost effective and can help provide livestock with what they need to thrive. Whether you are using pasture clippings, pasture plates, or a pasture stick, you will be able to better determine the DM available in your pastures regularly; resulting in better monitoring of the DMI from pasture. Regardless of the measuring method, consistent and frequent pasture measurement is the key to knowing what your animals are getting from pasture. It is important to communicate with your Crystal Creek® nutritionist about the herd's DMI from pasture to achieve better balanced rations, lower feed costs, more productive animals and increased reproductive performance and greater profitability. If you have any questions, or would like to learn more about the Crystal Creek® Nutrition Program, contact Crystal Creek® at 1-888-376-6777 to speak with one of our knowledgeable nutritionists or livestock specialists.

[1]"Pastures for Profit" by Paul Peterson, Dennis Johnson, Dennis Cosgrove, Beth Albert and Dan Undersander

Crystal Creek® Case Study: Increasing Herd Profitability Despite Low Milk Prices

By Teresa Marker, B.S.

Milk prices fluctuate due to market supply and demand. When milk prices are low, producers find themselves evaluating their current herd status and profitability. Many producers start looking at ways to improve herd health or try to cut costs by eliminating additives. One farm in northwestern Wisconsin, which milks 160 Holstein cows in a robot barn, decided it was time to look for a company that could help improve their situation. A neighbor of theirs, that is currently a Crystal Creek® client utilizing our Crystal Creek® Dairy Nutrition Model (CCDNM), referred them to Crystal Creek®. Their previous nutritionist was using a "band-aid" approach with the herd and it wasn't working. The herd owners and their sons stated they had three goals they would like to accomplish with their herd:

1. Improve Cow Robustness
2. Increase Milk Production
3. Increase Profitability

These are all very sustainable and achievable goals. In order to achieve these goals, I consulted our staff veterinarian, Dr. Ryan Leiterman, to help address and review current herd health protocols. As a team, we sat down to discuss a strategy moving forward by focusing on the transition cows, improving nutrition and understanding the value of timely communication with each other.

Step #1: Focus On Transition Cows

Prior to switching to the CCDNM, this herd fed the same ration to all of the lactating cows. There are three robots being utilized for milking. Two robots milk in a pen of 120 cows and another robot is dedicated to a pen of 60 cows. The larger group had access to headlocks, but the smaller group of 60 cows did not. All dry cows were fed the same ration and cows were moved to maternity pens a few days prior to calving. To improve the overall transition, we looked at bottlenecks that may be limiting dry matter intake prior to and after freshening. One suggestion Dr. Ryan made was to keep close-up cows out of the maternity pen until just prior to freshening. This limits a stressful pen move for the dry cows that could possibly decrease their dry matter intake. Another suggestion was to install headlocks in the milk cow barn for the group of 60. All fresh and early lactation cows could be moved into that 60 stall pen with plenty of bunk space. The new headlocks not only reduce competition at the feed bunk, but allow this producer to lock up his fresh cows several times per week to monitor and treat common fresh cow conditions (i.e. ketosis, milk fever, uterine infections and udder health). Dr. Ryan created a "Fresh Cow Protocol" for this herd that helps them be more proactive in their observation and treatment of their fresh cows.

Step #2: Improve Nutrition

One of the goals of the CCDNM is to improve overall rumen function and fiber digestion. I evaluated both the milk and dry cow rations and put together a step-by-step strategy that would eliminate the possibility of a milk production decrease during the transition. Items removed during the transition included a previous mediocre mineral source, an energy booster product, Crystalyx® Lick Tubs and distillers' grains. Items added to the ration included Crystal Creek® mineral, liquid molasses and free choice mineral/salt. Dry matter intake was maintained and adjusted as cows were separated into a Fresh Cow Group and Later Lactation Cow Group. Rations were adjusted each week to focus more on fiber and less on supplemental protein and grain. During one visit, I noticed red mold on some corn in the TMR. We pulled a TMR sample to screen for mycotoxins. This test came back positive for a significant amount of vomitoxin. To determine all of the sources, we tested the high moisture corn and corn silage being added to the ration. It turned out that one of the corn silages (they had two open bags) and one of the high moisture corn sources (they were feeding from two silos) were the culprits. The clean sources of corn were dedicated to the dry and fresh cows and the later lactating cows were fed the corn and silage that contained the vomitoxin. Crystal Creek® Fuse 207 was added to the dry and fresh cow groups as a precaution against mycotoxins. Crystal Creek ® Fuse 207 and Mycotex were added to the later lactating cow group to address the vomitoxin. Finding toxins in the feed can be a significant challenge to any dairy herd. This herd had been exposed to a significant level of mycotoxins without a proper mycotoxin binder for a minimum of 4 months.

		Previous Program	6 months on CCDNM	CC Advantage
Milk Production	**Milk**	53	55	2
	Butterfat	3.9	3.7	-0.2
	Milk Protein	3.05	3	-0.05
	SCC	450	300	-150
	MUNS	12	10	-2
Herd Health	**Body Condition**	Poor	Good	Positive
	Breeding	46%	70.40%	24.40%
	Foot Trimming	32	24	-8
	Warts	8	1	-7
	Blocks	5	2	-3
	Vet Bills ($/herd/month)	$2,601.55	$1,591.96	-$1,009.59
	Death Loss (cows/month)	3	1.5	-1.5
Ration Comparison	**Dry Matter Intake**	46	46	Pending
	Ration Crude Protein	17.65	16.5	-1.15
	Supplemental Grain (per day)	20.25	18	-2.25
	Out-of-Pocket Feed Cost ($ per month)	$25,900.40	$23,512.03	-$2,388.37

Increased Profit	In 6 Months (Actual)	Per Year (Projected)
Increased Milk Production ($18 milk)	$10,512.00	$21,024.00
Decreased Blocks ($25/Block)	$450.00	$900.00
Decreased Vet Bills	$6,057.54	$12,115.08
Decreased Death Loss ($1000/cow)	$9,000.00	$18,000.00
Decreased Feed Costs	$14,330.22	$28,660.44
Improved Colostrum Management	$4,500.00	$9,000.00
Increased Profit	$44,849.76	**$89,699.52**
Increased Profit Per Cow	$280.31	**$560.62**

Step #3: Observation And Communication

No team can be successful without proper communication. These producers are great communicators and their willingness to provide information and feedback has played a huge part in their success. If the cow manure consistency or dry matter intake changed, they called so the ration could be adjusted. Rations were sometimes adjusted three times per week, depending on how the cows were responding. These producers are also very proactive on taking forage samples so that the ration can be as accurate as possible. Any fresh cow questions were directed to Dr. Leiterman and treatment protocols were adjusted as necessary. Each communication by the producer that resulted in a change or adjustment to the herd was documented, as were the subsequent changes in the herd's performance. After the first 6 months we sat down together as a team to evaluate where we were, what we did and what the plan was for the future. The charts included in this article show the results of this herd after just six months on the CCDNM. Looking at our initial goals, we were successful in achieving them. Our goals for the future are improving milk production and profitability by maintaining focus on the fresh cows, improving breeding and decreasing days in milk.

Small changes to a herd can yield big results. An increase in profitability by $89,699.52 per year ($560.62/cow/year) is nothing to overlook. Milk production is starting to increase and the herd is now positioned well for even higher profitability in the future. Most of this herd's profit came from reduced feed costs, improved nutrition and better transition cow management. If you are interested in learning more about the Crystal Creek Dairy Nutrition Model, please contact one of our nutritionists at 1-888-376-6777. There is no cost to call!

Crystal Advantage® = A Performance Advantage

By Kaylee Viney
Livestock Specialist

Spring is one of the busiest seasons in the equine industry. From preparing for a competitive show season to conditioning horses for field work, we ask our equine athletes to perform with stamina and endurance every year. The Crystal Advantage® equine product line has been created for horses who need to perform at an optimum level despite the stress of traveling, competing or dealing with weather changes and heavy workloads.

Crystal Advantage® Equine Nutrition

Getting the most out of your horse requires good nutrition. A high quality mineral source is a key component to any equine nutrition program. Working horses are subject to various stressors and can benefit greatly from a sound foundation nutrition program. Crystal Creek® has formulated an advanced line of equine nutrition supplements marketed under the product line Crystal Advantage®. The Crystal Advantage® product line is broken down into two categories: 1) Foundation Nutrition Products and 2) Strategic Use Products. (See Figure 1).

1. Foundation Nutrition Products

The term *"Foundation Nutrition"* is described by Crystal Creek® as high quality, daily nutrition that is meant to be used on a long term basis for establishing fundamentally sound, overall health and function… simply put, these products are **the foundation** to a sound nutrition program. Crystal Advantage® minerals are an example of foundation nutrition supplements and are available in pelleted and granular forms. Crystal Creek® recommends granular or pelleted minerals over mineral licks/blocks to ensure proper intake. Crystal Creek® utilizes a high quality pelleted protein in the Crystal Advantage® pelleted mineral. Pelleting reduces the risk of separation of key nutrients in the grain ration resulting in more consistent and accurate delivery of nutrition.

Crystal Advantage® Minerals Are Formulated With:

1. A cleaned macro-mineral source to reduce levels of heavy metal contaminants (iron, aluminum, lead and fluoride).
2. Polysaccharide complex trace minerals which are highly bioavailable for improved absorption and utilization.
3. Strong vitamin and Biotin levels to support skin integrity, hoof health, immune system function and muscle recovery.
4. A 100% Selenium Yeast source which is over 90% bioavailable.

Commonly Seen Benefits:

Studies on the ingredients used in the Crystal Advantage® product line have shown improvement in endurance and post-exercise muscle recovery. Endurance is a key factor in conditioning horses to peak performance. In the equine industry, muscle recovery is important to prevent tying up and straining/bowing tendons. Offering grain and hay rations with less protein and minerals than what is required can cause horses to metabolize needed minerals from their bones, reducing their musculoskeletal function and performance. The Foundation Nutrition program promotes a strong immune system, better hoof health and a shiny hair coat. It is vital to boost the immune system when traveling circuit or introducing horses to new or unfamiliar environments.

In addition to helping with performance issues, the Crystal Advantage® product line offers flexibility

with feeding. It is easy to top dress or mix Crystal Advantage® mineral into your balanced grain ration. The Crystal Creek® Crystal Advantage® product line has a broad range of applications from working, performance and pleasure, to growing foals and breeding stock. Providing your horses with a balanced daily nutrition program reduces the need for additional nutrition packs; thereby lowering your feed cost.

2. Strategic Use Products

Strategic products are used on a short term basis for targeting specific problems or conditions. Stress management is essential for consistency in equine performance. Crystal Creek® recognizes this need and has developed a strategic support product to be used as a tool during times of stress. Crystal Advantage® Digestive Support is designed to work in addition to your horse's daily nutrition program. Feed Crystal Advantage® Digestive Support a week before intense workload/stress, during intense workload/stress and for one to two weeks after intense workload/stress to optimize your horse's performance.

The naturally derived ingredients in Digestive Support have been scientifically proven to:

1. Stimulate the immune system along the gastrointestinal tract.
2. Decrease inflammation by selective COX-2 inhibition.
3. Promote nutrient absorption in the lower gastrointestinal tract.

(CONTINUED ON PAGE 14)

Figure 1: **FOUNDATION NUTRITION PRODUCTS + STRATEGIC USE PRODUCTS = COMPREHENSIVE NUTRITION PROGRAM**

Granular & Pelleted Mineral Products **Digestive Support**

Crystal Advantage® = A Performance Advantage

(Continued from page 13)

4. Promote antioxidant regeneration.
5. Stop/reverse gastric ulcer formation in laboratory models.

Crystal Advantage® Digestive Support contains a comprehensive profile of high molecular weight polysaccharides that have been shown to support immune function, intestinal absorption, digestive health and help counter the effects of inflammation.

Stress/Performance Challenges:

Traveling, transporting or working horses presents a challenge to their immune system. Workloads heavier than expected and repetitive movements may cause lameness requiring stall rest which may delay work progress.

Even the intense fly pressure of summer can negatively affect a horse's immune function.

Balancing quality grain and hay rations with the Crystal Creek® Crystal Advantage® line of high quality minerals and using Crystal Advantage® Digestive Support during challenging times is key to supporting the horse.

Crystal Advantage® minerals and Digestive Support are two key products that will help maximize your horse's potential. For more information on our equine nutrition services or to view additional Crystal Advantage® equine products including fly repellent and equine salve, visit us at www.crystalcreeknatural.com or call 1-888-376-6777 to speak with one of our knowledgeable nutritionists or livestock specialists.

Monthly Promotions

April 2016

Pivot FL™

1-3 boxes: **$10/box discount**

4-9 boxes: **$18/box discount** ($10/box discount + $8 per box existing volume discount)

10+ boxes: **$23/box discount** ($10/box discount + $13 per box existing volume discount)

Pail: **$2/pail discount**

Heifer Pride™ **$10/bag discount** & **$2/pail discount**

May 2016

Jam Promotion

Receive a **FREE Jar of Jam** or **4 oz. Udder Fancy™** for every $100 of product purchased. Limit 5 per order.

June 2016

NO-FLY™

$5 per gallon discount
(4 gallons or more)
$2 per gallon discount
(2-3 gallons)
Normal discounts do not apply during promotion.

Crystal Advantage® Equine Fly Repellent

Concentrate: $4 per bottle discount
Ready-To-Use: $2 per bottle discount

July 2016

Save 10% When You Order Any Products in the Crystal Advantage® Product Line

Crystal Advantage®

Granular Mineral **50 or 10 lb.**
Pelleted Mineral **50 or 25 lb.**
Digestive Support **25 lb.**
Equine Fly Repellent (Ready-to-Use OR Concentrate) **32 oz.**
Equine Salve **4 oz.**

August 2016

Veterinary Dairy Liniment™

Save 10% ***IN ADDITION TO*** Normal Volume Discounts

CRYSTAL CREEK

1600 Roundhouse Rd., Spooner, WI 54801

Sustainable And Effective Livestock Nutrition Programs for Today's Progressive Producer!