

What's New For 2018



Crystal Creek® 37% Goat Pellets

Crystal Creek® is pleased to introduce our 37% Goat Pellets formulated with high performance features that make an excellent foundation for meeting the nutritional needs of both milking and meat goats.

- Easy to mix with on-farm grains
- Highly bioavailable trace minerals
- Supports optimum digestive function
- Excellent vitamin fortification
- Improved profitability / ROI

Dog Food And Supplements

In the dog food world today, consumers are bombarded with countless dog food formulas all claiming to be the best for their dog. Many of these formulas are based on creative marketing plans that are designed to appeal to the emotions of the pet owner, disregarding the actual nutritional value of the dog food.

Crystal Creek® recently has taken on the Canine Health Forward line of dog food and supplements. Canine Health Forward uses a combination of industry leading processing technology, ingredients sourced in the U.S.A. and nutritional science to ensure that your four-legged companion is receiving the most advanced nutrition available.



A Note to Our Customers:

On October 31st, 2017 a fire destroyed the BASF vitamin plant in Germany. As a result, a worldwide vitamin A and E shortage is projected until the fall of 2018. This will affect both the price and availability of livestock minerals containing these vitamins. Crystal Creek® has contingency plans for supply chain interruptions such as this. We are proud to say that Crystal Creek® will be able to maintain a supply of livestock vitamins and minerals to our customers between now and when the vitamin plant comes back into production.

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Preventative Nutrition: A New Way To Look At Feeding Your Dog



By Ryan Leiterman, D.V.M.
Director of Technical Services

When I went to veterinary school thirteen years ago, part of our curriculum focused on what was at the time, a relatively new concept: medical nutrition; specialized dog and cat foods created for companion animals that had

specific diseases. Some foods were formulated to help reduce the occurrence of kidney/bladder stones, or to help control blood sugar in diabetic dogs, while others were formulated to help dogs with chronically itchy skin. Some dog food companies even went as far as calling their dog foods “prescription” diets available only from licensed veterinarians. The dog food industry embraced the idea of formulating foods specifically balanced to act as an adjunct treatment for animals with different types of diseases. From this concept a new line of canine nutrition has emerged; preventative nutrition.

Preventative nutrition focuses on feeding a higher quality dog food every day in an effort to prevent or reduce the risk of certain diseases. Crystal Creek® is proud to announce that we now handle the Canine Health Forward line of dog food that is built around the idea of preventative nutrition. Canine Health Forward focuses on creating a healthier diet by improving the quality of the dog food. The quality of a dog food is determined by formulation strategies, ingredient selection and the manufacturing process.

Ingredient Quality

The quality and grade of ingredients going into a dog food has a direct impact on the digestibility of that food. Subsequently, the digestibility of the food has a direct impact on the health and performance of the dog. There are multiple grades of protein, fat and vitamins/minerals available

to dog food manufacturers, each one having a different nutrient bioavailability.

Webster’s Dictionary defines nutrient bioavailability as: “the proportion of a nutrient that enters the circulation when introduced into the body, so is able to have an active effect”. In simpler terms, bioavailability is the proportion of what your dog eats that is actually digested, absorbed and utilized by their body.

When a nutrient is highly bioavailable, it can be readily digested and absorbed in a consistent, dependable manner. The goal of the Canine Health Forward line of dog food is to formulate and produce products of the highest bioavailability possible. Because of this philosophy, Canine Health Forward has made the commitment to exclusively use the two highest bioavailable sources of fat and protein in the manufacturing of their dog food. The sourcing of vitamins and minerals also comes from the top tier of bioavailable ingredients.



The Manufacturing Process

Another factor determining the quality of the dog food is the process of cooking the dog food. The Slow Bake method of manufacturing increases the production cost but is imperative to making the most bioavailable dog food possible.

Conventional Baking processes use high temperatures to rapidly cook the dog food, thus shortening the manufacturing time and decreasing the cost of production. This rapid cooking and use of high temperatures can damage nutrients like fats, starches and proteins making them less bioavailable. Have you ever noticed that when feeding a cheaply priced dog food, you need to feed more of it to keep weight on a dog? Cheap dog foods commonly have compromised protein, fat and starch bioavailability; meaning dogs have to eat more of it to get the proper amount of nutrients.

By using the Slow Bake process, the food is baked at a lower temperature, preventing damage to key ingredients such as protein, fat and starch. As starches are baked, they begin to “gelatinize”. Gelatinization is the breakdown of starches in the presence of heat and water. This process creates a starch that is much more digestible. Research shows that the higher the gelatinization percent, the more usable the starch source becomes. Therefore, the Slow Baked process used by Canine Health Forward makes their carbohydrate sources (starches) highly digestible.

Formulation Strategies

Omega-3 and omega-6 levels are commonly discussed, but why are they so important and where do they come from? The best sources of omega-3 fatty acids come from oils derived from ocean-marine fish. Omega-3 fatty acids are important in brain and cardiovascular function while omega-6 fatty acids support skin health and coat quality.

Cheap dog foods will typically have high levels of omega-6 and low levels of omega-3, leading to a high omega 6:3 ratio.

The story of omega-3 and omega-6 is more complex than just the amount to feed or the quality of their sourcing. The omega fatty acids need to be formulated with the appropriate ratios. The topic of omega 6:3 ratios is relatively new to the dog food industry. New research shows that lowering the ratio of omega 6 to omega 3 can have beneficial effects on limiting cardiovascular disease, arthritis and even reduced risks of certain kinds of cancers. Simply put, the lower the ratio of omega 6 to omega 3, the healthier the dog food. Canine Health Forward is proud of the fact that they have one of the lowest omega 6 to omega 3 ratios in the dog food market!

The Canine Health Forward line of dog food is designed from the ground up with the unique focus of creating a dog food based on the core principles of preventative nutrition. Crystal Creek® is excited to carry this line of dog food because the foundational principles of preventative nutrition resonate well with our philosophies on animal feeding. Call Crystal Creek® at 1-888-376-6777 to learn more about this high quality nutrition for your canine companion.



Spring Pasture: A Great Asset



By Erik Brettingen, B.S.

The spring flush of pasture is a great resource for producer profitability, animal health, and productivity. While pasture can provide a great deal of opportunity as an economical feed source, it is important to ensure the proper management of this resource. Waiting until the

forage is adequately established before allowing grazing and keeping up with the fast growing flush, is critical to maintaining pasture health. Taking steps to prevent common pasture diseases like bloat and grass tetany will allow grazing animals to thrive on the new spring grass.

Pasture Care

Beginning the grazing season with pasture productivity and longevity in mind, sets the stage for a more productive grazing season. Although it is tempting to turn animals out as soon as possible after a long winter, holding them back to let the pastures become fully established will lead to more production over the grazing season. This is a great opportunity to utilize the grazing rule of thumb, “Take Half, Leave Half” to maximize plant health and re-growth. Reducing the plant material by more than 50% can start to greatly diminish root growth activity and pasture stand longevity.

Percent of Grass Removed	Percent of Root Growth Stopped
10%	0%
20%	0%
30%	0%
40%	0%
50%	2-4%
60%	60%
70%	78%
80%	100%
90%	100%

“Spring Pasture Management Tips” Tuck, Brian, OSU Wasco County Dryland and Irrigated Field Crops Agent.



Pastures should never be grazed to less than three inches of length. If following the, “Take Half, Leave Half” rule, pastures should never be grazed to less than six inches of growth. Ideally, the pasture would not be grazed until new growth has reached a height of 8-12 inches.¹

Just as it is important to not graze too soon, producers should manage pastures as the spring flush occurs to prevent overgrowth. As pasture plants mature, the ligneous, indigestible portion of the plant increases making it less beneficial or palatable to the animals. Grazing to keep forage in the pre-heading stage is key to maximizing digestibility. If stocking densities do not have enough animals to keep ahead of the spring growth, utilizing mowers or making hay on those fast growing pastures are great ways to increase pasture quality and minimize forage waste.

Animal Health Concerns On Pasture

Bloat

Bloat occurs when ruminants are introduced to lush, legume rich pastures. The gasses created by the digestion of the protein rich leaves of the legumes become trapped in foam and are unable to escape through eructation (burping).² Many times the symptoms of bloat are quite obviously noticed as a bulging on the left side of the animal (caused by a distended rumen). Other symptoms include signs of distress, animals off-feed, and possible heavy or strained breathing.

There are a number of anti-foaming agents on the market that can be helpful when symptoms of bloat are noticed. Poloxalene can work well for conventional dairies while many organic producers find vegetable oils given orally are helpful in reducing the foaming that causes bloat. In some severe cases, veterinary intervention is needed to relieve the bloat.

The following helpful strategies can help reduce the incidence of bloat by limiting high-risk feeds and grazing time periods:

1. Offer free-choice, dry, grassy hay to create a rumen fill of dry, bloat resistant feed before turning animals out. This will also fill animals up causing them to limit their intake of the fresh pasture.
2. Wait until mid to late morning when the dew has evaporated, before introducing animals to graze. High levels of moisture, specifically with legumes in the pasture, increase the risk of bloat.
3. Limit pastures to 30% legume or less or utilize a non-bloat causing legume species like birdsfoot trefoil.²

Grass Tetany

Grass tetany is caused by a clinical deficiency in magnesium. Often times, the soils are not necessarily deficient themselves, but because of cool soil temperatures and fast plant growth rates, minerals are not taken up into the plant. Therefore, magnesium is not available for the animal to consume. High levels of potassium and nitrogen in soils will also negatively impact the uptake of magnesium into the pasture

plants.² This makes fields with heavy manure application high risk grazing areas. Magnesium is critical for nerve, muscle and brain function. Because of this, the first signs of grass tetany are often staggering, trouble walking, nervousness, and eventually collapse, coma, and death if animals are left untreated.

Aside from giving routine daily magnesium supplementation with a high quality mineral supplement, animals that are exhibiting clinical symptoms should be seen by a veterinarian and may need intravenous (IV) treatment. Acting quickly at the first sign of symptoms is crucial for recovery.

Grass Tetany is easy to prevent. Because the condition is caused by a low level of magnesium in the animal, the prevention is simply to feed more magnesium. Crystal Creek® Pasture Mineral has elevated levels of magnesium when compared to the 2:1 Mineral (10% vs. 5%). Working with a Crystal Creek® nutritionist ensures animals receive all required nutrients. Rations are balanced with recent forage samples of both stored feeds and pastures. From those samples, the proper mineral supplementation can be chosen for optimum nutrition. For many producers, it works best to switch animals over to the Pasture Mineral as the grazing season approaches. In addition to feeding a properly selected mineral in the diet, providing the Pasture Mineral free-choice will make extra magnesium available for animals if needed. Knowing your high-risk fields and limiting animals grazing time on them is also helpful. Forages or pasture that test less than 0.2% magnesium and more than 3% potassium can be considered high-risk.² Flag fields that have had heavy manure application or soil test results showing low levels of magnesium and high levels of potassium and nitrogen.

Spring pasture is an excellent resource and when managed properly, can be a major contributing factor to increasing the profitability of the herd. Grazing success can be easily obtained with spring pastures if pasture growth and animal health are monitored. To learn more about spring pasture management, call Crystal Creek® at 1-888-376-6777 to speak to a knowledgeable staff member.

¹ OSU Wasco County, "Spring Pasture Management Tips", Tuck, Brian, OSU Dryland and Irrigated Field Crops Agent.

² Purdue University, "Spring Pastures-Grass Tetany and Bloat", Departments of Animal Sciences and Agronomy.

Improving Reproduction In Your Dairy Herd



By Kelly Hubert, B.S.

Reproduction plays a crucial role in the profitability and sustainability of a dairy farm. Finding ways to improve the reproduction of a herd can be challenging because there are many variables that can affect a cow's ability to get pregnant.

The waiting period before first service, ability to accurately detect heats, cow comfort, nutrition and the presence of mycotoxins in the feed are all factors that need to be evaluated when looking to improve the reproductive performance of your dairy herd.

One of the first factors to consider is the waiting period before the first service. Today's industry normal waiting period is 70-75 days in milk (DIM). A study conducted by Dr. Julio Giordano at Cornell University, compared waiting periods of 60 DIM to 88 DIM at the time of the first service. The study showed that 1st lactation dairy cows that waited until 88 DIM for their first service had increased conception rates of 8.7%. In 2nd lactation (and older) cows, an increased conception rate of 3.5% was observed. The longer DIM also showed cows with better body

condition scores and less endometritis at the time of the first service¹. This study shows that giving cows extra DIM before the first service could increase the conception rate of a herd.

Heat detection methods are another factor to consider when looking at a herd's reproduction program. A standing heat is the most accurate sign of estrus. A true, standing heat means a cow will stand to be mounted. If the cow is trying to walk away, this is not a standing heat. A standing heat will normally last for 15 to 18 hours but estrus duration may last anywhere from 8 to 30 hours. In order to easily monitor standing heats, cows must be able to interact with each other and should be observed multiple times a day. Secondary estrus signs include mucus discharge, restlessness, rubbed tail head hair, decreased feed intake or decreased milk production². Good heat detection can make a huge impact on a herd's conception rates.

Achieving pregnancy is only half the battle. Even if an egg is fertilized, the pregnancy may still be lost. Early embryonic death can occur between fertilization and day 42 of gestation. Approximately 80% of early embryonic death occurs before day 17, 10-15% occurs between



day 17 and day 42 and 5% occurs after day 42. Early embryonic death usually shows no sign of the lost embryo³. Genetic influences, nutrition, or even environmental stress factors can contribute to early embryonic death. Providing cow comfort and reducing stress all contribute to the animal's well-being and help reduce early embryonic death rates. It is important that cows have the proper amount of individual bunk space and that their feed is pushed up regularly. Cow comfort including ventilation, bedding, and stocking density should also be monitored as part of a farm assessment when determining reproductive status of the herd.

Having a properly balanced dry cow ration will help ensure cows have the nutrients needed to achieve their potential for milk production and reach their optimal conception rates. Nutrition plays a crucial role in a herd's reproduction capabilities. Trace minerals and fat-soluble vitamins, specifically vitamin E, have been linked to decreasing fresh cow problems such as retained placentas and mastitis. Less fresh cow problems lead to timely breeding and earlier confirmed pregnancies.

Last, but not least, is determining whether or not mycotoxins are present in the feedstuffs. Mycotoxins can compromise reproductive function

and cow health. Many molds and mycotoxins are estrogenic and may disrupt normal ovary function. Testing for mycotoxins in feeds is an important tool producers can use to determine if mycotoxins are a detrimental factor to their herd's reproduction rates. Using a mycotoxin binder such as Fuse 207™ can reduce the effects of mycotoxins. Reproduction issues are only one of multiple complications of mycotoxins in feeds.

As you can see, reproduction function can be tied to many different factors. Taking the time to analyze some of the topics mentioned in this article may help increase conception rates and overall reproductive function in your dairy herd. Fine tuning your herd's reproductive health will positively affect the profitability and sustainability of your operation. Our knowledgeable livestock specialists and nutritionists are available to answer any questions you may have to improve reproduction in your dairy herd.

¹ Coffeen, Peggy, "Study of Longer Voluntary Waiting Periods", October 2016, Progressive Dairyman.

² Penn State College of Agricultural Sciences, "Heat Detection and Timing of Insemination for Cattle", November 2017, Extension Circular 402.

³ Penn State College of Agricultural Sciences, "Causes of Embryonic Mortality in Cattle", August 2006, Department of Animal Science News.



Key Design Features To Consider Before Building A New Calf Barn



By Jessica Getschel, B.S.
and
Ryan Leiterman, D.V.M.

Proper barn planning saves time and money. For every decision, it is important to understand its associated ramifications. In calf barns, housing style and pen configuration decisions impact ventilation options, which in turn affects the overall success of the barn. Before

building a calf barn, think about the ventilation requirements for every season. Allocate at least 10 percent of the overall building cost for the purchase of a well thought out ventilation system and ask these three questions as you consider your ventilation options:

1. Will the system deliver a consistent source of fresh air into the barn during all seasons?
2. Will the system effectively control the air speed at calf level?
3. Can the ventilation system rapidly adjust to the changing weather conditions of spring and fall when there are warm days and cool nights?

Housing Style Impacts Ventilation Choices

Ventilation options vary according to the calf housing style. Group-housed and individually-penned calf barns face different limitations when it comes to providing good air quality. These limitations need to be addressed while considering the three routes of ventilation: natural, mechanical, or a hybrid of the two. Decades of past experience show that natural ventilation alone does not perform well without mechanical support. For that reason, most barns today are ventilated either strictly mechanically or naturally with mechanical assistance.

Group pens typically have very open spaces with little obstruction to airflow. This allows air to be delivered to the calf at their level from any direction. The concept of an open area broadens ventilation options. Fresh air can be drawn from open curtains and panel fans can increase the speed of the fresh air during warm weather to help with heat abatement. Both positive pressure tube ventilation and tunnel ventilation can be designed to provide seasonally appropriate airflow. The key to successfully ventilating group housing is ensuring that there are no solid barriers in the path between the fresh air inlet and the calves. Keep in mind that group pens pose a larger risk of contagious pneumonia spread by nose to nose contact. As a result, it is possible to have increased respiratory disease rates in group housed calves, despite excellent air quality inside the pens.

Individual pens typically have solid sidewalls which obstruct airflow at the calf level. Air must be directed into the pen from above the calf or through the back of the pen if an open material such as a cattle panel is used. When designing a ventilation system for individual pens, it is important to recognize that the air quality above and around the pens does not accurately reflect the air quality of the calf's immediate pen space. It is quite challenging to direct fresh air into the calf's small, obstructed area and as a result, many ventilation systems today do not provide individual pens with the necessary air volume changes. Tunnel ventilation systems may deliver fresh air to the barn, but may not effectively deliver fresh air to the calf level. Similarly, panel fans move air over the top of pens but do not effectively deliver fresh air at the calf level. Positive pressure tube ventilation is arguably the best way to ventilate individual pens, as the tubes can uniformly distribute fresh air down the length of the barn and direct it straight into the pens. Since the fresh air comes from directly above, the solid walls of the pen no longer pose as obstacles.



Picture 1: Splitting the curtains so the top and bottom halves move independently of each other creates flexibility for varying weather conditions.

With individual pens the layout should be designed to start two to three feet from the outside walls. This arrangement will help prevent drafts from the sidewall curtains, facilitate bedding delivery and avoid straw contamination of the milk and grain buckets.

Whether or not sidewall curtains will benefit your ventilation plan is another option to consider when designing a calf barn. Sidewall curtains offer a



Picture 2: These 18 inch knee walls create better airflow at the level of the calves.

great way to naturally ventilate calf barns, with many different arrangements to consider from the height of where the curtain starts to the direction which it rolls. Rolling curtains from the bottom up allows fresh air to enter at the calf level. It can also keep natural gusts of air from interrupting air streams directed out of positive pressure tubes.

Imagine in the spring or fall, when top-down curtains are open at the top for some extra fresh air. Unfortunately, the air coming through the cracked curtain will flow high above calf level and will likely disrupt the streams of fresh air coming out of the positive pressure tube. This scenario not only fails to provide fresh air at the calf level, it also limits the effectiveness of the assisting mechanical ventilation.

Splitting the curtains so that the top half and bottom half move independently of each other is the ideal option (Picture 1). This creates more flexibility with adjusting the curtains according to the varying weather conditions.

In addition to determining the height and direction of the roll of the sidewall curtain, the height of the concrete knee wall must also be determined. Historically, naturally ventilated barn blueprints required four foot tall concrete knee walls, upon which fabric curtains were installed. Tall knee walls interfere significantly with natural ventilation because they create a wind shadow that leaves large stagnant air spots around the perimeter of the building.

Lower concrete knee walls (one to two feet) save concrete cost and provide better airflow at the level of the calf when the curtains are open during warm weather (Picture 2). Bedding type and frequency of clean out need to be considered when determining concrete knee wall height. The height of the knee wall must be tall enough that bedding does not build up over the height of the wall or hinder the cleanout process by spilling over to the other side.

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Key Design Features To Consider Before Building A New Calf Barn

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Photo Credit: Dairyland Initiative



Picture 3a: Placing a drain under the bed space of the calves has been shown to help keep bedding dry.

Photo Credit: Dairyland Initiative



Picture 3b: Aggressive concrete slopes rapidly move liquid waste to a centrally located drain tile.

Floor Plan Layout

Besides ventilation and housing style considerations, the floor plan layout needs to address issues such as drainage and feed delivery. When considering a new facility, under the bed drainage is often used. A pre-weaned calf will generate roughly one gallon of liquid waste every day. Placing a drain under the bed space of the calves has been shown to help keep bedding dry and make a more comfortable calf environment (Picture 3a). This concept applies to both bedded pack and individual pen barns. Aggressive concrete slopes of one inch per foot are used to rapidly move liquid wastes to a centrally located concrete trench that contains a drain tile covered by pea gravel and two inch rock (Pictures 3b). The drain tile removes the liquid waste from the barn and moves it to a holding tank. Visit the Dairyland Initiative website, <http://thedairylandinitiative.vetemd.wisc.edu>, for information on the most current building ideas and techniques.

In an open housing situation, automatic calf feeders are most commonly used. Competition at the feed bunk is a common occurrence in adult cow housing and as an industry we take steps to minimize its negative effects. Likewise, feed bunk competition in group-housed calves can negatively affect their performance. The auto-feeder nipples on automatic calf feeders are small, discrete points that must be shared by a number of calves; further exacerbating the competition. It is extremely important that feeding points are easily accessible to increase the chances that smaller, or less aggressive, calves feel comfortable approaching the feeding station.

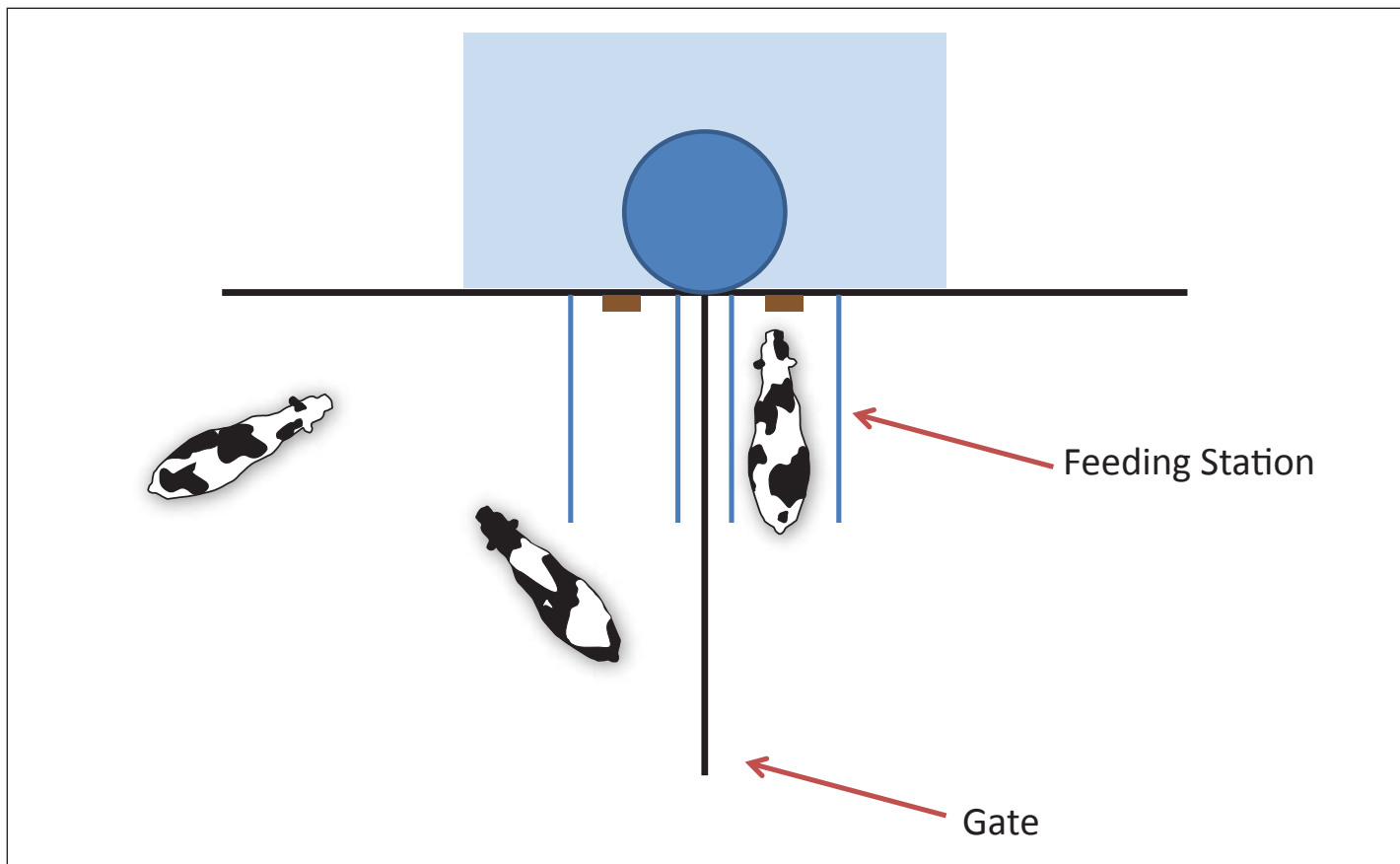


Illustration: Crystal Creek®

Picture 4a: Locating the feeding station along a wall or gate eliminates access from that side, leaving only one side available to approach the station.

How the feeding station is placed within the pen can make a dramatic impact on its accessibility. Locating the feeding station along a wall or gate eliminates access from that side, leaving only one side available to approach the station. This configuration will limit access for timid calves (Picture 4a). Locate the feeding station in the middle of a pen, away from gates or obstructions. This will allow access from all sides and improve access for timid calves (Picture 4b).

With proper planning, the investment of building a new calf barn can pave the way for years to come with sizeable returns in calf health, performance, and eventually milk production. Air quality and calf comfort are critical factors that can influence the success of any calf barn. Seek out professional industry consultants to help you plan your barn before pouring the concrete. Your calves, and your checkbook, will thank you.



Photo Credit: Crystal Creek®

Picture 4b: Locating the feeding station in the middle of a pen, away from gates or obstructions, will allow access from all sides and improve access for timid calves.

Forage Sampling



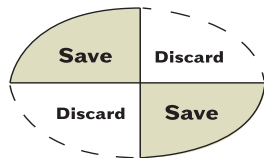
By Alex Austin, B.S.

It is important to sample forages before adding them to a livestock diet. Sampling allows producers to have a balanced ration for their livestock and test for mycotoxins. It also gives farmers a snapshot into their agronomy, harvesting and storage practices. The

results of a forage sample will only be as good as the technique and effort that went in to obtaining it.

Forage samples should be divided into different lots based on the variety, maturity or field location(s). When sampling a lot, limit lot size to 200 tons or less. If a lot is greater than 200 tons, take two samples. The sample should then be quarter sampled. To quarter sample, put each sample into a bucket, mix the feed samples in the bucket thoroughly and lay the mixed sample out in a pile. Flatten the pile and then divide into quarters. Take two quarters of the pile, mix it together and place it in a sample bag to send to the lab. Final sample size should be one pint to one quart.

How To Quarter Sample



Different Forage And Storage Types Require Different Sampling Methods

Bales And Bagged Haylage: Core Sampler

- Use a core sampler to take samples from dry hay bales, baleage and silage bags.
- Avoid using a handful of hay grabbed from the bale. This will be a poor representation of the lot. Small squares should have about 20 cores taken per lot² and large bales should have 12 cores¹. Place samples into a forage sample bag.
- Taking cores from bagged haylage and silage is fairly easy. Take 8-10 cores from different spots of the lot. Tape over the hole when done². Place samples into a forage sample bag.

Silos, Bunkers And TMR: Scoops Or Handfuls

- Collect scoops or handfuls of forage from silos, bunkers, TMR mixers and bags. Your hand should be in an up facing position, much like a scoop. Do not shake the sample when sampling, as it will cause the fines to fall out of the sample. Scoop with your hand or scoop and place the sample in a bucket.
- When sampling from bags, take 5-6 handfuls/scoops of feed. After taking the first set of samples, remove feed for the next feeding and take another 5-6 handfuls/scoops. Mix all samples together in a bucket and quarter the sample.
- When sampling from a silo allow silage to ferment for 3 weeks and don't take a sample from the top 3 feet. Run the silo unloader and collect 14 random handfuls/scoops¹. Put these samples into a bucket and quarter sample.
- When sampling from a bunker do not pull handfuls out from the face of the pile. This is dangerous. Use a facer or loader bucket to remove silage and place into a pile. Take 10 handfuls, place the samples into a bucket and quarter.
- When sampling from a TMR there can be a lot of variance. When feeding out, take samples from the beginning, middle and end of the bunk. Taking samples from various parts of the feed bunk is best to get an accurate analysis. Mix samples together in the bucket and quarter.

After the samples are taken and prepared, the next step is to remove as much air as possible before sealing the bag. Silages can continue to ferment after a sample is taken. If possible it is best to vacuum seal these samples. If a sample will not be mailed right away it is okay to freeze sample unless you are testing for molds and mycotoxins. Do not freeze sample for molds and mycotoxin tests.

¹ <https://www.dairylandlabs.com/feed-and-forage/submit-a-sample/sampling-tips/conventional-analyses>

² <https://u.osu.edu/beef/2014/12/10/forage-and-feed-sampling/>

A Fill out your **contact information**, “CC Crystal Creek®” on the email line to ensure your nutritionist receives a copy of your sample results.

B Give a clear **description** for each sample submitted.

C The **CNCPS 6.5+ (N3) NIR** is the most common test recommended with the Crystal Creek® nutrition program. Near Infrared Spectroscopy (NIR) is a rapid and cost effective analysis that gives information on numerous nutrients in a short amount of time compared to Wet Chemistry tests which take longer. Wet Chemistry is the term used to describe direct analysis of feedstuff nutrients. Wet chemistry analysis provides the most accurate values available for individual samples because this procedure utilizes chemicals to isolate individual nutrients.

D When testing for **Molds and Mycotoxins**, it is best to contact your nutritionist before submitting a sample. Crystal Creek® will most often recommend selecting **Mycotoxin Basic** for your mycotoxin testing needs. Do not freeze these samples as freezing can cause incorrect results.



DAIRYLAND
Laboratories, Inc.
www.dairylandlabs.com

ARCADIA | 217 E. Main St. | Arcadia, WI 54612 | 608-323-2123
ST CLOUD | P.O. Box 580 | St Cloud, MN 56302-9900 | 320-240-1737
STRATFORD | PO Box 418 | 212922 Legion St. | Stratford, WI 54484
DEPERE: | 1111 Lawrence Dr. | DePere, WI 54115 | 920-336-4521
BATTLE CREEK: | 4900 W. Dickman | Battle Creek, MI 49037 | 269-753-0048
JEROME: | 150 Bridon Way | Jerome, ID 83338 | 208-324-7511

Customer# _____ Payment Enclosed \$ _____ (VISA/MC Accepted) #/Exp. _____


Sampled By _____ Address _____

Sampled For _____ Address _____

Email: _____ Fax: _____

NIR Calibrations are available on the following products:

Hay	Small Grains	Corn Silage/Haylage Mix	Canola Meal	Soy Hulls
Western Hay	Corn Silage	TMR	Corn Gluten Feed	Wheat Midds
Haylage	BMR Silage	Distiller Grains	Meat & Bone Meal	Blood Meal
Corn Grain	Small Grain Silage	Soybean Meal	Beet Pulp	Brewers Grain

Sample Description #1	Sample Description #2	Sample Description #3
		

NIR/Chemistry Packages

Complete-NASEM (N9) Select Pkg + 4 NDFD time points, IVSD, VFA, UCP	\$31.00			
CNCPS 6.5+ (N3) Select Pkg + 4 NDFD time points, IVSD, VFA, UCP	\$31.00			
Select (N8) Basic Pkg + NDFD30, RFQ (hay/haylage/small grain silage), Milk 06/13 energy values	\$28.00	(Circle One) 24 hr. 30 hr. 48 hr.	(Circle One) 24 hr. 30 hr. 48 hr.	(Circle One) 24 hr. 30 hr. 48 hr.
Basic (N7) Proximates + RFV (hay/haylage/small grain silage), OARDC/NRC01 energy values	\$21.00			
Equine Choice DE (N7H)	\$29.00			
Corn Silage Processing Score (Q1) Starch by NIR	\$29.00			
UW Grain 2.0 (HIM Corn, Dry Corn, Snaplage)	\$56.00			
<i>The following Chemistry minerals and NIR packages can be combined with the above NIR packages. If the Chemistry and NIR packages listed below are requested individually (not in combination with an NIR Package) then a base fee of \$7.00 per sample will be added to the listed price.</i>				
Basic Minerals (M2) Ca, P, K, Mg, S	\$13.00			
DCAD Minerals (M3) Ca, P, K, Mg, S, Cl, Na	\$16.00			
Complete Minerals (M4) Ca, P, K, Mg, S, Zn, Cu, Mn, Fe, Na, Al, B	\$26.00			
Complete Mineral w/DCAD (M7) Ca, P, K, Mg, S, Zn, Cu, Mn, Fe, Na, Al, B, Cl	\$30.00			

For mineral mixes add \$16.00/sample to listed price.

Molds & Mycotoxins

Mold and Yeast Count & Identification	\$45.00			
Mold and Yeast Count	\$30.00			
Mycotoxins HPLC/MS/MS	2-5 Days in Lab			
Aflatoxin B1,B2,G1,G2	\$55.00			
Vomitoxin/DON	\$55.00			
Zearalenone	\$55.00			
T-2/HT2	\$55.00			
Fumonisin B1,B2,B3	\$55.00			
Ochratoxin A	\$55.00			
Mycotoxin Basic (13 Toxins) Includes Aflatoxin B1, B2,G1,G2, Vomitoxin(DON), Zearalenone, T2 /HT2, Fumonisin-B1, B2, B3, Ochratoxin A, Roquefortine C	\$170.00			
Mycotoxin Select (17 Toxins) Includes Mycotoxin Basic Plus 3 & 15 Acetyl DON, Citrinin, Fusaric Acid	\$225.00			
Mycotoxin Complete (22 Toxins) Includes Mycotoxin Select plus Fusarenon X, Nivalenol, Neosolaniol,DAS, Patulin	\$300.00			

(Continued on next page)

Forage Sampling

(Continued from previous page)

E Fermentation Quality Analysis / VFA Profile test will give you information on what can be improved and how it will feed out. Many factors contribute to the value of the ensiled feed including processing, moisture, and packing. This test would be recommended for silage after 21 days of storage, when it has reached a stable condition.

F Add On Wet Chemistry Mineral Package Tests

If precise mineral levels are needed, it is recommended to use the wet chemistry add-on packages. The M2 test looks at Ca, P, Mg, K, and S. All these minerals are tested for in the NIR tests except when testing TMR samples, but wet chemistry mineral tests are more accurate. M3 and M7 should be chosen when using DCAD diets.

G Individual Wet Chemistry Tests

Most of these individual tests are part of an NIR packages and some are a part of wet chemistry tests.



DAIRYLAND Laboratories, Inc.

Sampled By _____		Sample Description #1		Sample Description #2		Sample Description #3		
Name _____								
Sampled For _____								
Name _____								
Chemistry Analysis								
A - Crude Protein		\$18.50						
B - CP, ADF (ADF Energy calcs) (not on TMRs)		\$21.50						
C - CP, ADF, NDF (ADF Energy calcs. Not on TMRs) (RFV on hay/traylage)		\$29.00						
D - CP, NDF, Fat (ether extract), Ash (OARDC Energy calcs)		\$43.00						
D1 - D plus ADF, AD-ICP, Lignin (OARDC Energy calcs)		\$68.00						
D2 - D1 plus ND-ICP, Protein Solubility, Starch, Sugar (4-6 days in lab)		\$103.00						
G - Swine Basic Pkg (includes CP, ADF, NDF, Fat, Ash, ME energy calcs)		\$48.00						
G1 - Swine Select (includes Swine Basic Pkg + Starch)		\$64.00						
H - CP, Fat (ether extract)		\$29.00						
J - Equine Pkg (includes CP, ADF, NDF, Ash, Fat, Basic Minerals, TDN & DE)		\$51.00						
K - Whey Package (includes Crude Protein, Ash, Lactose, DCAD minerals & Karl Fischer Moisture)		\$55.00						
L - NDFD (must include NDF) circle desired time pts (7-10 Days In Lab)		\$41.00 ea.	12, 24, 30, 48, 72, 120, or 240 hr	12, 24, 30, 48, 72, 120, or 240 hr				
L1 - NDFD 6.5 forages (includes 30, 120, 240 hr) (7-10 Days In Lab)		\$95.00						
L2 - NDFD 6.5 commodities (includes 12, 72, 120 hr) (7-10 Days In Lab)		\$95.00						
Q2 - Corn Silage Processing Score (includes Chemistry Starch)		\$29.00						
Invitro Starch Digestibility 7 hr. (must include starch) (4-6 days in lab)		\$43.00						
Fermentation Quality Analysis (VFA Profile)		\$40.00						
Particle Size (Forage or grain micron size)		\$25.00						
Germination (7-10 Days In Lab)		\$26.00						
Moisture Only		\$15.00						
Roasted Soybean Package (PDI) (4-6 days in lab)		\$51.00						
Mixer Test (For grain & complete feeds & TMRs)		POR						
Fatty Acid Profile		\$69.00						
Ross RUP (16hrs) + UCP (10-15 Days In Lab)		\$105.00						
U1 - Lysine, Methionine, Cysteine +9 (5-7 Days In Lab)		\$105.00						
U2 - Amino Acid Complete w/Tryptophan (5-7 Days In Lab)		\$160.00						
Minerals & Supplemental Analysis								
The following minerals and supplemental analysis can be added to any Chemistry package at the listed price. If requested individually, then a base fee of \$7.00/sample will be added to the list price.								
Basic Minerals (M2) Ca, P, K, Mg, S		\$13.00						
DCAD Minerals (M3) Ca, P, K, Mg, S, Cl, Na		\$16.00						
Complete Minerals (M4) Ca, P, K, Mg, S, Zn, Cu, Mn, Fe, Na, Al, B		\$26.00						
Complete Mineral w/DCAD (M7) Ca, P, K, Mg, S, Zn, Cu, Mn, Fe, Na, Al, B, Cl		\$30.00						
Any individual Mineral(s). Within M4 pkg. Please Specify _____		\$15.00 ea						
Molybdenum		\$20.00						
For mineral mixes add \$16.00/sample to listed price.								
1. ADF	\$11.00	12. Protein Solubility (Must include CP)	\$13.00	1.	12.	1.	12.	
2. AD-ICP (Must include ADF)	\$6.00	13. NDF	\$11.00	2.	13.	2.	13.	
3. Ash	\$9.00	14. ND-ICP (Must include NDF)	\$6.00	3.	14.	3.	14.	
4. Chloride	\$14.00	15. Salt (Chloride as % Na Cl)	\$14.00	4.	15.	4.	15.	
5. Crude Fiber	\$16.00	16. Starch	\$16.00	5.	16.	5.	16.	
6. Crude Protein	\$11.00	17. Sugar (WSC)	\$16.00	6.	17.	6.	17.	
7. Fat (Ether Extract)	\$14.00	18. Lactose	\$16.00	7.	18.	7.	18.	
8. Fat (Acid Hydrolysis)	\$28.00	19. Prolamin (Grain & Corn)	\$23.00	8.	19.	8.	19.	
9. Mojonnier Fat (Whey/dairy products)	\$35.00	20. NPN or Urea (circle one)	\$30.00	9.	20.	9.	20.	
10. Lignin (Must include ADF)	\$16.00	21. Nitrates	\$11.00	10.	21.	10.	21.	
11. pH	\$9.00			11.		11.		

Chemistry analysis require 2-3 days after the sample arrives in the laboratory. • Prices subject to change without notice. Sample prep fee for non-typical samples \$15.00



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