



Stepping Back

Dan Leiterman is retiring after nearly 50 years in the agricultural industry.

Pictured are some of Dan's candid moments during his career.

Please see page 2 for Dan's full letter and future plans.







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Stepping Back: With Reflection and Gratitude



By Dan Leiterman

This coming April I will be 72 years old and have served the agricultural industry for nearly 50 years. After much reflection and with immense gratitude, I believe it is time to step back and retire.

In reflecting back on my career, it is humbling to see how much I owe the farming

community. Almost everything in my life can be somehow connected to my career in agriculture. It was 45 years ago, while working at a local feed mill in western Wisconsin that a pretty young woman came into our store looking for horse feed. I loaded the feed into her truck and asked her out on a date. Fast forward to today, Jan and I have been married for over 43 years. We have raised a family and now enjoy watching our sons grow their families.

Over 26 years ago, my wife and I started Crystal Creek[®]. As our business grew, our family alone could no longer keep up with the workload, and we added employees over the years. The extraordinary team that has developed is a testament to the dedication, work ethic and high standards that each employee brings to our effort. They strive daily to give our customers the very best service and products possible. It has been a pleasure to work closely with our employees over the years. They are an inspiration to see in action. My sincere thanks and appreciation goes out to our staff for their professionalism and genuine caring when serving our customers.

Our oldest son, Ryan, has taken over the business and has been in charge of the day-to-day operation for almost five years now. He is doing an excellent job. It makes me happy to see our family business transition to the next generation and I am very proud of the job he is doing. He continues to run the company with the same core values that my wife and I started our business with: honesty, hard work, and a dedication to quality products and service to our customers. The Crystal Creek® mission has been right from the start, to be innovative and find ways to help our customers reach their operation goals with healthier, longer lived and more profitable livestock to help their bottom line. Our customer's success was then, and still is today, our top priority. I am very proud of the Crystal Creek®



Ann O'Leary, 2016 Alice in Dairyland, Ryan Leiterman and Dan Leiterman at Crystal Creek headquarters in Spooner, WI.

team with their advanced technology and dedication to the industry, which enables them to provide leadership and quality service to our customers.

As a livestock nutritionist, animal agriculture has given me not only a job to put food on my family's table, but it has provided me a meaningful purpose in my career. It has been a very satisfying career that constantly challenged my mind and allowed me to be creative, take risks and grow as a person. It is also humbling to see how much the industry has changed. I still remember doing my first rations in college using the Pearson Square and a slide rule, because the hand calculator was not available yet. I have seen a lot of change over my career, some good, some not so much. I am still optimistic about the future of farming. I strongly believe that the core principles of good healthy livestock husbandry and sound business practices will bring success to the livestock industry.

I have enjoyed serving the farm families that this country relies on. Throughout the course of my career, I have had the honor of working with countless farming families and I consider myself lucky to be able to call many of them my friends. The tremendous support that I received in my career from so many wonderful customers has been truly appreciated. I humbly thank all of our customers for your trust and support. I firmly believe that agriculture is the backbone of this country. Farmer's hard work, dedication and strong family principles are a model we should all learn from.





Looking Ahead

What is next for me? While some people look forward to slowing down during retirement that is not in my fiber. I am full steam ahead with new projects. I recently bought a band saw lumber mill and have been putting in a lot of hours turning red pine, hard maple and white oak trees off of our property into lumber. It keeps me active, both physically and mentally, resulting in a good purposeful, quality day. I am really enjoying being a grandpa and spending more time with my grandchildren. I have a new nickname now, "Boot Camp Dan", because when the grandchildren come over they know grandpa has rules and expects them to behave. It is never too early to set some standards. The adventure of travel, hunting, fishing and camping have always been in my life and will continue to be as long as the good Lord allows. Ryan jokes that I've traded in rubber farm call boots for fishing waders. I also have some writing goals that I want to accomplish over the next few years. It is a full life. I am blessed.

Thank you again to all of the wonderful people I have worked for and with over the years. You are amazing!

Best Regards and a Sincere Thank You.

Dan Leiterman



Ask the Vet

When Mixing Milk Replacer, Water Temperature Matters

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



In the children's book *Goldilocks and the Three Bears*, a little girl named Goldilocks wanders into the forest home of a family of bears and while they are out, she eats from three different bowls of porridge. The first one is too hot and the second one is too cold, but the third one was "just right". When mixing milk replacer it's important that the water used to mix is not too hot or too cold. So what temperature is "just right" when mixing calf milk replacer?

Mixing Temperature

Depending on the formulation, fat sources and manufacturing style, mixing instructions may vary. However, most milk replacer manufacturers recommend a water temperature of 110° F to 140° F to achieve proper fat dispersion while also protecting the integrity of the proteins.

If the temperature of the mixing water is too hot (typically over 160° F), the proteins in the powder can be degraded and their digestibility will be reduced. If the temperature is too cold (typically under 110° F), the fats will not achieve proper dispersion within the solution. This reduced fat dispersion decreases the fat's digestibility and can lead to suboptimal weight gain and increase the risk of scours.

As a rule of thumb, the higher the percentage of fat in a milk replacer formulation, the more it could benefit from warmer water temperatures during mixing.

It's Harder Than It Looks

Dairy Management students at Penn State University participated in an assignment where the class was asked to mix two quarts of milk replacer according to the manufacturer's label. How hard could it be? The goal was to create two quarts of milk replacer with a total solids percentage of 13% and a temperature during mixing between 110° F and 115° F. Of the 41 students, only two of them created a milk replacer solution with the correct total solids percentage within the correct temperature range. That means that 39 out of the 41 students (over 95% of participants) mixed the milk replacer that delivered incorrect total solids and/or an incorrect temperature.

Are your employees consistently mixing milk replacer correctly? When is the last time anyone checked their mixing temperature? If you feed the calves yourself, when is the last time you checked your mixes with a thermometer?

Understanding Fat Dispersion

Milk replacer solutions are often high in fat and getting a fat to dissolve in water can be challenging. Fat, by its very nature is hydrophobic, meaning that it does not like to dissolve in water. The fats used in milk replacer formulations typically have melting points between 95° F and 115° F. If the water temperature during mixing is not warm enough to melt the fat in the formula, the fat will have reduced solubility within the solution; leading to poor fat digestibility in the calf's GI tract.

Tips and Tricks to Create Consistency

- 1. Stop using your finger as a thermometer. Consistent water temperatures are <u>a function</u> of good feeding discipline. Thermometers are inexpensive to buy and only require discipline to consistently use. Mix your hot and cold knobs and allow the water to run and reach a steady temperature and then check that temperature with a thermometer before starting the mix. Achieving the correct water temperature requires discipline to do it every feeding, day in and day out.
- 2. Seasonally adjust your water temperatures higher during cold weather and cooler during warm weather. The mass of the milk replacer powder will cool the water when its added. Using hotter water during the winter will provide a



buffer so when cold powder is added to the solution, the temperature stays above the desired mixing temperature. I've seen clients successfully start with water at 130° F during the winter and transition to 123° F during the summer, to accommodate for the drop in temperature when adding the milk replacer powder.

- 3. **Measure the temperature drop.** Your milk mixing room can be like a science lab. Measure the temperature of the water before and immediately after adding the milk replacer powder. By doing this over different seasons you will develop a fairly accurate gauge of how much the milk replacer powder will make the water temperature drop based on the temperature of the powder when its added. Knowing this rule of thumb will provide a good gauge to create consistency in the mixing process.
- 4. Use an on-demand water heater. If your tank water heater is old, consider replacing it with a digital on demand water heater. Many models will allow you to set the water temperature with a digital dial. These systems are very accurate and help create consistency when multiple feeders on a farm may mix the milk replacer. Many of the self-propelled milk delivery systems now come with integrated thermometers that show temperature on a digital display.

In summary, mixing milk replacer at the correct temperature is very important, and as the students at Penn State displayed, not as easy as one would initially think. The correct water temperature helps disperse the fats in the milk replacer solution and optimizes the nutritional digestibility of the feed. Adjusting mix water temperatures as the seasons change can help keep the overall mix consistent which leads to happy, healthy calves. To discuss your calf feeding program in more detail, please call Crystal Creek[®] and ask to speak with one of our livestock specialists.



Please submit your animal health or nutrition questions in writing to: Crystal Creek° Ask the Vet/Nutritionist 1600 Roundhouse Road Spooner, WI 54801 OR askthevet@crystalcreeknatural.com

Benefits of a High Quality Milk Replacer



By Cassy Golburg, B.A. Livestock Specialist

Choosing a milk replacer can seem daunting. There are a variety of things to consider including the type of ingredients, ingredient quality, and the way a milk replacer is processed. All of these can have a large effect on the digestibility and the quality of the milk replacer. Crystal Creek[®] offers four

high quality milk replacer formulations designed to help a calf reach its genetic potential in a dairy herd.

Processing Style:

Many milk replacers are heat processed. Standard heat processing involves adding heat and steam at many stages of production. Gentle processing, on the other hand, avoids any additional steam or heat that could compromise protein structure and nutrient availability. Gentle processing also plays a part in the digestibility of the milk replacer. Crystal Creek[®] uses gentle processing for its milk replacers, this allows for higher quality ingredients like human grade fats to be used, and the preservation of proteins.

Rumen Development:

A milk replacer should also aid in rumen development. During rumen development, the papilla in the rumen start to grow. The papillae are finger like structures that increase the surface area for better nutrient absorption. Adding sodium butyrate to milk replacer can aid in papillae growth, giving the calf better nutrition absorption. A study conducted in 2003 found that calves given milk replacer containing sodium butyrate had longer papillae after six weeks. These calves also had a higher average daily gain and weighed more than calves not given milk replacer with sodium butyrate at the conclusion of the study. The Swift Start[®] 25/25, 25/18 High Gain and 22/20 formulas all contain sodium butyrate.

Many milk replacers on the market contain soy. While soy does have a high protein content and stimulates rumen growth, it can be irritating to a calf's gastrointestinal tract. At birth, a calf is not a functioning ruminant. It is difficult for a calf to digest



Papillae in the rumen.

proteins from grain until about three weeks of age. Milk replacers containing wheat isolates can also help stimulate rumen growth but are much easier on a calf's gastrointestinal tract. Wheat isolates have a lower protein content but adding plasma can get this protein level higher. Several trials have been conducted showing the benefits of adding plasma to milk replacer. In 14 trials with 1200 calves, the scours incidence was 21% lower than all milk formulations. In 12 trials with over 850 calves, the average daily gain was 9% higher than all milk formulations. Three of Crystal Creek's milk replacers, the 25/25, the 25/18 High Gain and the 22/20, contain wheat isolates and plasma.

Ingredient Quality:

Having high quality fats will make the milk replacer more digestible to the calf. The better the digestion, the healthier the calf. Different fats have different levels of digestibility. Each fat has a fingerprint, a chemical make up, that determines how digestible a fat will be to the animal. For example, butterfat is about 97% digestible. A study published in the Journal of Dairy Science found choice white grease to only be about 50-60% digestible. Figure 1 shows the digestibility of fats commonly used in milk replacers. Fats that have a lower digestibility can be irritating to a calf's digestive system. Avoiding gut irritation in a calf can help prevent pathogen bloom as well. Gentle processing allows Crystal Creek[®] to use human grade liquid fats. Crystal Creek[®] uses a combination of coconut and palm oil, in combination with edible grade lard, both of which have high fat digestibility. This gives Crystal Creek[®] milk replacers a high level of digestibility without irritating the calf's digestive system.

All Crystal Creek[®] milk replacers contain chelated trace minerals. Chelated trace minerals are more bioavailable to the animal than non chelated minerals. Chelation involves tying a mineral to an organic component to form a ring like structure. This structure is now more bioavailable. For more information on chelation, see Dr. Darren Zimmerman's article, *Mineral Nutrition: Advancements Over Time* in the April 2023 Newsletter. Ruminants require selenium. This trace mineral is required for normal growth and fertility. Calves with a selenium deficiency can appear unthrifty, listless and weak. Having a milk replacer that contains quality selenium can help prevent these issues. Selenium yeast is about 85% bioavailable to the calf, while other selenium sources such as selenium selenite are only around 25% bioavailable. Crystal Creek[®] includes selenium yeast in all of its milk replacer formulas to ensure a higher bioavailability.

There are a lot of factors when it comes to choosing the right milk replacer, and reading a tag is key to making this decision. Crystal Creek's line of milk replacers is part of a cohesive strategy calf program including texturized calf feeds, pellets, electrolytes and supplemental products such as Calf Shield[®]. Call Crystal Creek[®] to discuss the calf program with one of our nutritionists or livestock specialists today.

References available upon request.



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Nutritional and Management Considerations in Robotic Milking Facilities



By Erik Brettingen, B.S.

Robotic milking systems are becoming increasingly common in the dairy industry. Milking with robots provides benefits for both the dairy

farmer and the cow. For the dairy farmer, robots take stress off a difficult labor situation and allow more flexibility of time. They allow time that would have been spent milking to be spent on potentially higher value activities like herd management tasks, making quality forage, and more time with family. For the cows, robots can improve comfort by allowing more expression of natural

cow behavior. Especially in free flow systems, cows can move about the barn as they please, get milked when they want, and rarely experience time standing when they would rather be laying or eating. Like anything, along with the benefits also come a few difficulties. Feeding cows in a robotic milking system can have some challenges but a few key concepts have been proven to help create success. Exceptional forage quality, robot concentrate palatability, transition cow performance, and a rumen focused formulation strategy all contribute to sustainable and profitable production in robot herds.

Exceptional Forage Quality

The two-part ration in robot herds does create a slightly different method of feeding. The partial mixed ration (PMR) is the feed the cows receive in the bunk made up of the forages and a portion of the concentrate. The remaining concentrate is delivered to the cow in the robot as they are being milked. The amount of feed a cow receives in the robot is determined by a feeding table set up by stage of lactation and production. The balance between the PMR and the robot concentrate is important. If cows consume too much energy in the PMR, they may neglect to visit the robot to consume



concentrate and get milked. If the PMR is lacking in energy, milk production and cow health may suffer.

With cows consuming the robot concentrate on their own, there is an unavoidable slug feeding situation that does not occur in TMR fed herds. This increases the need for high quality forage. Poor forage quality can lead to high starch, low forage PMR's. This is a disaster when paired with the slug feeding happening at the robot, especially if a high level of concentrate is offered. This situation leads to low rumen pH and rumen acidosis. When forage quality is very good, the PMR can provide adequate energy with high levels of forage. Forages that are highly digestible allow for increased intake and provide the cow with more energy and more digestible fiber to generate microbial protein. Focusing on neutral detergent fiber digestibility is key.

Robot Concentrate Palatability

The concentrate that is fed through the robot can be thought of as an incentive or the "treat" that helps bring the cows to the robot to get milked. Most robotic dairies rely on a pellet to feed through the robot. Pellets are denser and easier to consume quickly by the cow. Pellets also reduce the fines potentially left in the feed bowls at the robot. Some Table 1 TRANSITION COW PROGRAM INDUSTRY STANDARDS

Parameter	Achievable Rate	Alarm Rate	
Displaced abomasum	<3%	≥6%	
Milk Fever	<2%	≥5%	
Retained Placenta	<8%	≥10%	
Metritis and Ketosis	If the rate of displaced abomasums is over 6% it is likely that metritis and ketosis may also be a challenge in fresh cows. At this point ketosis should be investigated by chemical analysis.		
Stillborns – born dead or died within 24 hrs of birth	<10% of first lactation, heifer calves <6% multiparous cows, heifer calves	>12% of first lactation, heifer calves >7% of multiparous cows, heifer calves	
Dead and sold	<8%	≥12%	
Length of dry period: ≥ end of 2nd lactation	40-60 days	>20% less than 30 Days >20% greater than 80 days	
Length of dry period: Between first and second lactation	50-60 days	>20% less than 40 Days >20% greater than 80 days	

https://www.vet.cornell.edu/animal-health-diagnostic-center/programs/nyschap/modules-documents/transition-cow-benchmarks-inter-complexed-structure-complexed-structu

dairies feed ground concentrate through the robot with great success. This typically provides significant cost savings and can increase the likelihood of customizing your concentrate feed. Regardless of the physical form, the nutrient makeup of the robot concentrate determines the palatability. Palatability of the robot grain can become an issue when the pellet is being relied on too heavily as part of the ration. When nutritionists try to significantly increase nutrient density in the pellet, ingredients like blood meal, mineral feeds, amino acids, and some fats can create an off taste to the cows. This is counterproductive and reduces milkings and in turn, reduces milk production.

Transition Success Is Key

One of the biggest benefits of robotic milking systems is the ability of the cow to make frequent visits to the robot in early lactation. Ideally, cows ramping up to peak milk production will visit the robot four, five or even six times a day. This increase in milking frequency significantly increases milk production compared to milking two times a day. For a cow to want to go to the robot, get milked, and

eat in the robot, she needs to feel healthy. Cows that freshen with metabolic challenges like milk fever, ketosis, retained placenta, or acidosis struggle more in a robot herd. They are not being walked to the parlor 2 or 3 times a day. They become fetch cows, fall behind on milking, don't get their robot grain and never peak like they should. A successful pre-fresh ration is key to a good transition. Energy, protein, and DCAD levels are the largest contributing factors to a quality pre-fresh ration. Along with the correct nutritional makeup, the physical diet structure must be adequate as well. This includes feed particle length, feed cleanliness, and whether the cows can sort the ration. The table above, from Cornell, outlines some industry standard benchmarks to determine how well a transition cow program is working.

Rumen Focused Formulation Strategy

Most importantly, working with a nutritionist that understands robotic milking systems and your goals is crucial. It is important to remember the robots

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Nutritional and Management Considerations in Robotic Milking

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are a milking system, not a feeding system. It is not uncommon to visit prospective herds that may be feeding as much as 20 or 22 lbs. of concentrate through the robot to their high producing cows. This is a sign of nutritional frustration and entirely too much reliance on robot concentrate to provide nutrition. A cow is a cow regardless of the system she is in. This means the biologically appropriate rules of feeding a cow still apply in a robotic setting. It is very difficult to maintain rumen health when the robot feed is being relied on as a major part of the ration. When cows are eating that much feed in the robot, rumen pH drops significantly after each meal. This reduces rumination and decreases appetite. Reduction in dry matter intake causes a drop in milk production and less visits to the robot. The robot concentrate is also one of the most expensive portions of the ration. Focusing on higher forage rations and balancing the total ration around a better PMR reduces the need for as much robot pellet and generally produces more milk. A University of Wisconsin study found herds feeding higher levels of concentrate in the robot produced less milk. While the nutrient densities of high concentrate diets may look great on paper,

too much concentrate increases passage rate of feed through the cow, reduces digestion, and leads to more cow health issues. Studies have also shown that simply increasing the feed in the robot does not increase dry matter intake. Cows will reduce PMR intake when robot concentrate feeding rate is increased. A study conducted in 2018 found for every 2.2 lb. increase in robot feed, there was a corresponding decrease in PMR intake of 3.5 lbs. Feeding too much concentrate in the robot is counterproductive and fails to adhere to the sound principles of feeding cows.

Robotic dairies do require a slightly different approach. But cows that are milked in robotic systems are still cows. Principles of good, solid ruminant nutrition still apply and rumen function and cow health always come first. If you would like to learn more about how Crystal Creek[®] works with robotic dairies or are interested in ration balancing services, please call 1-888-376-6777 or visit <u>www.crystaclcreeknatural.com</u> to speak with a Crystal Creek[®] dairy nutritionist.

References available upon request.

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Next Step in Calf Barn Ventilation: Computer-Based Airflow Simulations & 3D Modeling





Modeling by Nele Leiterman, D.V.M.

We are excited to share with you the new technologies and approaches Crystal Creek's ventilation team is now utilizing in our ventilation projects. In this article, the software tools, which have improved the way we design ventilation systems, will be

explained. These digital tools allow us to obtain

precise calculations, visualize airflow patterns, and create realistic 3D representations of barns and ventilation systems before they are even built.

Designing the System

Crystal Creek's ventilation design considers a multitude of factors. The baseline factors are the number, age, and size of calves, combined with the size of the barn and the style of housing. With this information we start the design. Calculations and target values, combined with our extensive experience, help us create a solid foundation for our projects. Real life limitations, such as height restrictions and neighboring buildings, are then also taken into consideration to ensure our ventilation systems fit seamlessly into each individual barn.

After the initial design process, we then create a digital representation of the barn using SolidWorks[®], a widely used 3D modeling software. This allows us and our customers to visualize the finished system, explore various design possibilities, identify potential challenges, and optimize the system's layout for maximum efficiency and effectiveness.

Computer-Generated Fluid Dynamics Improve FLAP DUCT[®] Designs

To further enhance the accuracy of our designs, we rely on SolidWorks® Flow Simulation software. This computational fluid dynamics (CFD) tool enables us to digitally simulate and calculate the airflow throughout the barns, and most importantly, at the calf level. By comparing this simulation with the existing conditions, we can make data-driven decisions to fine-tune our design and ensure optimal airflow throughout the structure. Our ventilation systems are focused on high-volume, fresh air delivered to the calves. With the Flow Simulation software, we can predict the volumes of fresh air reaching each calf and the speed of air inside the calf's microclimate in the different seasonal settings of Flap Duct[®]. These results allow us to predict the efficacy of the system.

3D Visualization of Entire Barns

One of the most useful aspects of our design process is the visualization tools that bring our concepts to life. Just like a fogging test in the newly installed system, these tools provide a stunning visual representation of how the airflow will behave in the new structure.

Using Unreal[®] Engine, a professional design software, we create detailed 3D models of barns that haven't been built yet, and can then showcase how the FLAP DUCT[®] system will be integrated into both new and existing barns. Moreover, we take this visualization a step further by animating the airflow patterns for various scenarios, allowing our clients to witness the effectiveness of our ventilation solutions before implementation.

By leveraging the power of SolidWorks[®], Flow Simulation, and Unreal[®] Engine, our ventilation work has reached new heights of precision



and efficiency. These technologies enable us to design, calculate, and visualize the airflow in a structure before construction even begins, allowing us to fine-tune our solutions for the best possible outcomes. Our goal continues to be delivering the most effective and sustainable ventilation solutions for our customers' needs.



Farmer Feature

Chad McCauley Reedsburg, WI

Crystal Creek[®] recently sat down with Chad McCauley, a dairy goat farmer in Reedsburg, Wisconsin. He milks between 200-220 goats of different breeds such as La Mancha, Alpine and Nubian. Chad discussed his operation and life lessons he's learned along the way.



Why milk goats over some other type of farming, and what are some of the differences?

When I started in 2015, it was too expensive to buy cows, so I got into goats. A big difference is that there is less prepping before milking with goats. They also tend to spend more time in the barn. One of my goals now is to have a bigger barn where I can control everything; you can control the lights, the fans, the feed, the whole nine yards.

Tell us about your herd:

I use a variety of different breeds. Breed isn't as important as the health of the animal. I used to raise my own replacements, but now I sell our kids soon after birth and buy back in replacements. This helps speed up our genetic improvement in our herd. I do all the labor myself, I am a "one-man band" so to speak.

What led you to Crystal Creek®?

I was looking for treatments for my goats that didn't make me throw away milk due to holds. Many conventional treatments, like Rumensin, are labeled for use in dairy cows but are not labeled for use in dairy goats. Crystal Creek[®] helped me find alternative products that are allowed for dairy goat production.

I stay with Crystal Creek[®] for multiple reasons. The products are high quality and really work. I also have a good relationship with my nutritionist, Dr. Darren. He was my vet prior to him starting work at Crystal Creek[®]. Now he is my vet as well as my nutritionist and I see value in the knowledge that he brings to my operation. Crystal Creek[®] helps me solve problems and brings new ideas to my farm. Pivot[™] or Prevail[™] because I can feed this to the animals and still put milk in the tank. And it works too. The goat mineral is a high quality mineral. The fly repellent is nice because it takes some stress off of the animals.

What advice would you give to people looking to get into goat dairying?

They say goats will eat a tin can. Yeah, they might. But they won't milk on it. You need quality feed because cheap feed doesn't work. I've tried the cheap feed route. Go for quality feed. Quality feed brings you quality milk and a higher quantity of milk.

Stay independent. You know your own farm and you know your own animals. You can listen to others give you advice. But at the end of the day do lots of homework and research things thoroughly; make your own decisions.

What if you could start over, what would you do differently?

I would buy feed based on quality, not price. I'd focus on making a consistent feed. It's important to secure the acres or grain to do that. I would also set up for a TMR. It allows me to mix the feed and buy different commodities at different prices, control my own destiny. And the animals actually have the right feed in front of them.

Crystal Creek[®] would like to thank Chad McCauley for taking the time to answer these questions. To learn more about Crystal Creek's goat mineral or pellet please call 888-376-6777 to speak to one of our knowledgeable nutritionists.

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