

Comparing Calves To Bicycle Wheels

A Systematic Approach To Troubleshooting Pre-weaned Calves



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On October 11, 1826 Theodore Jones of London, England received a patent for what he called “wire wheels”. Jones found that if he added wires, or what we now call spokes, to a circular rim, the wheel could bear greater stress while maintaining its

round shape. The addition of the spokes helped the rim distribute the stress evenly throughout the wheel. This strength is dependent on all the spokes working together; if one or more spokes are weak or broken, the rim may collapse.

In the same way that spokes help keep a wheel round, calves have six main “spokes” that help keep them healthy when subject to stress, which are:

1. Colostrum
2. Calories
3. Bedding
4. Air Quality
5. Vaccination
6. Sanitation

When evaluating a calf rearing program, think of it like a bicycle wheel. A perfectly round wheel indicates a well-developed and executed calf program. A generally round wheel flexing under some stressors may indicate one or more areas of opportunity within the program. A completely collapsed wheel requires that the entire calf program be assessed to minimize any further calf morbidity and/or mortality. Tests can be run to evaluate the strength of each spoke in the wheel; procedures and protocols can then be instituted to strengthen the weak spokes and ultimately get the wheel round again. Consider these six components when assessing your calf program:

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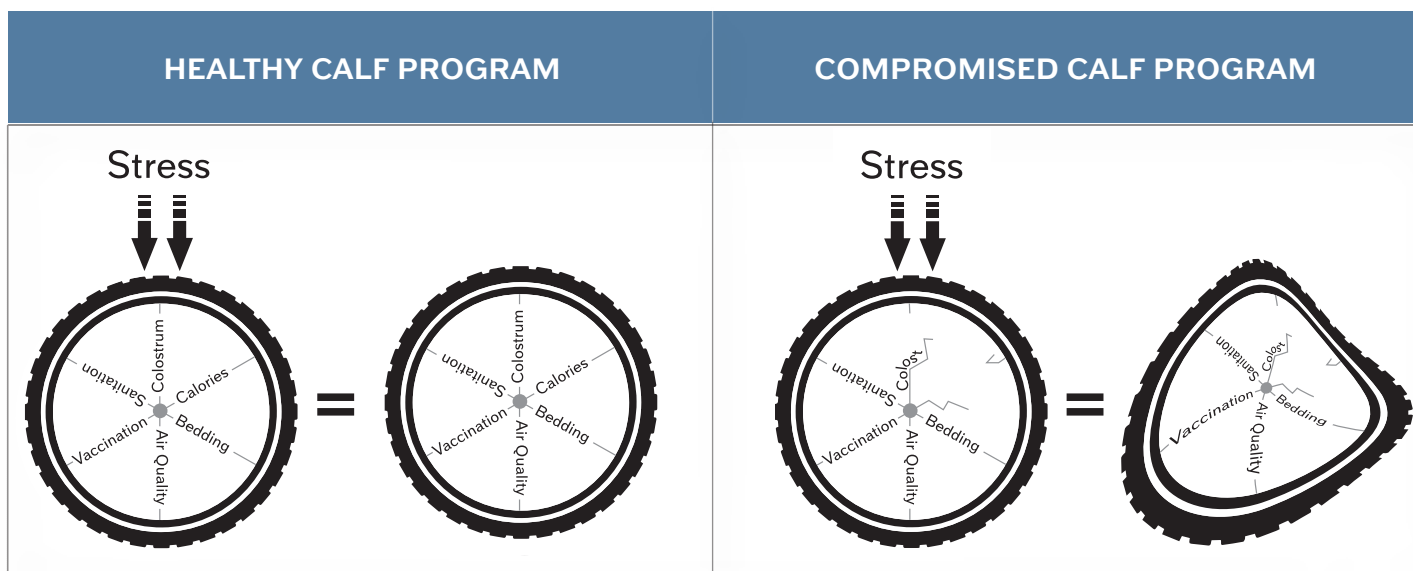
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Spoke #1: COLOSTRUM

Evaluate program with Brix refractometer, colostrum cultures, and blood serum total proteins

The quantity and quality of colostrum calves receive at birth influences their entire future, including the volume of milk they produce once they start lactating. Verify colostrum quality by testing colostrum samples with a Brix refractometer. Regardless of the brand or style of refractometer, choose one that operates in the 0-33 percent Brix range for colostrum evaluation. Test all colostrum prior to feeding and strive to feed heifer calves colostrum that is greater than 23 percent Brix. Feed enough colostrum to deliver a minimum of 200 grams of IgG within 4 hours of birth.

Improper cleaning of the lens/sample well can cause both digital and light refractometers to give an incorrectly high reading. Colostrum is high in fat content which can lead to a film buildup on the refractometer lens if it is not properly cleaned. This film will add to the degree of bend in the light and cause falsely elevated readings. Clean the lens of the refractometer after each use with 70 percent rubbing alcohol to prevent fat buildup and ensure accurate readings.

Validate proper colostrum collection and storage by periodically performing colostrum

cultures to evaluate bacteria levels. Proper colostrum collection and storage can limit the growth of harmful bacteria in the calf's first meal. Consider additional culturing for Salmonella and Mycoplasma if there is a history of issues with these pathogens on your dairy.

Figure 1

BACTERIA CULTURE GUIDELINES			
Type of Sample	Total Bacterial Count (cfu/mL)	Total Coliform Count (cfu/mL)	Total E. coli Count (cfu/mL)
Colostrum	< 100,000	< 10,000	< 1,000

Source: Wisconsin Veterinary Diagnostic Laboratory

Testing and feeding good quality colostrum is only half the battle. Confirm calves are utilizing the colostrum given and receiving the protection they need from it by routinely testing blood serum total proteins. Monitor your colostrum program with routine weekly or monthly testing of calves that are between 1 and 7 days of age. Colostrum management practices are considered successful if 80 percent of the calves tested are at or over 5.5 g/dL.

Spoke #2: CALORIES

Evaluate program by weighing calves and performing milk cultures

Weigh calves to determine if the calf feeding program is delivering the necessary calories to allow the calves to reach their full genetic potential. Calves should double their birthweight within the first 60 days of life. Calibrated digital scales are the most accurate way to know true average daily gains and for many farms, they are a practical solution that help improve awareness of calf nutrition.

Calf raisers feeding pasteurized whole milk should routinely culture pre- and post-pasteurization samples to ensure the pasteurizer is working properly.

Figure 2

BACTERIAL COUNT GUIDELINES			
Type of Sample	Total Bacterial Count (cfu/mL)	Total Coliform Count (cfu/mL)	Total E. coli Count (cfu/mL)
Waste Milk	< 1,000,000	NI*	NI*
Pasteurized Waste Milk	< 20,000	< 1,000	< 100

*NI: No interpretation guidelines have been established.

Source: Wisconsin Veterinary Diagnostic Laboratory

Spoke #3: BEDDING

Evaluate program with Nesting Score/Knee Test

Bedding is needed to keep calves warm, dry and clean. It is widely accepted that pre-weaned calves experience cold stress at temperatures under 50° F. As a result, bedding needs to keep calves clean, dry and warm during extended periods of cold weather. Using a bedding that stays lofty will help trap air close to the calf's body and keep it warm. Chopped straw may be easier to handle but it quickly loses its loft. Long stem straw is considered the gold standard for cold weather bedding. Provide 25 lbs. of long stem straw bedding for every 1,000 lbs. of calf body weight per day. Daily bedding during times of intense cold will help maintain bedding loft and calf warmth.

An assessment of bedding can be made using the University of Wisconsin-School of Veterinary Medicine bedding evaluation tool shown below. This tool is based on the concept that large amounts of lofty dry bedding allow the calf to nestle into the bedding and stay warm. Subsequently, the more the calf can nest into the bedding, the higher the nesting score and the better the bedding. Another simple bedding evaluation test is the "knee test". Simply kneel down in the bedding of multiple calf pens; if your knees stay clean and dry, the bedding passes the test.

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Nesting Score 1
Legs entirely visible.



Nesting Score 2
Legs partially visible when laying.



Nesting Score 3
Legs generally not visible when laying.

Source: University of Wisconsin Madison - School of Veterinary Medicine



Spoke #4: AIR QUALITY

Evaluate program with smoke bombs and air speed meter

Check that calves are getting enough fresh air by using a smoke bomb test as a safe and effective way to determine the number of air exchanges a barn is receiving per hour. Current industry recommendations suggest a minimum of four air exchanges per hour during cold weather. To estimate this, light several smoke bombs in the barn and walk around, filling the barn with smoke. Then time how long it takes the barn to clear the smoke in minutes and apply to the equation below.

$$\frac{60 \text{ minutes per hour}}{\# \text{ minutes to clear smoke}} = \# \text{ of air exchanges per hour}$$

Verify the fresh air is delivered to the calf level by using the smoke bomb test to visualize airflow. Bringing fresh air into the barn does not necessarily mean it is reaching the calf space. Smoke bombs are cheap, easy to use and can aid in the visualization of airflow. Introduce the smoke into the fresh air inlets or positive pressure tubes and watch how it is distributed throughout the barn.

It is very important to measure whether the calves are experiencing a draft by using an anemometer (air speed meter). A draft for a pre-weaned calf is defined as air moving faster than 50 feet per minute or ½ mile per hour. While drafts are to be avoided when it is cold, they are beneficial for heat abatement when it is hot outside. Accurate air speed meters can be relatively expensive. Most ventilation professionals will have access to an anemometer for evaluating air speeds on-farm.

Spoke #5: VACCINATION

Evaluate program with your veterinarian

Due to regional and operational differences, there is no such thing as a one size fits all vaccination protocol. Therefore, it is best to consult with your veterinarian when designing a vaccine protocol. A judicious yet effective vaccination protocol will limit vaccine use to those that have proven efficacy. Creating a protocol specific to your farm and reviewing vaccine use annually will provide the best protection for all animals involved.

Spoke #6: SANITATION

Evaluate program with ATP meter or surface protein swabs

Just because something looks clean, does not mean it is. Cleaning protocol efficacy can be assessed with an ATP meter or surface protein test. There are countless products and protocols when it comes to keeping calf equipment clean. Regardless of the approach used, an effective cleaning and disinfection protocol should reduce pathogen buildup and remove biofilm from calf feeding equipment and penning. Execute the established cleaning and disinfection protocol, then use an ATP meter or surface protein swab to test what is being left behind. ATP meter readings of 200 RLU or less are the goal for calf feeding equipment and penning after they have been cleaned and disinfected. Document your ATP readings to help identify areas that need improvement or to recognize times of the year that are more challenging to maintain cleanliness. Perform audits of cleaning and disinfecting protocols on a regular basis to keep pathogens at the lowest levels possible.

Focusing on maintaining strong spokes in your calf wheel will keep your calves at optimum performance. Evaluating colostrum, calories, bedding, air quality, sanitation and vaccinations can help calf raisers ensure that calves stay healthy despite the stressors they may encounter.

This article was originally published with the Progressive Dairy Magazine at: <https://www.progressivedairy.com/topics/calves-heifers/calves-and-bicycle-wheels-a-systematic-approach-to-troubleshooting-pre-weaned-calves>

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Canine Nutrition At Windy Hill Kennel

By Ben Hickerson, B.S.

Nestled in the hills of Holmes County, Ohio, you will find Windy Hill Kennel, owned and operated by Robert Beachy. Robert's interest in dogs and dog breeding started as a young boy when his father owned a few dogs as a hobby breeder. In the spring of 2000, Robert expanded on his interest and started a new endeavor with a small kennel consisting of Boston Terriers, Shiba's, and English Bulldogs. After 12 years in the dog breeding industry, Robert decided to take his facility to the next level and make it the best it could be. A 6,500 square foot expansion to the kennel in 2012 led to a 860 square foot breeding facility expansion that quickly followed in 2014. Robert had a passion for advancing the quality of the breeds he was working with and took a special interest in carefully choosing breeding stock to help further improvements in breed conformation, temperament and health but his mission for continual improvements did not stop there. During his pursuit to breed and produce top quality dogs, Robert experienced many challenges. In order to achieve better body condition, sperm counts and more consistent heat cycles, Robert began to explore options with different types of nutritional supplements. When that approach did not yield the

results he hoped for, he began looking for a new dog food. As luck would have it, during this time, Tim Yoder and Jonathan Miller from Maysville Elevator visited Robert and shared information on a dog food line from Canine Health Forward that is available through Crystal Creek®.

The goal of the Canine Health Forward line of dog food is to provide top quality nutrition. In the past, Robert evaluated the quality of dog foods by the percent of protein and the cost per bag, as is typical in the dog breeding industry. After talking to Tim and Jonathan from Maysville elevator, he learned there is much more to a quality dog food. *"Most folks just want to know what the protein percentage is and how much does it cost."* Robert said. When discussing the change to this new dog food, Robert said *"What jumped out to me right away was the higher quality. Crystal Creek® took the time to educate me on nutrient quality and its availability to the dog. Once I learned about all the attributes, I was convinced it was worth the value."*

Robert was correct; this dog food contains the appropriate protein, fat and carbohydrate sources that are highly digestible to the dog. This unique formulation created with chelated trace minerals



Windy Hill Kennel

helps support a stronger immune system, healthier hair coats and improved reproductive function because of its higher bioavailability. Antioxidants like astaxanthin, provide for a preventative nutrition focus on the prevention of diseases, overall aging and the conditions associated with it such as atherosclerosis. When looking at a dog food, ingredient quality is not the only factor to evaluate. Assessing the extrusion and cooking process of how the kibble is created is very important. A slow baked cooking process will help maintain ingredient integrity (preventing damage to key ingredients such as protein, fat and starch) and aid in increased gelatinization which makes carbohydrate sources more easily digestible.

The Results

In the fall of 2018 Robert started several dogs on the Canine Health Forward line of dog food through Crystal Creek® and he could not be happier with the results. Within the first 30 days he could visually see an improvement in the hair coat and body condition of the dogs. Within 4-5 months the consistency of the female's heat cycles started to improve and the amount of food intake had decreased. The concentrated, higher quality feed was paying off, proving that if you provide a dog with highly available and digestible nutrition that can be easily utilized, it will result in less food needing to be fed while still meeting (if not exceeding) nutrient requirements. Robert's results were saving him money while giving increased performance. The statement of *"I'm feeding 35% less dog food!"* was said with much enthusiasm.

Today, well over a year from starting on the Canine Health Forward dog food program, Robert is seeing many more benefits than he anticipated. In addition to the more consistent heat cycles and improved body condition, he is also seeing better semen quality, increased litter sizes, and better milk production for nursing pups. One of the best aspects of Robert's story is the fact he no longer feeds supplements. When assessing the value of a nutrition program, it is not the cost per bag of dog food that should be looked at but the cost per pound of kibble consumed per day along with the cost of additional nutritional supplements that need



to be fed to achieve the desired performance of the animal. When all costs involved were looked at, it became obvious to Robert that the higher quality dog food that negated the need for extra supplementation was a sound investment. In his own words, Robert exclaimed with a smile, *"Canine Health Forward costs more, but I spend less money than I previously did, and I got rid of all the supplements! Its more, but it's less!"*

Robert's Advice

As 2019 comes to an end Windy Hill Kennel continues to thrive and grow. In the past year another 1,800 square feet has been added to the current kennel and a brand new 2,800 square foot breeding facility has been built. Robert lives on-site with his family and they employ one full-time and one part-time employee. When asked if he had any advice for people thinking about trying the Canine Health Forward dog food line through Crystal Creek®, Robert stated, *"We plan to keep breeding healthy pups and I appreciate the nature of Crystal Creek® and Maysville Elevator"* (Robert's local dealer), *"Everyone wanted to help educate me on canine nutrition so that I could make the best decisions. Our experience is it's working, and I don't see any reason why it wouldn't work for you."*

Improving Butterfat: Using Components To Drive Profitability



By Erik Brettingen, B.S.

With the economic challenges facing the dairy industry today, farmers are looking for any and every way to increase profit and maintain sustainability. We are currently in a market where the volume of milk is exceeding the demand. In this situation, striving

to produce more milk can be expensive and often have a minimal return. An alternative to increased volume is increasing the nutrient quality of the milk through higher butterfat content. This can make a large impact on a farm's bottom line. In July of 2019, the average national price paid for butterfat was \$2.69 per pound.¹ A cow producing 75 pounds of milk could increase income by \$0.30 per day if butterfat content was raised from 3.6 to 3.9%. Along with the economic impact, higher components are also a sign of good rumen health indicating efficient digestion. Increasing butterfat is not always easy, but there are strategies that can help improve milk components to drive a farm's profitability.

Rumen pH

Acidosis, caused by low rumen pH, is one of the first things to look at when attempting to increase fat tests on a dairy. Sub-acute rumen acidosis (SARA) occurs when the rumen pH drops to levels between 5.2 and 6.0 for prolonged periods of time.² A healthy rumen should maintain a pH of between 6.0 and 6.4. This lowering of the rumen pH can occur for multiple reasons with two of the most common being diet formulation and timing of feeding.

Two major factors to look at in the ration that influence rumen pH are carbohydrate level and source. Starch and sugar levels should also be evaluated. Diets containing a combined level of starch and sugar greater than 30% can begin to cause a drop in rumen pH because of the increased amount of propionic acid produced when starches and sugars are introduced to the rumen. Sugar is soluble in the rumen and is readily available to the rumen microbes. Good rumen microbe health is needed for microbes to grow and properly ferment



fiber. However, this rapid breakdown of sugar in the rumen can cause low rumen pH if the sugar levels are too high. Typically, in high producing dairy cow diets, sugar levels of 5-7% are desired. When looking at starch in the diet, levels of 22-26% are targeted. It is not only the total level, but the source of starch that is very important. Corn silage and high moisture corn are ensiled. This ensiling process increases the fermentability of the feed in the rumen because the fermentation has already started in feed storage. While this can create more complete utilization in the rumen, it increases the risk of lowering the rumen pH because of how rapidly the feeds ferment. When evaluating carbohydrate levels, the fiber level of the diet also needs to be considered. Acid detergent fiber (ADF) and neutral detergent fiber (NDF) levels in the diet should be assessed. ADF level should be no less than 19% of the total diet on a dry matter basis. NDF level should be no less than 27% of the total diet on a dry matter basis. Sugar feeds the rumen microbes, whose job is to break down fiber, which promotes rumination and cud chewing. When cows chew their cud, they naturally produce sodium bicarbonate in their saliva. Sodium bicarbonate is a buffer that helps neutralize

rumen pH, decreasing the risk of SARA and improving butterfat tests.

Once the nutrient composition of the diet has been examined, the timing of feeding and feeding behavior should be reviewed. Any time large amounts of grain are fed or consumed; the rumen pH drops. When cows eat many, smaller meals a day the risk of SARA is reduced; hence the benefit of a total mixed ration (TMR). With a TMR, cows essentially get the same composition of nutrients with every bite that is taken. This keeps consistency and balance in the rumen compared to component feeding. If cows sort the TMR and pick through to find the grain and concentrate particles, the feeding situation has now essentially turned back into slug feeding. Eliminating sorting and striving for consistency is critical. Multiple feed, or feed push up events along with the avoidance of sorting, help keep intake consistent. Any time new feed is delivered, or feed is pushed up, it stimulates cows to get up and eat. If cows are only being fed one or two times a day, and no feed is pushed up in between those times, they will consume the majority of their feed only during those times. This again essentially creates a slug feeding approach. To prevent this, provide adequate bunk space (30" per head for fresh cows and 24" per head for lactating cows) to eliminate competition and provide a minimum of 6 feed events a day (meaning the combination of feedings and push ups is 6 or greater).

Fatty Acids

While the relationship of rumen pH and butterfat has been understood for quite some time, more recent research has taken place giving a better understanding of dietary fat level and type. Unsaturated fatty acids, like vegetable fats, can cause milk fat depression. When unsaturated fatty acids enter the rumen, they must undergo a process called bio dehydrogenation. This is the process in which the rumen turns the unsaturated fatty acids into saturated fatty acids that then leave the rumen and are used by the cow. During this bio dehydrogenation process, trans fatty intermediaries are formed that can lead to major drops in butterfat percentage.³ Rumen Unsaturated Fatty Acid Load

(RUFAL) is a measurement that is used to monitor the amount of unsaturated fatty acids in the diet. Diets containing more than 3% RUFAL pose a higher risk to causing milk fat depression. Ingredients in a diet that can lead to this issue include:

1. Distillers Grains
2. Raw Soybeans
3. Full Fat Roasted Beans
4. Cottonseed
5. Vegetable Oils
6. Extruded Soybean Meal

Feed Additives

Rumensin® is a common ingredient used in the dairy industry to increase feed efficiency and milk production. Unfortunately, butterfat level often drops as Rumensin® is added to the ration. Rumensin® is a feed grade antibiotic that functions by killing fiber digesting bacteria so the starch digesting bacteria can flourish. Crystal Creek® does not promote this type of logic of feeding a dairy cow. Ideally, dairy cattle should live long, productive, healthy lives while consuming diets high in fiber. The approach of feeding Rumensin® is counterproductive to the goals of maximizing milk components and overall farm sustainability.

Increasing butterfat and other components can be a great way to help improve a herd's overall profitability. With the right approach, positive impacts can be made to the butterfat concentration on a dairy. Rumen pH, fat levels and type, and ingredients in the ration can all add up to make large impacts. Crystal Creek® strives to maximize profits on dairies by maximizing components. Call 1-888-376-6777 to talk with a Crystal Creek® nutritionist today about increasing the butterfat on your dairy.

Sources:

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- ² Abdela, Nejash, et al. "Sub-acute Ruminant Acidosis (SARA) and its Consequence in Dairy Cattle: A Review of Past and Recent Research at Global Prospective." Retrieved from: <https://www.sciencedirect.com/science/article/pii/S2078152016300773>
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Crystal Creek's Beef Mineral Has A New Name: Return On Investment (ROI®)



By Teresa Marker, B.S.

Crystal Creek® is launching a new name for our beef mineral, now known as ROI® Beef Mineral. R.O.I. is an acronym commonly used in the investing community that stands for Return on Investment. The definition of return on investment (R.O.I.) is a ratio between net profit

and the cost of investment. When looking at an input, like a mineral supplement, a producer should always evaluate the cost of the input against the return it

will generate. To justify its use, any input will need to show a positive return; whether the effect is on animal health, net profit, or both. Before understanding the economics of mineral supplementation for beef cows, we must first understand the important roles that minerals play in the body.

Functions Of Minerals In The Body

The modern-day beef cow is an amazing animal. The metabolic demands placed on beef cows to gestate and raise profitable young stock require

Table 1

MINERAL TABLE

Mineral	Functions	Deficiency Symptoms and Associated Problems
Calcium (Ca)	Bone and teeth formation, blood clotting, muscle contraction, 12% in whole milk	Rickets, slow growth and poor bone development, easily fractured bones, reduced milk yield
Phosphorus (P)	Bone and teeth formation, involved in energy metabolism, part of DNA and RNA, .09% in milk	Fragile bones, poor growth, low blood phosphorus, depraved appetite, poor reproductive performance
Sodium (Na)	Acid-base balance, muscle contraction, nerve transmission	Craving for salt, reduced appetite, incoordination weakness, shivering
Magnesium (Mg)	Enzyme activator, found in skeletal tissue and bone	Irritability, tetany-increased excitability
Sulfur (S)	Rumen microbial protein synthesis, found in cartilage, tendons, and acids	Slow growth, reduced milk production, reduced feed efficiency
Potassium (K)	Maintenance of electrolyte balance, enzyme activator, muscle/nerve function	Decrease in feed intake, loss of hair glossiness, lower blood potassium
Iodine (I)	Synthesis of thyroxine	Big neck in calves, goitrogenic (enlargement of thyroid gland) substances may cause deficiency
Iron (Fe)	Part of hemoglobin, part of many enzyme systems	Nutritional anemia, pale mucus membrane
Copper (Cu)	Needed for manufacture of hemoglobin, coenzyme	Severe diarrhea, abnormal appetite, poor growth, coarse, bleached hair coat
Cobalt (Co)	Part of vitamin B, needed for growth of rumen microorganisms	Failure of appetite, anemia, decreased milk production, rough hair coat
Manganese (Mn)	Growth, bone formation, enzyme activator	Delayed or decreased signs of estrus, poor conception
Zinc (Zn)	Enzyme activator, wound healing	Decreased weight gains, lowered feed efficiency, skin/wound problems
Selenium (Se)	Functions with certain enzymes, associated with vitamin E, immune system	White muscle disease, retained placenta, lessens subclinical mastitis

Source: <https://www.merckmanuals.com/home/disorders-of-nutrition/minerals/overview-of-minerals>

sound nutrition. Forages fed and pastures grazed by beef cattle do contain many macro minerals, trace minerals and vitamins; but oftentimes the amount of those ingredients in the forage or pasture do not meet the nutritional requirements necessary for optimum performance. Table 1 shows macro and trace minerals along with their importance in bodily functions. Without proper supplementation, important bodily functions will be compromised.

Dispelling The Myth That Mineral Is “Too Expensive”

Cheap mineral is simply that...cheap mineral. Any beef operation is a business and as such, needs to show a profit. Sometimes beef producers will make a decision on a feed or mineral supplement based on its price per bag or price per ton. A knowledgeable beef producer takes time to learn about how a mineral is formulated and reads the mineral tag. Minerals with a feed tag that shows a makeup of oxides and sulfates will have the lowest bag price and also prove to be the least available to the animal. A mineral that shows a formulation with oxides and/or sulfates will typically be 10-50% bioavailable to the animal. Minerals that are formulated using polysaccharide chelates will be over 90% available to the animal. Producers need to be asking “If I spend the extra money on a top quality mineral, will I see a return on my investment?” With Crystal Creek® ROI® Beef Mineral, the answer is yes.

When beef cows get a high-quality mineral supplement, like the ROI® Beef Mineral, we know that the animals are getting their true daily requirements. Research has proven that farmers will get an improved return on their investment. A quality trace mineral supplementation can improve the health and performance of the animal. Average daily gain, immune function, feed conversion, conception rate and hoof health are all affected by the quality of the mineral fed. Beef producers should take into consideration how much extra return on investment they can actually have on their farm. Research shows improved health and

performance associated with beef operations using the ingredients found in the ROI® Beef Mineral. These improved performance characteristics will positively affect the profitability of beef operations.

The figures presented in this article compare the different trace mineral formulations and their effects on performance. All Crystal Creek® mineral formulations, including the Crystal Creek® ROI® Beef Mineral, use polysaccharide chelated trace minerals; supporting improved pregnancy rates, increased average daily gain and improved feed efficiency over cheaper mineral sources.

The return on investment starts with improved reproduction.

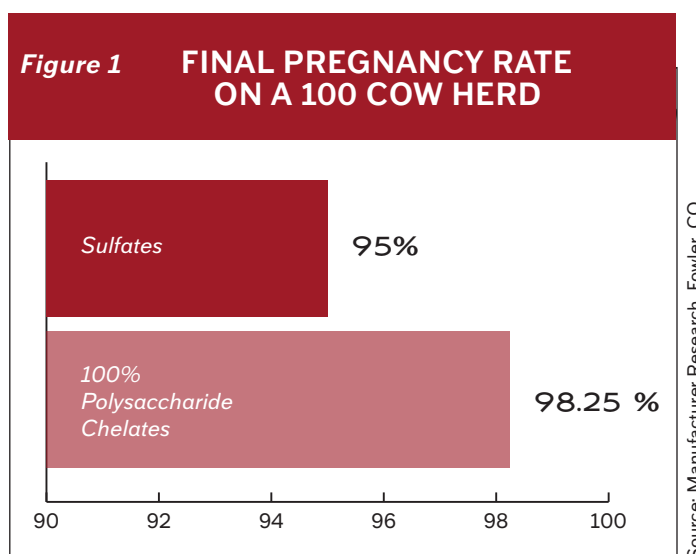


Figure 1 shows the final pregnancy rate of beef animals using a mineral formulated with sulfates vs. the polysaccharide chelates found in ROI® Beef Mineral. Using higher quality mineral sources will increase final pregnancy rates. 3.25 more pregnant cows on a 100 cow beef herd (assuming there is no pregnancy loss) would result in an increased calf value of \$2,275.00:

$$3.25 \text{ Calves} \times \$700.00 = \$2,275.00$$

(500 lb. calf at a market price of \$1.40 per lb.)

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Crystal Creek's Beef Mineral Has A New Name: Return On Investment (ROI®)

(Continued From Page 11)

Figure 2 shows that calves/cows on ROI® mineral supplements had an average increase in weaning weight of 48 lb. per calf.

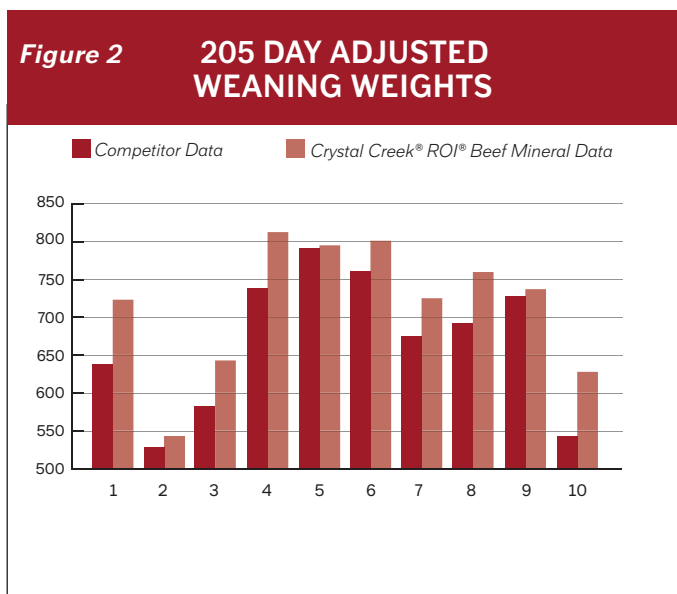


Figure 2 shows data collected from calves that were born from mature cows who had the same sex calf two years in a row. Calves were fed a beef pellet and cows were offered free choice minerals. The weights of the calves on the Crystal Creek® ROI® Beef Mineral program showed significant weight increases at weaning over the competitor's beef pellet and mineral program.

48lb. per calf x \$1.40/lb. market price = \$67.20 per calf
 \$67.20 per calf x 98 calves = \$6,585.60

Figure 3 explains the return on investment with an increased feed to gain conversion.

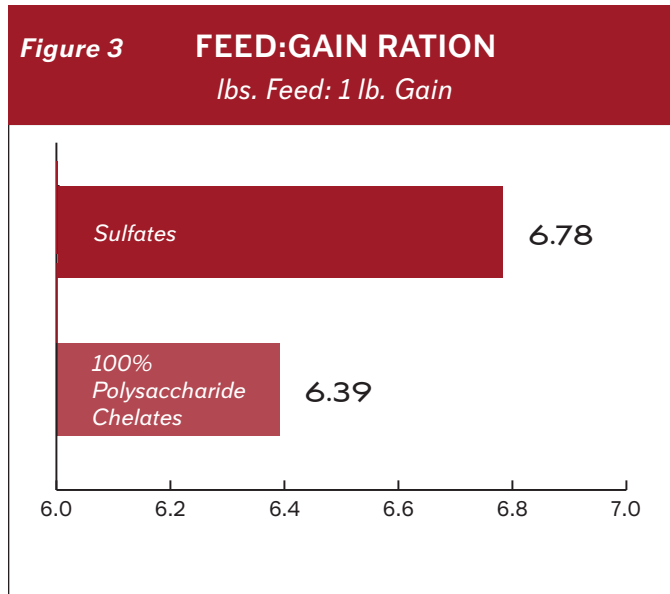


Figure 3 represents the results of feed conversion in animals using a 100% polysaccharide trace mineral. The numbers show these animals will have a better feed: gain conversion. Using a higher quality mineral source will reduce the feed needed per lb. of gain during the finishing period. If 200 lb. of dry matter feed is saved over the finishing period, it results in a savings of \$10.00 per calf. Crystal Creek® customers have seen an even better feed efficiency using the complete creep feed program formulated by our staff of nutritionists.

Dry Matter Value = \$0.05/lb. x 200 lb. = \$10.00 per calf
 \$10.00/calf x 98 calves = \$980.00 Savings



Mineral Investment

Investment for Cows	Cost/50 lb. bag	Feeding rate/hd/day	Cost/hd/day	Cost/hd/year	Cost/100 hd/year
Crystal Creek® ROI®	\$42.95	4 oz.	\$0.22	\$80.30	\$8,030
Brand X	\$22.00	4 oz.	\$0.11	\$40.15	\$4,015
Investment for Calves	Cost/50 lb. bag	Feeding rate/hd/day	Cost/hd/day	Cost/hd/150 days	Cost/98 hd/150 days
Crystal Creek® ROI®	\$42.95	2 oz.	\$0.11	\$16.50	\$1,617
Brand X	\$22.00	2 oz.	\$0.06	\$9.00	\$882

Return On Investment

Enhanced Performance	Brand X Sulfates/Oxides	Crystal Creek® ROI® Polysaccharide
Value of improved pregnancy rate	0	\$2,275.00
Value of increased weaning weights	0	\$6,585.60
Value of improved feed to gain ratio	0	\$980.00
Total Value	0	\$9,840.60

Final Calculations	Brand X Sulfates/Oxides	Crystal Creek® ROI® Polysaccharide
Improvements in performance using ROI®	0	\$9,840.60
Additional cost of ROI® mineral (Cows and Calves)	0	\$4,750.00
Earned profit on herd	0	\$5,090.60

The above chart numbers showing return on investment are only taking three factors of feeding Crystal Creek® ROI® Beef Mineral into consideration: pregnancy rate, improved weaning weights and feed to gain ratio. Other benefits could include: less days open, earlier sexual maturity, improved bull fertility, better utilization of feedstuffs and less treated animals. There is no doubt that healthy animals that are fed a high quality mineral will provide a better return on investment.

If you have any questions or would like to discuss how Crystal Creek® may be of service to your beef operation, please call and speak with one of our experienced nutritionists. Crystal Creek® livestock minerals are among the finest in the industry and give you the best value for your dollar. It's time to stop looking at the price per bag and start looking at total return on investment. It's time for Crystal Creek® ROI® Beef Mineral.

The Myth Of “All-In-One” Small Ruminant Feed And Mineral



By Alex Austin, B.S.

Sheep and goats are completely different species. They have a different number of chromosomes; sheep have 54 and goats have 60. They have different feeding preferences; sheep prefer to graze on pasture, while goats will browse and eat more twigs and brush. Another significant difference is their nutritional requirements. So, if these small ruminants are so different why does the feed industry promote an all-in-one sheep and goat mineral and all-stock feed?

Why People Like “All-In-One” Feed And Mineral

Using an “all-in-one” feed or mineral to feed two species of animals seems like a logical choice. Smaller farms that have both sheep and goats may pasture them together, which makes it easy to use one mineral or feed for both species. Even though this may seem easy, it is not the best nutrition for the animals and in certain cases, it can actually be detrimental.

Different Species Require Different Nutrition

As you can see in **Figure 1**, there are some similarities but also some very large differences in the nutritional requirements for sheep and goats. Copper is one of the most significant requirement differences between sheep and goats. Sheep have a very low requirement and excessive amounts of copper can be fatal to them. Copper toxicity often occurs over a long period of time when sheep consume copper above the required amount and the excess is stored in the liver. Signs of copper toxicity include dark urine due to the destruction of red blood cells, liver damage and jaundice.

If a mineral is offered with low copper for both sheep and goats, the goat’s nutritional requirements will not be met. It is because of these different mineral requirements, that there is no mineral that can be offered to meet the nutritional needs for both species. A separate sheep mineral and a separate goat mineral must be provided in order to provide proper nutrition.

“All-stock” feeds are another feeding strategy that are marketed as an “all-in-one” feed for sheep and goats. These “all-stock” type feeds

Figure 1 DAILY MAINTENANCE REQUIREMENTS			
Mature Ewe 176 lb.		Mature Goat 176 lb. (Non-Dairy)	
Dry Matter	2.86 lb.	Dry Matter	3.10 lb.
Ca	2.60 g	Ca	2.50 g
P	2.20 g	P	2.00 g
Na	0.90 g	Na	1.50 g
Cl	0.70 g	Cl	2.20 g
Cu	5.30 mg	Cu	31.00 mg
Se	0.05 mg	Se	0.18 mg
Zn	41.00 mg	Zn	24.00 mg

Source: Nutrient Requirements of Small Ruminants: Sheep, Goats, Cervids and New World Camelids. Pages 246-268 and 272-293. National Academies Press, 2007.

are manufactured out of convenience and are not nutritionally adequate to solely meet the needs of any given livestock species. They are made with little to no minerals or vitamins with a “least cost formulation” in mind, using low quality, cheap grains. It is because of these low nutritional values in all-stock feeds that they cannot be depended on to meet livestock’s nutritional requirements and should not be fed as a sole nutrition source.

Crystal Creek® Solution

Crystal Creek® recognizes that each species of livestock must be fed to specifically meet their individual nutritional needs. Crystal Creek® understands that livestock owners may have several different species of livestock to feed at one time and have developed a high-quality Foundation Grain Mix that can have a granular or pelleted mineral source added to it to meet these needs. This grain mix includes corn, oats, roasted soybeans, molasses and a low inclusion rate of a mycotoxin binder. This premium grain mix can be top-dressed with a Crystal Creek® species-specific mineral to create a complete feed. Crystal Creek® offers granular mineral for sheep and a separate mineral for goats in granular or pellet form.

Diet Delivery Solutions

Since many farmers pasture their sheep and goats together, extra steps need to be taken to ensure

their health and nutritional requirements are met. Pasturing sheep and goats separately with a temporary electric fence is one solution. When completely separated, a free choice mineral can be offered for that particular species. If pasturing separately is not possible, separating them once a day and feeding a sheep grain mix and a goat grain mix that includes the adequate minerals and vitamins is another option. Two choices for implementing separate feeding times are:

1. Building two separate feeding paddocks or
2. Using headlocks at feeding to ensure each animal gets the correct grain mix and does not steal feed from slower eating animals.

Other benefits of gathering and feeding animals once a day include having an opportunity to observe the animals and make sure they are not sick or injured. It also helps with socializing and making handling and restraint easier.

In conclusion, sheep and goats can be pastured together, but additional measures must be taken to ensure each are receiving proper care and nutrition. Crystal Creek® offers a wide range of nutritional products for both sheep and goats. Visit our website at www.crystalcreeknatural.com to learn more about our products and services.

Source:

¹ Sargison, Neil. “NADIS Animal Health Skills - Copper Poisoning in Sheep.” Retrieved from: <https://www.nadis.org.uk/disease-a-z/sheep/copper-poisoning-in-sheep/>





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