

Celebrating 20 Years In Business



On Saturday, May 13th, 2017, Crystal Creek® held an Open House to celebrate their 20th year in business serving the agricultural community. Crystal Creek® staff was on hand to answer questions and provide information on products and services.

Attendees enjoyed food, prize drawings and tours of the building, including the newly expanded warehouse. Crystal Creek® is honored to have had the opportunity to celebrate this 20 year milestone thanks to the support of their loyal customers, staff and community.

Dr. Ryan Leiterman Featured In Progressive Dairyman

Crystal Creek® is proud to announce that Dr. Ryan Leiterman will be contributing a three part series on calf barn ventilation to the Progressive Dairyman Magazine this year. Dr. Leiterman is the Director of Technical Services at Crystal Creek® and holds degrees in both veterinary medicine and agricultural engineering.

To view Dr. Leiterman's most recent article online visit:
<http://www.progressivedairy.com/topics/barns-equipment/crank-up-your-fans-to-improve-summer-calf-performance>



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Keep Calves Off The Temperature Roller Coaster



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

Spring and fall weather conditions often present calf raisers with the challenge of fluctuating temperatures. The rapid and ongoing transition from warm days to cold nights creates a temperature roller coaster that can increase calfhood respiratory disease rates.

The ventilation rates applied to calf barns are based on outside weather conditions, namely the ambient air temperature. During warmer weather, calf barns are ventilated with an increased volume and speed of fresh air. Conversely, during cold weather, calf barns are ventilated with lower volumes and slower fresh air speeds to prevent a draft.

Ventilation systems that cannot be adjusted in response to changing outside temperatures will leave calves over or under ventilated. To best cope with the ever-changing spring and fall weather conditions, calf barn managers must be able to quickly and easily adjust their ventilation systems to increase or decrease the volume and speed of fresh air throughout the day.

Calf raisers use different ventilation systems with varying degrees of success. However, a good ventilation system must:

1. Provide the correct volume of fresh air based on seasonal requirements by increasing volume during warm weather and decreasing volume during cold weather.
2. Evenly distribute fresh air to the calf.
3. Deliver fresh air to the calf at the correct speed based on the season; faster speeds (200-400 feet per minute) for warm weather heat abatement; slow, non-drafty speeds (less than 50 feet per minute) during cold weather.
4. Provide for easy adjustment of fresh air volume and speed in response to the warm days and cold nights of spring and fall.

Below are three types of calf barn ventilation systems that are able to meet these criteria.

1. Cold weather positive-pressure tubes with panel fans

This tube system contains numerous small holes (typically .75-to 1.5-inch diameter) that release a slow, gentle blanket of fresh air for cold weather ventilation (**Figure 1**). Although the tubes are designed for cold weather use and only minimally contribute to warm weather ventilation, it is important to run this system in the summer when the curtain sidewalls are open because an inflated tube remains taut and less prone to wind damage.

During spring and fall, curtain sidewalls are progressively opened from the bottom as the weather warms. Variable speed basket or panel fans can be turned on low to slowly increase air speed as needed. For heat abatement during warm weather, curtains are opened completely, and the basket or panel fans operate on high to circulate the incoming fresh air at high speeds.





Figure 1: This calf barn uses natural ventilation in conjunction with cold-weather positive pressure tubes and panel fans. This system works only in curtain sidewall barns because the panel fans rely on open curtains to draw in fresh outside air during warm weather.

Variable-speed basket or panel fans can quickly and easily be manipulated in conjunction with the curtain sidewalls to adjust both the volume and speed of fresh air delivered to the calf. Thermostatic controllers and total weather stations can completely automate the process.

This type of system is best suited to the open pen layouts of automatic calf feeders or post-weaned pens. It is not advisable to use this type of system in calf barns with solid-sided individual pens. Basket or panel fans direct air downward at roughly a 30-degree angle. When air blows across a row of individual pens with solid sides, the sidewalls deflect air and prevent it from reaching the calf.

2. Warm weather and cold weather positive-pressure tubes

This system combines multiple positive-pressure tubes, each designed for different seasonal applications (Figure 2). While commonly used in combination with curtain sidewalls, this system is not dependent on them because the tubes bring in fresh outside air. Consequently, it can be used in solid wall buildings as well.

These systems typically have multiple warm weather tubes with large-diameter holes for fast, high volume airflow and a single cold weather tube

containing numerous small-diameter holes for slow, gentle air distribution. The tubes can direct fresh air straight down into a row of individual pens without the pen's solid sides blocking air flow.



Figure 2: This calf barn uses natural ventilation with a central cold-weather tube and two warm-weather tubes. This system works well in solid sidewall barns because the tube fans deliver fresh outside air.

Warm weather tube fans are most commonly single speed and are turned on/off as needed. Closing curtains when the warm weather fans are off will prevent wind damage to the deflated tubes. These fans can be automated to turn on/off with a thermostatic controller, making them effective tools to handle the warm days and cold nights of spring and fall.

3. Multi-season positive-pressure tubes

Multi-season tubes combine warm weather and cold weather positive-pressure tubes into one unit. Each tube contains an internal membrane that runs the length of it. This membrane is used to block, restrict or change direction of air exiting the tube, achieving the desired airflow based on seasonal requirements. These systems are connected to variable speed fans and have an array of numerous small holes on one side of the

(Continued on Page 4)

Keep Calves Off The Temperature Roller Coaster

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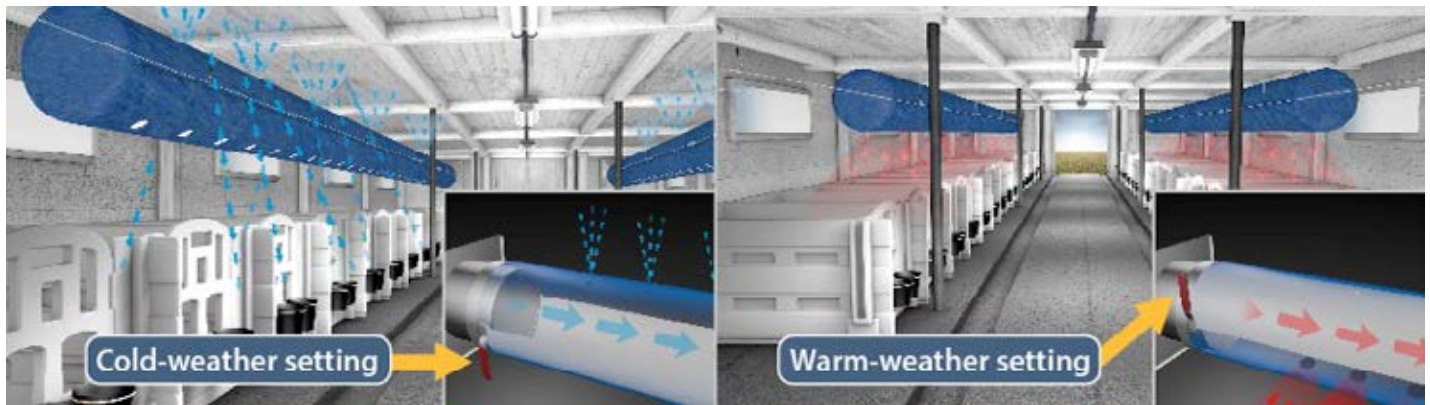


Figure 3: This depiction shows the inner workings of a multi-season tube. The internal membrane can be repositioned by moving the lever up or down to adjust air flow rates for warm or cold weather. This system works well in solid sidewall barns because the tube fan delivers fresh outside air.

tube and fewer, larger holes on the opposite side. When the fan is turned on, air pressure pushes the internal membrane against an inside wall of the tube. The membrane blocks one of the hole patterns while exposing the other. This allows air to be discharged out the small hole pattern for cold weather or the large hole pattern for warm weather (Figure 3).

Like the cold and warm season tubes, multi-season tubes can also be used to rapidly and easily adjust fresh air volume and speed to match the warm days and cold nights of spring and fall.

The multi-season tube is placed over the calf pen area and during warm weather the larger hole pattern is pointed down towards the calves. The variable speed tube fan is turned on high, increasing the volume of air delivered. The large holes release robust jets of air, delivering fast, cooling air to the calf.

When the weather cools, a lever mechanism connected to the fan can be used to adjust the internal membrane to the bottom of the tube, blocking the large diameter holes and redirecting the air out of the small holes in the top of the tube, away from the calves. At the same time, the variable speed fan is turned on

low, reducing the output. This style of multi-season tube is particularly useful for retrofitted stanchion barns because the air discharged out the top of the tube bounces off the low ceiling and gently falls into the calf pen.

In the winter, producers who have barns with taller sidewalls will commonly use a rotating mechanism to adjust the tube so the small holes are open, facing down towards the calves to discharge a gentle blanket of fresh air.

Multi-season tubes are being used successfully in every type of calf barn style and pen layout and eliminate the additional expense of warm weather fans.

What is right for your farm?

Having a proper ventilation system that keeps your calves comfortable and off the spring and fall temperature roller coaster is essential to raising healthy calves. Consult a ventilation professional to help you determine which system will work best for your operation's ventilation needs.

This article was originally published with the Progressive Dairyman Magazine at: <http://www.progressivedairy.com/topics/calves-heifers/keep-calves-off-the-temperature-roller-coaster>

Ask the Vet/Ask the Nutritionist



“We provide our calves with a clean maternity pen to be born in, good quality colostrum at birth and a sound nutrition program as they grow but we still have outbreaks of scours. We work hard to keep our calf pens clean and have developed a good vaccination program with our veterinarian. What are we missing?”

- Wondering from Minnesota

Congratulations on providing your calves with a healthy start to their lives. The three most common areas for exposure of newborn calves to harmful pathogens are 1) the maternity pen, 2) the calf hutch/housing and 3) feeding utensils, bottles and pails. Even when these three areas are managed well, invisible threats can pose a significant risk. Recent studies in sanitation protocols have led the agriculture industry to a new awareness regarding biofilms. Biofilms are layers of microorganisms that grow on surfaces, or in water, that are protected by a polymeric coating that prevents destruction from most standard disinfectants. Refer to the April, 2017, Crystal Creek® Newsletter for more information on biofilms.

Logical sources where biofilms can be found on a farm are surfaces such as rubber, plastic, copper/brass, aluminum and even stainless steel. Another common location for biofilms, which is often overlooked, is water. We may be trying to keep our calf pens and feeding equipment clean, but what about the water source we are using? Water is used in every application from washing hutches and bottles to mixing milk replacers. Automatic waterers and milk feeders can provide the perfect environment for biofilms to flourish; harboring the very organisms we try to protect our calves against. Pathogens such as E.coli, Salmonella and Cryptosporidium become encapsulated in the biofilm

layers within the water and are then ingested by the calves. As you can imagine, this can present a great threat to the calves and often cause gastro-intestinal disruption, resulting in scours. When calves scour, we recommend using an electrolyte solution mixed with water to hydrate them. Because this water is infected with biofilms, we have now introduced even more pathogens to an already sick calf. So how can we break this vicious cycle?

Many calf raisers are using water treatment systems using residual chlorine dioxide concentrations at a low inclusion rate of 0.5 to 0.8 ppm for the removal of biofilms.¹ Because chlorine dioxide concentrations can vary between different manufacturers, it is imperative that the concentration of the chlorine dioxide be verified every time prior to use by testing. Call Crystal Creek® to learn more about concentration verification and safe handling recommendations when using chlorine dioxide. Many calf raisers are implementing this new technology with great success. Destroying harmful biofilms may be the key your operation needs to raise healthy, trouble free calves.

¹ Sockett, Don, *Bovine Veterinarian* “Sanitation for Calf Scours Prevention”, January, 2015.

By Lorrie Meister, CVT
Livestock Specialist

Please submit your animal health or nutrition questions in writing to:

Crystal Creek®
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1600 Roundhouse Road
Spooner, WI 54801
OR
askthetvet@crystalcreeknatural.com

Reducing Feed Waste Can Return Big \$



By Teresa Marker, B.S.

Farmers are always looking for ways to improve their bottom line. One aspect that can easily be overlooked is feed loss due to issues in fermentation, storage, feedout or bunk management. This article

provides ideas to help reduce feed waste that can improve a farm's profitability.

1. Efficient Fermentation of Feedstuffs

Typically, forages and high moisture grains left to uncontrolled/wild fermentation could experience a dry matter loss ranging from 12 to 30%. Use of an effective inoculant, such as Crystal Creek's Inoc-U-Lock™, on forages and high moisture grains has been proven to reduce dry matter loss, reduce nutrient loss, improve aerobic stability for less mold and yeast growth and reduce heating in the bunk after feedout. See Dan Leiterman's article from August 2015 that calculates the potential return on investment (ROI) when using a high quality inoculant like Inoc-U-Lock™. The use of the Inoc-U-Lock™ product can save conventional producers money with a ROI of approximately 3:1 while organic producers can have a ROI of over 9:1 simply based on a conservative reduction in dry matter loss and protein degradation (this does not include economics on animal performance). Visit www.crystalcreeknatural.com for more information regarding the economics of using Inoc-U-Lock™.

2. Proper Storage

It is never too late to evaluate potential feed losses due to storage issues. For example, if round bales are left out in the weather, the bales can have waste anywhere from 2-8" or more on the outer layer. If we assume there is a 4" weathered layer all around the bale, that represents 21% waste on a 6' round bale. If you have 100 tons of round bales for the year and we estimate a cost of approximately \$60/ton, your loss is 21 tons of hay due to weather, which equals \$1,260. Protecting the bales from weather by storing them in a shed, wrapping them with plastic or putting a tarp over them could help save

your operation a large amount of money. Ideally, the bales should be kept up off the ground to help prevent feed loss due to ground moisture.

Significant losses can occur to feedstuffs not properly stored. It is very important to harvest and store feed at the proper moisture. After harvest, while in storage, wildlife, birds and pets around the farm can poke tiny holes in the plastic allowing air into the storage structure. This can create small pockets of air that will cause feed to spoil. It is a good idea to have tape handy to patch up any holes found while feeding. Train the dogs, cats and children not to run or play on the feed piles to prevent creating any holes. Rats and mice are known for burrowing holes into bags and piles. Consider using bait to prevent them from eating into your feed. Silos do not typically have damage to feed due to animals but spoilage does occur in silos due to improper maintenance. Have an expert evaluate your silo to make sure it is properly sealed.

3. Feedout

Proper face management of forage bags, piles or bunkers will help eliminate spoiled feed during feedout. Removing spoilage is the first step to providing a quality feed to the herd. Spoiled feed can wreak havoc in the animals. It is better to spread spoiled forage in the field than to feed it to an animal. The amount of spoiled silage can be reduced by using a facer and taking off enough silage each day to stay ahead of heating. Ideally, a flat, smooth silage face should be left at the end of each day. Each storage structure has a different face size so it is good to evaluate how much feed removal is optimum for the face. The time of year can also play into how much feed has to come off the face.

Managing the feed at feedout is important as well. Variation in feedstuffs can lead to improperly balanced rations which can lead to decreased milk production and/or decreased average daily gain. Evaluate the feed regularly by testing the forage for quality and moisture content. The use of a Koster tester on the farm can help evaluate the moisture content of the feed on a more regular basis rather

than sending a sample off to the laboratory. If you have questions on where to buy, or how to use, a Koster tester please call one of the nutritionists at Crystal Creek®. If you observe any differences in feed quality, moisture, excessive heating, mold or strong odors, the Crystal Creek® staff can help create a customized strategy to help deal with these issues.

4. Bunk Management

Once feed is mixed properly, delivery of that feed at the right time and management of the feed at the bunk is essential to maintaining good herd performance and improving feed efficiency. Prior to feeding fresh feed each day, the bunks should be cleaned out to remove old forage that may have started to heat or mold. This is especially necessary during warm weather. Observe the bunks for weighback. Are the bunks empty? Is the weighback evenly distributed between the pens? Are weighbacks hot or smelly? Does the weighback look like the original TMR mix? Aim to have around 3% weighback and *never* feed to an empty bunk.

Once you have observed the weighbacks for each group, you can then make sure the right amount of fresh feed is available for the cows after milking. Push feed up often so cows do not have to stretch to reach the feed. Evaluate your bunk space so each animal has adequate space to eat. Milking cows require a minimum of 24" of bunk space. Headlocks are useful and help to reduce competition at the bunk compared to post and rail setups.

5. Inventory Management

Fall is a great time to evaluate feed inventory. Work with your nutritionist to calculate your inventory for the year to see if you have enough good quality forage to last until next year's harvest. If you are going to run short on hay, silage or corn, you can start planning with your nutritionist to create a strategy to help stretch out your current supply.

Feed waste can significantly reduce a farm's profitability. The friendly and professional staff at Crystal Creek® are a tremendous resource for dairy operations wanting a stronger bottom line.



Vitamins And Minerals Are Key For Optimum Livestock Performance



By Jessica Dercks, B.S.

The conversations between producers and nutritionists regarding livestock mineral intake generally focus on two areas: 1) What mineral blend will most efficiently balance the dietary and performance needs of the animals and

2) How that mineral will be fed. When it comes to mineral delivery, special attention should be paid to how the mineral is physically consumed by the animal and, just as importantly, how the individual mineral components are utilized inside the body, i.e., the bioavailability of the mineral ingredients.

All too often we find that a mineral program is put in place and left alone until a problem arises. Don't wait for a reason to evaluate your mineral program; ask yourself these questions now to avoid a problem later:

Is there enough mineral in the diet?

Investigating whether or not there is enough mineral in the diet requires a thorough examination of the ration and what is actually fed. Once the ration is properly balanced, mineral delivery needs to be evaluated.

There are several methods used to incorporate mineral into a diet, all of which can pose challenges to proper mineral delivery. For example, many livestock producers feed their mineral in a TMR. To ensure that this method of mineral feeding truly distributes the mineral uniformly, a TMR audit should be done at least twice a year. An audit could reveal improper mixing techniques or inaccurate scale readings, which in turn, would reveal inaccurate mineral delivery.

Is the mineral delivery strategy appropriate?

While there is a mineral delivery strategy to fit the need of most operations, some methods are simply inefficient and are considered poor mineral delivery methods.

Examples of weak mineral feeding methods are:

Mineral Blocks: Blocks are typically not capable of providing enough macro-mineral volume to meet an animal's daily mineral requirement. Similarly with salt blocks, animals cannot physically lick off enough volume in a day to provide a sufficient amount.

Mineral Water: Some producers believe that supplementing their water source with mineral will meet their animal's mineral requirements. This, however, is not the case. Water systems cannot deliver adequate levels of macro-minerals or trace minerals.

"Cafeteria-Style" Free Choice: This strategy involves offering free choice minerals as individual mineral components, driven by the belief that the livestock are able to select which specific minerals, and how much, they need in their diet. Truth be told, several of these manufacturers admit that in order to avoid toxicities or deficient intakes, each individual mineral is flavored to drive the desired intake. This completely counters the original marketing claim that consumption will be driven solely by the animal's perceived need.

Can the mineral be utilized?

The answer to this question can be influenced by many factors ranging from feed delivery, digestion and/or utilization of the mineral.

Is the source of mineral appropriate?

As with the mineral feeding strategies, there is a wide array of options presented to the livestock industry as acceptable "mineral" sources. That being said, a number of these options are inefficient and can be a waste of money compared to a high quality mineral source that is readily bioavailable to the animal.

Kelp: The mineral quality and quantity of kelp compares closely to that of typical alfalfa, with the exception of kelp's high iodine content. Kelp contains a wide range of minerals and several vitamins that are high in bioavailability, but low in quantity; therefore, kelp does not qualify as a fortified mineral supplement as it does not meet an animal's daily nutrient requirements.

Clay: Various clays can contain a wide array of minerals. Because clay has a strong molecular structure, much of that mineral is not available to the animal and what is has a low bioavailability. Clay can also be damaging to the utilization of many other nutrients as it often binds them up. This is counterproductive to mineral delivery.

Charcoal: Typically used as a weak, non-polarized, mycotoxin binder, charcoal has the blind affinity to also bind macro-minerals, trace minerals and vitamins in the diet; which decreases their ability to be utilized by the animal.

Diatomaceous Earth (DE): DE is a silica clay that is mistakenly thought to be a natural dewormer. ATTRA (Appropriate Technology Transfer for Rural Areas) has done several studies and is unable to substantiate the efficacy of DE as a dewormer¹. This abrasive powder acts in a non-specific manner and can pose a respiratory hazard to livestock, as well as human health. DE can also significantly tie up nutrients and compromise the diet.

Humates: In the United States, it is illegal to feed humates to livestock. Humates are a high carbon derivative of charcoal, offer poor bioavailability, tie up dietary nutrients and contain several undesirable heavy metal compounds.

Is the mineral bioavailable?

Bioavailability is one of the most important factors to consider when choosing a mineral. The efforts put into ensuring proper delivery of the mineral is seriously compromised if the mineral is not able to be utilized correctly by the livestock. Minerals formulated with sulfate and/or oxide forms of trace minerals have a reduced bioavailability due to their high levels of reactivity with other nutrients². Also be aware that minerals appearing red in color may contain high levels of iron oxide (ferrous oxide), often added for visual appeal. Iron oxide, however, is another highly reactive compound that can greatly reduce the bioavailability of a wide range of minerals and vitamins.

Crystal Creek® minerals are formulated for high bioavailability to ensure that livestock truly utilize as

much mineral as possible and offer the best return on producer feed dollars. This, in part, can be attributed to the proteinate and polysaccharide mineral carriers Crystal Creek® utilizes that are more biologically accepted as compared to sulfates and oxides.

Is a complete, balanced, free choice mineral available?

Nutritionists will often not recommend putting out a free choice mineral because they feel the mineral is already included in the force fed ration. This approach is a bit arrogant and relies entirely on the idea that the nutritionist has complete control over what the livestock are fed and what they are truly consuming. Nutritionists who understand that complete control over all variables is impossible, will recommend offering a complete balanced (containing no salt and no flavoring) free choice mineral at all times.

Offering a balanced, free choice mineral will give the livestock an opportunity to indicate when they are not receiving adequate mineral from their feed, for whatever reason. For example, a drastic increase in free choice mineral intake could signify a problem such as poor TMR mixing or an exposure to mycotoxins. The alternative to not having free choice mineral available might result in a longer period of time before the problem is identified, all the while the livestock are insufficient on mineral intake. The small investment of feeding a free choice mineral more than pays for itself in prevention of lost revenue.

Mineral feeding provides the most basic level of nutrition necessary for an animal's functional and productive life, and therefore, should not be taken lightly. Dietary minerals touch all aspects of livestock health and can help improve a livestock operation's bottom line. Take the time to address your mineral feeding strategy as well as potential areas of improvement. To learn more about evaluating your livestock mineral program, contact a Crystal Creek® nutritionist.

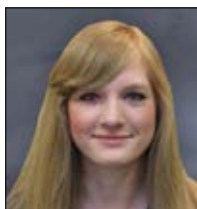
Sources:

¹ ATTRA Sustainable Agriculture "Tipsheet: Organic Management of Internal and External Livestock Parasites", July 2015

² Feed Management, December 1996

Hoof Defense™

A New Approach To Hoof Health



By Kaylee Viney
Livestock Specialist

Digital dermatitis, more commonly referred to as hairy heel warts, is the most common infectious cause of lameness in dairy cattle¹. The painful lesions are a result of compromised hoof or skin condition leading to an infection of the skin surface.

The most common location of heel warts are on the back feet, between the claws where the hoof heels meet the skin, below the dew claws. Lameness caused by hairy heel warts often reduces feed intake, subsequently negatively impacting milk production. Affected cows increase their laying time in the stalls, and are less likely to compete at the bunk.

Controlling the spread of heel warts and other conditions that compromise hoof health requires implementing preventative measures. Routine trimming and the use of a hoof bath are important tools that will reduce the impact of lameness in a dairy herd.

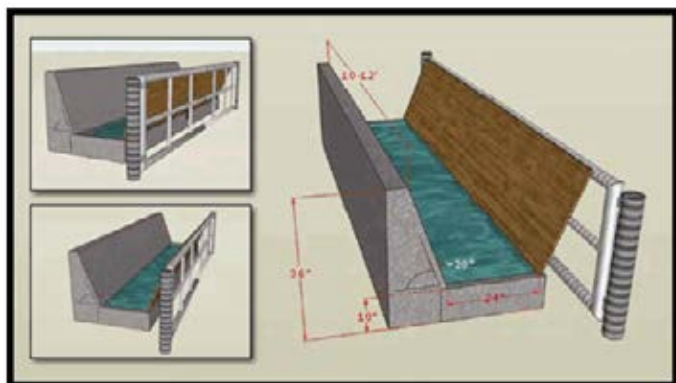
What Makes An Effective Hoof Bath?

University research has recently introduced new recommendations for hoof bath sizing. Previously, hoof bath recommendations used shorter and wider designs, resulting in less steps and decreased contact time, making them less effective.

Studies have shown an increase in hoof bath effectiveness when dimensions of the hoof bath are longer and narrower (see Figure 1). New curb height recommendations help slow cow travel through the hoof bath, allowing more contact time with the solution and the cow's feet. A slower pace and longer design causes more steps to be needed to pass through the bath. This increases soak time and solution penetration.

When evaluating the effectiveness of your hoof bath program, it is important to take into consideration

Figure 1



Picture courtesy of The Dairyland Initiative

factors that might inhibit solution penetration and decrease hoof health success such as:

- Solution type
- Frequency of changing solution
- Volume
- Placement
- Impact of organic matter

Hoof Defense™: Why Use Chlorine Dioxide?

Chlorine dioxide takes a different approach to hoof health by attacking harmful pathogens and bacteria from the cell wall inward². Chlorine dioxide provides the quickest action at the lowest concentration of use compared to most traditional solutions.²

Chlorine dioxide remains effective when in contact with organic matter and has a wider window of safety for handling. It is very soluble in water (10 times more so than chlorine), especially cold water. This high solubility makes the use of warm water unnecessary to hold the foot bath in suspension, resulting in a better quality solution overall.² Chlorine dioxide based foot bath solutions are not currently approved on organic farming operations but the National Organic Program does allow

chlorine dioxide as a disinfectant for cleaning equipment, feeding utensils and animal housing.

Hoof Defense™ is available as an activator and base formula (see Figure 2). See Table 1 for mixing directions and sizing recommendations. Farmers may choose to mix copper sulfate into the hoof bath at a reduced rate. Hoof Defense™ creates an acidic solution which holds the copper sulfate in

Figure 2



suspension better than regular solutions, reducing the risk of it settling out and allowing a lower copper sulfate inclusion rate.

Directions for Making Hoof Defense™ Concentrate:

1. Fill a 5 gallon pail with 3 gallons of cold water
2. Add appropriate volume of activator from Table 1 and rinse out measuring cup
3. Add appropriate volume of base from Table 1 and rinse out measuring cup
4. Seal container (airtight) and leave for at least 30 minutes
5. Fill hoof bath with cool water and add copper sulfate
6. Add Hoof Defense™ Concentrate to footbath

To make an economical decision for herd wide control of hairy heel warts with proven, effective results, turn to Hoof Defense™. For tips on how to get the most out of your hoof bath protocol, contact Crystal Creek® at 1-888-376-6777 or visit our website at www.crystalcreeknatural.com.

Sources:

¹ Tomlinson, Dana. "Foot Fitness: Preventing Digital Dermatitis." AgWeb. Farm Journal, 01 Oct. 2014. Web. 24 Apr. 2017.

² Acepsis Calf Hygiene Manual

Table 1

Foot Bath Size	Water	Copper Sulfate	Activator	Base
60 Gallons	3 Gallons	10 lb.	1 Quart	1 Quart
70 Gallons	3 Gallons	11.75 lb.	1.1 Quarts	1.1 Quarts
80 Gallons	3 Gallons	13.25 lb.	1.25 Quarts	1.25 Quarts

Give Your Dog An Advantage With Canine Health Forward



By Erik Brettingen, B.S.

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 pet owner, but actual nutritional value for the dog is put on the back burner compared to other factors like cost, ingredient availability, and human emotion. At Crystal Creek®, providing animals with the best nutrition possible is our number one goal, which is why we now carry a line of dog food from Canine Health Forward. Canine Health Forward offers three different dog food formulas, all made with ingredients sourced in the U.S.A, that deliver high-end, highly absorbable nutrition for your dog. Along with using only the highest quality, most biologically appropriate ingredients, Canine Health Forward uses industry leading processing technology and preventive nutrition to deliver the best dog food possible, every time.

Standing Apart - Above The Competition:

The ingredients in Canine Health Forward dog foods have been selected based on their potential to deliver the highest quality nutrition for your canine companion. The unmatched nutrient quality of the proteins, fats and carbohydrates all have attributes that set them apart.

1. Protein: Chicken meal is the number one ingredient in all three Canine Health Forward formulas. Chicken meal, as compared to whole meat chicken, is a much more concentrated form of protein. Furthermore, Canine Health Forward uses only the top two grades of chicken meal available on the market meaning they contain the highest amount of actual chicken meat in comparison to other sources. Along with chicken, you will find protein from fish and eggs in all three formulas. Using animal based proteins is biologically appropriate for the carnivorous canine.



It is agreed upon by most canine nutritionists that dogs thrive on protein from animal based sources like chicken meal.¹ Protein from grain or vegetable sources, usually by-products or legumes, are not as easily digested or utilized by dogs.

2. Fat: Having biologically appropriate fat sources is just as important to the canine as having the correct sources of protein. Dogs are programmed to use energy from fat, specifically animal fat, as their number one source of fuel. Studies have shown that dogs fed a higher fat diet are able to burn oxygen more efficiently.¹ Fats from other sources like vegetables and oils are lower in digestibility and can cause intestinal irritation and compromise the dog's immune system.

3. Carbohydrates: Contrary to the recent "grain free" trends, carbohydrates are actually quite digestible and useable by dogs, especially when using the correct forms of carbohydrates. Canine Health Forward uses brown rice or brown rice flour. When compared to legumes, like lentils and peas which are found in many trendy dog foods, studies have shown that cereal grains, like brown rice, are actually much more digestible to the dog.² These cereal grain based carbohydrates provide calories that are readily available for quick utilization during periods of intense activity.

4. Minerals: All Canine Health Forward dog food formulas contain chelated trace minerals. Mineral chelation is the act of bonding minerals to a more absorbable substance like a protein, amino acid, or polysaccharide. This chelation prepares the minerals for digestion before even entering the body and significantly improves their bioavailability to the dog. This higher quality mineral program can translate into a healthier coat, stronger immune system, and superior reproductive function in breeding dogs.

Astaxanthin is derived from microalgae and is found to be an extremely powerful antioxidant. Recent studies have shown astaxanthin to be 550 times stronger than Vitamin E and 6,000 times stronger than Vitamin C as an antioxidant.³ In one study, comparing astaxanthin to other carotenoids, astaxanthin was found to be 10 times stronger than beta carotene, zeaxanthin, lutein, and canthaxanthin. This preventative strategy is important as it may help prevent diseases like cancer, atherosclerosis, and overall aging.⁴

2. Broad Based Digestive Support: In situations like larger kennels and dog parks where a large number of dogs are kept in close proximity the threat of single cell parasites is very real. Single cell parasites such as coccidia, giardia, and cryptosporidium can all be spread from dog to dog, or even from wild animals to dogs and cause significant health issues for our canine companions. Kennel Keeper is a proprietary product that is incorporated into all Canine Health Forward dog food formulas. Kennel Keeper provides digestive tract support when a dog is exposed to these pathogens.

3. Specialized Polysaccharides: Specialized Polysaccharides have long been known to provide a number of health benefits. Some of these benefits include immune system support, improved digestive tract health, and anti-inflammatory properties.⁵ Most dog foods on the market focus only on glucosamine and chondroitin for joint support. These fatty acids are beneficial for joints but are limited by the amount that can be added to a dog food. In an effort to increase the joint support in their formulas, Canine Health Forward formulated with anti-inflammatory properties of special phyto-compound polysaccharides. This added protection is especially important as dogs age and joint support becomes a priority.

4. Slow-Baked Cooking Process: In the extrusion process, the raw ingredients are processed and then cooked to create the hard kibble we are all used to. In most large, conventional pet food plants,

Advanced Concepts To Support Health and Performance:

1. Antioxidants: Canine Health Forward is utilizing an industry leading antioxidant called astaxanthin.

(Continued on Page 14)

Give Your Dog An Advantage With Canine Health Forward

(Continued from Page 13)

the ingredients are cooked as fast as possible for maximum production. This improves the plant's profitability, but is not the best for the dog. Studies have shown that the faster a food is cooked and processed, the less gelatinization of the starch occurs.⁶ This is important because as gelatinization increases, so does the digestibility to the dog.⁶ By slowing the cooking process down, Canine Health Forward is providing the best possible nutrition for your dog and not allowing other factors like speed and production time get in the way of your pet's health and performance.

The three dog food formulas that Canine Health Forward offers are outlined in the chart below. Whether your dog is an extreme athlete, or just a calm couch potato, Canine Health Forward has a formula that will provide the appropriate level of nutrition for your dog.

Canine Health Forward dog foods have been formulated with the well-being and performance of

your dog as the number one priority. These science based formulas are biologically appropriate for your canine companion whether your dog is racing the Iditarod, hunting pheasants out west, or an important family member. Industry leading nutrition with the most powerful antioxidants, joint support, digestive support and slow baked processing can keep your dog healthy and living longer. Call 1-888-376-6777 to speak with a knowledgeable Crystal Creek® staff member to learn more about the entire Canine Health Forward line.

Sources:

¹ <http://www.wec.ufl.edu/floridaquail/Documents/FEEDING%20THE%20HIGH%20PERFORMANCE%20BIRD%20DOG.pdf>




² <http://jn.nutrition.org/content/131/2/276.short>

³ <http://articles.mercola.com/sites/articles/archive/2013/02/10/cysewki-discloses-astaxanthin-benefits.aspx>

⁴ <http://astaxanthin.businesscatalyst.com/studies/Antioxidants/pap53.pdf>

⁵ <http://www.mdpi.com/1420-3049/13/8/1599/htm>

⁶ <http://blackwoodpetfood.com/wp-content/uploads/2015/02/slowcooking.pdf>

Canine Health Forward FORMULAS	Canine Health Forward ADVANCE	Canine Health Forward COMPLEAT	Canine Health Forward ASPIRE
			
Protein (%)	32%	28%	26%
Fat (%)	21%	17%	14%
Metabolizable Energy (ME) (kcal/kg)	4171 kcal/kg	3880 kcal/kg	3696 kcal/kg
Fiber (%)	3.5%	3.7%	3.4%
Omega 3	1%	1%	1%
Omega 6	4.3%	3.5%	2.8%
DHA (%)	0.1%	0.1%	0.1%
EPA (%)	0.1%	0.14%	0.13%
Ideal For:	Sled Dogs, Hunting Dogs, Field Trial Dogs, Highly Athletic Dogs	Dogs of Average to Moderate Activity	Puppies and Less Active Dogs



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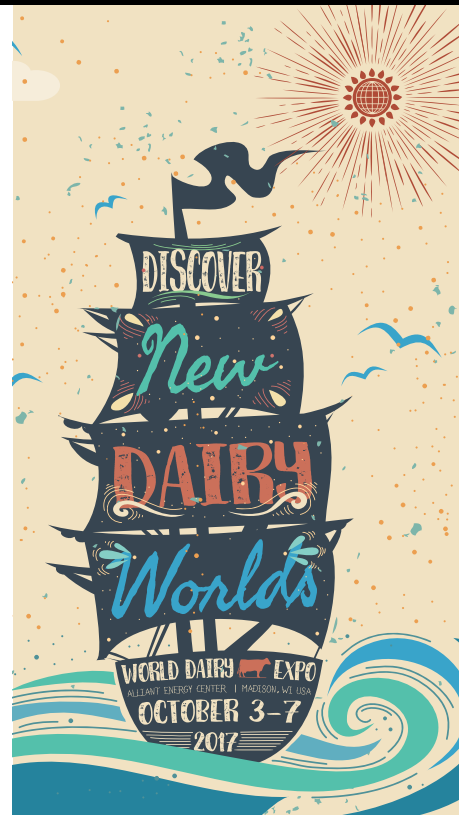
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