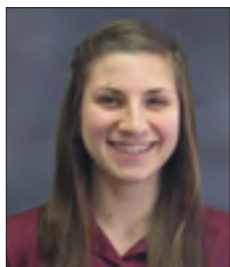


Ventilating A Retrofitted Stanchion Barn For Calves



By Jessica Getschel, B.S.

There's nothing more picturesque than a dairy farm with a big red barn on a cobblestone foundation. Many of these barns, referred to as stanchion, tiestall or bank barns, were built decades ago and tell stories of families who have been dairy farming for generations.



Over the years, many farmers have moved out of these older barns and into modern freestall barns for a variety of reasons: expanding herd size, new cow comfort recommendations or a new milking system, to name a few. This departure leaves a vacant building prized for its emotional value to the farm.

Rather than demolishing the barn or leaving it to harbor cobwebs, many dairy producers are choosing to put this space to good use: housing their calves.

An old stanchion barn is an excellent space for calf housing. It is an existing structure more affordable to retrofit than building a new facility. It provides a covered space that already has electricity and water available. The milk room attached to the barn that previously housed a bulk tank and milking equipment can easily be converted to a milk preparation room. This space can also be effectively utilized for cleaning and sanitizing feeding equipment.

For the sake of calf health, ventilation and the factors that impact it should be carefully considered before placing young calves in an old dairy barn. These barns tend to have very little opportunity for natural ventilation and rely considerably on mechanical ventilation.

If the mechanical ventilation is not appropriately modified for calf housing, air quality will plummet as moisture and gases build up. Poor air quality will be detrimental to calf health and can significantly outweigh any benefits that may be gained from indoor housing.

Many stanchion barns come equipped with existing tunnel ventilation or a similar negative-pressure system. Utilizing the barn's existing ventilation can help you avoid additional remodeling costs, but it may also lead you to assume the calves' ventilation requirements are met. Chances are, they are not. Producers should evaluate air speeds and perform a fogging test to determine whether the current ventilation is appropriate for the calves and their location in the barn before populating it with calves.

Before committing to a ventilation plan, consider if the calves will be housed in group pens or individually. Group-housed calf pens are much easier to ventilate due to the openness of the space. For group housing, position the calf pens directly between the existing air inlet and exhaust fans and eliminate any type of obstruction that could deter air flow along that path.

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Ventilating A Retrofitted Stanchion Barn For Calves

(Continued From The Cover)

One way to help guide fresh air to the calf level is to build a box extending from the exhaust fan within 3 or 4 feet of the calf pen floor. If possible, place the youngest calves directly next to the air inlet. This will provide the cleanest air to the most susceptible calves.

In this scenario, the speed of incoming air can only be as fast as the youngest calves can handle, especially during cooler temperatures. This may be a limiting factor to the amount of fresh air volume delivered to the oldest calves in the barn.

Calves housed in individual pens require a more evenly distributed source of fresh air, one that will not be redirected by the frequent obstruction of solid side panels. The ideal method of delivery is through a positive-pressure tube, which will ensure even, fresh air distribution throughout the entire length of the barn.

Positive-pressure tubes can be placed directly over the individual pens and blow unobstructed air straight into the calf's space. These tubes can be paired with existing exhaust fans to create a neutral-pressure ventilation system and can be used in group pen situations as well.

A multi-season positive-pressure tube will allow you to appropriately ventilate in both warm- and cool-weather conditions using a single system. Multi-season tubes use an internal membrane that separates two very different hole patterns on opposite sides of the same tube. Large holes line the bottom of the tube and allow large amounts of rapid, fresh air to reach calves during warm weather.

During cool weather, 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 calves.

Forcing air through small holes in the top of the multi-season tube is ideal for a stanchion barn because it enables air discharged out the top of the tube to bounce off the barn's low ceiling, causing it to gently fall into the calf pens below. This low-volume, slow air is ideal for calves during cool weather (**Figure 1**).

Single-season positive-pressure tubes can also be used seasonally when appropriate. In this situation, a number of cold-weather tubes typically run all year and can either be paired to run with warm-weather positive-pressure

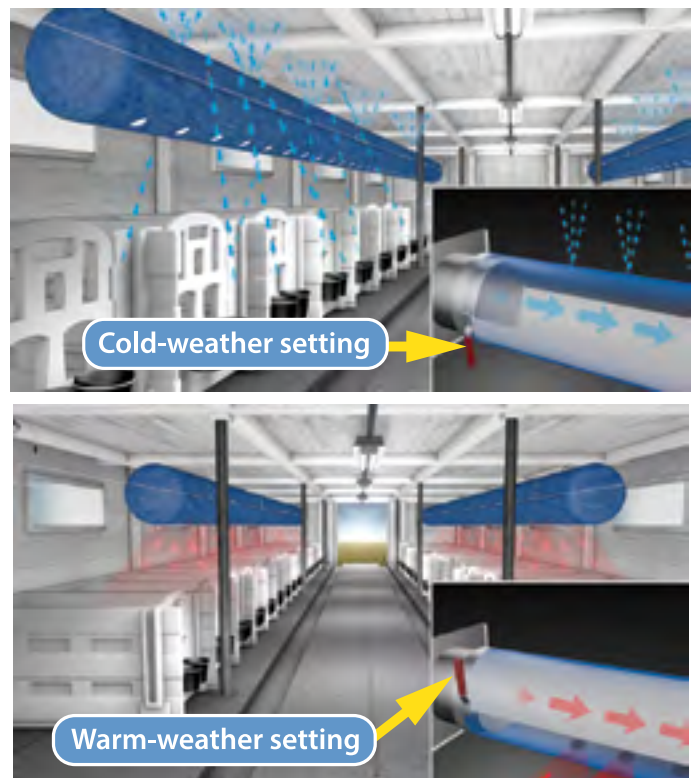
tubes or a combination of natural ventilation with mechanical fan assistance.

Warm-weather tubes can be run when temperatures are consistently above 70 °F to provide rapid air speeds for heat abatement.

The space requirement a positive-pressure tube requires in the barn must be considered before installation. Stanchion barns traditionally have very low ceilings that may already make pen cleanout a difficult process. A positive-pressure tube typically occupies at least 1 to 2 feet of headspace once installed.

In situations where space is tight, the tube fan can be turned off and the positive-pressure tube pushed back to the fan, increasing the height limit to the cables securing the duct. Once cleanout is complete, simply stretch out the tube and turn on the fan to allow the duct to resume its normal position.

Figure 1 A multi-season positive-pressure tube will allow you to appropriately ventilate in both warm and cool weather conditions.



Source: Crystal Creek®

Because stanchion barns have solid walls, positive-pressure tube fans will often be boxed in through a hay mow or attic, offering the unique advantage of pulling fresh, tempered air into the barn.

Producers can construct an air box system that allows them to change the source of fresh air according to the season by connecting the box to an exterior wall. In the winter, the exterior wall is closed off, allowing warmer attic air to be drawn into the air box and distributed to the calves below. In the summer, the exterior wall is open and the attic space is blocked off, allowing cooler outside air to be drawn in (**Figure 2**).

It is important to understand how the distance between the fans and the calves will affect the air speeds the calves experience, regardless of which type of ventilation is used in the barn. Due to the lower stanchion barn ceilings, fans will be much closer to calf height than if they were hung on a rafter in a newly built calf barn.

The air projected from the fan has a shorter distance to travel to reach the calf, which means it has less time to slow down, creating a greater risk for a drafty environment during cold temperatures.

While it is critical to provide the appropriate volume of fresh air to the calf year-round, it is equally important the fresh air is delivered at the correct speed. This can be a challenge in many barns, so make sure to assess the ventilation system efficiency in every season before determining its suitability for the barn.

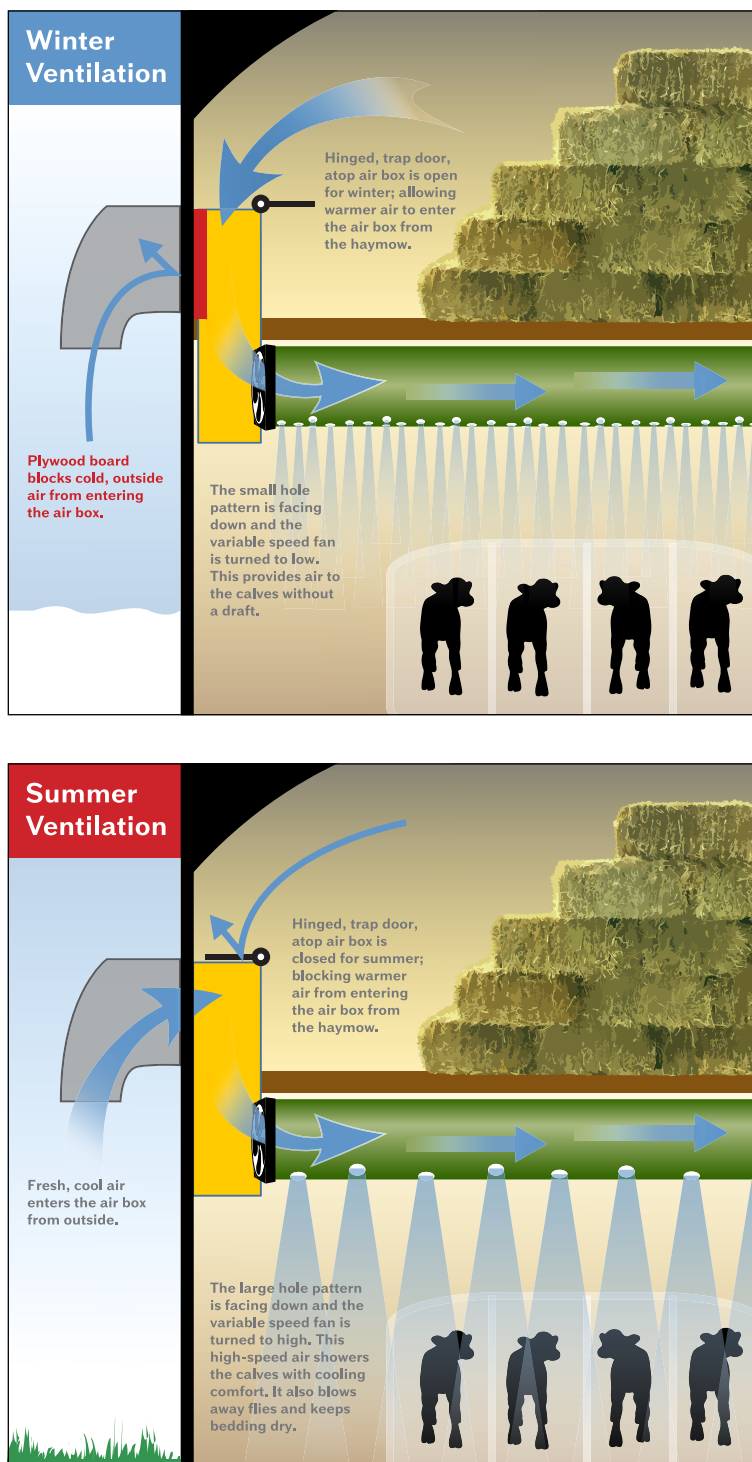
Retrofitting a stanchion barn for calves can be an extremely efficient way to reallocate existing space and resources on a farm. Carefully examining calf ventilation requirements prior to moving the calves into the barn will help prevent respiratory issues.

The time and effort spent researching ventilation designs and options will be well worth the investment when that “old dairy barn” transitions from representing the farm’s history to raising the farm’s future.

This article was originally published with the Progressive Dairyman Magazine at:
<https://www.progressivedairy.com/topics/calves-heifers/ventilating-a-retrofitted-stanchion-barn-for-calves>

Figure 2

Producers can construct an air box system that allows them to change the source of fresh air according to the season by connecting the box to an exterior wall.



Recognizing The Need For Disinfection In Your Poultry Operation

By Stephanie Hutsko, PhD

Why do we need to have a disinfection plan in place when working with livestock, especially poultry? One word: pathogens.

Pathogens are bacteria or viruses that, when exposure levels are high enough, can cause disease. When bacteria are left uncontrolled, their numbers grow quickly, wreaking havoc on the birds exposed to them. A common parasite associated with poultry, *Eimeria sp.*, can lead to coccidiosis. Common bacteria associated with poultry include *Salmonella* and *E. coli*, both of which can lead to food safety concerns. The main poultry viruses we are concerned about are Newcastle disease, Marek's disease and Avian Influenza.

Bacteria, single celled parasites and viruses can also evolve into protected communities, called biofilms. Biofilms have a defensive barrier that shield the pathogens within it from potentially harmful materials and compounds. As mentioned in a previous article in the April 2017 Crystal Creek® Newsletter, in Jessica Getschel's article,


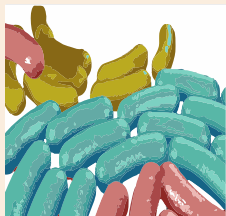
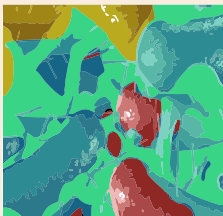
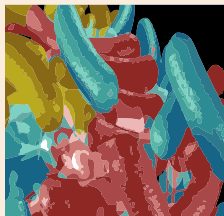
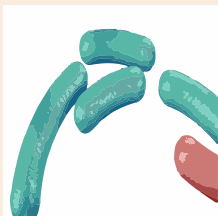
"Understanding Biofilms in Agriculture", biofilms have five stages of development (**Figure 1**). Traditional disinfectants, like peroxide or bleach, are ineffective in breaking down the biofilm's protective layer. This means, that even if a surface looks visibly clean, it may not be biologically clean.

A full-blown disease outbreak can be devastating to a flock, especially when mortality rates start to rise, but what many producers don't consider is the negative effects even low-level diseases can have on production and the overall efficiency of their operation. Important production factors to consider are feed conversion ratios, percent lay, body weight growth, egg quality, case weight and carcass weight. All of these factors can be negatively affected by pathogen exposure, and in the worst-case scenario increases in mortality can occur.

So, what is the solution? Crystal Creek® recommends implementing a cleaning and disinfecting protocol using a safe, effective and non-corrosive agent, such as chlorine dioxide. While many cleaning products use a form of chlorine (like bleach), chlorine dioxide is different

Figure 1

BACTERIAL BIOFILM FORMATION - 5 STAGES

ATTACHMENT	GROWTH	MATURATION	DETACHMENT	RE-DEVELOPMENT
				
Bacteria attach to a variety of surfaces, from metal, to plastic, to skin tissue, using specialized tail-like structures.	The cells grow and divide, forming a dense matrixed structure, many layers thick. At this stage the biofilm is too thin to be seen.	When there are enough bacteria in the developing biofilm the bacteria secrete a slimy extracellular matrix of proteins and polysaccharides.	The slime protects the bacteria from harsh environments, shielding them from many chemicals, antibiotics and immune systems.	As the colonies mature, the structures created weaken and cast off bacteria that look for new places to grow and prosper.

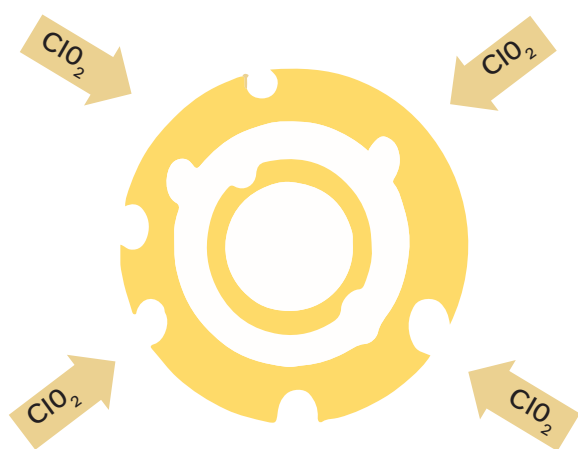
Source: 1. Centre for Microbial Innovation, University of Auckland, New Zealand

in that it is produced as a soluble gas. When activated, this gas is trapped by water molecules, making it into a chlorine dioxide solution. Chlorine dioxide works through oxidation, which disrupts cellular membranes, eventually leading to death of bacteria and single celled parasites in a short amount of time (**Figure 2**).

Crystal Creek® Offers Cleaning And

Figure 2

PATHOGEN MEMBRANE BREAKDOWN



**Destroys Pathogen Cell
Membrane In 30-90 Seconds**

Source: Crystal Creek®

Disinfecting Solutions

Crystal Creek® has multiple options to address your disinfecting needs. For general cleaning purposes, the detergent Chlor-A-Foam™ is the best option. This alkaline detergent can be easily put into a foaming gun and sprayed onto any surface, such

as cement floors, walls, even nesting boxes and roosts. The next step is to provide 10 to 15 minutes of contact time to allow for breakdown of any organic matter, scrub if necessary and then rinse with cold water.

HabiStat™, a chlorine dioxide disinfectant, comes in two easy to use forms: a ready to use tablet and a liquid activator/base set. The tablets simply need to be added to room temperature water in a sealable container and it is ready to use. The liquid activator/base also needs to be added to room temperature water, with the activator being added first and the base second. This solution needs to be left sealed for 12 to 24 hours before it is ready to use. Both options need to be made in a well-ventilated area.

Disinfecting On Farm

Not only does HabiStat™ come in two forms, it can also be used in two unique ways. The first is to disinfect poultry house water lines by running a low concentration solution of HabiStat™ through the line. This will clean and disinfect the lines themselves, getting rid of any biofilm and pathogen build up, and it can be done while the birds are still in the barn.

General protocol for use in waterlines:

1. Make a 50ppm HabiStat™ solution by dissolving a 20g tablet in 10 gallons of room temperature water.
2. Set the in-line dosage meter to a rate of 1 oz. to 128 oz. (or 1 oz. per gallon).
3. Connect a hose from the 10 gallon bucket to the in-line dosage meter and run according to the manufacturer's instructions at the above rate.

(Continued on Page 6)

Recognizing The Need For Disinfection In Your Poultry Operation

(Continued From Page 5)

Ten gallons of a 50ppm solution will last approximately five days for a barn containing 5,000 birds and costs \$10.50 per 20g tablet. A water line disinfecting system (**Figure 3**) can be of great benefit to your operation.

The second application is cleaning and disinfecting the poultry houses and facilities. This involves both the Chlor-A-Foam™ detergent followed by the HabiStat™ disinfectant spray. The detergent cleans the surface and begins the process of breaking open the biofilm protective barrier. The spray volatilizes into a gas that then seeps into any cracks or pores, thoroughly decontaminating the entire area.

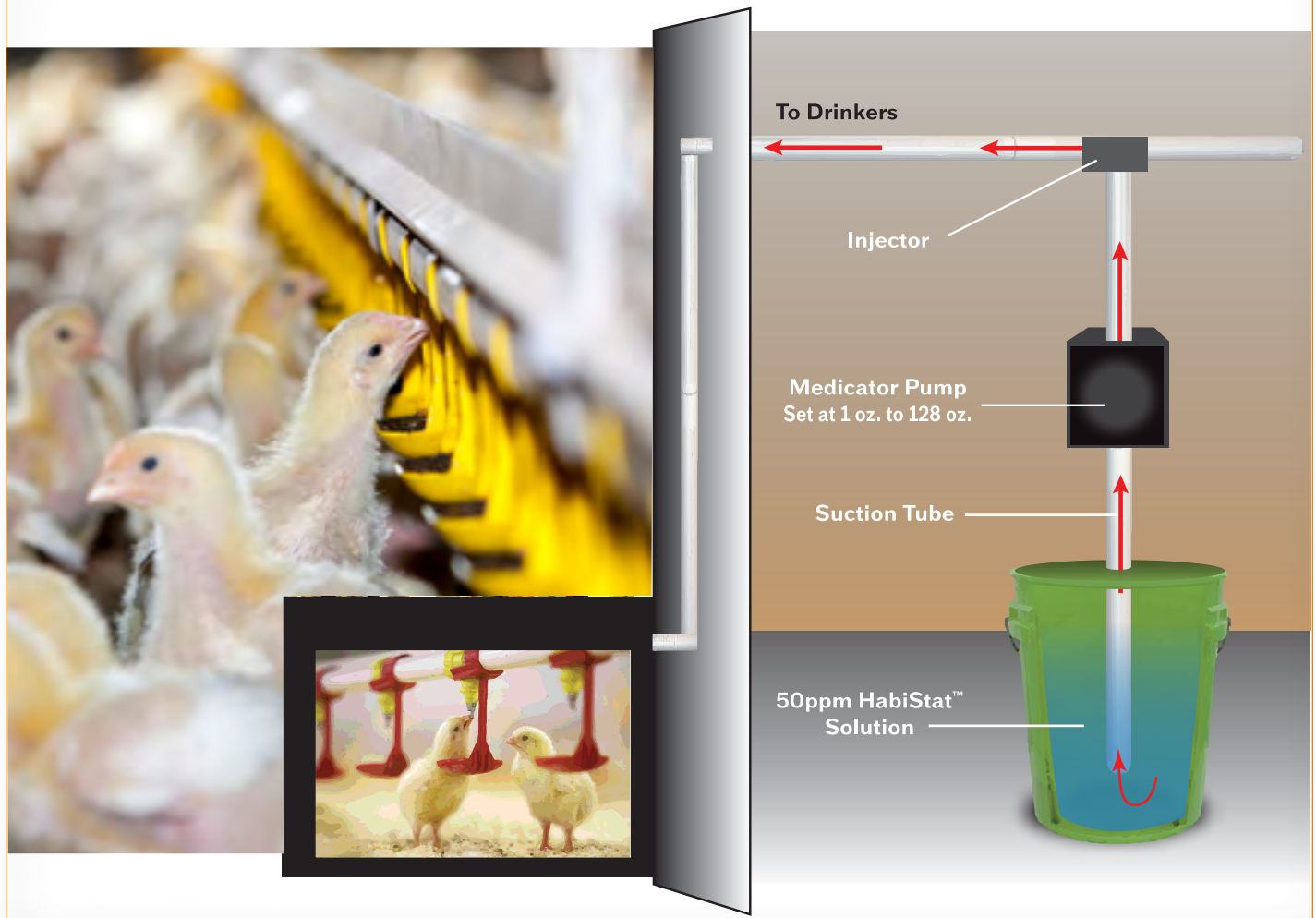
General protocol for use in facilities:

1. Remove all animals in the facility you intend to clean.
2. Remove any debris and gross soil from surfaces.
3. Spray Chlor-A-Foam™ onto the area, let it soak for 15 minutes, scrub and rinse with cold water.
4. Spray with 100ppm HabiStat™ solution. Let air dry for 12 to 24 hours before repopulating.

If you are searching for a safe, effective and economic solution to your disinfecting issues, give Crystal Creek® a call and our knowledgeable staff will help find an option that is right for your farm.

Figure 3

WATER LINE SCHEMATIC



Source: Crystal Creek®

Cold Weather Poultry Considerations

With winter just around the corner, Crystal Creek® wants to make sure that you and your chickens are prepared. Here are some tips and tricks to ensure that your birds make it through the upcoming cold season with “flying colors”.

Ventilation

Ventilation and draft minimization are key. Any holes or gaps in the coop or barn should be covered to prevent drafts. Keep in mind, birds need proper air flow to minimize ammonia build up and provide fresh air. This can be accomplished by having screened vents toward the ceiling to allow the ammonia to escape without bringing in gusts of chilly air.

Maintain Warmth

One way to keep warmth within your coop or barn is to use the deep litter method. This involves aerating the current litter and adding fresh top litter on a regular basis.

Heat lamps are another option if your coop has electricity, but be careful to place the lamps at least 2 feet away from any potentially flammable materials.

Nutrition

Birds need calories to maintain their body heat and fresh water to maintain proper digestion and kidney function. If you are not already doing so, you may want to consider free choice feeding and giving your birds access to fresh feed all day and all night so that they can adjust their intakes accordingly.

Checking the water every day to make sure it isn't freezing is paramount to keeping birds comfortable and healthy. Water heaters are also available if your barn or coop has electricity.

Outdoor Access

Active birds are happy birds! Providing them with a covered area outside is a great way to give them the freedom they need while also shielding them from the worst of the elements.



Supplying enough roosting space off the ground is another valuable point to keep in mind when considering outdoor, cold weather accommodations.

Additional Ideas To Consider

Birds' waddles and combs are more susceptible to frostbite and some raisers find that coating them in a thin layer of Udder Fancy,™ when temperatures reach below freezing, helps protect them.

Chickens that are used to foraging and pecking the ground outdoors may turn on one another when confined inside. You can prevent pecking and cannibalism within your flock by providing them with supplemental sunflower seeds, cabbage, corn stalks and even loose straw.

Here's to a happy and healthy winter season for you, your family and your birds!

Pregnancy Toxemia In Goats



By Teresa Marker, B.S.

Farmers consistently look for ways to be more efficient with time, money and resources. Hidden profit thieves in dairy operations can have a tremendous impact on a farmer's bottom line. One hidden profit thief in dairy goat

operations is pregnancy toxemia. This metabolic disorder is present in approximately 13% of does and has a herd prevalence of over 87%.¹

What Is Pregnancy Toxemia?

Pregnancy toxemia is also known by the name pregnancy ketosis or twin lamb disease. It is a metabolic disorder that occurs in does during the last stage of pregnancy. When does have a negative energy level, blood sugar values decrease and ketones increase due to an increased nutritional demand from fetus growth and development. This occurs mainly because the fetus requires 30 to 40 grams of glucose per day to meet their development requirements.² If a doe does not have the proper nutrition to provide the fetus with its needs, the doe's body will resort to breaking down body fat, which causes a condition in the doe known as fatty liver. Does in their second or greater lactation and those carrying multiple fetuses, are more susceptible to pregnancy toxemia.²

Clinical Signs Of Pregnancy Toxemia

Pregnancy toxemia occurs one to three weeks prior to kidding. Does exhibiting signs of toxemia can have a depressed appetite, circle, star gaze, have poor coordination and may grind their teeth. A smell of acetone may be on their breath due to the production of ketones from breaking down their body fat. If not treated accordingly, this can lead to the death of the doe and fetuses.

Diagnosing Pregnancy Toxemia

The best way to determine pregnancy toxemia in your herd is to take a blood test. To test the blood,

you can use a blood glucose monitor with a BHBA (beta-hydroxybutyrate) blood strip. Does with a reading of 0.8 mmol/L or higher can be classified as being positive for pregnancy toxemia and should be treated accordingly.²

Prevention And Treatment Of Pregnancy Toxemia

Proper nutrition is the absolute key to preventing pregnancy toxemia. Working with a Crystal Creek® nutritionist to properly balance the diet will help ensure does receive adequate nutrition. Performing a body score evaluation of each doe on a regular basis will help identify potential issues before they become problematic. Overly fat or thin does are at a higher likelihood of developing pregnancy toxemia. Minimizing triplet pregnancies can reduce nutrient demands on the doe and fetuses, thereby reducing the potential for ketosis.

Using Crystal Creek® products such as Cow Quench™ or Fresh-N-Drink™ once a doe is identified with pregnancy toxemia, can be beneficial. Cow Quench™ is an oral drench that would be given daily for three days. This product contains glycerin which has been proven to help provide energy. Fresh-N-Drink™ is a powder that is mixed with water and given as a drench. Fresh-N-Drink™ is given one time per day for one to three days. The ingredients in this solution provide energy and calcium needed by the doe.

Don't let your profitability be affected by this metabolic issue. Our staff is here to help answer your questions on pregnancy toxemia and help your does transition into lactation successfully.

¹ ABAH Bioflux, 2015, Volume 7, Issue 1. "Prevalence and Risk Factors for Pregnancy Toxemia in Goats" Retrieved from: <http://www.abah.bioflux.com.ro>

² Menzies, DVM Paula I., "Pregnancy Toxemia in Ewes and Does" Merck Veterinary Manual Retrieved from: <https://www.merckvetmanual.com/metabolic-disorders/hepatic-lipidosis/pregnancy-toxemia-in-ewes-and-does>

Ask the Vet/Ask the Nutritionist



“There are times we need to drench our calves or adult cows but no one on the farm is comfortable performing this procedure. Are there any tips that could help us? ”

~ Unsure in Iowa

There are many reasons for having to administer a liquid by mouth into the rumen or abomasum of an animal. Supplying the correct quantity of colostrum to calves or giving an electrolyte solution for rehydration are a couple common examples. Making sure that drenching is being performed correctly on your farm is crucial, as incorrect drenching can cause aspiration of fluids into the lungs leading to pneumonia, choking and even death. Training livestock handlers on the procedure will help set up your operation for success. Drenching requires skill, knowledge, strength, patience and the right tools for the job.

Correct placement of the tube, syringe or dosing gun is vital to carrying out this practice. Always use the proper sized equipment for the animal you are working with. Keep equipment clean and disinfected before use to prevent the spread of disease. Proper animal restraint will make drenching easier for you and the animal. Animals will naturally struggle when being drenched-do NOT rush the administration of liquid(s)! Take time to allow the animal to swallow and minimize as many stressors in the environment as possible. Do not hold the animals head so high that it interferes with their natural swallow reflex.

Organize your equipment and fluids so everything you need is within your reach. Once the animal is restrained, kink the tube to prevent leakage of any fluid during positioning. Open the right side of the

mouth, angle the tip of the tube to the left side of the animal's body as it moves over the back of the tongue, once the animal starts to chew/swallow slowly pass the tube down the esophagus. The tip of the tube can be felt quite easily once it is in the esophagus. Stop IMMEDIATELY if the animal starts coughing or showing any signs that the tube has entered the trachea. If proper positioning has been obtained, you will be able to feel the rigid, enlarged esophagus, alongside/as well as the rings of the trachea and you should be able to smell an odor of rumen gas coming from the tube. Once correct positioning is verified, unkink the tube and begin delivery of the fluids. Keep the animal as still and calm as possible. When drenching is complete, kink the tube again and slowly remove it.

Ask your veterinarian to show you how to pass a stomach tube or esophageal feeder when they are visiting your farm. This hands on experience with the help of an expert is invaluable. Keep visual drawings and clear, concise directions on what your drenching protocol is so your employees are well prepared in the event of an emergency.

Drenching livestock is an important skill for animal handlers to have as it can literally save a life. Ensuring it is done properly will keep your livestock safe and healthier from the benefits it can provide.

- Lorrie Meister, CVT,
Livestock Specialist

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

Crystal Creek®
Ask the Vet/Nutritionist
1600 Roundhouse Road
Spooner, WI 54801
OR
askthetvet@crystalcreeknatural.com

Cost vs. Value: Why Cheaper Is Not Always Better



By Erik Brettingen, B.S.

With the large selection of products available to the farming community, knowing what is needed, what isn't, and which product to buy can be difficult to sort out. Cost often plays a role in making the selection between different products and services. While cost is

important to consider, looking at a product's value is a wiser approach to efficient decision making.

Cost And Value: What Is The Difference?

Cost is simply what is paid for a product; value is the worth that the product has. To truly evaluate value, an understanding deeper than cost needs to be looked at. In agriculture, cost is frequently measured in dollars per pound, dollars per ton, or dollars per bag and many times this is how purchasing decisions are made. While this does need to be taken into account, these measurements of cost fail to take into consideration the amount of product used, the quality and composition of the product, etc. **Figure 1** shows a chart that outlines a very typical scenario seen with feeding mineral. While one mineral may have a higher cost per bag, the ingredients in that bag are much higher in quality, making the value of the mineral much more. A thorough look at the mineral tag will unveil a lot about the value of what is in the bag. Look for organic trace mineral sources like polysaccharide complexes (e.g. Zinc Polysaccharide Complex). These organic trace mineral sources are over 95% bioavailable and resistant to being bound up by antagonists in the environment. Non-organic alternatives are much cheaper, but have a much lower bioavailability (approximately 50% less) and can also tie up beneficial nutrients in the diet.

In this scenario, the brand X mineral appears to be cheaper up front, being less expensive per bag. When evaluating it more deeply, it is seen that when the feeding rate is taken into account, the mineral that was less expensive per bag actually becomes much more costly when looked at in price per head per day. To take it further, and evaluate the true value of each product, additional factors must be looked at.

Figure 1		
	Crystal Creek® 2:1 Dairy Mineral	Brand X 2:1 Dairy Mineral
Cost/50 lb. Bag	\$41.30	\$30.00
Cost/lb./of Mineral	\$0.83	\$0.60
Recommended Feeding Rate	8 oz./hd/day	16 oz./hd/day
Cost/hd/day	\$0.41	\$0.60

Animal performance is one of the factors that needs to be analyzed and monitored. Money saved on cheap products that later ends up being spent on vet bills or never provides a return on investment is not money saved at all; it is money wasted. Correctly evaluating performance can become quite complex. Reproduction, longevity, milk components, cell counts, vet bills, and replacement animal costs are all topics that can be affected by the mineral. In some scenarios the value gained in the way of performance may be difficult to measure. Immune status, for example, is difficult to see. Unless an active condition like ringworm or pink eye is present and improves, the strengthening of a herd's immune system is hard to quantify. Immune status is, however, a very valuable component that will increase profit. Many of these topics will often improve after switching to the Crystal Creek® mineral program due to the superior quality of the mineral. All of these factors, play a role in assessing the value of a mineral. A return-on-investment calculation should be done for every dollar spent.

This scenario can be seen over and over with many products that are offered. With dairy prices where they are currently, producers are being pressured to become more efficient and look at value to make sure that their money is being spent in areas that have efficient returns. When times are tight it can be tempting to fall into the "price per bag" mindset, because it feels like money is being saved. Many times the reality is the exact opposite. Purchasing cheap products that are attractive because of their up-front cost, can lead to more problems down the road that dramatically decrease the value of the product and unfortunately decrease profit for the producer.

Winter Tips For Livestock

With winter fast approaching, it is time to prepare your livestock for the upcoming cold season. The following tips can help maximize the performance of your animals this winter:

Proper Feeding

The main goal of feeding in the winter is to maintain body condition and, in pregnant animals, provide adequate nutrition for the growing fetus. Cattle require 1% more energy from their diet for every degree that is below their (environmental) critical temperature.¹ For beef cattle with a heavy, dry, winter coat, their (environmental) critical temperature is 19° F. The chart below demonstrates the relationship between temperature and energy needs.

Temperature	Extra TDN Needed	Extra Hay (lb./hd/day)	Extra Grain (lb./hd/day)
30° F	0	0	0
10° F	20%	3.5-4	2-2.5

Source: "Caring for Cattle in Cold Weather" Rasby, Dr. Rick, University of Nebraska-Lincoln²

Fresh Water Access

Make sure fresh water is available 24/7. Beef cattle will consume 1 gallon of water per 100 lb. of body weight.² Reduced water intake leads to reduced feed consumption which can affect body condition in a negative way. Pay close attention during severe cold weather to prevent water sources from becoming frozen. Ideally, a loose, free choice mineral should be offered in close proximity to the water source for easy access.

Balanced Nutrition

Good nutrition is key to maximizing the performance of your animals. Taking hay samples and testing the quality of your forages in the fall can help you plan ahead for the winter months. A hay or corn test costs approximately \$19 through Dairyland Labs (see Alex Austin's April 2018 Newsletter article, "Forage Sampling"). Once you obtain sample results,



work with a Crystal Creek® nutritionist to create a supplement strategy that will meet the needs of each group of animals being fed.

Provide Adequate Shelter

It is important to have a shelter or windbreak to protect the animals and prevent them from getting chilled. Livestock caloric requirements increase anywhere from 15-30% without windbreaks.³ When cold temperatures set in and winds become harsh, windbreaks are critical.

Keep Animals Clean And Well Bedded

Avoid mud at all costs! Mud can have negative impacts on foot and hoof health and can also get caked on the animal's hide, causing them to get chilled. If using a shelter, bed with 25 lb. of straw per 1,000 lb. of bodyweight to keep animals clean, dry and warm. For animals out on pasture, rotate pastures often to minimize the creation of mud in high traffic areas. Bedding can be a valuable tool to increase cattle comfort and performance during extreme weather conditions.

High quality nutrition paired with good management techniques can help your livestock successfully weather the colder months. Call Crystal Creek® today to discuss your winter feeding options.

¹ Virginia Tech, Hall, John, Beef Extension Animal Scientist.

² Nebraska Extension, Rasby, Rick, Professor of Animal Science.

³ University of Idaho Extension, Church, Jim, Extension Educator.

Calves, Cold Weather And Calories



By Alex Austin, B.S.

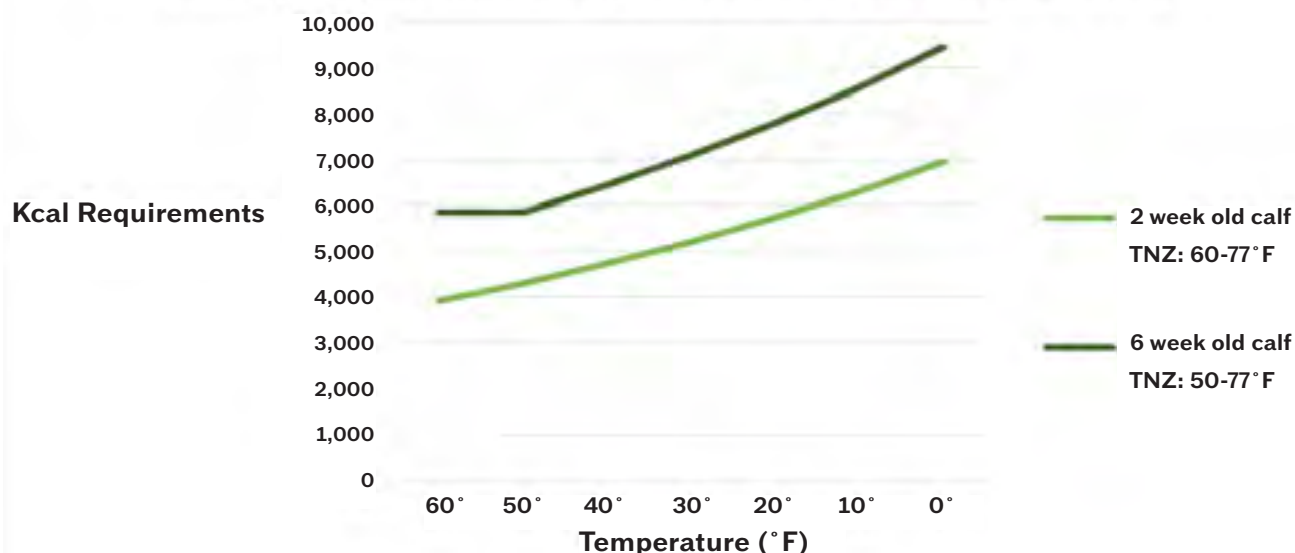
It's no secret that calves can be more prone to health issues when temperatures decrease. We know that proper bedding, calf jackets and avoiding drafts are all important in keeping calves warm in the winter. An often overlooked solution

is providing the calf with additional calories.

The need for energy increases as temperatures decrease. It is important to provide calves with enough caloric energy to meet all their needs. Before calves can use calories for immune support and growth, they must meet their maintenance needs. For this reason, calves not meeting energy needs will be more susceptible to disease and have a lower average daily gain. Calves are born with only 3 to 4% body fat.¹ A calf can easily go into a negative energy balance when exposed to cold temperatures. Negative energy balance happens when calves are not receiving enough energy in their diet, causing them to use fat reserves to meet their maintenance energy needs. Since calves are born with a low amount of body fat, they easily burn through what little fat reserves they have when temperatures get cold.

All animals have a thermoneutral zone. The thermoneutral zone (TNZ) is a temperature range in which the animal does not use any additional energy to maintain its normal core body temperature. A calf's normal body temperature is 100.0-102.5°F and their (environmental) thermoneutral zone is between 50-78°F.² When external, environmental temperatures are below 50°F calves must burn calories to stay warm. On the opposite side, when their environmental temperature is above 78°F, calves must burn calories to stay cool. For a young calf, when the temperature starts to drop below their thermoneutral zone, their maintenance energy requirements begin to increase to maintain their body temperature. For every 10°F drop in temperature below a calf's thermoneutral zone, their calorie needs increase 10%.² As more energy is being used to maintain body temperature, less energy is available for immune support and growth. The graph below depicts the amount of calories required for calves to achieve a 1.5 lb. average daily gain based on age and outside, environmental temperature.³ The calorie need shown here is based on a Holstein calf born weighing 90 lb. with a goal of doubling its birth weight by 56 days of age. It should be noted that calves greater than three weeks of age will begin to meet some of their caloric needs from consuming starter feed.

ENERGY REQUIREMENT OF CALVES WITH 1.5 LBS ADG GOAL



Source: ³ Hoffman, Patrick C., and Rhonda Plourd. *Raising Dairy Replacements*. 1st ed., Midwest Plan Service, 2003



Two different feeding style approaches are used to deliver more calories to calves during cold weather.

Feeding Strategy #1: Increase calories to the calf by increasing the volume of milk or milk replacer being fed.

Feeding Strategy #2: Increase caloric density of the milk or milk replacer by adding additional fat. Some companies market a fat additive or a cold weather calf milk replacer with a 25:25 protein to fat ratio.

Both feeding strategies will provide a needed increase in calories but which method is most beneficial?

Fat additives, or increasing the fat percentage in the milk replacer, does increase the calories delivered to the calf, but research studies have shown this strategy is not the best approach. In a research study done by Keunen and Renaud, calves were fed whole milk formulated milk

replacer with a 26% crude protein and 32% fat and a milk replacer that had a 26% crude protein and 17% fat. Calves fed the whole milk formulated milk replacer had a lower average daily gain and also had a decrease in calf feed starter intake compared to calves fed milk replacer with a higher protein to fat ratio.⁴ Another study resulted in similar findings when feeding milk replacers with 14, 17, 20, and 23% fat (all with a consistent 27% crude protein level). *"Prewaning apparent digestibility of DM, organic matter, fat, nonfiber carbohydrates, Ca, and P and serum amylase concentration were linearly reduced as fat increased from 14 to 23%".*⁵ In this study it was also found that starter intake was lower when the calf milk replacer was at 23% fat and best at 17% and 20% fat. The decrease in digestion and calf feed starter intake that was observed in the higher fat milk replacers (23%) resulted in a lower average daily gain.⁵

(Continued on Page 14)

Feeding a fat additive or a high fat milk replacer as part of a cold-weather feeding program has been shown to reduce calves' overall digestion efficacy, starter intake and average daily gain.

Producers feeding increased fat to their calves in the winter will sacrifice calf performance. It is for this reason that Crystal Creek® recommends increasing the amount of milk or milk replacer fed rather than increasing fat content.

When increasing milk replacer fed, it should be noted that the total solids need to remain between 12-14% (not just adding/increasing the milk replacer powder). Adding more powder but not increasing the amount of water mixed with it will change the total solids concentration and can cause nutritional scours.

Nutritional scours are usually caused by inconsistent milk feeding. Calves with nutritional scours are more likely to develop secondary infectious scours (scours caused by pathogens) confirming the importance of feeding milk at consistent temperatures, times, amounts and correct total milk solid concentrations.

Making sure calves are receiving enough calories during cold weather is crucial. Keeping them warm, healthy and growing during the cold winter months is possible with the right strategy. Contact a Crystal Creek® representative to learn more.

- 1 Iowa State University Extension and Outreach
Ryan Breuer, DVM, NW IA Dairy Specialist.
- 2 "Energize Your Calves This Winter." Dairy Herd Management, 17 Jan. 2011, www.dairyherd.com/article/energize-your-calves-winter.
- 3 Hoffman, Patrick C., and Rhonda Plourd. *Raising Dairy Replacements*. 1st ed., Midwest Plan Service, 2003.
- 4 Keunen, Aaron J. (June 24th 2018). *Performance effects of feeding Holstein calves a whole milk formulated milk replacer*. Presentation at ADSA Annual Meeting, Knoxville, Tennessee.
- 5 "Effects of Fat Concentration of a High-Protein Milk Replacer on Calf Performance." *Journal of Dairy Science*, vol. 92, no. 10, 2009, pp. 5147-5153., doi:10.3168/jds.2009-2245.



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