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The Elegance and Wisdom of Simplicity: As Applied to Dairy Ruminant Nutrition

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By Dan Leiterman

Preface: This is the second part of a two-part article addressing my thoughts about common sense strategies for dairy nutrition.

The Important Role of Simplicity

In part 1 of this article (published in the April, 2021 Crystal Creek® Newsletter), I talked about the important role of simplicity and how complex science needs to adhere to simple, basic and sound principles so information can be easily and efficiently applied with balance. If the concept of simplicity is not paramount, it is easy to lose perspective and forget what we have learned through decades of feeding animals. Simplicity also helps us deal with the overwhelming sea of data. Information that is consistent with simple principles will advance a cohesive and efficient strategy that helps us reach a sustainable goal.

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Has the Dairy Nutrition Industry Lost Its Way?

In part 1 of this article I reflected on how, from my perspective, the dairy industry has lost its way. I believe the dairy nutrition industry in large part has over focused on maximizing gross profit, i.e., milk production, and has lost track of the more important goal of sustainable, optimum net profit on the dairy farm as defined by a focus on improving lifetime milk production from a cow. I gave several examples of past attempts in the dairy industry that failed in large part because they did not pay attention to simple principles. In addition to employing easy hind sight to past failures, it is important to apply simple principles to what is still being used today in the dairy nutrition industry. We must recognize the short-comings and lack of cohesive strategy in current practices.

Simple and Wise Principles that Stand the Test of Time

Having been in the livestock nutrition industry for 47 years now, I find it fascinating to reflect on how much science we have learned in dairy nutrition since I started in 1974. However, some foundational principles seem to have faded from the industry's collective memory. To illustrate my point, consider some of these simple adages:

- Feed a cow like a cow.
- There is no good substitute for high quality forages in the diet.
- Listen to the cows, they will not lie.
- That old cow made me money.
- It is hard to be efficient with inefficient tools.
- Feed the ruminal microbes, and they will feed the cow.
- Do not fight Mother Nature, work with her.
- Whatever you do, don't make it worse.
- It is not about how much money you make, but rather how much money you can keep.

The time-honored principles of feeding a cow like a cow, at times, have been passed over and traded for the newest industry fad.

Products and Concepts

The following products and concepts that are still in use today, are ones I believe are not needed, based on sound biological principles, common sense, simplicity and good economics in dairy nutrition:

- Rumen Protected Amino Acids: With the proper diet, ruminants are already capable of meeting, and exceeding, amino acid requirements. The focus should be on the cow utilizing its current dietary amino acids, not on feeding more in the form of rumen protected amino acids. Return on investment is very questionable.
- Anionic Salts: If the proper forages are fed to a dry cow, anionic salts are not needed. They are expensive, unpalatable and inappropriate to be fed in a dry cow diet.
- Straw: To me, feeding straw is comparable to feeding plastic to a ruminant. It is a crutch to feeding an inappropriate and a poorly designed ruminant diet. It makes the paper values look good in high grain diets, but ignores the biological principles of sustainable dairy cow health and production.
- Calcium Binders in Dry Cow Diets: Feeding an inappropriately high calcium diet to a dry cow and then adding a calcium binder lacks common sense. With planning, it is not that hard to use the proper feed stuffs to balance cations in a dry cow diet. Calcium binders are not needed.
- Ionophores in Dry Cow, Lactating Cow and Heifer Diets: Ionophores are removed from all Crystal Creek® dairy diets, and are not missed. Our focus is on improving utilization of home grown forages to which ionophores are counter-productive. Ionophores kill some fiber digesting ruminal microbes in favor of starch digesting microbes. Also, if an objective person would read an ionophore label (which admits to reducing reproductive performance, milk components and dry matter intake), the question of why would anyone feed an ionophore to a dairy animal is inevitable. The amount of ionophores used in the U.S.A. dairy industry is a classic example of powerful marketing

vs. sound common sense and simple principles of a sustainable dairy cow industry.

- Antibiotics in Calf Milk Replacers: For some, it is thought to be 'impossible' to raise dairy calves without heavy reliance on antibiotics. This is simply not true. There are a number of good management practices that can significantly reduce the need for antibiotic use, i.e., good ventilation, immune supportive nutrition and proper sanitation. After applying good sanitation, management and immune support, there are a number of strategic nutritional alternatives that research has shown to warrant a first consideration before antibiotics.
- Low Performance and/or Counter Productive Nutritional Ingredients: Examples like cottonseed, straw, clay, kelp, diatomaceous earth, humates, charcoal, and peat moss. If any of the simple principles listed at the start of this article were applied, it would be difficult, or impossible to justify the use of these ingredients in a dairy ration.
- Electrolytes for Lactating Dairy Cows: University research has shown that electrolytes fed to lactating dairy cows experiencing heat stress had zero benefit to the cow on all health and performance metrics that were monitored.
- Probiotics to Support Intestinal Function in Excessively High Starch Diets: There are some probiotics that function in the intestinal tract of a cow and help to reduce the risk of pathogens, intestinal tissue degradation and poor nutrient utilization when feeding a high grain, acidotic ration. The question I ask is, why bother to feed the acidotic ration to begin with? An acidotic ration does not optimize return on investment, cow health, nor production. Adding a probiotic to a seriously flawed nutritional strategy seems to me to be lacking common sense.
- No Grain/Only Milk and Hay Calf Raising: This is a classic example of politically correct livestock nutrition currently found in niche industries that has nothing to do with biological facts. This practice has been shown to be detrimental to organ development of the calf, calf growth and subsequently to the cow's production for the rest of her life. Calves need grain to maximize organ development.

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- All Grain/No Forage Calf and Young Heifer Diets: These diets are a classic example of laziness that accommodates the poorly designed animal handling restrictions of large dairy operations that house animals for the convenience of feed handling, and not the optimum biological benefit and development of the animal. Young heifers should eat hay and forages.
- Growth Hormone for Lactating Dairy Cows: I have seen herds that have gone off of injectable growth hormone due to market pressure and do not miss the concept on a business level.
- Biotin: Typically, biotin is only needed in acidotic dairy rations due to impaired rumen function where the cow cannot produce enough biotin on their own. Again, why feed a cow an acidotic ration in the first place? Biologically and economically acidotic rations lack common sense.
- Mycotoxin Binders Without Enzyme Support Formulation: Mycotoxins are a common fact of life in the global grain supply. Some important mycotoxins cannot be bound-up without incorporating an enzyme to partially degrade the mycotoxin first, i.e., vomitoxin. Old school mycotoxin binders like clays lack species specific enzymes and are obsolete. In fact they can actually be counter-productive to good nutrition.
- Buffers: Products like sodium bicarbonate are only needed in acidotic diets, and/or high stress conditions, i.e., heat stress, sorting. Why feed an acidotic ration to begin with? Properly formulated dairy rations can help cows better cope with heat stress and reduce sorting. It is typical for Crystal Creek® dairy herds to have very good milk components and production, even in the summer, without the use of a buffer like sodium bicarbonate.
- Reproductive Hormones: The question should be asked, why isn't the cow reproducing properly? The cow should be biologically supported with proper nutrition and reduced stress, so she can naturally cycle and reproduce. In many cases where cows do not cycle, hormones will not help. It lacks common sense to try to synchronize something that is not happening. Also, I believe that, not unlike the growth hormones in dairy, once the public realizes the amount of reproductive hormone use in the dairy industry, there will be a market backlash against their use, and/or against consumption of dairy products.

- Corn Silage: Ask yourself some basic questions about corn silage. Why do we feed it? Yes, more tonnage per acre, and more cows fed per acre. However, the flip side of the corn silage coin is that a corn silage diet is also a higher cost diet due to the need to purchase more off the farm protein. A little corn silage is OK, and maybe it is necessary in some poor cropping years. However, I have found that it tends to be more profitable for dairy producers to feed less corn silage, or possibly no corn silage. The feed industry may not have as many protein sales, but I believe the dairyman would make more money.
- Rumen Protected (By-Pass) Fats: Even though by-pass fats do not melt in the rumen and reduce fiber digestion, the liver still needs to cope with this fat in the diet which is very difficult at key times of lactation. For example, it has been shown that cows should not be fed fat during early lactation (the liver is already struggling with excess fat off the back), nor during warm weather due to low digestibility. It is better to remove the fat from the diet, support rumen and liver function and improve dry matter intake to get more energy into the cow. I see by-pass fat as becoming merely a commodity, with decreasing use in dairy rations.

How Did We Get Where We Are Today Vs. the Good Old Days

I do not know for sure how the dairy industry arrived at this point, but I believe it is partially due to taking an eye off the bigger picture of net profit (profit after expenses/return-on-investment). This is caused by being distracted by the allure of gross profit (total milk production), which is easier to monitor, and demands less accountability to a sustainable business model, as well as drifting away from the simple foundational principles of good dairy nutrition and a profitable dairy business model.

I believe that focusing on a goal to achieve the best lifetime production for dairy cows is a smart business model for the dairy producer. It brings cow longevity into the formula and would require new rules for a biologically supportive nutritional strategy and a different attitude towards a more sustainably managed dairy cow. What is needed are healthier guidelines that are more biologically aware and compatible. For example, the highest milk production occurs in cows during their 4th, 5th and 6th lactation. Much of the U.S.A. dairy industry today seems to be attempting to force first and second lactation cows to milk like 4th, 5th and 6th lactation cows before they are biologically ready. The result is higher feed costs, reduced cow health, decreased longevity, poorer reproductive performance, higher cull rates and less profitability for the producer. The genetic industry truly benefits from a 40% to 50% annual culling rate, but I doubt the farmer does. Goals and management styles that target a cow to produce 150,000 to 200,000 lb. per lifetime means the cow must be fed and cared for in a manner that keeps her healthy, lets her naturally reproduce and also meet these lifetime production goals. Focusing on lifetime production for a dairy cow is successfully followed in other parts of the world. We can also do it here in the United States.

I remember the days when cows were fed only dry baled hay as the forage with a ground ear corn and soybean meal based grain mix. Granted the milk production in the good old days may have been less than now, but 'simple' principles were soundly in place that would have off-set some of the lower production. For example, healthier cows that lived longer had higher milk production due to proper maturation of the cow (optimum production during 4th, 5th and 6th lactation), and they actually showed heat without hormone treatments. Milk components were strong and life was a bit simpler. I am not proposing that we go all the way back to the old days. However, we could and should bring some of the simple and wise principles of that time forward in order to help shed much of the financial waste the industry is experiencing. This would help us to refocus on lifetime cow production and net profit for the dairy producer. As I have indicated here, there are still many products and feeding techniques employed today that do not pass the test of simple common sense and would not fit into a smarter and more profitable business strategy for the dairy producer.

The Crystal Creek® Dairy Nutrition Model is built on key, simple, biologically sound principles of dairy nutrition that have stood the test of time. Profitable, sustainable, common sense, and simple dairy nutrition, is very achievable in today's dairy industry. Give Crystal Creek® a call today and see for yourself.

Using Data Collection Devices to Evaluate Progress in Your Dairy Herd

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

Dairy producers have been given a new tool to help track a herd's overall health, fertility and production with activity monitoring systems. These systems provide data that can be measured over a period of time. Crystal Creek® has worked with several herds that utilize these activity monitoring systems and have found them to be an invaluable means of collecting data for making decisions impacting the herd. Nutritionists can collect and organize data from the system on a regular basis. The effects of changes in feeding strategies or procedural changes can easily be tracked by these monitoring systems. A nutritionist can conduct business meetings with the dairy producer and other team members, (veterinarians, breeders, bankers, agronomist, etc.) to review the data collected throughout the year and create goals for the future. This article focuses on a Wisconsin farm that has had an activity monitoring system installed for several years. Crystal Creek® started working with this farm in 2020. The data in this article was collected during the first six months of working with this client and formally presented to the dairy in the Spring of 2021.

Identifying Goals

This farm had three main goals: to improve reproduction rates, raise overall farm profitability and increase milk production volume. The first goal was to improve reproduction and fertility. Prior to using the Crystal Creek® Dairy Nutrition Model (CCDNM), 59% of cows were not showing heats by 80 DIM and the average service per conception was 2.5. The second goal was to raise overall profitability. Prior to being on the CCDNM, the majority of each milk check was being used to pay feed bills, leaving little leftover funds for other expenses or debt repayment. Increased profitability is not an independent goal but is achieved by the success of several factors such as getting cows bred, shortening the window of days cows are open, and increasing cow longevity, to name a few. The last goal was to increase milk production. Although new free stall facilities had been built in 2017 with a focus on cow comfort and better management, the average milk production for this herd was at 75 lb./head/day. Herd owners believed the cows had greater production potential, considering the improvements that had been made.

Assessing and Developing A Game Plan

After evaluating the diets, observing the cows, assessing their environment and collecting economic information, the Crystal Creek® team was confident the majority of this herd's issues stemmed from two main factors: an inadequate transition into lactation and a poorly designed nutrition strategy. Issues with milk fever, ketosis, metritis, and poor overall transition into lactation were all factors that played into the delayed heat cycle of the cows. The activity monitoring system further verified this was the case. The second factor was a nutrition strategy that did not support optimum rumen function and microbial growth. The majority of the cow groups were fed a diet of high grain/low forage that set cows up for acidosis issues. In the past, additional supplements were sold to the dairy for these problems as a temporary fix, ultimately driving up the overall feed costs in the process.

Implementation

Many feed companies would look at the dairy's goals and add in another supplement to "fix" the problems that were occurring. The Crystal Creek® approach is different as it looks at the big picture and works to achieve goals by getting back to the sound basics of cow nutrition and physiology. This dairy's first goal was to improve reproduction. Part of the poor transition into lactation and subpar reproductive performance related back to how the dry cow program was designed. Changes recommended by Crystal Creek® to the dry cow diet included:

- Removal of a feed additive that tied up calcium.
- Replacing the existing mineral with the more bioavailable, chelated polysaccharide Crystal Creek® Dry Cow Mineral.
- Adding Fuse 207™ with enzymes to address any potential mycotoxin issues.

Ingredients in the diets were adjusted to properly meet dietary guidelines and current dry matter intake. Crystal Creek® nutritionists are always careful to take "ration

steps" when making a significant change to the diet for a group of animals. The milk cows in this herd were being fed a high grain/low forage diet. If sudden changes were made, that altered that ratio overnight, milk production could potentially drop and affect the milk check. Taking incremental steps was crucial in transitioning the cows to a higher forage diet. A high forage diet supports microbial growth in the rumen. By improving rumen microbial growth, which are over 80% crude protein, the cow can, herself, grow and generate her own by-pass protein resulting in less purchased protein. Weekly systematic changes were made in the first few months of being on the CCDNM to move towards the goal of reducing feed costs and increasing the amount of forage in the diet. One approach to the dairy's third goal of increasing milk production, could be achieved by adding more grain and protein to diet, but that strategy would not help with reproduction or reducing the feed costs and would be counterproductive to improving overall farm profitability. Increasing milk production was realized by feeding a forage based dry cow diet that improved the transition into lactation, resulting in cows getting pregnant sooner while reducing the overall days in milk of the herd. Keeping cows alive and healthy in the herd results in cows getting into their 4th, 5th and 6th lactations where the most milk production potential exists. The achievement of improved reproduction and increased milk production resulted in progress towards the goal of overall profitability.

Results

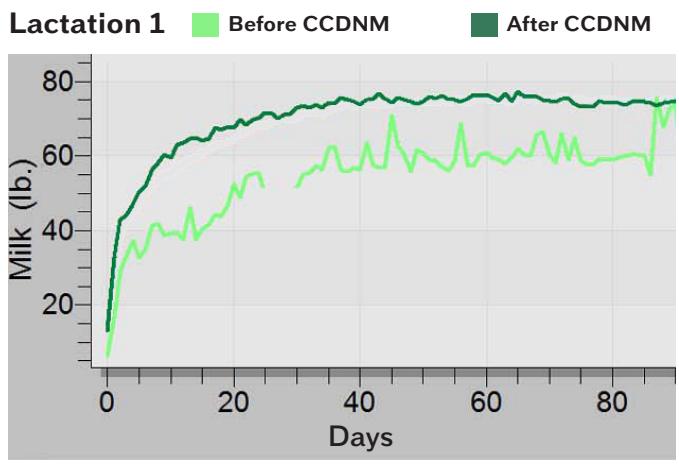
Figure 1 shows the comparison of the diet used for the High Producing Lactating Cow Group before and after being on the CCDNM. As you can see, there was an improvement in dry matter intake, an increase in the amount of forage provided in the diet, and an increase in the percent of microbial protein. An interesting fact the chart does not show, is that ten ingredients were removed from the original grain mix, resulting in great overall savings.

Figure 2 shows a comparison of milk production by lactation groups before and after being on the Crystal Creek® Dairy Nutrition Model. Lactation 1 is making HUGE improvements! Lactation 2 is also at a better production level and performing in a more consistent manner.

Figure 1 **DIET COMPARISON FOR HIGH PRODUCTION LACTATING GROUP**

	Before Using CCDNM	After Using CCDNM
Dry Matter Intake	61.02 lb./hd/day	65.0 lb./hd/day
Forage Equivalent	43.26%	54.35%
Crude Protein	16.82%	17.32%
Microbial Protein	47.9%	52.20%
Starch	25.67%	25.16%
Net Energy for Lactation	0.77 Mcal/lb.	0.77 Mcal/lb.

Figure 2 **MILK PRODUCTION BY LACTATION**



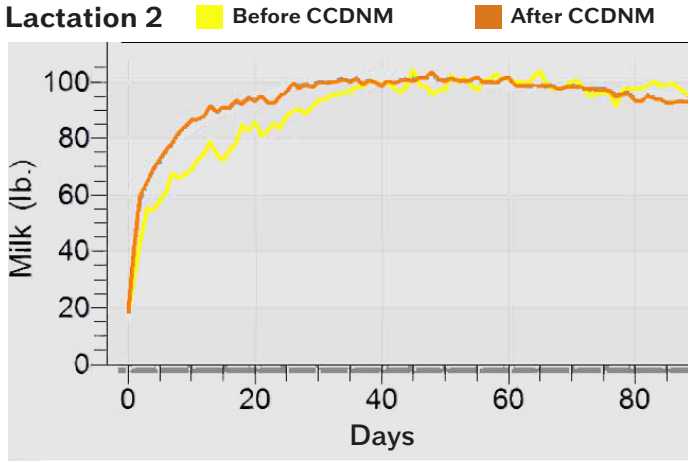


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Figure 3 **DAYS IN MILK COMPARISON**

GROUP #	GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Time Frame	8/12/2020 Before CCDNM	3/29/2021 After CCDNM	8/12/2020 Before CCDNM	3/29/2021 After CCDNM	8/12/2020 Before CCDNM	3/29/2021 After CCDNM	8/12/2020 Before CCDNM	3/29/2021 After CCDNM
Number of Cows	31	46	130	105	203	214	150	224
Days in Milk	53	57	115	123	150	128	284	274
Milk Production (lb./hd/day)	73	81.1	75.1	73.1	96.1	96	59	59.5

Figure 4 **BUTTERFAT AND MILK PROTEIN COMPONENTS**

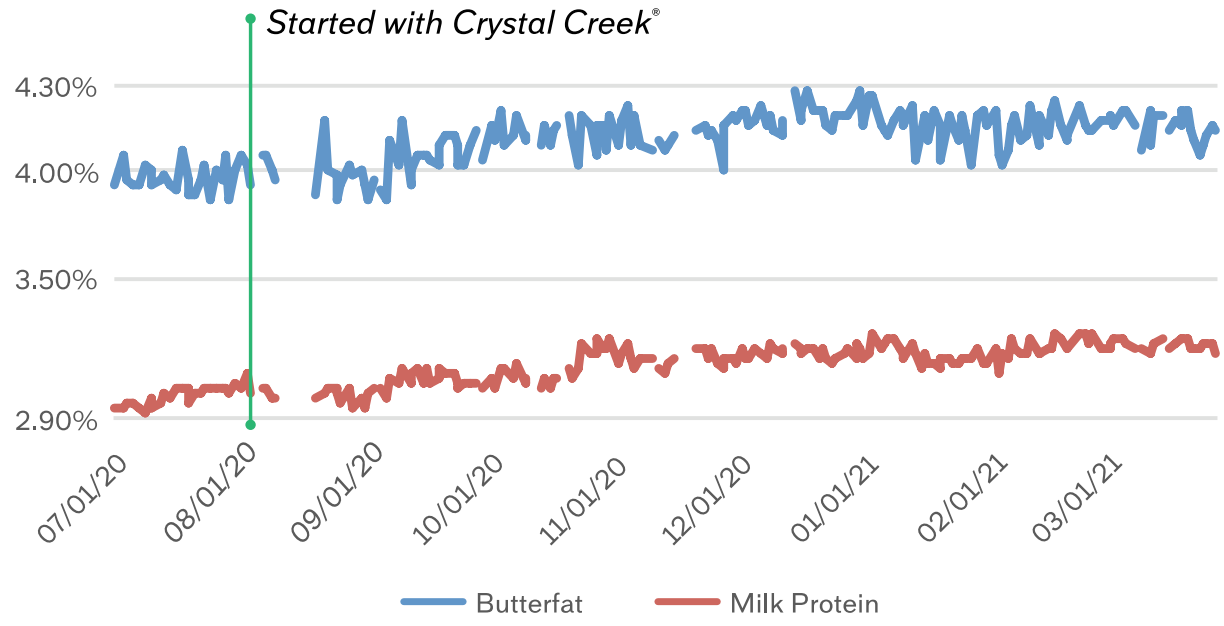

Figure 3 gives a comparison of milk production by group based off Days in Milk (DIM). Milk production for this herd is up slightly from when first going on the CCDNM. Milk production would be higher except for the fact there is carry over of poor reproductive performance from the previous nutrition program which led to an increase in DIM, resulting in less milk in the tank.

Figure 4 demonstrates both butterfat and milk protein component values steadily improving over a 9 month time period.

Figure 5 (See page 9) shows fertility results with higher conception rates across all lactation groups and heifers after 6 months of being on the CCDNM. Average days open is less in the first and second lactations.

Figure 6 (See page 9) depicts economics and savings for the herd. There is a projected annual total herd feed savings of over $370,000.

Future Considerations

Forage inventory is one of the top considerations for this herd moving forward. Forage inventory is of concern because there is minimal acreage/land currently available in the area, putting the dairy in a position where forage inventory could run short. While continuing to increase the percent of forage in the diet is still a priority, current inventory did not allow for this so more concentrates were fed than we would normally like. Another top consideration is continuing to focus

Figure 5	REPRODUCTIVE PERFORMANCE			
CONCEPTION RATES/LACTATION	**1st Lactation**	**2nd Lactation**	**3rd+ Lactation**	**Heifers**
1st Service	+4.0%	+12%	+0.60%	+0.5%
2nd Service	+0.6%	+14%	-6.82%	+7.0%
3rd Service	-3.8%	+14%	-0.90%	+5.0%
4th Service	+13.7%	-9%	+0.50%	+4.5%
TOTAL AVERAGE	+4.0%	+7%	-2.00%	+4.0%
DAYS OPEN AND DIM AT 1st SERVICE	**1st Lactation**	**2nd Lactation**	**3rd Lactation**	**AVERAGE**
2020-2021				
Average Days Open	115	128	136	127
DIM @ 1st Service	78	73	74	75
2019-2020				
Average Days Open	135	143	116	132
DIM @ 1st Service	69	70	73	71

Figure 6	TOTAL HERD FEED SAVINGS			
	# of Cows in Group	**Savings/Head**	**Savings/Day**	**Savings/Year**
High Group	210	$2.26	$474.60	$173,229.00
1st Lactation/ Fresh Group	154	$1.82	$280.28	$102,302.20
Low Group	229	$1.08	$247.32	$90,271.80
Far Off Group	51	-$0.63	-$32.13	-$11,727.45
Pre-Fresh Group	35	$1.74	$60.90	$22,228.50
Small Heifers	145	$0.41	$59.45	$21,699.25
Large Heifers	131	-$0.53	-$69.43	-$25,341.95
			TOTAL FEED COST SAVINGS	**$372,661.35**

on herd health and how cows transition into lactation. This goal will always be on the forefront as transition cow success is paramount to a healthy, productive herd. The third aspect to focus on for the future is to continue to improve milk production. After a six-month review, milk production has reached over 80 lb. per cow per day. Concentrating on keeping healthy cows in the herd longer, getting cows bred sooner and maintaining overall good health will naturally raise milk production because of less days in milk and milking older cows.

In conclusion, technology has provided Crystal Creek® team members with a way to help serve their nutrition clients in a better, more timely manner. Tracking of these herd health numbers and data will only help to improve the overall communication with clients and is an invaluable tool in monitoring the success of the Crystal Creek® Dairy Nutrition Model. If you have goals that are not being met, schedule a visit with a Crystal Creek® nutritionist to see what we can do for your herd.

The Skin: The Window to the Immune System

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

The skin is the frontline defense mechanism for every animal and as a result, it is under constant challenges from toxins, infectious agents and physical stresses. It's more than just a physical barrier between the body and environment; the skin is an active immune organ. Specialized immune cells found only in the skin are always on the lookout, patrolling for infection.

Unique to the skin, it is the only organ system that we can easily visibly evaluate in the live animal. Because the skin is a large immune organ and it is visible on the exterior of the animal, we can use the status of the skin to gauge the status of the overall immune system of the animal. Consider using the skin as the "window" to the animal's overall immune system status. Animals with a healthy skin coat likely have a healthy immune system. Animals with skin infections are likely immunocompromised at some level.

Ringworm is a fungal infection of the skin that manifests itself as flat, grey, slightly raised, generally circular, hairless lesions. It is typically found on the face and neck. Like any infection, ringworm is a result of an infectious challenge that overwhelmed the animals' immune defenses.

Imagine a ringworm infection like a constant teeter-totter with the fungus challenge on one side and the immune system on the other. The only ways to prevent ringworm infection are:

1. Decrease the ringworm load in the environment through cleaning and disinfection.
2. Increase the animal's immune system function through improved nutrition.
3. A combination of one and two above.

Decrease the Ringworm Load in the Environment Through Cleaning and Disinfection

The organisms that cause ringworm are hardy and can survive in the environment for months. When asked about the ringworm, most farmers will respond hopelessly saying something like "Ahh, we've had ringworm in this barn forever. There is so much of it in the wood by now, there's nothing we can do for it." This isn't true. The first thing needed to reduce ringworm frequency and severity is to address disinfection. Below is a simple cleaning protocol for post weaned calf barns that will help reduce the ringworm load in the barn. Both the Chlor-A-Foam™ detergent and HabiStat™ (a chlorine dioxide based disinfectant) can be purchased from Crystal Creek®.

Figure 1 **CLEANING PROTOCOL FOR POST WEANED CALF PENS**

1. Remove bedding from the pen, removing as much organic material as possible.
2. Apply a chlorinated alkaline foaming detergent (Chlor-A-Foam™) with hot water (140°F/60°C) to all pen surfaces using a hand held foamer. Soak for approximately 10–15 minutes.
3. Rinse with water. Allow pens to dry.
4. Apply HabiStat™ (a chlorine dioxide based disinfectant) to the post weaned calf pen.
5. Allow to dry prior to re-bedding the pen.
6. Re-bed with clean/fresh bedding.

After addressing pen hygiene, the next step is to increase the immune system's activity through nutrition.

Improve Immune System Function Through Better Nutrition

In my experience as a veterinarian, I've seen many farms feed growing heifers a least cost diet that may be deficient in vitamins, trace minerals or both. Often times, this group of animals is not heavily focused on and they might receive a cheap mineral or sometimes no mineral at all.

The immune system of an animal is highly dependent on vitamins A, D and E, as well as trace minerals such as selenium, zinc and copper to function correctly. Nutritional deficiencies in these areas will lead to a poor functioning immune system and increased prevalence and/or severity of skin diseases like ringworm.

Crystal Creek® offers a high-quality calf and heifer mineral (Swift Start® Calf & Heifer Mineral) that can be fed free choice or mixed into grain mixes and TMR rations. The Swift Start® Calf & Heifer Mineral uses a high-quality phosphorous source, chelated trace minerals, organic selenium and strong vitamin A, D and E levels; all designed to maximize the mineral's bioavailability to the animal. A premium mineral supplement like the Crystal Creek® Swift Start® Calf & Heifer Mineral is more digestible and easily absorbed, delivering higher levels of vitamins and trace minerals into the animal's blood stream. This in turn supports optimal immune function. This same high-quality mineral is used in the Swift Start® Calf protein pellet as well as all Swift Start® Texturized Calf Feeds.

Reducing or eliminating ringworm on your farm has a simple formula:

Improve disinfection and nutrition

Reduce ringworm exposure and improve immune function

= Decreased ringworm frequency and severity

Your animals are telling you a lot about the status of their immune system via their skin condition. Are you listening to what they are telling you? Skin infections like ringworm are often the result of nutritional deficiencies in vitamins A, D, E or trace minerals like selenium, zinc and copper. If your heifers are experiencing ringworm, think beyond the skin to what is actually going on with their immune system and consider if they are suffering from nutritional deficiencies. To learn more about heifer nutrition or disinfection protocols, call Crystal Creek® today to discuss how we can help.

Crystal Creek® Paladin® Swine Program

By Erik Brettingen, B.S.

Crystal Creek® has a highly successful, comprehensive swine program that can help swine operations with their ever-changing needs. The Paladin® Swine Program includes ration balancing services, innovative products and veterinary consulting to help support the profitability of a swine operation.

Ration Balancing Services

The Crystal Creek® Paladin® Swine Program considers nutrient quality, mycotoxin prevalence and remediation, and the need for flexibility of feed ingredients when balancing the ration.

Nutrient Quality

Regardless of the species, Crystal Creek® practices a core philosophy that is rooted in using the highest quality ingredients when it comes to diet formulation. Many nutrition companies use a least cost ration formulation to provide cheap feed on a cost per ton basis. These low-cost diets are made up of poor quality, by-product-based ingredients that can decrease animal performance. Crystal Creek® swine rations are built with a focus on the amino acid profile. Pigs do not have an actual protein requirement, but rather need specific levels of several amino acids, which are the building blocks for proteins. Unlike ruminants, pigs are monogastric and are unable to synthesize essential amino acids through microbial protein production, making it critically important that the proper amino acid profile be supplied through the diet. Lower quality protein sources, like distillers' grains, do not supply the optimal amino acid profile that soy-based protein ingredients do. The consistency of feed by-products can also be questionable. In some research studies, the true lysine digestibility in distillers' grains has been shown to vary from 43.9 to 63%. When diets are formulated to provide precise levels of nutrients, these inconsistencies can cause deficiencies in key nutrient areas.

The same mindset of high-quality ingredients applies to the formulation of minerals used by Crystal Creek® in every-day rations. Crystal Creek® Paladin® Grower/Finisher Swine Mineral utilizes industry leading technology in its macro and trace mineral ingredients. For example, phosphorus is particularly important in swine nutrition as it supports energy metabolism, bone structure, and muscle function. The source of phosphorus provided to the animal dictates the degree of phosphorus utilization. This ability to utilize phosphorus becomes critical for profitability in a swine operation when efficient reproduction and growth, both influenced by phosphorus utilization, are key. The phosphorus used in Crystal Creek® minerals is a high-quality mineral source, free of heavy metal contamination, which increases the bioavailability of the phosphorus, ultimately leading to more phosphorus being absorbed by the animal.

EXAMPLE: CRYSTAL CREEK® SWINE RATION (By Body Weight in lb.)										
PHASE	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
High Lean Growth Capacity	55-74	75-99	100-129	130-169	170-209	210-259	260-315			
Moderate Lean Growth Capacity	25-49	50-69	70-89	90-119	120-149	150-189	190-239	240-280		
Low Lean Growth Capacity	20-34	35-49	50-64	65-89	90-109	110-139	140-159	160-200		
									SOWS:	
Ingredients (lb.)									**Gestating**	**Lactating**
Ground Corn	1280	1360	1428	1496	1554	1606	1661.0	1701.5	1657.5	1442.5
Soybean Meal (47.5%)	650	575	515	450	395	345	290.0	250	260.0	480.0
Crystal Creek® Paladin® G/F Mineral	60	55	50	45	43	40	40.0	40	60.0	60.0
Salt	7	7	7	7	6	6	6.0	5.5	7.5	7.5
Mono-calcium Phosphorus	0	3	0	0	0	0	0.0	0	15.0	10.0
Calcium Carbonate	0	0	0	2	3	3	3.0	3	5.0	
TOTAL	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**

CAUTION: Paladin® G/F Swine Mineral contains selenium. The addition to feed of higher levels of selenium is not permitted. Do not feed Paladin® G/F Swine Mineral free-choice.

Trace minerals like zinc, copper, cobalt, manganese, and selenium also have essential functions in the overall production and health of pigs. Zinc, although a trace nutrient and required in small levels, can have huge impacts on animal health. Many of these trace minerals are required for the production of digestive enzymes that drive nutrient utilization in the diet. Trace minerals like selenium, are powerful antioxidants that support immune function and overall health. Crystal Creek® uses organic trace mineral and selenium fortification which reduces the risk of these minerals being tied up by antagonists, thereby increasing their ability to be utilized.

Mycotoxin Remediation

Mycotoxins are poisonous residues from mold found in feeds. Mycotoxins have a direct negative impact on profitability for swine producers, causing irritation in the intestinal tract and reduced nutrient utilization. Mycotoxins can have a negative impact on reproductive function, cause lower rates of gain and even cause death at high concentrations. Crystal Creek® has product options that are highly absorptive of mycotoxins and are designed to break down and degrade the mycotoxins to help increase product toxin binding efficiency. This degradation has been shown to increase animal performance, assist in improving immune function, and help with overall health in the presence of mycotoxins.

Flexibility

Crystal Creek® works with swine producers all over the United States with varying goals and production methods. This includes large, conventional barns and operations with corn and soy-based diets to smaller, backyard operations with very specific ingredient preferences. Purchasing the Crystal Creek® Swine Grower/Finisher mineral premix from Crystal Creek® and adding it to the feed mix allows producers to work with their area feed mills or dealers to find the best choice in local feed ingredients or source feeds that meet their preferences. This flexibility, combined with the expertise to formulate diets that meet nutrient requirements, allows producers to be successful in their niche markets.

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Supportive Products

Crystal Creek® offers an array of highly effective products that can be used in a variety of situations to help provide for good animal health and increase profitability. Immune supportives, fly repellents, udder and wound care products and feed/digestive supplements are all beneficial when developing a complete health care program for swine.

Veterinary Consulting

Along with providing support and knowledge on swine nutrition and ration balancing, Crystal Creek® can help answer producer's animal health questions. Being able to talk with a veterinary professional can assist in determining the root cause of an issue rather than just simply treating the symptoms. Our staff veterinarian and veterinary technician can help find practical solutions to health problems which can increase sustainability and profitability of an operation.

SUPPORTIVE PRODUCTS	
Crystal Creek® Aloe Vera Juice	Power Powder™
Check™	Primary Care®
Crystal Meal™	Prism™
Crystal Pellets™	Pro-Vita-Zyme™
Crystal Creek® Fly Repellent	Pul-Mate™
Fresh-n-Easy™	Replena-Lytes®
Lice & Mange Wash	Super Boost™
Pivot-FL™	Crystal Creek® Wound Spray

Crystal Creek® would like to bring their expertise to your swine operation with nutrition consulting, innovative product usage and qualified veterinary personnel. Give us a call, we are here to help and ready to join your team!

August 2021

VETERINARY DAIRY LINIMENT™

Save 10% *IN ADDITION TO*

Normal Volume Discounts

September 2021

CALF SHIELD®

Save 10% *IN ADDITION TO*

Normal Volume Discounts

October 2021

HARVEST APPRECIATION

For Every $150 Of Product Purchased

Get 1 FREE Cow Pie Candy Bar

(Limit 5 Per Order)

November 2021

PIVOT FL™

1-3 boxes: **$10/box discount**

4-9 boxes: **$18/box discount** ($10/box discount + $8 per box existing volume discount)

10+ boxes: **$23/box discount** ($10/box discount + $13 per box existing volume discount)

Pail: **$2/pail discount**

HEIFER PRIDE™ **$10/bag discount** & **$2/pail discount**

December 2021

CALF PRODUCTS

10% OFF The Following Calf Products (Normal Volume Discounts Apply)

- CALF SHIELD®
- CALF 180®
- PRIMARY CARE®
- REPLENA-LYTES®
- PRO-VITA-ZYME™
- GENESIS PLUS™
- CALF MILK MATE™
- BRIGHT START™
- SUPER BOOST™ CALF CAPSULES AND BULK POWDER
- CHECK™ CALF CAPSULES AND BULK POWDER
- POWER POWDER™ CALF CAPSULES AND BULK POWDER

CRYSTAL CREEK®

1600 Roundhouse Rd., Spooner, WI 54801

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CONTRAST THERAPY

WARM soothing comfort followed by COOL lingering relief

- ***Anti-inflammatory***
- ***Analgesic pain relief***
- ***Economical***

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