



Articles at a Glance

Common Questions about Ketosis

What is ketosis? What are the types of ketosis and how are they different? What are the options for treating cows if they do have ketosis? What preventative measures can be taken to ensure cows don't get ketosis? Keep reading on page 2 to learn more about what causes ketosis, and preventative measures you can take.

Products to Always Have on Hand - Calf Toolbox

When young calves first show signs of a health issue, such as scours or pneumonia, early intervention is key. Having essential products on hand makes it easy to start treatment at the first signs, so no time is wasted. Keep reading on page 4 about Crystal Creek® products to carry on your farm.

The Importance of Monitoring Nutrition When Pasturing Pigs

There has been a steady increase in the number of producers choosing to pasture pigs. When considering if pasturing pigs is right for your operation, there are many things to consider, with one of the most important being how to maintain proper nutrition for the animal. Keep reading on page 6 to learn more about pasturing pigs and the importance of nutrition.

Checking Forage Dry Matter: A Boring Magic Bullet

Measuring and monitoring forage dry matter could be the single most important thing to do on a dairy on a daily basis. Checking forage dry matter regularly makes sure the cows are actually eating what is being balanced for them. Keep reading on page 8 to learn more about monitoring dry forage matter.

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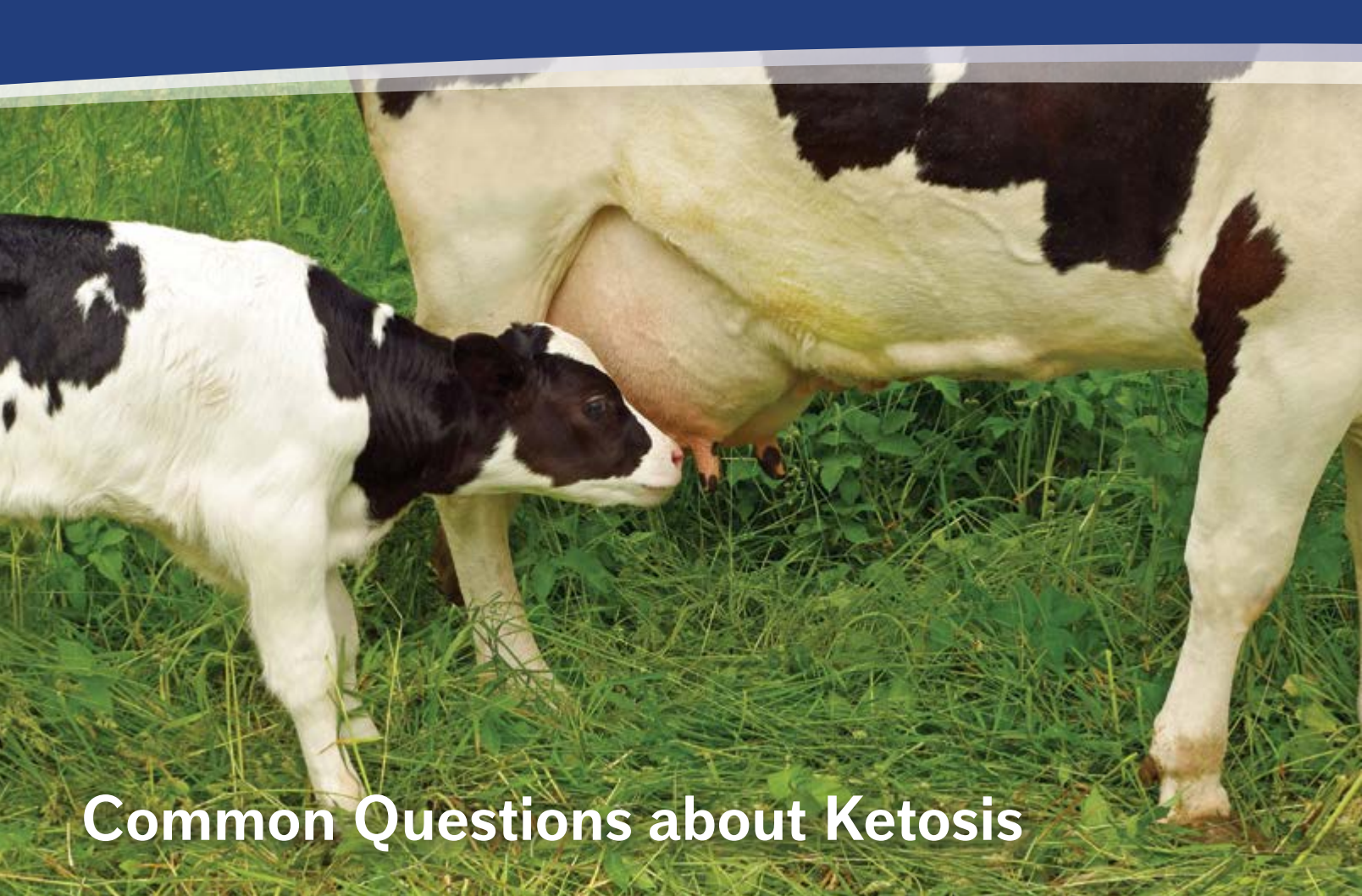
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Common Questions about Ketosis



By Carley Ciolkosz, B.S.
Livestock Nutritionist

What is ketosis? What are the types of ketosis and how are they different? What are the options for treating cows if they do have ketosis? What preventative measures can be taken to ensure cows don't get ketosis? These are all common questions associated with ketosis. This article is going to define

what ketosis is, what the different types are, how to treat the cows that have ketosis, and some good prevention strategies against ketosis.

What is ketosis?

Ketosis is defined as the buildup of ketone bodies in a cow's bloodstream as a result of either a carbohydrate deficiency or an inadequate carbohydrate metabolism. The cow's body senses that it is low on blood glucose (energy), so it breaks down fat to form non-esterified fatty acids (NEFAs) as an alternative energy source. NEFAs are further broken down by the liver to create ketone bodies. This underlying issue can decrease profitability and

milk production as well as increase the possibility of other health problems in early lactation.

There are conditions in which cows can be more susceptible or at higher risk of developing ketosis. These include cows that have either gained or lost body condition during the dry period, cows that were lame at any point during the transition or dry period, cows that calved with twins, cows that have a retained placenta, or cows that freshened in with milk fever.

What are the types of ketosis and how are they different?

There are two different types of ketosis, clinical and subclinical. Subclinical ketosis is when the cow does not look outwardly sick or show signs of sickness like being off-feed, low production in milk, lethargic, etc., but is still actually suffering from ketosis. Clinical ketosis is when the cow does exhibit the signs of being outwardly sick and therefore makes the diagnosis of ketosis much easier. The majority of ketosis cases are subclinical and can be easily undiagnosed by producers, leading to decreased milk production and later on poor reproduction.

How to treat cows if they have ketosis?

Oral energy supplementation and IV glucose are two ways to treat cows that have ketosis. Crystal Creek® recommends that once a cow has been identified as ketotic, they follow the Crystal Creek® ketosis protocol of 10 oz. of Cow Quench™ and two Super Boost™ boluses each day for three days. Oral supplementation is preferred over IV treatments as it gently raises the blood glucose levels over time and is less likely to lead to a blood glucose spike and crash afterwards. Whereas IV supplementation will raise the blood glucose very quickly and it is helpful at the time, but later on is more likely to result in a “crash” of the blood glucose levels which would therefore require additional treatment. Based on this research Crystal Creek® recommends the oral supplementation route.

What preventative measure can be taken to ensure cows don't get ketosis?

The best way to prevent ketosis from happening to fresh cows is through proper management. With good herd management, it will be easier and quicker to catch the cows that might be exhibiting symptoms or

to monitor the cows that are more at risk of ketosis, including a routine screening process for fresh cows. Cows should be observed on a daily basis on a regular schedule. It is important to assess appetite, udder fill, rumen fill, manure consistency, and overall health as any of these being abnormal could be a quick indicator to being or becoming ketotic. Making sure that all cows have access to pushed up feed and fresh water constantly is key to ensure proper feed intake and good health. Another way to assess the cows would be to use urine strips and ketosis meters to determine BHBA levels which can indicate the cows that have higher numbers putting them at risk for or having ketosis, and the lower numbers that mean they do not have ketosis. Implementing a ketosis screening and treatment strategy should minimize the negative impact of ketosis in a herd.

Being able to know what ketosis is and looks like, along with assessing, managing, and preventing it is key to helping production and reducing involuntary culling in a herd. This will also decrease postpartum health issues, improve reproduction performance, and increase overall milk yield. Ketosis is a costly and common disease in the dairy industry. Screening, finding and treating ketotic cows in an efficient manner will keep cows healthier and lead to a more profitable herd. Contact Crystal Creek® to discuss options or questions on how you can benefit your herd with good ketosis management strategies.



Products to Always Have on Hand - Calf Toolbox



By Alex Austin, B.S.

In my last article, I discussed the top three Crystal Creek® products to have on hand for adult dairy cattle. In this article I will focus on pre-weaned calves. When young calves first show signs of a health issue, such as scours or pneumonia, early intervention is key. Having essential products on hand

makes it easy to start treatment at the first signs, so no time is wasted. Below are some Crystal Creek® calf products to carry on your farm.

Calf Shield®

Calf Shield® is a daily feed additive for pre-weaned calves designed to support and stabilize the gastrointestinal health in young calves. It is a source of direct-fed microorganisms, with natural antimicrobial and immune modulator properties as well as probiotics, pH acidifiers and botanicals. By contributing to a healthy and stable Gi tract and having antimicrobial properties, Calf Shield® helps with feed efficiency, weight gain as well as being active against potential pathogens.

The feeding rate for Calf Shield® is flexible based on need. The conventional formula can be fed at 2.75 grams up to 10.9 grams. (1 scoop). The organic formula can be fed at 1.5 grams up to 6 grams per day.

Aloe Juice

Crystal Creek® Aloe Juice is a great product to have on hand. Crystal Creek® thoroughly tests the product using the methods recommended by the International Aloe Science Council to ensure quality and efficacy. Quality aloe has been proven to increase nutrient absorption and reduce the negative impacts of stress. In one study, one ounce of aloe vera juice significantly increased absorption of both water soluble and fat-soluble vitamins.

Aloe can be used daily by adding as little as 1 oz to each milk feeding. It can also be used strategically

by orally drenching up to 5-8 oz twice a day during a health challenge.

HabiStat™

HabiStat™ is a chlorine dioxide product that is very effective against a broad range of pathogens, including crypto, as well as breaking down the biofilm that can help harbor and protect pathogens. The HabiStat Exact™ Tablets can easily be mixed with water, to achieve the ppm concentration needed.

When the pathogens in a calves' environment outweigh the immune resources, calves can become sick. HabiStat™ is safe and effective. It can easily be used to sanitize calf penning as well as feeding equipment to prevent the spread of pathogens and keep the calf's environment clean.

Calf 180® Electrolytes

Scours are the leading cause of death in pre-weaned calves. Calves can become quickly dehydrated if left untreated. Electrolytes are an important tool to keep on hand when it comes to scours treatment. Calf 180® not only provides electrolytes to help rehydrate a scouring calf, but also fibers and vitamins as well as plant pectins, which help to firm up the stool.

Electrolytes should be fed as a separate feeding and not mixed with milk. Calves should remain on normal milk feedings to ensure they continue to receive the energy and nutrition necessary for not only growth but also for recovery. Ideally electrolyte feedings should take place 4 hours after milk feeding.

Every time a calf experiences a health challenge, it is not only costly but has negative impacts on their future performance as adult cows. Calves treated for scours are 2.9X more likely to calve at 30 months and almost produce 10% less milk during the first lactation. Prevention and early treatment are key to keeping calves on track. To learn more about the products in this article and the Crystal Creek® calf nutrition program, contact Crystal Creek® today.



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- CHECK™ CALF CAPSULES AND BULK POWDER
- POWER POWDER™ CALF CAPSULES AND BULK POWDER

The Importance of Monitoring Nutrition When Pasturing Pigs



By Darren Zimmerman, D.V.M.

There has been a steady increase in the number of producers choosing to pasture pigs. The reasons can vary: cost of feed savings, aid in tilling soil, spreading manure. When considering if pasturing pigs is right for your operation, there are many things to consider, with one of the most important being how to maintain proper nutrition for the animal.

There has been extensive research on swine nutrition, and nearly all recommendations are for a complete diet. A complete diet is one that is mixed evenly and proportional in all feedings to all desired ingredients to meet the needs of the specific intended animal. This includes calories, protein, fat, vitamins, minerals and other essential nutrients. Swine in different stages of life have different needs.

When considering pasturing pigs, it is essential to understand how pigs process nutrients. Pigs are monogastric. They do not have a rumen and have limited ability to ferment and digest fiber. As we are calling them pasture pigs, there is an expectation that they will get some nutrition from the plants. We should also understand that although they will eat some of the plants on pasture or in the woods, they will not “graze” the pasture evenly. There will be some fermentation in the large intestine and absorption of nutrients. The higher the amount of fiber in a diet, the faster it travels through the intestines. This gives the digestive system less time to ferment and

absorb nutrients. Older plants tend to contain more lignin and cellulose (undigestible or insoluble fiber), while the younger, fast-growing plants will have more hemicellulose or pectin (digestible or soluble fiber). They will obviously get more out of young growing plants than mature ones.

Aged adults and certain breeds have longer intestines and allow for higher digestion. Over time older pigs can get even more efficient on pasture as their intestine biome changes to accommodate the fiber in their diet. However, this can take months and may not be helpful with a seasonal pasture. Younger pigs have shorter intestines and limited ability to digest nutrients picked up on pasture. For every percentage point of the diet the young pigs are getting from pasture you can expect the same percentage of extra time to get them to a finished weight. It is expected to take 15% longer to finish a pig if their diet is supplemented by 15-20 % of pasture. That means an extra month on feed and pasture before finishing.

Nutrients are generally fed at a certain percentage of the diet. With a complete feed, this percentage is easily calculated. When a pig is on pasture, the animal has access to plants, insects and soil. The quality of the pasture or woods can change daily, depending on weather and time of the year. This changes what nutrients are available. It can be difficult to know what or how much the pasture is supplementing the diet. We would recommend they are always provided with adequate vitamins and minerals. How this is provided will depend on each farms management and the needs of the animals by their stage of life. See Figure 1.

Figure 1

	PALADIN SWINE MINERAL	SALT	MONOCAL
GROWER - 100 lbs	2.0 oz mineral daily	0.20 oz	
- 200 lbs	3.5 oz mineral daily	0.35 oz	
- 280 lbs	4.5 oz mineral daily	0.45 oz	
LACTATING SOW - small litter	4.0 oz mineral daily	0.50 oz	2.00 oz
- large litter	6.5 oz mineral daily	0.80 oz	3.30 oz
GESTATING - Sow	2.0 oz mineral daily	0.25 oz	0.67 oz
- Gilt	1.75 oz mineral daily	0.20 oz	0.60 oz
BOAR	2.3 oz mineral daily	0.20 oz	



What To Expect When Pasturing Pigs:

- Young animals will not digest fiber well. The more fiber there is in their diet the longer it will take them to develop.
- Mature pigs can digest some fiber.
- There is nutrition in bugs, nuts, plants and other things pigs will find when out foraging. It is likely not complete nutrition. It is better to treat the pasture as a supplement to their diet than to treat their feed as a supplement to pasture.
- Pigs are not going to graze the pasture like a sheep or a cow.

Pasturing Pig Tips:

When deciding to pasture pigs, there are few tips to help your operation be more successful:

- Stick to the basics
 - Access to clean fresh cool water
 - Available shelter
 - Feed balanced for vitamins and minerals
- Ensure there is enough space for the animals (approximately ½ acre per pig is a good place to start, every farm is different)

- Rotate pasture to allow for recovery... This could be yearly or more frequent
- Consider moving feed and water troughs to reduce flies, odor, soil compaction
- Monitor for parasites

What To Look Out For:

A pig on pasture may not be receiving proper nutrition. Symptoms of malnutrition vary depending on the nutrient and the animal. These can include the following: reduced growth, rough hair coat, lethargy or weakness, lameness or difficulty walking, and skin and/or bone problems. Pigs can display different symptoms based on the nutrient they are deficient in. For instance, lethargy could be due to an iron deficiency, while a niacin deficiency could lead to a roughened hair coat and diarrhea. If the animal is displaying any of these symptoms it is important to work with a nutritionist and veterinarian to ensure the pigs are properly cared for.

When deciding to pasture pigs, it is important to consider many factors. Cornell Extension has an informative article titled: "*The Dirty Truth about Homestead Pigs on Pasture*".

If you would like to speak to a nutritionist about whether pasturing pigs is right for your operation, contact Crystal Creek® at 888-376-6777 or visit the website at www.crystalcreeknatural.com



Checking Forage Dry Matter: A Boring Magic Bullet



By Erik Brettingen, B.S.

In working with clients to continually improve performance and success on their dairies, conversation often turns toward looking for one ingredient or tweak, that “silver bullet”, that could be added to the ration to make more milk, components, reproductive

performance, etc. The idea of a fast and simple solution is certainly appealing. However, improvement and success are typically found by doing many small things correctly every day, week or month. Consistency is key, especially for cows, and focusing on the little things that matter can make a huge difference. Measuring and monitoring forage dry matter could be the single most important thing to do on a dairy on a regular basis but it is something we don't see being done very often.

Why is it Important?

To answer this question, it is important to understand that when it comes to thinking about what cows are eating, many times nutritionists and dairy farmers think about things differently. In many conversations with clients, the answer to the question “How have intakes been?” is a measured weight in as fed pounds. This is alright, and it works, but it is not really telling the story of what the cows are eating. Nutritionists balance rations in pounds of dry matter intake, and

that is what cows actually consume. As the moisture percentage in a forage changes, the cows continue consuming the same amount of dry matter.

Checking forage dry matter regularly makes sure the cows are actually eating what is being balanced for them. For example, in a ration containing 15 lbs of dry matter from haylage, if that haylage is 40% dry matter, the ration would be balanced for 37.5 lbs of haylage as fed. If the haylage changed to 45% dry matter, without anyone measuring, and the same 37.5 lbs per cow of as fed haylage were added to the mixer, that will actually deliver 16.875 lbs of dry matter from the haylage. Who cares, right? Well, this is significant and can be the difference between meeting weigh back targets or having far too much feed left over. Along with simply delivering too much feed in this scenario, the composition of the ration is also changed. Adding an extra 1.875 lbs of dry matter from one single ingredient can throw things off.

In the case of haylage, depending on the quality, this could increase the concentration of undigestible fiber and limit intake. Protein levels could be increased, potentially making the cows loose. If the feed were to get wetter, the opposite happens, and too little dry matter is fed. This causes different, but equally detrimental issues. The largest issue is that it can leave cows out of feed for too long. Cows can't eat what is not there and an empty bunk costs milk production. Many efficient cows are making



1.8 lbs of energy corrected milk for every pound of dry matter they eat. If a dry matter change leaves the cows even just 1 pound of feed short, that could cost you 1.8 lbs of energy corrected milk. In 2024, Class III milk averaged \$18.37 per cwt or \$0.1837 per pound. That means there would be \$0.33 per cow left on the table in lost production.

Crystal Creek® works to balance rations that contain as much forage as possible while maintaining cow performance. Higher forage rations are usually more profitable, benefit cow health, and make cows more efficient. As forage level increases in the ration, accurate dry matter concentrations and forage dry matter delivery to the cows becomes that much more important.

Monitoring Forage Dry Matter on Farm:

Drying down forages on a farm can be quite simple and easy. A couple key pieces of equipment needed are:

1. A way to dry down the forage. Many clients use Koster testers or affordable air fryers
2. A scale that measures and reads in grams
3. Pen and paper or phone for keeping notes on before and after weights
4. Calculator

Following a few steps will get you accurate dry matter levels for your forages:

1. Place a paper plate on your gram scale
2. Tare the scale
3. Weigh out 100 grams of wet feed onto the plate
4. Place 100 grams of feed into Koster tester or air fryer
5. Turn on Koster and let dry for 30 minutes. If using an air fryer, set to bake at 250 degrees and let run for 30-45 minutes
6. Re - weigh the dried down sample
7. Starting with 100 grams of feed makes the calculation simple
 - a. $(\text{Dried grams} / 100) \times 100 = \text{dry matter percentage}$
 - b. Example: $(42 \text{ dry grams} / 100 \text{ wet grams}) = 42\% \text{ dry matter}$

After finding the correct dry matter of your feed. Talk with your nutritionist to adjust the forage feeding rate to keep the ration accurate.

While we often look to additives and other ration ingredients to make positive improvements, sometimes going back to the basics and making sure the cows are actually receiving the ration that is balanced for them is the best place to start. Please feel free to contact Crystal Creek® to talk with a nutritionist about ration balancing and protocols for maintaining consistency and improving profitability.

References available upon request.

Celebrating 20 Years with Crystal Creek®!

Mary Christman

Crystal Creek® would like to acknowledge Mary Christman, who has been with the company for 20 years. Mary works as our office coordinator and is responsible for customer service, inventory management and organic certification agency interfacing. Thank you, Mary, for your hard work!

Gary Peterson

Gary started with Crystal Creek® in 2005 and just recently retired after 20 years of service. Gary worked in our manufacturing department and was responsible for manufacturing Crystal Creek® products. During his time here, he manufactured almost 1.5 million capsules. We here at Crystal Creek® would like to thank Gary for all of his hard work and dedication throughout the years.

(Photos: clockwise, from upper right)

- Mary Christman
- Celebrating 20 years with Gary Peterson.
- Celebrating 20 years with a custom fishing rod.
- Gary cleans up after mixing products



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