

SECOND QUARTER 2004

CALCIUM

Feed-grade calcium products are available in a wide variety of particle sizes, from liquid suspendable products to large particle products for laying hen diets.

DICALCIUM PHOSPHATE

Both 18.5% and 21% phosphorus products are available.

SODIUM BENTONITE

Bentonite products are available in a wide variety of particle sizes suitable for any purpose.

POTASSIUM

ILC Resources has both potassium chloride (KCl) and potassium magnesium sulfate (K/Mg/S) available.

All products are available in both bag and bulk.

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Hypocalcemia (Milk Fever) — Is it all about calcium?

Milk fever is a metabolic disorder in dairy cows that manifests itself as a calcium deficiency and is referred to as hypocalcemia (low calcium). There is a tremendous metabolic demand when dairy cows are transitioning from the dry period to lactation. When cows fail to make the necessary transitional changes, several diseases may result, including milk fever, retained placenta, and displaced abomasums, along with lowered milk production for the subsequent lactation. This article is not an in-depth analysis of these conditions, and offers a few selective ideas to deal with this major economic problem in the dairy industry.

Low calcium diets pre-calving actually stimulate production of parathyroid hormone (PTH) that triggers the cow's body to mobilize and absorb adequate calcium when requirements spike dramatically at freshening. High calcium in the diet before parturition prevents stimulation of PTH production, and calcium absorption is retarded. Insufficient vitamin D at freshening also can lead to inefficient calcium absorption by the intestine. This low calcium condition results in such problems as lowered milk yields and poor reproductive performance. Unrecognized subclinical milk fever is more common than clinical cases, resulting in less than optimal milk production.

Although treatment may be predictably simple and easy, the losses are not necessarily recoupable even after treatment. Prevention is the only meaningful solution.

Excessive dietary cationic (positively charged) minerals, in particular potassium (K) and phosphorus (P), are apparent contributors to milk fever. Offsetting this by feeding more anionic (negatively charged) minerals results in a lower *dietary cation-anion difference* (referred to as DCAD). This concept hypothesizes that calcium homeostasis (tendency towards stability) is better achieved by lowering the DCAD, thus creating a more acidogenic condition (lower pH, more acidic) conducive to preventing hypocalcemia. It has been reported that DCAD reduction enhances active vitamin D production in the kidneys (Gaynor-1989, Goff-1991), thus increasing both the efficiency of Ca absorption and mobilization of Ca from bone. Metabolic acidosis is believed to increase bone resorption and thereby enhance mobilization of bone calcium.

(Continued on page 4)



Barnlime—Is It Really “Sweet”?



In *That's Old Fashioned* in 1962, the Everly Brothers sang, “It’s a modern changing world, everything is moving fast...” By today’s standards, that era was actually slow. There have been many advances and new ideas have surfaced; some for our betterment, some perhaps not. But some things haven’t changed and truly fit the adage, “if it isn’t broken, don’t fix it.” Such applies to our *Dairy-*

White Sweet BARNLIME. This ILC product came into being more than five decades ago. What did it do back then? What does it do today?

In a nutshell, the benefits can be categorized as three-fold. One, it helps control moisture. Two, it reduces odors. And three, it enriches manure. By encapsulating floor moisture in livestock housing environments, it makes for safer footing conditions. By chemically neutralizing acid, it reduces obvious odors in livestock housing facilities, regardless of species being fed. Enriched manure treated with Dairy-White Sweet BARNLIME enhances plant growth when applied to fields because CaCO_3 reduces soil acidity. Plant nutrient uptake is facilitated by a more neutral soil pH of around 6.0-6.5. Heavily fertilized soil is of a lower pH than is ideal for plant growth. Therefore, BARNLIME treated manure, along with an ag-liming program, makes sound agronomic sense for improved crop production.

Further, Dairy-White Sweet BARNLIME is non-caustic to livestock and humans, thus, environmentally harmless. But is it really *sweet*? Reducing

odors associated with both urine and manure present in any livestock housing facility unquestionably “sweetens the air” being breathed.

Over the years we have noted many uses for this product involving a wide variety of livestock and other applications. Some have mixed it with bedding materials used in poultry and/or swine buildings, and others have used it for odor control in the old outdoor “biffy.” The basic properties of BARNLIME lend themselves to many creative uses.

If you have not considered this half-century old, time-proven remedy for a while, it would behoove one to revisit this treatment for livestock housing environments. Quite frankly, it is inexpensive too. A little more labor may be involved than with more modern remedies, but when has work ever really killed anyone? Think about it.

**June is National Dairy Month
and ILC Resources is pleased to bring you several articles
related to dairy in this issue.**

Dairy-White Bedding Lime™

Does this beat straw, or what?

How does Dairy-White Bedding Lime™ differ from regular Dairy-White BARNLIME? Since both are calcium carbonate and possess the same chemical properties, can one replace the other? The products differ greatly in several key ways.

Dairy-White BARNLIME™ is a mixture of granular and finely ground limestone with neutralizing properties that impact odors and acidity problems. Dairy-White Bedding Lime™ is a coarser gradation used as a true bedding material.

Bedding Lime is a uniform coarse granular product intended for substitution of other, more conventional bedding materials. Typically, bedding materials have been from organic sources, such as sawdust, straw, or even paper products. Low costs and availability have driven these considerations. However, these organic bedding materials support conditions (moisture, nutrients, acidic environment) that are more ideal for pathogenic growth than an inorganic bedding material such as limestone. Application of limestone as an alternative bedding source has proven effective in reducing bacterial counts in bedding, on teats, and in milk.

Carbon and other *nutrients* present in organic sources are essential for bacterial growth. These essential nutrients are not available or pres-

ent in limestone. *Moisture* content of most organic bedding material is 30% or greater versus less than 1% moisture present in Dairy-White Bedding Lime. *Moisture* is essential for bacterial growth. *Acidity (pH)* ranging from 6.8-7.5 is optimal for bacterial growth. Dairy-White Bedding Lime has a *pH* of approximately 9.0, thus, inhibitory to bacterial growth.

Particle sizes range from an average sieve of 8 to 25; this corresponds with 2400 microns down to 700 microns. This range works best for two reasons. Larger particles than this range tend to be abrasive on cows' knees and tend to easily separate out from the free-stall. Smaller particles below this range can be *dusty*, making udder washing more difficult. Cow comfort is not sacrificed; in most instances there is little difference in cow acceptance of bedding area when organic bedding sources are switched to Dairy-White Bedding Lime.

Presenting cleaner, dryer bedding also reduces odors and has been cited as a way to reduce fly populations. Manure with Bedding Lime is much less bulky than organic sources, allowing for easier handling and storage.

Usually, a four-inch base is recommended for all stall surfaces. Buildup of manure and feedstuffs in free-stall areas can negate benefits of bedding lime, thus removal and replacement

or raking off contaminated areas and refilling is needed.

Dairy-White Bedding Lime is a unique product. This furnace-dried, uniform granular high-calcitic limestone allows for drainage of urine away from animals. Cleaner, drier bedding conditions may decrease pathogenic activity. Bedding rates and labor costs are reduced. Use of Bedding Lime brightens the area, giving a clean appearance and reducing offensive odors. Stall waste, including a portion from Bedding Lime, can be spread on croplands, adding an additional value as a source of aglime beneficial to soil. Free-stall bedding costs a reasonable 13 to 20 cents a day with Dairy-White Bedding Lime.

By its very name, Dairy-White Bedding Lime targets dairy applications. However, as a bedding material, it is equally effective and valuable for consideration in other livestock systems, including sows, pig nurseries or hovers, and poultry barns. Wherever bedding materials are needed, Dairy-White Bedding Lime can and should be used.

The number of varied applications addressed by the calcium carbonate products of ILC Resources is noteworthy. This is another idea worth considering.

There are Bricks in the Bin: Let's Talk Flowability of Feeds

It starts in the summer when moisture, heat, urea, and rapidly changing atmospheric conditions collide to create a “big brick” in the bin. It continues through fall. The “bridging” of pelleted or cubed feeds, beef feeds in particular, make handling a challenge. Usually, a whole lot of anger, sweat, and cussing go on as a result. Can we prevent this? Or, at least, can we greatly reduce the *cussin'-factor*?

Certainly, proper cooling of feeds before shipment to the country will help. Running high urea feeds through the pellet mill on low-humidity days also improves results. Sometimes, less than ideal conditions are

unavoidable. But beating on bins in frustration mainly tends to weaken bins and elevate temps.

ILC Resources offers a positive solution. Treat culprits pellets/cubes with our Unical-P, which is simply *powdered* uniform calcium (Unical™). These particles help absorb moisture and provide a coating shield against sticking and setting up for hardening into a bridging problem. There are some 9,000,000 particles of CaCO₃ in each gram of powder; so when treating a ton of feed with only 20 pounds of Unical-P, more than 40-million particles will be dispersed in each pound of feed.

The result? We have a number of very satisfied customers. One north central Kansas rancher now swears *by* his feed company—for their treatment of his high-urea cattle concentrate with Unical-P—instead of swearing *at* them. Another Kansas feed manufacturer believes the “*wheel* will have to be totally reinvented” before he would stop using ILC powdered calcium to treat either pellets or *cake*. It works well, and that's what counts. And it is very cost effective. Ask your ILC sales manager if we can help reduce your *cussin'-factor* in the months ahead.

Hypocalcemia (Milk Fever) — (continued from page 1)

It has been suggested that milk fever is a result of a deficiency in the rate of calcium metabolism rather than simply impairing either intestinal calcium absorption or bone calcium resorption. Calcium *turnover* then refers to the speed of calcium movement (loss and replacement). Thus, a cow with a high Ca turnover would be less susceptible to hypocalcemia than a cow with a low turnover, even if their pre-freshening blood calcium levels were the same. Calcium losses then need to be replaced either through intestinal calcium absorption or calcium removal from the bones.

Pre-freshening diets high in cations generally result from high potassium levels associated with high alfalfa feeding. Additionally, some calcium compounds in plants (e.g. alfalfa) or mineral supplements such as CaCO₃ could not only suppress calcium stability, but also increase an alkalinizing effect (elevated pH, more alkali). It is, therefore, important to control both dietary calcium and dietary alkalogenicity.

Careful attention should be given to accurately analyzing *dry cow* forages for minerals (especially potassium), by *wet chemistry*, not NIR (Near Infrared Spectrophotometry). Proper

adjustments to dietary formulations can be made by the dairy nutritionist to design the right anionic supplement to counterbalance the cations. By properly lowering the DCAD, better calcium homeostasis is reached and hypocalcemia can be prevented, while at the same time meeting the dramatic demands for increased calcium brought on by lactation. Balancing the diet is essential. Knowing all the parameters affecting the cow's state is vital to ensure proper balancing of diet.

Quite likely CaCO₃ is needed in this equation, but only as one of many components carefully fit together to achieve success.