ilc resources

MINERAL WRITES

SECOND QUARTER 2003

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

All products are available in both bag and bulk.

Quality Control Counters "Mad Cow Disease"

You've heard it: BSE, FDA Rule (21 CFR §589.2000), company policies, quality assurance, health concerns, public alerts, but what's all this hype? All of us in the feed industry know something about BSE ("Mad Cow Disease"), and now there is a lot of public concern over this issue. How does this relate to how ILC Resources does business? Read on.

First, there is a family of diseases known as *Transmissible Spongiform Encephalopathies* (TSEs). Some affect animals and others affect humans. *Bovine Spongiform Encephalopathy* (BSE) affects cattle. This concern is linked with its human counterpart called *new variant Creutzfeldt-Jakob Disease,* (nvCJD). So Mad Cow Disease could indirectly affect humans as well.

BSE was first identified in 1985 as a degenerative disease affecting the central nervous system of cattle. BSE has not been found in the U.S., but it has been detected in the United Kingdom and other European countries. Canada announced its first confirmed case of BSE on May 20th in an eight-year-old cow from an Alberta province cow-calf herd. The announcement read, in part, "The cow was on the farm for three years. The cow was slaughtered in January and appeared to have pneumonia and was quarantined. The head was sent for testing, and the carcass was rendered. After an inconclusive diagnosis of possible BSE, the government sent brain tissue to the United Kingdom for further testing and diagnosis. The UK scientists confirmed BSE in the cow on May 20th, and the government made the announcement and ceased export of beef and beef products." USDA and FDA closed the border for beef products and feed from Canada on May 20th as a precaution. While the cow's carcass did not enter the human food chain, questions exist. How did the cow become infected? What happened to the rendered material? When will the border be reopened for feed and pet food trade?

If what happened to a single cow seems like a lot of "foo-for-rah," remember that research supports an association between BSE and nvCJD. The human disease likely developed as a result of people consuming beef products contaminated with central nervous system tissue from cattle infected with BSE. In either of these TSE diseases, there is **no known cure and they are fatal**. The possible link to humans and its certainty of death is at the heart and soul of this issue.

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Distillers Dried Grains with Solubles (DDGS)

Distillers dried grains with solubles (DDGS) have been widely used in cattle diets for more than two decades. However, product availability has been limited to locations near ethanol plants. Feed usage has been determined by the number of plants and amount of by-products available. But this situation is rapidly changing. As our nation moves toward oil independence and efficient and cleaner fuels, more ethanol plants are being constructed. This is viewed as an excellent opportunity for farmers to "add value" to their grain marketing. Additional opportunities for ethanol production are being explored throughout the grain producing Midwest.

As this trend continues, there will be an increase in by-products available for use in livestock and poultry feeds. The most economical form for by-products is the *wet form (WDG: wet distiller's grains)*. But issues with transportation, storage and potential spoilage of WDG have been challenging. Feedlots and/or large dairies close to ethanol production have used WDG effectively for many years and will continue to do so. Although dried distillers grains have been widely fed as well, the increasing demand for this dry form will result in further industry growth and prosperity. With more DDGS available, new areas of application will be explored and utilized, especially for swine and poultry.

Historically, DDGS have received low acceptance from monogastric nutritionists due to nutritional variability. Today's better processing techniques and tighter quality control procedures have reduced product variability and improved nutrient profiles for monogastric considerations. Crude protein, phosphorus and other nutrients in DDGS are greater than found in corn. The energy content is about 80 percent that in corn.

Nutritionally, DDGS competes with other protein ingredients, most notably soybean meal, but also sunflower meal, canola meal, feather meal, and gluten meal. How well DDGS competes depends in large part on two factors. One is simply pricing. How cost effective will DDGS be per unit of protein? Secondly, what other nutritional contributions does DDGS make to animal diets? These two general factors are the determining points of usage.

What nutritional contributions does DDGS make to animal diets? On a *dry matter basis*, approximate numbers follow:

- crude protein - 27.5%
- fat - 10%
- fiber - 5.5%
- moisture - 12%
- energy -1150 -1275 kcal/lb (considering poultry and swine)
- 80-90% TDN (considering dairy and beef)
- calcium (Ca) - 0.22%
- phosphorus (P) - 0.83%.

Low levels of lysine hinder feeding DDGS to monogastrics. Lysine is the first limiting amino acid in the protein profile of high grain diets. Proper amino acid fortification can overcome this deficit. High fiber content in DDGS also has retarded its use in monogastric diets. Calcium and phosphorus levels in DDGS are comparable to levels in soybean meal (SBM). DDGS furnishes good levels of protein and energy (especially from the fat content). Dietary supplementation of both Ca and P is still necessary. Arguably, DDGS is relatively higher in P versus some other protein sources, so conceivably less phosphorus supplementation would be necessary. Sound applications for unlocking bound phosphorus in livestock and poultry diets high in grain are issues here. Phytase enzyme research is receiving a great deal of attention and improved recommendations will evolve. Calcium carbonate will continue to be a useful and necessary ingredient for fortifying mineral content of diets. Close attention to the proportions of

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Distillers Dried Grains *continued*

calcium to phosphorus will be needed.

Interestingly, recent development in technology may provide some positive solutions to the deficits we see with DDGS supplementation. Pioneering work involving extrusion of DDGS (dried down to only 30% moisture) in combination with either whole soybeans or hi-pro soybean meal is showing exciting promise. Much of the nutrient variability observed with the heating/drying process of DDGS is eliminated by only reducing the moisture in WDG to 30%. Combined with ground raw soybeans and subjected to extrusion processes, negative nutritional factors are overcome and a potentially enhanced protein supplement results that is superior to either source individually. This technology bears consideration.

Additionally, there are opportunities for the use of calcium carbonate to improve flowability and reduce caking of DDGS. Already being used in the handling of processed SBM for improved flowability, calcium carbonate would be useful in other ingredient considerations as well. Unical-S will provide improved flowability properties (10-30 lbs./ton) when included at 0.5 to 1.5 percent. At 0.5 %, the concentration of added Ca will be roughly 0.2%, with a 1.5 % inclusion rate resulting in just under 0.6% added Ca.This range of inclusion rates will work well for anti-caking purposes plus avoid an adulterated product in terms of meeting "tag" guarantees.

Recent CaCO Issues

Two issues stemming from "regulatory compliance" perspectives recently have surfaced.

1. *Is CaCO3 safe?*

Anyone who is associated with this product certainly recognizes that it is safe, so this may seem like a foolish question. However, there are government regulations for nearly everything, and compliance with government regulations is not only important but necessary.

THUS: According to the ***Code of Federal Regulations:***

Calcium Carbonate falls into two categories:

A. Nutrients and/or Dietary Supplements **(21CFR582.5191)** {"…This substance is generally recognized as safe when used in accordance with good manufacturing or feeding practice."} This is known as G.R.A.S.

B. General Purpose Food Additives **(21CFR582.1191)** {"…This substance is generally recognized as safe when used in accordance with good manufacturing or feeding practice."} This is known as G.R.A.S.

2. *Is calcium carbonate "organic"?*

Yes, it certainly is. According to the USDA's National List of allowed and prohibited substances that qualify officially as organic, the following rulings have been made:

a. Under rule **§205.605** (Nonagricultural (nonorganic) substances allowed as ingredients in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))." *Calcium* carbonate is specifically listed. *{Comment: One may question the designation as a nonagricultural substance, but the point is calcium carbonate is listed.}*

b. Under rule **§205.603** (Synthetic substances allowed for use in organic livestock production). *Mineral oil – for topical use and as a lubricant* is allowed. This would allow for any "dust treatment" of our $CaCO_3$ products to be acceptable.

Mad Cow Disease *continued*

The disease agent for BSE has been found only in brain tissue, spinal cord and retina of naturally infected cattle. If the BSE agent is present, cattle consuming feed containing these parts would be infected. But do cows eat brain tissue and spinal cords? Such parts would have been present, along with many others, in the years when cattle were fed "Meat and Bone Meal." This product has not been an acceptable or even allowable ingredient for cattle feed in the U.S. since 1996. In 1997 the FDA banned the use of "at-risk" mammal-derived protein by-products in feed for cattle. The majority of this movement was voluntary *action* by the feed industry, not just *reaction* to governmental mandate. However, there is ongoing concern that any possible contamination could remotely find its way into cattle feed and into possible human infection through food. This makes truck clean out and inspections vitally important.

ILC Resources has taken action in this arena for some time with quality control measures at our plant locations and transportation policies in place. We do not allow indiscriminant "dumping" or clean out of trucks arriving at our plant locations. Trucks must declare prior load material. They are allowed to clean out trailers only in designated areas. Upon arrival at points of load-out, the trucks (or rail cars) are carefully inspected for possible contamination. We have refused loading due to overt contamination. ILC Resources requires haulers to take direct responsibility for any consequences of contamination – especially on this issue of Meat and Bone Meal relating to BSE. ILC Resources is working toward a *Certification Program* in coordination with AFIA (American Feed Industry Association) that addresses strict policies to eliminate possible contamination. We are complying with the necessary measures and will soon submit ourselves for inspection and certification.

While the entire issue of BSE and *real danger risks* are quite remote, the loss of one human life is well worth our consideration. A good business reputation is important. We have devoted 80 years to acquiring and adhering to quality and honesty. We take these hazards challenging our industry, our business, and our very lives seriously. Every individual is a responsible part of the *quality control* measures at ILC Resources. In partnership with our business customer base, further strength is added to this effort, and to our commitment to be part of a responsible industry.

For additional information contact

Richard H Bristol, MS
ILC Resources Director of Nutrition and Technical Services

ILC Resources
500 New York Avenue
Des Moines, Iowa 50313
(515) 243-8106
Fax (515) 244-3200 • 1-800-247-2133
www.ilcresources.com
richardb@ilcresources.com

CaCO as Flowability Aid

ILC Resources continually receives inquiries regarding $CaCO_3$ use as a flow agent. Bridging or caking of warm materials is a problem for the feed industry. Whether this is a result of production of high urea cattle feeds, the manufacturing of soybean meal or the processing of distillers dried grains, bridging of product may occur and result in handling concerns.

Our calcium carbonate product, Unical-S, has provided some relief to this situation with its inherent "anti-caking" properties. The distribution range of fine particles in this product (less than 300 microns per average particle) has improved flowability by preventing caking or clumping when interspersed between particles of different ingredients predisposed to bridging.

Unical-S has an approximate pattern of particle size dispersion of nearly 270,000 particles per gram. The inclusion rate of 0.5 to 1.5 percent (10 – 30 lbs. per ton) for effectiveness is relatively low and does not result in an adulterated product. At these rates, more than 600,000 to nearly 2 million particles of calcium carbonate will be dispersed among the feed particles in each *pound* of ingredient. The even distribution of the application is the challenge, not whether enough has been added.

At this level of inclusion, miniscule amounts of Ca are added to the finished product. Calcium levels will be elevated by 0.19 – 0.57%. While other flow agents have been used, one additional benefit to using $CaCO_3$ is the fact that it provides a positive nutritional contribution to the resultant product, versus some other choices that provide none.