

## NEWS COLUMN

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January 2, 2008

### Feeding Distillers Grains? Watch Sulfur Content

Distillers by-products are a great source of protein for cattle producers.

It is projected that by 2013 30% of the corn produced in the United States will be used in ethanol production. Every bushel of corn used in that process is converted to 2.3 gallons of ethanol and 18 lbs. of distillers' dried grains (DDG). A single mid-sized ethanol plant that produces 40 million gallons a year also turns out more than 130,000 tons of DDG-enough by-products to satisfy the protein needs of nearly 200,000 feedlot cattle.

While many producers see distillers grains as a great feed source caution is waved regarding feeding too much. There are some real risks associated with over feeding distillers that could result in sulfur toxicity and the death of cattle consuming it.

Experts recommend no more than 15% of the total mixed ration on a dry-matter (DM) basis be distillers grains. Producers using levels any higher are taking unnecessary risks with their cattle.

While sulfur is an essential component of the ruminant animal's diet, high concentrations of the mineral in the total ration can be fatal. A total (DM) intake from all sources (including water) above 0.4% is considered above the tolerable level by NRC standards and can lead to polioencephalomalacia (PEM). PEM is caused by production of excessive amounts of hydrogen sulfide, a gas derived from rumen fermentation, which is belched and rebreathed into the lungs and transferred to the brain. Those animals that show clinical signs of PEM (brainers) will push their heads against solid objects or stagger in circles. Others may look into the sky with their heads thrown back over their shoulders. Other symptoms are respiratory distress, reduced feed intake and limited movement. Advanced signs of PEM include blindness, kicking at the stomach, and moaning followed by death within 48 hours. In a 2006 case study reported from a 5000 head facility struck with PEM, over 250 head died or had to be euthanized.

So why is this a problem in distillers grains? This can be traced back to multiple entry points or an accumulation of sulfur that goes on throughout the ethanol production process. Besides the accumulation of sulfur in the ethanol process plants can vary greatly from one batch to the next. This variability is due to the intermittent use of sulfur acid as a flow control agent. The slurry from the fermentation process begins to stick to the inside walls of the equipment. Adding sulfuric acid is the most inexpensive way to remove the material.

So how do I calculate sulfur content? The best way to deal with any potential sulfur problems is to first examine a herds total intake. Anything being consumed should be tested for sulfur content. (This also includes water) Water can be a real contributor to the overall percentage of the mineral consumed by the cattle. For example, if you had water with a sulfur content of 1,000 parts per million (ppm) and steers consuming 30 liters of water per day that equates to 12 grams of sulfur. That equals 0.1% in the total diet. Other feed sources are also high in sulfur. Corn gluten meal can contain more than 0.7% sulfur and rapeseed meal usually has over 1.2% sulfur.

Adequate mixing of TMR's containing distillers is also vital. Cattle really like the taste of DDG's and if not mixed properly some cattle are going to consume much more than you intended them to.

Some final thoughts on properly managing sulfur levels in rations.

- Learn as much as you can regarding the source of your distillers grains. Find out when and how much sulfur is added to the plant process.
- Determine both the average percentage of sulfur in the distillers grains and the percentage of its peak level.
- Remember an ethanol plants primary product is ethanol, not by-products.
- Test your water for sulfur content and balance it with the sulfur content of your ration.
- Pay attention to sulfur content of other feed sources. Remember the max sulfur content is 0.4% of ration dry matter basis.
- Make sure your ration is well-mixed in order to reduce the likelihood of the more aggressive animals consuming only packets of distillers delivered to the bunk.