



# Dairy Notes

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## Ruminant Feed Ban Rule Gets "Enhancements"

*Mortality management implications for renderers, meat packers, and dairy producers*

### ***New restrictions***

To further reduce the risk of BSE (Bovine Spongiform Encephalopathy – also known as mad cow disease), the FDA has added restrictions to the 1997 Ruminant Feed Ban. The 1997 Feed Ban prohibited the feeding of protein derived from mammalian sources (meat and bone meal for example) to ruminant animals (cattle, sheep and goats). When cattle consume these protein sources, there is greater risk for transfer of the BSE agent. The purpose of the 1997 Ruminant Feed Ban was to reduce this risk. The recent enhancements to the 1997 rule will take effect in April of 2009. They do not replace the rule, but rather strengthen existing safeguards against BSE. The new restrictions will:

1. Prohibit mammalian proteins from ALL animal feed, including poultry, swine and pet food, UNLESS it can be documented that the source does not contain brain and spinal cord from cattle older than 30 months. These tissues have greater risk of containing the BSE infectious agent. Infection is most easily transferred in rendered products if they contain materials from animals older than 30 months.
2. Place restrictions on tallow. Tallow may contain impurities which could include protein. The new restrictions allow tallow to be used for ruminant feed if it contains no more than 0.15% insoluble impurities. Tallow for use in other animal feeds does not have the restriction as long as it was not produced from prohibited sources. Tallow that is derived from prohibited material may not be used for any animal feed if it contains more than 0.15% impurities.

### ***Implications***

FDA's move has already begun to impact rendering companies who must implement protocols for determining the age of incoming carcasses and develop alternate processing technologies to remove and segregate brain and spinal cord tissue from all that are 30 months or older. Detailed records are required including documentation from their suppliers about the nature of materials received. Rendering costs will sky-rocket and revenue may be reduced.

### **Background**

Meat processing waste, dead farm animals and other perishable materials from food processing, restaurants and supermarkets are routinely taken to rendering facilities where they are processed into marketable products. The two main products of rendering are meat and bone meal (a high quality protein) and tallow (a high energy fat). These are used as ingredients in a myriad of products, including animal feed. Contemporary rendering is a high tech, modern version of an ancient practice that has served for centuries to recycle resources while protecting public health and the environment. Present day rendering companies are regulated by many state and federal agencies including the US Food and Drug Administration (FDA).

Meat packers have been removing brain and spinal cord from beef products since 2004, when FDA took action to minimize human exposure after a single cow tested positive for BSE in the US. Although their procedures for removal are already in place, the new restrictions require meat packers to segregate brain and spinal cord from other meat processing waste that routinely is rendered for animal feed. Dairy producers will need to provide age documentation for all dead stock picked up by or delivered to the rendering company. Timing will be critical, especially in summer because carcass decomposition prior to rendering impacts the ability to remove the prohibited tissue.

### ***Timeline for implementation***

All animal feed products in channels of trade after April 27<sup>th</sup>, 2009 must be in compliance. This means that the new protocols need to be in place very soon, in order to clear out inventory that does not meet the new restrictions and also to begin rebuilding inventory with animal feed that complies with the rules. Dairy producers need to start communicating with their rendering service provider very soon to establish a method for documenting carcass age. Dairies with DHIA and other herd management records can use these to verify age. Sorting and marking dead stock to distinguish those that are older than 30 months from those that are younger will be necessary. Signed certification regarding truthfulness of the age verification will be needed from each dairy supplier. Keep in mind that this will be a legal obligation subject to civil and criminal penalties. Certification forms will be provided by your rendering company. Contact them for details about their specific requirements. The south San Joaquin Valley area is served by Baker Commodities (559-237-4320) and Darling International (559-268-5235).

### ***Disposal of Cattle Material Prohibited as Animal Feed***

What happens to material that can not be used as animal feed? Older carcasses from which the brain and spinal cord have not been removed, any entire carcass from a BSE test positive animal and all of the prohibited tissue that is removed at meat packing plants or at rendering, are collectively referred to as Cattle Material Prohibited as Animal Feed, or CMPAF. The CMPAF must be disposed of by incineration, landfill, burial or some other alternate, non-feed method. In California, it is most likely that this material will be sent to landfills, at least initially. Landfill operators have already been alerted that this new

waste stream may be coming their way. Development of alternate uses which may be available in the future is underway.

### ***Carcass disposal options***

Rendering is the only legal option in California, unless an emergency is declared to allow alternate methods like burial, incineration or composting. There is tremendous concern that dead stock too badly decomposed for rendering will not be picked up, or that abandonment of carcasses in fields and roadways will become common because of increased rendering costs. These situations will create an enormous animal, environmental and public health challenge. Alternate legal options for disposal when rendering is not possible are sorely needed. Investigations currently underway by a multi-disciplinary team may lead to opportunities to utilize other disposal methods.

### ***Cost vs. risk***

BSE is not a contagious disease, meaning that it is not transferred directly from cow to cow. Scientists believe that transmission requires that cattle ingest feed that has been contaminated with meat and bone meal from an infected animal. In cattle with BSE, the CMPAF tissues are known to contain prions, the infectious agent. For perspective, consider that only three (3) BSE test positive cows have ever been found in the US. FDA estimates the additional safeguards will cost rendering and other affected industries about \$100 million per year.

### ***Additional resources***

More information about the Enhanced Ruminant Feed Ban will be forthcoming from industry trade groups, CDFA, rendering companies and others. You can also learn more on-line at the FDA's Center for Veterinary Medicine website, <http://www.fda.gov/cvm/bsetoc.html> and also at the National Rendering Association website <http://nationalrenderers.org/>. And as always, you are welcome to call your local UC Cooperative Extension dairy advisor if you have additional questions.

*Best Wishes for a safe and happy holiday season.*



# Milk Urea Nitrogen

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## What is Milk Urea Nitrogen?

Milk urea nitrogen (MUN), the concentration of urea in milk, is another tool that can be used to monitor the protein nutritional status of dairy cows. In the rumen, microbes degrade dietary protein to ammonia. When ammonia is coupled with fermentable carbohydrates, rumen microbes are able to capture it and synthesize amino acids and microbial protein. However, excess ammonia in the rumen is absorbed across the rumen wall and taken to the liver to be converted to urea. Blood urea is freely diffusible to milk, and therefore, MUN reflects the urea concentration in blood.

## What factors influence Milk Urea Nitrogen?

The factors that influence MUN values the most are the concentration and balance of nutrients in the diet. Feeding the following rations will result in wasted feed protein and high MUN values: rations high in crude protein, rations high in rumen degradable protein and soluble protein, and rations low in fermentable carbohydrates.

Other factors that affect MUN concentrations:

- Water intake: increasing water intake, increases urinary production and decreases MUN.
- Dry matter intake: urea concentrations are the highest 6 hours after feeding and the lowest prior to feeding.
- Time of feeding related to milking: a.m. samples are usually lower in MUN than p.m. samples.
- Level of production: MUN is higher in high producing herds than in low producing herds.
- Method of feeding: separate ingredient feeding increases urea concentration more than TMR feeding.
- Parity: MUN is higher in multiparous cows.
- Season: heat stress increases MUN values.
- Milking frequency: herds milked 3 times a day tend to have higher MUN than those milked 2 times a day.

## How should I use MUN values?

Research studies suggest that the most desirable MUN for Holstein cows range from 10 to 14 milligrams per deciliter (mg/dl). High concentrations of MUN (> 14 mg/dl) indicate an excess in protein feeding and/or deficiency in rapid fermentable carbohydrates. Low concentrations of MUN (< 10 mg/dl) indicate protein-limited diets. If MUN values are outside the normal range, the ration, the milk

components, the feeding program and the nutrient balance should be evaluated.

Many factors affect the MUN values, across herds and within herds. The variation is so wide that MUN in individual Holstein cows ranges from 5 to 20 mg/dl. So, every herd can have a **different optimal MUN** value. Individual cow samples should be summarized into groups to establish the different baselines. The cow group baselines may range from 8 to 16 mg/dl.

**Changes in MUN baseline** greater than 2 to 3 points should be investigated to identify the factors causing the shift. High **cow-to-cow variation** within a group, even if MUN falls within the normal range, suggests feed bunk problems such as feed mixing, delivery or sorting.

## What if MUN falls outside the normal range?

If MUN indicate inefficiency in protein feeding, you should evaluate your feeding program:

- Check that formulated rations are targeting the nutrient requirements especially for crude protein, rumen degradable protein, rumen undegradable protein, starch and sugars.
- Check that the ration is balanced based on current feedstuff lab analysis.
- Make sure rations are routinely reformulated based on dry matter.
- Make sure your employees follow the proper loading instructions and they are consistent in their mixing and delivery time practices.
- Evaluate the feed efficiency and conversion of nitrogen from feed to milk.

As an example, a shift in MUN can be observed when cows are fed: a corn silage that is lower in fermentable carbohydrates, unprocessed or improperly process; an alfalfa hay that is higher in crude protein; a protein source that has a larger fraction of rumen degradable protein.

## Take home message

MUN is another tool to monitor the protein nutritional status of dairy cows. MUN values should only be interpreted after examining the entire feeding program.

MUN values are highly variable across herds, so the greatest benefit is to evaluate a group of cows within a herd, and the cow-to-cow variation within a group.

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- *Mortality Management Implications of New Feed Ban Rules*
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