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Texas Agricultural Extension Service

The Texas A&M University System

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MILK UREA NITROGEN (MUN) TESTING AFFORDABLE AND AVAILABLE

Michael Tomaszewski, Ph.D.

MUN testing has been available for several years, but only recently has this procedure been available to Texas producers. The DHI lab at Texas A&M University can evaluate individual cow, pen(s) or whole herd samples. Depending upon where samples are sent, the cost ranges from \$.15 per cow up to \$5.00 per single sample. Texas DHI currently charges \$2.00 per sample.

Reasons to test for MUN include:

- ◇ Meeting nutritional requirements,
- ◇ Lowering feed costs,
- ◇ Increasing reproductive performance,
- ◇ Increasing milk and milk protein yield, and
- ◇ Reducing nitrogen excretion into the environment.

What benefits can I expect from MUN testing?

Research from Cornell University suggests as much as a ten to one return on the cost of MUN testing, depending upon cost and assuming feed program changes are necessary and implemented effectively. This reflects savings in feed, increased conception rate, and reduced number of days open. You can also expect increased milk production because the extra energy cows spent on urea excretion will be used for milk production.

For example, if MUN concentration is greater than 20 mg/dl, synthesizing urea requires enough

energy to produce about 7 pounds of milk per cow per day. In addition, lowering urea decreases manure odor concerns.

Milk Urea Nitrogen Basics

Urea is an organic molecule made of carbon, nitrogen, oxygen, and hydrogen. It is a normal component of milk and a source of the non-protein nitrogen found in it. Urea is a metabolite of ammonia. As protein is digested in the rumen, ammonia is formed and either used by rumen bacteria or released into the blood. Ammonia is highly toxic, so the kidneys and liver neutralize it by converting it into harmless chemicals, including urea. Urea readily diffuses into milk from the blood. Therefore, testing for urea levels in milk indirectly determines the urea content of blood. Urea is also excreted from the body in urine. MUN levels are affected by several dietary factors, including protein, energy and water intake. Testing for and understanding MUN values can identify potential problems in your feeding program.

Research from the University of Pennsylvania indicates that MUN levels in herds with optimal dry matter intake fall between 10 and 14 mg/dl of milk. However Illinois and New York reports have recommended a range of 12-17 and 12-18 mg/dl of milk, respectively. The exact range will depend on the lab to which samples are sent. A general rule however is if group or herd averages are less than 10

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mg/dl investigate whether sufficient protein is available. If the average is above 20 mg/dl check to see if too much crude protein or rumen degradable protein is in the ration.

What impact do high MUN levels have?

Elevated MUN concentrations indicate overfeeding of protein or underfeeding energy. Excessive protein feeding increases costs and may reduce reproductive performance. Urea production from protein digestion uses energy that might otherwise be used for milk production. High MUN levels also suggest your herd is excreting excessive nitrogen into the environment. Reduce your herd's MUN concentrations by feeding less protein or by simultaneously feeding more carbohydrates.

What impact do low MUN levels have?

Low MUN levels suggest too little soluble protein intake, which is associated with decreased milk and milk protein production. Protein deficiencies also lead to weight gain if energy is available. Supplying more rumen degradable protein (i.e., urea) may help overcome the problems.

How can I establish an MUN testing program at my dairy?

Step 1: Establish a Baseline MUN for Your Herd.

Establishing a reliable baseline MUN value for a herd usually takes two to three months. For small herds, samples can be collected from all cows. For larger herds, collect samples from 10 percent of the herd or 10 percent of each group. When evaluating the results, look at MUN values for the entire sample set rather than for individual animals because individual MUN concentrations typically vary about ± 6 mg/dl from the group average.

Step 2: Know when and how to collect milk samples.

Collect samples for MUN analysis at normal milking times. A sampling device has been developed that allows you to sample strings or pens of cows. This device, available through Texas DHIA, has been used in California and other areas as well. If individual cow samples are desired, samples obtained for normal DHI

testing may be used, provided the lab is told to run the additional test for MUN.

Step 3: Know when to test for MUN.

Monitor your herd by testing every three to four months, or when any of the following occurs:

- Major change in the rations,
- Cows are turned out to pasture, or
- New forage is used.

Consider MUN testing for diagnosing the causes of:

- Decrease in milk protein,
- Changes in fecal consistency, or
- Decrease in conception rate.

(All these problems can result from improper protein or carbohydrate feeding.)

Step 4: Interpret MUN values.

Remember to focus on the group mean rather than on individual MUN values when deciding if feeding changes are needed. While MUN values can be a valuable tool for managing your herd's feed program, do not isolate them from other management procedures. In some cases, MUN values may be within the acceptable range even though protein is not adequately balanced in the diet. Considering multiple factors when evaluating your herd's diet can help prevent costly mistakes.

For additional information on MUN testing for your herd, contact Michael Tomaszewski at (409) 845-5709, Texas Agricultural Extension Service.

Sources:

University of Pennsylvania School of Veterinary Medicine
University of Nebraska Institute of Agriculture and Natural Resources
Texas A&M University Department of Animal Science



BRING THE INFORMATION HIGHWAY TO YOU

Thomas Smeding and Michael Tomaszewski, Ph.D.

The old adage, "If it ain't broken, don't fix it" often turns up in dairy operations. People don't want to change because they believe current practices work well enough. Maybe it's time to consider changing to and using the Internet. Here's why.

The potential consequences of elevated somatic cell counts (SCC) on udder health are critical -- you need SCC test results on a timely basis. In recent years, various ways have been tried to get your herd's somatic cell test results back to you rapidly. First, results were mailed directly from the TDHIA lab to you to eliminate the processing holdup at DRMS. However, your records were still at the mercy of the U.S. Postal Service for prompt delivery. More recently, results were faxed to producers as soon as they became available. This helped but sometimes faxes are difficult to read.

Use the Internet to Communicate

Fortunately, the Information Age brought us Internet technology. It is a do-able and available avenue for communication. All areas of the state have local providers of Internet service (called ISPs), so there's no long distance calling involved. This technology allows for fast, rapid and inexpensive communication. Why not use the Internet as the foundation of our communication network?

Although Texas DHI has had a web site for several years (<http://tdhia.tamu.edu>), it contained non-time sensitive material and no herd specific data. It was essentially a reference page.

However, that has changed. You now have the ability to go on-line and access information about your herd. Since this is your data, we have built two *firewalls* to prevent unauthorized access to your database: You must know your herdcodes and your remote access code (RAC). You can change the RAC at any time if you feel that your herd's privacy might have been compromised. (Unfortunately, we can't handle that on-line, so just call our office to request the change. You still control your data!)

This new procedure is available to all herds tested through the Texas DHIA laboratory. A herd need not be processed through a processing center to

have access to this data. Also, we have redesigned the database to maintain information from previous and current months within the same database. This allows you to compare past and present herd performance data. You can identify which cows increased, decreased and stayed the same with respect to SCC.

Another big advantage is that you can compare your herd against other herds in Texas. With an on-line query, you can pull up herds by location, housing type, herd size, etc., and compare your herd's performance to others. You set the query, so you determine the comparisons. Remember, not all herds are processed through DRMS so not all variables are available on all herds.

Accessing the Site

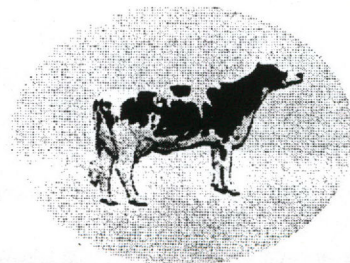
How do you use it? Simply point and click. If you want your *hotsheet*, sign on to the TDHIA site at:

<http://texasdhia.tamu.edu>

and select the 'Members' icon. When asked for your herd code and password, enter your assigned numbers. Point and click through the remainder of the menu selections. If you wish, you can print the reports you see. No more waiting. The new site is best viewed using Microsoft Explorer 4.0_, although it also works with other browsers.

In an effort to keep new technologies available to Texas producers, we have developed many products that have become widely used in the industry. The CTAP program, developed by TDHIA in the early 90s, is now used nationally and internationally as an evaluation tool. The Internet is our next platform. Timely SCC results are a good reason to try it!

**And the cost
is right--
It's free!**



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- Dec. 14, 1999 DOPA Training, 8 hours
Hopkins Co. Civic Center, Sulphur Springs, TX
Contact: Larry Spradlin - (903) 885-3443
- Mar. 23-25, 2000 Annual Professional Dairy Heifer Growers Conference
Contact Brenda Carlson - (877) 434-3377



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