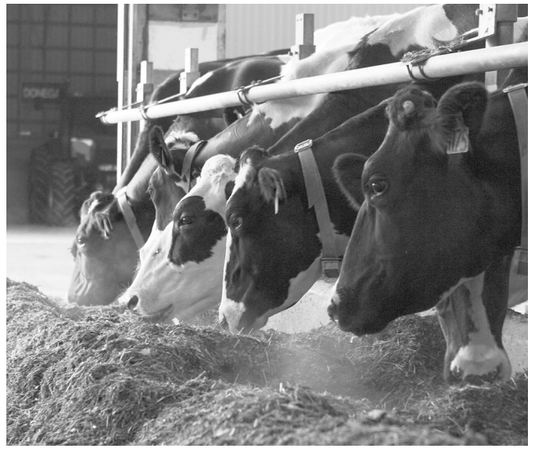
WHY TEST FOR MUN?

By Nyles Peterson, University of California, Co-operative Extension, and LawsonSpicer, Ph.D, Nutrition Consultant, Cal Poly Pomona University. Reprinted from California DHI publication.

Why look at MUN's? A dairy cow uses protein, which contains on average 16% crude nitrogen, which is broken down and used by the animal. Excess nitrogen from protein is converted to urea in the liver. Blood carries urea from the liver to several points of elimination. Some urea finds its way back into the rumen. The animal excretes the rest in the urine, manure or milk. Scientists have learned that there is a strong positive correlation between Blood Urea Nitrogen levels and Milk Urea Nitrogen levels.

In recent years equipment capable of measuring the nitrogen level in milk has been developed. The following key points come from research:



MUN will be high when there is too much protein for the amount of carbohydrate energy available to rumen bacteria.

VARIATION

- MUN concentrations are highest from July to September.
- MUN is lowest during the first 60 days of lactation, higher between 60 and 150 days in milk, and lower after 150 days in milk.
- MUN is generally lower in first lactation animals.
- MUN levels are highest within a 2 to 6 hour period after eating.
- In herds with an alternating AM/PM test schedule, MUN is generally lower in AM than in PM tests.

REPRODUCTION

- Increased MUN is statistically associated with decreased fertility.
- Increased MUN is associated with a lower detectable pregnancy at herd checks.
- Cows with MUN levels below 10 mg/dl are 2.4 times more likely to be confirmed pregnant than cows with MUN levels above 15.4 mg/dl.

FEED COSTS

- Higher herd MUN is associated with higher feed costs per pound of milk fat, lower gross milk revenue and lower income over feed costs.
- MUN offers a useful tool for monitoring the efficiency of nitrogen utilization in commercial dairy herds.
- Diets may be balanced to achieve greater efficiency of nitrogen utilization, lower milk urea concentration, and lower feed costs, while still achieving high production. This may lead to improved income over feed costs.

Since cows have the final vote on a ration, MUN can be viewed as a report card on a herd's protein - energy balance. MUN will be high when there is too much protein for the amount of carbohydrate energy available to rumen bacteria. While high MUN levels will indicate the relatively high protein energy ration, they do not necessarily indicate which of these two nutrients are in relative excess or deficiency.

The place to start is to establish an acceptable concentration range for your herd. The generally recognized range for a group of Holstein dairy cows is 10 to 16 mg/dl. We recommend taking samples on a monthly basis and working with your nutrition consultant to establish the proper action for your herd.

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CATALYST

New Ketosis Testing Service from DHI

Dairy producers and their advisors understand the importance of a successful transition period and early lactation. However, Ketosis continues to be a common problem on many farms.

Studies have estimated the incidence rate of subclinical Ketosis to be in the 30-40% range, and as high as 60-80% in some herds. Subclinical Ketosis results in lower milk production, higher risk of mastitis and metabolic diseases as well as a negative impact on reproduction, all adding up to significant cost.

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For that reason, some herds will monitor the level of Ketosis with the use of on farm tests. The new milk test from DHI now provides another testing option to help monitor the level of subclinical Ketosis in the herd.

The Ketoscreen test uses the regularly collected DHI samples and measures the level of beta-hydroxybutyrate (BHB), a ketone body, which when found in high level is an indication of the risk for Ketosis.

As the name implies, the Ketoscreen service is meant to be a herd screening tool that provides an overview and trend of the Ketosis status and risk in the herd. Results can be used to help assess and monitor the dry and early lactation periods, with a focus on prevention and reduction of Ketosis. Without regular measuring, it is impossible to assess where your herd is at and difficult to make improvements.

The Ketoscreen test uses the routine DHI samples through the high speed automated lines, therefore making the service convenient and inexpensive.

According to Richard Cantin, Manager of Customer Service for DHI, convenience and affordability will be key selling points of this new service. "Collecting a blood, urine or milk sample for on farm Ketosis testing is time consuming and inconvenient, which means it often doesn't get done. The fact that the DHI sample can now be used makes it incredibly convenient." He adds, "at 10 cents per sample, Ketoscreen is a very inexpensive way to keep an eye on your overall subclinical Ketosis level. That value is hard to beat."

For more information, talk to your local DHI representative or contact DHI at 1-800-549-4373.

Subclinical Ketosis Has Hidden Costs

By Todd Duffield, Department of Population Medicine, Ontario Veterinary College, University of Guelph, Ontario, Canada

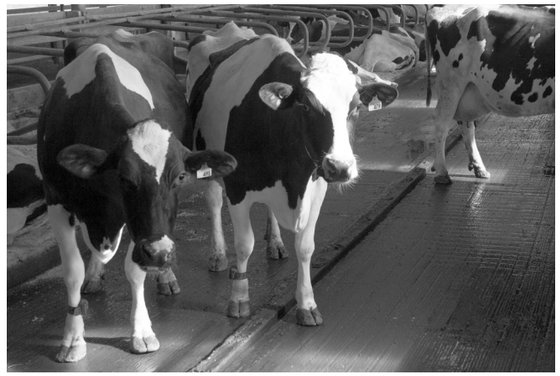
Ketosis is underrecognized on most farms. It has two forms; clinical (observed) and subclinical (unobserved). However, regardless of category, excess concentrations of ketones (also called hyperketonemia) in early lactation hurts cow health, milk production, and breeding.

Subclinical ketosis is created by an excessive demand for nutrients by the mammary gland to produce high quantities of milk, coupled with an inadequate feed intake to meet that demand. This situation creates a negative energy balance, and the cow responds by mobilizing body fat stores (nonesterified fatty acids or NEFAs). These NEFAs are transported to the liver where they are either used for energy, converted to ketones (beta-hydroxybutyrate, acetoacetate, acetone), or stored in the liver as fat (fatty liver). The process itself is a normal part of early lactation cow physiology. However, cows that have a poor adaptive response to negative energy balance have excess ketone production, excess fat storage in the liver, or both. These are the cows with subclinical ketosis.

The primary risk period for subclinical ketosis is the first two weeks of lactation. Occasionally, herds will have subclinical ketosis issues beyond this time period, but this is not common. There are several tests available to detect subclinical ketosis in either blood, milk, or urine. The gold standard is serum or blood beta-hydroxybutyrate (BHBA) measured at a laboratory.

Early studies from prior to and including 1995 using the gold standard test (lab - BHBA) reported incidence rates approaching 40 percent when measured during the first two months of lactation. More recently, a study conducted across North America in Ontario, New York, Minnesota, California, and Georgia showed the average herd incidence of subclinical ketosis for the first three weeks of lactation was 32 percent with ranges from 3 to 80 percent. This more recent data confirms that subclinical ketosis still is a common problem on most farms.

Several studies have now been conducted that illustrate the costs of subclinical ketosis. Cows with subclinical ketosis in early lactation are at greater risk of developing displaced abomasum, metritis, clinical ketosis, and mastitis. Those cows produce significantly less milk at first DHI milk test (reductions of 2 to 7 pounds per day), and cows that had subclinical ketosis during the week



after calving produced 660 pounds less milk for the full lactation.

Using recent estimates, an average herd of 100 cows would have a 30 percent incidence of subclinical ketosis, and this would cost the farm $16,425 annually.

Cows with subclinical ketosis also have been shown to have a 40 percent reduction in the first service conception rate and are more likely to be culled during early lactation. Taken together, these costs are substantial. Using recent estimates, an average herd of 100 cows would have a 30 percent incidence of subclinical ketosis, and this would cost the farm $16,425 annually.

All risk factors for subclinical ketosis relate back to the basic cause . . . dry matter intake and milk production potential. Cows or heifers with greater milk production potential are at a greater risk of subclinical ketosis. Therefore, older cows tend to be at higher risk than first-calf heifers.

Overconditioned cows tend to eat less. Therefore, cows with higher body condition scores before calving (especially above 3.5) are at a much higher risk. The same is true for first-calf heifers.

Herd risk factors include anything that could limit dry matter intake such as overcrowding, frequent mixing of transition cows, too few or too many transition diets, heat stress, limited bunk space, and so forth.

MUN & BHB Pricing Discount

At 10¢ per sample for BHB analysis, and 25¢ for MUN, either on their own is very affordable. But combined together, you will receive a discount and pay only 30¢ for both. So for the many herds already using MUN on a routine basis, adding BHB analysis will cost very little.

To take advantage of this discount, simply request both MUN and BHB analysis from your DHI representative on test day.

Easy Record Keeping

In an effort to streamline and consolidate herd events, each year DHI Field Staff distribute the the DHI Herd Event Log Book to producers as a Herd Management Tool.

ALL YOUR HERD EVENTS IN ONE HANDY SPOT

Conveniently sized, the Log Book is a handy way to easily record and maintain herd events such as:

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- Sold Cows & Breeding
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The DHI Log Book meets the requirements and standards set by the Canadian Dairy Breeds, Canadian Quality Milk Program (CQM) and the National Livestock Identification Program (NLID). As such, it is an ideal way to keep record of all mandatory Health Treatments required by CQM

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Call DHI at 1 800 549 4373 to purchase a Log Book for $20.00 (includes shipping and handling).

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