

FARM REPORT



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FROM THE PRESIDENT'S DESK — DON'T FORGET THE WATER!

As the heat of summer approaches (has already been here in many cases) and our thoughts turn toward heat stress abatement, let's take a moment to assess if our cows have access to sufficient water. Water is the most important nutrient for dairy cattle! Dairy cattle suffer more quickly and severely from a lack of water than from a deficiency of any other nutrient.



Major factors affecting water intake by dairy cattle are: 1) feed intake, 2) milk production, 3) dry matter content of the diet, 4) temperature and environment, and 5) sodium intake. Lactating dairy cows require about 5 units of water for every unit of milk produced. High producing cows require at least 50 gallons of water every day.

coincides with a major period of eating activity as well as milking equipment cleaning. Water pressure must be adequate to supply all tanks and waterers during this high-use period.

There should be no more than about 20 cows per waterer in free stall barns. The waterer placement must be convenient and readily accessible by all cows in the pen. Excessive accumulation of water in lots or holding areas must be avoided or increased mastitis will result. Cows waiting to drink, or bunched in corners of a pen, are good indicators that waterers are misplaced.

When given the opportunity, cows tend to alternately consume feed and drink water. Ideally, fresh, clean water should be available to the cow whenever she consumes feed and it ought to be within about 50 feet of the feeding area. Dairy cows drink approximately 30 to 50% of the total water consumed daily within the first hour after milking. This time

See **WATER**, Page 9



HOW DO YOUR CALVES MEASURE UP?

The Dairy Calf & Heifer Association (DCHA) has developed a set of gold standards for calves and heifers regarding performance and animal welfare. The gold standards were developed by a team of producers, contract growers, consultants and industry representatives, DCHA members, and university specialists across the United States. Highlighted below are some of the goals and recommendations for Holstein calves from birth to 6 months of age which producers should work towards.



Mortality

- Given that some calves are born with a heartbeat and breathing, yet die not long after birth, the age of 24 hours shall be used to distinguish between "dead-on-arrival" (stillbirth) and "calf mortality."
- All newborn calves should be placed in an environment that will be safe from adult animals and adult animal diseases.
- Every newborn calf should receive care to its navel to control infection.
- Target mortality rates are:
 - o 24 hours to 60 days of age: < 5%
 - o 61 to 120 days of age: < 2%
 - o 121-180 days of age: < 1%

Morbidity

- Defining scours as a case of diarrhea which requires any intervention for more than 24 hours, target morbidity rates are:
 - o 24 hours to 60 days of age: < 25%
 - o 61 to 120 days of age: < 2%

- o 121 to 180 days of age: < 1%
- Defining pneumonia as a case of respiratory disease which requires individual animal treatment with an antibiotic (does not include use of feed-grade medication fed with regular ration), target morbidity rates are:
 - o 24 hours to 60 days of age: < 10%
 - o 61 to 120 days of age: < 15%
 - o 121 to 180 days of age: < 2%

Growth Rate

- Target growth rate standards for Holstein calves are:
 - o 24 hours to 60 days of age: Double birth weight
 - o 61 to 120 days of age: 2.2 lbs. average daily gain
 - o 121 to 180 days of age: 2.0 lbs. average daily gain

Colostrum Management

- First feeding
 - o Colostrum equaling 10% of body

weight should be fed in the first 2 hours of life.

- Colostrum quality
 - o Colostrum should be free of blood, debris and mastitis
 - o Colostrum should be disease-free
 - o Test for quality with a colostrum tester or IgG test
 - o Target bacteria count (also known as standard plate count) is <100,000 CFU/mL
 - o Target immunity level of animals at 2 to 7 days of age is:
 - o blood serum total protein of >5.2 g/dL for maternal-source-colostrum-fed calves or serum IgG of >10.0 g/L

— Heather Dann
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*Reference: DCHA Gold Standards I: Production standards for Holstein calves, from birth to 6 months of age, across the United States – www.calfandheifer.org/?page=GoldStandards

The Heart's Delight Farm Heritage Exhibit is now open for the season!

The exhibit is open weekdays from 9 a.m. to 3 p.m.

May through October Free admission!

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DON'T LET ROUTINE PRACTICES AND TRADITIONAL CONCEPTS COMPROMISE YOUR COLOSTRUM MANAGEMENT

There is an old Chinese saying that habits and traditions will make you blind to mistakes. This motto was the first thing that jumped into my mind when I recently read several articles that challenge our routine practices and traditional concepts regarding colostrum management. A couple of good cases are listed below.

1) An esophageal feeder (EF) may reduce the absorption of IgG when a smaller amount of colostrum is fed.

Esophageal tubing is a convenient and quick way to feed colostrum when the calf is uncooperative or less responsive to the bottle nipple. A survey conducted on 55 Pennsylvania dairy herds in 2007 (PENN survey) showed that 20 and 14% of medium (101 – 200 cows) and large (> 200 cows) herds were only using esophageal feeder for the 1st colostrum feeding (Kehoe et al., 2007). A recent study compared feeding methods (EF vs. bottle) and colostrum replacer (CR) volume (1.5 vs. 3 L) on IgG absorption in calves at 1 day after birth (Godden et al., 2009; Table 1). An interesting result was that EF-feeding remarkably reduced the IgG absorption efficiency, serum IgG level, and total protein level compared with bottle feeding in calves that received 1.5 L of CR. Therefore,

58% of EF-fed calves were found as failure of passive transfer of immunity (serum IgG < 10 mg/mL within 2 days after birth) compared to 0% in the bottle-fed group. However, no difference was found between tube- and bottle-feeding in calves fed 3 L of CR. Since tube feeding cannot trigger the esophageal groove reflex and results in deposition of colostrum in the rumen, the author explained that a greater proportion of colostrum may be retained in the rumen when smaller volumes of CR are fed, consequently delaying the emptying of colostrum into small intestine for absorption. However, the negative effect of tubing may become less when a larger amount of CR is given and greater proportion of CR may pass into intestine for absorption.

2) Colostrum from first lactation heifers may not be as bad as you thought.

Heifer colostrum was traditionally considered as low quality due to the lower IgG concentration. The PENN survey showed that 22% of the 55 herds surveyed still don't use colostrum from first-calf heifers even when they were short of colostrum storage. Contrary to this traditional concept, recent research showed that heifer colostrum is good

enough to be fed to newborn calves in well-managed dairy farms (Kehoe et al., 2011). The study was conducted at three commercial dairy farms (~700 to 1800 cows/herd) with >500 colostrum samples collected from first-calf heifers and older cows (Table 2) Despite the lower IgG content compared with that of older cows, the average IgG concentration in first-lactation heifers was still more than 50 mg/mL, a benchmark value generally determining the quality of colostrum. Hence, discarding the heifer's colostrum may unnecessarily limit the supply of colostrum. Some dairy producers may argue that they observed more sick calves when the heifer colostrum was used in their herds. As we know, the heifers may be more susceptible to dystocia compared to older cows. Researchers have reported that calves that experienced a difficult birth had reduced intestinal absorption of IgG. Therefore, the stressed calves themselves may be the reason for more sick cases rather than the "poor quality" of heifer colostrum.

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* References are available upon request.

Table 1. Passive transfer indices for calves fed 1.5 or 3 L of colostrum replacer using either bottle or tube at 24 hours after birth.

Parameter	1.5-L by bottle	1.5-L by EF	3-L by bottle	3-L by EF
Serum total protein, g/dL	5.30	4.89	5.84	5.87
Serum IgG, mg/mL	12.5	9.8	19.6	18.6
Absorption efficiency of IgG, %	51.1	40.5	41.1	39.0
Calves with failure passive transfer, %	0	58	0	0

Table 2. IgG content and volume of colostrum from cows varying in parity.

Item	Lactation number			
	1	2	3	> 4
Number of cows	172	130	94	93
Volume of colostrum, L	6.2	6.1	6.8	6.5
IgG, mg/mL	84	93	107	113
IgG, g	533	579	620	690

FERTILIZER PRICE PREDICTIONS: WIN SOME, LOSE SOME

One of the hazards of making price predictions in print is that your predictions are out there for everyone to see, sometimes with humbling results. Last November I noted that only once in the past 10 years have fertilizer prices been lower in the spring than during the previous fall, and that while there were no guarantees I wouldn't wait to order spring 2012 fertilizer needs. By January, though, I was wondering (again, in print) about that recommendation since it looked like nitrogen prices were going to take a tumble with UAN solutions leading the way, while it appeared that diammonium phosphate prices could decline by 5% or so because of increased inventories.

As it turned out, if you ordered 2012 starter fertilizer last fall you made the right decision. Wholesale nitrogen prices remained low until just after the New Year, then shot up by hundreds

of dollars per ton, and started a steep decline after spring planting was underway. Wholesale phosphate prices remained stable from late fall until February (and were much lower than during the previous summer and early fall), then increased modestly during spring planting. Potash was the exception, with prices falling steadily throughout the winter and turning higher as the summer progressed.

Therefore, with the exception of muriate of potash, ordering fertilizer last fall or early winter would have been a very good decision. And my November comments referred to spring fertilizer needs, while most potash is applied during the summer.

That was then, this is now. It doesn't look like wholesale UAN or urea prices will increase much for the rest of 2012, neither will phosphate prices, though both N and P might be slightly

higher this fall than in fall 2011. What will happen to potash prices depends on whether potash producers continue to limit production in the face of significantly lower prices. Recent sales agreements with China and India, both huge potash consumers, will probably result in increasing muriate potash prices as we head into fall. Forecasts are for muriate of potash prices to bottom out this summer, so you might consider ordering the balance of your 2012 potash needs quite soon.

A caveat: The above comments and predictions are based on wholesale prices. There may be some delay between a change in wholesale price and the price quoted by your local dealer. If he has a bin full of muriate of potash that he paid for last winter, he may or may not be willing to give you a price that reflects current wholesale potash market conditions.

— E.T.

WORLDWIDE GM CROP ACREAGE INCREASES

To save time and effort we could simply reprint this article every year since each year the global acreage of genetically modified crops increases. But the numbers do change a bit, if always in the same direction. The envelope, please:

- A total of 395 million acres were planted to genetically modified crops last year, up 8% from 2010.
- No new countries approved the planting of "biotech" crops, but over 1 million more farmers (16.7 million vs. 15.4 million) in 29 countries planted them for the first time.
- With 170 million acres the U.S. has by far the largest acreage of GM crops, followed by Brazil with 75 million acres and Argentina with 59 million acres. These three countries account for over 75% of global GM crop acreage, but Canada and India are also sizable players with about 26 million acres each.
- Here in the Northeast when we consider GM crops we think of corn and soybeans, and more recently alfalfa, but U.S. farmers also plant genetically modified cotton, canola, sugarbeets, papaya (!) and squash.
- Even some countries that don't permit the planting of GM crops accept them for import. Most notable of these is Japan.

UPDATE ON VERMONT LEGISLATIVE ACTION ON FORMALDEHYDE USE IN FOOTBATHS

It is fortunate that legislative bill H.545, which proposed to ban the use of formaldehyde in footbaths on dairy farms, died in committee and was never brought to the floor for a vote. I commend the Vermont legislators for not passing a bill without understanding the facts about how formaldehyde is used on farms and understanding its importance to the well-being of dairy cattle when used properly. The bill H.774, which moved from the House to the Senate before the end of the legislative session in early May, gives the Vermont Agency of Agriculture, Food and Markets the authority to regulate the use of animal footbaths.

The bill indicates that the Vermont Agency of Agriculture and Department of Health are currently working with

federal authorities at the National Center for Environmental Health and Agency for Toxic Substances and Disease Registry to collect data and monitor air quality on and near farms where formaldehyde footbaths are used. Two study sites have been identified and testing is planned for the full month of May to evaluate both outdoor and indoor levels of formaldehyde in the air before, during and after manure spreading from farms that are using formaldehyde footbaths.

In early 2012, the Vermont Agency of Agriculture funded and collaborated with the Health Department to conduct tests to assess the farm environment as the formaldehyde solutions were mixed, used and then emptied into the manure pit. These tests found detectable

levels of formaldehyde in the area where formaldehyde was being poured into containers and inches above the footbath while in use. However, no levels of formaldehyde were detected in the breathing zone of workers when the footbaths were in use.

This issue was an eye-opener for me in terms of the legislative process and how the action of a few individuals with little or no knowledge about an agricultural practice can move quickly through the system to regulate its use. I'm glad the Agency of Agriculture and Department of Health are collaborating to collect scientific data on this issue before acting to restrict its use on farms.

— Katie Ballard
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CORN SHREDLAGE

A new word in our dairy/crop vocabulary, shredlage refers to whole plant corn that has passed through cross-grooved processor rolls that shred the plant (duh), with the objective of increasing digestibility. Theoretical length of cut is 30 mm compared to the 19 mm (3/4") typical with normally processed corn. Longer particle length can increase physically effective NDF.

On a February consulting trip to Indiana I had a chance to have breakfast with and then listen to a presentation on shredlage by Bob Sherer, the engineer who developed the shredder unit. Currently it's only available for 2011 and 2012 Claus Jaguar choppers, but a unit is being developed for John Deere choppers. The shredder replaces the processor unit, and the resulting forage sure doesn't look anything like "regular" processed corn. One of the several dairymen attending the meeting would have bought one on the spot but his Claus chopper was a bit too old.

Randy Shaver and his team at the University of Wisconsin have been evaluating shredlage in dairy rations, comparing shredlage to normal processed corn silage. So far the data is encouraging, with cows fed the shredlage diet tending to have higher dry matter intake, starch digestibility, kernel processing score and fat-corrected milk production. Even more encouraging is that fat-corrected milk response for cows on the shredlage diet increased as the treatment period progressed.

The shredlage process sounds good to me but I'm not mechanically inclined, to say the least. In fact, in this regard I'm only slightly more knowledgeable than the WWII Japanese soldiers who, when a truck wouldn't start, would beat it to teach the "engine demons" a lesson. (Only readers who have never kicked a tire in anger may laugh at this.)

— E.T.

CHECK FORAGE ANALYSES FOR ASH LEVELS

Hopefully you've had some forage analyses done on first cut forages as they were ensiled. You shouldn't balance rations on these numbers, but analysis of a few representative fresh-chopped samples should give you an idea of what you'll encounter when you start to feed that silage.

One number to check is ash level. Ideally it should be 10% or less, but the occasional 11-12% isn't anything to lose sleep over. However, consistently high ash concentrations need your attention, while an ash level of 14-15% is a sign that something definitely needs "fixin." Here are a few ideas to reduce ash concentrations:

- Mowing height — Just because your disk mower will let you shave fields to less than 2" stubble height doesn't



Think this farmer may have an ash problem in his alfalfa silage? Dry weather conditions can increase the potential of high-ash forages. (Photo courtesy of Steve Crosby.)

mean that you should. There's no hard-and-fast rule on stubble height since the ideal mowing height depends on species (mow grass higher than alfalfa), field topography (it is not recommended to use a disk mower as a land leveler) and the height of any stones left in the field.

- Rakes vs. mergers — Improper raking can result in the deposition of soil and other surface debris on the forage, with the amount depending on the skill (or lack thereof) of the raker. We saw an ash level of over 20% on the forage analysis on the first cut from an alfalfa seeding when the person on the rake apparently tried to pick up every last mowed stem. Mergers are somewhat more idiot-proof, though few things are immune to the sufficiently motivated idiot.

- Disk mower knives — Curved knives create more suction than do flat knives. If your ash concentrations are on the high side, an inexpensive and relatively quick fix may be to replace curved knives with flat ones.

— E.T.

NORTHERN NEW YORK DAIRY MANAGEMENT SURVEY

A collaborative effort between Miner Institute and Cornell Cooperative Extension of Northern New York



Cornell University
Cooperative Extension

We are looking for your participation! Your farm may receive a call looking for your help in conducting an on-farm survey to help us categorize dairy farms and current management practices across Northern



New York. The results of this survey will be used to develop programs of interest and demonstrate needs of our area farmers as well as to identify areas of research which would directly apply to current on-farm management strategies. The focus of the survey is primarily calf management, but also includes some information about lactating herd management. Participating farms will be entered into a drawing to win a \$100 gift card, with a winning entry drawn at the end of June, July and August! Entries are eligible for all three drawings as soon as we set a visit time, regardless of when we are able to visit your farm.

If you are interested in participating please contact one of the following:

Kimberley Morrill, PhD
Dairy Specialist
Cornell Cooperative Extension
Cell: (603)-568-1404 or (518)-564-0498
Office: (315)-379-9192 ext. 233
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FECAL FRACTIONS OF THE NASCO DIGESTION ANALYZER/CARGILL MANURE SCREENER

We've been working with the Nasco Digestion Analyzer (NDA), formerly the Cargill Manure screener, as part of projects to evaluate fiber digestion on-farm. Last October I wrote a *Farm Report* article discussing an ongoing study looking at fecal analyses relative to fiber digestion and milk production. We will discuss those results in a future issue. Here I would like to review some analyses of the particle fractions obtained with the NDA manure separator.

The NDA separator is comprised of 3 tiers of metal screens: top 4.76 mm, middle 2.38 mm, and bottom 1.59 mm. The sampling method we use is to obtain a ladle full, ~50 ml of feces from at least 10 fresh poops, combined into a single representative sample for the pen. (Number of samples depends on pen size, 10% is recommended). This results in about 500 g of feces to gently wash through the sieves. As the sieved particles are wet, only visual assessment of quantity and quality can be made on farm. Amount of DM or nutrients (starch, NDF, lignin) need drying and lab analysis.

Cargill originally developed a guide with pictures depicting "good" fecal particle distribution in the separator. Their recommendations are that <10% of particles should remain on the top screen, <20% on the middle screen and >50% of particles should remain on the bottom screen. The Cargill interpretations are included; we have not been able to find them on the web.

We thought it would be interesting to compare fecal particle distributions with

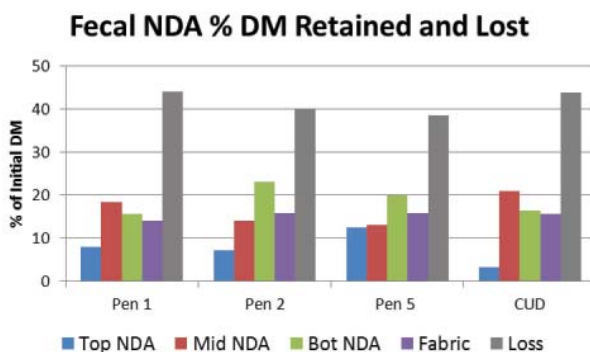


Figure 1

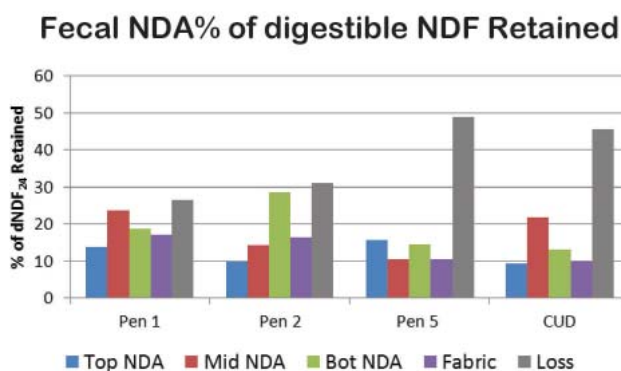


Figure 2

the NDA between our high cows (Pen 2) mid cows (Pen 1), late cows (Pen 5) and Close-up Dry cows (CUD) relative to the Cargill recommendations and also analyze the particles retained on each sieve for DM, NDF, NDFD₂₄. For this project we added a cloth fabric to retain particles that escape the bottom NDA sieve and then calculated amount of lost particles that passed through all. Starting with 500 g of as is feces, we gently washed the particles through the sieves with a shower nozzle. After about 5 min particles appeared clean and rinse water ran clear. We then observed and collected particles from each sieve into pre-weighed tins to document amount of DM retained. From initial fecal %DM and known starting weight, amount of initial DM of rinsed feces was calculated and used to calculate % of DM retained on each sieve.

Figure 1 displays %DM retained on each sieve and lost. For Pens 1, 2 and CUD there was <10% retained on the top screen, meeting the ideal recommendation. Pen 5, however, had >10% retained. All pens showed <20% retained on the middle sieve and <25% retained on the bottom. About 15% was retained on the fabric for each pen with 38-45% of DM lost across all pens. In spite of the CUD group diet containing about 15% chopped straw, these results show <5% on the top screen resulting from longer rumen retention time, greater rumination of fiber resulting in fewer long particles. Of note, Pens 1 and 2 diets differ from Pen 5 in that they contain BMR corn silage and higher quality haylage, possibly accounting for a greater amount on the top sieve.

As we looked at the NDFD₂₄ of each fraction and as a percent retained it is interesting to note that that the higher production, higher intake/rate of passage cows in pens 1 and 2 had more digestible aNDF retained on the sieves than did the low and dry cows (Figure 2). Not that we want our high cows to be as efficient as dry cows in terms of fiber digestion, but what amount of digestible aNDF in feces is acceptable or related to maximized milk production and rumen health?

Take-home points of using an NDA fecal separator:

1. It is difficult to visually assess % retained of wet fractions. Fractions should be compared on dry weight basis for quantifications.

See **DIGESTION**, page 8

HIGH-FORAGE RATIONS

I recently provided some advice to a dairy farmer who's bound and determined to put up enough high quality forage in 2012 to be able to feed an 80% forage ration to his 80-lb production group. Most farmers aren't going to this extreme but many want a higher percentage of forage in their lactating cow rations, especially when they look at their grain bill.

An easy statement to make about high-forage diets (at least 60% forage on a dry matter basis): It isn't easy. In fact it's really hard since everything falls to pieces if you don't mow first cut forage until after it's headed (grass) or after it blooms (alfalfa). You can feed late first cut to low producers and heifers, but if you want to replace grain with forage you need an increased amount of high quality forage (not all that difficult a concept) so there's little room for error. This is true whether delayed harvest was due to adverse weather or poor management. While a high percentage of corn silage in the ration gives you some flexibility, high-fiber, low-digestibility forage makes a tough challenge much more difficult.

I'd like to be optimistic about high-forage rations becoming common in the Northeast. However, between Mother Nature and human nature, few farmers will harvest enough low-fiber forage (40% NDF for legumes, 50-55% NDF for grasses) and high quality corn silage to make it possible. There will be too much corn silage harvested at less than 30% DM, resulting in lower starch content and lower whole plant digestibility. (I'm assuming that

a high-forage ration has the goal of maintaining good milk production. It's easier to make a high-forage ration "work" if your cows aren't making much milk to begin with.)

Some keys to high-forage rations:

- Harvest alfalfa at the bud stage and grass in the boot stage, even if it means sacrificing some yield — which it will. A very wet late May can doom even the best of plans.

- Plant corn hybrids adapted to your growing season and planting date, using management that will result in good yields of well eared, high-energy corn silage. Because of the uncertainty of weather conditions at the time of first cut, high corn silage diets and high-forage rations go hand-in-hand.

- Harvest corn for silage at 33% DM or higher, processing the crop so that the grain is highly available to your cows. You might consider BMR corn, but at least as important as hybrid selection is proper harvest DM.

- Ensile properly, regardless of storage structure. An additional 10% spoilage loss is even worse than a 10% yield loss because you've already spent the money to harvest and ensile the forage.

- Work with a competent dairy nutrition consultant, one who will rely on regular forage analyses to continually fine-tune rations for changes in forage quality.

— Ev Thomas
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DIGESTION, continued from page 7

2. Visual assessment is based on <50% of fecal composite sample retained. More than 50% of sample passes through all sieves of the NDA.

3. We agree with the original recommendations of <10% (visual minimum) on top sieve.

4. We want about 10-20% on each of the middle and bottom screens; want most to pass through all.

5. Proportion of digestible NDF retained is about 10-15% for late and dry cows and about 15-20% for high production cows. Is this a good thing???

6. %dNDF₂₄ decreases with smaller sieves for late lact and dry cows; longer retention times, greater digestive efficiency. Relatively constant across sieves for high production cows.

— Kurt Cotanch
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— Jeff Darrah, darrah@whminer.com

Original Cargill recommendations and interpretations:

Top Screen with: Ideal <10%

If >10% may indicate these issues

- Inadequate effective fiber
- Sudden ration change
- Low rumen degradable protein
- Inadequate sugar or starch
- Excess unsaturated fat

Long fiber particles, whole/large kernel fragments, cotton seed, soybeans

- Too much effective fiber
- Inadequate grinding of grains
- Excess grain feeding rates
 - Rumen acidosis
- Imbalance of NFC:RDP
- Wet TMR (<40% DM)

Middle Screen with: Ideal <20%

If >30% of total sample

- Imbalance of NFC:RDP
- Poor balance of starch and protein degradability
- Inadequate grinding of grains
- Excessive grain feed rate

Bottom Screen: Ideal >50%

Learn more about Miner Institute's Morgan horse herd by signing up for our quarterly equine newsletter, the *Stable Sheet*. Email
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WHAT'S HAPPENING ON THE FARM: LAURA'S LAST *FARM REPORT* ARTICLE

Summer has officially arrived and things are staying busy around the farm. Our crop season is well underway, and there are many new faces in the barn, as our new summer students have arrived. We would also like to welcome our new herdsman intern, Margaret Quaassdorff.

This will be the last Farm Report article I write, as my internship at Miner Institute has come to an end. When I arrived at Miner Institute last May I had just graduated with an animal science degree and was looking to gain more dairy experience. During this internship, I have learned herd health skills including how to diagnose and treat sick cows, assist

with calvings, and breed heifers. I also learned about many other areas including management, milking, calf feeding, and our reproductive and vaccination programs.

Working at Miner Institute also allowed me to take advantage of many other educational opportunities. Perhaps my favorite of these was a trip to the World Ag Expo in California. Here I was able to see how large western farms compare to farms in New York. Another fun learning experience was a hoof trimming clinic that I attended where I was able to try my hand at trimming. I truly appreciated being able to attend these events.

To sum up my internship, I learned more than I ever thought I would at Miner Institute and had a great time doing it. I now have the practical skills to complement what I learned in school. Hopefully this will make me a better employee of the dairy industry. The experience I gained has already allowed me to take another herd health position on a larger farm.

Finally, I would like to say thank you to Steve Couture and Anna Pape, and everyone that I worked with for teaching me what they know. I couldn't ask for better people to work with and for, and I think it will be hard to top the past year.

— *Laura Turek, Dairy Intern*

WATER, Continued from Page 1

Water troughs should be located near the feed manger or bunk, under shade, and in milking parlor exit lanes. Exit lane waterers are especially important on large dairies where cows need to walk 60 to 100 yards or more back to the barns from the parlor. It is recommended to have ~24 inches of water space per parlor stall in the return alley. For cows housed outside, when given a choice they will stay under the shade rather than walk in the sun to water. During hot weather, if cows only drink during cooler times of the day, then additional waterers need to be installed under a shade.

Water trough length should be at least 2 inches/cow, preferably 4 inches. Waterers should be long, shallow, and rapid filling to accommodate natural cow drinking behavior. More cows can drink from long, narrow troughs than from round troughs.

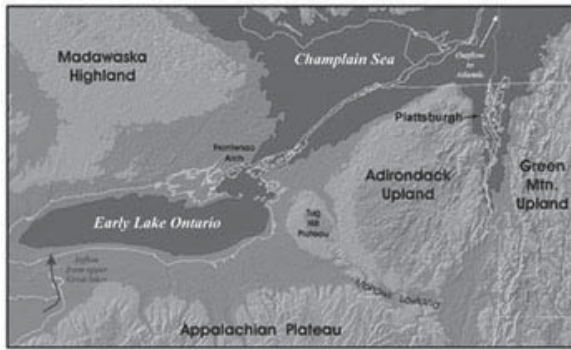
Cows should travel no more than 15 to 20 stalls to a water source. Studies at Kansas State University show that cows drink more water from troughs located in the center alley and near the pen exit as compared to troughs at the far end of the pen. So, when troubleshooting water availability on the farm, we need to consider not only amount of water space available, but also placement because cows do not use all water locations equally.

Now is the time to evaluate the water availability on your dairy – on those inevitable rainy days when you can't harvest haycrop. Too much water may slow you down in the fields, but you need to put water to work in your barns – making milk.

— *Rick Grant*
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A DAY ABOUT CLAY

Clay is common to many soils of the Champlain Valley. The amount of clay in a soil has a major impact on native fertility and drainage capacity. Clay not only has profound



a soil's cation exchange capacity (CEC), or its ability to retain nutrient cations such as Ca, Fe, K, and Mg. The amount and type of clay largely

effects on soil properties, but has also been implicated in the formation of life itself due to its unique ability to interact with amino acids and act as a catalyst for the abiotic synthesis of RNA. On June 1 Annelid Environmental Services, Middlebury College, and the VT NRCS sponsored the Champlain Valley Clay Symposium, a meeting to facilitate learning about the nature of clay soils. Topics included the geomorphic history of the Champlain Valley, communities of clay soils, clay mineralogy, mapping clay soils and agri-environmental aspects of clay soils.

determines CEC. Clay minerals typically consist of repeating units of a centrally located aluminum or silicon atom surrounded by oxygen atoms in either a tetrahedral (surrounded by four oxygen) or octahedral arrangement (surrounded by six oxygen atoms). The Si and Al ions can be displaced by other elements (Ca, Fe, K, Mg) during weathering which affects their net charge. In northern NY and VT, illite and chlorite are the predominant clay types which have relatively low negative charge (10-40 meq/100g) compared to smectite (80-150 meq/100g) or soil organic matter (200-400 meq/100g).

The Champlain Valley looked much different 10,000 years ago. By then the mile high glaciers of the Laurentide ice sheet had largely melted and retreated northward. The weight of this ice depressed the land and marine water from the Atlantic ocean flooded a very large region which included the Champlain Valley (see map). This marine environment was responsible for the deposition of much of the clay we see in our soils today. In addition, smaller isolated glacial meltwater lakes (termed lacustrine deposits) also contributed to clay deposition- the deeper, slow moving water permitted clay particles to settle out and accumulate as sediments. Contrast this to larger particles such as sand, which was largely deposited by moving water, such as underground glacial rivers, meltwater streams, or beaches (termed outwash deposits). The Ridge Rd. in Chazy largely follows what was once an underground glacial river (termed an esker) that left a winding deposit of sand, gravel, and stones.

Clay content also dramatically affects drainage. In northern NY, many of our poorly drained soils contain substantial clay. The use of tile drains is a key management practice on clay fields, allowing for earlier planting, reduced compaction potential, better soil quality, and more profitable yields compared to undrained clays. Research also indicates that tile drainage can reduce surface runoff/erosion and P loading on clay soils compared to undrained conditions. Maintaining soil organic matter with good crop rotations and manure/compost management is also important for facilitating good soil structure and reducing compaction potential. While much has been learned about managing clay soils, the bottom line is that we have a lot more to learn about these fascinating soils and how best to manage them for agronomic and environmental objectives.

Clay and organic matter are responsible for

— Eric Young
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PRICE MAKERS AND PRICE TAKERS

One of the oldest dairy farmer complaints (on the extremely rare occasion they complain) is that farmers are price takers for almost everything they buy — but then aren't we all? — and also price takers for what they sell. Just once, they say, they'd like to be a price maker. However, a couple of years ago farmers indeed were price makers, by simply saying No to very high fertilizer prices. Fertilizer purchases declined considerably, and soon after that so did fertilizer prices. Do you think this was because the fertilizer industry decided to make less profit per ton?

We're seeing price-making in action again, this time with alfalfa hay in the Western U.S. Alfalfa hay prices are heading down out there, but not because the cost of hay production has decreased (it has not) nor because alfalfa production is increasing. It's because most of this alfalfa is fed to dairy cows, and it looks like 2012 will be a year of "negative cash flow" (a more civilized term than "losing your shirt") for many dairies. Western dairies won't pay \$300 for hay, so the price will decrease as the owners and managers of these dairies become price makers.

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SOIL ANALYSIS AND FERTILIZER RECOMMENDATIONS

One of the results of the loss of Cooperation Extension educators due to budget reductions is that some farming areas — indeed, even some states — no longer have any relatively unbiased sources to make fertilizer recommendations. Most CAFO farms retain a crop consultant, and most crop consultants are competent to make fertilizer recommendations. (We see this in part through the improved phosphorus balance on NY dairy farms.) But what about small and mid-size operations that don't use a crop consultant? Some farmers rely on their fertilizer company to make recommendations, with highly variable results.

Not all fertilizer company reps are out to sell the farmer more product than needed; in fact, one company representative once complained to me that the University of Vermont's phosphorus recommendations were too high! However, there are still too many (and even one is too many) who push starter P and K where none is needed, and recommend micronutrients where the soil analysis doesn't indicate a need for them. In many cases it's

not the fertilizer company rep but the soil test laboratory making the recommendations. Some of these soil analyses and the resulting fertilizer recommendations wind up on my desk (both my old oak roll-top and my virtual one), sent to me by farmers or agribusiness representatives asking for comments.

Three things that should raise red flags:

1. Recommendations that don't take manure applications into account. Some soil test information forms don't even have a place to report manure applications! The nutrients in dairy manure are highly plant-available. If you applied manure and the data sheet didn't include a place for manure applications (type, rate, timing), the resulting fertilizer recommendations are likely to be on the high side. Maybe very high... Fertilizer recommendations that don't take manure applications into account are of little value.

2. Micronutrients recommended regardless of soil analysis levels. I recently reviewed fertilizer recommendations for a North Country dairy farmer that were made by a

Midwest-based soil test lab. The report recommended annual applications of boron, copper and manganese for established alfalfa in spite of soil analyses showing good soil status for all three nutrients. In over 45 years in this business I have never seen a manganese or copper deficiency in alfalfa, while boron is expensive and shouldn't be applied unless there's a known need for it.

3. Fertilizer recommendations by a soil test lab located far from where you farm. The lab personnel may have little knowledge of growing conditions or soil types in your area, and often any yield goal will be very optimistic — to say the least! The next time I see a yield goal on a soil analysis report that's lower than the state average for that crop will be the first. There's no attempt at dishonesty, but knowing little about where you farm and your actual yield potential, fertilizer recommendations often are high "just to be safe." That's because while over-fertilization is expensive, so is not applying enough fertilizer.

— E.T.

HORSEMANSHIP RETREAT AT MINER INSTITUTE! June 28-30, 2012 Camp for Grown Ups

The flowers will be in full bloom, the birds will be singing, foals will be frolicking and YOU will be in the thick of it all learning more about the care and training of horses. Alright, maybe that sounds a little Disney-esque, but we're excited to offer this new venture at Miner. The Heart's Delight Morgan herd will be the center of activities for three full days. Full schedule details are still being developed and I'm even open to suggestions, but there's already a lot to be enthusiastic about. Dr. Stephen MacKenzie from SUNY Cobleskill will discuss equine learning and then offer instruction on round-pen techniques on one day and there will be ample opportunity to practice these skills over the course of the three days. We'll go over basic health evaluation skills with practice doing thorough nose-to-tail checkups. A nature walk will be a plant and weed identification trip. A relaxing evening including a yoga-for-riders class. Stay overnight in comfortable accommodations and we'll feed you too! The retreat is limited to six people to insure plenty of hands-on time. All inclusive price of \$450 for our first year offering this camp. Contact Karen Lassell for more information, 518-846-7121, ext. 120 or email lassell@whminer.com.

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Closing Comment

Politics is the art of looking for trouble, finding it,
misdiagnosing it and then misapplying the wrong remedies.

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