

# FARM REPORT



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## FROM THE PRESIDENT’S DESK: FORAGES & FEEDING TO MAKE YOUR COWS SMILE

Cows respond to high quality forage. When cows consume highly digestible fiber, they produce more milk components, have fewer metabolic and hoof problems, and greater longevity. The farm can have up to 30% greater income over feed cost when high quality forages are fed.

But, we need to remember that cow response to forage is a function of its nutritive value and the feeding environment. A forage test measures the potential feeding value of a forage, but poor feeding management reduces this potential.

A great example is the negative impact of the excessive competition that comes with bare bunk disease. Research at the Institute found that overcrowding and feed restriction from 1:00 to 6:00 am resulted in up to 9 h/d greater sub-acute rumen acidosis (pH < 5.8). In vitro artificial rumen studies tell us that pH this low will reduce NDF digestion rate by up to 50%. Clearly, overcrowding can easily lead to a situation where expensive, high NDF digestibility forage is essentially wasted.

Remember that the perfect recipe for low rumen pH would be a highly digestible diet designed to boost milk production, overcrowding (especially greater than 120% of stalls), and an empty bunk. In overcrowded pens, cows that are able to

ruminate more while lying in a comfortable stall will have a higher, healthier rumen pH. Recumbent rumination reduces sub-acute acidosis – especially in competitive environments.

An overlooked component of forage quality is how much time the cow needs to spend at the feed bunk in order to eat it. Time spent eating at the bunk is a function of forage percentage in the diet, NDF digestibility, and TMR particle size. Cows fed corn or haycrop silage-based diets tend to chew feed to a relatively uniform particle size before swallowing, and higher NDF, lower digestibility forages take longer to chew and swallow.

If the ration is not formulated to account for greater forage percentage, higher NDF, or lower NDF digestibility, then we see feed intake drop, eating time increase, rumination increase slightly, and resting time go down. Increased chewing time (mostly longer eating time) happens at the expense of resting time. The bottom line is that, if required eating time exceeds about 5 hours, then the cow may well run out of time to eat her required daily dry matter intake. Research consistently shows that about 5 h/d encourages natural feeding behavior in dairy cattle.

See **FORAGES**, Page 3

# TRIPPING DOWN LOONY LANE

In the December Farm Report we reported on the increased popularity of pet foods (including bird seed) made exclusively with non-GMO grains. We commented on the seeming gullibility of pet owners, including noting that the average life expectancy of a songbird is about 2 years, hardly enough time for genetically modified seeds to wreak much havoc. This is assuming that they do, a tenuous claim at best. The latest example that some pet owners have lost any vestige of common sense is the availability of vegan pet foods. The occasional meatless meal might be OK for humans since we're omnivores, but dogs and cats are carnivores, defined as "animals that eat meat". Vegan dog kibble costs at least \$2.00 per pound, twice what meat-based kibble costs, while premium-priced vegan kibble costs about \$5.00/pound.

But what are we to expect, since pet owners have long been known as among the most gullible of all consumers? Long-time Farm Report readers may recall our article on neuticles, which are silicone testicular implants to help pet owners "overcome the trauma of altering and allowing their beloved pet to retain its natural look and self-esteem". The Bride and I have owned cats — or perhaps they've owned us — for most of our 53-year marriage and never noted that our cats (with or without testicles) suffered from a lack of self-esteem. Cost (per pair, of course) is about \$400 for dogs and \$100 for cats, not including installation (for lack of a better term). There's also a company that will skin your (recently departed) pet and make its skin into a pillow, throw rug or similar memento. With apologies to Barack Obama, "If you love your pet, you can keep your pet." If a pet pillow doesn't appeal to you, we recently read about a company that will freeze-dry your pet into a lifelike position, to then assume a permanent place in your home. (Talk about conversation pieces...) This service is a bit pricey: \$700 for the first 5 pounds (the average weight of a chihuahua), \$75 per pound after that. Dairy farmers contemplating having their favorite cow freeze-dried might be in for sticker shock since a frozen Friesian (har!) would cost over \$100,000.

— E.T.

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## FERTILIZERS, FABLES AND FOO-FOO DUST

Farmers are often confronted by sales reps with their lineup of crop supplies. Some are quality products with independent research backing up their performance claims. But often there are wild claims backed only by farmer testimonials — and of course assurances from the sales rep that the product is the greatest thing since sliced bread. What's a farmer to do?

Fortunately, for those with internet access there's a good place to go for answers. It's called the "Compendium of Research Reports on Use of Non-Traditional Materials for Crop Production". <http://extension.agron.iastate.edu/compendium/index.aspx> Primarily intended for the North Central States, it's a collection of research reports and abstracts by Land Grant Colleges in that region. The compendium began in 1985 and since then has had two supplements. It started as a loose-leaf notebook but now the material would fill several notebooks, and most farmers and other agricultural professionals have internet access. (According to the most recent Census of Agriculture, about 75% of U.S. farmers have internet access.) To be included, the product has to have at least two site-years of research and include statistical analysis.

Readers will no doubt be utterly shocked to discover that many of these "non-traditional" materials don't perform as advertised. Some results are similar to those of the untreated control...or worse. But other products do pretty much as promoted, so it's unfair to generalize. If the sales rep claims that "This stuff is so new that there's no research on it," tell the rep to come back when there is research (preferably from an unbiased source) showing that the product works as advertised.

The compendium is very easy to use: Just enter the name of the product in question and hit the "Search" button. Some of the reports are quite technical, so don't hesitate to ask your crop advisor or Extension educator for help in interpreting them.

— E.T.

# NOW ENROLLING HERDS IN NEW NNYADP CALF RESEARCH PROJECT!

## *"Determining the Enteropathogen Causing Neonatal Diarrhea and Associating it with Antibiotic use on Northern New York Dairy Farms"*

Calf scours can be caused by a variety of pathogens including bacteria, viruses, and parasites. However, only bacterial diarrhea will respond to antibiotics, so the goal of this research is to identify the main pathogens causing diarrhea in the North Country (Clinton, Essex, Franklin, Jefferson, Lewis, and St. Lawrence counties) and relate it back to antibiotic use on these herds. In order to accomplish this, we will need to collect fecal samples from diarrheic calves prior to them being treated with antibiotics. The overall objective of this project is to determine if there is an opportunity to reduce antibiotic use on NNY dairy farms, and to better understand how to manage diarrheic calves.

How can you help? If you have calves with scours on your farm AND you plan to treat them with antibiotics AND you want to participate in this project, please contact the following:



Casey Havekes (all counties) 315-955-2059  
 Lindsay Ferlito (all counties) 607-592-0290  
 Sarah Morrison (Clinton County) 518-846-7121, ext. 105

**Cornell Cooperative Extension**  
 North Country Regional Ag Team



## FORAGES, Continued from Page 1

The table shows what we currently recommend for TMR particle distribution and the associated silage particle sizes. Considerable variation between TLC and silage particle size distribution exists and a major goal is a chop length that ensures good packing in the silo.

**Recommended particle distributions using Penn State Particle Separator (% as fed).**

| Screen, mm | TMR   | Corn silage | Alfalfa silage | Grass silage |
|------------|-------|-------------|----------------|--------------|
| 19-mm      | <5    | 3-8         | 5-15           | 5-15         |
| 8-mm       | >50   | 50-65       | 50-75          | 50-75        |
| 4-mm       | 10-20 | 30-40       | 25-30          | 20-30        |
| Pan        | 25-30 | <5          | <5             | <5           |
| TLC, inch  | ---   | 5/8 – 7/8   | 1/2-3/4        | 1/4-3/8      |

So, if you seek a combination of forages and feeding environment to make your cows smile, consider these suggestions: 1) particle size, NDF digestibility, and forage percentage to allow 3 to 5 h/d eating time that allows natural feeding behavior, 2) populate the rumen with particles from the second screen (8 to 10 mm) of the Penn State Particle Separator that will stimulate rumination, 3) allow ample access to stalls to encourage recumbent rumination, and 4) make sure that feed is available 24/7 and pushed up!

— Rick Grant  
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# PUT YOUR TMR TO THE TEST

Feeding our cows TMR is a choice to deliver animals with a consistent and balanced ration. However, our TMR may not always be as consistent as we think. We can better control TMR variability by using a simple management tool like a TMR mix check or audit system. TMR variability can result from real differences in nutrient composition and/or equipment failure. Much of TMR variability is usually attributed to management factors that can be controlled. Eleven errors can occur during TMR mixing alone: 1) Worn augers/kicker plates/knives 2) unlevelled mixing, 3) time mixed after last ingredient loaded 4) loading position of the ingredient 5) load size 6) ingredient processing 7) ingredient loading sequence 8) liquid distribution 9) vertical mixer auger speed 10) forage restrictor settings 11) time sequence of vertical augers. By setting up a routine schedule, a farm can track how feed delivered deviates from the balanced ration over time and what steps can be taken to fix it.

One method to check TMR mix consistency is to determine the Coefficient of Variation (CV) in a TMR delivery across a bunk or pen through a Penn State Particle Separator (PSPS). Collect 10 equally spaced samples from a bunk immediately after TMR delivery, being sure that the 10 samples account for the length of the bunk including either end. When grabbing samples, scoop underneath the TMR and lift directly up, so not to lose any of the particles within the TMR. Put each sample in

Ex 1) Consistent PSPS Test from Mid-Lactation Pen

| Screen | Mean, g |
|--------|---------|
| 19 mm  | 2.32    |
| 8 mm   | 45.84   |
| 4 mm   | 11.17   |
| Bottom | 40.67   |

Screen Standard Deviation

|        |      |
|--------|------|
| 19 mm  | 0.87 |
| 8 mm   | 3.47 |
| 4 mm   | 0.51 |
| Bottom | 3.90 |

Screen CV, %

|        |       |
|--------|-------|
| 19 mm  | 37.62 |
| 8 mm   | 7.57  |
| 4 mm   | 4.59  |
| Bottom | 9.59  |

Ex 2) Variable PSPS Test from Mid-Lactation Pen

| Screen | Mean, g |
|--------|---------|
| 19 mm  | 2.36    |
| 8 mm   | 47.29   |
| 4 mm   | 11.43   |
| Bottom | 38.92   |

Screen Standard Deviation

|        |      |
|--------|------|
| 19 mm  | 0.87 |
| 8 mm   | 4.28 |
| 4 mm   | 1.18 |
| Bottom | 4.78 |

Screen CV, %

|        |       |
|--------|-------|
| 19 mm  | 36.80 |
| 8 mm   | 9.04  |
| 4 mm   | 10.31 |
| Bottom | 12.29 |

an airtight bag. Using the PSPS with screens sized at 19 mm, 8 mm, 4 mm, and a collection pan, shake out each TMR sample and record the percent weight that remains on each screen. Using the values from the 10 TMR samples, calculate the CV of each screen by taking the standard deviation from one screen and dividing it by the average for that screen, and multiply by 100% [CV % = (SD/mean) x 100 %]. The 8 mm, 4mm screens and pan should each have a CV equal or less than 10%. A higher CV represents more variation of the TMR across the bunk.

Another way to test TMR variation is to use a micro ingredient test. In my experience this hasn't been as actively used on dairy farms as it has in feed mills, but it's also a valid way of determining TMR variation. This test involves selecting a micro ingredient present at 0.5 % DM or less in the TMR and using an assay to determine the levels of that ingredient in each TMR sample. Salt is a common micro ingredient used for this test because it is present in all rations while being easy and cheap to test on-farm. To determine salt levels,

purchase a chloride titrating or sodium meter kit. Using the same TMR collection protocol used to check TMR mix consistency, collect 10 samples of TMR. Each sample of TMR will be mixed with water for a specific period. At Miner Institute we mix 500 g TMR with 1 gallon of water for 30 seconds. After the TMR and water is mixed, the solution is strained and 5 mL (5 cc) of the solution is placed in a cup with the titration stick.

This titration stick or meter will give you a reading of the sodium or chloride levels in the solution from that sample. Record the sodium or chloride levels for each sample of TMR. Using these values, one can calculate the CV across all the samples collected. In the micro ingredient test, a good CV is 10% or less.

No matter which test method you use, it's important to remain consistent with the sampling and testing technique. "Messy" techniques could result in extrinsic variation, or variation that falsely exists through sampling error. If you find that your CV levels are too high, consider re-evaluating your mixing protocols and evaluating the state of your mixing equipment. If you want to compare TMR variability from day to day, or between different feeders, it may be useful to repeat these TMR checks.

A comparative field study across Ontario dairies in 2013 found that every 0.5% increase in the variability in the Net Energy of lactation was associated with a 7 lb decrease in milk.

— Kristen Gallagher  
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# BLURRING THE LINES: DAIRY BEEF 3

As the dairy industry has evolved, new technology including sexed semen has allowed for improved efficiency. Sexed semen has allowed dairy producers to select the top-performing animals to provide replacements and use beef semen on the rest of the herd. Dairy x beef crosses have allowed for another revenue stream for the dairies. New York dairy producers have to ship cattle to feeding operations farther away due to the proximity of these operations. There is an opportunity to feed cattle in New York by utilizing the strengths that our operations already have. Specifically, our ability to grow high-quality corn silage, but this takes a lot of planning to make this a productive and profitable operation.

In the January 2017 Farm Report (“Blurring the lines: dairy beef, Part 1”) I discussed incorporating beef on your farm, and in the July 2017 issue (“Blurring the lines: dairy beef, Part 2”) I discussed nutritional considerations for dairy x beef crosses. This article will discuss the inclusion of corn silage into the grower and finishing rations. Corn silage has gained popularity due to it providing digestible fiber and starch. This makes it an ideal forage for growing and finishing animals that need high energy diets but also sufficient fiber to minimize digestive upset. In a conference proceeding from the Silage for Beef Cattle 2018 Conference researchers from University of Nebraska reported on silage inclusion in beef cattle rations. They reported that higher inclusion of corn silage resulted in about 5% decrease in feed-to-

gain conversion and more days on feed, but if grain is expensive it was economical.

The quality of the fiber has an impact on intake and performance. Brown midrib corn silage has a gene mutation, either bm1 or bm3, that has lower indigestible neutral detergent fiber (iNDF) and higher NDF digestibility (NDFD). The increased fiber digestibility should allow for higher intakes and average daily gain (ADG). There has been relatively little research on the effects of bm3 corn silage in growing and finishing diets.

A couple of articles in the Nebraska Beef Cattle Reports investigated the effects of bm3 corn silage on intake and ADG in growing and finishing diets compared to conventional corn silage. In the grower ration, the corn silage composed 80% of the ration dry matter (DM) to growing steers with a starting weight of 714 lbs. They reported that the growing steers fed the bm3 corn silage consumed greater dry matter intake (DMI) and ADG with greater ending body weight compared to the steers fed the conventional corn silage. This makes sense as the bm3 corn silage has lower iNDF and greater NDFD, which allowed for greater intakes and ADG with similar feed to gain conversion in the growing ration. In the finishing ration, corn silage inclusion was 15% and 45% of the ration DM and fed to finishing steers with a starting weight of 736 lbs. The finishing steers fed the bm3 corn silage at 15% of ration DM did not differ in DMI and ADG compared

to the steers fed the conventional corn silage. This suggests that intake was not limited or affected by forage inclusion. The finishing steers fed bm3 corn silage at the 45% of ration DM had no difference in DMI, but greater ADG and lower feed to gain conversion compared to the steers fed the conventional corn silage. This suggests that steers were able to utilize more of the bm3 corn silage most likely due to a greater potentially digestible NDF fraction.

Inclusion of homegrown forages such as corn silage can help reduce purchased feed costs in growing and finishing rations. The forage quality and inclusion levels are important to consider when formulating diets. The bm3 corn silage has a lower indigestible fraction and greater NDFD which allowed for greater intake and ADG in growing rations and greater ADG and lower feed to gain conversion in finishing rations with corn silage inclusion at 45% of ration DM. Although this effect was not reported when corn silage inclusion was 15% of ration DM, if the inclusion of corn silage is not greater than 15% of ration DM, then bm3 corn silage might not be the best option. Dairy x beef crosses can be a good alternative revenue source; pairing that with our ability to grow high-quality corn silage may be a way to survive a variable milk market. Make sure to use a team when considering dairy beef such as a nutritionist, agronomist, and local extension educators.

— Michael Miller  
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# CULTURE COUNTS, AND NOT JUST IN MICROBIOLOGY

Multiple sources estimate that the average American spends more than 1/3 of their life at work. We often spend more time at work than with our own families. We grow to know coworkers and managers as well as, if not better, than some of our other acquaintances. Some become lifelong friends, some we leave behind with the job if and when we move on. Some make you look forward to coming to work every day, and some make you want to find every excuse necessary to avoid being in their presence. However, coworkers and managers are just a small cog in the wheel that is workplace culture.

Having experienced varying levels of workplace culture ranging from toxic to apathetic to spectacular, I can tell you without a doubt how important it is to employee well-being, satisfaction, and performance. There's a big difference between the occasional grumble and an absolute onslaught of negativity, but you won't realize the difference until you're somewhere where that type of attitude isn't the norm. Workplace culture is defined as the "character and personality of your organization", and is the sum of the attitudes, efforts and beliefs of management and employees alike. There's a big difference in how employees behave when they believe in what they do, are encouraged to perform, and feel like they are appreciated for the work they put in as compared to those who feel they are directed by invisible voices who

sit in offices in a different building and are driven by deadlines and the fate of their bonuses. I've been both of these people. A positive workplace culture is worth its weight in gold, and isn't something that should be considered a privilege. Since every company is different, culture manifests itself in different ways, but you'll be able to gauge the quality of it for yourself after a while. You'll begin to notice the general attitude of employees and managers. If your workplace culture experiences to date have been subpar, finding the workplace culture you deserve will be a true breath of fresh air. Believe me; I'm experiencing that right now, here at Miner Institute.

On farms, where days are long and work is hard, a positive culture is even more important. A question I'm glad I've learned to ask as a candidate, and also that I hope to hear as an interviewer, is "What is the culture like here?" If you're interviewing with potential peers, ask them why they like working there, and what they like about their job. Ask managers what their honest opinion of the culture is. Pay close attention to how people answer. You'll be able to tell the difference between an enthusiastic, genuine answer and one that is just smoke and mirrors. These aren't prying or inappropriate questions; rather, it shows that culture is something that's important to you. You are interviewing the company to see if it's a fit for you, just as much as they're interviewing you to see if you fit. More

and more jobseekers are recognizing the importance of workplace culture, and more companies are striving to make sure that they foster a positive one in order to attract candidates. If it's an organization to which you are going to commit a considerable chunk of your time, it's important to know what you're getting into, and you darn well deserve to have a relatively pleasant time at work. Once, an HR representative I met with during an interview gave me an extremely frank description of employee attitude and some of the issues the company was facing, and this led me to make the decision to pass on the job. (The hiring manager was speechless when I told him why I didn't accept.) As you're weighing other factors like hours, pay, benefits and job responsibilities, don't forget to take culture into consideration as well.

Whether you're a manager, owner, or employee, take a minute to reflect on your current workplace culture as the year gets underway. If you have a positive one, recognize what makes it great and strive to maintain that standard (or be grateful that you work somewhere amazing). If there are areas for improvement, acknowledge them and address the issues before they become unmanageable. It's a constant work in progress that only leads to benefits for everyone.

— *Cari Reynolds*  
*reynolds@whminer.com*



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# CONTROLLING ROOTWORMS AND NEMATODES IN CORN

## *Corn rootworms*

In the “old days” farmers relied on granular insecticides to control corn rootworms and several other insect pests. This required insecticide hoppers, an expensive option on corn planters and also involved using bagged insecticides, some of which were highly toxic. Therefore, after Poncho and Cruiser seed corn pretreatments became available at rates that would (supposedly) control rootworms some farmers were convinced that they no longer needed the hoppers. So when it came time to order a new corn planter some farms ordered one without insecticide hoppers. This included Miner Institute.

We now know that even the high rates of seed corn pretreatments don't provide good control of heavy rootworm infestations. Rootworm-resistant hybrids provide excellent control — unless and until Western corn rootworms develop resistance to one or more of these genetically modified traits. In some cases farmers have come full circle and are back to using granular soil insecticides. Rootworm resistance isn't a problem with granular insecticides because with band or in-furrow applications

the toxin only reaches a portion of the root system. This means that some rootworm larvae survive treatment, preventing the development of insecticide-resistant rootworms.

## *Nematodes*

For many years Counter 20G granular insecticide was the only planter-applied product labeled for nematode control in corn. (Fumigation was — and still is — an option, but the next dairy farmer I meet who fumigates his corn fields will be the first.) Now we have several seed pretreatments labeled to control nematodes in corn. **Lumialza** is a biological nematicide marketed by Pioneer that protects corn roots for about 3 months. Pioneer reported yield responses averaging 3.7 bu./A under low nematode pressure and 9 bu./A under high pressure. Pioneer also sells **Poncho 1250 + Votivo** which adds corn rootworm protection. BASF sells **Poncho 250 + Votivo**, also **Poncho Votivo 2.0** which contains a second biological bacterium. BASF stated that the second microbe increased yield response by 3.8 bu./A over Poncho + Votivo. Avicta Complete Corn is sold by Syngenta Seeds, and contains a nematicide plus Cruiser insecticide

and several fungicides. Syngenta reported an 8.7 bu./A yield advantage over Cruiser alone.

I'm convinced that using a nematicide will increase corn yield in many (perhaps most) cases. BASF based its yield responses on 900 trials over a 10-year period and claims that the nematicide increased corn yield in 83% of the comparisons. One ton of corn silage typically contains 5-6 bushels of corn: You can do the math, supplying your own price for corn silage vs. the cost of the nematicide. The cost of adding a nematicide to your seed corn pretreatment differs among seed companies, so check with your seed dealer. Many years ago we did several nematode assays in the Champlain Valley, submitting soil and corn root samples to the Iowa State University testing lab. We discovered that in most cases our nematode levels — both root lesion and dagger nematodes — were above what would be considered a damage threshold. For one sample the ISU plant pathologist noted that he didn't know what the threshold for dagger nematodes was, but we had definitely exceeded it!

— Ev Thomas

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### *Closing Comment*

Never attribute to malice something that can be explained by stupidity.

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