

FARM REPORT



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FROM THE PRESIDENT'S DESK: DO ANIMALS COMPETE FOR HUMAN FOOD?

Recently a *Farm Report* reader requested an article on the competition between humans and livestock for food. The perception endures among US consumers that food produced for livestock competes for human food supplies and must be an inefficient use of resources. Some worry about greater consumption of meat and animal proteins and the sustainability of global food production.

The best review of this topic that I know of is a Council of Agricultural Science and Technology paper (CAST number 53, Sept. 2013) written by a panel of livestock and food industry experts. They focused on the fact that global animal agriculture provides safe, nutrient-dense food while using byproduct feeds that enhance sustainability and reduce the environmental footprint of animal production. Their detailed analysis makes it clear that livestock are important for the economic and social sustainability of both developed and developing countries.

Large tracts of land are not capable of growing human food crops, but they are suitable for grazing or forage production. Recycling the byproducts from human food and fiber production as animal feeds substantially reduces the competition between humans and animals for those crops that can actually be used for both

food and animal feed. Ruminants possess the ability to digest plant material via microbial fermentation that is either less efficient or nonexistent in non-ruminants.

The FAO estimates that about one-third of cereals are fed to livestock, and this fact leads some to believe that consumption of animal protein ought to be reduced. But animal consumption of cereal grains is only a problem if the same cereal crops are in fact used for human and animal food. The truth is that globally, livestock diets include many crops that are not suitable for human food due to safety, quality, cultural, or digestibility limitations. In fact, about 37% of the plants grown for human food end up as byproduct feed suitable only for livestock.

Globally, one in seven people lack sufficient dietary energy and protein for health and well-being. This shortfall in food availability is often attributed to problems in food distribution and food waste. Pre-retail losses approach 40% of the food harvested due to spoilage, pests, improper storage, and other marketing factors. This is truly something that needs to be addressed in tandem with the focus on sustainability of the food production systems themselves.

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GEARING UP FOR SPRING DAIRY FORAGE CROP SEASON

The 2017 forage crop season will soon be in full force. A relatively damp April has kept fields fairly wet, limiting field operations so far in many areas. A total of 3.47 inches of rainfall has fallen in Chazy as of April 25 (1.1 inches above 30-yr mean). Hay fields and winter cover crops are slowly greening up. Warmer temperatures are expected, however showers remain in the forecast.

Be ready to go when your weather window opens. Better-drained fields will be ready to work first, so plan operations accordingly. For cool season grasses, plan to apply 70 to 80 lb/ac of nitrogen as soon as fields are green and trafficable.

Spring hay forage seedings will do best when seeded early because they get a head start on weeds. Follow your soil testing guidelines for N, P, and K applications. Use manure to meet as many nutrient needs as possible. In some cases, all nutrient requirements can be met with manure application, particularly if soil test P and K levels are in the high category. Broadcast and disk in any remaining nutrients needed prior to seeding. Remember that good seed to soil contact is key for optimum germination. For the last couple of years, we have used a mixture of alfalfa, tall fescue, reed canarygrass, perennial rye grass, and a blend of forage oats with peas and have been

happy with the results.

For corn planting, make sure fields are dry enough to avoid compaction before applying spring manure or commencing with any tillage. Clay soils are easily compacted if driven on with heavy equipment when soils are in a plastic state. Driving manure tankers on these fields or performing tillage can result in irreversible compaction damage to depths of 3 ft. in the soil profile. If possible, apply manure and immediately incorporate prior to planting. Utilize a starter where needed but avoid applying P and K where your soil test indicates that it is not needed. There is a very low chance of a corn yield response where P and K levels are in the high and/or very high range. Save your money for the fields that need extra nutrients.

Another important and often overlooked factor with corn planting is soil temperature. Planting in cold, wet soils can result in significant yield reductions due to chilling injury and presents a higher risk for damping off and development of fungal pathogens. Soil temperatures should be at least 50 °F before planting corn. It is recommended that soil temperatures be taken in late morning after the dew has evaporated. Follow your seed dealer's recommendations for plant populations. Aim for planting at 2 inches deep. Make sure to take the time to properly

set up your planter and perform seed depth checks as you plant and move to different soil types and fields.

Plan to harvest cool season grasses in the boot stage for lactating cows without exception (aim for NDF of 50 to 55%). Even if you plan to harvest in the boot stage, chances are that the weather and other complicating factors will result in some portion of grass acres being harvested after heading. For first cutting, we generally target a group of fields for lactating cows and another group of fields for dry cows and heifers to be harvested later after heading out. For alfalfa-grass fields, plan to harvest when the alfalfa is in the bud stage (aim for NDF of 40% for pure alfalfa). You can also use alfalfa stem length to guide harvest timing for both grass and mixed alfalfa-grass stands.

Your goal when making hay crop silage should be 32 to 35% dry matter. If you are not using wide swath mowing, you are missing an opportunity to improve forage quality. Lay your windrows out as wide as possible to maximize the rate of dry down and capture more of the valuable carbohydrates that fuel fermentation. Shoot for a density of >14 lb /ft³ on a dry matter basis (44 lb/ft³ at 32% dry matter) for bunks and piles.

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SLEEPING, IT IS CRITICAL!

This past February I attended the Vermont Dairy Producers Conference and was surprised that they had a speaker there to explain the importance of sleep. I think we all understand that it's important for our cows to get an adequate amount of rest each day but have we been undervaluing our own? If you surveyed the dairy industry I would bet that a large percentage of people don't get enough sleep and are sleep deprived for a number of reasons. By the end of this article I hope you consider trying to get a few more hours each night.

Twice a week I drive from the Miner Institute to the University of Vermont campus for class. The drive is about an hour and 10 minutes one way and during the drive I listen to a variety of music, audiobooks, webinars, and podcasts with the hope that they will help me remain awake. This past week I listened to a Ted Talk on the importance of sleep and why we should try to get more. The speaker explained that as we become sleep-deprived we affect our

memory, ability to focus, and our overall productivity. Dr. James Maas, the speaker at the Vermont Dairy Producers Conference, elaborated even more and stated that 71% of people don't get enough sleep. He also explained that there are several negative health effects such as an increased occurrence of heart disease, diabetes, cancer, and obesity in individuals not getting enough sleep at night. These individuals exhibited decreased motor skills and slower reaction times. This can be harmful while working on a dairy farm for a number of reasons. Lack of sleep can lead to mistakes due to a reduction in focus, which can cause a loss in profit on farm. Not getting an adequate amount of sleep each night can also lead to the possibility of accidents occurring. The National Sleep Foundation found that sleep-deprived workers are 70% more likely to have a workplace accident. That is a scary thought, especially when you consider the work environment on a dairy farm. The majority of employees on a farm are working at a fast pace and often times with large equipment.

So how do we solve this issue? The first step is to determine the amount of sleep you need each night. The average is 8 hours but you may need more or less each night. Second, make it consistent! Cows aren't the only individuals on the farm that need consistency. By routinely getting enough sleep at night you're helping reduce the possibility of accidents caused by drowsiness. Finally make sure it is good sleep. Get comfortable, avoid caffeine late in the day, and avoid bright lights that keep your brain awake (smart phones).

In summary, it's important that we all get an adequate amount of sleep each night. It is very important for a number of reasons but the statistic that a sleep deprived individual is 70% more likely to have a work place accident is what worries me. Please keep this in mind especially as spring planting season begins. Stay safe and sleep well!

— Wyatt Smith
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ALFALFA STAND EVALUATION

There are at least six factors affecting the winter survival of alfalfa:

Age of stand — Older stands have more root and crown diseases, weakening the plants.

Soil fertility — Low plant-available potassium is a killer, while a pH below 6.6 can increase the severity of winter damage.

Prior year harvest management — Intensive harvest management last summer, especially followed by a fall harvest, can increase alfalfa winter damage.

Variety — There are considerable differences in winterhardiness among alfalfa varieties.

Snow cover — This is the factor over which we have least control, though leaving a high stubble in the fall (or not taking a fall harvest) will help hold snow and protect plants.

Dealing with winter-damaged stands can be tricky. One recommendation is to delay first cut of stands that were intensively managed last year or which had a fall harvest. However, if these stands look iffy and first cut yields are low, many farmers will

want to rotate them to corn. But delaying first cut harvest also delays what is already a late corn planting date. My recommendation: Don't plow the stand prior to first harvest unless you're sure it's a goner. Harvest the first crop in the late bud stage and plant an early-maturity corn hybrid. Late-planted corn will usually "catch up" a bit during the season, but it's still best to plant a hybrid that's at least a week earlier in relative maturity than whatever is normal for the farm.

— E.T.

WHAT'S HAPPENING ON THE FARM

We installed new brushes in the milking barn this spring – Lely Luna rotating back brushes. The first week was pretty amusing as the cow discovered the brush and groomed themselves like never before! They came to the parlor with crazy cowlicks and all their extra winter hair brushed off their backs.

Before we know it, warm spring weather will finally come to Chazy and we are working hard to be ready for fieldwork. Shaun and Kris and Henry have been working in the shop getting equipment ready for springtime. As soon as the ground dries up a bit, they will be out in the fields spreading manure and then working the ground for planting. This means another season of rock picking – really how there can be so many rocks

when we just picked them the year before!!

In the barn we have 3 cow trials underway right now and are discussing the details of 2 more trials that will start as soon as two of the current ones wrap up. Late winter/early spring has been one of the most intensive periods of research in the barn. Coupled with changes in our labor force, the stress-level has been pretty high. We are in the process of hiring a couple new people and are getting things organized and settled in the barn before summertime work starts.

After a couple months of low milk production the cows are finally up in milk – into the mid 90's. In mid-January we had a pretty severe case of dysentery

run through the barn along with some pneumonia in the first lactation animals. The herd took a huge drop in milk production. Then in late winter we transitioned out of 2015 conventional and BMR corn silage and into the 2016 conventional corn silage. The new corn was dry and the kernels weren't sufficiently processed and the cows dropped in production again. We knew there was better silage further into the bunk so we adjusted the ration as best we could and fed through the dry stuff. We have finally made it into some better corn with more available and digestible starch. We're back on the right track, getting ready for another spring on the farm.

— Anna Pape
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FORAGE LAB FAREWELL

Wow, yes it is true, I am leaving Miner Institute to take a job with Jasper Hill Farm, “The Cellars”, acclaimed cheesemakers in Greensboro, VT. I will be overseeing their dairy and crop operations as they look to expand their business, grow the community and maintain open land through dairy, specifically cheese. This has been a sudden turn of events for both me and Miner Institute. Managing a dairy operation has long been a “bucket list” item for me; an exciting opportunity that given my age and abilities I would regret not taking. If you did not already know, I am also a bit of a “foodie”, having been in the wedding cake business, as well as a stint in catering many years ago. I can still recount the 5 best things I have ever eaten; one of which was a fresh ball of buffalo milk mozzarella, not quite finished brining at the University of Bologna dairy. Anyhow, I have been offered the opportunity of working intimately in the management of soil, forage, cow and rumens to tailor the production of milk, protein, fat and flavor compounds that

serve as the raw product in production of various cheeses. A rare opportunity that I am fortunate to be offered; an honor.

It has been a great experience, my 16 years here at Miner Institute; the CPM Feed Dictionary, the Z-Box (good grief... there are 8 remaining and that is it!!!), cow trials, behavior watches, silage inoculant trials and so many buckets and vacuum bags packed along with the all night mini-silo, (inverted concrete culverts); countless students, lectures, presentations and farm tours. So many friends out there amongst you all, producers and industry people. Many thanks to “The Fiber Group” for their inspirations and tutelage: especially Mike, Charlie, Andrea, Dave and Pete (PJVS). Thanks to my coworkers who have tolerated my quirks and my “never quite full glass” approach; hopefully with a wry grin. And thanks to Rick for offering not to turn the lights out on me as I take this plunge...

I do not view this as an end, but an

opportunity to apply what I have learned regarding forage quality (FQ), fiber, intake, gut fill and chewing out in to the field in a very unique situation. Jasper Hill feeds only dry hay and looks to track forage species and qualities with milk components and cheese quality. I hope to work with Miner Institute, Dr. Barbano, Dr. Dann and the crew here at the Institute to track milk fat composition as we progress through various feeding regimes. Jasper Hill has a European-style round bale hay dryer which minimizes the risk of silage and other microbial contamination of raw milk for cheese but also facilitates knowing exactly what forage was consumed in the production of milk and cheese.

Thank you all for helping to make my Miner Institute experience so memorable.

Grazie mille! Dozo, Merci and God bless.

— Kurt Cotanch
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CORN PLANTING TIME

Plant population: I think that seed company-applied seed corn treatments (insecticide-fungicide combinations) have resulted in higher % emergence. The old recommendation was to plant 15% more seed than intended for a final stand. So for 30,000 plants, drop 34,500 seeds. The move to plateless and air planters resulted in more uniform stands — and permitted faster planting speeds — but research found that with these planters most of the farmer-applied planterbox treatment was no longer on the seed when it reached the furrow. Current recommendations are to overplant by only 5% under good soil conditions, and by 10% with very early planting or cloddy soils. So for 30,000 plants with good conditions you'd drop 31,500 seeds.

You can calculate corn planting rate vs. final stand on your farm. Multiply the bags of seed corn planted by the kernel count per bag. Actual kernel count should be very close to what's stated on the tag, probably a bit higher. Then, if you know how many acres you plant — not based on field size but on your corn planter's

acreage meter — divide the number of kernels planted by planted acreage to get kernels per acre. Then when the corn plants are a foot or so tall, measure off a length of string (for 30" rows, 17'4") and do at least 10 plant counts per field. Average the counts and multiply by 1000 to get plants per acre. This isn't as much work as it may seem (especially if you bribe one of your kids into doing the stand counts), and your crop consultant may be making stand counts anyway. In the two years we did this at Miner Institute — after we had a plateless planter but before the advent of company-applied seed treatments — we wound up with a 7-8% loss. After that we started dropping 10% more seeds than we wanted for a final stand.

Date of planting: I haven't seen much date of corn planting information lately, perhaps because nobody's asking the question. Previous research — including some by Cornell University many years ago at Miner Institute — found that the earliest date of planting (first week of May) resulted in slightly lower yields than corn planted one and two weeks later. Is this still the

case? Perhaps, but I expect that the combination of climate change (the length of our growing season has definitely increased) and better seed treatments may have backed the ideal planting date up by about week vs. 25 years ago. If so, early May planting would result in about the same yield as that planted a week or so later. But as I've noted before, it's not as important when you start planting as when you finish: My goal was to have all of Miner Institute's corn planted by May 20th. The earliest we ever started was April 23rd but that was during a very warm spring — and that corn emerged in a week and produced a fine crop. In deciding when it's time to plant corn we should look at the soil and not just the calendar — being reasonable of course; mid-April is still too early for corn planting in Northern NY. And in making this decision I'm as concerned about soil moisture as temperature. Planting early into a wet soil is a recipe for disaster, and disking a wet clay loam in an effort to dry it out is even worse.

— Ev Thomas
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I would like to leave you with this bit of Rumen Haiku

Low U, high FQ
ahhh, high FQ, much less chew
rumen fill, tricky.

Chew, chew, chew, stop...repeat
cow comfort, healthy rumen
chew, chew, chew, stop...repeat

p e N D F
size or U, what makes her chew?
healthy rumen, good for you



— Kurt Cotanch

SILAGE BEST MANAGEMENT PRACTICES, PART I

Ensiling is one of the most commonly used methods to preserve the quality of forages on a farm. The sugar contained in the forages serves as a fuel for naturally occurring micro-organisms of the plant. The most important “bugs” in silage are lactic acid bacteria. These good bugs ferment the sugar of the forage to produce organic acids such as lactic acid and acetic acid, which will reduce the pH of the ensiled material. The acidic conditions promoted by the fermentation of plant sugars help in the preservation of the forage, something similar to the pickles in your fridge. The ensiling process is somewhat simple, but we must keep in mind that good quality silage starts in the field. In this *Farm Report*, I will try to summarize some of the most important factors that you should be looking at now to ensure a high-quality silage. I will come back with a second part addressing harvest, storage and rules of thumb that can be useful for your farm.

Hybrid selection

If you are about to plant this year’s corn silage, make sure you choose the best hybrid suited for your region. Talk to the seed companies and ask them for research results from hybrid trials from at least 3 years. Look at specific variables such as NDF, ADF, uNDF (30, 120, 240 hours), NDFD (24, 30, 48 hours), starch content and starch digestibility. With this

information, you can evaluate your corn hybrid by going to this website <http://www.uwex.edu/ces/forage/> and search for the MILK 2006 spreadsheet from the University of Wisconsin, the results from this spreadsheet will give you an idea about the potential milk production you can obtain by using different hybrids on your farm. Talk to your nutritionist about these values and together make the best decisions to ensure your crop land and farm profitability.

Soil fertility

Generally, soil nutrients will influence yield rather than forage quality. Nitrogen, phosphorus, potassium, calcium and sulfur are some of the minerals that may influence silage/forage quality. Soil type, soil pH, organic matter levels, among other factors important to consider while establishing a forage. Make sure you take some soil samples to evaluate how many nutrients you are consuming or putting into your soil. The following website provides information about the soil types in your region. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

Plant pests and diseases

Another factor affecting silage quality is plant pests and diseases. A well-established stand suffering from a plague or disease will be negatively

affected in yield and quality. Always look for symptoms in your forage, talk to your neighbors and do your own “plant-pests and disease benchmarking”. A plant suffering from pests and diseases will have a lower nutritive value for your cows when compared to a healthy crop, also the silage fermentation could be compromised.

Weather conditions

It is crucial to be aware of weather conditions, for now, start monitoring factors like temperature and precipitation. Use websites like this one <http://newa.cornell.edu/index.php?page=weather-station-page> to look for this information. If you do not find your region, look for other websites with weather stations near you. Try to be a step ahead of rain events so your planting schedule stays as close to the one you planned. Additionally, be aware of the maximum and minimum temperatures, this will help you calculate the growing degree days of your corn which will be the base for your harvest schedule and the key to having a very efficient harvest.

Best wishes for this season and stay tuned for the second part of the silage best management practices.

— Salvador Ordaz,
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FORAGE CROP ONE-LINERS

- In harvesting forage grasses, when you see the head the quality is dead.
- It’s not as important when you start planting corn as when you finish.
- “Sod ground” usually grows your best corn crop.
- “Silo blend” seed corn is cheap but a poor choice even if it’s free.
- It’s too late to check planter or seeder calibration after you get a poor stand.
- Mowing first cut hay crop into a narrow windrow often produces compost, not haylage.
- Four-wheel drive tractors get stuck in places you’d never go near with a two-wheel drive.

— E.T.

IS IT MIXED ENOUGH?

Early in my education I heard the statement that there are four diets: the one you formulate, the one you mix, the one put in front of the cow, and the one the cow eats. This emphasizes the importance of the nutritionist and feeder working together to ensure the cow eats what was formulated for her. As we feed total mixed rations (TMR) the importance of a quality mix that won't be sorted by the cows is vital for optimal health and production.

When formulating diets the goal is to meet all the animal's requirements at the lowest feed cost. One consideration that sometimes is forgotten is how well the ingredients mix together. This becomes most evident when the diets are drier than normal or there are several low-inclusion ingredients. If the ingredients don't blend well the mixer will have a harder time mixing and the cows will have an increased ability to sort the TMR.

Once the formulation is optimal for meeting the animal's requirements and the ability to mix together well, then it's the mixer's job to combine all the ingredients into a well-blended TMR. An article by Thomas Oelberg and William Stone in the *Journal of Veterinary Clinics of North America: Food Animal Practice* addresses this

topic. For optimal mixing they ask us to consider the age of the mixer, loading sequence of ingredients, load size, and mixing time. As a mixer ages the knives, kicker plates and augers begin to wear and will affect the ability to mix. The loading sequence of ingredients is dependent on the type of mixer, the ingredient type, and the level of inclusion. The load size is also dependent on the type and size of the mixer used. To ensure a proper mix of the TMR, it's essential to follow the mixer manufacturer's recommendations for loading sequence and load size. The mixing time after the addition of the last ingredient is one of the most important factors for a quality mix. To complete various farm chores many farmers will rush to get all the animals fed, but shorting the mixing time is not a recommended practice. Oelberg and Stone suggest a mix time of 3 to 5 minutes after the addition of the last ingredient with 1700 to 2000 rpm speed. With proper maintenance of the mixer along with using the correct load size and sequence and adequate mixing time, you can produce a quality, uniform TMR.

When the formulation and mixing are done correctly the dispensing of the TMR at the feed bunk should be the easy part. If there's concern that the TMR

isn't uniform there are ways to evaluate it. The first and most commonly used method is the Penn State Particle Separator (PSPS) developed by Penn State to evaluate TMR particle length. The second method is the salt test, in which ten equally spaced samples are taken during dispensing of the TMR and the salt concentration of each sample is measured. The PSPS also takes ten equally spaced samples, and both methods test the coefficient of variation, which can be calculated by the standard deviation divided by the mean and multiplied by 100. The recommendation for a salt test is a CV below 10% for a quality mix. The salt test is a good method to evaluate how well the low inclusion ingredients are mixing.

The importance of an evenly mixed TMR for optimal cow health and performance cannot be understated. When the formulation and mixer do the job correctly it decreases the cow's ability to sort. Be sure to take the time to let the mixer run for 3 to 5 minutes longer after the addition of the last ingredient, and periodically evaluate your TMR with either PSPS or salt test to ensure accurate mixing.

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FOOD, Continued from Page 1

All foods will have an environmental cost – but considerable benefits accrue to society as a result of the livestock industry such as economics, high quality proteins, and provision of cultural and social standing within developing countries.

Global population will continue to increase, and as it does some critics

will continue to argue that producing feed for animals is at odds with feeding humans. The bottom line is that use of byproduct feeds and more efficient management strategies effectively lessens the environmental and economic impacts of animal agriculture.

As an industry we must meet the

challenge of addressing societal concerns surrounding feed production for animals. And at the same time we must continually explain the many benefits of animal-derived human food and the animal industry's many economic and social contributions.

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Two eagles enjoy some late-April sunshine in a Miner Institute field.

Closing Comment

Some people can have all the lights on and still be in the dark.

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