FARM REPORT

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FROM THE PRESIDENT'S DESK: A GIFT FOR LOVED ONES

The hustle and bustle of the holiday season is here, bringing with it many cherished traditions: decorating the Christmas tree, gathering for parties with friends and family, searching for the "perfect" gift, and setting goals for the coming year. One of my most important traditions began about 10 years ago after receiving the dreaded call that my dad was in the hospital unexpectedly. His cancer diagnosis changed his life and our family's. That experience shifted my outlook on preparing for the "what if" scenarios in life. So every December, I take some time to review my preparations for life-changing events and discuss them with my family.

What if you were to become disabled due to a serious illness, an accident, or advanced aging? What if you were to die suddenly due to a tragic accident or aggressive disease? Imagine having your spouse, child, or employee step into your shoes tomorrow and pick up where you left off. Will they be successful? Do they know all the things you do regularly? This is the perfect time to plan to minimize the emotional burden and financial impact on your family and business when something happens. Discussing your plans with your family is crucial. While it might be uncomfortable or difficult, having these conversations ensures that everyone understands your wishes and knows what to expect. It can also prevent misunderstandings and conflicts among family members. I'm thankful that I was able to have those discussions with my parents before their passing. It reduced the stress and anxiety for our family especially when making healthcare decisions.

There are several resources available for life-changing events and end of life planning. I recommend consulting with financial, insurance, and estate planning experts, as well as having a relationship with a trusted lawyer. Here are some major tasks that are part of the preparations:

- Create a will and naming an executor of the estate to oversee the terms of the will
- Set up a power of attorney (POA)
- Establish a guardian for living dependents
- Create or update beneficiaries on plans such as life insurance and financial accounts
- Create a living will and name a medical power of attorney
- Discuss end-of-life plans with loved ones
- Make funeral arrangements or communicate your wishes to loved ones

Generating a master document or folder for loved ones that serves as a road map for locating personal and financial information is critical. I call mine the ICE (In Case of Emergency) folder and share the location with loved ones. Here are some components of the ICE folder:

- Date of birth and social security number
- Contact information for family, friends, employer, and lawyer

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SIZING UP HEIFER HOUSING

While at the Penn State Dairy Nutrition Workshop in early November I attended a session by Penn State Extension Agricultural Engineer John Tyson where he discussed updates to heifer housing requirements. The goal of a heifer raising program is to provide a safe, healthy and comfortable environment that allows them to be ready for breeding between 12-15 months of age and to become a productive member of the milking herd. Management and facilities should be designed with both animal and caregiver well-being in mind. Rearing heifers is an investment, and approaching it wisely ensures that your investment performs at her best when she enters the herd.

Animal Weight, lb	Total stall length, in	Length to brisket tube/board, in	Length to neck rail, in	Stall width, center-to-center, in	Height to top of partition, in	Height to neck rail, in
300-500	72-76	44-52	42-48	32-36	34-38	34-38
500-700	76-82	52-58	48-55	36-39	38-41	38-41
700-900	82-90	55-62	55-62	39-41	41-44	41-44
900-1100	90-96	62-64	62-64	41-43	44-46	44-46
1100-1300	96-102	64-67	64-67	4345	46-48	46-48

Penn State Extension

Current recommendations for dimensions of closed-front freestalls for heifers.

Today's heifers are consuming more feed and growing at a faster rate than before, and this means that management strategies need to remain dynamic. Simply put, today's animals just don't fit in the shelters of years past. Space, ventilation, and feeding considerations need to account for animals that are eating more, growing faster, and creating more manure and heat. A few key points and current recommendations were discussed to ensure that facilities are adequate to meet the needs of baby calves (0-2 months), transition calves (2-4 months), and heifers (4+ months).

- **Access to feed and water.** "Water is the cheapest thing you can feed a calf", said Tyson. Waterers should be frost-free, kept clean, easy to access and use, and at an appropriate height for the animal based on their size. Waterers should be located away from feed or lying areas so as not to restrict these spaces or complicate cleaning. For feeding calves in groups, 18 in/head (hd) of feeding space is recommended, along with slant-bar feed barriers instead of headlocks as younger animals may be reluctant to use them. Feed access for heifers should allow all animals to eat at the same time and provide 18-24 in/hd of space. Feed barriers at appropriate height (throat height 14-21 in), headlocks with adjustable neck openings, and bunk surfaces/designs that allow feed to be kept within reach (such as a J-bunk if not pushing up feed regularly) create convenient access.

- **Pens.** For baby calves, individual pens should be a minimum of 30 ft^2 but more is preferred, with at least a 2:1 (up to 3:1) length : width ratio to provide enough clean, dry lying space. Group housing for baby and transition calves should have at least 40 ft^2/hd, which doesn't include feed or watering areas. There should be enough room to provide some flexibility for occasional overcrowding, and groups should remain similar in size and age. Draft protection in the form of jackets and generous bedding will keep animals dry and warm. A combination of sawdust and straw in colder weather allows calves to nestle down, provides a barrier between soiled bedding, and could be used through the transition period. Solid pen dividers 48 to 54 in. in height separate groups. Calves like to lay against these barriers, even if cold concrete.

Bedded packs for heifers should be generously bedded and allow for 40-80 ft^2 /hd of space, with an increase of ~10 ft^2 for every 200 lb of body weight. Groups of heifers should be managed according to needs as they develop, such as ration changes, heat detection/breeding, and pregnancy checks.

Group pens can have either concrete or earthen floors and be easy to enter for bedding removal or addition. Strategically placed gates can allow pens to be scraped, and bedding to be removed or replenished even if the pen is occupied.

- **Freestalls.** It has become necessary to increase the size of freestalls for heifers, and dimensions for freestalls in heifer facilities should be designed based on the size of the animals that are leaving the group, not age. The figure above lists the current recommended dimensions for closed-front freestalls based on animal weight. Grooved, slatted, or slotted floors allow for confident footing, and these surfaces should be cleaned regularly to avoid manure buildup.

Tools, like scales, to monitor growth of calves and heifers can provide information on how best to manage animals as they develop.

It's bittersweet for me to announce that this is my last *Farm Report* as I will have departed Miner Institute by the time this article is published. For those of you who may remember my very first article — I

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NEW RESEARCH INTERN

Hello, my name is Sommer Thompson, and I am excited to be a year-long intern. I began my journey with Miner Institute in 2023 as a student in the Summer Experience in Agricultural Research program. During that time, I acquired valuable exposure to studies involving dairy cattle nutrition, health, and behavior. I am enthusiastic to further develop my expertise in animal nutrition and welfare and my goal is to end my time here with the skills to become a dairy cattle nutrition consultant.

Growing up, I have always been an avid outdoorswoman and developed a love of deer and deer hunting. I had a dream that one day I would be able to raise my own deer herd and be able to care for them at my own farm. This dream quickly grew into a goal when I began my academic career. Initially, I was interested in raising deer for the sale of meat and antler products, but after the exposure to some of my studies and research projects, I was fascinated by the unique rumen function of cervids and knew that I wanted to pursue research on the subject of nutrition. Living in the Northeast, deer farms are few and far between and dairy farms are more common. To gain experience, I began working with cows and quickly fell in love with the lifestyle and management techniques.

With a strong educational foundation in Wildlife Ecology (B.S) and Animal Science (Minor) from the University of Maine, I have developed a solid

understanding of animal behavior, nutrition and how they relate to the environment around them. During my time in school, I took advantage of opportunities to participate in various club events, classes, and research projects. Among these, the most notable was the Northeastern Student Affiliate (NESA). For two years I participated in this event; the first of those years, as a volunteer staff member when the University of Maine hosted. As an undergraduate, I also had the privilege to acquire a technician certification in the artificial insemination of dairy cows. One of my proudest achievements in school was participating in a club-run dairy show each semester. I had the privilege to train with the same heifer every year and watch her grow from a little calf into a beautiful working dairy cow. I put the work in and was delighted with the opportunity to use her as an example to teach others in my class. Being placed into a leadership role is a comfortable position for me and one of my best memories was watching my mentee win second place in her first show!

In addition to my technical abilities, I've developed strong communication and conflict resolution skills through my recent summer experience as a Park Ranger for the town of Scarborough, Maine. In the past I had always avoided confrontation, but in a job that leaned heavily toward law enforcement, I learned to effectively communicate with people from diverse backgrounds and to approach challenging situations with respect and understanding. I believe these skills will serve me well wherever my future path leads.

I am thrilled to return to Miner Institute and connect with like-minded professionals to explore nutrition-based careers. I am eager to continue learning and growing in this field, and I am looking forward to making a positive impact in the cattle and cervid industry and contributing to the well-being of animals and the people who care for them.

— Sommer Thompson
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HEIFERS, Continued from Page 2

still have the “No Farms, No Beer” t-shirt. I have truly enjoyed contributing to this publication over the years, and to know that it holds such great value to our readership gives me immense feelings of gratitude. May your holiday season be full of comfort, joy, and all things bright and beautiful. I’ll see you out in the world.

— Cari Reynolds
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IS BLANKET BETTER? COMPARING DRY COW THERAPIES

Cows are at the highest risk of contracting intramammary infections at the start of their dry-off period. It normally takes a couple of days for the teat end to create a natural seal; in the meantime, cows may leak milk, allowing potential pathogens to enter the mammary system. Additionally, cows can maintain pre-existing mastitis across the dry period, since milk is not being flushed out of the udder.

To combat these concerns the National Mastitis Council (NMC) has long recommended blanket dry cow therapy (BDCT), where upon dry-off, all cows are treated with intramammary antimicrobials in all four quarters. This is widely thought to improve udder health, milk quality, milk production, and overall animal longevity.

The rise of drug-resistant bacteria and public concern over antibiotic usage has the dairy industry looking to decrease antibiotic usage without compromising the health and welfare of cattle. One study (Pol and Ruegg, 2007; JDS 90(1):249-261) surveyed dairies in Wisconsin to quantify the use of antimicrobial drugs. They observed that on conventional dairies, 66% of antimicrobials were given via intramammary administration and BDCT accounted for 29% of all antimicrobial usage. For farms hoping to decrease preventative microbial usage while minimizing mastitis risk, selective dry cow therapy (SDCT) seems to be a reasonable alternative.

With SDCT, only some cows (those deemed to be 'high risk' by different algorithms or criteria) are treated with antimicrobials at dry-off. Several studies have observed that SDCT and BDCT yield similar milk quality and mastitis rates (Rowe et al., 2020; Rowe et al., 2023; Lipkens et al., 2023). Current recommendations state that teat sealant should be used with SDCT to minimize the risk of contracting new mastitis cases during the dry period. This is a logical recommendation but likely deters farms that don't use teat sealant from utilizing SDCT.

A recent study by Paiva et al., 2024 from Texas Tech [JDS 107(10):8259-8270] compared BDCT with two methods of SDCT on two Texas farms that don't use teat sealant. They sought to compare the effect of dry cow therapies on udder health, milk production, and culling rates.

This study was conducted over a nine-month period. Farm A housed 6,900 cows in freestalls with dry manure solids and milked twice daily in a rotary parlor. Farm B housed 3,500 cows in dry-lot pens and milked twice daily in a double-parallel parlor. In the year prior to the study, clinical mastitis rates observed in the first 60 DIM were 9.9% and 5.5% for Farms A and B respectively. At the start of the study, the bulk tank SCC was 187,000 and 135,000 cells/mL for Farms A and B respectively. Cows at both farms were dried off weekly using Orbenin-DC (Merck Animal Health). Neither farm used teat sealant. Cows were randomly assigned to one of three treatments:

1. CON: Blanket dry cow therapy in all four quarters, where 435 of 435 cows received Orbenin-DC.
2. ALG1: Only cows with SCC>200,000 cells/mL at any test date or 2+ cases of clinical mastitis during the most recent lactation received Orbenin-DC. This accounted for 222 of 455 cows.
3. ALG2: Only cows with SCC>200,000 cells/mL at the most recent test date or any case of clinical mastitis during the most recent lactation received Orbenin-DC. This accounted for 107 of 458 cows.

	CON	ALG1	ALG2
% of cows receiving antimicrobials at dry-off	100%	51.3%	24.7%
Clinical mastitis rate (up to 180 DIM)	21.4%	19.6%	19.4%
Somatic Cell Score (up to 6 mo in lactation)	2.26	2.44	2.41
Average milk yield, lb/d (up to 6 mo in lactation)	97.0	95.2	95.2
Risk of death or culling (up to 180 DIM)	19.5%	18.5%	17.1%

The results are summarized in the table above. Somatic Cell Score and milk yield were recorded up to 6 months of lactation while the cumulative clinical mastitis rate and risk of death or culling were observed for the first 180 DIM.

The results show that SDCT reduced preventative antimicrobial usage by 50-75% depending on which algorithm was used. The clinical mastitis incidence and the risk of death or culling for all cows in each treatment was not statistically different. Average somatic cell score and milk yield were numerically slightly higher for CON cows but were not statistically different across treatments. Overall, treatment did not significantly impact udder

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SOMETHING OLD, SOMETHING NEW

Dutch Rovers, a Chazy farmer who left us far too early, used to plant about a dozen guard rows around the corn fields intended for high moisture shelled corn, and in September he'd chop the guard rows for silage to open up the fields prior to grain harvest. One year he decided to save some money on seed corn by planting an old (and once very popular) hybrid in the guard rows. It was from the same seed company and similar Relative Maturity as the hybrid he'd planted for grain harvest, but somewhat less expensive per unit. He'd grown the old hybrid before so knew how it would do — or thought he did. I happened to be on the farm just as he started chopping the guard rows, and Dutch was not a happy camper. Because it was very obvious that the newer hybrid was clearly superior, dwarfing the difference in seed price — yet another case of "penny wise and pound foolish". Live and learn!

In the "old days" (50+ years ago) most corn hybrids planted in this region were "station releases": These were hybrids developed by Land Grant University plant breeders and sold by Agway and other farm supply stores. Corn hybrids commonly planted in Northern New York back then included Penn 290, Wisconsin 335A, New England 144 and Cornell M-3 and M-4, and they were planted year after year. A few companies including Pioneer and DeKalb were selling their brand of seed corn, but this was nothing like the dozen or so seed companies now doing business in the North Country.

In choosing corn hybrids farmers should rely on the "Something old, something new" idea: Remembering how their hybrids performed that year, they should order seed of their best performers, However, they should also consider university trial results and seed company rep suggestions and order one or more new hybrids — either new on the market or new to them. And while there are exceptions, the longer the hybrid has been on the market (as in the case of the one Dutch used in his guard rows) the greater the chance that there are now better hybrids available. The newest hybrids will usually be more expensive per unit, but at a planting rate of 35,000 kernels/acre, resulting in about 2.3 acres per 80,000 kernel unit, it doesn't take much difference in performance to make a more expensive hybrid the better choice.

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GIFT, Continued from Page 1

- List of user IDs and passwords including the cell phone password
- List of bank accounts, insurance policies, and investment
- List of owed and borrowed debts
- Copy and location of important documents such as the will, health care proxy, birth certificate, marriage certificate, property deed, and financial statements
- List of email and social media accounts
- List of monthly bills with typical charges, due dates, and payment type (electronically or check)
- Business information and key contact information
- Instructions for pet care/ custody and veterinary contact information
- Letters to loved ones to be shared at the appropriate time

It's important to review and update documents and the ICE folder at least yearly or anytime there is a major life change.

Planning for life-changing events and ultimately death can be uncomfortable and even scary. However, it is one of the most selfless things we can do for those we care about. These preparations are not only pragmatic acts but gifts to those we love. Don't procrastinate, start planning today. Just taking 5 minutes out of your day over the next couple of weeks can have a tremendous impact.

— Heather Dann
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DRY COWS, Continued from Page 4

health, milk quality and quantity, or animal longevity. This study suggests that SDCT may be a suitable alternative to BDCT even when teat sealant is not used.

It's important to note that success with SDCT protocols is dependent on multiple farm-specific management factors. If you would like to transition to SDCT, it's recommended to first consult your veterinarian to discuss if this is a reasonable alternative for your herd.

— Alexandria Bartlett
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WHAT'S HAPPENING ON THE FARM

Winter is approaching, bringing with it colder temperatures and seasonal challenges that we face on our farm. We can experience temperatures below 20°F for much of the winter season. Additionally, we typically receive 10 to 15 inches of snow each month from December to March accompanied by occasional blizzards. However, being accustomed to the harsh weather of the North Country, we are well equipped and prepared to manage these conditions effectively. The dairy barns have insulated ceilings and automatic side wall curtains, some with airbag curtains and the newer barns have canvas roll ups. Unless a deep freeze below zero for days the barns stay above freezing. When housed in close quarters, cows produce sufficient heat through the digestion of feed to effectively warm the entire barn.

The calf barn and transition calf barn built in 2020 and 2021, have a computer ventilation system designed to optimize airflow. The system controls curtains, summer and winter air tubes and chimneys that are based on outside temperature, the system will also raise the curtains if heavy rain or wind are present. These systems allow us to set and regulate the desired temperature within the barns. In contrast, our older heifer barns feature manual curtains, which we adjust by hand. Just like the curtains, all of the barn doors remain closed with the exception of the feed alley doors which we close when the temperatures dip below freezing.

Our calves are more vulnerable to the freezing temperatures. Cold stress in calves can lead to weakened immune systems, making them more susceptible to illness. To ensure their comfort and well-being, we provide calf jackets and utilize heated floors for our day-old calves. On cold days the calves will stay in this room until dry and then move to our calf barn. The indoor calf pens, usually bedded with shavings during other seasons, are bedded daily with a straw base and then sawdust on top to keep the calves warm and dry. Water buckets are filled with water heated by our milk taxi twice a day. All calves are closely monitored for signs of illness and treated promptly in accordance with protocols developed in collaboration with our veterinarian.

With the drier fall, the process of emptying our three manure pits was completed toward the end of November. Timely manure application is crucial, as we aim to spread it before the ground freezes to prevent the loss of valuable nutrients. By finishing this task before winter sets in, we also reduce the risk of overflow during the colder months.

Although spreading manure in the spring is ideal, spreading manure in the fall offers benefits including reducing the spring workload.

As winter sets in, we continue to prioritize the well-being of our animals and the efficiency of our operations despite the obstacles posed by the harsh conditions. The careful planning and preparation that goes into these winter practices allow us to mitigate risks and maximize the effectiveness of our farm's resources.

— Ella Shamus-Udicious
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2025 FORAGE SEED SUPPLY SITUATION

Many farmers are Johnny-on-the-spot in ordering seed corn, encouraged by seed company reps bearing trinkets such as a pair of gloves. Such is not the case when ordering forage seeds, but this winter it may pay to get your orders in soon because according to industry officials the seed supplies of several key forages are very short. This includes reed canarygrass and improved varieties of Ladino and red clover. However, seed supplies of alfalfa, bromegrass, timothy, and late maturity orchardgrass varieties are also tight.

— E.T.

FROM BARN TO BULK TANK: HOW TRAINING IMPACTS DAIRY FARM OUTCOMES

Milk is the core of dairy farms. It is the primary product, and the reason why dairy farms exist. The harvesting of milk is one of the most critical jobs on a farm that happens two to three times a day, on average. The consistency of a milking routine affects cows' health and productivity and is essential to optimizing production and reducing mastitis. The success of this milking routine and resulting milk quality relies heavily on the dairy employees.

Training employees on a dairy is vital for the safety and well-being of both the animals and employees, as well as animal productivity and milk quality. Unfortunately, training and re-training processes on farms can sometimes be overlooked or ineffective. Ineffectiveness of a training program may be due to a language barrier, high employee turnover rate, or a range of learning styles and educational backgrounds.

A study published in the *Journal of Dairy Science Communications* (Alanis et al., 2022), surveyed 95 milkers from 15 commercial dairy farms in Northern New York. Of the milkers surveyed, 83% said that they received training when they first started the position but had not received any training in more than 6 months. Initial training is important for obvious reasons, but regular retraining helps employees stay up to date and gives them an opportunity to learn more, which in turn can help with employee retention. In this same survey, 67% of the milkers said they were initially provided milking equipment training, but 59% of the milkers received this training from another milker. While it isn't realistic for farm owners and managers to always be available to provide training, it's important that trainers are aware of the procedures and expectations. Having current employees train new employees can often lead to protocol drift, which unfortunately happens frequently on dairies.

On-farm training may not always be practical or efficient, and for this reason the researchers in this study designed and tested an e-learning training course for dairy farm milkers and received feedback. The training was an interactive course that covered the basics of milking equipment and was offered in English or Spanish. The course consisted of 5 modules in total, with the whole course taking users about 30-40 minutes to complete. All 95 milkers in the study completed the training, however only 57 milkers completed the post course survey. Of those that did complete the post course survey, 95% of them said that they feel able to check milking equipment for problems, and 86% of them said they were confident in reporting a problem to their manager. While more research is needed to determine the effectiveness of online training courses for farms, this could supplement or be an alternative way the dairy industry trains employees.

Regardless of how training is done it has an impact. A study recently released in the "Articles in the Press" section of the *Journal of Dairy Science* (Rodriguez et al. 2024) measured the impact of a training session on the milking routine and its impact on udder health and milk quality. The study was conducted on 9 farms in Michigan and 7 farms in Ohio, with a total of 112 employees participating in the training. On the first visit, all farms were observed during milking for about 2 hours to identify areas of improvement. During the second visit, milkers received training. On the final visit 21 days later, the milkers were again evaluated at the same time of day and for the same duration as the first visit. Pre- and post-training evaluations were conducted to determine the change in knowledge and behavior. Data on clinical mastitis cases and bulk tank somatic cell were also obtained as a measure of milk quality. Following the training, observers saw improvements in knowledge (68% of questions answered correctly after trained vs 49% before; $P < 0.001$), an increase in pre-milking disinfectant contact time ($P < 0.001$), an increase in adequate lag time ($P < 0.001$), and a reduction of milking time by 25 seconds ($P = 0.04$). Immediately after the training, there was a significant increase in clinical mastitis cases ($P = 0.001$), suggesting an improvement in mastitis identification. Additionally, the previously upward trend of bulk tank somatic cell count was found to have shifted to a downward trend after training.

Effective training of dairy farm employees is crucial for optimal milking routines, animal health, and milk quality. Whether through in-person training or innovative methods like e-learning courses, regular and well-structured training will help to improve employees' skills and confidence, which in turn leads to better overall farm performance. Ensuring that training programs are consistent, accessible, and tailored to the needs of all employees will contribute to the long-term success of a dairy farm.

— Emily Bourdeau
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WHAT DIFFERENCE CAN MYCOTOXINS MAKE?

There are four rations on a typical dairy farm: the ration formulated on paper, the ration mixed and fed by the feeders, the ration the cows eat, and the one that is fermented/digested. The goal of every nutritionist is to ensure that the fermented/digested ration is as close as possible to the formulated ration, but aside from the dry matter (DM) content of the feed, another major factor that can lead to a wide difference in rations is the presence of mycotoxins. Mycotoxins are toxic compounds that are naturally produced by certain types of molds (fungi). Hundreds of mycotoxins have been identified, but the most common ones that affect human and livestock health include aflatoxins, ochratoxin A, patulin, Fumonisins, zearalenone and nivalenol/deoxynivalenol. These mycotoxins are produced by molds that grow on various foodstuffs including cereals, dried fruits, nuts and spices. Specifically, they can be found in feed ingredients including corn and other grains used in dairy cow feeds. The growth of molds can occur before or after harvest and during storage, usually under warm and humid conditions.

During one of the breakout sessions at the just-concluded Penn State Dairy Nutrition Workshop in Hershey, PA, Caroline Knoblock (Agrarian Solutions) shed some light on the effect of mycotoxins on the productivity and health of dairy cows. Plants are more susceptible to mold growth when they are exposed to stressors like drought, high moisture, and physical damage. Mycotoxins are becoming more frequent, and their presence in feeds lead to several health and production problems. The table above summarizes the major mycotoxins found in the US and Canada, and the main effects they exert.

Mycotoxin	Major Effect
Aflatoxin	Liver damage, Class 1 Carcinogen that will prevent milk from being shipped. [the test for aflatoxin can be done for every batch of milk leaving the farm, and in the in the U.S. the acceptable limit for aflatoxin in milk according to the Food & Drug Administration (FDA) is 0.5 parts per billion (ppb)].
Vomitoxin (DON)	Reduced milk production, general immune activation, reduced gut integrity, loose and inconsistent manure
Zearalenone	Estrogenic – abortions, cystic cows, short cycles
T2/H2	Most toxic but least common – reduced gut integrity, bloody diarrhea
Fumonisin	Liver damage, reduced gut integrity

Mycotoxins can be controlled in the field by full tillage, and by the use of fungicides (at full silking and with the drop nozzle method). To prevent the growth of molds during storage (or ensiling), the pH should be reduced as quickly as possible, and proper packing, covering, and complete oxygen removal should be ensured. Inoculants (lactic acid bacteria) can also be used. Feed additives like binders, enzymes, and probiotics can also be fed to the animals to tackle the impact of ingested mycotoxins if it cannot be controlled at the field level.

A very insightful part of her session was the result of the mycotoxin survey that was done from March to September 2024 in the US. According to her, the Northeast, Pennsylvania, Virginia, and Georgia are contributing high Vomitoxin (DON) total mixed ration (TMR) samples for 2023 and 2024. For Zearalenone, there's an indication that this mycotoxin will not be a problem in the Great Lakes area in 2024, although it is still showing up in the Northeast and Pennsylvania, with new occurrences in Virginia and North Carolina. For T2, even though this mycotoxin was low in 2023, it's becoming higher in the 2024 crop, especially in Virginia, while samples from Southeast Pennsylvania show a medium to high risk level for it. There is every likelihood that 2024 would show more Fumonisin contamination in some parts of the country, with higher incidences in Virginia, North Carolina, and Pennsylvania.

In my opinion, these results can help to project the outlook of mycotoxin contamination for 2025, and the more feed and TMR samples that are tested, the more accurate the predictions to ensure timely interventions. If there is a concern about the feed you have grown, bought, or have in the bunk, it's worth testing such feeds to understand the potential impact of any mycotoxins present, and to decide on changing your feeding strategy or consider including a binder in the diet. These efforts will guarantee that our cows are fermenting and digesting the feed we formulate on paper, and save us the cost of curative measures.

— Gift Omoruyi
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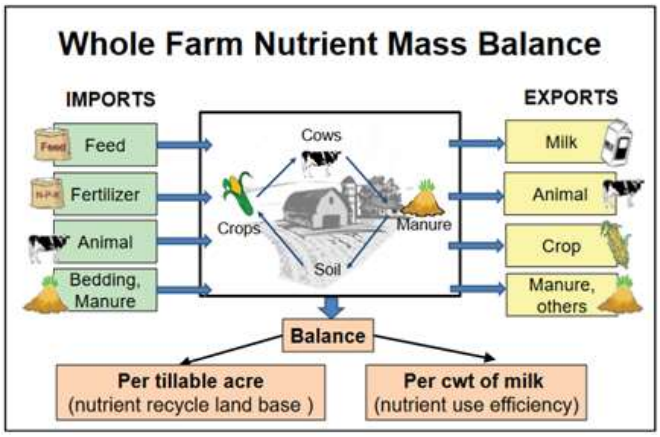
VT DAIRY PRODUCERS CONFERENCE: FEB. 18, 2025

Registration opens in early January 2025
For more information, visit vtdairyconference.com

NUTRIENT MANAGEMENT INSIGHTS WITH THE WHOLE FARM NUTRIENT MASS BALANCE

Many of our current strategies for nutrient management on farms focus on how to manage nutrients only once they are a part of the farm. These strategies include running risk assessments for phosphorus (P) and nitrogen (N) loss in drainage [phosphorus index (NY-PI 2.0); nitrogen leaching index (NLI)], and erosion with RUSLE2, the Revised Universal Soil Loss Equation, ver. 2. These risk assessments are complemented by in-field nutrient management strategies such as cover/double cropping and manure injection/incorporation.



All of these practices play a critical role in mitigating nutrient loss from cropland, but what they all have in common is that they are reactionary – they're only intended to manage nutrients once they are already on the farm. Unlike these more common nutrient management practices, a whole farm nutrient mass balance (NMB) is a tool that can account for all nutrient [P, N, and potassium (K)] imports and exports from the farm gate. Other states have developed their own tools, but the Nutrient Management Spear Program (NMSP) of Cornell University began collecting data in the early 2000s to develop a model specific to New York's dairy farms. While the tool was developed with NY farm data, it should still be helpful and applicable to farms outside of NY. As with many nutrient management practices, adhering to the recommendations should result in both economic and environmental benefits.

The concept of the tool is relatively simple and works on an annual basis. Although there is some data to track down, the accounting is relatively simple: we just add up all of the nutrient imports (feed, fertilizer, etc.), followed by all the nutrient exports (milk, crops, etc.), then find the difference, or net balance, by subtracting the imports from the exports (see figure). This balance can then be expressed per tillable acre or per hundredweight (cwt) of milk to reflect the efficiency of nutrient usage in crop production and milk production, respectively. Not only will the results show what types of balances your farm currently has, but you can also see how your balance compares to anonymized data from dairy farms across New York state. Although one year's balance won't provide enough information to begin making major decisions, it can provide a snapshot of your current status, and continuing to accumulate balances each year will provide valuable insights into the stability and sustainability of your farm's current nutrient management strategies.

If you're interested in developing a whole farm NMB, Cornell University has a number of resources to get you started. The easiest places to start would be at the main webpage for the NMSP team's nutrient mass balance research, which has plenty of background material and testimonials from farmers who have participated in the program. Detailed information on the steps for developing a NMB and links to the software can also be found in Cornell's Agronomy Fact Sheet series (Fact Sheet #25: http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership/MassBalances.html). Check back in next month when I'll delve deeper into the tool and the types of results and insights the tool can provide.

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NOTABLE QUOTES

- The older I grow the more I distrust the familiar doctrine that age brings wisdom. *H.L. Mencken*
- Always follow your heart … but take your brains with you. *Louisiana Sen. John Kennedy*
- Nothing spoils a story like the arrival of an eyewitness. *Mark Twain*
- It's only work if someone makes you do it. *Calvin (in Calvin and Hobbes, by Bill Watterson.)*

— E.T.

HOW CAN WE HELP DRY THEM UP?

I was talking to a dairy farmer who had recently purchased boluses he was planning to use for aiding dry off. He asked me if I had any experience with them, and I admitted that I did not. However, this topic piqued my interest so I dug into what literature was out there. With the Miner Institute herd, dry off is often brought up as a topic of concern because of the level of productivity of our animals, not an uncommon issue with farms that have increased milk yield in recent years, but also increased persistence in lactation. Normally, high milk production would not be something to complain about but when we transition these cows into the dry period it can be a challenge to maintain cow health and welfare.

Conventional methods of dry off may include a reduction in the number of milkings, a change of feed quality or amount, or abrupt cessation of milking. Managing the number of milkings or a diet change could be challenging depending on the farm size and ability to manage these different methods. Likely the most common method would be abrupt cessation of milking along with a diet change as they move to a far dry or dry diet. The challenge with abrupt dry off comes with high producing cows that might not be as prepared for dry off. When abruptly dried off, high-producing cows can be at greater risk of intramammary infections, clinical mastitis in early lactation, and higher somatic cell count (SCC) in the next lactation. For a time after dry off cows continue to produce milk which increases the intramammary pressure, results in milk leakage, increases pain and discomfort, alters lying behavior, and can also delay the teat plug formation which puts cows at risk of intramammary infection. Are there other methods that could help dry these cows off?

Two studies have evaluated using acidogenic bolus in cows and the impact on milk production, udder health, and behavior of cows around dry off and their health in the subsequent lactation. Acidogenic bolus use ammonium chloride and calcium chloride which are strong acidifying agents that induce metabolic acidosis and reduce feed intake. In the first study in a series of three conducted in Spain (Maynou et al., 2018; https://doi.org/10.3168/jds.2018-15058), 84 cows were bolused either a sham (control), one 20-gram bolus, or two 20-gram boluses five days before dry off. In this study they gave the bolus five days before drying off the cows so that they could record milk production in response to the treatments. Cows started out at 62 lb/d (28 kg/d) before the treatments were administered. The milk production of cows given two boluses dropped steadily over the next three days to ~54 lb/d (24.5 kg/d) or about a 4.5 lb/d (2 kg/d) decrease.

In the second study, the researchers followed the initial project to determine the impact of two boluses on dry matter intake in lactating cows. After the two boluses were administered the researchers observed a decrease in dry matter intake of 5.7 lb/d (2.6 kg/d) during the first three days. This decrease in dry matter intake from anionic salts had previously been well-documented. Of interest with the bolus, the salts are fat-coated and thus should not impact palatability like they would potentially be in acidified close-up diets. This reduction is likely related to the metabolic acidosis induced by the pulse dose from the bolus. After the initial three days after the bolus, the intake of the cows returned to levels similar to that observed before the bolus.

The third study from this research group used 152 cows that were either given a control or two boluses 8-12 hours before dry off. On average the cows in the control group were producing 60.4 lb/d (27.4 kg/d) of milk and 19.2 lb (8.7 kg) in the last milking (3x/d milking schedule) before dry off, while the cows given the two acidogenic bolus averaged 58.0 lb/d (26.3 kg/d) and 18.5 lb (8.4 kg) in the last milking before dry off. There was no difference between these two treatment groups for production before dry off. In this study, they measured udder pressure in the days after dry off, which decreased with time and was more marked in cows given the two bolus.

See **DRY OFF**, Page 11

FERTILIZER PRICES

We don't yet know what impact proposed tariffs would have on fertilizer prices, but it's worth noting that in 2024 25% of nitrogen imports and 86% of potassium imports came from Canada. Fully 90% of potash is imported. If tariffs increase the prices of Canadian fertilizer, the chance of increasing the proportion of imports from other nations is dimmed by the fact that in second place for both N and K imports is — Russia.

— E.T.

GETTING BEYOND RELATIVE MATURITY

Ever since man started breeding different varieties of crops and comparing them there's been an effort to describe the differences between those varieties. Some of them might be on the taller side while others might flower earlier. The assessment of how long some varieties take to develop in comparison to others is now termed "relative maturity," a rating that most every seed company attempts to report in some way.

Relative maturity is most often expressed in days (i.e. days to maturity) since that was historically the easiest way to measure differences in time. This can be a bit of a misnomer, however. On hearing "days to maturity," most people assume that they can just go ahead and count the days from when they planted to see when they will be harvesting. While this may have worked at some place and at some time, the truth is that relative maturity almost never lines up perfectly with actual days to harvest. Depending on how "maturity" is defined and what the climate is like where the crop is grown, it might be way off.

In more recent years, corn breeders have started measuring corn maturity in "Growing Degree Days/units" rather than just days. You might see this written as GDD to black layer or some other point in crop development in seed catalogues. What makes this method better is that it accounts for how warm it is for each day that the plant is growing. This makes sense since plants don't grow and develop as well when it is too cold/hot for them.

While the degree day method is better, it's still far from perfect when it comes to actual crop development. As it turns out, plants are somewhat adaptable in the amount of heat units they need for development depending on how much light they are getting each day, how healthy they are, and how stressed they are. Thus, late-planted corn may be able to mature with fewer degree days than the same corn planted on time.

So, what's the point of all this rambling about relative maturity in corn? The point is to not get too hung up on relative maturity when you buy your corn seed for next year. Yes, hybrids do differ in maturity relative to one another, but there are enough limitations in this number that it shouldn't be held up as gospel truth. There is no universal standard for how relative maturity is assessed by seed companies. So, 100-day corn from one company is not necessarily going to mature with 100-day corn from another company. I can also tell you that most corn breeders are more focused on grain maturity than silage maturity. So, what looks like a 100-day corn from a grain standpoint might perform more like a 95-day corn if the stalk tends to dry down quickly.

When the rubber meets the road, the big questions that silage growers need to answer are: "How is the tonnage on my farm?" and "Is the quality (fiber, starch, moisture…) acceptable for the needs of the farm in most years?" The only way to truly assess this is to try different hybrids on your farm and to look at as much of the local silage trial data that you can get your hands on. Of course, seeing what's working on your neighbor's farm is a good strategy as well.

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DRY OFF, Continued from Page 10

Cows had lower udder pressure 24 and 48 hours after dry off, and tended to be lower at 72 hours compared to control cows. Interestingly, cows given the bolus spent 85 more minutes per day lying down compared to control cows, which might be due to lessened pressure and discomfort as a result of the bolus. There was no difference noted in milk leakage, and it was highest in the first one to two days after dry off for both groups. When these cows entered lactation, there was no difference in milk production.

A more recent project, published in 2024 (Florentino et al., 2024; https://doi.org/10.3168/jds.2023-23757), followed up on this work to evaluate the rate of intramammary infection, milk production, SCC, clinical mastitis, and herd removal in the subsequent lactation after cows received either a control or two acidogenic bolus. This study enrolled 901 cows across three commercial farms. They had 458 cows on the control and 443 cows that received two bolus at dry off. The results from this study included no difference on intermammary infections, fat corrected milk production, or protein or fat yield in the subsequent lactation between the two groups. They researchers did observe a lower SCC in the first two months after calving for cows who received the bolus and the presence of high SCC in the first 30 days was 9.1% lower than the control. Furthermore, cows that got the bolus at dry off had a reduced risk of clinical mastitis and removal from the herd.

This information supports the potential for acidogenic boluses to assist the dry off process of high-producing cows. There doesn't appear to be any negative impact on the cow from the short-term metabolic acidosis induced from the bolus and there could be reduced risk of mastitis in the next lactation. Have you used this on your farm or seen places it's been effective?

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Wishing you a healthy and happy holiday season!

Closing Comment

It helps if you imagine Autocorrect as a tiny elf in your smartphone who's trying hard to be helpful but in fact is quite drunk.

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