

FARM REPORT



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FROM THE PRESIDENT’S DESK: EXPLORING SEASONAL CHANGES IN MILK FAT & PROTEIN

As a dairy farmer, it’s crucial to recognize how the composition of milk from your herd changes throughout the year. There is a repeatable seasonal pattern that occurs yearly regardless of your geographic location. Kevin Harvatine and his team at Penn State used monthly DHIA records from Pennsylvania, Minnesota, Texas, and Florida herds from 2003 to 2016 to understand the annual rhythm of milk yield and composition. Milk yield peaked in April with a greater change (i.e., peak to mean) occurring for southern (≥ 6.8 lb) vs. northern states (≥ 2.6 lb). Milk fat and protein yields peaked from late February through March and similarly showed greater changes in the

southern vs. northern states. In contrast, milk fat and protein concentration peaked from December to early January and were opposite of yields with northern states having a greater change in concentration (≥ 0.14 vs. $\geq 0.12\%$ -units for fat; ≥ 0.09 vs. $\geq 0.06\%$ -units for protein). Based on these data, Harvatine’s team suggested that the yearly pattern of milk yield follows the day-to-day changes in day length, whereas the yearly pattern of milk fat and protein concentrations follow the pattern of absolute day length. Photoperiod explained more variation than environmental temperature or heat stress.

See **SEASONAL CHANGES**, Page 5

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USING CARRY-OVER CROP INPUTS

As winter begins to break its grip it's time to consider the carry-over seeds, crop chemicals and silage inoculants lurking in farm buildings, some since last spring. In many cases they can be used safely and effectively, but as usual the devil is in the details. Use it or lose it? If a product is of questionable condition or unknown age it's often better to toss it than to use it with the chance of poor results.

Seeds: Most carry-over seeds should be OK as long as the bags were kept dry and not exposed to hot temperatures. *Seed corn* should retain high germination for at least one and probably several years, but plant carry-over seed corn this spring. No need to increase the planting rate. *Soybean seed* has a high oil content and will deteriorate over time, especially under the warm conditions that often occur when stored in uninsulated farm buildings. Research has found a significant decline in the viability of carry-over soybean seed. If you want to use carry-over soybean seed have a germination (warm test) and vigor (cold) test done to determine its viability. Your seed company may

be able to help but contact it now, not in May! *Alfalfa* and other forage legume seed generally retains good germination. This is true for *grass seed* as well, with the possible exception of reed canarygrass. Reed canarygrass seed is expensive and the seedlings are slow to get established; combined with so-so forage quality its popularity with dairy farmers has understandably declined.

A note on germination testing: I couldn't find a lab that does routine seed testing, so unless your seed company will do it you'll need to do your own seed viability tests. Put 20 or so seeds on a paper towel, fold it in half and wet it lightly. Then roll up the towel and keep it slightly moist for several days to a week at household temperatures. Any seed that hasn't germinated in a week is unlikely to.

Pesticides: *Granulars and wettable powders* should be OK if the bags have been kept dry. *Liquids and emulsions* have widely varying storage recommendations: Some can be frozen without any problems, while

others should be kept above freezing — some at 40F or above. Read the label — hopefully you did this before storing the container — and if you have questions call the “help line” number on the label. If in doubt put a small amount of a liquid pesticide in water to see if it mixes properly. Make sure that you properly dispose of any unusable product.

Silage inoculants: The bacteria in most silage inoculants will remain viable for at least a year — some for two or more years — but the containers must be kept unopened, cool and dry. Store carry-over inoculants at 70F or less, and the packets or bottles can also be refrigerated. Some inoculants can be frozen, but first read the label. (Do you detect a trend here?) While I'm not a fan of granular inoculants because they're harder to uniformly apply to the forage, if you have carry-over granular inoculant it should be OK as long as it's last year's product and the bags were kept cool and dry.

— Ev Thomas
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CONTROLLING SOIL INSECTS WITH NEMATODES

Farmers in Northern NY raising corn or alfalfa should read the article accessed via the following URL. Entomopathogenic (friendly) nematodes can be applied either with a field sprayer or manure spreader that can provide long-term control of corn rootworms and the dreaded alfalfa snout beetle. Over 25,000 acres of alfalfa in NNY have already been treated with these nematodes, which are native to the region.

<https://blogs.cornell.edu/whatscroppingup/2021/12/08/are-persistent-biocontrol-nematodes-entomopathogenic-for-the-control-of-corn-rootworm-an-economic-benefit-for-your-ny-farm/>

The cost to treat an acre is somewhat more than an application of soil insecticide or using Bt corn, but offers the opportunity of soil insect control for the entire crop rotation. And the option of being able to apply the nematodes during liquid or slurry manure spreading makes it particularly attractive for dairy farmers.

— E.T.

ESTIMATING COW VALUE IN DAIRY COMP

When deciding to cull a cow, milk production, age, stage of lactation, health, and reproductive performance are all areas that farmers look at when deciding if a cow should stay in the herd. Typically, a cow is removed from the herd when her profits are no longer exceeding the costs of raising her, or when there are higher profits expected from a potential replacement.

The dairy herd management program, DairyComp 305, has a module called CowVal (Cow Value) that can be used to estimate the value of adult animals.

CowVal calculates the current value for adult cows as they compare to the value of an average fresh heifer in the herd. Therefore, a cow with a positive CowVal is worth more than the average heifer. A cow with a negative CowVal implies that that animal is worth less than the average heifer and is one you may consider replacing. CowVal also calculates the value of a pregnancy for each adult animal. This part of the tool can help you decide the value of breeding an open cow back.

A study published in the Journal of Dairy Science in 2007 evaluated how CowVal performed for two commercial herds in Ontario over several months. Both farms were enrolled in Ontario/CanWest DHI milk recording for about 7 years before this study was conducted. Overall, the study concluded that CowVal should not be exclusively relied on for management decisions, but is suitable to use as a guide. The study found high variation in CowVals during the first 60 DIM. This high variation was likely due to

ID	PEN	DIM	LACT	RPRO	DSLH	TBRD	DUE	MILK	MTOT	305ME	RELV	SCC	NMAST	CWVAL	PGVAL
3646	2	170	3	PREG	86	1	9/7/24	95	90	26100	80	15	0	719	367
3669	4	295	3	PREG	212	1	5/4/24	68	63	32300	99	115	0	723	685
3420	5	301	4	PREG	219	1	4/27/24	76	51	35770	110	115	0	725	716
4062	5	326	1	PREG	224	2	4/22/24	52	43	33690	104	141	1	725	724
4255	301	131	1	PREG	51	1	10/12/24	91	87	31110	96	50	0	726	276
4259	3	77	1	FRESH	0	0	-	81	90	24800	76	29	0	729	142
4120	5	306	1	PREG	226	1	4/20/24	76	73	33010	101	44	0	732	483
4307	3	69	1	FRESH	44	0	-	85	90	27510	84	35	0	732	109
4263	3	107	1	BRED	9	1	-	83	85	27600	85	20	0	737	138
3779	2	207	2	BRED	29	6	-	95	85	28770	88	47	0	738	353
4013	201	85	2	OK/OPEN	0	0	-	120	90	30550	94	23	0	742	258

more fluctuations in milk production and health during this time. As a result, it was concluded that farmers should not use CowVal as a tool until cows are at least 60 DIM to allow for enough milk test results that can be used to predict overall cow value.

If you've never run CowVal in DairyComp 305, make sure that the items "CWVAL" and "PGVAL" exist in your file. This can be found by typing "alter" in the command bar and then selecting "items". The item "CWVAL" is the cow's current value, and "PGVAL" is the pregnancy value. Once those items are set, you begin by typing "Cowval" in the command line, you will then be given a menu with 4 options, begin by selecting "edit parameters". CowVal uses parameters like conception rate, heifer cost, feed cost, milk price, cull rates, and more to estimate cow value. When first using Cowval, data from your cowfile is used to calculate the parameters, but all parameters can be edited to better reflect your farm and the current market. It's best to change these parameters quarterly to account for changes on farm and in the market. Once the parameters are set you can now estimate cow value. This estimate will create an overall summary for your herd. For

example, it will give you the number of cows in your herd you should keep, the number of cows to sell, and the average cow value on your farm. With the cow value estimated, you can use "CWVAL" and "PGVAL" in the command line to look at CowVal's of specific cows.

To use CowVal as a guide you could use a command such as, "LIST ID PEN DIM LACT RPRO DSLH TBRD DUE MILK MTOT 305ME RELV SCC NMAST CWVAL PGVAL FOR LACT > 0 DIM > 60 RC < 6 BY CWVAL". This will give you a list of all your milking cows that are greater than 60 DIM sorted from lowest to highest cow value. The "CWVAL" value is essentially how much money that cow is worth compared to your average heifer, and "PGVAL" is how much a pregnancy is worth. The further along a pregnancy is, the higher the CWVAL and PGVAL will be. The PGVAL of a cow that is bred or open is how much a confirmed pregnancy will increase or decrease the cow's value.

The image provided is an example of what using CowVal in DairyComp looks like using the command above. The CWVAL and PGVAL for each cow can

See **COWVAL**, Page 4

ROTATE CROPS — HERBICIDES TOO

You'll seldom read recommendations about specific herbicides in this newsletter; we leave this job to custom spray applicators and professional crop advisors. That said, it's important not to rely too heavily on one herbicide (or one herbicide family—more on this shortly).

During the 1970s I believe that I was the first person in Northern NY to discover (and soon have confirmed) the presence of triazine-resistant lambsquarters. It was in a Franklin County field that had been in continuous corn with atrazine the only herbicide used. The farmer noticed an alarming number of healthy lambsquarters plants, so he applied a second (higher) rate of atrazine. By the time I got there the lambsquarters plants were at least three feet tall and were competing with the corn. I collected a handful or so of seeds and shipped them to Cornell University where in a greenhouse trial the lambsquarters survived an application rate of 2 gallons of atrazine 4L per acre, far exceeding the labelled rate. An agronomist in Central NY discovered triazine-resistant lambsquarters that same week, also in continuous corn (and with a history of continuous atrazine), so we share that dubious honor.

The Franklin County farmer chopped the field for silage, weeds and all, and ensiled it. The lambsquarters seed went from the silo into the feedbunk, into one end of the cow and out the other, winding up in the manure and thence back onto his cropland. Lambsquarters seeds survive both ensiling and the ruminant digestive tract quite well, so this did a very effective job of a single-field problem becoming a much more widespread one.

A more recent challenge is glyphosate (Roundup): We now have Roundup-Ready corn, Roundup-Ready soybeans and Roundup-Ready alfalfa, so it's possible to use glyphosate as the sole herbicide for an entire corn-soybean-alfalfa rotation. Possible, but not advisable. There are already a handful of glyphosate-resistant weed species, though so far none in the Northeast (that we know of). Let's keep it that way. Used properly, glyphosate is a terrific herbicide, a game-changer. But it's important to rotate herbicides, not only the particular herbicide but the herbicide class, which includes the herbicide's family, mode and target site of action. Discuss this with your crop advisor or custom applicator.

— E.T.

COW VAL, Continued from Page 3

be found in the last two columns. All cows in this example have a positive CWVAL and are therefore worth more than a replacement heifer. Although all the cows are similar in CWVAL, they all have different PGVAL's. For instance, 3669, 3420, and 4062 have the highest PGVAL's because they are closer to calving. On the other hand, 4249 and 4307, and 4013 have the lowest PGVAL's. These cows have not yet been bred, but their positive PGVAL's are indicating that there is value in breeding these animals back. If a cow had a negative PGVAL, then she might one to investigate further

before breeding her. Although CowVal doesn't consider any health events, any impacts that health events have on production or reproduction will affect CowVal.

DairyComp 305's CowVal module is a very interesting and useful tool. In recent years updated CowVal has been updated to account for component production. Instead of using "COWVAL" as your initial command, use "COWVAL\F" to include fat and protein. CowVal provides farmers with some insight on how their cows are performing, but again, it should

only be used as a guide. In the end, farmers always know their cows the best. You can learn more about CowVal at vas.com/ReferenceGuide/COWVAL/CowValIntro.htm. There are a lot of resources and technologies for dairy, some farmers may unknowingly already have the tools. I encourage farmers to get to know their herd management and other software's on the farm well, and take full advantage of everything they're paying for.

— Emily Bourdeau
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SEASONAL CHANGES, Continued from Page 1

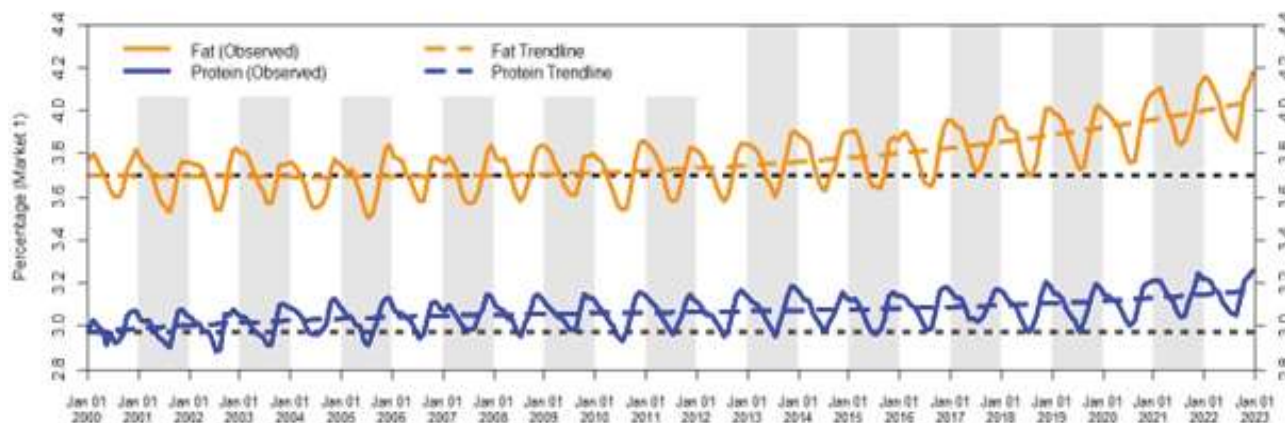


Figure 1. Milk fat and protein concentration for Federal Milk Market Order 1 (Northeast).

At Miner Institute we recently looked at the seasonal patterns of milk fat and protein concentration from Federal Milk Market Order 1 (FMMO1; Northeast) from 2000 to 2023 (Figure 1). The seasonal pattern is still present as expected. What caught our attention was the fact that the average percentage of milk fat and protein has increased greatly in recent years following several years of no change. These increases are likely the result of the financial incentive to produce more fat and protein, and were driven through herd improvements in management, nutrition, and genetics. Interestingly, the annual pattern of change in FMMO1 has been consistent year to year for fat (Figure 2) and protein (Figure 3) concentrations.

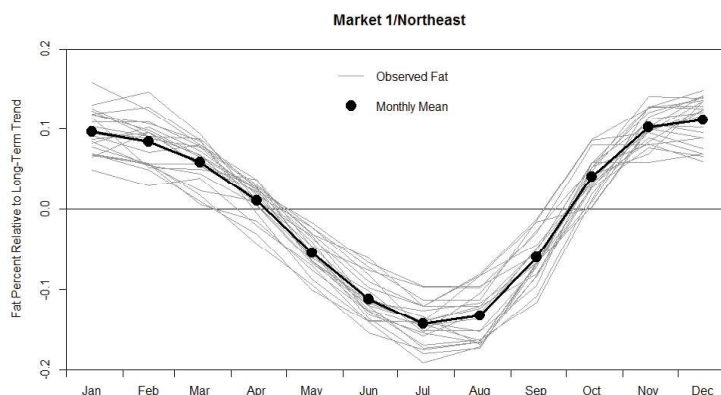


Figure 2. Milk fat change over time relative to the long-term trend for milk fat concentration.

Our Miner dairy team, including our nutritionist, have been discussing these patterns and looking for opportunities in our herd to produce more pounds of fat and protein. Our goal is to stay informed, observe trends, and make informed decisions about milk composition and management practices to keep our herd thriving. We are focusing on improving our forage quality and quantity, especially hay crop silage, this coming harvest season so we can feed more forage, optimize rumen fermentation and health, and ultimately increase milk fat and protein yields.

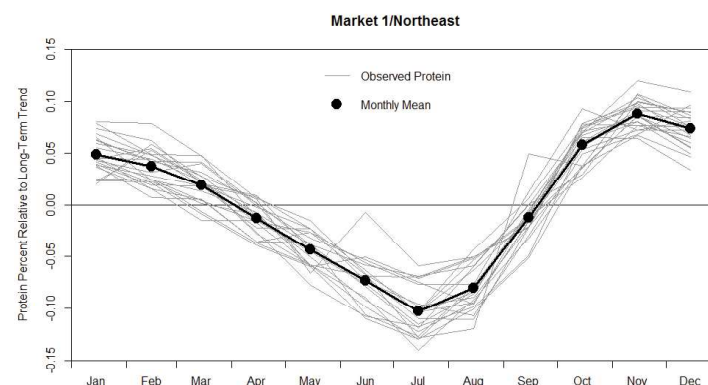


Figure 3. Milk protein change over time relative to the long-term trend for milk protein concentration.

The benchmarks for milk fat and protein yields and concentrations have been increasing and are expected to increase for the next several years. Make sure your herd is keeping up.

— Heather Dann
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POSITIVE INTERACTIONS WITH HEIFERS CAN ALLEVIATE STRESS IN THE PARLOR

The transition period for primiparous cows entering the herd is a very stressful time. After months of infrequent handling and little responsibility apart from growing, each heifer eventually reaches adulthood where she is suddenly moved in and out of the pen and milked multiple times daily. These management changes mean that first-calf heifers must adapt behaviorally while also managing significant physiological and social changes.

Naturally, some heifers struggle more with the transition and can be averse to handling. Most milkers know the hassle of parlor-training a particularly aggressive or fearful fresh heifer. Diving out of or balking in the entrance alley, stamping during the prep procedure, and kicking at staff and the milking unit are common and unpleasant behaviors that take extra time for staff to address. This can also pose a safety risk; in fact, a 2002 survey of 500 UK farms observed that 6% of heifers are culled per year due to behavior alone. A comparative statistic wasn't found for US-based herds, but it's not uncommon to factor in disposition when making culling decisions. Given these issues, research scientists have used different approaches (with varying degrees of success) to look at how heifers can more easily acclimate to the parlor.

Multiple studies have observed that stimulating the teats and udders of pre-fresh heifers can improve behavior in the parlor after calving. Researchers from the Institute for Livestock Sciences in Switzerland observed that fresh heifers who were exposed to the milking routine 10 days prior to calving displayed less stamping and kicking

in the parlor than a control group (*J. Dairy Sci.* 98(8):5241-5251).

In another study, researchers from the Indian Veterinary Research Institute massaged the udders of pre-fresh heifers to investigate the potential effects on parlor behavior and production (*Appl. Anim. Behav. Sci.* 89(1-2):17-26). Heifers that received udder massages had a faster milk letdown time by about 20 seconds and a higher milk flow rate by about 5 grams per second compared to a control group. Control cows had higher rates of urination and defecation in the parlor up to 16 days in milk and worse temperament scores through 75 days in milk, at which point the study ended. The authors concluded that udder massaging for 30 sessions before calving was ideal to reduce fear during parlor training, compared to 15 or 45 sessions.

While tactile stimulation appears to improve behavior during the transition period, I find the most compelling study to be from Newcastle University in the UK. Here, researchers studied the impact of brushing heifers before calving on parlor behavior and production (*Appl. Anim. Behav. Sci.* 114(1-2):65-75). Researchers divided 148 animals into a control or treatment group over a three-year period. Each treatment heifer was brushed on the head, neck, and shoulders by the same individual for five minutes per week for 6, 13, 31, or 49 weeks prior to calving. All animals were brushed unrestrained, and if a heifer was resistant to brushing the individual stood at the edge of their flight zone and slowly advanced for the allotted five minutes per week. After calving

the cows were observed for four weeks in the parlor. Though there was no difference in milk yield, treatment cows had a 19% faster milk letdown than control cows. Treatment cows stamped and kicked at significantly lower rates, and the extra time that milkers had to spend with treatment cows (beyond the normal udder preparation and unit attachment) was 75% less than the extra time spent with control cows. Time was an important factor for these effects and by four weeks into the lactation, there were no significant differences between treatments. The authors concluded that brushing heifers five minutes per week for six weeks prior to calving is sufficient to reduce fear responses and improve behavior while being parlor trained.

Given these results, would I expect to see farmers out with their pregnant heifers, giving them massages and brushing them down? Frankly, the additional time and labor that this would take is just not feasible for many producers. Rather, I feel that this data can serve as a good reminder that the way we manage our heifers has a measurable impact on their behavior and welfare. The authors in each of these studies credit their results in part to the decreased fear displayed by treatment heifers. By spending an extra few minutes in the pen and having non-fear-based interactions with your heifers, you may help to build their trust with humans and mitigate some of the stress that they will experience during the transition period.

— Alexandria Bartlett
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WHAT EVER HAPPENED TO A NORMAL GROWING SEASON?

It has been said: “There’s no such thing as normal” when it comes to seasonal weather patterns, and I’m beginning to think it’s true. Yes, we can plot a line depicting the “average” temperature and precipitation, but the conditions we experience never follow it perfectly. As an avid skier I enjoy tracking the running snowpack depth data from the top of the tallest mountain in Vermont (Mt. Mansfield). On average there’s a linear increase in snow depth until mid-March. But if you examined every year of snow data on record, you would be hard-pressed to find anything even close to linear. The same is true for environmental conditions during the growing season.

As I write this we’ve just completed the months of December and January with temperatures so mild that we have set a record for the highest minimum temperatures during this time frame in the Northeast (NOAA, 2024). For this reason I’m hopeful that we will have good survival of winter forages and cover crops in the area. This also could benefit winter-sensitive grasses and forage legumes. The only trouble is that snow cover has been hit-or-miss this winter and we’ve been quite wet for the time period in the region (3rd wettest on record). Thus, if we lose plants this winter

it’s probably going to be the result of ponding and ice sheeting rather than extreme low temperatures.

As for the 2023 growing season at Miner Institute, we got a strange one. The year started out with above-average temperatures and precipitation, but then evolved into a cool and dry period that included the entire month of May. Somewhere in June we transitioned into an extremely wet summer pattern, which eventually brought record-breaking flooding to northern New York, Vermont, and other parts of the Northeast. When we finally caught a break from the rain in September, the corn dried down extremely quickly with much of it being overmature by the time we were able to get onto our heavy soils.

Corn yields were fair given the circumstances, but the wet conditions took their toll on the quality of the crop, resulting in low crude protein and poor digestibility. Wet years are typically not the greatest for plant health, and that’s exactly what we saw in 2023. In addition to our usual Northern Corn Leaf Blight and leaf spot, we experienced a widespread outbreak of anthracnose this past year. This disease occurs as both a leaf blight and a stalk rot that can prematurely kill the top or even the

whole plant. While this fungus doesn’t produce mycotoxins it leaves behind dead plant tissue that can easily be colonized by other organisms. Our mycotoxin tests did come back high, so it is likely that *Fusarium* spp. were also present either as ear or stalk rots.

While our corn quality suffered, we made decent alfalfa/grass silage in 2023. This was aided by the dry weather in May which allowed for a timely first cut. The rain and cooler than normal weather that showed up during the mid-summer months kept the grass growing and we tried to use every stretch of dry weather we could to take another cutting. When all was said and done, we had taken a total of six cuttings from our intensively managed fields (aside from a few wet spots) – a potential record for the farm at Miner Institute. Looking ahead, the NOAA Climate Prediction Center continues to favor a warm bias for much of the country for the start of the growing season. While this could mean an early spring for some of us, it’s always important to manage risk when planting early. The only thing certain about seasonal weather predictions is uncertainty. Who knows what the 2024 growing season will bring.

— Allen Wilder
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LAMENESS IS MULTI-FACETED: HOW DOES IT IMPACT REPRODUCTION?

In the world of dairy cattle, lameness is attributed to discomfort and decreased overall performance over a cow's lifetime. Lameness has been acknowledged as one of the leading health issues along with mastitis and has a prevalence of 15 to 30% in indoor housing systems (Cramer and Solano, 2023). Cows classified as lame are three times more likely to have decreased reproductive performance because of underlying factors influencing decreased fertility outcomes. In recent years dairy cattle research has considered new determinants in which lameness alters overall reproductive health, estrus behavior, hormonal imbalances, and chronic stress in a cow's lifetime.

Understandably, lameness affects the behavioral patterns of a healthy cow, especially her mobility. Behavior such as "standing heat" at the peak of estrus is compromised when a cow is uncomfortable due to lameness. In a study by Morris et al., 2011, researchers sought to further understand the impact of lameness as a stressor upon the reproductive cycle

in dairy cattle through evaluation of follicular growth and estrus behavior using a synchronization program. They found that all healthy cows responded to the synchronization and ovulated. Of the lame cows, 50% responded to synchronization and ovulated, 21% responded to synchronization but did not ovulate, and 29% did not ovulate or respond to synchronization. Lame cows that had ovulated displayed less intensity in their estrus behaviors, especially when being mounted. The researchers believed the cause to be the lack of pulses of luteinizing hormone early in the estrous cycle which then decreased estrogen levels and disrupted proper ovulation and hormone regulation. But what physiological mechanism was responsible for the lameness to impact hormone production?

The hypothalamus and pituitary gland within the brain are vital in properly regulating and synthesizing hormones for reproductive functions but are easily impaired when a stressor such as lameness results in increased cortisol levels. A study by O'Driscoll et

al. (2015) hypothesized that constant pain from lameness, specifically sole ulcers in dairy cattle may have a detrimental effect upon the immune system and inflammatory status. Within their results, they found that lame cows experienced increased levels of cortisol and leukocytes through blood sampling over a year. Thus showing the influence that lameness has as a stressor and an inflammatory response which also alters the crucial functions of the hypothalamus-pituitary-ovary axis (Tsousis et al., 2022). These disruptions undoubtedly contribute to the loss of intensity during estrus as well as responsiveness to synchronization programs used to breed cows.

Lameness is a multifaceted issue which permeates key physiological functions needed to sustain the reproductive cycle. Important practices like regular hoof trimming will not only ensure cow comfort, but will improve reproductive performance.

— *Jasmine Guerrero*
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GOOD ADVICE

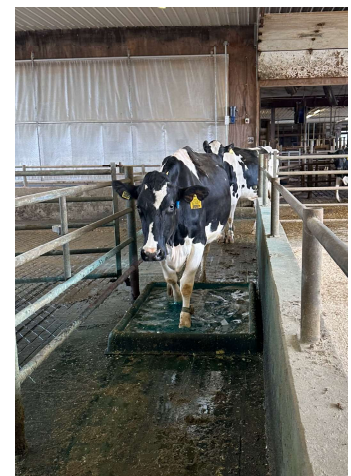
- Don't corner something that you know is meaner than you.
- Life is simpler when you plow around the stump.
- When you wallow with pigs expect to get dirty.
- Don't interfere with something that isn't bothering you.
- Sometimes you get, and sometimes you get got.
- Always drink upstream from the cows.
- If you think you're a person of influence try ordering someone else's dog around.

WHAT'S HAPPENING ON THE FARM

It is hard to believe that it's already March. Spring is right around the corner, and the rise and fall of temperatures has kept us on our toes when monitoring and preventing pneumonia, especially in our young stock. We're working hard to keep calves healthy by staying on top of vaccinations and treating sick calves promptly and effectively as needed. Making sure the barns are properly ventilated by raising and lowering the curtains and opening and closing barn doors depending on the temperatures outside has been key. Thankfully we've encountered minimal pneumonia cases in our calf barn and transition heifer barn so far.

As for the milking herd, the cows are milking well, averaging 95lbs. We've been keeping busy on the farm, replacing outdated SCR collars on our cows so that our 24/7 health and activity monitoring stays precise and up to date. We've also increased stall grooming in our sand-bedded barn from twice to three times a week to prevent and reduce mastitis cases. If the sand-bedded stalls aren't groomed regularly urine, feces, and other bacteria can pool in the stall creating a rather unpleasant "bath tub" effect, leaving quarters and teat ends filthy and more susceptible to mastitis. Grooming the stalls more often will ensure the sand bedding is level, clean and comfortable for our cows!

At the end of February we had our hoof trimmer at the farm to do routine trimming, and 94 cows ended their day with fresh pedicures. A few cows have thin soles; more toe trimming will be done for these cows and the sole left to grow. Thin soles are



Images above: Hoof trimming chute (left), footbath (right).

more common among the cows that are housed in our sand bedded free stall barn with concrete floors. The concrete and sand act as a natural nail file against their hooves leaving some with thin soles. It's important not to over-trim cows with thin soles and allow ample time for regrowth. For the most part thin soles shouldn't bother the cow unless lameness, abscess or injury to the hoof occur. If a cow's soles become too thin causing her to go lame we'll move her to our sawdust bedded, freestall barn with rubber mat flooring. Having a barn with rubber mat flooring gives us the option to rehab cows with extensive hoof problems. Walking on the rubber mats causes much less wear and tear to the hoof. If the cows' hoof health is not managed properly, they could become lame making it hard for them to walk to the feed bunk to eat or to the parlor to get milked. You will see big drops in milk production and the overall health of the cow. We do our best to prioritize hoof health by keeping up with routine trims and foot bath procedures. Our cows are trimmed at least once every lactation, and we usually aim for the cow to be around 180 days in milk.

We also run copper sulfate foot baths for our cows twice a week. A helpful tool to figure out the correct foot bath concentration for your herd can be found on the Dairyland Initiative Website under LifeStep Footbath Concentration Calculator. On foot bath day, our cows walk through a copper sulfate foot bath on their way back to their designated pens. Copper sulfate foot baths are great for the cows' hoof hygiene, It's antimicrobial properties help prevent foot rot, hairy heel warts and it reduces moisture in the hoof. Hoof health is detrimental to the overall production and wellbeing of cows, so we make it a priority to maintain our hoof health management practices. Healthy hooves, happy cows.

Along with all the hustle and bustle on the farm, we've also been interviewing candidates for our summer internship programs. We'll be welcoming a new batch of students to the Institute in mid-May and are excited and looking forward to seeing new faces around the barn again!

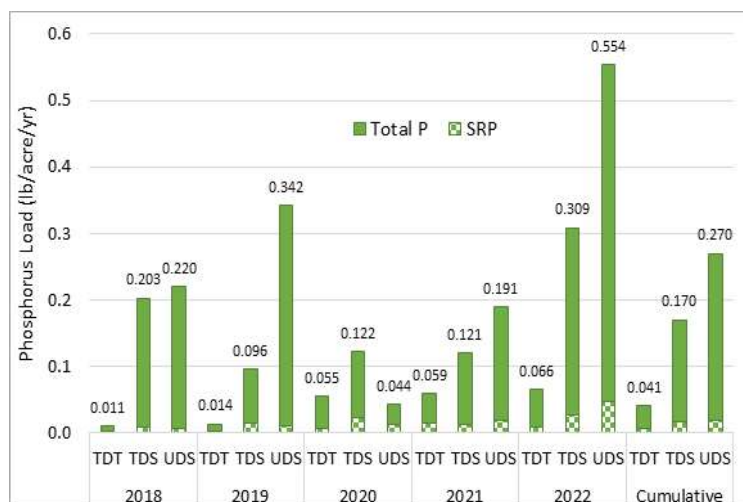
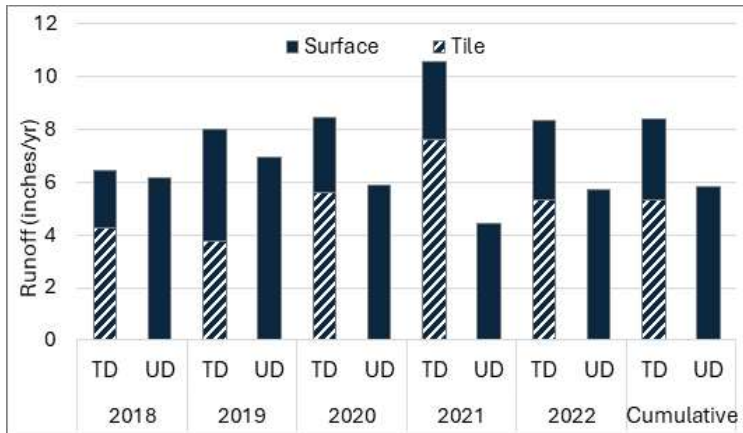
— Mackenzie Abbati
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FIVE YEARS OF CONTINUOUS PAIRED FIELD DRAINAGE RESEARCH

Tile drainage is an important practice on farms in northern climates with short growing seasons where improved field trafficability can extend the growing season, significantly increase crop yields, and minimize soil compaction by field equipment (e.g., tire ruts). The extended growing season can also provide greater flexibility in the timing of manure applications and adoption of conservation practices such as cover cropping.

With proper installation and nutrient management, phosphorus (P) concentrations in tile drainage water are typically substantially lower than in surface water runoff. In addition to enhanced crop production and soil quality, tiling can reduce soil erosion and total P losses in fields that experience surface runoff. Tiling has come under increasing scrutiny for its role in P export from farm fields, particularly within the past 10 years. However, few long-term, year-round, side-by-side comparisons of tile-drained and undrained fields have been performed in Northern New York.

In 2018, with funding from the Northern New York Agricultural Development Program (www.nnyagdev.org), an edge-of-field monitoring project was initiated on two adjacent 6-acre farm fields in Keeseville, NY. Both fields were primarily composed of a somewhat poorly drained silt loam and had the



same cropping and management history. Both fields were also managed the same throughout the study, save that one of the fields was tile-drained (Field TD) just prior to the study. The other field (Field UD) only had surface drainage improvements, which were also done in the tile-drained field to allow a single collection point for surface runoff in each field.

Surface runoff from both fields and tile drainage from the tiled field was collected with automated sampling equipment that adjusted sampling frequency in response to flow rates. Sampling was conducted continuously, year-round to characterize the water quality across the entire year, with the exception of equipment failures. Both fields were planted with corn

for silage and received tillage-incorporated manure applications within 24 hours of planting, supplemented by commercial fertilizer when necessary to satisfy the crop's nutrient requirements.

From 2018 through 2022, there was 44% more total drainage from TD (surface + tile drainage) than UD (surface drainage only). This is not surprising as the purpose of tile drainage is to increase the drainage of water from the fields. However, tile drainage typically greatly reduces surface runoff, and this was observed in our study, as UD generated twice as much surface runoff as TD.

Despite the increased drainage volumes, water quality improvements can be achieved in many cases when surface runoff is reduced following the installation of systematic tile drainage. We did observe this pattern, as the concentrations were much higher and the majority of the P load from TD was transported in surface drainage. Although surface drainage only generated 37% of the total field drainage in TD, it was responsible for 81% of the P exported from the field. Ultimately, the reduced rates of surface runoff resulted in 22% less P lost from TD than UD. It is important to note that as seen in the graph of P loads, regardless of drainage differences, both fields lost very low rates of P, with averages of 0.21 lb/acre/yr. See **DRAINAGE**, Page 11

BIG CHANGES IN THE NORTH COUNTRY DAIRY INDUSTRY

The 2022 U.S. Census of Agriculture was released recently, and it reveals big changes in the dairy industry in the six counties in Northern NY. Following are the numbers of dairy farms and milk cows, and the % changes since the 2017 Census:

Looking at the numbers below, it could be argued that the dairy industry in Northern NY is getting much smaller (number of dairy farms) or not changing much at all (cow numbers). Since milk production has increased in the past 5 years, it could even be argued that the industry has grown.

— E.T.

	Dairy Farms	vs. 2017	Milk Cows	vs. 2017
Clinton	60	-21%	24,094	+45%
Essex	10	-57%	141	-90%
Franklin	71	-42%	16,637	+8%
Jefferson	77	-47%	25,524	-9%
Lewis	127	-39%	23,355	-14%
St. Lawrence	109	-62%	34,557	-2%
Total	454	-47%	124,308	0

DRAINAGE, Continued from Page 10

acre/yr and 0.27 lb/acre/yr of P lost by TD and UD, respectively, across the five-year study. These values represent less than 2% of all the P that was applied to the field throughout the study in manure or commercial fertilizer.

In next month's Farm Report issue, I'll wrap up a few more key points from this phase of the project, and then introduce what is in store for the next several years at this site.

— Laura Klaiber
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Above at left: Tile drainage outlet. At right: Surface drainage through monitoring equipment at UD.

Is there something you'd like to know more about?

Email article suggestions to dutil@whminer.com

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ENJOY!

Back in February, we hosted a cow kissing event that raised more than \$15,000 for homelessness prevention programs in our region. Big thanks to this year's cow kissing team pictured above from L to R: Amanda Tagliarino, Senior Director at Fieldstone Foundation; Greg Janisewski, Franklin County Legislator; Holly Black, President of Hurdle Group, Inc.; Mackenzie Abbati, Miner Institute; Sparta the cow; Alison Webbinaro, Governor Kathy Hochul's North Country Regional Representative; Assemblyman Billy Jones; Tom Scozzafava, Retired Supervisor of the town of Moriah and Essex County Board of Supervisors; John Bernardi, President and CEO of United Way of the Adirondack Region.

Closing Comment

The easiest way to find something you lost is to buy a replacement.

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