

FARM REPORT



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FROM THE PRESIDENT'S DESK: GENETICS AND HEAT STRESS

Feed efficiency continues to be a hot topic, with at least 23 papers focused on this topic published during the past few years in the Journal of Dairy Science. A recent paper assessed the influence of weather on feed intake and feed efficiency in temperate climates (Hill and Wall, 2017. J. Dairy Sci. 100:2240-2257). This research caught my attention because the authors were concerned about the potential for climate change to increase the challenge of achieving high dairy efficiency as average temperatures and the intensity and duration of heat waves increase. No one knows with certainty to what extent global climate and weather may change, but most people agree that farmers will need to manage under warmer conditions by mid-century and beyond.

With high ambient temperatures we expect cows to reduce their dry matter intake in an attempt to lessen their metabolic heat load. Of course, high producing cows require large amounts of feed intake and are therefore more susceptible to heat stress.

The researchers investigated two genetic lines of Holstein cattle: 1) high genetic merit, and 2) average for the UK where the trial was conducted. The higher genetic merit cows produced more solids-corrected milk and had greater dry matter intake and feed efficiency than the average genetic merit cows. Using data from 328 cows over 8 years, they found that cows from both genetic lines suffered reductions in

feed intake and fat- and protein-corrected milk as THI increased. That was expected. But, they also had greater feed efficiency as THI went up. Overall, the THI ranged between 21 and 74 and averaged 50. So these cows were definitely managed under a temperate environment and exposed to mild heat stress similar in many ways to what cows experience in the northern U.S. and Canada.

The results of this study indicate that greater feed efficiency may at least partly offset the costs of less milk production during warmer conditions. Interestingly, the rate of increase in feed efficiency with higher THI was greater for higher genetic merit cows than for the average cows. Based on this observation, the researchers raised the possibility that genetically superior cows may adapt better to heat stress and use what the authors termed “more effective coping tactics.” Of course, it’s also likely that cows of different genetic merit vary in their sensitivity to weather conditions. Future research should delve into what these more efficient cows do to better handle heat stress.

In the future, using feed intake records to identify cows that are able to better maintain feed intake under heat stress conditions may provide opportunity to breed and select for cattle that will be more adaptable to weather-related stress. In fact,

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WEATHER WOES

One of the disadvantages of newsletters that are printed and mailed — as are hundreds of copies of the Farm Report — is timing: A couple of weeks may elapse between when an article is written and when it appears in your mailbox, during which time the weather may have markedly changed. (One more reason to subscribe to the email version.) That said, the very wet conditions prevailing in April and May have had a severe impact on manure spreading, corn planting and other spring fieldwork. A few items to consider:

- The calendar date has no impact on what constitutes an adequate seedbed. If the soil is too wet to plant it's simply too wet, even if the calendar says it's already late for corn planting.

- If you have a corn planter equipped to notill this might be the year to do so, especially on acreage that was in corn last year and wasn't fall tilled. However, notill isn't an excuse to "mud in" corn.
- Don't hesitate to contact your seed dealer and trade full-season corn hybrids for ones that are at least a week earlier — maybe more. Planting full-season hybrids in June is a triumph of hope over experience.
- Late-planted corn will often "catch up" somewhat, but don't expect miracles. You'll need to revise your yield assumptions for very late-planted corn. Corn planted in June will probably not mature enough to be harvested as grain. However, there may

be a seller's market for corn silage this fall, both standing and chopped into buyers' trucks.

- Sudan-sorghum is an alternative to late-planted corn, but my preference is to plant corn at least through mid-June. Some 75-80 RM corn hybrids will still do fairly well when planted that late — but don't skimp on plant population.
- Effluent from immature corn silage could be a big problem this fall. It's not too early to think about this and make sure your silage effluent collection/treatment systems are operating correctly. NYDEC has little tolerance for silage effluent problems.

— E.T.

FERTILIZER FACTS AND FANCY

- The nutrients in manure are at least as plant-available as those in commercial fertilizers, in some cases even more so.
- Farmers who routinely apply micronutrients without a need confirmed by soil and/or plant analysis apparently have more money than common sense.
- Boron is the micronutrient most likely to be deficient in alfalfa, zinc the most likely in corn.
- Forage crops including corn harvested for silage use a lot of potassium — you can't afford to let soil test K levels drift down into the low range.
- Few crop investments return a profit as quickly and as reliably as nitrogen fertilizer on grass.
- Granular and fluid fertilizers are similar in plant nutrient availability, with fluids having a potential advantage in convenience and uniformity of analysis.

— E.T.

NEW RESEARCH INTERN: ASHLEY CATE

I am the new research intern here at Miner. My love for dairy cattle started early, and I guess you could say that it runs in the family. I was lucky enough to have an uncle who raised Milking Shorthorns and he was generous enough to allow me to show them in 4-H. However, it was not until I was in college and started helping out at a local family-run dairy farm in central NH that I started to truly understand and better appreciate the dairy industry.

I graduated from University of New Hampshire in May 2016 with a B.S. in Zoology. In the Zoology program at UNH I was exposed to a wide variety of classes encompassing ecology, environmental science, developmental biology, evolution, animal behavior, and everything in between. However, it was not until the middle of my junior year that I started to look outside of the box. I took agriculture-related classes as electives and started working for a dairy nutrition research



scientist at UNH, where I worked on trials testing the bioavailability of many amino acid feed additives. This introduction to dairy nutrition and research made me realize there was no turning back for me.

I quickly developed a desire to learn more about dairy nutrition. What exactly factors into the formulation of a diet? More importantly, how does the dairy cow turn this formulated ration into milk? I knew there would not be a simple answer to these questions, but that only made me want to

gain the knowledge that much more.

I stumbled across a job posting on Facebook (of all places) for the position here at Miner Institute, and decided to take the chance and apply. I could not possibly be more glad that I did. In the short amount of time that I have been here, I have learned so much. Although things are about to get a little crazy around here, with two trials currently underway, two new trials starting up on the farm, one trial starting up involving local farms, and the imminent arrival of summer research students, I am looking forward to the rest of my time here at Miner. As with most recent college graduates, I am not sure exactly what my career is going to be. However, I can tell you this much, my love and respect for hard-working dairy farmers and their hard-working cattle will continue to motivate me every step that I take towards my future.

— Ashley Cate
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FARM DAYS: A 35-YEAR TRADITION STILL GOING STRONG

For the past 35 years, Miner Institute has hosted Farm Days for 5th Graders for three days in early June. This program allows students the opportunity to observe agriculture in action. Our mission in this program is to help the students become more aware of agriculture in our community and the impact on our daily lives.

Areas that 5th graders, along with their teachers and chaperones explore during the day include the Dairy Barn where they learn about the comfortable environment where the cows live, the areas where cows are milked and what cows eat. Students also observe the modern equipment used for planting, harvesting and storing our crops. Additionally, students participate in a ‘hands-on’ activity with the fistulated cow where everybody has the opportunity to put their hand in one

of our rumen-fistulated cows. Horse behavior along with care, maintenance, and training is explored in the equine area. We also show students the Heritage Exhibit where they learn about Heart’s Delight Farm 100 years ago.

Our tour guides for most of the eight stations are our summer interns; in 2017 we have 3 in Farm Management, 4 in Ag Research, and 5 in Equine Management, all college students from around the country. We feel it’s important for our students to have the opportunity to interact with the public and tell our story regarding animal agriculture. Each year, we host approximately 600 5th graders and many people from this area recall fond memories of their day with us when they were in elementary school. This year, one of the participants enrolled in

our Dairy Nutrition Shortcourse shared that she first became aware of dairy cattle nutrition as a career when she came here about 12 years ago, as a 5th grader!

We are quite proud of the energy and enthusiasm that our summer students share. Many of our students have participated in similar activities, but for some this is a brand new experience. They come away with a tremendous amount of respect for the teachers that are with elementary students every day! We appreciate the many teachers, bus drivers and chaperones that have made it possible for area students to be a part of this long-standing annual event. We recognize that there are a lot of other possibilities for class field trips and we are proud to be able to share our story of animal agriculture.

RFI: A SOLUTION FOR LOW MILK PRICES?

As milk prices continue to be low dairy farmers need to look for new ways to stay profitable. One of the best ways to handle low or variable prices is to decrease the cost of inputs. In a survey done by the USDA in 2011, they reported the largest operating cost to a dairy farmer is feed costs at about 80%. Improving feed efficiency of your herd will have the largest impact on your bottom line.

Feed efficiency for lactating dairy cattle is measured using several different traits such as milk yield to dry matter intake (DMI), residual feed intake (RFI), and others. For this article we will focus on RFI. Residual feed intake in the simplest terms is actual individual feed intake minus predicted individual feed intake, and is calculated by regressing DMI on body weight, body weight change, and energy corrected milk (ECM) or milk energy output. When including body weight, body weight change, and ECM in the regression it allows us to identify cows that consume

less DMI than cows that are similar in size and production. Since RFI is actual intake minus predicted intake, the cows with a negative number will be classified as efficient because they ate less than predicted and vice versa for the inefficient cows.

A Journal of Animal Science article by researchers at the USDA in Beltsville, Maryland reported an 8.16 lb difference in DMI between the low- and high- RFI cows. If the cost to feed your cows is \$0.19/lb of DMI, with an 8.16 lb decrease in DMI to produce the same amount of milk you would save \$1.55 per cow per day. If you milked 300 cows in one month you'd have a savings of nearly \$14,000. This is just an example of how selecting for more efficient animals could help your farm survive low milk prices.

Most of you are probably thinking those numbers look really promising, but is RFI a heritable trait that I can select for? The USDA researchers reported that

RFI is a heritable trait, and by selecting for RFI it will lower DMI. Teagasc Animal and Grassland Research and Innovation Centre reported using milk samples analyzed with mid-infrared spectroscopy to predict RFI. They reported a strong genetic correlation between the predicted RFI and the true RFI, and this could give the ability to identify efficient cattle in your herd. As more research becomes available RFI should be considered for inclusion into multi-trait selection indexes.

The beef industry has extensively researched RFI, but it has taken a lot longer for the dairy industry to adopt it. As we cope with low milk prices and start looking for ways to save money, feed efficiency should be at the top of the list. Selecting for feed-efficient animals won't happen overnight, but with planning it can be an achievable goal that will help your farm thrive in the future.

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**Visit the Heart's Delight Farm
Heritage Exhibit at Miner Institute!**
**Open weekdays May - October
from 9 am to 3 pm**



**New in 2017, we have a special exhibit about William
Miner's hydro power projects! Join us for NY State's
Path through History weekends June 17-18 and Oct. 7-8**

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DAIRY FARM NUTRIENT MASS BALANCES

Most dairy farms require nutrient inputs for optimal animal and crop productivity. Productive dairy cows require diets that are balanced for energy, protein, and minerals. While a good portion of those nutritional requirements can be met with high quality forage produced on the farm, dairies also require feedstuffs in the form of grain and other supplements to optimize nutritional quality of diets. In addition, calves and young stock require purchased grain to help meet their nutrient requirements.

Part of the need for additional nutrients from off the farm is due to inherent biological inefficiencies. Based on the literature, dairy cows have an average utilization efficiency of around 26% for N and 32% for P. That means that for every lb of N or P consumed by the cow, approximately 0.26 and 0.32 lb of N and P, respectively, are converted into milk with the remainder excreted in urine and manure. Fertilizer N use efficiency for most forage crops ranges from 25 to 75% depending on timing of application and conditions, while N use efficiency from manure application is generally <50% due to the multiple interactions in soils that limit uptake after application.

While manure can meet a substantial fraction of forage crop N, P, and K needs, fertilizer is often required to achieve economically optimized crop yields, particularly where manure availability is limited. While nutrient use efficiency varies by crop, management, and weather conditions, our management practices can profoundly impact efficiency and nutrient loss. Manure incorporation and sidedress N application to corn are both good examples of best management practices that increase nutrient use efficiency and decrease environmental losses.

Table 1. Feasible nutrient mass balances for NY.

NMB	N	P	K
Per acre (lbs/acre)	<105	<12	<37
Per cwt milk (lbs/cwt)	<0.88	<0.11	<0.30

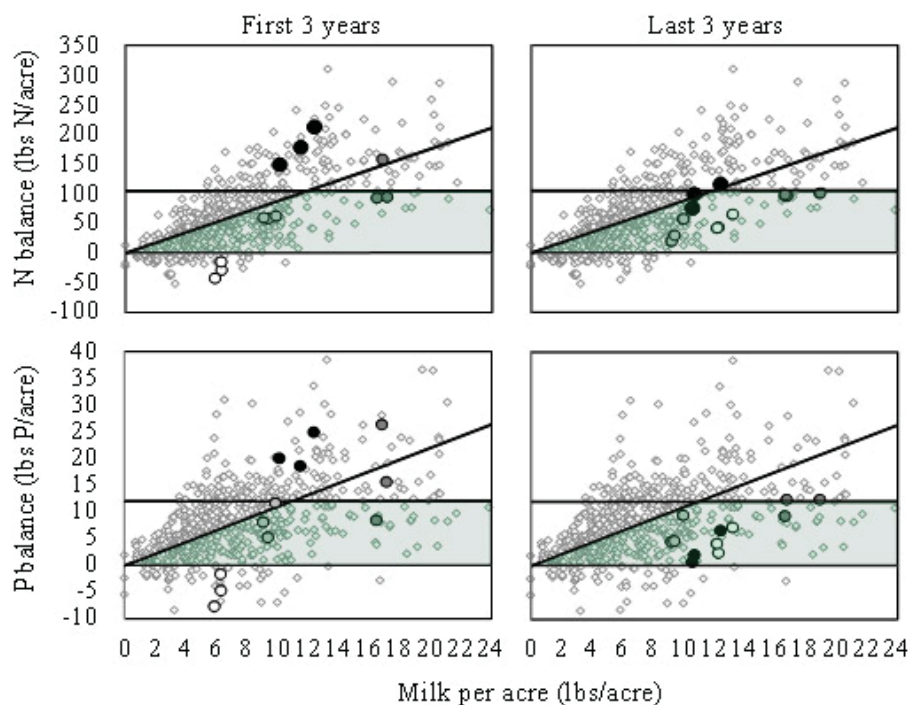


Figure 1: Farms showed improved N and P balances over time (from Cela et al., 2015).

A farm's nutrient mass balance (NMB) is the difference between all nutrients (N-P-K) entering the farm gate and those leaving in the form of milk, meat, manure, crops sold, and/or manure exported. While nutrient use efficiency at the field level can vary depending on weather and other factors, NMB can be thought of as a more stable, long-term measure of nutrient accumulation at the whole farm level. By combining a NMB estimate with the amount of milk produced, a relative measure of how efficiently a farm converts purchased nutrients into milk can be obtained.

Research by Dr. Quirine Ketterings and colleagues at Cornell University has shown that NMBs of NY dairy

farms can vary widely. While productive farms should maintain a positive balance (to offset unavoidable losses), the rate and extent of nutrient (im)balance relative to milk production has implications for long-term sustainability and profitability. For example, farms with excessive P or N balances every year are more likely to face restrictions on manure application and may also have an elevated risk of losing nutrients to surface and groundwater over time, all other factors being equal.

The main drivers of NMBs are the amount of purchased feed and fertilizer. In general, farms that have

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SOIL pH AND FERTILITY TRENDS

I wish this soil fertility stuff was easier; just when you think you finally understand it someone changes the rules. The latest example: For many years we told farmers that they didn't need to use sulfur fertilizer because plenty arrived in rain and snow. Then the EPA got involved, sulfur was scrubbed from industrial stacks and removed from diesel fuel, and the result was a big decline in sulfur depositions which meant precipitation with a much higher pH. This was good since acid rain was causing a lot of damage to lakes, eating the letters off of limestone grave markers — and acidifying the soil. In some areas the pH of precipitation has increased from under 5.0 to over 6.0. Since pH is

measured on a log scale (where a pH of 6.0 is ten times more basic than a pH of 5.0), these changes are huge.

So it's all good, right? Well, mostly: Crop sulfur deficiencies have become increasingly common, so farmers may now need to apply a nutrient that they once got for free — whether they wanted it or not. Farm Report readers should know this since we've noted it several times in recent years. Cornell University research found that 0.01 M calcium chloride is a good soil test for S, with a critical level of 8 ppm if the crop is alfalfa. However, another problem that's just now being recognized is that with the increase in soil pH the

phosphorus in the soil becomes more plant-available — which means more water-soluble. Plant-available P is good but as it becomes soluble it also may become more subject to leaching. This is especially problematic (at least theoretically and perhaps actually) where the subsoil pH is also near 7.0 or slightly basic, as with many lake-laid clay loams including those along the St. Lawrence River and Lake Champlain. Where does theoretical become actual? We don't yet know because the problem is just now being recognized. Stay tuned.

— *Ev Thomas*
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NUTRIENTS, Continued from Page 5

an adequate land base for forage production with higher milk production tend to be more efficient and have more opportunity to manage the NMB within acceptable ranges. Cela et al. (2014) looked at 102 dairy farms in NY and developed feasible mass balances (per acre and per cwt of milk produced) for N, P, and K (see table 1; Cela et al., 2014). These balances are based on 75th percentile values across all farms, records of long-term participating farms, and theoretical calculations for sustainable P balances given a certain P level in rations, crop yields and rotations. The latter calculations showed that if we assume that 70% of feed is produced on-farm, no manure is exported, and ration contains 4 g/kg of dry matter, then P excretion by animals is balanced by crop P removal when a farm has animal density of approximately 1 animal unit (1000 lbs of live weight) per acre of tillable

cropland. Farms that meet both the feasible balances per acre and per cwt are farms that are operating within the “green box” (optimum operational zone). Figure 1 shows four farms that participated in the NMB program for at least 6 years that implemented management changes that to improve their NMB and the farm's economic and environmental status.

The goal of the NMB targets are to allow for high forage and milk production with manageable increases in soil fertility, while discouraging nutrient enrichment that can lead to future environmental risks. Dairy farms in NY have shown that improvements can be obtained over time without giving up on milk production. This was true for the farms represented in Figure 1 and also for 54 NY dairy farms that did NMB assessments annually over a 4 to 6 yr period as

reported in Soberon et al. (2015).

Dairy farm NMB should be seen as a viable tool to better manage whole farm nutrient flows, efficiency and long-term environmental risk. It is clear that farms producing a greater fraction of their total feed on-farm tend to farm within the feasible balances. The bottom line is that soil/manure testing and precision feed management fine-tune nutrient requirements for both animals and crops, allowing nutrient allocations to be optimized according to biological demands. With low milk prices and increasing environmental regulations, making the most of on-farm nutrients makes economic and environmental sense.

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WHAT'S HAPPENING ON THE FARM

As we reach the end of May things are very busy on the farm! Our summer students have finally arrived and started their rotations through milking, calves, herd health, and crops. We have three fantastic students this year, all from various states and backgrounds. Although it's early, they have already shown us how bright and hardworking they are. We are very excited to work with them for the rest of the summer!



Seeing as we've had such a rainy spring this year we're in the same boat as most of the other farms in the area, having gotten a bit of a late start planting. However, thanks to a great crops crew and lots of extra help, things have been in full swing out on the fields these past few weeks. We have our new seedings done and are now planting corn. I thoroughly enjoy getting to help so much in the fields, from picking stones and driving tractor, to helping fill the planter. It's hard to believe we will soon be cutting hay! We also have a new bunker silo going up. It will be 35' x 200' with a blacktop floor and will hold most of our BMR corn this year.

In the barn, the cows have been milking well, averaging 94 lb/day over the past several weeks. Over the past 8 months we've maintained a fairly low SCC as well — it's stayed between 68,000 and 112,000. We don't know exactly what we should attribute this to, but our milkers have been very attentive in catching mastitis early and have been doing a great job in the parlor. Every summer we struggle with *Klebsiella* mastitis, so we hope we can continue to maintain a SCC below 150,000 through the summer.



— Victoria Vendetta
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Lyme Disease in the North Country: What's up with these Ticks?

Thursday, June 15 at 6 pm

**Joseph C. Burke Education and Research Center at Miner Institute
586 Ridge Rd., Chazy**



Melissa Stone is a Ph.D. candidate at the University at Albany, in the Department of Biological Sciences. Her dissertation focuses on Lyme disease ecology and the genetic diversity and evolution of *Borrelia burgdorferi*, the causative agent of Lyme disease. Tick-borne diseases, such as Lyme disease, have recently become a public health concern in Northern New York as the ticks that transmit them have expanded their range into the region. Melissa will discuss ticks of public health importance in New York State and the pathogens they transmit. She will focus on how to help protect ourselves against these pathogens and discuss symptoms of disease in case infection does occur.

This talk is free and open to the public. For more information, contact Rachel at dutil@whminer.com or 518-846-7121, ext. 115.



The Dairy Princess program is alive and well in New York State. The program has evolved over the years to become a coveted leadership development program for young people interested in careers in agriculture. Katarina Emerich recently became the new Clinton County Dairy Princess. She is pictured at left with Dairy Ambassador Ava Castine.

The Dairy Princess program is offered through the American Dairy Association & Dairy Council with dairy farmer checkoff dollars. The Dairy Princess program offers a chance to learn how to advocate for the dairy industry, how to speak to an audience of consumers, how to write press releases, how to dress for different occasions, and how to answer tough questions about farm practices and misconceptions about milk.

Congratulations to Katarina and Ava!

THE VALUE OF BEING RAISED ON A FARM

Last year our middle son graduated from college with a degree in Chemical Engineering. Oh, we knew at a young age that this boy was not going to stay on the farm. Not because he excelled at all his academics; I've known many farmers who have graduated at or near the top of the class. I married one. No...for this boy it was getting going in the morning. Waking up for morning chores was always a battle, especially during football season. You could hear him grumbling all the way to the barn and I was thankful I couldn't hear the exact words...although I'm sure it was something like "XY#%\$^ Farm!" "I hate this #%&*!". Yes, he begrudgingly did what was asked of him...but only what was asked of him. It wasn't that he didn't enjoy the animals. He loved showing his 4-H heifers at Franklin County Field Days every year. And honestly, he is a natural with animals. And I can't say he didn't like to work. He loved playing football and wouldn't take shortcuts when it came to preparing for each season. He didn't even mind long hours...he certainly enjoyed sugaring season and would stay up to the wee hours boiling at a neighbor's sugarhouse. I'm not quite sure what it was that set him against being a

farmer, but that was a career choice that wasn't even a consideration for him as he set his life goals.

As his college years wound down he began his job search. He developed his resume and as he filled out the part that listed previous employers, he realized that his primary employer had been Ballard Acres as a farmhand. He had done some part time work at college filming for the football team and worked for Macy's over a Christmas break but most of his time through high school and over summers was spent working on the farm. How was his resume going to stand out from other applicants? His degree came from one of the top engineering schools in the country but his GPA was average. His pursuit of chemical engineering summer internships had been unfruitful. Toward the end of his senior year he sent out applications and got interviews with several companies. The one thing that was most interesting in the interview process was the interest by the different companies that he was raised on a farm. Even though his vocation of choice has nothing to do with agriculture, the farming background had a positive perception by potential employers. The work ethic associated with farm life

was what helped his application stand out from the others. There was some hesitation during one interview that my son wouldn't be able to find his way around Boston very easily...coming from a small town. But he allayed their concerns by explaining that he led his high school group through London and negotiates his family through New York City. In the end he had two job offers to consider in the Boston area and last November headed off to begin his life off the farm.

He loves his job and enjoys living in Boston. The food, the sports, the culture is exciting for him. But, he certainly has come to appreciate being raised on a farm. During a recent conversation about work he expressed his frustration with two co-workers who were hired at the same time. They would cut out of work early or not focus on the task at hand. After six months of employment, he received a raise and promotion while the other two did not. My son recognizes the value of being raised on a farm and thankfully those outside our agricultural sector do too.

—Katie Ballard
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GENETICS, Continued from Page 1

sufficient heritable genetic variation exists for feed efficiency to make this a realistic goal.

So, does this research point out any potential avenues to better manage dairy cows in a future with changing climate and weather patterns? First of all, dairy herds in temperate climates may be more sensitive to heat stress than generally realized. With the trend of slowly increasing days over 70 THI, the low tolerance of cattle in temperate climates to higher THI is concerning.

This research was the first reported longitudinal study on the influence of weather on feed efficiency. We need more corroborating data, but this initial look tells us that higher genetic merit cows seem to respond better to higher THI. As we look to the future, understanding how genetics and the physical environment interact will help to ensure a more resilient and sustainable dairy industry.

—Rick Grant
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THE IMPACT OF HEAT ABATEMENT SYSTEMS ON LYING TIME AND STALL USE DURING HEAT EVENTS IN NORTHERN NEW YORK

In the March *Farm Report* article “From The President’s Desk” Rick talked about heat stress and the importance of adequate heat abatement systems on animal health and productivity. In 2016 Miner Institute received funding from the farmer-driven Northern New York Agricultural Development Program (NNYADP) to assess the impact of different heat abatement systems on the behavior and performance of the dairy cows at Miner Institute. In our herd we have three pens that provide three levels of heat abatement: 1) Minimal (**Min**) – 52-inch box fans over freestall beds (mattress and sawdust) that were activated when the temperature was 70°F or higher; 2) Moderate (**Mod**) – 52-inch box fans over feed alley and freestall beds (sand) that are

Table 1. The effect of THI level on lying time (minutes/day) by pens with differing heat abatement strategies, Heat Stress Abatement Project, Miner Institute, NNY, 2016.

Pen	n	THI <68	THI 68-72	THI >72	SE	P-Value
Min	20	681 ^a	671 ^a	631 ^b	25	<0.001
Mod	10	817 ^a	804 ^a	776 ^b	53	<0.001
Max	20	642 ^a	644 ^a	611 ^b	22	<0.001

^{a,b}Rows with differing superscripts are significantly different $P < 0.05$

activated when the temperature is 70°F or higher; and 3) Maximum (**Max**) – 52-inch box fans over feed alley and freestall beds (mattress and sawdust) that were activated when the temperature was 70°F or higher. In addition, an evaporative cooling system was used with water nozzles attached to all the fans. Three settings were utilized. During mild heat stress (THI of 68) the spray would be on for 45 seconds with an interval of 4.5 minutes. During moderate heat stress (THI of 72) the spray would be on for 1 minute with an interval of 3.5 minutes. During dangerous heat stress, the

spray would be on for 1.5 minutes with an interval of 2.5 minutes.

A focal group of animals in each pen was followed from June through August and the impact of different heat events was assessed. As expected, when THI exceeded 68 milk production and milk fat percentage was reduced for all cows regardless of the heat abatement system provided. However, those cows with maximum heat abatement didn’t decline as much and recovered more quickly than cows with only fans over the stalls. Lying time (minutes per day) was compared within each pen when average THI was <68 (no heat stress), THI 68-72 (moderate heat stress) and THI >72 (high heat stress). Resting time

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WELCOME 2017 SUMMER STUDENTS!



We would like to formally welcome our 12 summer experience students! **Back row L to R:** Lauren Offutt, Colorado State University; Sam Berube, SUNY Cobleskill; Ben Henrichs, Southern Illinois University; Breanna Watson, Mississippi State University; Christina Markunas, Michigan State University; Megan Miller, Clemson University; Gabbie Green, University of Tennessee; Kyle Pimentel, University of New Hampshire.

Front row L to R: Karen Bonhomme, Plattsburgh State University; Courtney Hoff, Cornell University; Abby Maucieri, Virginia Tech; and Mayumi Marzolf, University of Missouri.

HEAT STRESS, Continued from Page 10

decreased significantly as THI increased but to a lesser degree with cows provided with maximum heat abatement (Table 1). Cows with minimal heat abatement lost the greatest amount of lying time. It's also interesting to note the much greater lying time for cows in the pen with moderate abatement; this pen had sand-bedded stalls compared with mattresses for the other two pens. Most studies have found lying time to be greater for sand versus mattress systems.

In addition to lying behavior we assessed stall standing index (SSI: The number of cows standing/total number of cows in contact with a stall bed) two hours before and after each milking time using a game camera with panoramic view of a group of stall beds. With minimal heat abatement there was a positive relationship between THI and stall standing index where cows tended to stand in the stalls more as THI increased (Figure 1). In contrast, there was no relationship between THI and stall standing index with either moderate or maximum heat abatement (Figures 2 and 3). These results indicate that with adequate heat abatement higher THI does not result in more standing in the stalls. With greater THI, cows with minimal abatement stood more in an effort to cool themselves.

It's clear from the results of this study that heat stress impacts animal productivity and well-being in the North Country. A follow-up study is planned for this summer where we will be working with four collaborating farms in Clinton and Franklin counties that have varying degrees of heat abatement. All our collaborating farms are interested to find out to what extent their herds are impacted by heat stress. We are thankful that the farmer-driven NNYADP has continued its support of this important research.

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— Victoria Couture
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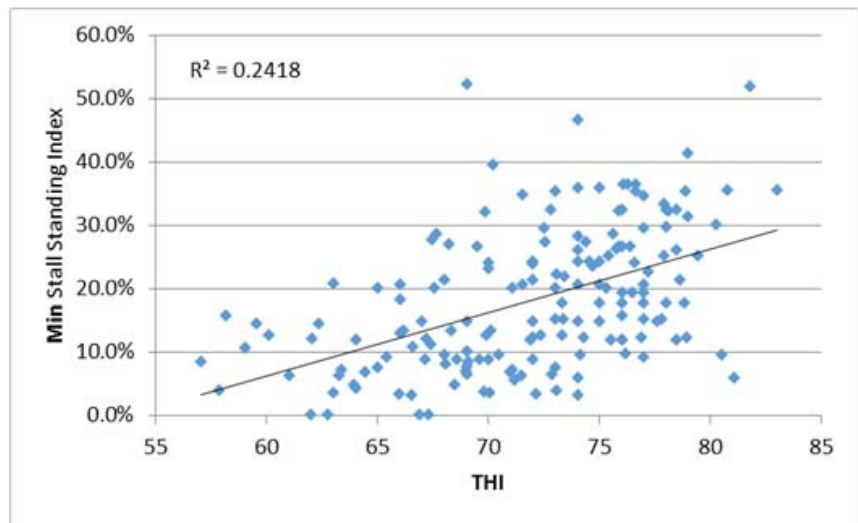


Figure 1. The relationship between stall standing index and THI in pen with fans over stall beds only – minimal heat abatement. Heat Stress Abatement Project, Miner Institute, NNY, 2016.

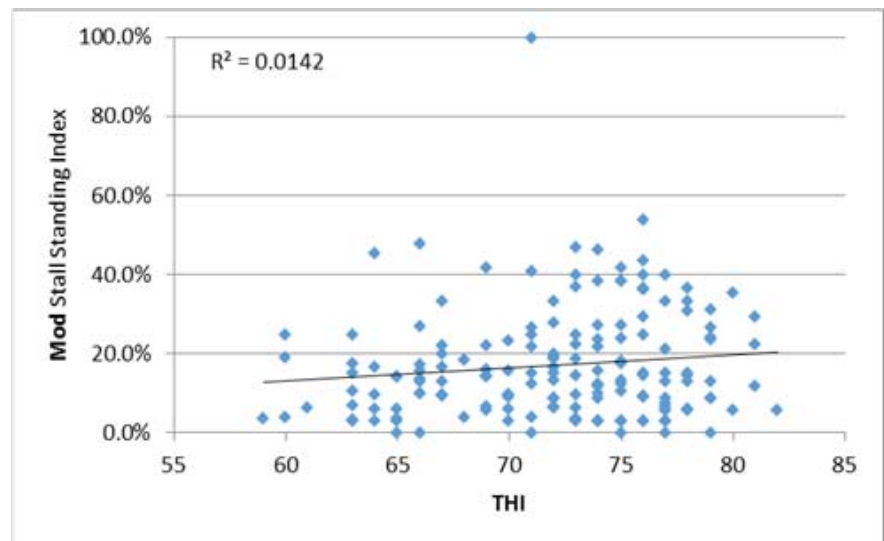


Figure 2 The relationship between stall standing index and THI in pen with fans over stall beds and feed alley – moderate heat abatement. Heat Stress Abatement Project, Miner Institute, NNY, 2016.

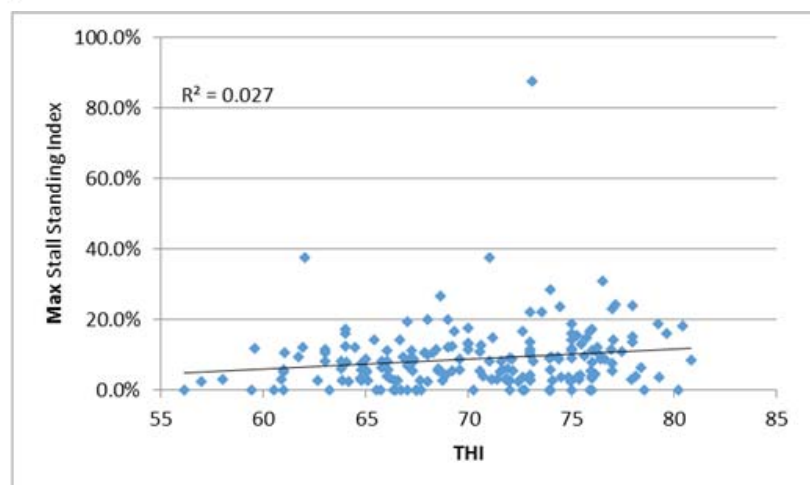


Figure 3 The relationship between stall standing index and THI in pen with fans and sprinklers over stall beds and feed alley – maximum heat abatement. Heat Stress Abatement Project, Miner Institute, NNY, 2016.

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Mrs. Idzik's class from Mooers Elementary School during our 35th annual Farm Days for Fifth Graders event earlier this month.

Closing Comment

Women spend more time wondering what men are thinking than men spend thinking.

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