FARM REPORT

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FROM THE PRESIDENT'S DESK: REVISITING PROTEIN NUTRITION FOR YOUR TRANSITION COWS

Protein nutrition during the dry and fresh periods affects lactation performance and health. The quality of the crude protein (CP) sources and the availability of fermentable carbohydrates in the diet for microbial growth in the rumen will impact the dietary protein needs during the transition period. The supply of metabolizable protein (MP) provided from rumen undegradable protein (RUP) and microbial protein can be estimated by diet formulation models, such as CNCPS. The demand for amino acids (AA) increases near calving and after to support fetal growth, mammary development, and the onset of lactation.

The protein recommendation for mature dry cows is typically between 12 to 15% CP or approximately 800 to 1,300 g of MP per day. Far-off cows are usually fed less protein than close-up cows when a two-group dry cow management strategy is used since the demand for AA for fetal growth and mammary development is less. With the use of close-up diets that are low in fermentable carbohydrates, in particular starch, like the controlled energy, high forage diet, the diet may need to be supplemented with RUP ingredients to provide the appropriate amount of MP with the proper AA profile. Field observations support providing a greater supply of MP during the close-up period to account for intake variation within a pen of cows in the range of 80 to 100 g MP/kg dry matter (DM; 36 to 45 g MP/lb DM) ensuring that a greater proportion of cows are receiving adequate MP (≥1,100 g per day). Interestingly, controlled research studies during the close-up period that have increased MP supply have shown an inconsistent lactation response. This might be due to a lack of AA balancing, especially for lysine and methionine, in some studies and the supply of MP in the fresh diet. A meta-analysis of studies that changed prepartum MP supply showed a limited benefit other than milk protein yield when MP supply was 1200 g vs. 900 g/d.

Fresh cows should be fed a diet formulated to provide sufficient amounts of fermentable carbohydrates and rumen degradable protein to promote microbial growth as a source of protein while promoting intake. In addition, the diet should provide high quality RUP sources and include rumen-protected AA as needed to optimize the AA profile. Even with the best formulated

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EXPECTATIONS VERSUS REALITY

The phrase, "Consistency is key" rings true for every aspect of the dairy industry. When managing cows, keeping consistent protocols, environment, management practices, and diets contribute to a more comfortable and productive herd. Being human, however, we also know that things don't always go according to plan A, plan B or even plan C.

There are 3 diets for cows: The formulated diet, the diet fed to the cow and the diet the cow actually eats. The inconsistency of a diet becomes part of a bigger issue when there's potential for over or underfeeding nutrients, the cost of wasting limited ingredients like forages, and the impact it may have on production. This is usually emphasized for lactating cow diets, but are we also limiting the future production and health for our dry cows?

A recent study published in the Journal of Dairy Science investigated the true consistency and variability in close-up diets, and their association with early lactation performance on Ontario dairy farms. Forty free-stall dairy farms were enrolled in an observational study consisting of 20 automated milking systems and 20 parlor milking systems. Farms were visited once a month for 6 months to take samples of the close-up diet, blood samples from fresh cows that were 0-14 DIM and to monitor milk yield through peak lactation. Following the study, nutritionists were asked to send the formulated diets to compare them to the lab analysis of the sampled diets. These comparisons were calculated by subtracting the formulated values by the lab analysis values. Individual nutrients had a calculated coefficient of variation.

In total, 1,404 cows were evaluated with 228 close-up feed samples. These diets were characterized by forage and concentrate type, with corn silage the primary major forage source for 67.6% of farms, while 80% of farms used straw as either a primary or secondary source. Soybean meal was the main concentrate with 37.8% and 24.3% of farms utilizing it as a primary and secondary source respectively.

While the diets were lower in dry matter, crude protein (CP) and copper (Cu), they had higher concentrations of acid detergent fiber (ADF), non-fibrous carbohydrates (NFC), potassium (K), Iron (Fe) and net energy for lactation (NEL). Interestingly, the most overfed nutrient was Fe, which contributed to the high concentrations in feeds and forages in particular. Crude protein was formulated at 14.4% on average, while the diets actually offered averaged 12.9% crude protein.

In the fresh cows, for each percent increase of NFC variability in close-up diets there was a 0.064 decrease in the liver health index (LHI). Research at Cornell University has shown that cows who have more successful post-partum performance in terms of less disease, higher milk yield, and increased pregnancy within 150 DIM are associated with a higher LHI. Therefore, in this study lower variability between NFC formulated and fed was contributed to higher LHI and potential post-partum performance.

Alternatively, visit-to-visit variability provided results potentially closer to the formulated values than the lab analysis revealed. This was true for both variability in NFC fed associated with decreased BHB concentration and higher blood glucose, as well as CP variability and decreased NEFA concentration.

Overall, the saying "consistency is key" was proved correct for at least two diets in this study, where the sampled close-up diet did not accurately mimic the formulated diet. Underfeeding nutrients can short our cows on future energy, dry matter intake potential and health status once freshened, whereas high diet variability day-to-day can decrease the opportunity for optimum post-partum health. It's important to keep in mind that the order ingredients are loaded in, equipment and cow preferences can all influence the accuracy of your final product diet. Consistency is important, and it turns out it can hold the key to a close-up cow's future production and health.

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MILK REPLACER INTAKES IMPACT GROWTH AND BODY COMPOSITION

Feeding rates of dry matter, and more specifically protein and energy, are directly related to the amount and composition of gain for preweaning calves. A recent article in the *Journal of Dairy Science* (Bartlett et al., 2024; 107:7842-7850) detailed the growth and body composition of dairy calves fed at three milk replacer feeding levels. This study is very important in determining the energy requirements for growth and the impact on composition of body weight (BW) gain. Is there a limit to how much a calf can consume? Does it make them over-conditioned? How much energy and protein do they need?

	Milk Replacer Feeding Rate		
Variable	1.25%	1.75%	2.25%
DM intake, kg	0.65	0.99	1.28
Crude protein intake, kg	0.16	0.25	0.32
Metabolizable energy intake, Mcal	3.01	4.57	5.91
Final body weight, kg	58.6	70.6	82.9
Average daily gain, kg	0.36	0.70	1.03
Gain to feed ratio	0.55	0.71	0.81
Final body composition, % of empty body			
Water	72.67	71.01	70.81
Protein	18.82	18.63	18.16
Fat	4.95	6.52	7.50

Table of selected results from Bartlett et al., 2024 in which three levels of milk replacer were fed to dairy calves

All calves were fed a milk replacer containing 24.8% crude protein (DM), 18.9% fat, and reconstituted to 12.5% solids. The three feeding levels used were 1.25% of BW (DM basis); 1.75% of BW, and 2.25% of BW which were adjusted weekly as the calves grew. On an as-is basis the calves were fed 10, 14, and 18% of their BW when the milk replacer was reconstituted. The calves were only fed milk replacer during this period and were evaluated after 35 days on the feeding program to determine body composition.

As dry matter and nutrient intake went up the average daily gain increased linearly. The efficiency in which the calves used the milk replacer for BW gain also increased linearly. The gain-to-feed ratios ranged from 0.55 to 0.81. Other studies have also demonstrated an increase in feed efficiency when more intake is provided, which is partly explained by the dilution of maintenance but also because the first two months of a calf's life is the time when they are most efficient at increases in BW and stature.

The fecal scores observed across these feeding rates (score of 1 to 4, with 1 being well-formed and 4 being like water) were higher with increased intakes. However, the growth and feed utilization were not diminished indicating that it was not likely due to pathogenic microorganisms, but rather the "loosening" of the feces due to higher intakes of the liquid diet. This agrees with other studies that have shown that higher intake doesn't lead to scours.

The fat content of the whole body increased with increased feeding rates but overall was low across all treatments. Protein and water decreased with increasing feeding rates, which is the typical inverse relationship with fat. In general, this response is very typical of higher feeding rates and should not be a concern with over-conditioning. Sometimes if protein is inadequate for requirements there is a greater deposition of fat, but that was not the case in this trial. The efficiency of utilization for energy increases with increased intake because of the dilution of maintenance. Furthermore, protein efficiency was lowest on the lower intake, but was similar for calves fed 1.75 or 2.25%. Taken together this means that protein and energy intakes were reasonably balanced.

Overall, calves' growth is determined by their intake, which determines energy and protein supply for maintenance and growth. Calves at 1.25% DM of BW did not provide adequate energy for maximal growth. By providing calves milk replacer at or above 1.75% DM of BW with adequate protein, there is a positive response to capturing the high efficiency of these animals for increased growth and body composition.

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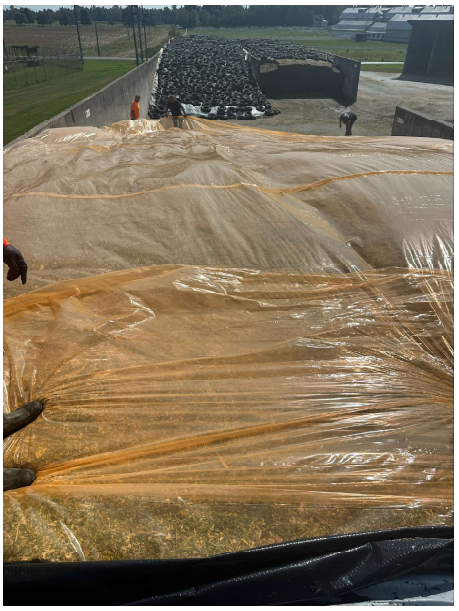
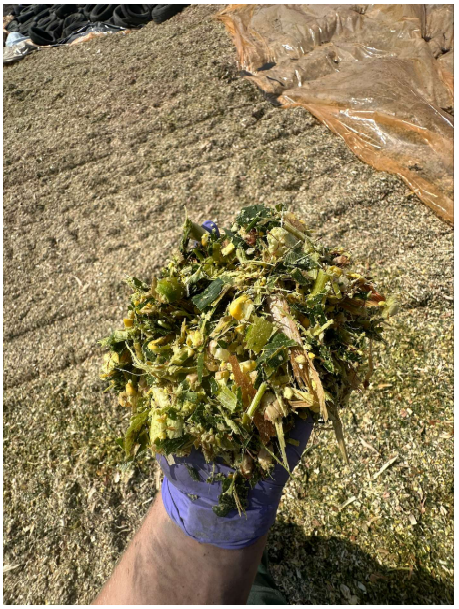
WHAT'S HAPPENING ON THE FARM

In the dairy barn, we are keeping busy with daily herd health checks. We prioritize daily health monitoring of our fresh cows to ensure they get the proper treatment if necessary. Historically, we have monitored blood minerals, such as calcium, phosphorus, and magnesium in fresh cows with an IDEXX VetTest 8008 blood chemistry analyzer. Given the age of it and inability to get consumables, we upgraded to a new unit, the IDEXX Catalyse One. We found it to be useful when diagnosing and treating fresh cows for fresh illnesses such as milk fever. It's used for research purposes too. Some might argue that it might be cheaper to just treat the cow and skip the blood testing and they are likely right. However, being at a research farm gives us the opportunity to characterize the issues that are occurring in our fresh and sick cows and use it as a teaching and monitoring tool.





We are also keeping busy out in the fields. Corn harvest is in full swing, our crops team has been working hard the past few weeks to make sure our corn gets harvested on-time at the correct dry matter and maturity. We grew 615 acres of corn total with167 acres of brown midrib (BMR) corn and the remaining 450 acres conventional corn. The BMR corn has higher fiber digestibility when compared to conventional corn allowing us to. feed more forage in the cows' diet while maintaining or improving milk production relative to conventional corn. Our BMR corn and conventional corn are separated into different bunker silos at harvest with the BMR corn silage being fed to our higher producing, lower days in milk groups where intake can be limited by gut fill.

The dry matter content of the corn is our main factor for determining the ideal harvest time. Dry matter content affects our ability to appropriately pack the corn in the bunker silo and can affect the fermentation process. We use Harvest Lab technology in our John Deere chopper to help us determine the yield and quality of the corn as it is being chopped. The Harvest Lab tests for moisture, dry matter, protein, starch, neutral detergent fiber and sugar. We do our best to harvest our corn at 32 - 35% dry matter. The corn is chopped, loaded into our trucks and weighed before being delivered to the bunker silo. We also take a green (fresh chop) sample of every field of corn that gets chopped as it is going into the bunk. We then send the green samples to the lab for an NIR analysis, where they will test for field yield and quality by hybrid of corn. We use the results from the green samples to determine the quality of feed the bunker silos and to identify which cows we should feed it to later on. We try not to feed it until January to allow sufficient time for it to ferment. Once

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THE DEVIL IS IN THE DETAILS

I recently read an abstract of a research project evaluating whether triticale silage could replace corn silage in the diet of high-producing dairy cows. The conclusion was that this is possible while at the same time maintaining dietary energy and starch. However, and acknowledging that this was an abstract and not the entire research report, both triticale and corn silages seemed to appear magically in the cows' feed bunks with no information about yield, growing costs or the many other factors that determine whether a crop is both practical and economical to grow, harvest and store. No mention in the abstract of whether the silage was spring or winter triticale (I assume winter), how many times the triticale was harvested, harvest timing, etc. Yes, this was a feeding study and not an economic analysis of the cost of forage production, but dairy farmers would need more details before deciding to make what would be a huge change, from corn silage to triticale silage.

Let's assume a dairy herd somewhat similar to the one at Miner Institute: 500 lactating Holsteins at a high level of milk production with about 2/3rds of their forage as corn silage, or about 60 lbs. CS/cow/day. A lower rate of corn silage is fed during late lactation, so this would work out to about 8 tons of CS/cow/year x 500 cows or 4000 tons of corn silage per year just for the cows, not young stock. Assuming 35% DM for both corn silage and triticale silage, I find it difficult to imagine how Miner Institute could harvest and ensile 4000 tons of "dairy quality" triticale silage *in a timely manner.* Planting and harvesting 50 acres or so of triticale and then harvesting it at the ideal (pre-heading) stage seems doable, but 4000 tons? The "window" for corn silage harvest at 35% DM can be made fairly wide by planting hybrids with a range of maturity and by spreading out the planting dates; corn planting normally takes a week or longer on many dairy farms. Between the differences in planting dates and relative maturity, farmers can take about two weeks to harvest their corn silage and have almost all of it within a couple points of 35% DM. Can we do this with triticale?

I can sense Tom Kilcer mumbling and grumbling all the way from his new digs in Tennessee. As many of our readers know, Tom is a big proponent of triticale silage: He's done a great job of evaluating winter triticale in a range of management options as well as evaluating some innovative summer annual forages, and he also has research results (including both yield and quality) to support his conclusions. My concern isn't the high forage quality possible with timely planting, fertilization and harvest of triticale, but how the whole process (particularly harvest) would extrapolate to large-scale dairy farming since there are no more hours in the day, nor days in the week, for a large farm than for a small one.

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diet, fresh cows will still experience a negative MP balance for 1 to 2 months after calving. Some studies have shown a positive lactation response to either infusing more protein or feeding to increase the MP supply. At Miner Institute we observed greater yields of energy-corrected milk and protein when we increase MP supply in early lactation following a higher supply of MP prepartum. It's possible that the early lactation response to increased MP may be influenced by how the cow is fed protein during the dry period.

A recent study by Cornell University researchers, published in the Journal of Dairy Science, evaluated MP supply during both the close-up and fresh periods. They fed multiparous Holstein cows 1 of 4 treatments starting at 28 days before calving until 21 days after calving. Close-up cows were fed diets to supply either a control (85 g MP/kg DM; 39 g MP/lb DM) or higher amount of estimated MP (113 g MP/kg DM; 51 g MP/lb DM) with a similar amount of methionine (1.24 g/Mcal metabolizable energy (ME)) and lysine (3.84 g/Mcal ME). Fresh cows were fed diets to supply either a control (104 g MP/kg DM; 47 g MP/lb DM) or higher amount of estimated MP (131 g MP/kg DM; 60 g MP/lb DM) with a similar amount of methionine (1.15 g/Mcal ME) and lysine (3.16 g/Mcal ME). A common diet was fed to all cows from 22 to 42 days after calving. Feeding diets that increased supply of MP in either the fresh period or close-up and fresh period and had adequate amounts of methionine and lysine relative to ME increased lactation performance without affecting intake or subclinical ketosis. Changing the close-up and fresh period MP supply affected plasma AA concentrations, but did not affect indicators of protein/muscle mobilization, suggesting that increasing the MP supply positively affects nutrient partitioning towards the mammary gland.

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CAN COVER CROPS IMPROVE THE VALUE OF FALL APPLIED MANURE?

Fall manure applications are common in the dairy industry – and for good reason. Fall weather is reasonably dry, so the fields can typically handle the traffic. Labor is available for field work since you don't have to worry about new seedings or harvesting some forage at the perfect time. And then there's the fact that most of us have to drop the level of the pit before winter or else a messy winter becomes a whole new level of messy.

At the same time, fall is also kind of a bad time to be applying manure since you are giving the field a large dose of nutrients right before it sits fallow, exposed to the elements for several months. I don't care where you live or how little precipitation you get over the winter, some of those nutrients are going to escape during the off-season. This is especially the case for nitrogen – which is why current Cornell recommendations consider inorganic N from fall manure to be essentially gone by springtime.

So, what's the solution? Well, there isn't one – at least not a perfect one. Rapid incorporation helps to prevent volatilization and surface runoff, but that still leaves a high concentration of nutrients somewhere in the upper soil profile. But what if there was a crop there to take up some of those nutrients and incorporate them into plant biomass that could last the winter? That's exactly what researchers from the Northwest Crops and Soils program have been researching for the last several years in Alburgh, VT.

The study looked at silage corn plots with and without a rye cover crop receiving 6,000 gal/acre of manure in either the spring or the fall (pre-plant incorporated). This was done under both tilled and no-till conditions. The most recent data from the 2023 growing season showed a huge yield advantage (more than seven tons per acre at 35% dry matter) for no-till plots that had a cover crop as compared to no-till plots with fall manure alone. While no difference was detected in plots where tillage was used, there was significantly greater soil respiration measured in the fall manure plots where the rye cover crop was present. This suggests that perhaps the large amount of cover crop biomass may have caused some nutrient tie-up which hurt the corn as it initially degraded.

A word of caution here: While cover crops do typically increase corn yields, they can cause some problems if managed poorly. When incorporating large quantities of biomass before corn planting, you may need to increase the starter fertilizer rate to help the crop survive early season nutrient tie-up. However, these fields will probably require a little less late-season nitrogen, since all those stored nutrients will at some point finally become available. I would also suggest boosting the starter fertilizer rate in no-till plantings with cover crops. It does appear that the nutrient tie-up isn't quite so bad under no-till, so this may be the winning strategy for high residue situations.

The more data I see on cover crops, the more I realize that they are a big win for the dairy industry. Whether it's emergency forage, reducing environmental impacts, capitalizing on carbon credits, or boosting continuous corn yields, if managed properly cover crops can do it all.

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RECIPE REPORT

During the 1930s in St. Louis, a German baker accidentally swapped his butter and flour proportions while making a regular yellow cake. Despite the error, the resulting pastries were so popularthat the baker began making them intentionally. While the exact maker of this delisious sweet is debated among family bakeries, the result is always a melt-in-your-mouth rich and fluffy treat. From classic dessert bars and cookies to flavor variations like lemon, red velvet, chocolate, or blueberry, there's a version for every taste. I personally find that the yellow cake cookies perfectly complement my morning coffee.

Gooey Butter Cake Cookies

Ingredients

- 8 oz. cream cheese, softened
- 1/2 cup (1 stick) unsalted butter, softened
- 1 egg
- 1 tsp. vanilla extract
- 1 box of yellow cake mix
- 3-4 cups powdered sugar

Instructions

1. Preheat oven to 350°F
2. Mix together the softened cream cheese and butter in a large bowl until it is well blended, then beat in vanilla and egg.
3. Slowly add the yellow cake mix and stir until it reaches cookie dough consistency. If needed, put the mix in the refrigerator to make it easy to shape into balls.
4. Shape dough into rough 1 1/2 inch ball and roll them in powdered sugar/ Place them 1-2 inches apart on an ungreased cooki sheet. Tip: Put powdered sugar on the cookie sheet to prevent them from sticking to the pan.
5. Bake for roughly 10-12 minutes or until edges are done. Allow cookies to cool, then roll or sprinkle more powdered sugar on them if desired.

There are many recipes for gooey butter cake or cookies, this is my favorite because it is easy to whip up and the results are never short of delectable.

— Hannah Jones

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the chopped corn arrives at the bunker silo, it is packed and covered with plastic as soon as possible to exclude oxygen. We use two different types of plastic when covering the bunk. The first layer of plastic is an orange Silostop high oxygen barrier plastic. This plastic layer is puncture resistant and flexible allowing it to lay flush on the surface of the corn eliminating air pockets and promoting better fermentation with less spoilage. The second layer of plastic is a FeedFresh Silage Cover. It is a reinforced barrier product with a carbon black side (the black bottom) and a uv-thermal stabilizer side (the white top). It has a webbed like technology making the cover incredibly durable for our North Country weather and against our local pests.. Once the two plastic covers are layered on top of each other we use tires to cover the entire surface. The tires are placed side by side, and from wall to wall to hold the plastic in place and eliminate air gaps. Covering bunk is a big job and it is usually all hands on deck to get the job done.

We are thankful for our crops crew and all of their hard work and continue to hope for good weather as fall field work continues.

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HERBICIDE RECOMMENDATIONS… OR LACK THEREOF

Regular readers of the *Farm Report* may have noticed little discussion of specific herbicides, particularly by this writer. This is for a couple of reasons: First, the array of herbicides for corn and soybeans changes, frequently from year to year, as new and improved products are developed and released. I don't spend the time necessary to keep up with these changes, considering this the job of the farm's custom pesticide applicator or crops consultant. I made the pest control recommendations for Miner Institute when I was the agronomist there, but even so I consulted with our pesticide applicator before making final decisions.

The second reason I won't make pesticide recommendations is because of how badly some farmers can screw up their attempts to control pests, and I don't want to be a party to this. Four examples from over the years (actual names withheld to protect the guilty):

- John wondered why his alfalfa seeding looked so sick. After looking at it I asked what herbicide he'd used. "2,4-D". "Good grief John, that's not registered for alfalfa seedings! Why did you do that?" "Because that's what I've always used. The alfalfa usually looks bad for a while after I spray but not this bad." (Sigh)
- Joe asked how much atrazine 4L he could safely use the year prior to drilling oats, and I told him a maximum of one quart per acre. He said that he was pretty sure that's what he'd used the previous year. I told him that "pretty sure" wasn't good enough, but he said that the more he thought about it he was sure it was only one quart. A few weeks later I stopped by his farm to find that the oats were a complete failure. Concerned about this I asked the farmer what happened and he replied that it wasn't my fault at all, upon further reflection he'd remembered that the previous year he used more than one quart per acre. Getting that old sinking feeling, I asked how much he used. "Four quarts per acre." (Another sigh.)
- Andy was going to apply a moderately toxic herbicide to an alfalfa seeding, using a high-pressure sprayer instead of a normal field sprayer. I cautioned him against doing this because of the danger of herbicide drift. Early that evening I got a phone call from a very worried wife: Her husband had applied the herbicide on a moderately breezy day, and on the passes with the prevailing wind he was enveloped in a fog of herbicide. He'd obviously inhaled enough pesticide to make him sick. He recovered, but only after some very worrisome hours.
- Paul had never used a field sprayer so asked me to calibrate the one he'd just purchased. When we were finished he went into his shop and returned with a 2.5-gallon jug of methyl parathion. "The guy at the farm supply store sold this to me to spray for alfalfa weevils. How do I use it?" I was aghast since methyl parathion is one of the most lethal pesticides on the planet, and this was what he was going to use with absolutely no prior experience? I told him to take it back to the supply store, and I recommended an insecticide that was much less toxic. But I wondered where the supply store person's head was when he sold the farmer — who wasn't the sharpest knife in the drawer — the jug of methyl parathion. Actually have a pretty good idea where his head was….

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Advanced Dairy Management – residential course offered January-May 2025

This course is designed for undergraduate students interested in a career in the dairy industry or allied agribusiness.

Course Goals and Objectives include:

- Provide students with critical thinking skills through engagement with faculty, dairy producers, and agribusiness leaders
- Provide a hands-on learning environment to enable students to assess dairy farm design and management
- Provide tools to assist students in making crop and nutrient management decisions for dairy farms in the Northeast
- Provide students with skills necessary to objectively evaluate dairy, crop and facility issues on the farm
- Provide students with skills to effectively communicate thoughts and ideas in a group and 1-on-1 setting

For more information, contact Dairy Outreach Coordinator Wanda Emerich, emerich@whminer.com
Application (due 11/15/24) available at: https://www.whminer.org/advanced-dairy-management

TO SIP, TO LICK, OR TO STAND IN: HOW DO COWS PREFER THEIR WATER TROUGHS?

Did you know that cows have the highest water requirement of any land mammal?

Some of our cows at Miner Institute have SmaXtec ruminal boluses that track rumination and activity. They also estimate water consumption. When summarizing SmaXtec data from one of our high group pens I was surprised to see that this summer each cow drank an average of 123 liters (32.5 gallons) of water per day! It's safe to say that those water troughs get plenty of traffic.

At least in the Northeast water is the least expensive nutrient for cows. Universally, it's the most required nutrient and is essential for producing milk, digesting feed, and utilizing other, more expensive substances. Understanding cattle drinking behavior can help producers optimize water management, supply, and consumption. For example, we know that water intake is highest in the summer, so adequate water supply in the winter may not be enough on those hot days.

We should also consider preference toward or away from certain water conditions. Do cows prefer a certain waterer type? Does their drinking behavior change when the water is dirty? Burkhardt, et al. from the University of Bonn in Germany addressed these questions by evaluating the effect of water trough design and cleanliness on drinking behavior (Appl. Anim. Behav. Sci. 254:105752). They utilized a herd of 135 lactating Holstein-Friesian cows at a commercial farm in North-Rhine-Westphalia, Germany. The cows were housed in one free stall pen, milked from an automatic milking system, and fed a typical TMR once per day.

Figure 1. An example of an open tank water trough at Miner Institute.

The pen had four stainless steel waterers: two open tank troughs (see Figure 1) that were 2.00 m x 0.43 m x 0.15 m and held 70 L of water and two double-valve troughs (see Figure 2) that were 0.73 x 0.32 x 0.10 m and held 5 to 15 L of water. Water supply came from a well on the farm that complied with human drinking water standards.

Figure 2. An example of a double-valve water trough found at www.suevia.com. Miner Institute does not currently have this type of water trough.

Two 15-day study periods were performed, one in December and one in February. At day 1, all water troughs were cleaned; then, one of each trough type was randomly assigned to be cleaned daily while the other was not cleaned throughout the study period. In the second study period, researchers switched which troughs were cleaned versus not cleaned. Time-lapse cameras were used above each water trough to evaluate drinking behavior for two hours following feeding. This included total time at the trough; time spent smelling, tasting, licking, and drinking; interruptions and antagonistic behavior by other cows; and number of breaks taken during a drinking episode.

On average, one drinking episode lasted 123 seconds with multiple breaks. This was variable – the longest drinking episode lasted over 17 minutes. Most drinking episodes occurred 30 to 60 minutes after feeding. No statistical preference was found between cleaned and uncleaned troughs, contrary to the researchers' hypothesis. Past studies have shown that cattle prefer clean waterers over fecal-contaminated waterers (Willms et al., 2002; Schütz et al., 2019). In this study, E. coli levels were below the detection limit in all water troughs at day 15, so fecal contamination did not technically occur.

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VT DAIRY PRODUCERS CONFERENCE
Feb. 18, 2025
DoubleTree, South Burlington, VT

2025 AGENDA

8:00am	Registration Opens
8:00-9:00	Visit Sponsor Exhibits and Breakfast Refreshments
9:00-9:05	Welcome – John Clark
9:05-9:55	Dr. Kirby Krogstad, "Are hot diets harming the gut?"
9:55-10:50	Jacob Shapiro - "Geopolitics and the Future of American Agriculture"
10:50-11:20	Morning Break
11:05-12:10	Dr. Ryan Breuer - "Neonatal Calf Care: Making the Most of the First 24-hours."
12:10-1:15	Lunch
1:00-1:15	2024 Vermont Milk Quality Awards presented by Vermont Dairy Industry Association
1:15-1:30	Sponsor Recognition and Announcements
1:30-2:20	Bruce Vincent - "With Vision there is Hope"
2:20-2:30	Remarks by Governor Phil Scott (Tentative)
2:30-3:00	Break
3:00-4:00	Dr. Andy Halloway - "A practical conversation on dairy carbon credits."
4:00-4:10	Door Prizes and Adjourn

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

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Cows spent more time drinking and consumed more sips at tank troughs. Water intake wasn't measured but this may have translated to higher water consumption. Cows were also interrupted more at the tank troughs. At any one time, up to four cows could access a tank trough and up to two cows could access a valve trough. It's possible that cows were drawn to the tank troughs because more could access them at a time, thus leading to more antagonistic behavior. Additionally, while all troughs were located near feed bunk areas, the tank troughs were also closer to the milking systems. Water consumption is high after milking, so it's possible this influenced the preference towards tank troughs as well.

The authors noted that looking at social dominance may add context to these findings. It's possible that more dominant cows had a preference toward one type of trough while more subordinate cows opted for a less popular trough with less competition.

The same researchers conducted this study again in the summer to test the effect of seasonality on drinking preference and behavior (Burkhardt, et al. 2024; Animals (Basel) 14(2):257). Cows in the summer had fewer drinking episodes but drank for longer. Tank troughs remained more popular than valve troughs, and antagonistic behaviors were still higher at tank troughs. Cows didn't show a statistical preference for cleaned or uncleaned troughs, but cows drank for longer at cleaned troughs in the summer compared to winter.

Cattle drinking behavior is clearly a complex system influenced by social hierarchy, barn design, climate, and water trough design. It would be interesting to replicate these trials while measuring water consumption and social dominance. Other metrics like feed efficiency could be calculated and further implications of water trough type and management could be investigated.

— Alexandria Bartlett
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DAIRY DAY AT MINER INSTITUTE
DECEMBER 11, 2024
10 am - 3 pm

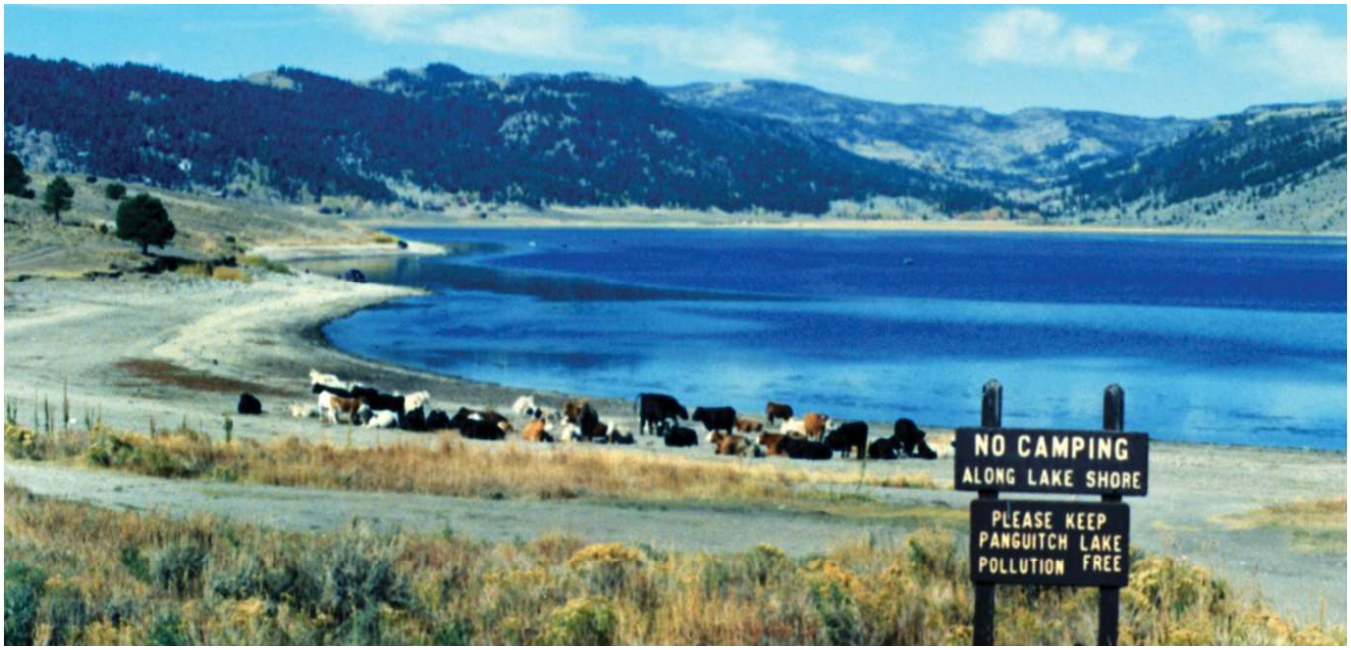
Join us for our annual day-long dairy outreach conference! This event is FREE and open to the public, no pre-registration required. Lunch will be available for purchase for $5.

2024 Speakers:

- John Brouillette, Lallemand – *How to feed what was grown and harvested in 2024*
- Dr. Kate Creutzinger, University of Vermont – *Demystifying cow-calf contact on commercial dairy farms*
- Dr. Heather Dann, Miner Institute – *Management Opportunities for 2025*
- Dr. Marcos Marcondes, Miner Institute – *The use of beef semen on dairy herds*
- Dr. Sarah Morrison, Miner Institute – *Direct-Fed Microbials Strategies to Support Growth and Health of Calves*

Dairy Day will be held in the auditorium at the Joseph C. Burke Education and Research Center at Miner Institute, 586 Ridge Road in Chazy, NY. For more information, contact Wanda Emerich at emerich@whminer.com or call 518-846-7121, ext. 117.

THEORY VS. PRACTICE



The photo is of Lake Panguitch, which lies at an elevation of just over 8200 feet in Garfield County, Utah. Panguitch is a Paiute Indian name meaning “big fish”, and indeed the lake is a fisherman’s paradise with a variety of trout species. Ev and his wife came upon the lake — and this sign — some years ago while on their way to Bryce Canyon National Park. The idea is sound: No camping along the lake shore, but obviously nobody informed this herd of cattle.

The William H. Miner Agricultural Research Institute
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Drone image of a sunset over Miner Institute's dairy complex taken by Farm Manager Steve Couture.

Closing Comment

Lord, please keep your arm around my shoulder and your hand over my mouth.

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