PROGRESSIVE DAIRY

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Jenn Coyne

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What's the deal with sustainability?

Progressive Dairy Editor **Jenn Coyne**

As winter retreated this year, my 5-year-old son made a peculiar observation as we drove through the countryside on our way into town. He said, "Look at all the crops growing in the fields. I don't remember seeing a planting tractor though."

He was right; there hadn't been farm equipment in the fields yet. Despite a mild winter, it was still far too early for fieldwork to begin. His scrutiny of the fields gave way to a more important conversation – one about farmers' pledge to the land and longevity of their businesses, and how a practice like cover cropping aids in that.

The conversation is becoming far more prominent, and not just with those young minds in the back of their mom's minivan.

As global climate commitments and net zero pledges crowd the agriculture sector, farmers, cooperatives and food companies are all joining in the conversation on the critical role of the dairy industry to meet those sustainability goals. At the forefront of those conversations is the interest in carbon market opportunities.

Sure, it's the anaerobic digesters capturing methane and working with a third-party vendor to sell renewable natural gas through markets like California's Low Carbon Fuel Standard or the EPA's Renewable Fuel Standard programs. This is the most vetted and mature carbon market available, but there's so much more. Feed ingredients to minimize enteric methane emissions, as well as improved cropping and soil management to mitigate a greenhouse gas (GHG) footprint are growing practices farmers can implement as part of their business plan.

Just as there are a number of opportunities to participate in the carbon market, there are just as many questions about it: *What approved practices can one apply to their dairy? What current on-farm practices are accepted? What determines eligibility of a certain program? How are credits generated? What financing is available?*

In this issue of *Progressive Dairy*, we wanted to take the reins of that conversation for a moment and share experts' advice and insight into GHG mitigation while also highlighting the work dairy producers across the country are doing on their farms and with herds of all sizes.

As you'll read beginning on page 30, the opportunities are vast in the carbon market space – from soil conservation in the fields to feed management at the bunk – and if there's currently not a financial reward for practices, that doesn't mean it won't hold monetary value in the future. Topics such as the use of feed additives, calculating a carbon intensity score and knowing a farm's carbon footprint are all dissected in this issue. I'm by no means an expert in this space, so I can't express enough gratitude to those in the industry who articulated these concepts so clearly.

I spoke with several dairy producers who shared their perspective on the marketplace and how this ever-growing demand on the industry affects their livelihood. Here are two excerpts from the articles you'll find further in the magazine:

"As dairy farmers, we know we make the same from less or that we make more from the same, but we don't always think about it in a sustainability metric."
—Paul Lippert, Wisconsin (full story on page 38)

"It's all full circle for us. All that we're doing on the land to improve digestibility with forages leads to higher production, and higher production by this way reduces the carbon footprint."
—Clement Gervais, Vermont (full story on page 34)

Please remember, as the industry strives to meet the demands of global climate commitments and more questions are answered about the carbon market space, your work is not going unnoticed, especially from those 5-year-old boys in the backseat of their mom's minivan.

Photo courtesy of Ben & Jerry's.

34 *Ambitious carbon goals*

Four Girls Dairy and Gervais Family Farms join Ben & Jerry's in their Low Carbon Dairy pilot program to reduce emissions by 50% and increase farm resilience.

NEWS AND BUSINESS

JUNE DAIRY MONTH

MILK QUALITY

MANAGEMENT

GENETICS AND REPRO

SUSTAINABILITY

REGIONAL FEATURES

ON THE COVER

Illustration by Corey Lewis.

PROGRESSIVE PUBLISHING
dairy | forage | beef

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24 Avoiding danger

Discuss with your children ways to keep them safe around farm machinery and other hazards.

DEPARTMENTS

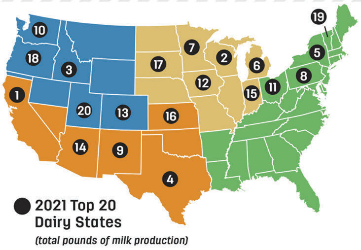
BUSINESS TO BUSINESS

Northwest Edition

Total circulation

Progressive Dairy: **39,300+**

Progressive Dairy is targeted to all dairies in the western United States and all 100+ cow dairies in the Midwest and East.



Northwest Edition
2,500+

Southwest Edition 3,200+
Midwest Edition 18,000+
East Edition 15,600+

Cheese is the most frequently consumed dairy product

90% of American consume cheese weekly, followed by butter (85%), milk (75%) and yogurt (60%)

— International Food Information Council Consumer Research study, "Understanding Fluid Milk & Dairy Food Consumption Patterns to Enhance Diet Quality & Nutrition Equity," published May 2024

"Mastitis is a disease of details."

— Luciana da Costa, Ohio State University, during the May webinar, "Udderly Important: Solutions to Mastitis Challenges"

"We commend Chairman Thompson and committee members from both parties for approving a 2024 House Farm Bill that includes critical priorities that will help support and grow this industry."

Gregg Doud

— Gregg Doud, president and CEO of National Milk Producers Federation, in response to the House Agriculture Committee's advancement of the 2024 Farm Bill

1,596

The number of American-made cheeses evaluated during the American Cheese Society (ACS) Judging and Competition June 3-7. Winners of the competition will be announced at the ACS 2024 Annual Conference July 10-13.

— The American Cheese Society

78

Grocery stores across southern California that are participating in Add Milk!, a dollar-for-dollar match program for SNAP participants who purchase milk products, including lactose-free options

— International Dairy Foods Association


“We’re seeing a 12 – 16 pound increase in milk production and our components have stayed right there too. Not only are the cows comfortable but they’re coming to the robots and milking really, really well.”
– Matt Byrnes,
Owner, 5-M Dairy, Iowa

WHAT HAPPENED? WHAT'S NEXT?

Nationwide efforts underway to reduce methane, HPAI

Progressive Dairy Editorial Staff

In this column, Progressive Dairy *summarizes issues in the news and attempts to describe how they might affect dairy farmers. Look for more extensive background, details and updates online (www.progressivedairy.com).*
Items in this column are compiled from Progressive Dairy *staff news sources. Send news items to karen@agproud.com*

METHANE REDUCTION

What happened?

After a comprehensive, multiyear review, the U.S. Food and Drug Administration (FDA) has determined Elanco's Bovaer (3-NOP) meets safety and efficacy requirements for use in lactating dairy cows.

This feed ingredient is designed to reduce methane emissions in lactating dairy cattle by suppressing the enzyme responsible for methane production in the rumen.

What's next?

Feeding 1 tablespoon of Bovaer per lactating dairy cow per day can reduce methane emissions about 30% or about 1.2 metric tons of carbon dioxide equivalent (CO_2e) emissions annually. If fed to a million cows, it would equate to removing over 285,000 cars from the road for a year.

Elanco expects product launch and added carbon credit value to producers beginning in the third quarter.

Bottom line

By integrating Bovaer into their operations, farmers can participate in carbon markets and leverage government funding to implement sustainable practices.

CALIFORNIA EMISSIONS

What happened?

In a decision made May 30, the California Air Resources Board (CARB) denied a petition that would immediately initiate a rule-making process for all dairies in California to implement methane emissions mitigation practices under regulation of CARB and the California Department of Food and Agriculture (CDFA). The petition requested these two organizations measure dairy methane emissions, fund digesters and other practices; increase dry manure management systems; and provide technical assistance.

Based on ongoing work to reduce GHG emissions and meet the state's target to reduce dairy and livestock emissions by 40% below 2013 emissions by 2030 under Senate Bill (SB) 1383, CARB denied the request to immediately initiate rule-making proceedings. The organization also denied the request to establish funding for methane reduction on dairies as both CARB and CDFA do not appropriate state funding.

What's next?

The letter does grant a portion of the petition, which requests CARB and CDFA to take specific actions to reduce dairy emissions of methane. Specifically, the agencies will continue to implement efforts for GHG emission reductions consistent with state law, including further assess if statutory requirements are met under SB 1383, offer incentives and technical assistance programs for alternative manure management methods and digester projects, research and analyze nitrogenous emissions from dairies, and research enteric emissions reductions opportunities.

Bottom line

The petition was first filed March 1, 2024, and public comment was opened shortly thereafter. Numerous organizations filed comments in response to the petition, citing the tremendous efforts already underway within the dairy industry pursuant to SB 1383.

Michael Boccadoro, executive director of Dairy Cares, states, "In the seven years since the passage of SB 1383 in 2016 [2017-30], the dairy sector has made tremendous progress in reducing methane against the 2013 baseline through a comprehensive approach including methane avoidance, methane capture and utilization, and attrition [fewer cows] in the state's dairy herd."

AVIAN INFLUENZA

What happened?

At deadline, there were 96 confirmed cases of highly pathogenic avian influenza (HPAI) in dairy cattle. The total affected states reached 12, and included Colorado, Idaho, Iowa, Kansas, Michigan, Minnesota, New Mexico, North Carolina, Ohio, South Dakota, Texas and Wyoming.

At the same time, three human cases of highly pathogenic avian influenza (HPAI) A(H5) virus infection were recorded in connection to the outbreak in cattle. One was the previously reported dairy farmworker in Texas, and two new cases were workers from dairy farms in Michigan.

The first two cases reported eye symptoms (conjunctivitis), while the third case presented eye discomfort along with more typical symptoms of acute respiratory illness associated with influenza virus infection.

What's next?

Dairy producers across the country are encouraged to practice good biosecurity, such as limiting visitors, minimizing cow movements, milking sick cows last, keeping feed and water sources clean, and excluding any wild birds or animals from the dairy.

The threat to the general public remains low, but farmers or farmworkers who interact regularly with dairy cattle should take extra precautions to limit possible transmissions.

According to the Centers for Disease Control and Prevention (CDC), pasteurized dairy products remain safe to consume. Dairies are always required to dispose of milk from sick animals to ensure only milk from healthy animals enter the food chain.

Symptoms of HPAI in cattle include a drop in milk production, loss of appetite, changes in manure consistency, thickened or colostrum-like milk and low-grade fever.

Dairy farmers should monitor their herd and contact their herd veterinarian immediately if cows appear sick.

A USDA federal order regulating the interstate movement of lactating dairy cattle does require testing for and reporting of HPAI in certain dairy cattle.

Under a new Voluntary H5N1 Dairy Herd Status Pilot Program from the USDA, dairy producers from selected states will have the option to enroll their herds for a modified testing plan using on-farm bulk tank milk samples.

Additional testing requirements are being implemented at the state level. In Iowa, they are testing dairy farms around infected poultry sites to enhance the state's response capabilities. Wisconsin and Minnesota are requiring lactating dairy cows be tested for influenza A prior to movement to fairs or exhibitions. Pennsylvania has issued a quarantine order prohibiting animals that show symptoms or have been on a premises where HPAI was detected from entering an exhibition. In addition, cattle over 18 months old must be tested before arriving at an exhibition or fair.

Bottom line

An additional $824 million was made available to support anticipated diagnostics, field response activities, premovement testing requirements, other necessary surveillance and control activities, surveillance in wildlife and more.

Financial assistance is available for supplying personal protective equipment (PPE) to farmworkers, developing and implementing biosecurity plans, and reimbursement for veterinary costs and shipping expenses associated with sample collection for H5N1 testing.

Any dairy producer interested in financial assistance should contact the APHIS Veterinary Services office in their state.

Distillers undervalued, blood meal overvalued

Patrick French for *Progressive Dairy*

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Feed expense is the largest outlay of cash for a dairy, making up 50% to 65% of total operating costs. Since feed is a significant cost contributor, we need methods to identify feedstuffs that will meet the nutrient requirement of the dairy cow more economically than the feedstuffs currently in the ration. Several technologies exist to rate or rank the economic value of feedstuffs in addition to the one this column uses.

Nutrient values are derived using the composition and weekly market prices for a basket of 20 feeds available in the region. Market prices are gathered from several published and unpublished sources. Values are determined for rumen-degradable protein (RDP), rumen-undegradable protein (RUP), digestible neutral detergent fiber (dNDF), non-fiber carbohydrates (NFC) and fat. For RUP, NFC and fat, only the fraction digestible in the small intestine is valued. For NDF, only the fraction fermentable in the rumen is valued.

When nutrient values are combined with the composition of a feed, we arrive at a relative economic value of the ingredient. This gives us a global perspective of the feed's value. However, many times we may need a specific nutrient, so we have derived nutrient-specific values for the categories of carbohydrates, proteins and fiber carbohydrates.

Overall, nutrient costs are up slightly versus the previous month but 16% lower compared to a year ago. Although nutrient costs are 2% higher compared to the previous month, not all nutrients have changed similarly. For example, dNDF and dRUP are up, while other nutrients are lower or unchanged. The market cost for 1 pound of dry matter is 15 cents, which is equivalent to feed costs in the range of $7.55 to $8.05 per cow per day or $9.50 to $10.05 per hundredweight (cwt) of milk. These costs are running below the short-term average of 15.3 cents per pound of dry matter but below the long-term average of 16.8 cents per pound of dry matter, respectively.

The table lists several feeds, their price and their value based on whether all nutrients (comprehensive) or specific sets of nutrients (carbohydrates, proteins or fiber) were used in their valuation. Blue shading and intensity of shading indicates undervalued feeds, and yellow shading indicates overvalued feeds. Feeds without shading indicate the market price and derived value are similar.

Overall, canola meal, corn gluten feed, distillers, soybean meal and several other ingredients are undervalued, whereas blood meal, molasses and several other ingredients are overvalued. Undervalued feedstuffs when observing specific nutrient sets are rolled corn (carbohydrates), bypass soybean meal (protein) and straw (fiber).

Use of undervalued feedstuffs may reduce ration cost, but value is only one of several factors that should be considered when evaluating the inclusion of a new ingredient.

FEED PRICES

Regionally available feeds and their recent prices

Feed name	Market Price $/T As-Fed	Comprehensive Value, $/T As-Fed	Carbohydrate Value, $/T As-Fed	Protein Value $/T As-Fed	Fiber Value $/T As-Fed
Alfalfa, Supreme	240	254	246		146
Alfalfa, Premium	210	214	221		164
Alfalfa, Good	170	176	194		176
Canola Meal	425	526		457	
Corn Gluten Feed	261	359	220	301	193
Corn Silage, 35% DM	70	53	63		92
Cottonseed	488	528		281	157
Distillers Dried Grains (DDG)	400	470		372	157
Hominy	292	340	283		
Molasses	361	168	300		
Porcine Blood Meal	1460	1201		1342	
Rolled Barley	282	251	291		
Rolled Corn	275	285	299		
Soybean Hulls	154	177			355
Soybean Meal, 48%	510	577		553	
Soybean Meal, expeller	545	802		777	
Straw	100	21			271
Tallow	1047	979			
Urea	629	605		623	
Wheat Millrun	192	316	170		130

Extremely undervalued feed
Undervalued feed
Extremely overvalued feed
Overvalued feed

TABLE 1 2024 Projected DMC feed cost, milk prices and indemnity payments at $9.50-per-cwt coverage[1]

2024	Projected U.S. all-milk price	Projected feed cost	Projected DMC margin	U.S. all-milk price trigger	Projected payment
January[2]	$20.10	$11.62	$8.48	$21.12	$1.02
February[2]	$20.60	$11.16	$9.44	$20.66	$0.06
March[2]	$20.70	$11.05	$9.65	$20.55	
April[2]	$20.10	$10.91	$9.60	$20.41	
Averages[3]	$22.97	$10.61	$12.37	$20.11	

[1]Projected prices reflect the DMC Decision Tool dated May 30, 2024 and are not guaranteed. Projections listed do not account for sequestration or premiums that must be paid.
[2]Actual DMC data
[3]Projected average for the rest of year

Valerie Mason-Faith
Risk Education Program Manager
Center For Dairy Excellence

April margin is $9.60 per cwt

April's Dairy Margin Coverage (DMC) margin came in at $9.60 per hundredweight (cwt) (**Table 2**), 10 cents above $9.50 per cwt, and did not trigger an indemnity at any margin coverage. April's margin conveys a 5-cents-per-cwt drop from March's margin at $9.65 and starkly contrasts April 2023's margin of $5.84 per cwt. From March to April, the all-milk price dropped 20 cents from $20.70 to $20.50 per cwt, while feed costs dropped 15 cents from $11.05 to $10.90. There was a slight increase in the corn cost from $4.36 to $4.39 per bushel, or $156.79 per ton. Alfalfa hay cost continues to decrease from March's $271 to $260 per ton, and soybean meal cost also fell from $362.17 to $357.68 per ton. Both reached multiyear lows again with alfalfa and soybean meal being at their lowest since December 2021 at $253 per ton and October 2021 at $325.43, respectively. Additionally, soybean meal has declined for five consecutive months.

2024 DMC margin projections

Based on the DMC Online Decision Tool (updated May 30, 2024), the 2024 DMC margin projections are predicted to remain above $9.50 per cwt maximum coverage, which would not trigger indemnities at any coverage levels (**Table 1**). With the recent DMC predictions, the margin is projected to continuously climb to $13.10 per cwt in October, which, if it occurs, would make it the highest margin to date for the program. All-milk price projections climb to $23.79 per cwt in November, then dip slightly to $23.43 per cwt in December. As feed cost forecasts fluctuate throughout the rest of the year, they are projected to remain under the $11-per-cwt mark and reaching a low of $10.47 in June and then gradually increasing to $10.82 in December. Based on current projections, the remainder of the program year 2024 forecasts an average of $12.37 per cwt margin with a $20.11 all-milk price floor.

TABLE 2 Dairy Margin Coverage program margin calculations

2024	Feed costs			Total feed costs* ($/cwt)	Milk price ($/cwt)	Margin above feed costs ($/cwt)
	Alfalfa hay** ($/ton)	Corn ($/bushel)	Soybean meal ($/ton)			
April	260.00	4.39	357.68	10.90	20.50	9.60
March	271.00	4.36	362.17	11.05	20.70	9.65
February	278.00	4.36	363.63	11.16	20.60	9.44
January	274.00	4.74	378.40	11.62	20.10	8.48
2023						
December	275.00	4.80	440.60	12.16	20.60	8.44
November	271.00	4.66	464.27	12.12	21.70	9.58
October	278.00	4.93	416.16	12.16	21.60	9.44
September	288.00	5.21	411.07	12.56	21.00	8.44
August	282.00	5.73	438.80	13.24	19.70	6.46
July	288.00	6.22	443.15	13.88	17.40	3.52
June	310.00	6.49	413.36	14.25	17.90	3.65
May	317.00	6.54	423.58	14.47	19.30	4.83

*The feed cost for each month is calculated by summing three numbers: 1) the corn price per bushel times 1.0728; plus 2) the soybean meal price per ton times 0.00735, plus 3) the alfalfa hay price per ton times 0.0137.
**Alfalfa hay prices are adjusted to include 100% of premium dairy-quality alfalfa hay price
Source: USDA Farm Service Agency

AUCTION PRICES
June 13, 2024

Auction	Top Springer	Top Average	Medium Holstein Springer	Short-breds	Open Heifers Light	Open Heifers Heavy	Heifer Calves	Bull Calves	Breeding Bulls
Farmers Regional Livestock Market of Glasgow LLC Glasgow, KY (270) 678-2118 *(sale 6/11/24)*	$1,900 $300 ▲	$1,500	$1,475	$900 $175 ▼	$685 $35 ▲	$1,175 $65 ▲	$480 $10 ▼	$640 $100 ▼	N/T
New Holland Sales Stables New Holland, PA (717) 354-4341 *(sale 1/10/24)*	$2,050 $50 ▼	$1,825 $125 ▲	$1,375 $325 ▲	$1,850 $250 ▼	$785 $335 ▲	$925 $425 ▼	N/T	N/T	N/T
Equity Co-op Livestock Reedsville, WI (920) 754-4361 *(sale 6/6/24)*	$1,900 NC	$1,200 NC	$1,150 NC	$1,300 NC	$90/cwt NC	$130/cwt $10/cwt ▲	$300 $50 ▼	$620 $50 ▲	N/T
Lake Odessa Livestock / Ravenna Auction LLC Lake Odessa, MI (616) 374-8213 *(sale 4/22/24)*	$2,400 $975 ▲	$1,175 $75 ▲	N/T	N/T	$430	N/T	N/T	N/T	N/T
Rosebush Sale Barn, Inc Rosebush, MI (989) 433-5348 *(sale 6/5/24)*	$2,750 $150 ▲	$2,300 $50 ▲	$2,250 $350 ▲	N/T	$364/cwt $159/cwt ▲	$223/cwt $49/cwt ▲	N/T	N/T	$1,950 $450 ▲
Equity Co-op Livestock Lomira, WI (920) 269-4351 *(sale 6/12/24)*	$2,200 NC	$1,500 NC	$1,400 NC	$1,800 NC	N/T	N/T	$400 $50 ▲	$760 $40 ▲	N/T
Pipestone Livestock Auction Market Pipestone, MN (507) 825-3306 *(sale 5/16/24)*	$2,950 $150 ▲	$2,750 $150 ▲	$2,500 $25 ▲	N/T	$250/cwt $17/cwt ▲	$245/cwt $47/cwt ▲	N/T	N/T	N/T
Oberholzer Dairy Cattle & Auction Loyal, WI (715) 773-2240 *(sale 6/6/24)*	$2,600 $350 ▼	$2,300 $100 ▲	N/T	$1,975	$170/cwt $25/cwt ▼	$200/cwt $10/cwt ▼	$380 $20 ▼	$620 $30 ▲	N/T
Springfield Livestock Marketing Center Springfield, MO (417) 869-9500 Doug Thomas (417) 840-9316 *(sale 5/28/24)*	$2,200 NC	$1,200 NC	N/T	N/T	$300 NC	$800 NC	$200 NC	$250 NC	N/T
Premier Livestock & Auctions Rocky Olsen Withee, WI (715) 721-0079 *(sale 6/12/24)*	$3,000 $100 ▼	$2,300 $300 ▲	$1,975 NC	$2,500 $50 ▲	$1,450 $100 ▲	$1,850 $50 ▼	$400 $150 ▲	$680 $30 ▲	N/T
Kreeger and Associates Chad Kreeger Cass City, MI (517) 294-3484 *(sale 6/7/24)*	$2,503 $104 ▼	$2,207 $44 ▼	N/T	N/T	N/T	N/T	N/T	N/T	N/T
Turlock Livestock Auction Yard Turlock, CA (209) 634-4326 *(sale 6/7/24)*	$2,500 $200 ▼	$1,800 $200 ▼	$1,775 $200 ▼	N/T	N/T	N/T	N/T	N/T	N/T
Escalon Livestock Market Escalon, CA (209) 838-7011 *(sale 6/12/24)*	$2,175 $165 ▲	$2,150 $175 ▲	$1,800 $300 ▲	N/T	$140/cwt NC	$174/cwt NC	N/T	N/T	$1,250 NC
Winnsboro Livestock & Dairy Auction Winnsboro, TX (903) 365-2201 *(sale 5/22/24)*	$1,725 $100 ▼	$1,400 $200 ▲	$1,400 $200 ▲	$900 $50 ▲	$475 $25 ▲	$600 $25 ▲	$475 NC	N/T	$800 $350 ▼
Farmers Livestock Market Oakdale, CA (209) 847-1033 *(sale 6/6/24)*	$2,400 NC	$2,100 $100 ▲	$1,800 $50 ▼	N/T	$180/cwt $20/cwt ▲	$145/cwt $5/cwt ▼	N/T	N/T	$1,350 $50 ▲

N/T = No test NC = No change Decrease (since last sale) ▼ Increase (since last sale) ▲

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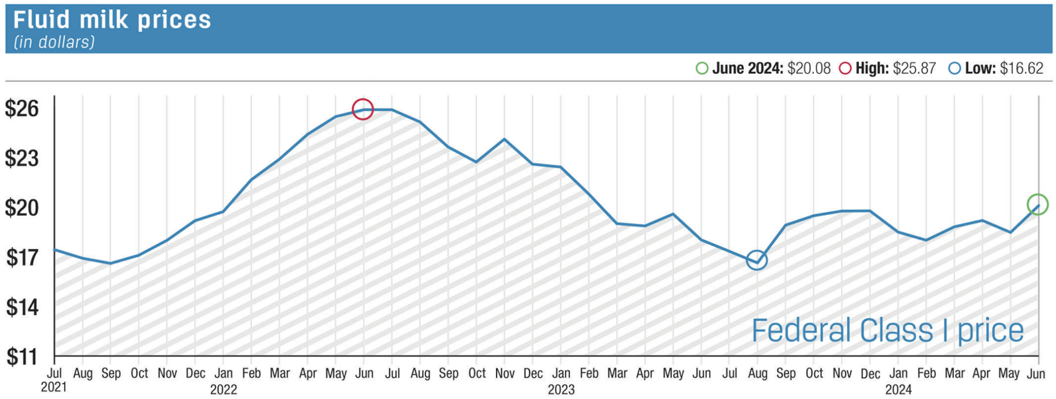


Ron O'Brien
President North America
Nui Markets

Global markets continue to shape U.S. dairy climate

It's no secret that U.S. dairy producers are suffering through tough economic times with low farmgate milk prices and high input costs. While domestic economic factors play a significant role in setting milk prices, we can't overlook the impact of export markets.

Unfortunately, U.S. dairy product exports did not start out strong in the first quarter of 2024. While February exports were the highest in two years, March exports gave back those gains and were below export totals for 2022 and 2023. The culprit, in general, was depressed powder sales across global markets.

But cheese stays strong

The one shining star in the export market is still cheese. Below-average cheese prices over the last 18 months spurred stronger-than-expected exports and increased production of non-Cheddar varieties. Combined with strong retail promotions, chaos in the southwestern milk markets and speculative short covering, the markets have surged. Since late March, block cheese prices have jumped 40%, and barrels are up 50%, with reports indicating that fresh cheese remains extremely tight. As we get into the teeth of summer, pay attention to cheese prices as hot weather impacts milk production.

How long will China slumber?

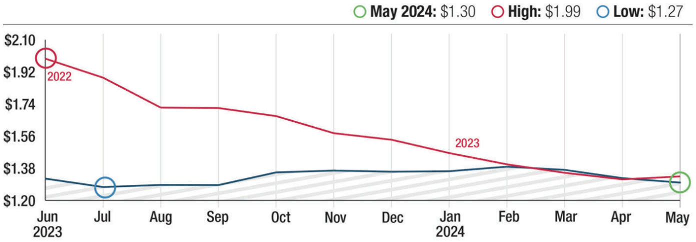
China has seen its dairy imports drop considerably since 2021, and the trend continues in 2024. Our Nui Markets representative in China, Ashwini Law, expects the market to remain down for another 12 to 18 months. In the meantime, domestic production in China continues to grow and is expected to be more than 5% higher in 2024 than last year. Chinese consumers remain skeptical about domestic product, so domestic demand won't increase to pick up the extra production, resulting in a reduced need for imports in the near term.

If China isn't buying, other areas must pick up the slack, or global supply needs to drop to balance the market. The volume China buys cannot be shifted to others; this offset must come through a production decline, but the market isn't signaling that today. Supply has been flat, except for the ongoing decrease in the U.S. cow herd and milk production since June 2023.

Where will butter go?

Butter remains at a strong price point in the market, consistently above $2.50 per pound since last July and trading higher since a brief stall

Non-fat dry milk
(monthly average in dollars)



Class III milk prices
(in dollars)

last December. Prices as of May 31 are at $3.09 per pound. Milk production is flat or down in most parts of the country, yet consumer demand remains strong and is expected to strengthen throughout 2024, especially as warehouses start to fill in anticipation of holiday demand. As these fundamentals strengthen, butter prices are likely to follow.

Will the EU markets remain flat?

Trading in the EU has been remarkably unremarkable. While per-cow production is expected to see modest growth compared to last year, the domestic herd is expected to drop slightly and offset production gains. At the same time, EU dairy producers struggle to deliver more milk in the face of growing environmental regulations. The biggest challenges facing the EU dairy industry come from off the farm. Structural changes to the EU dairy sector, political elections in many countries and the ongoing geopolitical issues in Ukraine, Russia and the Middle East will have an impact on trade over the foreseeable future.

How will New Zealand evolve?

The New Zealand dairy industry is undergoing changes. Cow numbers continue to decline, resulting in a drop in milk production compounded by the El Niño effect, which creates drier pasture-growing conditions across the country. At the same time, production costs continue to rise, straining dairy producer margins.

As lower production affects the entire industry, processors are starting to shift production to higher-value products like butter, cheese and cream rather than volume products like milk powders. Even as the market evolves, New Zealand will remain a major player in global export markets, as indicated by the 19% growth in the export of New Zealand products over the first quarter of 2024 compared to 2023.

What is the demand situation for NFDM in Mexico?

Despite a strong peso offering Mexican consumers greater purchasing power, nonfat dry milk (NFDM) demand in Mexico continues to languish. This hand-to-mouth buying behavior, reflected in a 25% year-over-year decline in NFDM imports, presents a significant challenge.

Manage risk

As global markets continue to evolve and impact the U.S. export market, milk price volatility will continue for U.S. dairy producers. Employing risk management techniques is always a good idea for both your milk supply and feed inputs, and in today's market, it may be more important now than ever.

As global dairy markets continue to experience uncertainties, the U.S. dairy industry is well suited to take advantage of export opportunities. Major players like China and New Zealand are undergoing significant changes to their dairy industries, and the EU continues to struggle with off-farm challenges. U.S. producers still have the green light to produce as much milk as efficiently as possible and use the tools available to them to manage risk.

This article is provided for information purposes only. Readers should consult their own professional advisers for specific advice tailored to their needs. Information contained in this article may be subject to change without notice.

Season 6, episode 17

Dr. Mark Kinsel: What dairy producers should know about biosecurity

In this episode of the *Progressive Dairy Podcast*, Dr. Mark Kinsel joins host Kimmi Devaney for a discussion about biosecurity. With recent reports of highly pathogenic avian influenza in dairy herds across multiple states, this is a timely topic that is on the minds of many dairy producers right now. Kinsel shares how to put together a biosecurity plan, how to manage animals on multiple sites to protect herd health, considerations for fairs and shows, and other key insights dairy producers should know.

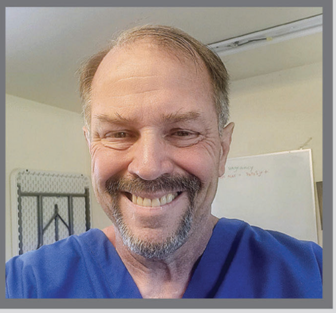
PROGRESSIVE DAIRY PODCAST

Topics covered:

- Key components of a biosecurity plan
- Tips for industry professionals visiting farms to minimize spreading anything from one farm to the next
- How to minimize risk when managing animals on multiple sites

"The best thing is to think these things through before you are [in a situation where you have an outbreak or another problem]. Have a protocol. This gets back to have a plan, think it through, talk to your veterinarian."

— Mark Kinsel, DVM



Courtesy photo.

agproud.com/podcasts

The *Progressive Dairy Podcast* is available in most streaming services.

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The Center for Dairy Excellence is a non-profit organization initiated by the Pennsylvania Department of Agriculture in 2004. Bringing together people from more than 40 different dairy organizations in Pennsylvania, the Center's mission is to enhance the profitability of the dairy industry by empowering people, creating partnerships, and increasing the availability and use of resources. Learn more at centerfordairyexcellence.org.

Pennsylvania dairy farmers and consultants team up to strategize in seven key areas of business

Todd Benedict worked with a Dairy Decision Consultant on financial analysis and management for his dairy operation.

When it comes to making strategic business decisions at the farm level, there is a lot for dairy producers to think about. From employee management and product marketing to business planning, financial management and pre-farm transition, Pennsylvania dairy farm families don't have to make these types of decisions alone. Leveraging funds provided by the Commonwealth of Pennsylvania, the Pennsylvania Dairymen's Association and other partners, the Center for Dairy Excellence helps Pennsylvania dairy farm families have a fresh perspective and outside set of eyes through Dairy Decisions Consultants (DDC) grants.

There's nothing more powerful than a team approach and having the ability to team up with consultants who have vast expertise in the dairy industry. See how these Pennsylvania dairy producers are honing in on seven key areas of business with the help of their consultants.

1 Employee management and communication

Employee management is more than just ensuring your employees are doing their jobs. Dairy producers and consultants focus on developing procedures and strategies that can help measure, monitor and interact with their workforce.

"We employ 26 employees. We decided to use the grant to employ a consultant to help plan for the future and create a management strategy for our business. We liked using the consultant because he was able to give his insight on what he has already seen and experienced from working with other dairy producers. A lot of the time, the consultants may be able to help further your goals with less roadblocks." —Milton Rotz, Cedar Pine Farm, Franklin and Adams counties, Pennsylvania

2 Business planning and structure

Business planning is a necessity to help manage volatility and create a roadmap for decision-making in all aspects of the business. Many dairy farm families feel more confident in what their future looks like after developing a detailed business plan with their consultants.

"We have two separate operations, one milking 300 and one milking 800. We wanted to work with a consultant to understand areas for improvement, as both operations were purchased in the last three years. Having the resources from the consultant to be in a benchmarking program allows us to compare several key data points and look for ways to improve. It is easy to see most of the problems that come up on a daily basis. It is much harder to take the time and go through all the books to decide what is cost-effective, efficient and productive. It's good to work with an experienced consultant for the knowledge and experience they have working with many farms." —Cory Mellott, Molly Pitcher Milk LLC, Cumberland County, Pennsylvania

3 Product marketing and labeling

Effective marketing and labeling of branded dairy products can create a more positive impact on customers' purchasing decisions. With so many responsibilities and limited time to spare, dairy farmers find value in working with outside consultants who can help them prioritize product marketing and labeling.

"For my husband and father-in-law, [the DDC program] helped them see that change is a possibility for the future. They were feeling stuck and like they didn't have options because the market was so bad. To hear our consultant's perspective and his projections, they learned what to eliminate that's losing money and how they can come out on top. The DDC program allowed us to have the support to seek some other funding and try to add a value-added portion to our farm. This

Continued on page 18

Photos courtesy of Center for Dairy Excellence.

Jill Henry and her family worked with a consultant in the product marketing and labeling space who helped them have the courage to say yes to pursuing a new opportunity.

Engaging in Excellence: Pennsylvania dairy farmers and consultants team up to strategize in seven key areas of business, cont'd from page 17

program gave us the courage to say, 'Yes, we can keep going.'" —Jill Henry, Henry Farms of Knox LLC, Clarion County, Pennsylvania

4 Direct marketing

Directly marketing products made from a farm's milk to consumers can help a producer capture more revenue, but the processing and branded business can be complex. Consultants through the DDC program help dairy farm families throughout the entire marketing process and open doors they might not have had before.

"We're focusing on regional growth first and then national growth. With our consultants' help, we've figured out how to go into this retail industry that's really hard to puncture. We're working with distributors and brokers and learning how to deal with small and big wholesale accounts. It's a whole other language, and without the consultants, we definitely wouldn't know what we're doing. Things are going really well right now. We're optimistic and being strategic with the help of our consultants."
—Stephanie Painter, The Painterland Sisters, Tioga County, Pennsylvania

5 Animal welfare

Veterinarian consultants will help farms establish animal welfare protocols related to the FARM Program as well as help train employees in FARM compliance.

"Dairy farmers are continually evaluating best practices, how we can improve, what changes we can make, and going above and beyond to keep our cows safe and comfortable. There are consultants and continuing education opportunities for farmers that share the latest research and practices, demonstrating that U.S. dairy farmers are committed to producing high-quality, safe milk with integrity." —Jennifer Orr, Harmony Acres Dairy, Fayette County, Pennsylvania

6 Financial management

Financial management and planning can provide dairy farm families with professional consulting resources to help make decisions that will shape the future of their farm – and help give them some peace of mind.

"It can be easy for farmers to [get depressed] or go into a downward spiral. I can see how it happens. I lost money last month, but now that I've talked to my consultant, I know that it's the industry and not something huge that I can do. I always felt like such a failure when I couldn't pay my bills or make money. I always wondered what I was doing wrong. He put it in perspective for me. It gave me peace of mind. Consultants help make everybody accountable. I never knew I was going to learn this much."
—Todd Benedict, Sunset Dairy, Warren County, Pennsylvania

Photo courtesy of Center for Dairy Excellence.

The Painterland sisters, Hayley and Stephanie, worked with a Dairy Decisions Consultant to develop their marketing approach for their value-added dairy product.

7 Pre-farm transition

Business and financial feasibility is an important part of transitioning the farm and/or family issue projects to set the farm up for a future transition team. Dairy farm families and consultants work together to create a farm succession plan that honors all family members and partners.

"When you work with each other day in and day out, sometimes you don't always hear things like someone else does. Our consultant just had a different perspective on listening to what we all had to say and then presenting it back to us. It was helpful. He encouraged us to take [the farm transition] slow and gave us real insight on how to keep things moving forward and some thoughts on which direction to go." —Betsy Yoder, Heron Run Farms, Huntingdon County, Pennsylvania

Learn more about the DDC grant program and how dairy producers can work with professional consultants. This grant program is expected to open in the fall of 2024. To learn more about the Center for Dairy Excellence, or to get involved in our programs and support our mission, visit the center's website (www.centerfordairyexcellence.org/).

New and innovative dairy offerings

Progressive Dairy Editor **Audrey Schmitz**

Identifying consumer trends and generating new, innovative dairy products to meet these demands provides opportunities for increased dairy consumption. Read all about these three new dairy products and how the ideas for them came about.

Photo provided by Emily Gilels.

A delectable drinkable yogurt called lassi

Inspired as a young woman in her 20s traveling in India, Emily Gilels became fascinated with lassi and got excited about introducing it in the U.S.; dosa by Dosa was founded to share this homestyle lassi recipe with the world. Lassi is one of the oldest and most celebrated yogurt drinks in the world at 3,000 years old. It is made with a cultured probiotic dense yogurt base, real fruit puree and freshly roasted spices.

"In homes in India people often make their own yogurt by taking a very bright piece of fruit and grinding some fresh spices into their lassi, and that's how it's drank," says Emily Gilels, CEO and founder of dosa by Dosa. "We really decided to bring this product to market so that we could be the brand that introduced authentically made lassi to America."

Gilels has since created a lactose-free lassi formula that has a natural flavor to pair well with the fruits and spices they put into it.

"Over many years, we developed our flavor profiles and continue to refine them and play around with different fruits, different spices, different levels of different strains of probiotics until we landed in what we thought was kind of the most refreshing, most delicious and indulgent-tasting flavors that are good for you," Gilels says.

The four flavors Gilels has taken to market are cardamom mango, turmeric banana, peppercorn berry and cayenne tamarind.

"What makes it unique is that it's an authentic Indian product

Continued on page 20

New and innovative dairy offerings, cont'd from page 19

and every flavor is spice-forward. It's very high-protein calcium, rich in B12 vitamins and it just has everything going for it. So it really stands out," Gilels says. "We're really creating a category for it that hasn't existed before. So that's what gets us excited. The yogurt category really hasn't had much happening in terms of drinkable yogurts, and now it's hard to find a category leader such as lassi."

Lassi by dosa by Dosa was recently named the grand prize winner of the Real California Milk Excelerator. It can be found in natural food stores and world-class retailers like Sprouts and Whole Foods Markets as well as e-commerce partners such as Good Eggs and Imperfect Foods.

"It really is the type of product that attracts children and adults. It's not confined to a specific generation," Gilels says. "Everybody loves it because it's delicious, healthy and indulgent-tasting but also good for you. So I love it. To me, I think it's a really satisfying snack, and I drink them all day."

Photo provided by Kate Mitchell.

Kraft Singles launches three bold new flavors

For the first time in almost a decade, Kraft Singles recently launched three new so-good taste and perfect melt flavors: jalapeño (spicy), garlic and herb (garlicky), and caramelized onion (savory).

"When thinking through new flavors outside of our original Kraft Singles, we uncovered that 67 percent of U.S. cheese consumers enjoy trying new cheeses, with flavor being one of the lead purchase drivers – but American cheese offerings were not delivering on bold taste or diverse usage occasions," says Stephanie Vance, brand manager for Kraft Singles.

Vance says they also found that flavored cheese is driving category growth, opening up a ripe opportunity for them to expand their portfolio.

"Building on our legacy as the go-to leader in American cheese, we focused on innovating and meeting the evolving needs of our consumers," Vance says. "Recognizing a gap in bold taste and diverse usage occasions, we crafted these options in response to the consumer demand for spicy, garlicky and savory flavors."

Flavored cheese has seen a 20% increase in sales from 2021 to 2022, reflecting a growing desire for unique and delicious options.

"Lastly, our new flavors address the ask from millennials for new flavor experiences that add excitement into their routine, as we


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uncovered that more than a quarter of millennials seek out food products that are fun," Vance says.

The new flavor additions address a market gap, transforming ordinary sandwiches essential for home cooks, chefs and anyone who loves cheese. The new flavors can be found at national and regional retailers across the country.

"Our brand is on a mission to

reignite America's love affair with cheese, and these new tantalizing flavors will elevate any ordinary sandwich into irresistible culinary delights," Vance says. "Picture a mouthwatering ham and cheese panini featuring Caramelized Onion Singles, a bold steak sandwich with the zing of Jalapeño Singles or a savory chicken Parmesan masterpiece enhanced by the aromatic Garlic and Herbs Singles."

Shaking things up with A2/A2 whole milk shakes

When Once Upon a Farm decided to go into dairy, it was imperative they partnered with organic farms that are making a positive impact on the planet and in the dairy industry specifically. For them, it was a no-brainer to partner with the suppliers they did both for their A2/A2 Whole Milk Shakes and their Grass-fed Whole Milk Smoothies.

"Currently most kids' dairy items on the shelf contain a combination of added sugar, natural or artificial color and flavors, and synthetic additives. We wanted to offer something that not only tasted delicious but didn't contain any added sugar and had a simple ingredient list that both parents and kids could pronounce," says Cassandra Curtis, Once Upon a Farm co-founder and chief innovation officer.

Through rigorous consumer testing, lots of tasting panels, multiple iterations of product reformulation and testing on the line to ensure they created the perfect product, they wanted their shakes to meet the standards parents expect.

"These are no-added-sugar shakes that actually taste good and have benefits from real fruit and veggies that you can't find with most dairy products on the market that are targeted for kids," Curtis says. "And they're our first product to contain organic dairy as an ingredient, which makes for a creamy, dreamy and delicious taste and texture."

When asked how it made her feel to see and taste the shake for the first time, Curtis says, "So excited! I was most excited because my kids couldn't stop eating them, and I felt good knowing they were getting the added benefit of the B12 from dairy along with the added nutrition of fruits and veggies."

The A2/A2 whole milk shakes come in three flavors that include triple berry, banana crème and strawberry crème. The shakes can be found at most major retailers nationwide, in particular at Whole Foods Market, or can be shopped online at onceuponafarmorganics.com.

"We are always looking to add more into our product pipeline, and we will continue to bring many more exciting things to families in the future," Curtis says. "We love all of our consumers and are here to support those that love high-quality, nutrient-rich and tasty snacks for themselves and their families."

Courtesy photo.

MILK QUALITY IN THE WESTERN WORLD

Bulk tank SCC **limit:**
400,000 cells/mL

Total bacteria count **limit:**
500,000 cfu/mL

Average herd size:
100 cows

Average annual production per cow:
24,575 lbs

UNIQUE FEATURES

- Due to supply management conditions, obligatory reporting measures require 100% of herds to report to DHI.

TRENDS

- Bulk tank SCC average in Ontario has trended below 200,000 for many consecutive years.
- The national average for bacteria count is approximately 25,000 IBC/mL.

CHALLENGES

- The “Buttergate” incident in 2020 instigated an increase in demand for monitoring of free fatty-acids and fatty acid profiles.

MILK QUALITY STANDARDS AND ENFORCEMENT

- Each milk load is screened at the processors; provincial programs randomly test loads for a wide range of inhibitors. If a load is not marketed due to contamination, all load losses and costs are borne by the producer(s) whose bulk tank sample is found to contain the detected inhibitor in the penalty range.

Bulk tank SCC **limit:**
500,000 cells/mL

Total bacteria count **limit:**
300,000 cfu/mL

Average herd size:
30 cows

Average annual production per cow:
8,406 lbs

UNIQUE FEATURES

- Unlike the other countries listed here, Brazil has a tropical production system.
- Most Brazilian dairy cows are crossbred with the most common cross being Holstein × Gyr.
- Over 280,000 milk producers

TRENDS

- No improvement to bulk tank SCC in the last five years
- Since its implementation in 2019, on-farm mastitis pathogen identification via culturing has become increasingly popular.

CHALLENGES

- Limited investment and innovation in the sector
- Low incentives to improve and maintain milk quality
- Rising competition for land use

UNIQUE FEATURES

- Herd distribution size is bimodal
- Prevalence of beef × dairy cows is increasing
- Raw milk is available in numerous states through retail, on-farm sales and cow share programs.

TRENDS

- There have been dramatic reductions in the number of dairy herds over past decades.

MILK QUALITY STANDARDS AND ENFORCEMENT

- Milk is classed as Grade A or Grade B and 95% of milk sold is Grade A.
- Bulk tank SCC geometric mean is 169,000 cells/mL – this represents results from 44% of milk produced.
- In 2022, antibiotic residues were found in 0.007% of bulk milk pickup tanker tests.

Average annual production per cow:
24,251 lbs

Total bacteria count **limit:**
100,000 cfu/mL

Bulk tank SCC **limit:**
750,000 cells/mL for Grade A milk

Average herd size:
340

Editor's note: The information presented in this infographic is based on the reports featured in the 2024 National Mastitis Council Annual Meeting presentation "Milk Quality Around the World."

PROGRESSIVE DAIRY

UNIQUE FEATURES

- There is strong labor retention due to a national scheme which helps foreign workers stay for four consecutive years with a farm as manager or herdsperson.
- There is zero tolerance for all inhibitors.
- Premiums are paid to farms with a bulk tank SCC of <200,000 cells/mL.
- Every six months, all farms are screened for *Salmonella* dublin in all quarters.

MILK QUALITY STANDARDS AND ENFORCEMENT

- The national mastitis rate is 0.24 cases per cow per year.
- Depending on the processor, penalties may be applied to milk with a bacteria count of 60,000 IBC/mL or higher.

CHALLENGES

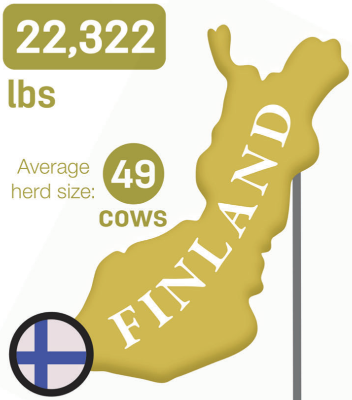
- Ongoing concerns due to the spread of *Strep. agalactia* in systems with selective dry cow therapy.

TRENDS

- Jerseys are the predominant breed due to their climate efficiency.
- There is a rapid rise in the number of automated milking systems, as part of a wider trend observed throughout Scandinavia
- The average herd size is increasing by one cow per month.

Average herd size: **254** cows

Average annual production per cow: **23,462** lbs



Average annual production per cow: **22,322** lbs

Average herd size: **49** cows

UNIQUE FEATURES

- A national *Salmonella* control program is in place. The rate in cattle is < 0.5%.
- No cases of Johne's disease have been detected on Finnish dairies.

TRENDS

- Most farms send quarter milk samples for microbiological analysis to a mastitis laboratory on a regular basis.

CHALLENGES

- Annually, there are antibiotic residues found in milk loads; although rare, this does lead to significant economic losses.

MILK QUALITY STANDARDS AND ENFORCEMENT

- Milk pricing is based on raw milk quality, with the top class being "Class E" for which producers receive a premium. Class E refers to milk with a bulk tank SCC of <250,000 cells/mL and a bacteria count of <50,000 cfu/mL.
- 97.4% of milk produced falls under Class E.

Standards for EU countries:

Bulk tank SCC **limit**: **400,000** cells/mL

Total bacteria count **limit:** **100,000** cfu/mL

Average annual production per cow: **21,184** lbs

Average herd size: **77** cows

UNIQUE FEATURES

- 95% of dairies participate in Johne's disease screenings using ELISA tests on blood or milk samples.

TRENDS

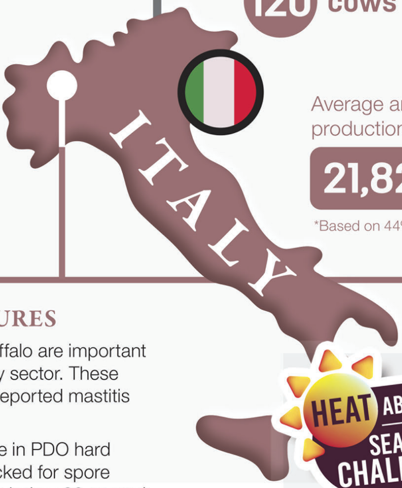
- Ongoing projects to validate low protein diets to meet nitrogen emission reduction goals
- Increased consumer demand for milk from herds with pasture access

CHALLENGES

- Unknown impacts on milk quality and human health related to the rise of alternative feed and health additives like prebiotics, probiotics, and herbs.
- Limited opportunity for serological and chemical analyses.

MILK QUALITY STANDARDS AND ENFORCEMENT

- There are procedures in place for all dairy farmers, including warnings to herdspeople, reporting to the federal food safety body and required herd visits.



Average herd size: **120** cows

Average annual production per cow: **21,826** lbs*

*Based on 44% of dairy cows

HEAT ABATEMENT & SEASONALITY CHALLENGES

UNIQUE FEATURES

- Sheep and water buffalo are important to the country's dairy sector. These operations have no reported mastitis cases.
- Milk dedicated to use in PDO hard cheeses is also checked for spore counts (target level is below 90 spores).
- Selective dry cow therapy is mandatory.

TRENDS

- Large decreases in antimicrobial usage have been observed in recent years – 18% decrease in defined daily dose.

CHALLENGES

- Only 11% of herds report to DHI.
- Recent drought years have resulted in poor quality forages and silages, increasing the presence of aflatoxins, causing health issues in dairy herds.

MILK QUALITY STANDARDS AND ENFORCEMENT

- Premiums and penalties applied are based on bulk tank SCC and bacteria count. Bulk tank milk is sampled and analyzed every 10 days.
- Bulk tank SCC average is 225,000 cells/mL.
- Bacteria count average is 17,843 cfu/mL.

Keeping kids safe on the farm

Emily Krekelberg for *Progressive Dairy*


Illustration by Kristen Phillips.

AT A GLANCE

Topics to discuss with children to keep them safe around farm machinery and other hazards.

The farm is a great place to raise kids, but it is also dangerous. About one-third of all farm incidents involve children, and every three days a child in the U.S. dies in a farm-related incident. Prevent your child from becoming a statistic by being proactive about practicing safety on the farm.

Warn children about on-farm hazards

Many of the everyday hazards on the farm are not always obvious to kids. A hazard is a potential source of harm or danger (i.e., an icy sidewalk), and risk is a situation involving exposure to a hazard (i.e., walking across an icy sidewalk). Talk to children about what makes certain areas of the farm dangerous, and what the risks are. Ask them what they think they can do to keep themselves safe.

Examples of hazards on the farm include machinery, livestock, grain bins, silos and chemicals. Considering the risks of certain farming activities can help us find jobs on the farm that are safe for kids.

Give children age-appropriate tasks

Kids tend to be very eager helpers on the farm. Although they may want to help with everything, consider the age-appropriateness of certain tasks and the risks involved. Some tasks like feeding livestock, cleaning out pens and operating machinery will not be appropriate for every child. Think about age, development and body size when considering which tasks to assign. A great resource for determining age appropriateness is the Agricultural Youth Work Guidelines (cultivatesafety.org) from the National Children's Center for Rural and Agricultural Health and Safety.

Talk with your kids about the types of jobs they want to do and the types of jobs they think they're ready to do. Before letting a child work independently, be sure they are properly trained in the task and spend some time observing them to see if any changes or adaptations need to be made or if the child may not be ready for that task yet. Never force a child to do a task they are not comfortable with or that they are not ready to do on their own. Take the time to fully instruct children on a task, its hazards and what to do if they need help. The investment of time now will make taking on new tasks easier in the future.

Supervise children on the farm

Lastly, supervision is critical to keeping kids safe on the farm, whether they are working or not. Over half of child injuries on farms happen to children who are not working but are simply in the vicinity of dangerous activities. For younger children, consider how to set up safe play areas outside using snow fence or another highly visible material. Post signage around the farm and at driveways to alert visitors to watch for children.

During high-traffic times like planting and harvest, put children in safety vests and keep them in an area safely away from the action. When children are helping you with a job or task, be sure to model safe practices and explain why you are doing things that way.

Make safety a part of your farm's culture, and your children will follow your example. Keeping a watchful eye on any kids around the farm is crucial in ensuring their safety.

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Protecting dairy workers from H5N1 bird flu: What employers and supervisors can do

Matt Solberg for *Progressive Dairy*

While uncertainty still surrounds how humans can get the H5N1 bird flu virus from cattle, dairy producers, supervisors and workers continue their vital agricultural production on the frontline of these unfolding events.

As of June 4, three U.S. dairy farm workers have tested positive for H5N1, with many more dairy farmworkers being monitored for possible exposure and disease. The best actions dairy producers can take for their operations and for their workforce are:

1 Hold safety meetings with employees to talk about:

• Symptoms of H5N1 in cows, which include:

o Decreased appetite

o Reduced milk production

o Abnormal color to milk

o Be aware that some cows that have H5N1 may not show symptoms

• Symptoms of H5N1 in humans, which include:

o Red, swollen or watery eyes

o Fever

o Cough

o Sore throat

o Headaches or body aches

o Nausea, vomiting or diarrhea

o Difficulty breathing (call 911 immediately)

• Good hand-washing practices

• Avoiding any contact or consumption of raw milk

• How and where workers can seek health care if they have any symptoms

2 Provide personal protective equipment (PPE) and encourage its use (especially face shields and gloves), even if your cattle aren't currently showing symptoms. Dairy producers can receive financial support from the USDA for PPE, or you can get PPE for free from your local health department.

The Centers for Disease Control and Prevention (CDC) is currently recommending dairy workers use: N95 masks or respirators; safety goggles and/or face shields; gloves; rubber boots or boot covers and fluid-repellant aprons or coveralls.

Use this guide (www.cdc.gov/flu/avianflu/h5/worker-protection-ppe.htm) for guidance on proper usage and disposal of PPE.

3 Assess points of risk for workers on the farm and change procedures to reduce that risk, especially for tasks where it is difficult to use the recommended PPE.

Dairy producers can access this biosecurity guide from the FARM Program (https://nationaldairyfarm.com/dairy-farm-standards/farm-biosecurity/) for more information on good biosecurity practices to employ.

A recent study from the University of Vermont Extension found that 75% of dairy workers had never received training related to zoonotic diseases, despite 50% saying they think it's important.

If interested in a training for employees, dairy producers can contact the National Center for Farmworker Health (www.ncfh.org/contact.html) for support.

Contact your state health department to inquire about receiving free PPE for your employees and to get any employees with symptoms such as red or watery eyes, cough, fever, joint pain or headaches tested for H5N1.

Matt Solberg
Employer Engagement Coordinator
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Matt Solberg, B.Sc., works to connect agricultural employers and labor contractors in the U.S. with public health resources in their area.

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Transdermal
(flunixin transdermal solution)

IMPORTANT SAFETY INFORMATION: NOT FOR HUMAN USE. KEEP OUT OF REACH OF CHILDREN. Milk that has been taken during treatment and for 48 hours after treatment must not be used for human consumption. Cattle must not be slaughtered for human consumption within 8 days of the last treatment. Not for use in replacement dairy heifers 20 months of age or older or dry dairy cows; use in these cattle may cause drug residues in milk and/or calves born to these cows or heifers. Not for use in beef and dairy bulls intended for breeding over 1 year of age, beef calves less than 2 months of age, dairy calves, and veal calves. Do not use within 48 hours of expected parturition. Approved only as a single topical dose in cattle. For complete information on Banamine® Transdermal, see accompanying product package insert.

[1] Banamine® Transdermal Product Label

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US-FIN-240400001

MERCK
Animal Health

Product Information
Approved by FDA under NADA #141-450

Banamine® Transdermal

(flunixin transdermal solution)

Pour-On for Beef and Dairy Cattle
50 mg/mL

Non-Steroidal Anti-inflammatory Drug

CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION: Each milliliter of Banamine Transdermal pour-on contains 50 mg flunixin (equivalent to 83 mg flunixin meglumine), 150 mg pyrrolidone, 50 mg L-menthol, 500 mg propylene glycol dicaprylate/dicaprate NF, 0.20 mg FD&C Red No. 40, and glycerol monocaprylate NF qs.

INDICATIONS: Banamine Transdermal pour-on is indicated for the control of pyrexia associated with bovine respiratory disease and acute bovine mastitis, and the control of pain associated with foot rot in beef cattle 2 months of age and older and dairy cattle.

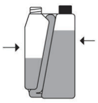
Not for use in beef and dairy bulls intended for breeding over 1 year of age, replacement dairy heifers over 20 months of age, dry dairy cows, dairy calves, or veal calves.

DOSAGE AND ADMINISTRATION: Apply only once at a dose of 3.3 mg flunixin per kg body weight (1.5 mg/lb; 3 mL per 100 lbs) topically in a narrow strip along the dorsal midline from the withers to the tailhead. Round the dose up to the nearest weight increment on the dosing chamber. If pyrexia, or the pain associated with foot rot persists, the diagnosis should be re-evaluated and alternative therapy considered. Do not treat cattle if the hide is wet or may get wet in the six hours after dosing because effectiveness has not been evaluated under wet hide conditions.

Practice the Administration and Overfill Reduction Instructions a few times to become familiar with operating the package before dosing animals.

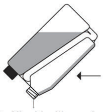
Step 1

Step 2



If the dosing chamber is overfilled, follow the Overfill Reduction Instructions.

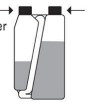
Step 3



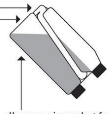
A small amount of liquid will remain on the walls of the chamber, but the chamber is calibrated to account for this.

OVERFILL REDUCTION INSTRUCTIONS

Step 1

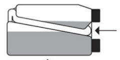


Step 2



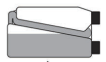
Tilt the bottle to allow an air pocket form at the beginning of the transfer tube inside the bottle.

Step 3



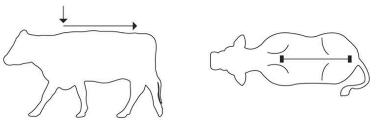
Hold the bottle horizontally to allow product to cover the end of the transfer tube inside the dosing chamber

Step 4



Squeeze and release the bottle repeatedly. Product will return to the bottle through the transfer tube.

Figure 1 – Recommended pour-on location



CONTRAINDICATIONS: NSAIDs inhibit production of prostaglandins which are important in signaling the initiation of parturition. The use of flunixin can delay parturition and prolong labor which may increase the risk of stillbirth. Do not use Banamine Transdermal pour-on within 48 hours of expected parturition. Do not use in animals showing hypersensitivity to flunixin meglumine.

USER SAFETY WARNINGS: Not for use in humans. Keep out of reach of children. Flunixin transdermal solution is a potent non-steroidal antiinflammatory drug (NSAID), and ingestion may cause gastrointestinal irritation and bleeding, kidney, and central nervous system effects.

This product has been shown to cause severe and potentially irreversible eye damage (conjunctivitis, iritis, and corneal opacity) and irritation to skin in laboratory animals. Users should wear suitable eye protection (face shields, safety glasses, or goggles) to prevent eye contact; and chemical resistant gloves and appropriate clothing (such as long-sleeve shirt and pants) to prevent skin contact and/or drug absorption. Wash hands after use.

In case of accidental eye contact, flush eyes immediately with water and seek medical attention. If wearing contact lenses, flush eyes immediately with water before removing lenses. **In case of accidental skin contact and/or clothing contamination, wash skin thoroughly with soap and water** and launder clothing with detergent. **In case of ingestion do not induce vomiting and seek medical attention immediately.** Probable mucosal damage may contraindicate the use of gastric lavage. Provide product label and/or package insert to medical personnel.

WITHDRAWAL PERIODS AND RESIDUE WARNINGS: Milk that has been taken during treatment and for 48 hours after treatment must not be used for human consumption. Cattle must not be slaughtered for human consumption within 8 days of treatment. Not for use in replacement dairy heifers 20 months of age or older or dry dairy cows; use in these cattle may cause drug residues in calves born to these cows or heifers. Not for use in beef calves less than 2 months of age, dairy calves, and veal calves. A withdrawal period has not been established for this product in pre-ruminating calves. Approved only as a single topical dose in cattle. Repeated treatments may result in violative residues in milk or in edible tissues.

PRECAUTIONS: As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Patients at greatest risk for adverse events are those that are dehydrated, on concomitant diuretic therapy, or those with renal, cardiovascular, and/or hepatic dysfunction. Banamine Transdermal should be used with caution in animals with suspected pre-existing gastric erosions or ulcerations. Concurrent administration of other NSAIDs, corticosteroids, or potentially nephrotoxic drugs should be avoided or used only with careful monitoring because of the potential increase of adverse events. Banamine Transdermal is approved only as a single topical dose. The safety of repeated treatment has not been evaluated.

NSAIDs are known to have potential effects on both parturition (see Contraindications) and the estrous cycle. There may be a delay in the onset of estrus if flunixin is administered during the prostaglandin phase of the estrous cycle. NSAIDs are known to have the potential to delay parturition through a tocolytic effect. The use of NSAIDs in the immediate post-partum period may interfere with uterine involution and expulsion of fetal membranes. Cows should be monitored carefully for placental retention and metritis if Banamine Transdermal pour-on is used within 24 hours after parturition.

Not for use in beef and dairy bulls intended for breeding over 1 year of age because reproductive safety has not been evaluated.

CLINICAL PHARMACOLOGY: Flunixin meglumine is a non-steroidal, anti-inflammatory drug. It is a weak acid (pKa=5.82)[1] which exhibits a high degree of plasma protein binding (approximately 99%).[2] However, free (unbound) drug appears to readily partition into body tissues (Vss predictions range from 297 to 782 mL/kg).[2-5] In cattle, elimination occurs primarily through biliary excretion.

Flunixin persists in inflammatory tissues[6] and is associated with anti-inflammatory properties which extend well beyond the period associated with detectable plasma drug concentrations.[4,6] Therefore, prediction of drug concentrations based upon the estimated plasma terminal elimination half-life will likely underestimate both the duration of drug action and the concentration of drug remaining at the site of activity.

Pharmacokinetic properties of flunixin transdermal solution in cattle administered at a dose of 2.5 mg/kg, are summarized in Table 1, comparing results between animals that were allowed to self- and allo-lick vs. animals that were prevented from licking. Animals that were allowed to self- or allo-lick had lower rate and extent of absorption when compared to the animals prevented from licking. However, no dose adjustment is needed to account for the effect of licking because the substantial evidence of effectiveness was demonstrated in animals that were allowed to lick.

Table 1. Average (+/- standard deviation [SD]) PK parameters after a single administration of flunixin transdermal solution at a dose of 2.5 mg/kg in cattle that were either allowed to lick or prevented from allo- and self-licking (n = 24/group).

PK parameter	Non-licking		Licking	
	Mean	± SD	Mean	± SD
C_{max} (ng/mL)	1496	769	N/A	N/A
Concentration at 2 h*	1282	533	1072	353
T_{max} (h)	1.29	0.464	N/A	N/A
$AUC_{2\text{-}last}$ (ng*h/mL)	7499	2131	6827	4672
$T_{1/2}$ (h)	8	2	9	6

* First blood level in the licking group was taken at 2 hours post-dose.
First blood sample in non-licking group was taken at 0.25 hours post-dose.
C_{max}: Maximum observed plasma concentration
T_{max}: Time at which C_{max} was observed
$AUC_{2\text{-}last}$: Area under the plasma concentration versus time curve measured between 2 hours and the time of the last quantifiable concentration
$T_{1/2}$: Terminal elimination half-life

Absorption of flunixin transdermal solution in cattle is dependent on environmental temperature. The effect of temperature on flunixin absorption was tested in temperatures ranging from 15.3 to 20.1°F (average low in the coldest study) to 80 to 100°F (average high in the warmest study). Flunixin concentrations were consistently lower when the pour-on product was administered in a cold (temperature) rather than hot (temperature) environment. However, the clinical effectiveness was demonstrated over the range of environmental conditions expected under field conditions. No dose adjustments are necessary due to environmental temperature.

References:

1. Johansson M, Anler EL. Gas chromatographic analysis of flunixin in equine urine after extractive methylation. *J Chromatogr.* 1988; 427:55-66.
2. Odensvik K, Johansson M. High-performance liquid chromatography method for determination of flunixin in bovine plasma and pharmacokinetics after single and repeated doses of the drug. *Am J Vet Res.* 1995; 56:489-495.
3. Anderson KL, Neff-Davis CA, Davis LE, Bass VD. Pharmacokinetics of flunixin meglumine in lactating cattle after single and multiple intramuscular and intravenous administrations. *Am J Vet Res.* 1990; 51:1464-1467.
4. Odensvik K. Pharmacokinetics of flunixin and its effect on prostaglandin F2∝ metabolite concentrations after oral and intravenous administration in heifers. *J Vet Pharmacol Ther.* 1995;18:254-259.
5. Hardee GE, Smith JA, Harris SJ. Pharmacokinetics of flunixin meglumine in the cow. *Res Vet Sci.* 1985; 39:110-112.
6. Lees P, Higgins AJ. Flunixin inhibits prostaglandin E2 production in equine inflammation. *Res Vet Sci.* 1984; 37:347-349.

TARGET ANIMAL SAFETY: In a target animal safety study in 32 six-month old beef cattle (16 castrated males and 16 females), flunixin transdermal solution was administered topically at 3.3, 9.9, and 16.5 mg/kg body weight (1X, 3X, and 5X the labeled dose) on Days 1, 2, and 3 (3X the labeled administration frequency). Cattle were continuously restrained to prevent licking. In addition, the study was conducted under warm environmental conditions (70°F to 80 °F on dosing days). One animal in the 3X group and three animals in the 5X group exhibiting twisting, kicking, rubbing on the fence, and or prancing, starting 5 to 15 minutes after dosing and lasting up to an hour after dosing on both Days 2 and 3. Two 5X animals had positive fecal occult blood on one of three post-treatment days, and one 5X animal had positive fecal occult blood on Days 2 and 3 post-treatment. Trace occult blood was found in the urine of three animals: one 5X animal on Day 1, one 5X animal on Day 3, and one 3X animal on Day 3. Test article-related pathology changes included a dose-related increase in the incidence and severity of abomasal erosions and ulcerations; and inflammatory cell infiltrates, epidermal necrosis, and small areas of dermal necrosis at the application site. The abomasal lesions correlated with fecal occult blood in three 5X animals. There were no animals with any other evidence of gastrointestinal bleeding or clinical signs of abomasal ulceration during the study.

Application site reactions, including dandruff/skin flakes, hair damage (thin, broken, brittle hair), and skin thickening were observed in effectiveness and/or supportive studies. The application site reactions were first observed around three to seven days post-dosing and lasted for about 14 days. These reactions were cosmetic in nature and generally resolved without treatment.

A pharmacokinetic evaluation demonstrated that the systemic exposure of flunixin is markedly lower when administered transdermally at a dose of 3.3 mg flunixin/ kg BW than when administered intravenously at a dose of 2.2 mg flunixin/kg BW, therefore, female reproductive safety is supported by reproductive safety studies conducted for the approval of BANAMINE (flunixin meglumine injection) in cattle, NADA 101-479.

EFFECTIVENESS: *Clinical field studies - bovine respiratory disease.* Pharmacokinetic studies established that the absorption of flunixin administered transdermally to cattle is highly dependent on environmental temperature. Therefore the effectiveness of flunixin transdermal solution for the control of pyrexia associated with bovine respiratory disease was demonstrated under a range of environmental temperatures in two studies: a field study conducted at four geographic locations (California, Kansas, Nebraska, and Texas) under moderate environmental temperatures (average temperatures ranged from 42°F to 74°F on enrollment days) and a field study conducted at a single site (Nebraska) under cold environmental conditions (average temperatures ranged from 2 °F to 20 °F on enrollment days). In both studies, cattle were housed in groups and were not prevented from licking.

In both studies, cattle exhibiting clinical signs of BRD and having a rectal temperature of at least 104.5°F were enrolled. A total of 235 cattle in the multilocation field study and 50 cattle at the single site field study were administered either flunixin transdermal solution (3.3 mg/kg BW) or an equivalent volume of dyed saline as a pour-on once on Day 0. Six hours after treatment, rectal temperatures were measured. The treatment success rate of the flunixin transdermal solution-treated group was compared to the treatment success rate in the dyed saline control group. A treatment success was defined as a drop in rectal temperature of ≥ 2°F in an individual animal. In the multi-location study, the treatment success rate was significantly different (p < 0.0001) and higher for the flunixin transdermal solution-treated group (70/120, 58.3%) compared to the dyed saline control group (7/115, 6.1%). In the single site study, the treatment success rate was significantly different (p = 0.0002) and higher for the flunixin transdermal solution- treated group (19/25, 76%) compared to the dyed saline control group (4/25, 16%).

Induced infection model studies - foot rot. The effectiveness of flunixin transdermal solution for the control of pain associated with foot rot in beef and dairy cattle was demonstrated under a range of environmental temperatures in two studies: an induced infection model study conducted in Nebraska with temperatures ranging from 61°F to 85°F on the day of enrollment and treatment; and an induced infection model study conducted in Kansas with temperatures ranging from 27°F to 53°F on the day of enrollment and treatment. In both studies, cattle from both treatment groups were commingled in pens and were not prevented from licking.

In each study, cattle were challenged by subcutaneous injection of a culture of *Fusobacterium necrophorum* into the interdigital space of the right front foot using a method that was validated to induce pain representative of foot rot. Cattle were enrolled when they demonstrated signs of pain associated with foot rot based on lameness, interdigital lesion, and interdigital swelling criteria. Pressure mat gait parameters maximum total force (kgf) and contact area (cm) were also measured at enrollment. A total of 30 cattle at each site were administered either flunixin transdermal solution (3.3 mg/kg BW) or an equivalent volume of dyed saline as a pour-on once on Day 0. Six hours after treatment, lameness scores and pressure mat gait parameters maximum total force and contact area were measured.

Effectiveness was determined independently at each site based on treatment success rates at six hours after treatment; and the change in maximum total force and contact area between enrollment and six hours after treatment. A treatment success was defined as a decrease in lameness score by ≥ 1 (scale 1 to 5, with enrollment of animals with lameness score ≥ 3) from the enrollment lameness score. The treatment success rate of the flunixin transdermal solution-treated group was compared to the treatment success rate in the dyed saline control group at both sites.

Changes in biometric gait parameters were also compared between the treatment groups.

In the Nebraska study, the treatment success rate was significantly different and higher for the flunixin transdermal solution-treated group (15/15, 100%) compared to the dyed saline control group (1/15, 6.67%); and the mean change in maximum total force and mean change in contact area were statistically significantly different (p <0.0001) and higher in the flunixin transdermal solution-treated group (43.08 kgf and 16.76 cm) compared to the dyed saline control group (-4.14 kgf and -2.70 cm). In the Kansas study, the treatment success rate was significantly different (p=0.0387) and higher for the flunixin transdermal solution-treated group (14/15, 93.33%) compared to the dyed saline control group (8/15, 53.33%); and the mean change in maximum total force and mean change in contact area were statistically significantly different (p= 0.0002 and p<0.0001, respectively) and higher in the flunixin transdermal solution-treated group (34.32 kgf and 16.38 cm) compared to the dyed saline-treated control group (-0.54 kgf and -0.96 cm).

Clinical field study - acute bovine mastitis. The effectiveness of flunixin transdermal solution for the control of pyrexia associated with acute bovine mastitis was demonstrated under a range of environmental temperatures (37.4°F to 86°F) in a multi-site field study conducted in France, Germany, and Spain. Cattle were housed in a manner which did not prevent them from licking themselves or other cows. Lactating dairy cows were enrolled when they exhibited acute signs of mastitis in one or two quarters (based on an evaluation of udder firmness, swelling, and pain), milk characteristics consistent with mastitis, and a rectal temperature of at least 104°F.

Enrolled cows were administered either flunixin transdermal solution (3.3 mg flunixin/kg BW) or an equivalent volume of dyed saline as a pour-on once on Day 0. Six hours after treatment, rectal temperatures were measured. The treatment success rate of the flunixin transdermal solution-treated group was compared to the treatment success rate in the dyed saline control group. A treatment success was defined as a drop in rectal temperature of ≥ 2°F in an individual animal. The treatment success rate was significantly different (p < 0.0001) and higher in the flunixin transdermal solution-treated group (61/64, 95%) compared to the dyed saline control group (23/66, 35%).

CONTACT INFORMATION: For technical assistance or to report a suspected adverse drug experience, call: 1-800-211-3573. For customer service or to request a Safety Data Sheet (SDS), call: 1-800-521-5767. For additional Banamine Transdermal pour-on information go to www.BanamineTD.com. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at www.fda.gov/reportanimalae

HOW SUPPLIED: Banamine Transdermal pour-on, is available in 100-mL (NDC 0061-4363-01), 250-mL (NDC 0061-4363-02), and 1-L (NDC 0061-4363-03) bottles.

STORAGE INFORMATION: Store at or below 30°C (86°F). Use within 6 months of first opening.

For Patent information: http://www.merck.com/product/patent/home.html. Approved by FDA under NADA # 141-450. Use Only as Directed. Formulated in Germany. Distributed by: Intervet Inc. d/b/a Merck Animal Health, Rahway, NJ 07065

Rev.10/2024

MERCK Animal Health

Setting the next generation up for success

Andy (Caygeon) Junkin for *Progressive Dairy*

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AT A GLANCE

An overview of how confidence and self-esteem can make someone a better leader on the farm and elsewhere, as well as the negative impacts of low self-esteem on a family business.

When your farm's successor looks in the mirror, who do they see? A boy or a man's man? Daddy's little girl or a farmer who is kicking butt and taking names?

Self-esteem is how you value or perceive yourself. You can also call it self-respect. How do you feel and treat yourself every day? Are you confident? Do you believe you are good at certain things? Do you think you are worthy of being loved and respected?

Within a family business, self-esteem becomes 10 times more complicated because it is not just you; it is the baggage of your family dynamics that comes into play. You might have personal goals, but do they jive with your parents' personal goals or are they at odds with one another? Do you have the same goals, yet misperception causes complications to be exacerbated? You might get along great as a family for a decade, but nearly overnight the complications of everyone's emotional needs cause the organization to quickly unravel in ways you would never predict.

After realizing the importance of having self-esteem, I put in many hours of study and research into this potential pitfall, and over 75-plus books later, I am realizing that I am just scratching the surface. However, it is incredible the results you can get out of a son or daughter taking over a farm within a matter of a few weeks when they think of themselves in a positive light.

But where do you start?

The family farm isn't always the best environment for building a young farmer's self-esteem. In fact, it can be downright toxic.

Farmers have a suicide rate higher than war veterans who have returned from Iraq and Afghanistan. Do you think self-esteem has anything to do with this? Negative self-esteem impacts every farmer as they lace on their boots each day. The degree of it is the one thing that impacts farm success in unseen yet destructive ways.

When someone takes over the family farm, feeling good about themselves can really help make the farm successful in the long run. Here's why.

• *Confidence helps make good decisions.* If you are confident, you trust yourself to make the right choices for the farm. You are not afraid to try new things or adapt when things change.

• *Bouncing back from problems.* Farming has lots of ups and downs. If you feel confident, you are better at dealing with tough times. You don't let setbacks bring you down. You keep trying and don't let circumstances define you.

• *Being strong in negotiations.* Running a farm means dealing with other people – everyone from input suppliers to your mother-in-law. If you believe in yourself, you are better at standing up for what the farm needs in these discussions. You are going to respectfully disagree with partners when new efficiencies can be found and fight for what is right, respectfully.

• *Being a good leader.* Leading a farm means being someone others can look up to. If you feel confident, you are more likely to inspire and motivate your team, and that makes the farm work better.

Consequences of poor self-esteem

Business partners with poor self-esteem can have many negative impacts on a family-owned business.

• *Trouble making decisions.* Partners who don't feel good about themselves will often second guess themselves and might have a hard time making decisions for the business, which

Continued on page 2

NATHANIEL BRANDEN'S *SIX PILLARS OF SELF-ESTEEM*

• *Having goals and working toward them.* Set goals you want to achieve and take steps to make them happen. Having something to aim for gives your life direction and purpose. When I start working with a farm family, this starts with setting audacious goals for what you want to have done by sunset tomorrow night, and eventually works into long-term goals for your life (living with purpose).

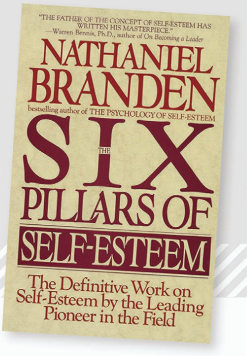
• *Taking responsibility for your actions.* Understand that what you do affects your life. Instead of blaming others for things that happen to you, recognize that your choices matter. Problem-solve how you approach problem-solving itself.

• *Being aware of yourself.* Pay attention to your thoughts, feelings and what you do. How do you react to problems, and how could you react better in the future?

• *Accepting yourself.* It is being OK with who you are, even if you are not perfect. Embrace your good qualities and your flaws without being too hard on yourself. Yet, having the grit to gradually turn weaknesses into strengths. On a yellow sticky note in the corner of your bathroom mirror, write down one new thing you are working on to improve each month and ask daily if this change is happening.

• *Speaking up for yourself.* Don't be afraid to say what you need or believe in, but do it respectfully. It is about being true to yourself without stepping on others. Always be respectful yet authentic. Never wear a mask and fight for your beliefs.

• *Being honest and consistent.* Do what you say you will do, and be truthful with yourself and others. It is about being trustworthy and living by your values. I carry a jackknife which has the mantra "Be the man you want your boys to become." This has changed my mindset/actions in everything I say and do.



Setting the next generation up for success, cont'd from page 1

can slow things down like the rate of improved efficiency on your farm and cause you to miss out on good opportunities.

• *Not taking initiative.* Farmers with low self-esteem might not take the lead or try new things to help the business grow. They will lack ambition. This can hold your farm back from reaching its fullest potential.

• *Avoiding problems.* If a partner doesn't feel confident, they might avoid dealing with problems, which can make things worse in the long run.

• *Not feeling like a good leader.* Low self-esteem can make it tough for you to act like a leader. This can make it hard for others to follow your lead or respect you.

• *Spreading negativity.* When farmers feel bad about themselves, it can bring everyone else down in the partnership. This negativity can hurt morale and make it harder for everyone to work well together.

• *Being too cautious.* If someone is afraid of failing, they might not want to take any risks. But sometimes, taking smart risks is important for the farm to grow.

• *Struggling with relationships.* Farmers with low self-esteem might have a hard time getting along with others or just having a relationship that goes beyond the superficial, which can make it tough to work together effectively and have each other's backs.

In simple terms, feeling good about yourself can help the family farm succeed by making you better at making decisions, dealing with problems, negotiating and leading. But if you don't feel good about yourself, it can hold the farm back by making you avoid risks, struggle with setbacks, have trouble speaking up and not lead effectively. So feeling confident and positive about yourself is really important for making the family farm thrive.

Six pillars of self-esteem

Nathaniel Branden wrote a book called *The Six Pillars of Self-Esteem* where he broke down the elements of self-esteem into six categories: having goals and working toward them, taking responsibility for your actions, being aware of yourself, accepting yourself, speaking up for yourself, and being honest and consistent (see **sidebar**).

Which of the six elements above does your business partner struggle with the most?

When you go to farm meetings, we all focus our discussions on financial structuring or protocols for feeding calves. We would never openly discuss building self-esteem. That would be silly, and your neighboring farmers would think it was weird to discuss. Yet, this is the stuff that truly makes or breaks a farm's long-term success.

Many successful farmers might be geniuses in building efficient businesses and making strategic plays but are absolutely dumbfounded in how to build their son or daughter's self-esteem. In fact, their attempts to do so have the absolute opposite effect.

I have known this for a long time, but perhaps I didn't "know it, know it" until I saw a successor with all the talent in the world whose world fell apart from the slightest comment from his father. I had seen it a hundred times before, but the impact of this particular father and son duo really made a lot of things "click" about how a \$50 million business's long-term success can hinge on just how a son looks at himself in the mirror for 10 seconds in the morning.

I could write a book on this (and I just might). However, I think the first step for any family farm is to realize this thing we look at as silly or wishy-washy is actually a very big thing that causes a lot of family businesses to do really dumb things. For everyone within your family to recognize the importance of "emotional intelligence" and how partners see themselves in the mirror is the first step in getting positive changes made.

Andy (Caygeon) Junkin's niche is helping stubborn farmers work better together. You can download his audiobook, Bulletproof Your Farm, *and/or take his masterclass "Farming with your Stubborn Family" for free online (www.stubborn.farm).*

The following section contains content for use in dairy training. The article on this page is available in Spanish on page 5

Enhancing calf wellness: A comprehensive approach

Kelly Reed for *Progressive Dairy*

In the ever-evolving landscape of calf raising, maintaining a consistent approach is key to ensuring the health and productivity of your herd. Just as human babies thrive on routine, calves benefit from a structured feeding schedule and care regimen. This article delves into essential strategies and updates to optimize calf care, addressing challenges that arise with changing seasons and evolving farm dynamics.

1 Growth objectives: Establishing pathways to productivity

Setting clear growth goals at different stages of calf development is essential for achieving optimal productivity. Begin by considering the mature bodyweight (MBW) of your herd, as it forms the basis for growth targets. Milestones such as weaning at double the birthweight, pre-breeding at 55% of MBW and close-up springer at 95% of MBW or 85% of MBW post-calving are crucial.

Referencing industry standards, such as those endorsed by the Dairy Calf and Heifer Association, provides valuable guidance. Recognizing the energetic demands of growth entails meticulous attention to factors like dietary composition and individual weight assessments, steering clear of generalized assumptions.

2 Prenatal preparations: Embracing early intervention

Calf care initiates not at birth but during the dry period, underscoring the significance of prenatal attention. The emerging field of epigenetics underscores the enduring impact of early experiences, including those within the womb, on lifelong productivity. Stressors encountered during the dry cow period, such as environmental conditions and nutritional adequacy, wield profound effects on the epigenome, shaping the trajectory of both calfhood development and future productivity as a mature animal.

Colostrum management is also critical. Calves are born without an active immune system. Because of this, they must receive immunoglobulins from colostrum in order to have any defense in the first two to three weeks of life (**Table 1**). Maternal colostrum immunoglobulins have a half-life of approximately 28.5 days, and colostrum replacer IgGs have a half-life of 19.1 days to 23.9 days.

Colostrum, produced by the dam over a month before calving, is a cornerstone for calf immunity and development. Timing of colostrum feeding is critical, with the first two hours post-birth being the optimal time frame for maximal absorption. Factors affecting colostrum absorption include the timing of colostrum feeding, immunoglobulin concentration, total volume and bacterial levels. Feeding multiple colostrum feedings can also greatly improve passive transfer. Proper colostrum harvest and handling, including quick cooling and cleanliness, contribute to improving the quality of the colostrum and therefore the calf's health and development.

Consistency in milk feeding is also key to calf well-being. Ensuring uniformity in total solids intake and milk temperature, in collaboration with veterinary and nutritional expertise, cultivates an environment conducive to calf flourishing.

TABLE 1 Consensus serum IgG concentrations and equivalent total protein (TP) and Brix measurements, and percentage of calves recommended in each TPI category

TPI category	Serum IgG categories (g/L)	Equivalent TP (g/dL)	Equivalent Brix %	Farm level calves[1]	NAHMS study % calves[2]
Excellent	>25.0	>6.2	>9.4%	>40%	35.5%
Good	18.0-24.9	5.8-6.1	8.9-9.3%	-30%	25.7%
Fair	10.0-17.9	5.1-5.7	8.1-8.8%	-20%	26.8%
Poor	<10.0	<5.1	<8.1%	<10%	12.0%

[1]Consensus recommendation for percent of a farm's calves in each category.
[2]Percent of calves in NAHMS 2014 Dairy study in each consensus category.
Source: Modified from Godden et al., VCNA 2019

3 Seamless weaning and housing solutions

Managing the weaning transition requires a strategic approach. Introduce one change at a time to minimize stress. Address factors such as ration changes, grouping, vaccinations and social dynamics with careful consideration. Clean, dry housing with weather protection and slip-resistant surfaces is important for calf health. Smaller group sizes, typically eight to 10 calves, can reduce competition, crowding and pathogen sharing. Water is also crucial for improving dry matter intakes (DMIs) and calf immunity. Ensure water is clean and readily available.

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4 Maximizing the benefits of milk nutrition

Investing in milk-fed calves pays dividends in the long run. Increased nutrient intake and improved average daily gain (ADG) before 56 days of life result in higher milk yield. Studies show an average advantage of 1,500 pounds in the first lactation, with a cumulative advantage of 6,000 pounds after three lactations.

In conclusion, the trajectory of our calf programs lies within our grasp, shaped by proactive measures and innovative strategies. Through the implementation of these insights and approaches, we chart a course toward resilient, high-performing herds. Consistency, spanning growth objectives to colostrum stewardship, emerges as the bedrock of success in calf care.

Mejorar el bienestar de la becerra: Un abordaje exhaustivo (Establo progresista)

Kelly Reed para *Progressive Dairy*

En el panorama de la crianza de becerras que está en constante evolución, mantener un abordaje constante es clave para garantizar la salud y productividad de su hato. Así como los bebés humanos prosperan con la rutina, las becerras se benefician con un horario de alimentación y régimen de cuidado estructurados. Este artículo profundiza en las estrategias esenciales y actualizaciones para optimizar el cuidado de la becerra, para lidiar con los desafíos que surgen con las estaciones cambiantes y la evolución en la dinámica del establo.

1 Objetivos de crecimiento: Establecer rutas para la productividad

Establecer metas claras de crecimiento en las distintas etapas de desarrollo de la becerra es esencial para alcanzar una productividad óptima. Comenzar por considerar el peso vivo maduro (PVM) de su hato, ya que éste forma la base para los objetivos de crecimiento. Son cruciales los hitos como el destete con el doble del peso al nacimiento, 55% del PVM antes del servicio y 95% del PVM cercana al parto u 85% del PVM posparto.

Hacer referencia a los estándares de la industria, como los avalados por la Dairy Calf and Heifer Association, proporciona una orientación valiosa. Reconocer las demandas energéticas del crecimiento conlleva una atención meticulosa a factores como la composición de la dieta y las evaluaciones de peso individuales, evitando suposiciones generalizadas.

2 Preparaciones prenatales: Adoptar la intervención temprana

El cuidado de la becerra no se inicia al nacimiento sino durante el periodo seco, lo que subraya la importancia de la atención prenatal. El campo emergente de la epigenética recalca el impacto duradero de las experiencias tempranas, incluyendo aquéllas dentro del útero, sobre la productividad a lo largo de la vida. Los factores de estrés encontrados durante el periodo seco de la vaca, tales como condiciones ambientales y adecuación nutricional, tienen un profundo efecto sobre el epigenoma, que da forma a la trayectoria, tanto del desarrollo de la becerra como de su productividad futura como un animal maduro.

También, es fundamental el manejo del calostro. Las becerras nacen sin un sistema inmunológico activo. Debido a esto, deben recibir inmunoglobulinas provenientes del calostro, con el fin de tener alguna defensa en las dos o tres primeras semanas de vida (**Cuadro 1**). Las inmunoglobulinas del calostro materno tienen una vida media de 28.5 días, aproximadamente, y las IgG del sustituto de calostro tienen una vida media de 19.1 a 23.9 días.

CUADRO 1 Consenso recomendado para concentraciones séricas de IgG, proteína total equivalente (TP), mediciones Brix y porcentaje de becerras en cada categoría de TPI

Categoria TPI	Categíras IgG séricas (g/L)	Equivalente TP (g/dL)	Equivalente Brix, %	% de becerras a nivel de granja[1]	% de becerras Estudio NAHMS[2]
Excelente	>25.0	>6.2	>9.4%	>40%	35.5%
Buena	18.0-24.9	5.8-6.1	8.9%-9.3%	-30%	25.7%
Regular	10.0-17.9	5.1-5.7	8.1%-8.8%	-20%	26.8%
Mala	<10.0	<5.1	<8.1%	<10%	12.0%

[1]Recomendación de consenso para el porcentaje de becerras en la granja en cada categoría.
[2]Porcentaje de becerras en el estudio Lechero NAHMS 2014 en cada categoría de consenso.
Source: Modified from Godden et al., VCNA 2019

El calostro, producido por la madre más de un mes antes del parto, es una piedra angular para la inmunidad y el desarrollo de la becerra. El momento en que se administra el calostro es crítico, siendo las dos primeras horas después del nacimiento el marco de tiempo óptimo para una absorción máxima. Los factores que afectan la absorción del calostro incluyen el momento en que administra, la concentración de inmunoglobulinas, el volumen total y las concentraciones bacterianas. Además, alimentar con tomas múltiples de calostro puede mejorar en gran medida la transferencia pasiva. La cosecha y manipulación adecuadas del calostro, incluyendo el enfriamiento rápido y la limpieza, contribuyen a mejorar la calidad del calostro y, por lo tanto, la salud y el desarrollo de la becerra.

También, la constancia en la alimentación con leche es clave para el bienestar de la becerra. Asegurar la uniformidad en la ingesta de sólidos totales y la temperatura de la leche, en colaboración con la experiencia veterinaria y nutricional, genera un ambiente propicio para el florecimiento de la becerra.

3 Destete fluido y soluciones de alojamiento

Manejar la transición al destete requiere de un enfoque estratégico. Introducir un cambio a la vez para minimizar el estrés. Abordar los factores como cambios de ración, agrupamiento, vacunaciones y dinámicas sociales con una consideración cuidadosa. Un alojamiento limpio y seco, con protección contra la intemperie y superficies antideslizantes, es importante para la salud de la becerra. Grupos más pequeños, típicamente de 8 a 10 becerras, pueden reducir la competencia, el hacinamiento y el intercambio de patógenos. El agua es también crucial para mejorar el consumo de materia seca y la inmunidad de la becerra. Asegurar que el agua esté limpia y fácilmente disponible.

4 Optimizar los beneficios de la nutrición láctea

Invertir en becerras alimentadas con leche produce dividendos en el largo plazo. Una mayor ingesta de nutrientes y una ganancia diaria promedio mejorada antes de los 56 días de vida dan como resultado una mayor producción de leche. Los estudios demuestran que hay una ventaja promedio de 681 kg (1,500 lb) en la primera lactación, con una ventaja acumulada de 2,724 kg (6,000 lb) después de tres lactaciones.

En conclusión, la trayectoria de nuestros programas de becerras está a nuestro alcance, moldeada por medidas proactivas y estrategias innovadoras. Mediante la implementación de estos conocimientos y abordajes, trazamos el curso hacia hatos resilientes y de alto desempeño. La constancia, que abarca desde los objetivos de crecimiento hasta la administración de calostro, emerge como una base del éxito en el cuidado de la becerra.

3 steps to help employees be happier at work

Bob Milligan for *Progressive Dairy*

AT A GLANCE

Measuring success for each job, identifying who or what benefits from a job well done and getting to know team members on a personal level can improve workplace morale and employee satisfaction.

What makes the difference between employees who are happy at work and those who are miserable? While the answer can include a lot of things, three notable causes worth considering are immeasurement, irrelevance and anonymity.

To illustrate how each of these topics can positively or negatively impact employee engagement, I will refer to Patrick Lencioni's book *The Truth About Employee Engagement: A Fable About Addressing the Three Root Causes of Job Misery*.

The book is a fable about Brian Bailey – who, after an exceptional career as a CEO, retires when the company he led was sold. Think about what you would do if you unexpectedly no longer had a farm. You would go nuts! That is what happened to Brian.

After failed attempts at retirement, he became the weekend manager and part owner of a struggling downscale Italian restaurant called Gene and Joe's. In the next few sections of this article, we explore how Brian identified and corrected the three root causes of job misery.

Immeasurement

As he started as the weekend manager, Brian visited with Joe, the remaining owner from Gene and Joe's. Joe described his employees as "a motley crew. At least the ones who stick around." After two nights of observing, Brian told Joe he wanted to make a major change. Joe was relieved but confused when Brian explained the major changes as wanting to "give the employees a clearer sense of what is expected of them."

During his first meeting with the staff, Brian confirmed that the employees were clearly miserable at work and then told them, "I'm here to tell you that my job is to get you to like your jobs. To look forward to coming to work." Brian concluded the meeting with, "In addition to being on time, I want everyone here to start measuring what you're doing. … And don't worry. I'll be helping you figure out what you should be measuring and how we are going to go about doing it."

After a discussion with each employee, measurements were developed for each employee.

- *Order takers at the drive-up window:* Number of orders without errors and number of customers who smile when ordering
- *Servers:* Tips and number of impromptu positive customer comments
- *Cooks:* Timeliness of finishing orders and positive customer comments on the food

Irrelevance

As employees began to measure their performance, their attitude and the performance of the restaurant began to improve. Brian then called another meeting. He began by stating, "I want you all to figure out who is the beneficiary of your work."

Using questions and group input, the staff identified who each benefited.

- *Servers:* The customers in many ways, not just by serving food
- *Dishwashers:* The customers by providing clean plates and silverware
- *Cooks:* The customers by cooking excellent food and all employees by making their jobs easier

Anonymity

Brian discovered his third cause of misery at work partly by accident. An early event that Brian observed with horror was the staff quickly closing the restaurant when a bus approached near closing time. As staff motivation was slowly improving, a bus again arrived at closing. By habit, the staff raced to close the restaurant. However, Brian "flipped on the dining room lights, to the horror of his employees. Then he went to the door, opened it and waved the bus full of hungry basketball fans inside."

"Though [the staff was] initially less than excited, as soon as the customers started coming inside, the mood changed," Lencioni writes in the book. "Within 10 minutes, the dining room was as lively as it had been just an hour earlier, and the crew regained their momentum."

As a reward after the bus departed, Brian traded Italian food with a Chinese and a Mexican restaurant nearby, and

Frequently connecting employees' tasks and responsibilities with the farm's vision and with meaningful outcomes can reduce irrelevance.

the crew gathered to eat. As they talked, Brian made an important observation.

"It was the first time that he could remember hearing them (the employees) talk at any length about their lives outside Gene and Joe's," he said.

Brian's theory about the changes

On the two-month anniversary of his work at Gene and Joe's, Brian's wife, Leslie, took him to dinner to celebrate. Leslie asked how work was going and asked him about his theory. Here is what he shared.

• *Immeasurement:* Brian felt comfortable about the first part, saying, "Basically, a job is bound to be miserable if it doesn't involve measurement. If you don't get a daily sense of measurable accomplishments, you will go home at night wondering if your day was worthwhile." The discussion then turned to what to measure, and Brian added a very important point using the experience of his employees at his earlier company. "But they didn't measure everything. We didn't want them creating a bunch of bureaucratic tracking systems for every little activity. … The key is to always measure the right things. If you measure the wrong things, people still will lose interest."

• *Irrelevance:* Brian began by explaining irrelevance as "the feeling that what you do has no impact on the lives of others." In conclusion, Brian stated, "Every person that works has to know that what they do matters to another human being. … If a manager has any responsibility in the world, it's to help people understand why their work matters."

• *Anonymity:* Brian shared his third job misery by driving Leslie to a warehouse-looking building that housed a soccer field where two employees from Gene and Joe's were playing soccer. Brian explained to Leslie what had happened after

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serving passengers on the bus and how he "started learning things about them that he wouldn't have imagined. How can a person feel really good about going to work when they don't feel like anyone there knows who they are? Or cares?" Brian said. "It's really the person's manager who needs to know them. Co-workers too, but the manager is the key."

This is a key to what we have often referred to as connection when discussing motivation.

Brian soon moved on to other challenges to test his misery theory – immeasurement, irrelevance, anonymity – and ended up in London, England. One evening, Brian opened a package with the restaurant as the return address. Inside were two T-shirts. Beneath a picture of two smiling faces were the words "Migo and Joe's Pizza and Pasta. Here. There. Everywhere." Migo was one of the "motley crew," as Joe described his staff, when Brian came to Gene and Joe's.

Implementing these concepts on your operation

How can you eradicate immeasurement, irrelevance and anonymity at your farm or agribusiness?

Immeasurement is reduced by meeting frequently with employees to establish and review clear performance expectations for his or her position. Frequently connecting employees' tasks and responsibilities with the farm's vision and with meaningful outcomes can reduce irrelevance. Like Brian, you can reduce anonymity by getting to personally know your employees.

Bob Milligan is also professor emeritus, Dyson School of Applied Economics and Management, Cornell University.

Entries open for 40th World Forage Analysis Superbowl

Entries are being accepted for the World Forage Analysis Superbowl. The 2024 contest, held in conjunction with World Dairy Expo, is set to award over $26,000 in cash prizes.

Corn silage samples are due July 10, while all other entries are due Aug. 22.

The superbowl is comprised of eight divisions that evaluate samples through lab and visual analyses. The winning entry of each division earns a cash award of $2,500, with additional cash prizes presented to second through fifth place. The divisions are Dairy Hay, Commercial Hay, Grass Hay, Alfalfa Haylage, Mixed/Grass Haylage, Baleage, Standard Corn Silage, and Brown Midrib (BMR) Corn Silage.

A Grand Champion Forage Producer is also named in the contest and receives a check for $2,500. The Grand Champion First-Time Entrant is awarded a $2,000 cash award, and other special awards presented in the contest are the $1,000 Quality Counts Award for Hay/Haylage and the $1,000 Quality Counts Award for Corn Silage.

Award winners will be recognized at the Brevant seeds Forage Superbowl Luncheon on Oct. 2 at World Dairy Expo in Madison, Wisconsin.

Visit www.foragesuperbowl.org for more information and entry forms.

EmGenisys joins BioTools Innovator Accelerator cohort

EmGenisys Inc. announces participation in the BioTools Innovator Accelerator. EmGenisys is one of 20 companies participating in this four-month program and competing for $300,000 in cash prizes.

The company is developing non-invasive technologies for the embryo transfer industry. This software provides objective data to make better transfer decisions. In addition, it analyzes the performance and health of the embryos to find the best embryos for transfer. In the near future, additional products will be available for users: sexing, detecting embryos that will abort, heat stress and more.

Visit www.emgenisys.co/home.html and biotoolsinnovator.org to learn more.

Announcing Fortiva: The next evolution of ingredients for the future of animal health

NEW

Fortiva combines proven feed technologies, such as Ambitine, FloMatrix and Vitacy FeedLock, with a commitment to proactively seek out new ingredients to help solve the industry's biggest challenges, now and into the future. The company is also launching several new technologies within the monogastric and ruminant spaces, including Fortiva Amulet, a feed technology designed to support gut health during times of stress for dairy calves and transition cows.

Visit fortivaimpact.com for more information.

Elanco announces FDA has completed review of Bovaer, first-in-class methane-reducing feed ingredient, for U.S. dairy industry

Elanco Animal Health Incorporated announced the U.S. Food and Drug Administration (FDA) has completed its comprehensive, multiyear review of Bovaer (3-NOP), a first-in-class methane-reducing feed ingredient, and determined the product meets safety and efficacy requirements for use in lactating dairy cattle.

Go to www.elanco.com to learn more.

New Polaris Adventure UTV drives demand for Mattracks

NEW

Mattracks announced increasing consumer demand for its high-end utility task vehicle (UTV) tracks, uniquely specified to fit the new Polaris Xpedition XP and ADV UTVs.

Recognized for high quality and performance, these are the only tracks certified to fit the industry's first Adventure side-by-side vehicle, introduced last year by Polaris.

The company has multiple track models designed for the two-seat Polaris Xpedition Ultimate and the five-seat Polaris Xpedition NorthStar to fit the customer's needs.

Along with increased traction, mobility and comfort, the rubber track conversion systems are easy to install. The average time to convert all four tires to tracks is less than one hour.

Visit www.mattracks.com for more information.

2023 Star of the Breed shines

Holstein Association USA recognizes Budjon-Vail Drm Sunshine-ET EX-95 2E as the 2023 Star of the Breed. The highest honor presented to a registered Holstein, the award recognizes a cow that excels in both type and production.

Sunshine is bred by Tom and Kelli Cull of Budjon Farms and by Peter Vail. She is currently owned by Tom and Kelli's nephews Chandler and Calvin Bening of Arlington, Minnesota, who have found success with Sunshine in the junior show ring. Sunshine calls Budjon Farms of Lomira, Wisconsin, home.

The 7-year-old cow qualified for the Star of the Breed award with her fourth-lactation production record of 42,130 pounds of milk, 2,244 pounds of fat (5.3%) and 1,508 pounds of protein (3.6%). With a classification score of Excellent 95 2E, Sunshine also has exceptional type. She has an impressive list of show ring successes, including being named Grand Champion Bred and Owned at the Midwest National Spring Holstein Show in 2021.

In 2022, Sunshine was Grand Champion and Reserve Supreme of the Junior Holstein Show at the North American International Livestock Exposition. Later that week, she went on to take home Senior and Grand Champion honors at the Mid-East Fall National Holstein Show before being named Reserve Supreme Champion. Sunshine's second-place finish in the Aged Cow Class at the Midwest National Spring Show in 2023 qualified her for the Star of the Breed award.

The 2023 Star of the Breed will be recognized during Holstein Association USA's 138th Annual Meeting at the 2024 National Holstein Convention in Salt Lake City, Utah, this summer. Visit www.holsteinconvention.com to learn more.

JCB breaks ground at new $500 million North American factory

In June, JCB began work on a new $500 million factory in San Antonio, Texas – the biggest investment in the company's history.

An official groundbreaking ceremony at the site marked the beginning of construction, where Alice Bamford, daughter of company Chairman Anthony Bamford, turned the first shovelful of dirt on the property.

Work on the 720,000-square-foot factory is now under way on the 400-acre site. It will be the company's second largest plant, rivalled only by JCB's world headquarters in Rocester, Staffordshire, England, and it will create 1,500 new jobs over five years. The factory will make Loadall telescopic handlers and aerial access equipment, with production scheduled to start in 2026. The factory will also have the capacity to expand and build other products in the future.

JCB sold its first machine in North America in 1964 and opened its first U.S. manufacturing plant in 2001 in Savannah, Georgia, which employs 1,000 people. The new facility will manufacture machines for customers specifically in North America.

The company will mark its 80th anniversary in 2025.

Foremost Farms USA announces 2024 board of directors and board leadership

Foremost Farms USA is pleased to announce its new board leadership.

The board welcomes Joel Eigenbrood, Mount Pleasant, Michigan, as Foremost Farms' new chairman of the board, effective April 30. Eigenbrood has been on the cooperative's board for four years, serving as a director, assistant secretary/treasurer and first vice chairman. Eigenbrood also serves as a board member for the United Dairy Industry of Michigan.

Other board officers are first vice chairman Kyle Olson, Shioctin, Wisconsin; second vice chairman Roger Hibschman, Syracuse, Indiana; secretary Steve Trescher, Cashton, Wisconsin; and assistant secretary/treasurer Jeremy Bratz, Franksville, Wisconsin.

Foremost Farms would like to recognize and thank outgoing chairman of the board Rick Burkhamer for his dedication and service to the cooperative. Burkhamer, who served as the cooperative's secretary of the board for nearly 10 years prior to his beginning his term as chairman in 2022, started his service as a board member in 1991 for Wisconsin Dairies before the merger with Golden Guernsey Dairy that resulted in Foremost Farms. We

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Industry Happenings, cont'd from page 9

also thank John Machuzick for serving for the past nine years as our independent director and wish him well on his retirement.

Wisconsin Farmers Union launches season 2 of the Farmer-Labor Podcast

Wisconsin Farmers Union has launched season 2 of the Farmer-Labor Podcast, an educational series that delves into the dynamics of power within the agricultural sector. Hosted by Zoe Sullivan, this five-episode season explores how farmers and workers build power and why their solidarity is crucial across the economy.

Season 2 brings together compelling voices from within the Wisconsin Farmers Union, and beyond, making a strong case for farmers to embrace solidarity across the economy. Each episode features in-depth discussions and personal stories that highlight the challenges and triumphs within the agricultural community. The podcast is available for free on www.wisconsinfarmersunion.com, Apple Podcasts and Spotify.

DCRC selects UW –Madison's Briza Castro as its 2024 Scholar

The Dairy Cattle Reproduction Council (DCRC) named Briza Castro, a Ph.D. candidate in the University of Wisconsin's animal and dairy sciences department, as the 2024 DCRC Scholar. As the award recipient, Castro earned an expense-paid trip to attend the 2024 DCRC Annual Meeting, Nov. 12-14, in Arlington, Texas.

Castro received her bachelor's and master's degrees from New Mexico State University. Her master's thesis addressed lipopolysaccharide endotoxin exposure on ovarian follicle immune responses, steroidogenesis, oocyte competence and early embryonic development. With the guidance of her Ph.D. adviser – M. Sofia Ortega, University of Wisconsin assistant professor in reproductive physiology – Castro's research in reproductive physiology focuses on identifying bovine oocyte competence markers following follicle-stimulating hormone (FSH) stimulation in dairy heifers.

Currently, Castro's research strives to better understand the differences in the competence of in vitro versus in vivo matured oocytes. She is studying Holstein heifers undergoing a conventional four-day FSH stimulation to compare differences in reproductive parameters, follicular dynamics, and oocyte competence to further improve the success of assisted reproductive technologies (ART) and their use in dairy cattle reproductive programs.

Mike VanMaanen elected president of Livestock Marketing Association

Mike VanMaanen married into a family of Livestock Marketing Association members in the 1980s but never dreamed he'd one day lead the organization. Even though he immediately recognized the benefits of membership, he thought he was too busy to get involved, or since his niche market wasn't nationally known, he didn't have a place. Soon enough, VanMaanen learned he was wrong on both accounts, and on May 17, he was elected president.

VanMaanen, who grew up on a corn, soybean and hog farm in Iowa, attended Missouri Western State University, where he graduated with degrees in agricultural economics and agronomy. It was there he met Lori Angell, a third-generation livestock marketer. The two married soon after graduation and joined her family's auction market business in Columbia, Missouri, and bought into it in 1990. In 2000, the couple, along with two of her cousins, took over Eastern Missouri Commission Co., in Bowling Green. Last year, they became sole owners.

The World Livestock Auctioneer Championship was VanMaanen's gateway to Livestock Marketing Association leadership, first serving as a judge in the Parsons, Kansas, qualifier in the fall of 2009 and at the finals in Oklahoma City the following summer. He joined the association's government and industry affairs committee in 2014 and the board of directors in 2016. During his tenure on the board, he also chaired the membership services committee for two years. He said his time on the board has had many highlights, and he looks forward to what's to come.

VanMaanen took over the reins from Mark Barnett during the association's annual convention in June. First up on his agenda? Having deep discussions with members and staff about how to protect the livestock auction market sector.

But the conversation won't just be about markets. He said association members will continue to push their producer profitability initiative, aimed at bringing the entire industry together for a common goal.

The incoming president said he hopes all members will take the opportunity to get more involved this year, whether that means attending the convention, participating in the D.C. Fly-In, joining a committee – or even just staying in touch with their regional executive officer.

Biosecurity guidelines for the fair

Contributed by **Fred Hall**

With everyone's focus on the implications of highly pathogenic avian influenza (HPAI) in the dairy industry, let's remember that good biosecurity and best management practices have been the mainstay of a healthy dairy herd since we learned that illness and disease are transmitted by bacteria and viruses.

Many hours of training and hard work are invested to prepare healthy, high-quality animals for competition. Exhibition of animals is a rewarding experience. Unfortunately, even healthy animals entered in fairs are at risk for exposure to disease.

Fair and exhibitions may pose a potential threat to individual animal health. The commingling of animals of different species, breeds and ages, from multiple premises and herd management backgrounds, creates an environment for potential exposure and spread of animal diseases. The stresses of travel, close confinement and a changing environment may compromise an animal's resistance to disease. People attending the fair also contribute to potential disease spread. At the end of the fair, animals that return to their home premises may also pose a risk of disease spread to their home herd.

Biosecurity refers to measures taken to prevent the introduction of new disease agents into a herd. Commingling of animals, multiple human contacts and contaminated equipment represent the greatest threats for disease exposure and spread at a fair. To minimize risks, fair exhibitors can implement a fair biosecurity plan. The objective of a fair exhibitor's biosecurity plan is to minimize potential exposure to disease and to prevent or limit disease spread from the fair to the home premises. Even the best biosecurity plan may not eliminate all risk of disease exposure, but each step taken will reduce the potential. Successful biosecurity plans include the following practices:

- To restrict animal contact with other animals, people and livestock equipment
- To clean and disinfect equipment
- To isolate and remove sick animals

Biosecurity before the fair

Disease prevention and fair biosecurity start before exhibitors leave home. Only healthy animals should be entered in the fair. Before animals leave the home premises, the herd veterinarian should examine each animal to ensure healthy animals enter the fairgrounds.

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Tools and equipment may harbor disease agents. To minimize potential disease spread from the home premises to the fair, before packing for transport, clean and disinfect:

- Feed equipment such as buckets, feeders and hay racks
- Cleaning utensils such as shovels or pitchforks and grooming equipment such as clippers, brushes and wheelbarrows
- Vehicle and trailer, inside and outside, and avoid transporting animals from different premises in the same trailer.

Be sure to use approved disinfectants that are safe for human and animal contact (see www.epa.gov/pesticide-registration/list-m-registered-antimicrobial-products-label-claims-avian-influenza).

Biosecurity at the fair

- Limit animal-animal contact.
- Limit animal-human-animal contact.
- Avoid sharing equipment with other exhibitors unless you thoroughly clean and disinfect between use.
- Cover feed and equipment to reduce risk of contamination.
- Use your own milking equipment and never share milkers between exhibitors. If the show requires you to use their equipment, disassemble, wash and sanitize the milker before using.
- Change clothing, hats and shoes used at the fair before doing chores at home.
- At the end of the fair, clean all animals returning home and disinfect all equipment before loading the trailer.
- Unused feed, hay and bedding should be discarded at the fairgrounds, not taken home.

Continued on page 12

Getty Images.

Biosecurity guidelines for the fair, cont'd from page 11

Biosecurity after the fair

The possibility of animal exposure to disease agents can occur with even the best biosecurity practices at the fair. Since they may be harboring disease agents without clinical signs, your protocols should include:

• Consult your veterinarian to develop an isolation plan suitable for your premises and herd.

• Animals returning from the fair should be isolated from other animals, wildlife and pets.

• Monitor animals in isolation daily for signs of illness and contact the herd veterinarian if any unusual symptoms are observed.

• To minimize the possible chance of disease spread to the main herd, modify your chore routine to care for isolated fair animals last.

• Change your clothes after completing chores for isolated animals.

• Consult a health care provider and your state or local public health department if exhibitors or family members develop an influenza-like illness (e.g., fever or chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, tiredness, and/or vomiting and diarrhea).

Use of fair biosecurity is a good management practice. These practices contribute to keeping your animals healthy and help to protect all livestock. As conditions change, state veterinarians will ultimately decide what changes will be required for county and regional dairy shows.

The most current (May 22, 2024) recommendations for dairy cattle livestock exhibitions from the USDA Animal and Plant Health Inspection Service can be found online (www.aphis.usda.gov/sites/default/files/guidance-dairy-cattle-livestock-exhibition.pdf).

—This article originally appeared in the June Iowa State University Extension and Outreach E-Dairy News and Views called Herd in the Barn.

Don't let poor fertility and pregnancy losses impact the proportion of multiparous cows in your herd

J. Richard Pursley for *Progressive Dairy*

AT A GLANCE

Culling multiparous cows could be negatively influencing overall production. Managing fertility can correct this problem.

Dairy producers understand the delicate balance between maximizing milk production, controlling costs and ensuring the long-term sustainability of their operations. Efficiency in milk production per cow is a cornerstone of dairy farm profitability and sustainability. In recent years, advancements in reproductive technologies have offered promising opportunities to enhance the efficiency and profitability of dairy farming. However, effectively leveraging these tools requires a thorough understanding of their potential benefits and challenges.

One of the critical challenges facing dairy producers is the unnecessary culling of multiparous cows (second lactation or greater). This not only results in decreased herd average milk production but also leads to increased replacement costs and diminished operational efficiencies. Remarkably, as many as 50% of cows leave the herd before their third lactation, highlighting the urgency of addressing this issue. A general goal to shoot for is for about 70% or more of the herd to be multiparous cows at any given time. To accomplish this goal, there are several aspects of reproductive management that must be controlled.

It is critical to ensure that multiparous cows receive timed A.I. following a first-service fertility program such as Double Ovsynch, G6G, G7G or Presynch-11/Ovsynch. Recent data from our laboratory indicated that multiparous cows had a 260% greater chance of pregnancy in an initial first A.I. breeding window (69 to 94 days in milk) when managed with Double Ovsynch compared with detection of estrus with automated activity monitoring. Cows in each group had an equal chance for pregnancy loss of around 10%. Cows in both groups had greater chances for pregnancy if they were cycling prior to this breeding window.

Tip 1

Be sure that all multiparous cows receive timed first A.I. before 85 days in milk.

Goal: 50% pregnant at initial pregnancy diagnosis (around 35 days post-A.I.).

Tip 2

If possible, utilize automatic activity monitoring to detect returns to estrus in non-pregnant cows.

Goal: To detect approximately half of the non-pregnant cows. It appears that a significant number of losses occur between "conceptus attachment" at around 20 days post-A.I. and the first pregnancy diagnosis. These cows are less likely to be detected in estrus prior to the first pregnancy exam.

The value of early pregnancy is much greater in multiparous cows compared with first-lactation cows. Pregnancy before 130 days in milk results in fewer chances for excessive body condition at calving, which in turn translates into less body condition loss following calving, fewer postpartum diseases and greater chances for pregnancy in the next lactation. Cows with reduced body condition loss after calving also have lesser chances of pregnancy loss after the first A.I. This is known as the high fertility cycle.

It doesn't appear that early pregnancy in primiparous cows translates into positive effects in their subsequent lactation. Pregnancy before 85 days in milk results in approximately a quarter of these cows having too low of body condition at second calving, leading to reduced milk production and more health problems following second calving. Consequently, there exists greater flexibility in the reproductive management of first-lactation cows in contrast to multiparous ones. First-lactation cows can benefit from the adoption of in vitro-produced (IVP) embryos or sexed semen without the added concern of extending calving intervals. Yet, due to increased pregnancy loss following IVP embryos and sexed semen, intensive reproductive management of first-lactation cows is still paramount. Studies are needed to test a delay in time for first A.I. in primiparous cows.

Tip 3

Sexed semen or IVP embryos can be used in heifers and first-lactation cows but not multiparous cows. It is risky to use these technologies in multiparous cows due to reduced pregnancy rates and greater pregnancy losses. It would exacerbate unnecessary culling of these valuable cows.

A clear advantage of utilizing sexed semen in first-lactation cows is the option to use beef semen in the lower genomic value primiparous cows and all the multiparous cows. Four advantages are:

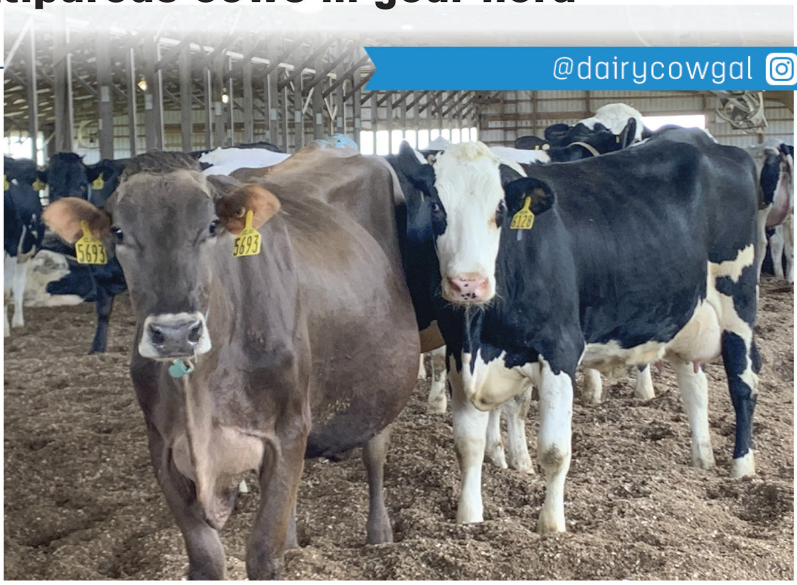

Photo by Lisa Reeck.

Reproductive management heavily influences a producer's bottom line.

1 *Increased calf prices:* Utilizing beef semen on multiparous cows offers the opportunity to capitalize on calf sales.

2 *Faster genetic progress:* Sexed semen in heifers and first-lactation cows offers the opportunity to accelerate genetic progress of the herd.

3 *Increasing average milk per cow with a greater percentage of multiparous cows:* Limiting the number of replacement heifers needed each year reduces the conventional dogma to calve all heifers born from conventional semen on all cows. Planning for a 30% replacement rate puts pressure on management to maintain a greater percentage of high-producing multiparous cows.

4 *Cost of rearing replacements:* Raising replacement heifers represents a significant cost for dairy operations. By utilizing a beef-on-dairy program, producers can optimize the replacement strategy, potentially reducing raising costs while enhancing the quality of replacement heifers.

Tip 4

Primiparous cows receiving sexed semen should be synchronized with a fertility program such as Double Ovsynch or G6G. The reason is to maximize the chances of a pregnancy.

Tip 5

Detect pregnancy early and often. Pregnancy diagnoses with ultrasound or pregnancy-association glycoproteins (PAGs) around 35 days post-A.I. in concert with an Ovsynch (cows with corpus luteum [CL] at open diagnosis) or GnRH – seven days later – Ovsynch (cows without CL) re-synchrony program is critical for ensuring pregnancy in multiparous cows before 130 days in milk. Rechecking two more times prior to 120 days post-A.I. will find most pregnancy losses and will help to gain a greater understanding of potential replacements needed in the future.

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Lastly, new data from our laboratory indicates that approximately 65% to 80% of primiparous and 55% to 65% of multiparous cows are pregnant and have conceptus attachment based on daily PAG levels. Yet many of these cows lose these pregnancies within the next two weeks. Gaining a greater understanding of why this happens could lead to greater efficiencies in the future.

Adopting new management strategies plays a vital role in driving innovation and sustainability within the industry. Embracing advancements in reproductive technologies can optimize the productivity and longevity of dairy herds. From reducing unnecessary culling to enhancing milk production, there are numerous opportunities to improve the efficiency and profitability of dairy farming.

Dr. J. Richard Pursley is co-creator of the Ovsynch program. His current program focuses on enhancing fertility of dairy cattle.

Breeding for the ideal milking robot cow

Dan Meihak for *Progressive Dairy*

AT A GLANCE

Understanding the interplay between data and dairy cattle genetics allows producers to make more informed and efficient decisions around their reproduction programs, leading to better outcomes both in yields and finance.

There is no doubt that robotic dairy systems have revolutionized the dairy industry since their commercial introduction nearly 30 years ago. Producers who were early adopters of the technology found themselves with the new luxury of being able to redirect their time away from daily tasks like milking and feed delivery, to the overall management of their operations and understanding the specific production and health metrics of individual cows in their herd.

Part of successful management in a robotic dairy is developing reproduction programs to optimize the genetic potential of cows that perform best in milking robots. This optimization is facilitated primarily by using the oceans of data generated by robotic milking systems (which in some cases are specific down to the performance of the individual quarter) to guide reproduction decisions. To determine which cows are genetically predisposed to be high performers in robots, it is important to understand the dynamic interaction between cow and equipment.

In truth, a cow in a robot facility is not much different than a cow in a conventional barn. Regardless of which type of milk harvesting system, every dairy producer wants cows that calve easily, eat aggressively, walk confidently, milk bountifully and breed back quickly. How you get them to do that is really in the hands of the dairy producer.

Many dairy producers using automated milking systems focus on box time (time spent in the milking robot) as a key indicator of performance – and indeed, it is an important factor in managing a robot herd. Box time is influenced by many factors: Does the cow enter and stand calmly? In other words, does she like the feed she is going to get from the robot or does she leave some behind? Has the milking process been a comfortable experience for her? Yes, pulsation and vacuum settings as well as liner choice affect box time. If it has been comfortable for her, she will stand calmly while being prepped and the robot arm will attach on


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its first attempt and the cow will milk evenly and quickly. She will exit the robot after the post-milking treatment and go about the rest of her day.

How does a cow become an ideal robot cow?

The purpose of this article is to identify the traits that make an ideal robot cow. I would like to shift it to a call-out to industry: Let's define the personality traits that impact feeding and milking behaviors in robot herds.

There is one important behavior trait that a robot cow possesses: She knows how to get there.

Figure 1 identifies milking interval variation in a robot herd. All parity groups are fed the same PMR. Parity 1 group has a feed table established based on production level, and Parity 2 and Parity 3+ use the same feed table, which is based on production levels as well. Cows in all groups are managed the same.

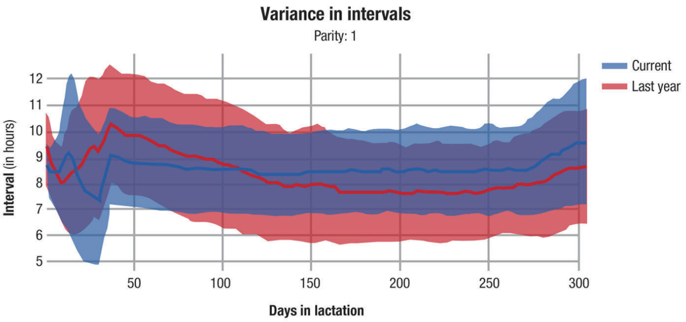
We can clearly see a large degree in variation of milking visits in first-lactation animals and the variation decreases, but is not eliminated, over time.

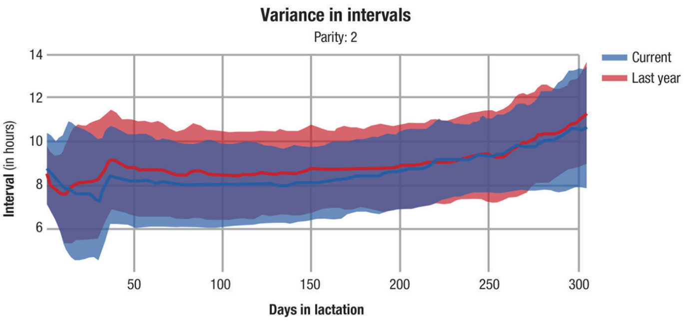
Behavioral traits in animals are often on display during times of stress. Automated milking facilities, by design and management opportunity, have reduced the most common stressors to dairy cows: human interaction, which is limited to short periods of time and cows are allowed to remain in their pen; and competition for feed access which is decreased by the natural social order of a pen or by the use of a mixing and feeding robot.

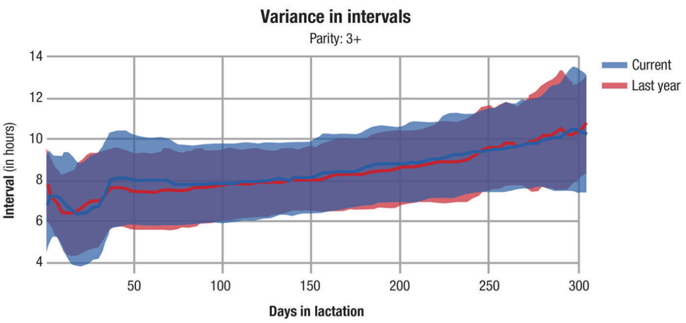
So what makes a cow more fearful or more social? I'm hopeful more research can be performed to identify the personality traits that affect behavior in dairy cattle and those traits become included in our indexing systems.

FIGURE 1 Identify milking interval variation in a robot herd

Lactation group	Group size	Fat and protein/cow/day
Heifers	770 (36.3%)	2.3 kg
Multiparous (2 lactations)	600 (28.3%)	2.6 kg
Multiparous (3+ lactations)	752 (35.4%)	2.7 kg







It is important to remember the goal in robotic milking is not to milk as fast as possible. Rather, the goal is to ensure a complete milking that has been performed as efficiently, cleanly and gently as possible and the robot performs this task the same way, every single time. This helps balance the need of the cow to be milked with the need of the machine to harvest milk from the rest of the herd. With those two considerations balanced, a producer can get the most value out of their robot and maximize the cow's genetic potential.

Carbon intensity in dairy: Measuring and managing for a greener future

Bryan Stolzenburg for *Progressive Dairy*

AT A GLANCE

Carbon intensity is a metric that puts all greenhouse gas emissions associated with an activity in terms of the amount of product generated. Knowing the carbon intensity of producing milk should be as familiar as knowing the herd's somatic cell count.

Just as financial indices are used to gauge the overall health of an economy, many different metrics exist to express the relative impact of certain activities on the health of our climate.

Carbon intensity is a metric that puts all the greenhouse gas (GHG) emissions associated with an activity in terms of the amount of product generated. For example, if you produce 100 pounds of milk and emit 100 kilograms of GHG emissions (expressed as carbon dioxide equivalents or CO_2e) to produce that milk, the total GHGs emitted, known as the "absolute" emissions, would be 100 kilograms of CO_2e. The "carbon intensity" of the milk would be 1 kilogram of CO_2e per hundredweight (cwt) of milk.

While this simple conversion may seem trivial, expressing emissions in terms of everyday items is remarkably powerful. Using a relative measure enables producers, retailers and consumers to evaluate the climate impact of different products by thinking about them in terms of emission efficiency. This comparison allows for the establishment of product-specific climate benchmarks, which is why some brands would like farms to eventually be as familiar with the carbon intensity of their milk as they are with their somatic cell count (SCC) or herd average.

TABLE 1 General data types needed to calculate a dairy's carbon intensity

Data type	Example data source	Purpose
Herd size and livestock categories	Herd management software	Determine the emissions on a per-animal basis for the different livestock categories housed at the farm.
Milk production	Milk production records (e.g. bulk tank measurements)	Calculate the emissions per unit of fat- and protein-corrected milk.
Feed rations	Feed management software	Calculate the emissions associated with feed production and diet-related parameters for calculating enteric methane emissions
Manure management	Manure flow descriptions, storage types and spreading records	Calculate the emissions associated with manure storage and application
Energy use	Electricity and fuel purchase records (e.g. electricity bills)	Calculate the emissions from purchased electricity and fossil fuel used on site
Transportation	Fuel use records and estimated distances traveled (e.g. diesel purchase invoices and average # of trips per week)	Calculate the emissions from the use of fossil fuel for transportation of feed and other on-farm inputs

Source: Bryan Stolzenburg, Ag Methane Advisors

What is U.S. dairy's carbon intensity?

The U.S. dairy industry has set a goal to achieve GHG neutrality by 2050, meaning milk production in the U.S. would produce no additional warming to the planet by 2050. This would be achieved through a combination of reducing emissions and removing CO_2 from the atmosphere through carbon sequestration.

While this goal is significant and marks a major step for the industry, it is challenging to fully comprehend without considering the current climate impact of milk production. Research conducted by the American Dairy Science Association calculated the average carbon intensity of U.S. milk in 2020 at 1.3 kilograms CO_2e per kilogram milk, when only including emissions from activities at the farm level. Applying this carbon intensity to the estimated 100 billion kilograms of total milk produced in 2020 comes out to just over 130 million metric tons of CO_2e emitted by the dairy sector. **Figure 1** breaks down where these emissions came from.

To put this into the context of the industry's 2050 goal, to become climate neutral, the average field-to-farmgate carbon intensity of milk will need to decrease by almost 50%, i.e., from 1.3 to 0.67 kilogram CO_2e per kilogram milk.

While no single solution can achieve this industry-wide goal, there are numerous actions individual farms can take to contribute to it. Part of the beauty of dairy farms is the variety of solutions and management practices that have developed over time. This also means emissions sources and the available opportunities to reduce them can have just as much variety, so to fully understand how your farm fits into the bigger climatic picture, you first have to determine your farm's unique carbon footprint.

What goes into calculating dairy's carbon intensity

While there are a plethora of tools and models out there used to calculate a dairy's carbon intensity, most of the calculations rely on the same general categories of data: herd size and livestock types, milk production, feed rations, manure management, and energy use and transportation. A more in-depth description of the typical information needed to calculate a dairy's carbon intensity can be found in **Table 1**.

While this list is by no means exhaustive, it provides a birds-eye view of the information used to calculate a dairy's carbon footprint. Luckily, much of the necessary data is likely already available in some form as part of a typical dairy's regular operations.

One well-known example of a tool used to calculate farm footprints is the Cool Farm Tool (the CFT). This web-based modeling tool (coolfarm.org/the-tool/) relies on numerous published datasets and accredited methodologies to calculate a farm's (or group of farms) carbon intensity and identify the biggest on-farm emission levers, even allowing for "what if" analyses to model the potential impact of certain on-farm interventions. While the CFT and other GHG calculators are providing farmers and processors with a means to quantify their climate impact, they are also being leveraged by many major brands to incorporate climate performance indicators into their supply chains and track progress toward their own sustainability goals.

Corporates, carbon intensity and incentives

For the world's largest food brands, balancing the increased demand from growing populations while continuing to make progress toward ambitious climate targets is only possible through farmer engagement. This need is especially apparent in the dairy industry, where the majority of emissions from dairy products originate from on-farm activities that are spread across complicated supply chains. For a deeper dive on these supply chain emissions and their important role, go to www.agproud.com/articles/58738

Multiple big-name brands are attempting to tackle this challenge head-on, with some notable examples:

• As part of Danone's Climate Transition Plan, they have been using the CFT to calculate their milk producers' emission factors (i.e., carbon intensity) to incorporate (along with other climate performance indicators) into supplier contracts. This will enable them to progress toward their targets of a 30% reduction in methane emissions from fresh milk by 2030 and to source 30% of ingredients from farms practicing regenerative agriculture by 2025.

• According to the CFT's 2023 Impact Report, Strauss Family Creamery also uses the tool to track the emissions profile of their suppliers, leveraging the results to structure practice-based incentives for farmers, which can amount to an additional 1% to 5% on milk premium payments for farmers who adopt sustainable practices and do measurement and monitoring using the CFT.

• Also included in the CFT's 2023 Impact Report, Unilever has been using the tool since 2011 to collect data on their supply chain to develop their Sustainable Agriculture Code, which identifies criteria for suppliers that qualify them for third-party certification as a sustainable supplier.

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These are just a few examples of companies using climate performance indicators (such as carbon intensity) to structure future sourcing requirements and incentives for producers, with more and more companies expected to adopt similar emission reduction targets in the coming years. For farmers, learning more about what drives your milk's carbon intensity puts you in a better position to comply with updated procurement policies and to realize additional revenue from practice-based incentives.

Conclusion

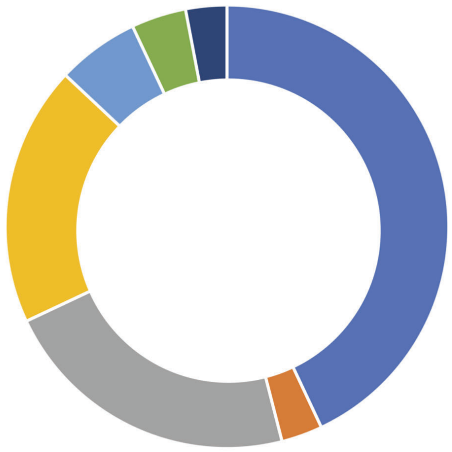
With advances in GHG models, and the incorporation of these models into global dairy supply chains, learning more about your farm's carbon intensity is a way to contextualize your own impact compared to the rest of the industry and to identify which practice changes align best with your goals and the industry's goals.

With the combined pressures of climate policies and consumer preferences driving demand for sustainable dairy products, carbon intensity will likely play a key role in determining the value of low-carbon milk and what brands are willing to contribute to help produce it.

The details of how this trend materializes remain to be seen, but what is certain is that decarbonization efforts at the farm level will shape the future of the dairy industry for years to come.

References omitted but are available upon request.

FIGURE 1 U.S. dairy GHG emission sources



Emission source	Description
Enteric CH_4	Methane produced from enteric fermentation during the cow's digestion process
Other CO_2	Carbon dioxide emissions from fossil fuel combustion and decomposition of lime and urea fertilizer
Resource production	Emissions from the production of resources used on the farm such as fuel, fertilizer and feed
Manure CH_4	Methane emitted from the decomposition of manure
Manure N_2O	Nitrous oxide emitted from the decomposition of manure
Cropland N_2O	Direct nitrous oxide emissions from microbial activity in soils
Indirect N_2O	Nitrous oxide emissions from the loss of ammonia and nitrate to the environment, which can later transform into nitrous oxide

Source: Adapted from Figure 2 in Rotz et al. (2021), Environmental assessment of United States dairy farms, license (CC BY-NC-ND 4.0 DEED)

Feed additives: The next frontier of the dairy industry's sustainability journey

Conor McCabe for *Progressive Dairy*

AT A GLANCE

Feed additives can have a major impact on methane emissions. It's not easy to incorporate to ensure consistent reductions while maintaining cow health and production, but it's worth the effort.

Dairy cattle have the power to turn grasses and forages into milk and meat. Their unique digestive system allows them to break down this fiber and turn it into human-consumable food. In the process, a handful of microbes – less than 1% – produce methane, which is eventually burped out by the cows. Despite their small numbers, these methane producers receive big attention from consumers.

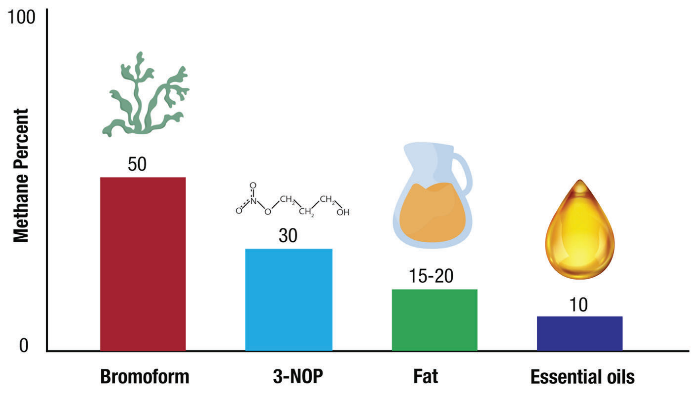
It's not altogether unfair. Methane is a potent greenhouse gas (GHG) that warms at a greater rate than carbon dioxide in the short term. Plus, as the planet gets ever hotter, all sectors – dairy among them – need to pitch in and reduce their own emission footprint.

Assuming we don't want to cut back on our production of meat and dairy (there are compelling arguments that make the case for why we shouldn't), there is ongoing research from vaccines to genetics to feed additives to reduce methane emissions in cows.

Additives have been highlighted as the best way to reduce enteric methane emissions in the short term due to their ease of applicability in a dairy farm. Typically, additives account for less than 1% of a dairy cow's diet, but they have a drastic impact on enteric methane – up to 30% on commercial farms. Put another way, a feed additive is roughly equivalent to the spices in a meal. Just as these seasonings make a difference in the taste and texture of your food, additives can have a major impact on methane emissions. However, they only work if cows eat them daily. It's not easy to incorporate additives to ensure consistent methane reductions while maintaining cow health and milk production, but it's worth the effort.

Feed additives aren't equal in how they reduce methane emissions. The two main classes of additives are methane inhibitors and rumen modifiers. The former acts directly on the enzymes that produce methane in cows' guts. The latter alters the rumen environment, making it less favorable for methane emissions to form in the first place. Inhibitors can achieve greater methane reductions; they're akin to cutting the head off the proverbial snake by targeting the process that results in methane formation instead of reducing the probability that methane emissions will form. There are opportunities for both on farms, depending on management goals, the feeding system and pricing. The aim is to find the right combination of additives for an operation, given various incentives, impact on animal performance and availability.

FIGURE 1 Methane emissions reduction of various feed additives



Various feed additives and their average impact on reducing methane emissions. The left two belong to a class known as inhibitors, while the right two belong to the class of rumen modifiers.

Inhibitors stop methane in its tracks

Methane is the result of a precise recipe that requires hydrogen and carbon dioxide. Methane can't be formed – and emissions can't take place – if any of the recipe's steps is circumvented. Inhibitors do that; they disrupt a recipe step so methane can't be formed.

There are two main groupings of inhibitors that are effective in reducing methane today: 3-nitrooxypropanol (3-NOP) and bromoform (**Figure 1**). 3-NOP is a synthetic molecule set to be available to U.S. farmers by the middle of this year. This additive reduces methane by 20% to 30% on farms and has set itself apart as the additive that could most readily reduce dairy enteric methane emissions in the next few years.

The other main inhibitor is bromoform, found naturally in red seaweed varieties. Bromoform works similarly to 3-NOP by eliminating a step of the methane-formation recipe and has achieved up to 50% methane emission reductions in short-term research settings. However, long-term studies are not realizing the same massive reductions in methane emissions. Additionally, concerns remain about the additive's impact on animal health and palatability and ensuring that it does not impact milk and meat. At this point, no farms are using these methane inhibitors, but rumen modifiers have made their presence felt on hundreds of farms.

Altering the rumen environment for methane mitigation

Rumen modifiers also curb methane production. These additives cut methane at a lower rate than inhibitors through reducing the compounds – that is, hydrogen or carbon dioxide – that methane formation requires, attacking the methane-producing microbes or by making the rumen environment less favorable for methane formation.

The broad classes of rumen modifiers include essential oils, ionophores, nitrates, tannins and fat supplementations (Figure 1). Currently, farmers are feeding some of these additives to their cows because of the positive impact they can have on milk production. The net reduction of 2% to 15% in methane emissions is just icing on the cake.

The remaining unknowns of methane-reducing feed additives

While we have made significant progress from where we were just a decade ago, there are still countless unknowns remaining. The areas with open opportunity for methane reduction utilizing feed additives include (**Figure 2**):

- Grazing animals
- Long-term implications
- Calf and youngstock interventions
- Multiple feed additives at once

Grazing dairies are located across the country, from the rolling hills of New York to the coastal plains of Oregon. In a conventional dairy, everything the cow eats is placed in front of them and nutritionists can formulate the diet down to the specific bite. However, when cows are raised on pasture, it is a little more challenging to deliver the feed additive to the cow. Novel methodologies such as bolus treatments, water-based solutions and trace mineral mixes may be needed. Much of our progress in this area will be thanks to research from the beef cattle sector as they seek to reduce methane from tens of millions of cows that graze rangelands across the U.S.

Research is expensive, challenging and takes significant time and resources. Almost all research on these methane-reducing feed additives has taken place in a four-month-or-less time frame. However, these additives won't be included in rations for a week or a month but for multiple years and lactations. We remain cautiously optimistic about certain additives and wonder if they will lose their potency or methane-reducing ability once they've been fed for multiple years. With promising candidates, a handful of investigations are being made around the world to target this very question.

Also, we can influence the amount of milk a cow will produce in her lifetime by investing in their nutrition and health through early life programming in their first few months of life. This begs the question: If we feed our calves an additive early on in life, will that impact lifetime methane production? What if it was as easy as changing our calf-feeding protocols to reduce the carbon footprint of a dairy farm? While this may seem like a bold idea, it would be irresponsible to not go after it.

Lastly, if one feed additive works well, does that mean two together are even better? Different classes of feed additives reduce methane in different ways depending on if they are an inhibitor or a modifier. This strategy could potentially have a double-whammy impact by altering the playing field against the methane-producing microbes. In the limited number of investigations, this strategy hasn't panned out just yet. While we're just starting out, we will likely need a combination of additives and other factors such as genetics and management that will play the greatest role in reducing methane on dairy farms.

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Making green while going green with carbon credits

There's no such thing as a free lunch, and that applies to feed additives. We must make it feasible for farmers – who often work with impossibly tight budgets – to adopt new technology. One way is to compensate them with carbon credits. These credits are tradeable tokens that represent the reduction of 1 ton of carbon dioxide equivalent. To put that in perspective, this is equivalent to the amount of methane burped by 100 lactating cows a day.

Like an admission ticket, a carbon credit can only be sold once, and there are several customers both in and out of the dairy supply chain hungry to buy these credits. Researchers at Colorado State and Ohio State universities are doing cost analyses to determine the break-even point for a farmer looking to fund feed additives through the sale of carbon credits. As we work to find solutions to reduce methane emissions, economic sustainability will be key to help producers afford the long-term adoption of these feed additives.

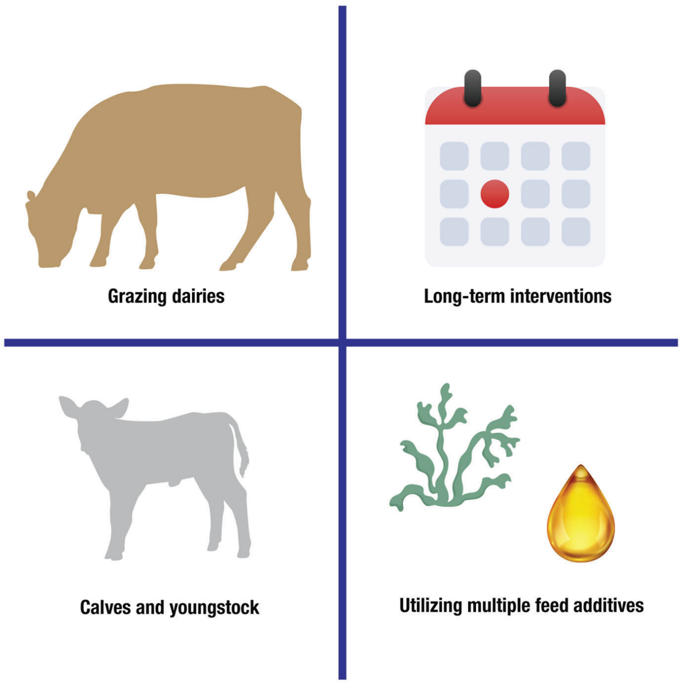
Scratching the surface of methane reduction

Few methane-reducing feed additives are being used on U.S. farms, but momentum is building. Making these products available and incentivizing farmers to use them will allow us to achieve the vast methane reductions we need. Answers on who will foot the bill for these additives are needed, as farmers are concerned about the financial costs if utilizing these additives results in no benefits for animal health or milk production. Universities, such as the University of California – Davis and others around the world are working daily on more and better methane-reducing candidates for dairy farms. With enough time and research, there could be technologies that offer the best of both worlds: drastically reducing methane emissions and improving milk production and animal health.

At the end of the day, these feed additives are likely to make an impact in the carbon footprint for dairies of all sizes. The opportunity is ripe for the taking, and dairy farmers need to be empowered to add a dash of an additive to make a huge impact for cows and climate.

Conor McCabe is a Ph.D. student at the University of California – Davis studying dairy cattle sustainability.

FIGURE 2 The untapped areas of methane-reducing feed additive research and implementation



The untapped opportunities of methane-reducing feed additives including grazing dairies, long-term interventions, calves and youngstock, and utilizing multiple feed additives. The next decade will bring insights to understand how we can maximize methane reductions and animal health on farms.

Vermont farms work to reach ambitious carbon goals

Progressive Dairy Editor **Jenn Coyne**

AT A GLANCE

Four Girls Dairy and Gervais Family Farms join Ben & Jerry's in their Low Carbon Dairy pilot program to reduce emissions by 50% and increase farm resilience.

Clement Gervais and his family have always been on the leading edge of farming practices to better their livelihood in the dairy industry. So when the family was approached by Ben & Jerry's to be a part of a pilot program focused on reducing carbon emissions on the farm, it was a rather easy decision to join the initiative.

"In the end, a lot of the decisions we make are for either the cows or land, but you need both to be happy," Gervais says.

Gervais Family Farms and Peter Rainville's Four Girls Dairy are two of seven dairy farms in the U.S. participating in the multiyear pilot program aimed to reduce on-farm emissions by 50% from a 2015 climate baseline. An additional 10 dairies in the Netherlands are also participating.

Ben & Jerry's Low Carbon Dairy pilot project, which began in 2022 and will continue through 2025, represents the manufacturer's core values of producing ice cream that is euphoric and changes the world by protecting and restoring the Earth's natural systems. It builds off of Ben & Jerry's longstanding Caring Dairy program and its four key pillars: Supporting dignified livelihoods for both farmers and farmworkers, providing an excellent life for cows, implementation of regenerative agricultural practices and advancing low-carbon farming.

"The idea for the pilot was to provide learning for us and the farmers about how dairy farming can be a part of the climate solution while also building their own resilience to environmental and economic changes," says Jenna Evans, global sustainability manager for Ben & Jerry's.

Each farm participating measured its individual carbon footprint, which was then compared to the Caring Dairy 2015 baseline. Sources of the emissions were categorized into varying intervention areas:

- Enteric emissions
- Manure
- Regenerative agriculture
- Renewable energy
- Nutritious, homegrown feed
- Animal welfare and longevity
- Nature-based solutions

Those dairy producers have then collaborated with the ice cream company and the University of Vermont Extension to address greenhouse gas (GHG) emissions on their farms.

"Both [Gervais and Rainville] are great participants in this program because of their willingness to collaborate, and they always have open minds, no matter what crazy ideas we're throwing out there," says Rebecca Manning, Low Carbon Dairy pilot project coordinator. "They're addressing those intervention areas at their own pace and in a way that makes sense for their farm."

Pilot program makes carbon reductions possible for Four Girls Dairy

When Rainville thinks about the act of dairy farming and its role in creating a more sustainable planet, he often looks to it as a puzzle and each management decision is a jigsaw piece.

For him and his small farm, the completed puzzle is an improved use of resources to secure longevity in the industry.

Clement Gervais dairy farms with his brother Larry in Vermont. The family has one of their farm sites enrolled in Ben & Jerry's Low Carbon Dairy pilot project.

"Take care of it all and it'll all take care of you," Rainville says. "Everything from the soil to the manure … everything you do in the soil to everything that you harvest from the cows and back to the soil, that's it. The soil is where it all begins."

Rainville has utilized the pilot program to evaluate the management practices of his 60-cow robotic dairy and improve upon soil and crop health with developed cover cropping and minimal-tilling practices and equipment for more timely forage harvesting as well as automated technology to deliver feed in front of the cows more consistently.

Within the year, he has also added solar to the farm.

"There's a lot of opportunities with carbon [reduction] but smaller farms don't always have those same opportunities just because of scale," Rainville says. "It's exciting to think about what other farms my size can do and benefit from when they have the resources."

Rainville notes grant funding and support from the University of Vermont Extension has made some of these improvements possible.

Most notably, the automatic feed pusher has been Rainville's greatest investment, he says. The steady feed delivery has increased milk production significantly and gave way to more consistent components. In turn, this improvement has lowered his farm's carbon footprint.

"The best investment any farm can make is keeping quality feed in front of the cows," Rainville says. "I'm a one-man job here, and feeding can be a lot of time and stress tied up into that one job. [This technology] has alleviated that."

With one more year left in the pilot program, Rainville has plans to focus on his manure management as one last piece to the puzzle. He is working with the extension team to test soil composition and develop management techniques to meet the needs of the land, including injecting manure, appropriately applying it so as not to overfertilize the soil, and using urease inhibitors.

Gervais Family Farm stays on forefront of opportunity

Gervais and his brother Larry consider themselves forward-thinking producers and know that the success of their family's dairy enterprise relies on the decisions made today.

"We've focused on no-till and other practices that are low-carbon-based, and wanted to continue on that trend," Gervais says. "I think this trend is not just for the daily operations of a farm but as an industry. We are heading that way and need to make sure we're doing the best we can here on the planet."

At the Gervais family's farms, the concept for carbon insetting is simple: Convert it back into milk.

LEFT: The Gervais family focuses on managing the land to improve forage digestibility for higher milk production.

"Produce more milk," Gervais says. "If the same cow can produce more milk, she's not going to need as much feed and you reduce your footprint by raising your production and your components."

For almost a decade, the family has no-tilled their land. They also cover crop on corn ground. Additionally, the farm's land is fertilized with injected manure and then surface groomed to level out rough spots.

"That way we're able to increase our organic matter and carbon in the soils," Gervais says. "It's all full circle for us. All that we're doing on the land to improve digestibility with forages leads to higher production, and higher production by this way reduces the carbon footprint."

Through the pilot program, the Gervais family has worked closely with the University of Vermont Extension on several trials. Those trials include utilizing urease inhibitors to reduce urea application on grasslands and fully utilize the nitrogen versus losing it to the atmosphere through volatilization, cover cropping and no-till practices to maximize land use, and feeding an enteric feed additive to reduce enteric methane production.

Gervais credits much of the work to his brother's confidence in farming smart.

"Larry is definitely a driving force behind all of this," Gervais says. "He's always pushed us."

The Gervais family runs two farm sites, with the larger one being a part of this pilot program. At the 1,000-cow site, a manure separator assists in removing solids before the liquid is stored in a lagoon to reduce the methane produced. The solids are also dried and used for bedding.

Additionally, the family installed a solar array on one of their barns this past winter. Much like Rainville, Gervais has not seen the maximum return on that project yet, as it was installed in the winter.

"January is probably the worst month you can get to actually produce solar energy," Gervais says. "But when the panels are working fully, it's estimated it'll cover up to 50 percent of the electricity used on the dairy."

Any electricity produced over the needs of the farm is pooled in a net-metering program.

With each decision, the Gervais family considers not only how it's going to better their farm – through management, output or return – but also how it's going to improve relations with their community and the greater society needed to support dairy farming.

"You know, you need your land and cows to be happy for the farm to work, but you also need a society that supports you," he says. "We have to keep that in mind as we make decisions for our dairy."

Photos courtesy of Ben & Jerry's.

Peter Rainville participates in Ben & Jerry's Low Carbon Dairy pilot project on his farm in Vermont.

Low Carbon Dairy's future

By the end of 2025, the pilot will be complete in both the U.S. and the Netherlands. Farms are currently implementing strategies to reduce their carbon footprint in various capacities and will continue doing so in the year ahead. The program will then be evaluated, with insight from data on each farm, and then scaling practices that are economically and environmentally feasible into future dairy programming.

What has been seen so far is promising for the manufacturer and dairy producers.

"As a company, we want to thrive and be around for a long time. A crucial part of that is our dairy supply chain; we rely on them and we want them to thrive, too," Manning says. "This program was designed to reduce emissions but also create efficiencies at the farm level, like improving milk yield or reducing operating expenses while still maintaining a very high standard of animal care and maintaining a high level of soil health."

Rainville agrees.

"We, as producers, need to learn to do more with what we have and become more efficient, regardless of size," he says. "This program has pushed me to be as efficient as I possibly can be and, in turn, lower my carbon footprint."

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Carbon accounting opportunities for any size farm

Lauren Brown for *Progressive Dairy*

Courtesy photo.

AT A GLANCE

Historically, only larger farms have had access to carbon credit development as a net source of revenue. However, with a changing regulatory landscape, opportunities for new project types – particularly for smaller farms – are arising to meet the demand for reductions within the supply chain.

Lauren Brown
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To dairy farmers, carbon credits, or offsets, are best known in association with anaerobic digestion. These projects require big farms with significant amounts of manure and plenty of capital, resulting in credits sold to buyers outside of the dairy or even the food and beverage industries.

The parameters of carbon credits and offsets are changing and evolving rapidly. For instance, California's recent Voluntary Carbon Market Disclosure Act was groundbreaking legislation designed to bring transparency and accountability to the voluntary carbon credit market and carbon-related claims. The act mandates that entities selling carbon offsets in California's voluntary carbon market must provide clear and comprehensive information about their offsets. This includes details about the project type, location and methodology for calculating emissions reductions. Similarly, in the European Union, carbon-neutral claims are allowed pending specific certification approval. These changes are designed to ensure the credibility and effectiveness of carbon reduction projects.

Organizations are looking for ways to reduce emissions and accomplish these reductions along their supply chains by investing in, implementing, and realizing on-farm reductions and removals. Commonly referred to as Scope 3 reductions or insets, they can impact the footprint of your farm, your cooperative, consumer packaged goods brands and even retailers.

Dairies' on-farm emissions primarily come from three main sources: enteric methane emissions, manure management and feed production. Additional emissions come from energy use and the opportunity for removals through soil carbon, forestry and silvopasture.

Enteric methane emissions projects use feed supplements and various seaweed supplements. Supplements are in different stages of regulatory approval, which is currently one of the most significant barriers to adoption, followed by cost. These projects, however, are typically quick to implement and require minimal record keeping, such as dry matter intake (DMI), cow numbers, feed records and invoices. Some supplements come with other benefits, such as feed efficiency improvements and improved body composition. For most projects, the cost of the product is reduced for the farmer by the price organizations are willing to pay for the carbon benefit.

Beyond the traditional anaerobic digestion projects, installing solid-liquid separators or converting flush systems to scrape systems can improve manure management and reduce methane emissions. It may be a fit for a variety of operations. These projects often require longer project terms and some manure sampling to ensure the accuracy and accountability of the level of removed solids. Project financing can occur as up-front and annual payments for emissions reductions. The California Air Resources Board has various public resources on project modeling, implementation and modeling criteria adapted for other states.

Feed production includes various project types that are likely familiar to those working in cropping systems. Nitrogen fertilizer reduction, cover crops and reduced tillage are some of the most common practices. Feed production may also include improved grazing practices, pasture refurbishment and adding perennial species. Various programs are willing to pay for these reductions as offsets or insets, but it is essential to know the requirements of the project you are starting.

Removals refer to the opportunity for carbon sequestration below or above ground on your farm. Removals require significant monitoring over many years to ensure permanence. Still, increasing soil carbon and silvopasture or agroforestry projects are great ways to improve the productivity and profitability of your operation while also receiving an incentive to do so.

Dairy farms have a crucial role to play in addressing climate concerns. The improvements that occur on your farm can have a positive impact on purchasers of your milk, as consumers increasingly demand sustainable products. Look to your cooperative and consumer packaged goods brands to identify project opportunities applicable to your operation. There are many programs to support offset and/or inset development on dairies to meet the growing demand for greenhouse gas (GHG) reductions, and you can tap into them.

The increased regulatory and public pressure is creating a net new funding source for carbon reduction projects on dairies, and farmers should take advantage of these opportunities. These projects not only deliver a climate benefit but also a host of benefits that can make your operation more profitable and easier to manage. By participating, you can improve the sustainability of your farm, reduce your carbon footprint, and increase your revenue through the efficiencies you gain from the additional benefits of the projects. In a few cases, you may also obtain revenue by selling carbon credits.

Dairy producers share their perspective on carbon accounting

Progressive Dairy Editor **Jenn Coyne**

AT A GLANCE

Three Wisconsin producers discuss their involvement in Professional Dairy Producers' Your Farm – Your Footprint initiative, which expanded their knowledge of dairy's carbon footprint with metrics specific to their farms.

Professional Dairy Producers' (PDP) latest initiative empowers dairy producers to better understand their environmental footprint. The Your Farm – Your Footprint initiative is a unique program that meets the growing need of producers to know and understand their farms' carbon impacts and take charge of conversations about dairy sustainability.

Here is what three Wisconsin producers have to say about their involvement in the pilot program, which expanded their knowledge of carbon accounting on their farms.

John Haag, Haag Dairy LLC, Dane, Wisconsin


John Haag

Haag Dairy LLC is a 120-cow dairy operated by John Haag and his son Josh. The cows are milked in an automated milking system. Together, the Haags farm 200 acres, growing corn and alfalfa.

Paul Lippert, Grassridge Farms, Pittsville, Wisconsin


Paul Lippert

Grassridge Farms is a partnership between Paul Lippert, his dad, Matt, and brother Carl. The family milks 600 cows in a double-12 parlor. The Lipperts run about 2,000 acres total.

Brady Weiland, Weiland Dairy LLC, Columbus, Wisconsin


Brady Weiland

Weiland Dairy LLC is a partnership between Brady Weiland, his brother and parents near Columbus, Wisconsin. They are the fifth generation to operate the dairy business. Weiland serves as the dairy's manager, overseeing the two 600-cow herds.

Why did you want to participate in Your Farm – Your Footprint?

HAAG: We all know the dairy industry's goal of being carbon neutral by 2050, and we know this type of accountability is coming. It's easy to say that goal, but until you have a way to measure it and prove it, it doesn't really mean a whole lot. I want to get ahead and know my numbers so I can be as proactive as possible. Also, agriculture gets blamed a lot for greenhouse gas emissions, but the reality is that agriculture contributes less than 2%. Now, we have the numbers to back that up.

LIPPERT: As dairy farmers, we know we make the same from less or that we make more from the same, but we don't always think about it in a sustainability metric. Through other programs, we've figured out our numbers in the past, but we didn't feel like we had a well-rounded answer, especially when it came to the cropping side of things. This was a good opportunity at a fairly low cost to get some sort of a benchmark number on where we're at.

WEILAND: We believe it is important to know our numbers, whether it is the cost of production, breakeven, milk and crop yields, and more. Honestly, the carbon footprint number wraps all those numbers together and gives us a score on how efficiently we are doing those things.

Why is it important for you to better understand your farm's carbon footprint?

HAAG: At some point, this is all going to be dictated to us from the top down, from the consumer and your processor. As producers, it's important to know more about what we're expected to do in the future, and knowing our carbon footprint helps us better understand that and get a jumpstart on those expectations.

LIPPERT: So we can track it over time. I don't believe that I need to do it every year, not at this point. Maybe I won't use it for 10 years, but I have it in my back pocket. It's something I've measured. It's something to work from, whether I use it now or in the future, because we're running a long-term business here.

WEILAND: You cannot manage what you do not measure. Like caring for our cattle, it is equally important to our family that we care for the environment the best we know how. We are still learning and growing as an industry on how to do that. We want our farm to be around for many more generations to come, and understanding our carbon footprint will help ensure that.

Explain the key findings in your involvement with the initiative.

HAAG: We've been doing cover crops for about eight or 10 years already now. It's nice now knowing how big of an effect that's had on our farm's carbon footprint. The same is true for injecting manure and reduced or shallow tillage. We've already adopted those practices, but it's nice to see those are the right things to be doing.

LIPPERT: It's not always the things in your control, such as soil type and erosion potential. How you process your manure is a huge deal, which is good and can be frustrating; daily hauling looks OK, digesters look good, my lagoon that I haul twice a year does not actually look good. At least if some day we decided we needed to do something, [manure handling] is a little bit of a black mark on my score. With this report, your ears are open to opportunities that might help you in some of those areas that you view to be issues.

WEILAND: Essentially, it all comes down to producing more with less. Whether it be on the cow side or the crop side, it is important to not be wasteful but still get the cows and crops what they need. And, carefully monitoring our energy usage and implementing new technologies to cut down on energy usage where possible.

What most surprised you about the information collected on your farm?

HAAG: I was surprised to see practices on the cow side of it are already contributing to a negative carbon footprint number. The agronomy side of it, we're slightly above. Overall, our numbers are very good already.

LIPPERT: I was pretty impressed that they cared so much about soil types. Also, if you can change your efficiency of turning dry matter into milk, that's a big deal.

WEILAND: Efficiency. The more efficiently you produce pounds of fat and protein, the better your number is.

How do you plan to use the information when marketing your milk?

HAAG: I've already had a couple conversations with our processor, and they said it's probably at least five years out before they're going to start requiring reporting a number. But, we know it's coming, and we're just trying to get ahead of the eight ball.

LIPPERT: I do want to have that number in my back pocket in case my co-op or my milk buyer comes to me and says we need it. Or, if at some point, maybe I'm looking for a new milk buyer, and this is important to them. I don't know if that will happen, but I have it now.

WEILAND: Know your story. This will only add to our story. It is becoming evident that dairy producers will need to understand and be able to explain and share their numbers with those up the food supply chain.

How did this initiative spark conversation among your dairy team about environmental sustainability?

HAAG: It's a shift in your mindset. We're not going to be making any major changes to our cropping side of things, but this initiative and the results of our carbon footprint are always going to be in the back of our minds. Every time we do something, we're now thinking, "How is this affecting the carbon footprint?"

LIPPERT: We're doing a methane project that kind of grew out of this, just as an aside. Through my brother, I was connected with somebody who lives in the startup space. Maybe if we hadn't done this, I'd have been a little bit more leery about doing some sort of a project that I didn't really understand the ins and outs of. But since we've been through this and other PDP programs, I felt like I had enough of a comfort level that I could do this without having some huge blind spots.

WEILAND: We have been hearing the buzzword "sustainability" for some time now but had very little knowledge of what that meant. This really helped open our eyes and understand how to measure and manage it. One of the other things our team really appreciates is participating in peer group discussions. Having conversations with the others involved in Your Farm – Your Footprint has really opened our eyes to additional measures that could work on our farm.

I just knew I could make it

By **Tom Heck**

In our early years farming here, we had several acres of land on the lower end of our farm that had a lot of grass and brush on it along with a few trees. It was a real wet piece of land with a few springs. I always looked at it, seeing it had the potential to be an excellent field to farm someday.

After being here several years and getting established financially, we decided to proceed and make it into our dream field. Sometimes dreams take a lot of work and money to bring to reality. This one certainly did.

I had Jack come in with his big drain tiling machine and two backhoes to install drain tile in the land and clear all the brush and trees. He put the tile in 6 to 7 feet deep. The tile has small holes that allow the excess water in the ground to seep into it and drain out at the lower end of our field into the woods.

One of the springs on the land toward the upper end was a pretty big one that always flowed year-round. I had never seen it dry up, even in a drought year. When Jack came to the springs, he would hook his two backhoes with heavy cables to the front of his tiling machine to get through them so he wouldn't get his tiling machine stuck. It worked very well.

Jack was hesitant about the big spring though; he wasn't sure it would dry it out enough for us to farm that particular area. I fully believed it would, so I insisted he put a drain tile line right through it.

After Jack had the tile all in, he finished clearing the brush and trees, then loaded up his equipment and left. Then our work really started – picking up a lot of tree roots and rocks. We enjoyed it; we could see the great potential this piece of land held. After discing and plowing it several times and picking up more roots and rocks, we had it looking beautiful.

There was one slight problem though – the big spring hole area. It had dried out fairly well and looked really nice. It looked like it shouldn't be any problem at all working that area. And as long as I didn't have the plow or disc in the ground too deep, it wasn't. But if I had it in too deep, then I would get the tractor stuck bad. That happened a couple of times and I'd have to get another tractor to pull it out.

Spring came, and we were looking forward to planting corn on our new field to feed our cows. We had to do one more thing to it yet before planting it, and that was to get lime spread on it to raise the soil pH to the right level.

So I called up Bill to bring his big, heavy lime truck loaded with lime out to our new field. I caught him before he got to the field and pointed out the spot that had been the big spring area and told him, "Don't go through that area with your truck until you have it at least half empty. If you try to go through there with a loaded truck, you will never make it." He looked at me in disbelief because the area was on the upper side of the field and looked just fine. I went on to explain to him that it had been a big spring hole and how on more than one occasion I had gotten my tractor stuck there. He said OK and drove off. I stood there watching him to make sure it would go well for him. He spread it on the lower side of our new field without any problem.

Then he brought out the second load. To my astonishment, he headed straight for the big spring area, spreading lime as he went. I thought, "Oh no! What's he doing?" He got to the spot with his heaping full lime truck and it went down fast. By the time I got to the truck, Bill was walking around it surveying the situation. The first thing I said to him was, "What did you do? I told you not to go here with a full truck." He replied, "Yeah, I know, but I just knew I could make it through here. It looked so good. You know something? You might have a hard time believing this, but this is the worst I ever got a truck stuck in my 40 years of spreading lime." Seeing the truck sinking how many feet down into the earth, headed toward China, I didn't have a hard time believing that.

The next thing Bill wanted to know was if I could get my tractor and pull him out. I knew I couldn't pull his truck out with my tractor and told him so, but he insisted I try. He emptied the lime from his truck and I tried to pull him out. I moved his truck about 2 feet forward and that was it. Bill ended up calling my neighbor, Tom, who lived up the road from us. He brought his big four-wheel-drive International tractor with dual tires on it and pulled him out. It took all the tractor had, but he did get the truck out. Unfortunately, something gave a little in the transmission or rear end; it was never the same again. We all were very glad to see his big muddy lime truck out again, even if the tractor went limping home.

Even though I told Bill not to go into that spot with a full load of lime, he did it anyway. As he told me a number of times over the years, "I just knew I wouldn't get stuck there." We laugh about it today. But there's something a whole lot more that can be said here. Oftentimes, God tells us not to do stuff in His word. He tells us that for our own good because He loves us so and doesn't want to see us get hurt. Sometimes, we think He's just trying to keep us from having fun or from getting ahead, but such is not the case. If we will heed His word, we will be blessed. I know when I heed His word I'm blessed, and Bill would have been better off if he would have heeded my word and stayed out of that area with his loaded truck. He still says, "You know, that's the worst I've ever gotten stuck." And I still believe him.

Tom Heck, his wife, Joanne, and their two children own and operate a dairy farm in Wisconsin. Order his book at his website (tomheckfarm.com).

How to choose the right candidate

By Yevet Crandell Tenney

Here we are again in an election cycle. In November, we go to the polls. It is starting to feel like it is a never-ending cycle instead of an event, but nonetheless, we have weighed the pros and cons, and based on what we have seen and heard we are confident we have the right person to lead our country. We have listened to the debates and attack dogs on both sides of the aisle and have searched the internet splattered with ads. We have recognized that some ads are true and some are blatant lies. We have waded through the campaign speeches and the commentaries and have made our own decision as to who won the debates, who is the most camera-worthy, the coolest celebrity and who draws the most crowds.

Some have chatted with neighbors and families to find out how they are voting because we have not had time to watch the news. We simply say, "That is how my dad is voting, and I will vote with him." Or we say, "I am a Democrat, and my father was a Democrat and his father before him. I will vote Democrat." On the other hand, some say, "My father, grandfather and great-grandfather were Republicans, and Lincoln and Reagan were Republicans. I will vote Republican."

Some of us have looked at the posters and slogans along the street and decided based on looks and camera appeal or which name sounds like an American president or an honest man. Some have even resorted to coin toss and the eeny-meeny-miny-moe approach. Some don't even vote.

I am confident that this election is not an eeny-meeny-miny-moe proposition. We need to know the heart of the candidate and we need to be sure that his or her philosophy is in line with our core beliefs and the founding documents. We cannot afford to allow someone to destroy what took generations and precious American blood to build. Following are principles that should be considered when voting both in the state and general elections.

1 Who are their friends and who are their enemies?

My parents always told me, "You will know a man by the company he keeps." If he chooses friends who are upright and righteous people, he will be upright and good. If he is not a good man, he will feel very uncomfortable with people who desire righteousness and eventually will seek his own kind. People do not generally stay where they are uncomfortable. Water seeks its own level. Looking at a person's enemies is also enlightening. Are their enemies the ones we would consider our enemies or are they our allies who have stood by America in the past? Are their enemies the candidate of the opposing party? Campaigns are messy, but if both parties love America neither should go for blood. If they do, it is telling. Do we want someone to govern our precious country who won by destroying their opponent? There can be winners and losers without proverbial dead bodies.

2 What are the fruits of their labor?

Christ said, *"Wherefore by their fruits ye shall know them" (Matthew 7:20 KJV).* When choosing a candidate, it is vital to know what they have accomplished in their life. What kind of family life do they have? Where have they spent time and energy? What kind of books do they read or write? Do they have a good work ethic or are they a leisure seeker? Have they had a chance to vote on issues that we value? How did they vote? How do they spend money? Are they frugal or a spendthrift? We have to live with the results. The debts the government incurs will belong to the American people and their posterity, not the governor or the president.

3 Do they value others' lives and property?

What value do they place on human life? Are they pro-abortion or pro-life? Do equal rights mean equal opportunity or spread the wealth around? Do they focus on someone else's mistakes or on the issues that will solve America's economic problems? Do they exhibit compassion for the jobless and focus on job creation, rather than looking for more reasons to blame others for the problem? Do they pay tribute to lawlessness and respect violence as a means to solve problems? Are they in touch with mainstream America? Do they understand what is at stake?

4 Do they respect the law of the land?

Do they understand and value the Constitution as the supreme law of the land? Are they willing to abide by its principles no matter how long it may take to make changes? Are they willing to subject themselves to the will of the people no matter how it conflicts with their agenda? Is the executive order a first resort or a last resort? Do they respect and honor each branch of government equally and reverence the power of checks and balances? Do they use their office to make deals to further personal agendas?

5 Do they make and keep promises?

On the campaign trail, candidates make promises. They speak in flowery terms of what they will do on the first day in office. If they have held an office, did they keep the first-day promise and every promise after that? Did they honor the oath of office or systematically try to change the rules? Does the candidate show fidelity to his wife and family?

6 Can they collaborate with other people?

What has the candidate done in the past to show they can collaborate with other people? Have they served in jobs that deal with all kinds of people? Have they been on a town council or a school board? Have they held public office or owned a business? What were the results of the service?

7 Do they demand respect or command respect?

Are they a leader who lives by the principle, "It is amazing how successful you can be if you don't care who gets the credit"? Leaders find ways to bring people to their level rather than tear them down.

8 Do they respect and honor the traditions of the nation?

In private and in public, do they speak highly of America? Do they promote America's greatness in every situation, or is there a hint of disrespect for America and her people? Do they in word and action promote the breadwinners of America? Do they honor and respect our Christian heritage? Do they honor and promote Christian holidays as they were set up by our founders and subsequent leaders? Do they honor our traditional allies in Europe and other parts of the world? If they do not respect America's time-worn traditions, why not? Get the answer before you vote. After the election, it is too late.

9 Do they cherish the Constitution as the supreme law of the land?

Does the candidate believe in a hand up or a handout? Do they want to make America into a nanny state in a European model or do they want to make American independent of government intervention, where every man and woman prospers because of hard work and self-management?

10 Is the candidate a man of God?

The other nine principles of voting could be cast aside if you are sure the candidate is a man or woman of God. Do they have a habit of prayer? Will they, in a moment of crisis, turn to God before they turn to their advisers? Do they exhibit signs of being a true Christian or do they quote the Bible with the intent to further an agenda?

It is difficult in these days of mass media and differing opinions about honesty and integrity to decide about the candidate. But we do not need to depend solely on the media. Prayer is still available. If we watch campaign ads, we can say a silent prayer, "Father in Heaven, is this ad true?" If we stop and listen with our hearts, the answer will come into our minds. God has never let His people wander without guidance unless we do not ask. We do not need to do the eeny-meeny-miny-moe or coin toss. God will direct us if we are willing to follow Him. He has promised, *"Ask and ye shall receive and knock and it shall be opened ..." (Matthew 7:7 KJV).* We need His direction more than ever before in the history of America.

Yevet Crandell Tenney is a Christian columnist who loves American values and traditions. She writes about faith, family and freedom.

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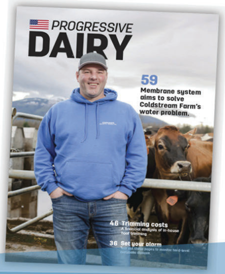

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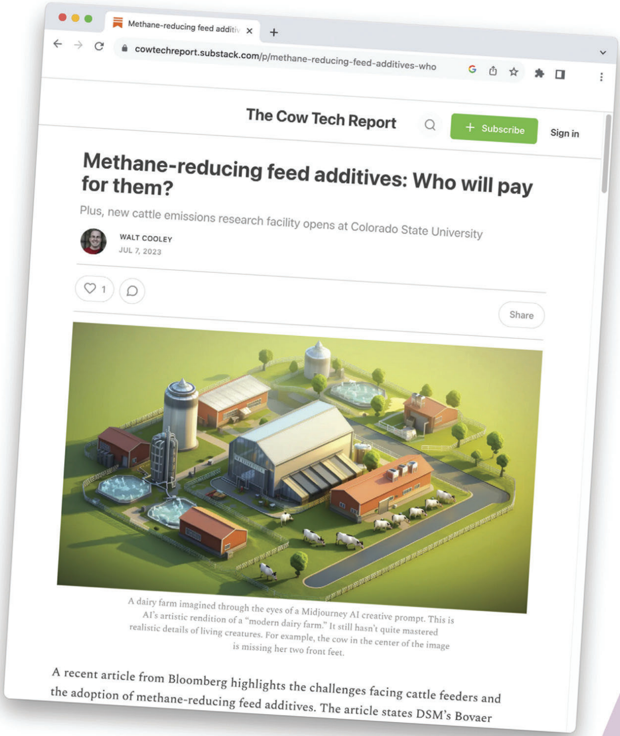

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Richard Appleby
Livestock Visibility Solutions
CEO/Founder

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Carolyn Cooks!

My daughter wowed our family with this rich and creamy casserole last week. This is a complete meal in one pan, with a grain, vegetable and plenty of protein from the milk and cheese. It is a meatless dish, but you won't miss the meat. Every bite will have you begging for more.

Have a great recipe that includes dairy?
Submit your favorites to editor@progressivedairy.com

Broccoli and sour cream casserole

1 cup grated onion
1/2 cup melted butter
1 teaspoon salt
1/3 cup flour
3 cups milk
1 cup sour cream
4 ounces parmesan cheese
1/2 cup grated cheddar cheese
3 cups cooked rice
2 bunches broccoli, chopped
1/2 cup bread crumbs

Sauté grated onion in melted butter. Sprinkle in salt and flour; stir until bubbly. Add milk and stir until thickened. Remove from the heat. Add sour cream and the cheeses. Stir until smooth.

Spread cooked rice in a greased 9-by-13-inch pan. Add a layer of broccoli. Pour sour cream sauce over both layers. Top with bread crumbs. Bake at 350° for 45 minutes.

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Feeling the fear and doing it anyway

Brittany Olson for *Progressive Dairy*

While there's always a non-zero chance that trying something new, big or otherwise different might blow up in our faces for all the world to see, let's instead ask ourselves this question: What if it does work out?

Every planting season brings a sense of excitement and opportunity to try something new. Each spring also seems to come along with its own challenges. This year, we decided to no-till plant our corn crop not only green (into a living cover crop) but without a planter monitor.

Our monitor had been sent to Iowa for repair but failed to reach its destination after 24 days in the post office's possession. Even after its much faster arrival to its destination via a different carrier, we'd reached a point where we could no longer wait because a week of rain was looming in the forecast.

My husband, Sam, loaded up the planter and took off anyway. He discovered that not only was green cover easier to plant into than dying residue, but the seed seemed to be leaving the planter. And, wouldn't you know, it emerged from the soil after nine days – and 4 inches of rain.

It's courageous to put a seed in the ground no matter how you slice it because there's always the chance it doesn't come up. Even if we had a corn planter with a functional monitor and even more bells and whistles than our Deere 7200 Conservation planter, there are very few guaranteed things in life that aren't death and taxes.

There are even fewer guarantees in a vocation as laden with risk and uncertainty as ours, and even with risk management and best management practices in place, it's enough to make even the most even-keeled individual anxious and apprehensive.

However, in a dynamic and volatile industry, we can't afford to live life with blinders on or confine ourselves to dairy farming how Grandpa or even Dad did it.

Even more paramount than our survival in a consolidating industry is the fact that life is short and moves faster as we get older. We are simply too mortal to be mediocre.

When everything we do feels like a gamble, what's the secret to surviving? It's knowing what to throw away and what to keep or prioritize. As the great folk poet Kenny Rogers said, "You've got to know when to hold 'em, know when to fold 'em."

Another secret is taking risks and doing it scared; feeling the fear and doing it anyway.

Let me be clear that I'm not glamorizing anxiety disorders or gambling addictions. I'm not asking you to discount your intuition if it's telling you something isn't right, either. Rather, I'm talking about living outside our comfort zones and taking calculated risks that benefit our businesses and families in the long run.

Of course, taking risks and stepping outside our comfort zone to try something new opens us up to a level of vulnerability that leaves us feeling almost naked. What if it doesn't work out? What if we fail? Most pressingly, in an industry deeply dependent on interpersonal relationships, what will other people think or say about us?

It doesn't matter what that something is, either, or how big it is.

Are you going to switch seed or feed suppliers?

Are you going to change a few management practices on your farm?

Do you want to develop an additional on-farm enterprise like cut flowers or another specialty crop?

Is there a conservation practice you want to try, but you've been told your entire life that it won't work here?

Brittany Olson
Dairy Farmer
Freelance Writer

Are you taking the plunge into processing some or all of your own milk?

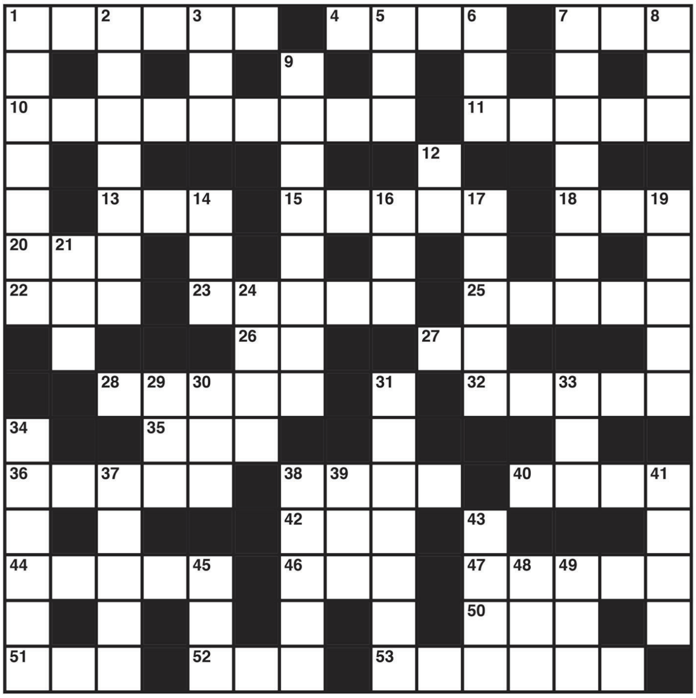
The antiquated "This is the way we've always done it" mindset has stymied the stories of more family farms than we realize at first blush.

While there's always a non-zero chance that trying something new, big or otherwise different might blow up in our faces for all the world to see, let's instead ask ourselves this question: What if it does work out?

May the answer to that question give us all the strength and grit to feel the fear and do it scared anyway.

Brittany Olson is a dairy farmer and freelance writer from Chetek, Wisconsin. She and her husband, Sam, milk 40 registered Holsteins and Jerseys on their 116-year-old farm.

CROSSWORD PUZZLE



No cheating.
But if you are truly stumped, the answer key can be found on page 48.

Across

1. Opportunity
4. Farm building
7. Terrier or setter
10. Plant renewing itself yearly
11. Belief
13. By way of
15. Body of good conduct
18. Unruly crowd
20. ___ carte, 2 words
22. Laughter on the internet, abbr.
23. Ambition
25. Do very well
26. Overtime, abbr.
27. Milliampere, for short
28. In a disorderly condition
32. Pours down
35. Jeans brand
36. Stroll
38. Squander
40. Cast a ballot
42. Cattle call
44. Under
46. Finish, with "up"
47. Take on
50. Weight measurement
51. Coast Guard rank, abbr.
52. Highest degree
53. Michigan and California, for example

Down

1. Funds needed to run a business
2. Advent
3. Preserve, in a way
5. Everyone
6. Bring home
7. Energetic
8. Obtain
9. Faithfulness
12. Circle ratio
14. Include
16. Ground digger
17. Cloudless
19. Makes a bundle of hay
21. Auction segment
24. "Titanic" heroine
29. Building add-on
30. Understand
31. Blooms
33. Wedding agreement, 2 words
34. Speculate
37. Chimes
38. Go red with embarrassment
39. ____ Gatos, California
41. Chow
43. Information to make decisions on
45. Pale
48. Period, in web addresses
49. "___ moment"

NEW HIRES

Progressive Dairy would like you to meet:

Alexis Hruby Weston

Dairy Nutritionist
CSA Animal Nutrition
Dayton, Ohio
alexis@csaanimalnutrition.com

What education are you bringing with you to this position?

I received my Ph.D. from Virginia Tech and my B.S. degree was from Auburn University in animal sciences.

Please describe your agricultural background.

My grandparents operate a Beefmaster cattle ranch in south Texas, so I was exposed to the agricultural industry from a young age. Although I never worked on their ranch, I always loved learning about the cows. When I went to Auburn University for my undergraduate degree, I knew I wanted to pursue animal sciences. At the end of my freshman year, I began working at the Auburn veterinary school dairy and stayed working there until I graduated!

What territory will you cover?

The majority of the clients are in the Northeast and Midwest, but I will operate out of the CSA office in Dayton, Ohio.

What are your new responsibilities?

I will be a resource to nutritionists who are either independent or employed by a regional feed manufacturer. I will also be responsible for helping to put together new tools and providing relevant information in our monthly newsletter.

Who has made the biggest impact on your career?

My father, a dedicated general surgeon, has made the greatest impact on my career. His unwavering passion for his work, relentless pursuit of knowledge, strong work ethic and genuine desire to aid others have deeply influenced me since childhood. His example not only sparked my interest in understanding mechanisms and hands-on applicability but also ingrained in me the values of passion and hard work, ensuring that whatever path I chose, I would approach it in the same manner he has throughout his career.

How will you be of most help to producers in your region or area of expertise?

My expertise in amino acid metabolism in dairy cow mammary glands, and I feel that I can apply this by incorporating consideration of other amino acids other than just Met and Lys to nutrition formulations. Additionally, I have lots of experience in modeling and statistical analyses and have plans to develop innovative and useful tools for our customers.

Why did you choose this company?

I was particularly drawn to this company for its diverse teams spanning multiple species, fostering engaging discussions that spark innovative problem-solving. I found the small dairy team particularly impressive, characterized by their unwavering work ethic, remarkable productivity and cohesive collaboration toward achieving company objectives. Their commitment to integrating science-backed research into dairy farm nutrition plans and prioritizing customer needs left a lasting impression.

What goals would you like to accomplish while in this position?

I would like to help our customers exceed dairy production goals by incorporating well-researched technologies and techniques into our formulations and tools.

Why we tell stories

By **Ryan Dennis**

Telling stories is arguably what makes us human and creates personal significance in a variety of ways, but it is also crucial in the bigger picture. The loss of the farm narrative, in books and stories, is eventually a loss of power.

My father asked for help cleaning out my grandfather's shed. He and my grandfather had separate farms but shared the land and equipment. My grandfather had just retired, and we were there to sort through what was left.

We mostly worked in silence, dumping tools into 5-gallon buckets and carrying away old compressors and barn fans. My father would look over a power take-off (PTO) shaft or plow coulter, turning it in his hands before throwing it into the back of the trailer to take to the scrap yard. He had worked with my grandfather all his life, so I knew he saw things in the dusty objects that I did not. Before the day was over, he mentioned that cleaning out that shed was hard, and that was the type of thing he seldom said.

At one point, we had to lift an old tractor door together. "You probably don't remember the John Deere this belonged to, do you?" he said. He then told about a day he disked the Beehive Field as a young teenager while my grandfather started planting it. After a few hours, my grandfather eased his tractor to a halt and stopped to urinate next to the front tire. My father also pulled his parking brake and, looking to surprise him, threw a small flat stone toward his father's feet. The stone curved through the air, hit my grandfather on the back of the head and dropped him to his knees. As the story goes, my grandfather recollected himself and pulled up his pants. He immediately remarked, "I think I got some on my hands."

I had heard that anecdote a few times but always enjoyed watching my father tell it. Although he never said this to me, I believe my grandfather taking the moment with humor made my father feel like an adult.

It was in my father's nature to tell stories. Before, I thought they were entertainment, but eventually, I learned that they were his compensation. Many people of his generation who farmed long enough saw the milk check fail to cover the costs of feed and fuel and watched their equipment get older without being able to do anything about it. Still, like everyone else, they had to make sense of what they did and the reasons for it. A narrative is a way to have ownership over what is difficult to hang on to. If you can tell a story about something, then it is not entirely gone. Eventually, I began to realize, whether or not I would become a farmer myself, that it was my place to listen to what people like my father said.

The belief in stories that my father unknowingly passed on to me is probably why I became a writer. As a child growing up in the '90s, I saw families like mine struggle to keep a farm going, but no one was writing about it. There are surprisingly few novels set on dairy farms in North America, especially toward the end of the 20th century. My second book is a memoir of the experiences our family went through on the farm, as well as a consideration of the ag policies that created those conditions. However, after the death of my father in the winter of 2021, progress has been slow. Five years and 1,200 hours of working on the project have passed, and it's still not quite ready to show to agents.

In the meantime, I've tried to honor the importance of stories by helping others share their experiences. Several years ago, I received funding from a university to publish an anthology of short stories, essays and poems by Irish farmers, most of whom were writing for the first time. I've begun teaching creative writing courses through The Milk House website (www.themilkhouse.org) and will have a class this fall titled "Tell your Story." Also on The Milk House, the second annual Best in Rural Writing Contest will be held this summer. The intent is to highlight stories and essays that deal with rural life, giving people from the countryside the chance to see their experiences reflected back to them in the things they read.

I think sometimes there's a tendency to see the arts as less valuable than other fields, such as science and economics, but in truth, they're all interconnected. Telling stories is arguably what makes us human and creates personal significance in a variety of ways, but it is also crucial in the bigger picture. The loss of the farm narrative, in books and stories, is eventually a loss of power. Social and political capital – or in other words, the ability to get legislation passed that is beneficial to farmers – ultimately comes from making the general public care about what happens to farmers. Without sharing these narratives, those who don't farm become further disconnected from what farmers do. They are less aware of where their food comes from, why it is important to support family agriculture and why cheap food has larger consequences. Without that understanding, farmers lose an ally.

Everyone has stories. Regardless of what you think your writing skills might be, consider putting some of them on paper. Even better, afterward, give them to someone else to read. In the end, it matters. There's a lot at stake in making sure your story gets told.

Ryan Dennis is the author of The Beasts They Turned Away, *a novel set on a dairy farm. Visit his website (www.penofryandennis.com).*

Courtesy photo.

Suntado opens first vertically integrated class 1 and class 2 dairy processing plant in Idaho

Tetra Pak shared that Suntado LLC opened a facility in Burley, Idaho. The facility can process up to 1 million pounds of milk per day into shelf-stable and extended shelf-life (ESL) milk and other liquid dairy products, many of which will be packaged in Tetra Pak cartons.

With capacity and capability to produce a variety of dairy-based and other beverages, and a vertically integrated milk supply, Suntado offers solutions that cater to a range of needs. Located in the third-largest dairy-producing state of Idaho, the facility is owned by Dirk Reitsma and Jesus Hurtado, who own 6,000 organic and 30,000 conventional dairy cows within 20 miles of the processing facility, thus supplying fresh local milk to the plant.

About the facility:

• 190,000-square-foot production plant on 23 acres of land

• This is phase one of a three-phase project, with the ability to triple capacity in the future

• Estimated 800,000 to 1 million pounds of milk to be processed every day in the next 12 months

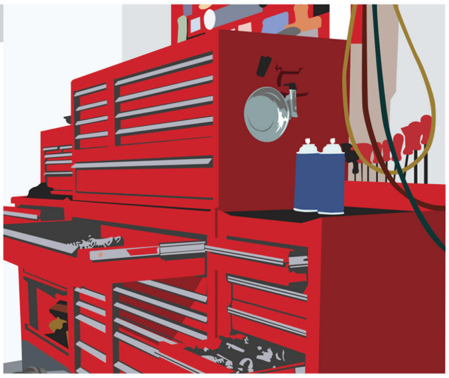
• Suntado is not producing its own brand. It will instead enable retailers and national brands to create private-label beverage products.

• The initial focus is on shelf-stable and ESL milk, cream and other dairy-based beverages, with the ability to expand beyond dairy into additional beverages.

Visit www.suntado.com and www.tetrapakusa.com for more information.

ANSWERS FOR CROSSWORD PUZZLE ON PAGE 45.

1 C	H	2 A	N	3 C	E		4 B	5 A	R	6 N		7 D	O	8 G
A		R		A		9 F		L		E		Y		E
10 P	E	R	E	N	N	I	A	L		11 T	E	N	E	T
I		I				D			12 P			A		
T		13 V	I	14 A		15 E	T	16 H	I	17 C		18 M	O	19 B
20 A	21 L	A		D		L		O		L		I		A
22 L	O	L		23 D	24 R	I	V	E		25 E	X	C	E	L
	T				26 O	T			27 M	A				E
		28 M	29 E	30 S	S	Y		31 F		32 R	A	33 I	N	S
34 G			35 L	E	E			L				D		
36 A	M	37 B	L	E		38 B	39 L	O	W		40 V	O	T	41 E
M		E				42 L	O	W		43 D				A
44 B	E	L	O	45 W		46 U	S	E		47 A	48 D	49 O	P	T
L		L		A		S		R		50 T	O	N		S
51 E	N	S		52 N	T	H		53 S	T	A	T	E	S	



When to take it to town

By Brad Nelson

Nothing quite like breaking something and knowing it ought to be replaced, but it's almost dark. A new part would probably have to be ordered in. The closest hope for a new part is two hours away. Plus, it's Saturday evening. The cattle haven't been fed, and the broken part needs fixed or replaced before the feed truck will feed the heifers.

In this situation, there is no "take it to town option." I would venture that there are more people in the production end of agriculture who know how to do some welding than those who do not.

I would define welding as applying enough controlled heat to two pieces of metal so that the melted metal flows together to make one piece. Most of the time, additional material is added to the mix.

I'll start by talking about stick welding iron and steel. Aluminum, titanium and stainless steel may be welded, but it's not the same as welding iron or steel.

I asked a friend, who has had his own manufacturing and repair business in a rural area for about half a century, what he saw as the cause of failed welds brought to his shop to be welded "right." He said it was usually lack of penetration or the weld material being contaminated with air pockets, slag or other debris, like oil and paint.

Penetration

This means making a repair that is 100% weld. It is possible to weld with enough heat to melt completely through the broken pieces, leaving no part cratered or still fractured. Heavier parts should be shaped, usually with a hand grinder, so that the weld will melt through to the backside of both pieces. Often this requires two or more passes to fill the void.

Contamination

The area to be welded should be cleaned of any oil, grease, dirt, paint or galvanization (or other coatings) before being welded.

Some will state that a good hot rod (electrode) will burn off the above contaminants. Yes and no. When a weld is finished, the "new" metal that is "created" by the electrode as you weld is now an alloy (mix) of the two pieces being welded together, and the rod, and any contaminants or coatings that remain, visible or not.

Air pockets

The shielding gas will prevent oxidation of the weld area. Welding in the wind can blow the shielding gas away from the weld and allow oxygenation of the weld, usually showing up as air pockets. Oil in the weld area will also cause air pockets.

What material are you welding? What rod should you use?

All steel is not the same. Almost all truck frames have stickers that say, "Do not drill or weld to frame rails." You will notice that said truck frames have been drilled and welded as they were made. The manufacturer knows exactly what quality of steel that frame is made of and will match it with welding materials of the same strength.

Mild steel is the most common. A 6011 electrode should be adequate for mild steel. T-1 is a common high-strength steel. A 7018 rod is preferred here. (Note: The "60" and "70" refer to the tensile strength of a properly made weld.)

Welding mild steel to T-1 steel works, but the higher-strength rod should be used. A 7018 rod will alloy nicely with T-1 and also with mild steel. A lower-strength rod would not properly alloy with the higher-strength steel and would result in a weak weld.

6013 is the other popular welding electrode. Often called the "farmer's rod," this can be easier to run than a 6011, but it is much more difficult to achieve proper penetration with it. To simplify, the 6013 would be prone to lie down on top of the parent metals (the two pieces being welded together), while the 6011 and 7018 will burn into the parent metals easier.

Note that if your stick welding machine is AC only, you need a 7018 rod that states it is suitable for AC machines. (The lettering on each rod should be E7018 AC.) 6011 works best with AC current (running it on DC results in excessive spattering).

Brad Nelson
Retired Hay Hauler
bnelson1946@live.com

The heat setting should be hot enough for adequate penetration and low enough that you're not spending all day filling holes burned through your work. Get the rod size, type and heat set by trying it on scrap metal so when your critical repair is first touched by your "sparks," they are the right sparks.

Back to the feed truck breakdown. It was a 1-inch shaft that broke with a spiral break and, of course, inside a bearing.

The shaft was removed from the feed truck and taken to the farm shop. An angle grinder was used to open the areas of the broken shaft wide enough to reach for penetration with a 1/8-inch 7018 rod. The spiral break was about 3 inches long, diagonal to the shaft. This left about 1/8-inch of broken material toward the center of the break untouched by the grinder. Clamped together in the original position, it was welded with heavy tacks on one side, then the other.

This was followed by heavy penetration beads, alternating sides. After each pass, the area was chipped or wire brushed to remove the slag. Alternating sides, one pass at a time, the shaft was built up to at least its original diameter. Then came the tedious part of using the angle grinder to reduce the repaired area so the bearing and its keeper would fit more or less snugly on the shaft.

Reassembled, it worked with only minimal wobbling. The owners declined to spring for a new part.

I would venture that there are more people in the production end of agriculture who know how to do some welding than those who do not.

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AD INDEX

INNER SECTION

Gunpowder and hot dogs

By **Dwayne Faber**

It's a big month in the Faber house as we celebrate the birthday of America and our middle daughter. The plus side of having a child with a birthday on July 4 is that we tell her all the fireworks and barbecues are in her honor. This white lie will either give her an incredibly inflated sense of self-worth or give her something to share with her therapist at some point.

When I conjure up images of what the typical *Progressive Dairy* reader looks like on July 4, I picture a massive mullet, an American flag Speedo and a boisterous voice reciting the national anthem while holding Roman candles in each hand. You are all legends in my mind. While our Faber Family Fourths are a lot more subdued, there was a time in your young author's life where July 4 was the highlight of the year.

Getty Images.

How distinctly American of us to blow stuff up to honor the founding of our nation. While I assume no responsibility for these unique insights, as fireworks are incredibly dangerous, there was a time when yours truly knew how to modify some conventional fireworks into a much better version of themselves. This fascination of turning the seemingly mundane into the extraordinary seems to cross cultural and socio-economic boundaries. The pinnacle of childhood-modified fireworks was wrapping sparklers in electrical tape and creating a boom that would put you on an FBI watch list. This degeneracy ultimately leads to putting matches in tennis balls, Molotov cocktails and shooting Tannerite out in fields. As a former county EMT, I would encourage discretion if you are particularly fond of your digits.

This expression of rebellion through fireworks had a highlight in the midst of the COVID-19 pandemic when Los Angeles County asked all of their residents to stay home and watch a fireworks show in their house on TV. The news crews shared footage in utter horror of the L.A. night sky being lit up like a Christmas tree in NYC. There is also something incredibly ironic in the fact that we blow up communist, sweatshop-manufactured fireworks in order to celebrate our independence. Made-in-America fireworks are typically only reserved for the likes of Raytheon and Lockheed Martin.

July 4 is also the official barometer to see how well this year's corn crop is looking. Our corn crop has always been knee-high by the fourth of July. Some years, however, we have had to send the 3-year-old out for a measurement.

This year, the Pacific Northwest had a particularly wet start to it. Wet enough that if Noah was building his ark, he would have found plenty of volunteers to assist in the build-out. Our July 4 knee-high measurement this year might be going to someone with a few less trips around the sun than normal.

As you and your family take some time out of your busy schedule to burn hot dogs and gunpowder, take time to reflect on this social experiment we call America. While there is much that is wrong with our country, it is still a country founded on Judeo-Christian principles with freedom, opportunity and independence coursing through her veins. She was, and still is, a place where those with ambition, desire and a work ethic could achieve anything. We owe what we have to those who have toiled, sacrificed and bled before us. Let us appreciate those before us, and work to make this nation one we improved on and left better for the generations that follow us.

Dwayne Faber is a writer, speaker and dairy farmer. He and his family operate farms in Oregon. To contact him, visit his website (dwaynefaber.com) or follow him on X (@dfaber84).

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