



THE DAIRY PRACTICES COUNCIL PERSPECTIVES E-NEWSLETTER



Featured Topic: Impact of Labor Shortages on the Dairy Industry

The Dairy Practices Council is a nonprofit 501(c)3 dedicated to developing and disseminating uniform educational guidelines for proper and improved procedures in the production and processing of milk and milk products under a cooperative effort of industry, educational, and regulatory members. Interested in joining this network of food safety professionals and subject matter experts? Visit www.dairypc.org for additional information.

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Overview

Nima Homami, Federal Milk Market Administrator Office-Cleveland

As employers across the country struggle to fill vacancies, dairy farmers are adapting the best that they can. The sobering reality is that the labor shortage in dairy farming predated Covid and judging by long-term trends it is not expected to improve. According to a 2020 nationwide labor survey report of dairy farms by FARM Workforce Development the number of employees on dairy farms dropped by more than 30% in 2018 compared to 10 years ago.¹ To retain workers, farmers have tried raising wages and providing additional non-wage benefits, such as employer subsidized housing. This has caused on-farm labor costs to explode by nearly 50% over the last 15 years.² Farmers have tried to offset some of these costs by turning to immigrant workers, but that comes with its own set of legal and administrative costs. U.S immigration law is simply not designed to make it easy for agricultural workers to find permanent employment in the U.S and this compels many dairy farmers to look elsewhere for cost savings.



One promising avenue for controlling rising labor costs is investing in labor saving technologies that reduce the need for workers to perform redundant, labor-intensive tasks. In fact, automation is nothing new for the dairy industry since robotic milking systems became commercially available in the U.S more than 20 years ago. These robotic systems operate within a free stall barn where cows, incentivized by the availability of feed, and will voluntarily enter a separate area, housing the robot. Using sensors, the robot will clean and spray the cow's teats, apply the milking cups, and perform the actual milking completely unaided by a human worker. Robotic milking systems can milk between 55-65 cows and have a useful life of about 10 years. Typically, use of this technology, results in a 75% reduction in the amount of milking labor and a 5-15% increase in milk production relative to a conventional parlor systems in which cows are manually milked twice a day.³ Currently, the biggest hurdle to the adoption of these systems is their cost. In 2018 a typical robotic milking system including installation cost about \$200,000. However, costs continue to decrease, with some robotic milking units being marketed for as low as \$12,500.³

How dairy farmers will respond to the changing labor environment is unclear. One thing that is clear is that the dairy industry has historically performed well in producing greater levels of output despite rising costs. These productivity gains have, however, come at the expense of smaller dairy farms through economies of scale. Whether these historic patterns will continue, will depend on what industry and policy makers do to ensure that these modern technologies are accessible and affordable to all farmers.

¹https://nationaldairyfarm.com/wp-content/uploads/2020/07/Nationwide-Dairy-Labor-Survey_FARM-Workforce-Development.pdf

²<https://www.usda.gov/sites/default/files/documents/2023aof-Anderson.pdf>

³https://www.usda.gov/sites/default/files/documents/Larry_Tranel.pdf

On-Farm Perspective

Dr. Joe Zullo, University of Missouri & Dr. Dan McFarland, Penn State University

With today's limited labor force, many producers are considering reducing milking to two times per day and/or installing robotic milking systems. When making these decisions as it relates to labor and large capital investments, it is important to keep in mind the long term goals of the operation. Oftentimes, producers are able to add efficiencies, labor savings and even improvements to cow throughput during milking, just by auditing the entire routine for areas of improvement. These changes could include minor adjustments to milking equipment settings, employee placement or other modifications to the parlor that improve ergonomics. Cows are creatures of habit and often express fear when exposed to new situations, such as changes in routine. Fear responses can increase levels of epinephrine that inhibit the success of the entire milk harvesting experience! Research has shown that cows will milk faster and produce more milk during each milking and the entire lactation when managed consistently. Happy, comfortable employees help keep cows calm and content during milking. This results in a safer, more efficient and profitable milking center which allows producers to pay competitive wages to boost employee satisfaction and retention. Training and corrective feedback are important. Please see [GL#098, Milking Procedures for Dairy Cattle](#), for more additional information on milking procedures.



Automatic Milk Systems (AMS), also referred to as “Automatic Milking Installations” (AMI), or “Robotic Milking Systems,” are another option that is gaining in popularity as they provide a means for cows to voluntarily enter the milking center to essentially “milk themselves.” These systems have the potential to reduce labor associated costs and free up time for the producer to address other farm and family needs. This technology often results in

increased production potential, as cows respond to greater access to feed, a greater number of milking opportunities and consistencies built into the management of these installations. Cow flow and traffic patterns are key to AMS installation success. This technology offers the producer a tremendous amount of data collection on their animals such as activity monitoring capabilities to manage reproductive performance, or udder health monitoring tools to manage somatic cell counts. This data helps the producer manage the herd better without the need for additional labor to monitor the animals effectively.

All AMS units require cows that are consistently clean and dry for the pre milking hygiene to be most effective. Consequently, cow housing & environmental management is paramount to success with robotics. Certain housing models and bedding types are

simply not compatible with automated milking. It is recommended to consult with equipment dealers that have reputable experience installing and maintaining robotic milkers, prior to making any formal commitments. Additional facility modifications or new construction may also be necessary prior to installation depending on individual business plans. The decision to incorporate automated technologies on your dairy farm should align with your business's long-term strategy, philosophy and goals. Family considerations, financial capabilities and succession planning all play a role in the final decision-making process. Refer to **GL#109, Automated Milking Systems-Questions Dairymen Need to Ask**, for additional guidance.

Processing/Plant Perspective

Neil Bendixen & Alex Beard, Dairy Farmers of America

Today's economic climate has resulted in an extremely limited labor pool for bulk milk haulers/samplers. These individuals must be professional commercial operators, capable of collecting and transporting milk in all types of weather and terrain. In addition to the unique working conditions and challenging work hours, bulk milk haulers & samplers are also food handlers. This requires them to have the ability to understand and perform the state testing requirements to obtain a weigher sampler permit, to properly sample and collect bulk raw milk.

Training, evaluations and continued updates are required in order to properly obtain a weigher sampler license and perform the duties of a bulk milk hauler/sampler. Training can be in the form of classroom instruction, required reading, and demonstrations. Candidates must also pass (minimum score of 70%) an exam approved by the regulatory agency at the conclusion of the training program. For more background on requirements reference **GL#050, Farm Bulk Milk Collection Procedures**.

With these limitations on milk hauler availability and as some dairy operations get larger, the need for flexibility and adaptability is greater than ever. To aid in the dispatch and transportation of their farm's milk, some producers are converting to vertical silos or direct-load tankers options for milk storage. Modern silos used on dairies today can provide superior agitation, cooling, and sampling milk with great accuracy. They also allow for regularly scheduled and rapid loadout capabilities. Direct fill operations utilize insulated milk transport trailers for storing the milk until it leaves the farm. These type of storage units function as a thermos bottle to store



the milk. They do not have agitation or cooling capabilities, and milk loaded onto trucks during milking must be properly cooled before loading.

Most farms use a propylene glycol chiller to cool the milk immediately to 35-38°F (2-3°C) to preserve milk quality and ensure it remains under 40°F until it is received by a processing plant. The final milk temperature depends upon the flow of milk, its initial temperature, coolant temperature, coolant flow, contact area, and properties of the heat exchanger. For more in-depth guidance reference **GL#097, Direct Loading of Milk from the Milking Parlor into Bulk Milk Tankers**.

Although the PMO requires the milk be <45°F (7°C) to be shipped legally from a farm, the actual temperatures need to be lower than 40°F (4.5°C) to ensure the quality of the product is maintained and in case of weather delays, traffic concerns, truck breakdowns, etc. which might inadvertently delay the shipment from arriving quickly to the plant for application of additional cooling. For example, when ambient conditions outside are hot, tankers may absorb heat from the air resulting in milk warming more as compared to cooler weather. So extra cooling of on-farm milk may be required prior to shipment of the milk from the farm to the processor. Additionally, friction generated during milk transfer may raise temperatures a degree or two and will need to be considered as part of the milk temperature rise when shipping milk from the farm to the processor.

Basic standards of sanitation are required for interstate milk shipments and are governed by the PMO. At a minimum, the federal standards are followed, but individual states may choose to require more stringent standards. Dairy farms vary in size, which require customized equipment to ensure the proper cooling of milk. All equipment must conform to 3-A Standards and Practices. Refer to **GL#108, Guidelines for Proper Cooling of Milk on Dairy Farms**, for more detailed information on these systems and how to avoid common mistakes in the sizing and the operation of milk storage tanks and milk pre-coolers.

Laboratory Testing/Quality Control Perspective

Carli Peskar, Federal Milk Market Administrator Office-Cleveland

Prior to receiving a finished product sample in a laboratory setting, the final, finished product itself should have already adhered to the current requirements set forth in the Pasteurized Milk Ordinance. The current version of the PMO (2019) requires that milk and/or milk products must be labeled with the following:

- declared food allergens (applies to by-products),
- “homogenized” (if in fact all milk has passed through a homogenizer),
- identity of the milk processing plant,
- “keep refrigerated after opening” (if applicable),
- common name of hooved mammal producing milk (if different than cattle’s milk),
- “Grade A” on the product container’s exterior surface,

- “reconstituted” or “recombined” (if applicable),
- the milk plant identity/distribution identity and code or lot number identifying contents with applicable information (if condensed or dry milk products are produced).

*Misleading marks, words, or endorsements are not permitted on milk and/or milk product labels.

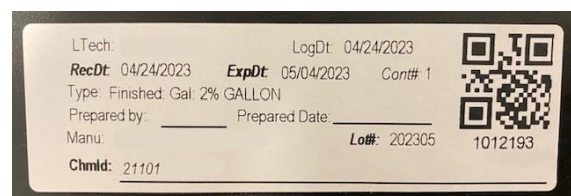


When a finished product sample is received by a testing laboratory, it must be tested appropriately. In order to know what type of testing needs completed on the sample and the timeframe required to complete such testing, staff must be properly trained. During a time with significant labor shortages, this testing and training may be more difficult. For example, in a laboratory setting, there may be

just enough employees to perform the necessary duties. So, when staffing is affected due to illness, budget cuts or turnover, current staff may need to pick up additional responsibilities, which may be entirely new to them. As the cows keep providing milk, the tests still need to be ran and results generated, so what are the options?

If a management system has never been developed or was thought of but not pursued, the time is now to put one into place. A management system should be tailored to the specific needs of each department. In terms of a testing laboratory, a management system may offer staff standard operating procedures (SOP) and supplemental materials (e.g., slide decks, videos) to not only learn a process but to perform it with guided instructions to help ensure the quality of the test run, and that results are unaffected. Procedural directions should not replace a training program but when needed, it can successfully keep a lab running and act as the foundation for traceability. Procedural changes should be well documented, so a lab has information/versions to relate back to if questions arise. SOPs should also include the required information for method selection, test run, and result reporting.

One of the first measures to ensure a product’s testing can be repeated and reproduced with minimum acceptable variability, is accurate labelling of the finished product. Then, proper sampling techniques must be followed to ensure the sample is representative of the entire product received. Most often, in-house labels are generated and should include at least the following: technician, plant identification, type and size of product,



expiration date, when the product was received, and any other unique, specific information to strengthen the audit trail. Documentation and traceability practices are best completed through electronic means. If the laboratory is able, automated recording of data is strongly encouraged. The latter may require some initial database configurations, but the end goal would be to capture information/data in real time. The finished product UPC and/or the sample's in-house label could be scanned into a database and would then autofill the applicable fields, which is most helpful when performing a test. Automated recording helps to minimize the need for additional staff time as the system auto fills based upon programming. Errors in data recorded and keystroke errors are also reduced compared to manual methods. During this time of labor constraints, automated testing and recording equipment will remain as critical tools to help keep the industry running smoothly. Refer to **GL#111, Setup/Remodel of a QC Laboratory and Development of a QC Program**, for additional guidance.

Industry Perspective

Muril Niebuhr, Eastern Laboratory Services

During the last few years, finding quality people to fill positions has been challenging no matter where you go. As organizations look for promising talent that will collaborate well with their team, it takes time, money, and energy. Once you find and hire someone, your time and energy can then be focused on getting the new hire trained as soon as possible. Right? Yes and No. Most new hires have had little or no type of dairy background. Training is a process that takes time and patience. There are proper training procedures and protocols that need to be followed. A respected lab manager once commented that seasoned lab technicians are the best communicators of best practices to new talent. This is so true. Your seasoned team needs to take the time to teach new employees the importance of the accurate data every step of the way. Not having accurate data can sink your business fast.

Once your staff is trained and certified as required, how do you keep them? At times retention can be more challenging than the hiring process. Not only is retention getting to be a buzz word in most organizations, but engagement is also part of the process. Keeping employees engaged in the organization is key. Another key word is empowered.



Empower your employees to do more to expand their knowledge. Involvement in the Dairy Practices Council is a terrific way for employees to expand their knowledge and network of industry peers to help them solve everyday problems and discover innovative approaches for success. Additionally, employees will gain a greater sense of ownership in the role they play in your organization and in keeping dairy safe for consumers to enjoy.

Growth and empowerment helps take the stress off of managers. Managers do not have superpowers even if they say they do. Managers need to have confidence in the people they hire. Another way to look at this is in sports teams. Managers or “coaches” try to put the best team together. It is up to the coach to professionally train the team. Like any team that is not properly coached, there is failure. Baseball managers do not throw strikes, the pitcher does. Managers and leaders are in place to train and empower the team to make the right decisions at the right time. Empowering and engaging employees will enhance work efficiencies and aid in employee retention.

Documentation and traceability were mentioned previously. Traceability and accountability go hand in hand. Traceability needs to be accurate, fast and not require a lot of staff time. Including information technology (IT) staff in your process review and planning discussions may help identify automation opportunities for your business, push the envelope towards faster, accurate and secure movement of data and reduce the strains on personnel resources. The extra time spent at the forefront of inputting accurate data and needed comments, helps lessen the headaches if questions arise later with customers.

Regulatory Perspective

Joe MacPhee, Michigan Department of Agriculture and Rural Development

Clean, dry, well nourished, and comfortable dairy cows produce more milk and are less apt to have problems due to mastitis and many other disease problems. Bacteria need moisture, warmth, and nutrients to multiply and, while all of these are present in a dairy barn, measures can be taken to minimize them. Some bacteria will double every 20 minutes under optimal conditions. Lack of attention to stall cleanliness and cow comfort due to insufficient staffing can contribute to higher somatic cell counts (SCC).



Consistent milking also impacts the quality of the milk. Specific milking routines by all employees to the recommendations of 10 to 20 seconds of stimulation time, at least 30 seconds of kill-time for pre-milking teat disinfectants and milking unit attachment ideally within at least 60 to about 90 seconds (prep-lag time) from initial stimulation of the cow will allow for maximal milk letdown response, reduce over-milking, and stimulate optimal milk flow rates. Your milking system also needs to provide stable vacuum, adequate pulsation, minimal cluster on time, and with gentle milking action. Be sure to have your milking

machine dealer evaluate your system every 1,200 hours of operation, or annually, whichever is shorter. Reference **GL#098, Milking Procedures for Dairy Cattle**, for more details.

In the United States the legal limit for SCC in Grade “A” farm raw milk produced for pasteurization is 750,000 cells per ml for cows. The Grade “A” Pasteurized Milk Ordinance (PMO) indicates that during any consecutive six (6) months, at least four (4) samples of raw milk for pasteurization shall be collected from each producer, in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days. The producer will not be allowed to ship milk whenever the standard is violated by three (3) of the last five (5) SCC in accordance with the requirements of the PMO, until the problem causing the high count has been solved, and the SCC is below the legal limit as determined by sample testing results. Proper training of employees on how to detect, treat and control somatic cell counts is vital for cow health and the production of high-quality saleable milk. Having an adequate number of trained employees helps ensure the daily production of high-quality milk for consumers to enjoy. See **GL#101, Farmers’ Guide to High Somatic Cell Counts in Cattle**, to learn more about what employees need to know.

Educational Perspective

Chris Hylkema, Division of Milk Control, NYS Department of Agriculture and Markets

Regulations and regulatory requirements are simply rules that dairy processors must comply with. For example, “All raw milk and milk products shall be maintained at 7°C (45°F) or less until processed...” and another, “Each milkhouse is provided with facilities for heating water in sufficient quantity and to such temperatures for the effective cleaning of all equipment and utensils.” Regulations do not specify the details of how processors should operate to maintain compliance. When training our inspectional staff, we utilize the DPC Guidelines to help our inspectors get an understanding of best practices producers and processors can follow to maintain compliance with the regulatory requirements. **GL#010, Maintaining and Testing Fluid Milk Shelf Life**, is a great example of a guideline that gives insight into the best practices for maintaining the quality of milk and in doing so a processor would be in complete compliance with temperature requirements. Another guideline that we utilize to great extent with both new inspectors and veteran inspectors is **GL#002, Effective Installation, Cleaning and Sanitizing of Basic Parlor Milking Systems**. This guideline has allowed many individuals to learn how to review on-farm milking systems and determine regulatory compliance by having a better understanding of what a properly designed system is. The bottom line is that the regulatory requirements are the bare minimum of what a producer or processor must comply with and by following the best practices outlined in the DPC guidelines they will always be able to meet the requirements.



In addition to using guidelines as a reference, we have also sent inspectional staff to the DPC preconference workshops. All our staff who have attended the DPC conference in

the last few years have taken the AMS (Automatic Milk Systems) workshop and several attended the Preventative Maintenance Best Practices for Pumps, Valves, Gaskets, & Heat Exchangers as well as Environmental Monitoring. This continued education is invaluable for keeping our staff up to date on current thinking and allows them to take that knowledge back to staff in each of their inspectional regions.

Final Thoughts

Keith Hay, President of The Dairy Practices Council and Pennsylvania Milk Marketing Board

As you have been reading, the continued need for skilled employees and automation is great within our industry to ensure the security, safety, and quality of dairy products. For over 53 years, The Dairy Practices Council, a 501(c)3 nonprofit organization has been dedicated to developing and disseminating uniform educational guidelines for proper and improved procedures for the production and processing of milk and milk products.



The Dairy Practices Council is comprised of a broad network of food safety experts with different perspectives (on-farm, processing, lab/QC, regulatory, industry and education). Our [54th Annual DPC Conference is coming up November 7-9th](#) at the Embassy Suites by Hilton Nashville Airport in Nashville, TN. This conference is a fantastic opportunity for you to meet with us in-person to learn dairy food safety best practices and expand your network of dairy expertise through participation in technical sessions, task force sessions, vendor visits, and pre-conference

educational workshops. Pre-conference educational workshops will be held Tuesday, November 7th. Wednesday, November 8th the conference officially begins at 7:30 a.m. CST and ends the evening of November 9th. Mark Your Calendars and Join Us! Planning is underway. The Board meets on May 4-5th to discuss session topics and speakers. Contact evp@dairypc.org or call 419-890-5147 if you have questions about the conference or have interest in being a sponsor.

What Does DPC Membership Mean To You



Michael M. Schutz, Dept. Animal Science CFANS, University of Minnesota

Being asked to share a few thoughts about what membership in DPC has meant to me has given me the opportunity to think about one of the most important and most fun organizations I have been involved with in my professional career. While I remember reading about the Northeast Dairy Practices Council when I was younger, my initial opportunity to really learn more about the organization came about in 2002 when I was asked to represent dairy production from a university perspective on the board of directors. What I found was an organization that addressed many of the issues

I was concerned about and attempted to cover in my Extension program at Purdue University and now at University of Minnesota. I count among my closest friends and work associates the contacts I have made through DPC. Little did I know that the initial connection would lead to 10 years on the board, since I was given the honor of serving as vice-president and then president. Those roles were easy because of the servant-leader attitude of all board members.

I suppose I have not yet answered the real question about what DPC membership has meant to me. That answer lies in the friendships and work connections I have made. Relationships made at the DPC annual meetings certainly impacted my own Extension program by the opportunity to use DPC guidelines in outreach to dairy producers, knowing experts in all aspects of milk quality to connect to others seeking information, and having the opportunity to recommend DPC contacts as presenters at Extension workshops. Of course, the opportunities to work side by side with true experts in the field when writing or revising (updating) guidelines was professionally very satisfying. For my classroom teaching, I also used DPC guidelines and even had DPC connections come to campus for invited guest lectures. Now in a slightly different role, I have the opportunity to serve as a member of the planning committee for the FFA Milk Quality and Products Career Development Event. Also on that committee are Pat Healy, Rebecca Piston, and Dr. John Partridge who were outstanding contributors to DPC. I know that our DPC connections in some way contributed to our work on that committee too. It certainly has led to the recommendation of DPC guidelines as resources for FFA members dedicated to learning about careers in the big tent of our beloved industry.

Upcoming Events

Calendar of Events:

DPC Annual Conference November 7-9, Nashville, TN

Other Events

[PA Association for Food Protection, May 9-11, State College, PA](#)

[American Dairy Science Association, June 25-28, 2023, Ottawa, ON](#)

[NADRO Conference, July 9-13, Madison, WI](#)

[IAFP Annual Meeting, July 16-19, 2023, Toronto, ON](#)

[American Cheese Society Conference, July 18-21, 2023, Des Moines, IA](#)

[NY State Association for Food Protection 100th Annual Conference, September 19-21 2023, Altmar, NY](#)

[IDF World Dairy Summit Oct 16-19, 2023, Chicago, IL](#)

[Eastern Milk Seminar 2023, October 24-26, Nashville, TN](#)