Northern New York Agricultural Development Program
2020 Project Report

E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance – Effect of Milking Equipment on Teat End Health: Phase II

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- 15 dairy farms in Northern New York (Table 1.)

Table 1. Cooperating Producers; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

St. Lawrence County	Lewis County	Jefferson County	Clinton County
Chambers Farm	Moserdale Farm	Doubledale Farm	Carter Farm
Greenwood Dairy	Kennell Farm	Morning Star Farm	Rusty Creek Farm
Kelly Farm	HanCor Dairy		Remillard Farm
C & M Dairy	Silvery Falls Farm		
Gebarten Acres	Conway Farm		

Background:

Mastitis research has focused on developing strategies to improve udder health, milk quality and, more recently, to promote judicious antibiotic use. Nevertheless, maintaining high milk quality standards depends on dairy employees and remains a constant need for many dairy farms mainly due to insufficiently trained work teams. There is no doubt that strategic management of human capital is a necessity in any business type and can lead to ongoing successes, however, access to

strategic and focused training is an ongoing challenge in the dairy industry. This has been especially true over the last year of COVID-19-related challenges that have severely limited in-person training events. Technology has helped in this matter by providing web-based access in more remote areas, such as those in northern New York. Online learning approaches, however, are still emerging and focused tools that are targeted with the specific audience in mind are needed to help fill this gap.

The challenges facing dairy farms in providing and delivering science-based training for employees are many. Although most dairy producers and industry professionals would agree that both initial hire and ongoing employee training is essential to assuring proper adherence to protocols, the practical logistics of on-farm training are a limiting factor. Based on the most recent USDA–APHIS report, less than 60% of the milkers among all the dairies in the U.S. received any kind of training (USDA National Agricultural Statistics, 2014).

In most cases, the native language of milkers is not English and, in some cases, the literacy level in their native language is limited (Maloney et al., 2016); leading to higher worker turnover on dairy farms (Durst et al., 2018). This higher turnover is thought to be related to non-English speaking employees being less likely to receive primary training, understand the farm goals, or be given the opportunity to provide ideas on how to improve the business. Most milkers are trained on the job by a colleague, who may have similar limitations in communication.

Without ongoing evaluation and training/retraining, assuring adherence to protocols is impossible. In addition to the benefits of training, it is important to note that there is a desire for more information by employees. Two recently published studies showed that employers oftentimes underestimate the employees' interest in learning and commitment to the success of the farm (Durst et al., 2018) and that the lack of training or training materials has detrimental impacts on employee recruitment and retention (Moore et al., 2020).

These limitations can limit the farm's success by impacting employee job performance. Since 1946, Quality Milk Production Services (QMPS) has worked directly with farms on improving milk quality, udder health, promoting judicious use of antibiotics particularly through mastitis pathogen identification, and comprehensive training and education. Although there are four QMPS laboratories across New York State, developing a face-to-face connection with all farms is impossible.

Identification of training methods that would allow broader and more efficient access to more farms would benefit both farms and the dairy industry in Northern New York (NNY). Additionally, improving employee knowledge and providing user-friendly training may increase employee satisfaction.

Phase 1 of this project in 2019 explored development of e-learning education as an alternative approach to face-to-face training and pilot-tested an e-learning module for providing milkers' education in a manner that engages workers and is easy to understand and to apply in the milking parlor, and that allows farm managers/owners the opportunity to evaluate and provide workers with constructive feedback.

Research conducted in Germany in 2018 shows that e-learning modules may be able to fill that gap. Employee engagement during e-learning was high and the modules were effective at creating a feeling of confidence and accuracy in work performance (Hesse et al., 2018).

A cloud-based learning management system (LMS) provides the platform to distribute e-learning modules in an efficient manner and to areas where in-person training can be difficult to schedule. Proper training is especially needed for new employees as they begin employment. The main goal of this 2019-2020 Northern New York Agricultural Development Program (NNYADP)-funded pilot project is that farms with access to this milker e-training module will have better-trained milking personnel able to detect milking equipment problems earlier and have the confidence to bring concerns or areas for attention to farm managers or owners.

This NNYADP-funded e-learning development and testing research was conducted on 15 commercial dairy farms across four counties in NNY (Table 1) between September 2020 and January 2021.

Methods:

Development of E-learning Modules on the LMS System

Over a nine-month period in 2020, we developed and designed an interactive online training module using Gomo learning suite© as an authoring tool. The main idea was to continue the story from Phase 1 (2019) about a milker who needed help so that farm staff users/trainees could relate to the experience. The module was focused on how to perform five basic checks of the milking equipment prior to the start of milking. There were five sections within the module: liners, vents, pulsators, vacuum, and milkhouse. We estimated that each of the five sections within the module would take the user only six to eight minutes to complete with the entire training lasting approximately 30-40 minutes.

Each section includes embedded videos, pictures, and text to add to the information on how to perform each equipment check and why each check is important to the health of the cows and the quality of the milk being produced. These elements are simple and straightforward in order to keep the learning process less stressful and engaging. For two of the five sections, we included the option for participants to have the text read to them. The decision was made to only offer the audio option for two of the most complicated sections so that participants could give feedback on which format they preferred in order to direct future programming decisions.

Based on our Phase 1 experience, we streamlined entry to the 2020 module so that within two screens, the participant was actually in the module. We interspersed four sets of three questions each in the module to gain some background information on the participant and the farm. An example question is: “How often do you bring up milking equipment problems to the farm manager?” In addition, we inserted knowledge check questions at the end of each module to gauge how well the participant understood the main concept. An example question is: “Which two things should you do next if you see a liner that looks like this?” In the module there is a picture of an improperly aligned liner to the left of this question and three choices.

We also created an additional section that outlined the major components of the milking system and explained the function of each in case milkers were unfamiliar with this topic. Participants

could choose to explore each component on their own or have it taught to them through a narrated video. A full glossary of all terms in the module was developed with pictures and definitions of the key terms. See Appendix 1 for screen shots from the module.

Baseline Survey

For each of the cooperating farms, we first performed an extension survey, which consisted of an assessment in the following areas:

1) Equipment working order analysis involving average claw vacuum, milk line vacuum during milking, and graphing all pulsators,
2) Milker assessment re: milking routine timing, milk flow rate analysis, unit alignment scoring, teat end cleanliness scoring, and dip coverage, and
3) Cow assessment involving teat scoring, strip yields, and udder hygiene scoring.

This baseline survey assessed the opportunity areas for the farms to reduce the risk of mastitis and identify bottlenecks that might impede employee performance. For each farm we prioritized our recommendations and then only looked at the top three priorities. In addition, the manager or owner was also given an equipment problem log sheet and asked to record any equipment problems brought up by milkers until we returned for the training session. This was done to establish a baseline for the farm of how often the employees were bringing equipment problems to management.

Training on Using the E-learning Tool

The training visit for the e-learning tool was performed as a one-hour visit with the milkers being paid by the farm for this training. Four group questions were asked at the start of the session with individual results tallied. Then, each participant was provided a set of four written questions (Table 2) in their native language with a tear-off sheet with their individual unique login ID to the e-learning tool. The milkers were instructed to login to the module either on their smart phones or with a tablet that we provided to complete the module during the next 50 minutes. In addition, the farm manager or owner was given a set of eight written questions (Table 3) with a tear-off sheet with an individual unique login ID to explore the module.

As each milker completed the module, we provided a printed certificate with their name on it and gave them a round of applause for a job well done. We verbally asked how they liked the module and if they had any suggestions for how to improve it.

Presentation of Equipment Problem Communication Whiteboard

It was obvious from our observations and discussions at the baseline extension survey and the first training that there was a gap in communication between milkers and farm manager/owners concerning equipment problems. A common statement we heard from milkers was “We continually bring up equipment problems, but management does not correct them.” From the owners we heard, “Milkers rarely bring up milking equipment problems.”

To help bridge this gap in communication, we purchased whiteboards to be given to each farm and specifically dedicated to recording milking equipment problems. The design of the whiteboard (Appendix 1, Photo 5) has three designated areas: 1) milker, 2) management, and 3) milking equipment dealer. The milker is responsible for listing the initial milking equipment

problem and dating and initialing their entry. The manager is responsible for assigning a priority level to the milking equipment problem and either putting it under the management column or the milking equipment dealer column for attention. In addition, the manager is responsible for putting an expected completion date to each problem so that milkers are aware of when the problem will be corrected. As part of the whiteboard we laminated a copy of the module glossary in both English and Spanish with a picture of the equipment item in the middle to provide an easy reference for the milker when they recorded a problem.

On our follow-up visit to the farm we presented the whiteboard to the farm and trained both milkers and owners/managers on how to utilize the whiteboard. On the majority of farms the whiteboard was hung on the wall in a prominent location for the milkers to access it before we left.

Results/Data Analysis:

Baseline Survey Findings

From the baseline survey, over half (53%) of the farms had one or more of the top three priorities that involved an issue with milking equipment that milkers could have detected and reported to management. This data reinforced the need for additional milker training on this subject on these farms and for improving the communication channel for reporting equipment problems.

Ninety-three percent of farms had a milking equipment problem as one or more of the top three priority issues, further reinforcing the need for more attention to milking equipment issues and education.

Milking routine challenges were identified by 86% of the farms as one or more of the top three priority issues.

Pre-Training Questions Insights

A total of 95 milkers participated in these e-learning trainings with 90 of these milkers with Spanish as their native language and five with English. Due to technical problems the data from one farm with a total of six participants (four Spanish-speaking, two with English as their native language) was not recovered. As this left only three milkers with English as their native language this data is not reported here.

In the group questions prior to the trainings, 83% of milkers stated that they had received some type of training when they started the position but that this was their only training to date. It is of vital importance to note that 100% of the milkers stated that the last time they had received training on the farm was more than 6 months past.

Furthermore, almost half (46%) of the milkers had not milked cows before arriving at this farm and 40% had worked less than six months on this farm.

These pre-training questioning results reinforce a need for a good on-boarding tool that dairy farm employers could use to train new employees on detecting milking equipment problems since many of their applicants/new hires are lacking the basic knowledge that is gained from

growing up on a farm or previously working on a farm. These results also reinforce the need for helping farms establish a culture of ongoing worker training.

Table 2: Results of Pre-Training Written Questions for Milkers on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

Written Milker Questions	Response (Percent)
Have you ever had training on the milking equipment? (How it works? What to do if it breaks?)	
Yes	67%
No	29%
Not sure	3%
Are you satisfied with that training?	
Yes	71%
No	19%
Not sure	10%
Who trained you on the equipment on this farm?	
Coworker	59%
Manager	13%
External professional	13%
Nobody	11%
Other	5%
How many hours do you work per pay period?	
Less than 80	82%
80-130	7%
>130	11%

Sixty-seven percent of milkers reported being trained on milking equipment; this was a higher percentage than we anticipated. However, when you combine the number of milkers who were not trained, were not satisfied with the training, or were unsure if they were trained or satisfied, it totals to 45% of milkers, showing a need for this type of training on NNY dairy farms.

Furthermore, when you consider the farm managers' questionnaire results, 57% reported that they did not perform milking equipment training or were unsure if they did or did not. In addition, only 27% of the managers reported having ongoing training programs in place on milking equipment. As previous studies have revealed, our results also show that the majority of workers (59%) receive training by a coworker rather than a manager or external professional. This further supports a need for the development of tools to help managers better train their employees in the area of milking equipment operation and to conduct the training in their native language.

Table 3: Results for Pre-Training Written Questions for Managers on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

Written Manager Questions	Response (Percent)
Do you provide training on the milking equipment? (How it works?/What to do if it breaks?)	
Yes	43%
No	50%
Not sure	7%
How is milking equipment training done on the farm?	
Only when the milkers arrive	33%
Routinely, such as every few months	27%
Only when something bad happens	33%
Never	7%
The milking equipment works well on your farm most of the time?	
Fully agree	33%
Agree	53%
Neutral	13%
Disagree	0%
Fully disagree	0%
How often do milkers bring up milking equipment problems to you?	
Every day	7%
Every week	60%
Every month	27%
Never	7%
How do milkers communicate milking equipment problems with you?	
They tell someone	59%
They write on a board	18%
They send text messages	14%
They Google translate and show	5%
They do not bring up problems	5%
How timely do milkers bring up milking equipment problems?	
Same shift	47%
Same day	20%
Within a couple of days	33%
Within one week	0%
It depends	0%
How quickly do you fix milking equipment issues?	
Same day	56%
Within a couple of days	44%
Within one week	0%
Within one month	0%
Never	0%
How many hours does your average milker work per pay period?	
Less than 80	87%
80-130	13%
>130	0%

Completion of E-learning Module by Milkers

Of the 95 participating milkers, 100% completed the module, vastly improved from the 6% completing the module in 2019 when we allowed them to complete it on their own time. Even though the modules were online and theoretically available at any time, it was important to give the employees dedicated time to complete the training. The number of answers varies as learners had some freedom to choose their own learning path.

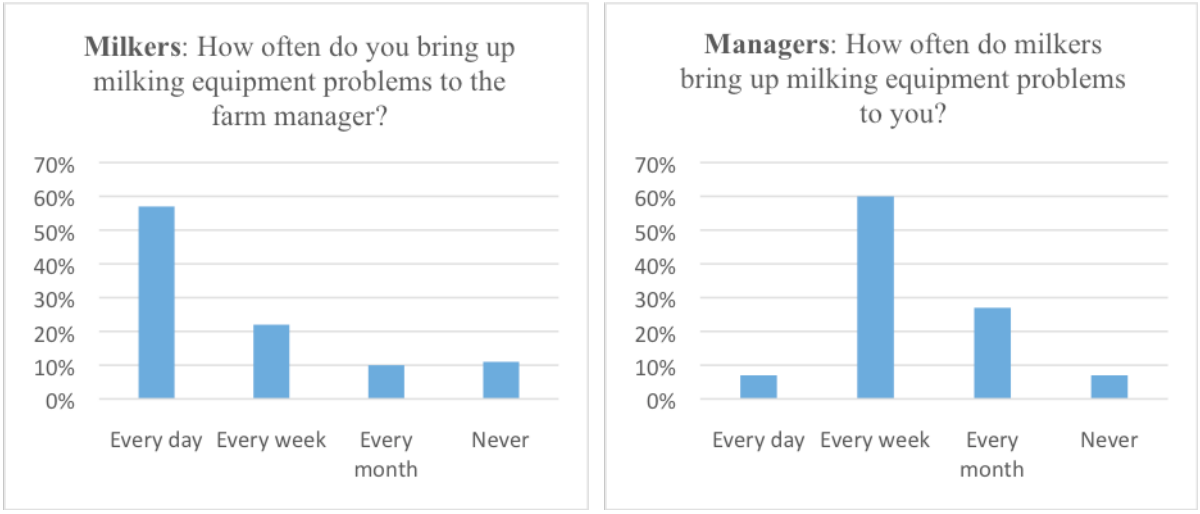
Table 4: Results of milker questions within the module on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

Within Module Questions	Responses (Percent)
The milking equipment works well on our farm most of the time	
Yes	74
No	14
Not sure	12
How often do you bring up milking equipment problems to the farm manager?	
Every day	57
Every week	22
Every month	10
Never	11
How do you communicate milking equipment problems to the farm?	
Tell someone	35
Write on board	5
Send text message	29
Google translate and show	6
I do not bring up problems	6
Are you expected to fix milking equipment problems on the farm?	
Yes	69
No	20
Not sure	11
How quickly are milking equipment issues fixed on the farm?	
Same day	83
Within a couple of days	6
Within one week	4
Within one month	1
Never	6
How long have you milked dairy cows on this farm?	
Less than a month	20
1 to 6 months	20
More than 6 months	60
What did you do most in these modules?	
I listened to the voice recording.	17
I read the texts.	47
I used both options.	35
What did you like better?	
I like the text better	70
I like the audio recording better	30
Would you like to have audio recording in future training modules?	
Yes	73
No	9
Not sure	18

At the training event we collected the equipment logs that we had asked managers to complete in the time between the baseline survey and the training. There was a wide variation in how many equipment problems were brought up to management from none to 3 per week. Thirty-three percent of farms had one or more per week, 47% had 0.1 to 0.9 per week, and 20% had none per week.

There also was a wide discrepancy in the results from milkers versus managers related to how frequently milkers reported milking equipment problems (Figure 1). You can see that for milkers over 50% reported that they identify milking equipment problems every day whereas 60% of managers reported that milkers are bringing up milking equipment problems every week. Hearing this discrepancy from milkers and managers was one of the motivating factors for developing the equipment problems communication whiteboard, as noted earlier in this report, to improve the communication channel between milkers and managers and hopefully lead to an earlier correction to milking equipment problems.

Figure 1. Milker and manager response to how often are milking equipment problems brought up on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.



We were surprised to find that 69% of milkers reported that they were expected to fix milking equipment problems on their farms. Almost half (45%) were not trained or not satisfied with their training. This situation is unacceptable and might cause even larger problems since employees may not know how to correctly fix the milking equipment. This further emphasizes the need for farm managers to provide appropriate trainings.

The responses of milkers on whether they preferred the text or audio was surprising in that 70% preferred the text. This was in contrast to what we had heard in feedback on the module in 2019 and in contrast to the next question in which 73% of the milkers reported that they wanted audio recordings in future trainings. One explanation for this is that the first section was text only and

so maybe the milkers became accustomed to reading and therefore were biased to read the text rather than listen to the narration in the sections where it was available. It is possible that the way we presented the audio was not what they expected since they had to click on the narration to start it rather than it starting automatically. Unfortunately, the option to have the narration start automatically is not achievable in all browsers and so was not offered. It is also possible that this response was influenced by the fact that these trainings were completed in a room with multiple people and harder to hear versus a more typical situation where the participant may use headphones.

Both milkers and managers were in close agreement that most equipment problems were fixed on the same day, which is encouraging. If we can help solve the communication channel of getting the message about equipment problems from the milkers to the owners it is likely that the equipment problems will be quickly corrected to support more efficient operation in the milking parlor.

Post-Training Assessments

Within the module we asked milkers knowledge check questions after the end of each of the five sections and the results of their responses are shown in Table 5.

Table 5: Results of knowledge check questions within the modules for milkers on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

Within-Module Knowledge-Check Questions	First Time Response (Percent)
Liner alignment section	
Correct	81
Incorrect	19
Vents section	
Correct	Data not available
Incorrect	Data not available
Pulsator section	
Correct	81
Incorrect	19
Vacuum section	
Correct	83
Incorrect	17
Milkhouse section	
Correct	75
Incorrect	25

This data was encouraging as it shows the vast majority of milkers did comprehend the main points of the module and were able to correctly answer the questions. Unfortunately, due to a technical error, the data from the knowledge-check questions at the end of the vents section was not retrievable.

At the end of the module we also asked two questions (Table 6.) to assess if milkers were trained and confident enough to bring up milking equipment problems to management.

Table 6: Results of final two within-module questions for milkers on 15 NNY farms; E-learning Training Systems as an Educational Approach for Dairy Farm Workers on Milk Quality and Parlor Performance Project, NNYADP, 2020.

Final Questions Within the Module	Responses (Percent)
After this training are you able to check the equipment before milking?	
Yes	95
Not sure	4
No	1
Do you feel confident now to tell the management that there is a problem?	
Yes	87
Not sure	8
No	5

We were very pleased that 95% of the milkers reported that they were able to check the milking equipment in the five areas that we trained them on. Also, it is encouraging that 87% reported that they were confident enough to bring up equipment problems to management although there were still some who were not sure or were not confident.

Although the results of these questions showed milkers potentially had gained knowledge by completing the training, there still was the remaining question of whether the milkers could actually perform the skills. As outlined in detail in the Next Steps section of this report, we piloted a model-based test on a few farms to actually test the skill set of the milkers. We realized that not as many milkers could actually perform a skill even though they had the knowledge of that skill. This has led us to think about pairing this type of online training with a set of model-based tests which management would perform as a hands-on follow-up to the online training. This is explored in more detail in the Next Steps section.

Individual Farm Management and Milker Feedback

Overall, the 15 participating farms were eager for training tools to better educate their employees in the area of milking equipment as many farm managers/owners felt they had not done a good job in this area.

We did not receive any push-back on having the milkers on the payroll for the one-hour training session and compared to the 2019 Phase 1 pilot testing this resulted in a much higher completion rate. This observation demonstrated that owners were not unwilling to pay employees to be trained in a dedicated session. If we asked them, however, to give employees paid time to complete a training on their own, the training was unlikely to happen. This may also demonstrate why providing owners with a systematic approach to trainings and training tools may be important in order for them to establish a training culture with routine ongoing trainings to milkers. It appears that for most managers either they do not have enough time or they are not convinced of the value of coming up with their own training plans for their milkers.

One farm owner stated that he had noticed a definite difference after the training with employees paying closer attention to the milking equipment and bringing up more problems. Another farm owner was very pleased with the white board and stated that having it posted on the wall would help him remember what problems he had to fix. He did admit that he had previously forgotten about a milking equipment problem that milkers had brought up. Multiple owners also requested the paperwork be completed so that they could document the training as part of the FARM program requirements.

Milkers were very excited with the training on the use of milking equipment as many expressed that they had been trained on how to use the equipment but not on how it actually works or how to know if it was not functioning correctly. The individual printed certificates with names on it also were a "big deal" to the milkers. One milker expressed that he had not graduated from high school and the only other certificate that he had received in his life was when he graduated from elementary school. He immediately texted a picture of his certificate to his family in his home country.

Two of the milkers who could not read showed a great interest in the use of a training tool with voice recordings. They said that this made them feel involved in the knowledge and they wished to have more of this type of audio tool covering different topics. The list of topics that were brought up included artificial insemination, calf care, maternity management, fresh cow management, and additional mastitis and milk quality areas.

One of the participants, who was a veterinarian from Mexico that recently traveled to New York with a work visa, stated, "The level of detail and knowledge is appropriate for milkers. Continuous training is a necessity on dairy farms to increase the involvement level of the workers."

Another important detail to highlight is how the younger generation of milkers seemed more comfortable using the tool. It was observed that the older generation of milkers had to struggle at the beginning but after the first section, they continued with remarkable ease.

It was very interesting that on some farms, the employees requested more text and detail in the module. This was in contrast to what we had heard from the majority in 2019. We referred these milkers to the glossary of terms and the full explanation of each component of the system that were part of the module. This led us to think that there might be a way to provide a basic or introductory level of a module with buttons to explore each topic in more depth if they desired.

In addition, one Spanish-speaking employee wondered if he could log in to the English version and hear the text read to him in English so that he could improve his pronunciation of English words.

Conclusions/Outcomes/Impacts:

This project indicates that farms in NNY, and likely elsewhere in New York State, could benefit from additional employee training in the area of milking equipment operation and importance. Our e-learning module was built to help milkers learn new skills in this area and, as a result, to become confident enough to bring up any equipment problems detected to management attention. Based on the milker's responses on the 15 participating dairy farms, we did successfully achieve this goal of educating the milkers on a new set of skills and giving them the confidence to raise related issues with management.

This project identified a communication channel problem on many of the farms in terms of how milkers reported milking equipment problems to owners. It is our hope that the provided and implemented equipment problem communication whiteboard will help to address this issue but reassessment of farms in the future will be necessary to see if this is achieved. As noted earlier, on the majority of farms the whiteboard was hung on the wall in a prominent location for the milkers to access it before we left.

We did successfully address the literacy problem that we encountered in the 2019 pilot testing by having the audio option on two of the sections in 2020, however, for a few of the participants it would have been helpful to have an audio edition for the entire module as the workers were unable to complete it without assistance from us.

Furthermore, this project showed us that there is not an ongoing learning culture on many farms due to the lack of a structured training program. It is our hope that the e-learning system that we are developing through this project can help to change this culture on farms. However, we acknowledge that having appropriate tools is only one part of the picture. More work is needed to help farms realize the importance of developing a learning culture where training and feedback are provided to milkers on a regular basis in order to promote continued improvement and job satisfaction, and, in so doing, improve the farm's efficiency and production success.

Outreach:

1. NMC Annual Meeting Presentation. January 26, 2021; virtual lecture.
2. QMPS-hosted webinar for NNY farms. February 8, 2021; virtual lecture summarizing findings.
3. One-page summary of NNYADP grant and results will be distributed to QMPS clients and provided to Cornell Cooperative Extension for potential inclusion in newsletter or on websites.
4. Cornell University PRO-DAIRY Milk Quality Course planned for Spring 2021.

Next Steps:

1. Model-based Tests

One of the ideas that we piloted on a few farms is to create a set of model-based tests that could be administered by farm management after the theoretical training in the online module has been completed. For example, we temporarily disabled one side of a pulsator on a few farms and then had the milkers evaluate the pulsator using the finger test covered in the module. It was obvious that the milkers understood what they were supposed to do to perform the test as demonstrated in the module but not all milkers were able to correct identify which side of the pulsator was

abnormal. After helping them refine how they placed their fingers in the liner, they were then able to correctly identify the problem. Our idea would be that we would provide a set of three model-based tests to management, such as 1) handing the milker a liner that was not aligned correctly and asking them to fix it, 2) performing the finger-based pulsator test, and 3) taking the milker to the vacuum gauge on the farm and have them correctly record the vacuum level displayed. The idea with this follow-up testing is that it helps the manager and the employee confirm that they can actually perform the skill versus just having the knowledge of how to perform it. These model-based tests would be available for both the milking routine module and the milking equipment module.

2. Prudent Antimicrobial Drug Use Education Module

We would like to create a third training module to train farm employees to correctly execute common but highly relevant tasks related to animal health and prudent antimicrobial drug use. The detailed goals for this third training are how to properly obtain an aseptic milk sample for culture, how to properly prepare an individual teat for an intramammary infusion, how to properly administer lactating cow antibiotics, how to properly assess milk for when a cow can be returned to the saleable milk pen, and how to properly prepare a cow for dry cow therapy and administer it, considering dry cow antibiotics, internal teat sealants, and external teat sealants.

3. Participant Email Database Building for Training Notification

We are starting to explore the possibility of obtaining the email addresses of participants so that we could offer them the chance to participate in future trainings and gauge their interest in other training material. Also, email-based communication is an effective way to motivate learners to re-access learning materials.

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