

# Annual Report 2015

QMPS is a program within the Animal Health Diagnostic Center, a partnership between the NYS Department of Agriculture and Markets and the College of Veterinary Medicine at Cornell University.



## Director's Notes

In 2015, Quality Milk Production Services (QMPS) continued its mission to help dairy herds profitably produce high quality milk through integrated field services, laboratory diagnostics, applied research, and teaching/extension interacting with over 1,000 different NYS farms and 175,000 cows. We are working to support total dairy management and control of all diseases which hamper production efficiency primarily through the control of mastitis and the avoidance of antibiotic residues.

Our expert staff has continued to expand our milking time and parlor services throughout the state and country. In addition to equipment testing, we have increased our labor training and milking procedures monitoring services as well.

In the laboratory, the Animal Health Diagnostic Center (AHDC) has refined the use of MALDI-TOF (matrix assisted laser desorption/ionization – time of flight) technology, which will assist in decreasing the time involved in final diagnoses of pathogens. It uses mass spectroscopy of 16S ribosomal proteins and compares the data to an enormous library of known pathogens. With the move of our western regional laboratory from Geneseo to Warsaw, that lab was equipped with a MALDI-ToF also. QMPS saw a substantial volume of samples that were processed in all four of our locations, thanks to the hard work of our dedicated staff.

Our staff has been involved in education throughout the year. We also have visited many countries through our International Mastitis Academia program that has helped improve dairy practices worldwide. In addition, QMPS staff has given invited talks and seminars regarding udder health in the past year at international meetings such as NMC, American Association of Bovine Practitioners, and the Western Veterinary Conference as well as regional meetings like Northeast Dairy Producers Association and we hosted the regional NMC in Syracuse. We continue to train PhD students and post-docs in QMPS while conducting research important to the dairy industry and dairy product consumers.

Please enjoy reading through our annual report. We are happy to share our accomplishments with you and look forward to working with the dairy community in the coming year. Please let us know where we can provide better services with our current activities or if you have ideas of things we can provide that we are currently not offering, those concepts are welcome also.

## 2015 Facts and Figures

<b>Milk Sample Cultures</b>	<b>108,747</b>
<b>Bulk Tank Cultures</b>	<b>2,038</b>
<b>Mycoplasma Cultures</b>	<b>58,734</b>
<b>Other Tests</b>	<b>87,079</b>
<b>TOTAL TESTS &amp; SAMPLES</b>	<b>256,598</b>
<b>TOTAL SUBMISSIONS</b>	<b>14,451</b>
<b>TOTAL FARM SURVEYS</b>	<b>357</b>

The regulatory portion of the program is mandated through the New York State Department of Agriculture & Markets, Division of Milk Control (Ref. 1NYCRR PART 2 of the Agriculture & Markets Law relating to the Requirements for the Production, Processing and Distribution of Grade A Milk and Milk Products; Sections 2.8 and 2.60).

## Service

<b>Laboratory Proficiency Enrollees</b>	<b>29</b>
---	-----------

### New AHDC Executive Director

Dr. François Elvinger, Dr. med. vet., Ph.D., began his role as Executive Director of the Animal Health Diagnostic Center (AHDC) effective October 1st.

He earned his Dr. med. vet. degree from the Hannover Veterinary School in Germany in 1983, where he was a research and teaching associate at the Institute for Milk Hygiene and Technology, and his Ph.D. in dairy science from the University of Florida in 1990. Dr. Elvinger then joined the faculty of the University of Georgia, College of Veterinary Medicine as a veterinary epidemiologist at the Veterinary Diagnostic and Investigational Laboratory, Tifton. He left that post for Virginia Tech in 1997.

Dr. Elvinger is board certified as a diplomate by the American College of Veterinary Preventive Medicine and by the European College of Veterinary Public Health.

### Implementation of new data system

In August 2015, a new Laboratory Information Management System (LIMS) was rolled out to replace our current system. A considerable amount of testing and training

took place prior to this implementation and the go-live was very smooth. Our customers have seen new invoices and the ability to have them emailed or faxed to them monthly in addition to the mailing option. More updates are planned for the near future to help make this program more useful to our veterinary clinics and producers.

### **QMPS Western Laboratory Relocation**

The QMPS Western Laboratory relocated to Geneseo in 1989 and remained there until Dec of 2015. During the 26 years in Geneseo, they outgrew the 1,000 square foot laboratory and office. In Dec of 2015, they moved into the Wyoming County Agriculture Business Center (WCABC) located in Warsaw, NY. The WCABC is the first of its kind in agriculture noting that there are county, state and federal agencies housed within the same building. QMPS was the first agency to relocate within the WCABCE on Dec 17, 2016. With the move to the WCABC, QMPS was able to double the size of the laboratory and bring on new equipment and service.

QMPS has purchased a MALDI-TOF, which is a mass spectrometry machine that identifies the genus and species from bacteriological growth. The advantage to using the MALDI-TOF in the laboratory is that the QMPS Western Lab can now provide culture results to clients within 24 hours for most organisms. QMPS will also have a 24 hour drop-off area within the WCABC which will allow clients to drop off samples 24/7. They look forward to seeing you at their new laboratory located at 36 Center St. STE A Warsaw, NY 14569.

## **Teaching & Outreach**

### **AABP 2015**

QMPS provided a one day pre-conference seminar at the 2015 AABP conference. The program was oversubscribed with thirty seven people attending, consisting of participants from across North America and European countries. A broad range of subjects were presented, including Pathogen Based Treatment Decisions, Monitoring Parlor Performance, and an update on recent Research on Mastitis Pathogens at QMPS. An expanded program is planned for 2016 in Charlotte, NC.

### **Mastitis Seminars**

QMPS, Pro-Dairy and DeLaval teamed up in October 2015 to conduct a one-day seminar for producers on maximizing the profitability of their parlor. This seminar was held at four locations across the state in order to minimize the travel time of producers who attended. The participants of

this seminar deepened their understanding of managing the milking center with topics including cow handling and milking routine, equipment setup and maintenance, controlling mastitis risks, personnel management and the use of technology for evaluating parlor performance.

The four seminars were held in Batavia, Ithaca, Ballston Spa, and Watertown. There was good attendance at all locations with a total of over 100 attendees representing more than 80 dairies. The attendees varied from owners to parlor managers to individual milkers for some dairies. There also were representatives from other segments of the dairy industry including veterinarians, nutritionists, milk inspectors, milking equipment dealers and cooperative extension agents.

The speakers for the seminar included Dr. Rick Watters (QMPS), Dr. Jessica Scillieri Smith (QMPS), Dr. Mike Zurawski (QMPS), Jason Karszes (Pro-Dairy), Betsy Howland (Pro-Dairy), Jared Yousey (DeLaval), Steve Jones (DeLaval) and Dr. Paul Virkler (QMPS).

Feedback received from this seminar was very positive with producers stating that the information presented was very useful and that they could start using some of it the next day in their operations. There were numerous requests for QMPS to host more events like this seminar in the future.

### **QMPS Retreat**

QMPS held their annual retreat at the Cornell Biological Field Station at Oneida Lake in August 2015 for all employees. Topics included updates on the QMPS initiatives and goals set in place last year by Dr. Daryl Nydam, QMPS Director. There was an open discussion on ideas to help QMPS remain relevant to the dairy industry in the afternoon followed by group breakout sessions.

### **Summer Dairy Institute – Mastitis Week**



In 2015, the content of the VETMED 6604 course, which had been routinely offered as a two week course focused on milk quality education for veterinary students, was condensed into one week and became part of the Summer

Dairy Institute (SDI). The vision of the SDI program is to provide a concentrated six-week course of the highest quality to a select group of professionals whose career objective is to enhance the well-being of dairy cattle such that they contribute to efficient, profitable, and environmentally

sound production of safe food. It was possible to condense the VM6604 program into one week because a significant portion of the background necessary was already covered in the SDI program.

During this week, all QMPS personnel including field technicians, laboratory personnel and management, participated with hands-on laboratories and lectures. There were 33 students, with nine from Cornell and 13 international students. This is by far the largest class for the VM6604 course and SDI.

### **Super Milk Achievers**



In 2015, there were a total of 1,379 Super Milk Achievers. The 'Super' Milk program, under the direction of the Empire State Milk Quality Council (ESQMC), was created in 1990 to recognize herds that were producing milk at a higher level. Since 2013, Super Milk standards have lowered to 200,000 SCC to reflect the quality of milk in New York State. These changes are in addition to maintaining an exemplary farm determined by the milk inspector. Milk inspectors are a key component to the Super Milk program since they are the nominating party. For more information, contact ESQMC at [www.supermilknny.org](http://www.supermilknny.org).

### **Field Technician Training**

QMPS had two areas of focus when it came to Field Technician trainings during 2015. These areas included a revised milking equipment evaluation form and disconnecting vacuum regulators and variable frequency drives.

Our first focus was to develop a revised NMC Vacuum and Airflow form to be used by all QMPS staff when evaluating milking equipment. Revisions to the NMC form took place from February to August 2015 until a final format was approved by all Field Technicians. In 2012, NMC made revisions to the Vacuum and Airflow testing requirements and QMPS took the opportunity of generating a new form to make sure all Field Technicians were up to date on the revised testing procedures. A training on the use of the new form and the revised NMC testing methods took place in February and again in May of 2015.

The second area of focus for the Field Technician Training was related to disabling vacuum regulators and variable frequency drives. There are more than 15 different types of mechanical vacuum regulators and variable frequency drives used to regulate vacuum within the dairy industry. Disconnecting mechanical vacuum regulators usually requires removing a sensing hose or taping off a sensing port; however, disconnecting variable frequency drives is not as

straightforward. Variable frequency drives can be deregulated by disconnecting a vacuum sensing hose or by navigating through the internal software and menus. Navigating through each manufacturer's menu options to disable vacuum regulation was also part of our trainings in February and again in May of 2015.

## **Research & Development**

### ***New York Farm Viability Institute (bulk tanks)***

QMPS laboratories began offering quantitative bacteria counts in June of 2014 for the coliforms, staph species, and strep species as part of the new bulk tank program. The previous bulk tank program only reported qualitative information about the presence or absence of bacterial organisms. This data along with the reports generated from this program has helped farms identify areas of opportunity for improving milk quality. Over 100 farms have enrolled in this program and more than 90% have re-enrolled. We are anticipating budget approval to begin the second phase of this program which will include on-farm training based on the information captured from this research.

Additionally, the sensitivity and specificity of the bulk tank in relation to individual cow mastitis pathogens has been evaluated by comparing the results of individual cow composite cultures and the bulk tank. There are 130 farms which have had herd milk surveys as well as bulk tanks reported. This data is being summarized to evaluate the sensitivity and specificity of the test.

### ***New York Farm Viability Institute (bedding)***

Bedding and its association to mastitis is a very important topic. The NYFVI has approved a project to evaluate two focal points. The first is to create a standard operating procedure (SOP) for sampling bedding and the second is to evaluate the association between bedding and mastitis. Currently, we have completed the sampling for phase I and are summarizing that data. We plan to sample bedding (e.g., manure solids, sand, sawdust, etc.) on herds throughout the state during the summer of 2016.

### ***Hetacin-K Comparison***

PhD student Dr. Amy Vasquez led a sponsored clinical trial comparing Hetacin K to Spectramast for the treatment of clinical mastitis. Six herds were involved in the study. The herds are distributed in major dairy-producing regions of New York State, with one herd in Northern New York (Jefferson Co.), two in Western New York (Wayne and Ontario Counties), two in Eastern New York (Washington Co.), and

one in Central New York (Cayuga Co.) and all QMPS labs participated. The trial measured the efficacy of these two antibiotics for treating various mastitis causing pathogens.

### **Research on Teat End Congestion**

Clinical Fellow, Dr. Matthias Wieland, is being mentored by QMPS professionals and working on a sponsored study to examine the association of teat shape and milking preparation and milk flow characteristics. As part of this, he has carefully described the changes in teat end congestion with precise ultrasound measurements of the teats between milking times.

### **Dry Cow Antibiotic Therapy**

QMPS has received funding from NY Farm Viability Institute to develop, evaluate, and implement selective dry cow antibiotic therapy (SDCT). Udder health is the largest reason for antibiotic use on a dairy with half that expense being for dry cows. Historically, blanket dry cow therapy (BDCT) was justified, but with advances in udder health management, SDCT has the potential to meet the public's expectation for judicious use. In year one, 600 cows from a NYS dairy eager to help the industry develop protocols for prudent antibiotic use will be enrolled.

Cows with <200,000 SCC on last test before dry and with <200,000 SCC average on the last three DHIA tests are at low risk for infection. All cows with  $\geq 3$  mastitis events or above these SCC cut-points will be treated with dry cow therapy (DCT) as they are at high risk for an infection. Cows at low risk will be randomly allocated to BDCT or internal teat sealant only. Milk samples will be obtained at dry date and at three days in milk. Statistical models will be used to compare first-test linear score and milk production, risk of culling, and risk of mastitis in the first 60 DIM. We expect that SDCT is not different from BDCT. For similar dairies, this will decrease dry cow antimicrobial use by 60%, reducing operational expenses, with almost no implementation cost, and lowering risks of antimicrobial resistance and residues. Based on the results of this applied research we will develop educational materials to implement this on other similar dairy farms in year two of this project.

### **AABP Research Presentation Award**

Dr. Amy Vasquez, a PhD student working with QMPS, won best graduate student research presentation at AABP in New Orleans based on the work that laid the foundation for our 24/7 program. \*Vasquez A, Nydam DV, Capel MB, Eicker S. Clinical outcome comparison of immediate blanket treatment versus a delayed pathogen-based treatment

protocol for clinical mastitis in a New York dairy herd. 48th Annual Conference of American Association of Bovine Practitioners. New Orleans, LA. September 2015.

### **Bulk Tank Monitoring Program**

In 2015, the Bulk Tank Monitoring Program continued to see a growth in enrollees across the state, including a few outside of New York. This program offers six quantitative counts of a producer's bulk tank over a one-year period with a single annual enrollment fee. This year, the NNYFVI project was able to assist by offering a subsidy of the enrollment fee to help offset the cost. Participants receive culture results and a report every other month to help monitor bacteria levels and Mycoplasma, as well as evaluate monthly Somatic Cell data. The response has been positive and we look forward to increasing the level of participation in this program in 2016.

---



---

## **Publications**

Operario DJ, Bristol LS, Liotta J, Nydam DV, Houpt ER. Correlation between diarrhea severity and oocyst count via quantitative PCR or Fluorescence microscopy in experimental cryptosporidiosis. *Am J Trop Med Hyg.* 2015, Jan 7;92(1):45-9

Fulton RW, d'Offay JM, Eberle R, Moeller RB, Van Campen H, O'Toole D, Chase C, Miller MM, Sprowls R, Nydam DV. Bovine Herpesvirus-1: Evaluation of Genetic Diversity of Subtypes Derived from Field Strains of Varied Clinical Forms and Their Relationship to Vaccine Strains. *Vaccine.* 2015, Jan 15;33(4):549-58

McArt JAA, Nydam DV, Overton MW. Hyperketonemia in early lactation dairy cattle: a deterministic estimate of component and total cost per case. *J Dairy Sci.* 2015; 98 (3): 2043–2054

Caixeta LS, Ospina PA, Capel MB, Nydam DV. The association of subclinical hypocalcemia, negative energy balance, and disease with body weight change during the first 30 days postpartum in dairy cows milked with automatic milking systems. *Vet J.* 2015, May; 204 (2):150-6

Mann S, Leal Yepes FA, Overton TR, Wakshlag JJ, Lock AL, Ryan CM, Nydam DV. Dry period plane of energy: effects on feed intake, energy balance, milk production and composition in transition dairy cows. *J Dairy Sci.* 2015; 98:3366-82

Huzzey JM, Mann S, Nydam DV, Grant RJ, Overton TR. Associations of peripartum analytes of stress, inflammation, and negative energy balance with milk yield and reproductive performance in Holstein dairy cows. *Prev Vet Med.* 2015; Jul 1;120 (3-4):291-7

Streeter RM, Struble AM, Nydam DV, Bauer J, Castellano M, Todhunter RJ, Cummings B, Wakshlag JJ. The associations between serum adiponectin, leptin, c-reactive protein, and insulin and serum long-chain omega-3 fatty acids in Labrador retrievers. *Vet Med: Res Reports*. 2015; 6: 103-110

Duplessis M, Mann S, Nydam DV, Girard CL, Pellerin D, Overton TR. Folate and vitamin B12 in colostrum and milk from dairy cows fed different energy levels during the dry period. *J Dairy Sci*. 2015; 98: 5454-5459

Plumed-Ferrer C, Barberio A, Franklin R, Werner B, McDonough P, Bennett J, Gloria G, Rota N, Welcome FL, Nydam DV, Moroni P. Antimicrobial susceptibilities and RAPD-PCR fingerprint characterization of *Lactococcus lactis* subsp. *lactis* and *Lactococcus garvieae* isolated from bovine intramammary infection. *J Dairy Sci*. 2015, 98: 6216–6225

McCarthy MM, Mann S, Nydam DV, Overton TR, McArt JAA. Concentrations of non-esterified fatty acids and  $\beta$ -hydroxybutyrate in dairy cows are not well correlated during the transition period. *J Dairy Sci*. 2015, 98: 6284–6290

Ollivett TL, Caswell J, Nydam DV, Duffield T, Leslie KE, Hewson J, Kelton D. Thoracic ultrasonography and bronchoalveolar lavage fluid analysis in Holstein calves affected with subclinical lung lesions. *J Vet Intern Med*. 2015 Nov; 29(6):1728-34

Watters RD, Bruckmaier RM, Crawford HM, Schuring N, Schukken YH, Galton DM. The effect of manual and mechanical stimulation on oxytocin release and milking characteristics in Holstein cows milked 3 times daily. *J Dairy Sci*. 2015 Mar;98(3):1721-9.

Scaccabarozzi L, Leoni L, Ballarini A, Barberio A, Locatelli C, Casula A, Bronzo V, Pisoni G, Jousson O, Morandi S, Rapetti L, García-Fernández A, Moroni P. *Pseudomonas aeruginosa* in Dairy Goats: Genotypic and Phenotypic Comparison of Intramammary and Environmental Isolates. *PLoS One*. 2015 Nov 25;10(11):e0142973.

Giordan JO, Stangaferro ML, Wijma R, Chandler WC, and Watters RD. Reproductive performance of dairy cows managed with a program aimed at increasing insemination of cows in estrus based on increased physical activity and fertility of timed artificial inseminations. *J Dairy Sci*. 2015;98(4):2488-2501.

Watters RD, Bruckmaier RM, Crawford HM, Schuring N, Schukken YH, and Galton DM. The effect of manual and mechanical stimulation on oxytocin release and milking characteristics in Holstein cows milked 3 times daily. *J Dairy Sci*. 2015; 98(3):1721-1729.

Cha E, Hertl J, Schukken Y, Tauer L, Welcome F, Gröhn Y. Evidence of no protection for a recurrent case of pathogen specific clinical mastitis from a previous case. *J Dairy Res*. 2015 Feb;83(1):72-80. doi:10.1017/S002202991500062X. Epub2015 Nov 16. PMID: 26568557

J. A. Kessels,\*1,2 E. Cha,† S. K. Johnson,\* F. L. Welcome,‡ A. R. Kristensen,§ and Y. T. Gröhn. Economic comparison of common treatment protocols and J5 vaccination for clinical mastitis in dairy herds using optimized culling decisions *J Dairy Sci*. In Press

## Trade Publications

Ospina PA, Santisteban C, Virkler PD, Moroni P, Welcome FL, and Nydam DV. Let milk cultures guide treatment. *Hoard's Dairyman*. February 2015 p. 140.

Moroni P, Welcome FL, and Virkler PD. *Prototheca* thrive on moisture. *Hoard's Dairyman*. May 2015 p. 376.

Virkler PD. Do your cows like being milked? *Hoard's Dairyman*. July 2015 p. 461.

Watters RD, Virkler PD. Milking time evaluations are more than just numbers. *Dairy Business East*. July 2015

Ospina PA, Welcome FL, Zurakowski M., Start culturing with the bulk tank. *Hoard's Dairyman*. October 25, 2015

Nydam DV, Vasquez A. Why are there no bugs in my milk culture. *Hoard's Dairyman*. December 2015 p. 782

Nydam DV, Welcome FL, Leone W. can you take your cows off the oxy juice. *Hoard's Dairyman*. September 2015 p. 598

McArt JAA, Nydam DV. 2015. The cost of subclinical ketosis. *Progressive Dairyman*. February, pp. 40-41

Watters RD. Lag time matters in milking routines. *Progressive Dairyman*. October 2015 pp. 41-42.

Watters RD, Ceglowski B, Thomas M. Link cows, people and equipment for milking efficiency. *Progressive Dairyman*. September 30, 2015.

Watters RD. QMPS: How did that water get in my milk? *Dairy Herd Management*. September 7, 2015.

Watters RD. Lag time matters in milking routines. *Progressive Dairyman*. May 7, 2015 p. 51.

Watters RD, Zurakowski M. Yeast won't make you dough. *Hoard's Dairyman*. March 25, 2015 p. 208.