



**Wisconsin Veterinary
Diagnostic Laboratory**
UNIVERSITY OF WISCONSIN-MADISON

Newsletter - Winter 2019

Director's Report



The Fall of 2018 flew by and we are still trying to catch our breath! Hopefully everyone had a chance over the holidays to take some time off and enjoy the season. In our Madison and Barron laboratories, we are looking forward to the Spring and are busy with projects and development of new tests that you can read about below.

We have been working hard on finding, testing, and purchasing a new Laboratory Information Management System (LIMS). We will be deploying this new system in 2019 that will greatly enhance the interface between WVDL and our clients. Stay tuned for news on the new LIMS! Other news below that I would like to point out are changes and new avian testing, BVDV diagnostic testing review, and the employee spotlight on Dr. Lorelei Clarke, a diagnostic pathologist at the Madison Laboratory.

I would like to highlight a very important moment in 2018 at WVDL. During our annual Bovine Genetics Export Meeting, we dedicated our boardroom to Ben Brancel. Mr. Brancel was instrumental in modernizing and developing the WVDL as we know it today as Secretary of the Department of Agriculture, Trade, and Consumer Protection (DATCP).

Ben was able to take a break from remodeling his house on the farm where he raises registered angus cattle to join us at the meeting and see the plaque that hangs in the Ben Brancel Executive Boardroom at the WVDL-Madison Laboratory. Thanks for everything you have done for WVDL, Sec. Brancel. (Below, Dr. Jim Meronek, President of the WVDL Board of Directors (left), presents Secretary Brancel with his honorary plaque.)



**On Wisconsin!
Keith Poulsen
Director**



AAVLD Update

American Association of Veterinary Laboratory Diagnosticians (AAVLD) Accreditation update:

The most recent WVDL AAVLD Accreditation site visit was completed in November 2018. The site visit report will be reviewed by the AAVLD Accreditation Committee in February 2019. We expect an updated accreditation to be awarded in March of 2019. Until then, a certificate showing an extended accreditation period is available on our website

<https://www.wvdl.wisc.edu>.

Staff Spotlight: **Dr. Lorelei Clarke, Diagnostic Pathologist**

1. Where are you from? What high school and college did you graduate from? What are your degree(s) in?

I was born and raised in Kaneohe, Hawaii. My parents were both marine biologists who worked for the University of Hawaii. We moved to Dallas, Oregon when I was a teenager and I finished high school there. I then moved to Fort Collins, Colorado, for 9 years and got my BS in Microbiology (2007) and DVM from Colorado State University (2012). After that I moved to



Buffalo, New York, and was an emergency small animal vet for a year before starting an anatomic pathology residency and graduate program at the University of Georgia in Athens. I passed my board exam in 2016 and graduated with my PhD last May 2018. This is also where I met my best friend and work-wife Betsy Elsmo, with whom I'm so happy to rejoin here at the WVDL!

2. When did you know that you wanted to become a diagnostic pathologist?

I went into veterinary school planning to be a researcher and was introduced to pathology in second year classes. Towards the end of vet school, I was oscillating between interests in pathology and internal medicine. Some time in practice and a few late night necropsies in the ER convinced me where I wanted to go. Diagnostic laboratories form the backbone of infectious disease outbreak response and herd medicine, and I'm excited to be a contributing member of a lab like this one that can provide tangible value to producers around the state. I still like to dabble in research, especially collaborative work with people from other scientific circles.

3. Rumor has it that you are an avid runner. How many marathons have you participated in and in what states/cities?

I have run a total of 18 marathons in 14 states and DC. My goal is to run a race in all 50 states before I'm 50. So far I've checked off Colorado (Ft Collins and Denver), Illinois (Chicago), Massachusetts (Boston), Alabama, North Carolina, South Carolina, Mississippi, Florida, Tennessee, Georgia, West Virginia, Missouri, Indiana, and Wisconsin.

4. What is one thing on your 'Bucket List'?

I don't really keep a bucket list since I keep being surprised by life circumstances. I guess my biggest goal would be to pay off my veterinary school debt.

5. What's the best piece of advice you've received?

Practice the way of the duck and let it roll off your back.

6. What was the best concert you ever saw?

Victor Wooten, Ft Collins, 2006. I was a trombonist in jazz, funk, and symphonic bands since high school, but I had dreams of being a bass player. Another good piece of advice I learned from one of his records: You can't hold no groove if you ain't got no pocket.

7. What is the worst-tasting food you've ever eaten?

It's really hard for me to turn down food! Most of my aversions are to weird textures, like water chestnuts.

8. What movie can you watch over and over and never get tired of? Monty Python's The Meaning of Life

9. Who has had the greatest influence on your life?

There are too many to name! I've been blessed to have a lot of strong, caring people in my life, and I would not be here without them!

10. What are your favorite 'pig-out' foods?

Mac n cheese, Mexican food from New Mexico, my boyfriend's eggplant curry

11. What is/are your favorite animal(s)? Why?

I really do love dogs, it's hard to imagine life without one. My dog Lucy and I try to get away for a weekend backpacking trip every year just the two of us. My PhD studies involved bottle raising white-tailed deer fawns, which was a fulfilling experience. Also horses who like to go fast.

12. What TV shows are you addicted to?

I don't watch a lot of TV, it's hard to sit still for that long. Scrubs and Southpark are all time favorites. Lately we've watched some of Bo Jack Horseman, Brooklyn 99, The Magicians, and The Handmaid's Tale.

Client Services

Media Price Changes

Beginning Feb. 1, Weybridge media used for culture of *Campylobacter fetus* will be seeing its first price increase in 10 years from \$4.50 per tube to \$5.00 per tube. Additionally, media and supplies will now have one rate for both in-state and out-of-state clients.

Blood Collection Tube Program

WVDL is launching a blood collection tube program and will be offering 9ml serum separator tubes, EDTA tubes, and no additive tubes (for ear notches). We receive discounted rates from one of our vendors that allows us to pass the savings of consumables on to our clients. Prices are listed below. By using these tubes, we benefit by getting consistent high quality samples in tubes that work well with automation and robotics for high through put testing. The tubes are all virtually unbreakable PET plastic

(Polyethylene terephthalate), which will eliminate occurrence of broken samples received in transit. The tubes are VACUETTE® brand made by Greiner Bio-One.

Order form is available on our website at - [WVDL Blood Collection Tube Order Form](#)

VACUETTE K3 EDTA Blood Collection Tube

- \$0.15 per tube
- Packs of 50 for \$7.50
- Case of 1200 for \$180.00

VACUETTE Serum Clot Activator Tubes

- \$0.20 per tube
- Packs of 50 for \$10.00
- Case of 1200 for \$240.00

VACUETTE No Additive Tubes *(for ear notches)*

- \$0.12 per tube
- Packs of 50 for \$6.00
- Case of 1200 for \$144.00

Microbiology

MG, MS and MM ELISA Tests and ELISA Panels Now Available

On January 15, 2019, the WVDL began offering three new avian serology ELISA tests at the Barron laboratory. We now have the following ELISAs:

- *Mycoplasma gallisepticum* (MG) ELISA - \$3.00
- *Mycoplasma synoviae* (MS) ELISA - \$3.00
- *Mycoplasma meleagridis* (MM) ELISA - \$3.00

In addition, we are offering these Mycoplasma ELISAs as a panel for the following prices:

- *Mycoplasma* ELISA panel 1 including MG and MS - \$5.00
- *Mycoplasma* ELISA panel 2 including MG, MS and MM - \$7.50

Changes in Price for Reo virus, MM, MG and MS Plate Agglutination Tests

Due to increases in the reagents required for these tests, we are announcing a pricing adjustment to Reo virus ELISA and the *Mycoplasma gallisepticum* (MG), *Mycoplasma synoviae* (MS) and *Mycoplasma meleagridis* (MM) plate agglutination tests. These prices will go into effect on February 1, 2019. We will be increasing prices on the following tests:

Reo ELISA from \$2.60 to \$3.00

MG Plate from \$1.66 to \$2.25

MS Plate from \$1.66 to \$2.25

MM Plate from \$1.66 to \$2.25

Government shutdown Causes Backorder of MS Plate Agglutination Antibody

Due to the U.S. Government shutdown, reagents that the WVDL requires to run avian serology testing have become backordered. In particular, the *Mycoplasma synoviae* (MS) plate agglutination antibody has been affected. The WVDL is beginning to run extremely low due to the lack of availability of the antibody required for this test. The company we purchase from has a new antibody lot available for distribution, but because of the shutdown, the process in conducting the quality control checks has been slowed drastically, leading to a shortage. We estimate, at our current usage, to only have approximately one week worth of antibody left. Therefore, we are requesting clients to plan ahead and determine if another test is a viable option for their testing needs. We suggest using the MS ELISA, which will provide titers. If you have any questions, please contact the Barron laboratory (715-637-3151).

New Avian Serology Panels Now Available

New avian serology panels were developed for ease of testing and to meet client needs. Starting February 1, 2019, the WVDL will be providing the following panels:

- *Mycoplasma* Plate Test Panel 1 including MG and MS Plate Tests - \$4.00
- *Mycoplasma* Plate Test Panel 2 including MG, MS and MM Plate Tests - \$6.00
- Turkey Panel 1 including BA, HE and NDV ELISA - \$7.50
- Turkey Panel 2 including ORT and Reo ELISA - \$5.00
- Chicken Panel 1 including AE, IBV and NDV ELISA - \$7.50
- Chicken Panel 2 including IBD, IBV, and NDV ELISA - \$7.50

Caseous Lymphadenitis (CL) ELISA Now Available

Additionally, the WVDL is finishing up the validation of a caseous lymphadenitis (CL) ELISA for goats and sheep. The WVDL plans to offer this test starting March 1 at \$9 per sample. The test will be run at the Barron location.

WVDL Collaborates with Others to Publish 'Genome Divergence and Increase Virulence of Outbreak Associated *Salmonella enterica* subspecies *enterica* serovar Heidelberg' in Gut Pathogens

The WVDL continues to see multi-drug resistant (MDR) *Salmonella enterica* subspecies *enterica* serotype/serovar Heidelberg infections in dairy beef calves and more recently beef steers and cows. To better understand this *Salmonella* isolate, the WVDL collaborated with

researchers at South Dakota State University (SDSU) and the SDSU Veterinary Diagnostic Laboratory. Whole genome based single nucleotide polymorphism based analysis of the isolates from the 2015 and 2016 multi-state outbreak of *Salmonella* ser. Heidelberg, which also had human cases confirmed in fifteen different states, were analyzed. It is believed the majority of human cases were caused by direct contact with dairy beef calves that were sick with active *Salmonella* ser. Heidelberg infection. Traditionally, *Salmonella* ser. Heidelberg was predominately a *Salmonella* serovar adapted to poultry. This publication defines the relatedness of the *Salmonella* ser. Heidelberg strains collected from many different hosts and also examined both virulence and antibiotic resistance genes. The 2015-2016 outbreak isolates did cluster together and were highly related. As compared to older *Salmonella* ser. Heidelberg isolates, the outbreak-associated strain had more antibiotic resistance genes and contained *Salmonella* atypical fimbriae (Saf) genes that were absent in other *Salmonella* ser. Heidelberg strains, which may have contributed to the increased disease severity of these strains in both humans and calves.

The publication can be found on our website at:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6304783/pdf/13099_2018_Article_279.pdf

For more information:

Centers for Disease Control and Prevention (CDC):

<https://www.cdc.gov/salmonella/heidelberg-11-16/index.html>

Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP):

https://datcp.wi.gov/Pages/News_Media/2016.11.29_SalmonellaHeidelberg.aspx.

Wisconsin Department of Health Services (DPH):

<https://www.dhs.wisconsin.gov/foodborne/salmonella.htm>

Wisconsin Veterinary Diagnostic Laboratory (WVDL):

<https://www.wvdl.wisc.edu/index.php/salmonella/>

How to Report a Pet Food Complaint

As a laboratory network member of the U.S. Food & Drug Administration (FDA) Veterinary Laboratory Investigation and Response Network (Vet-LIRN), we would like to encourage veterinarians to report pet food complaints using the following website:

<https://www.fda.gov/AnimalVeterinary/SafetyHealth/ReportProblem/ucm182403.htm>.

Vet-LIRN is a federal program that coordinates facilities, equipment and professional expertise of government and veterinary diagnostic laboratories across the U.S. and Canada, which can be used to respond to high priority chemical and microbial feed and drug contamination events. Along with collaborating with veterinary diagnostic laboratories, Vet-LIRN also works with referring veterinarians and pet owners to investigate cases of potential food borne or drug-associated illness in pets. For more information about the Vet-LIRN, please see

<https://www.fda.gov/AnimalVeterinary/ScienceResearch/ucm247334.htm>.

Brucellosis Fluorescence Polarization Assay now Available

As of December 1, 2018, the WVDL started offering the Brucellosis Fluorescence Polarization Assay (FPA). This test compliments our current Brucellosis testing options including the BAPA, Rivanol, antibody card, standard tube (STT) and complement fixation (CF) test. The test costs \$4 in-state, \$6 outside of Wisconsin and is performed daily as needed. Feel free to contact us with any additional questions.

Free Molecular Testing for Equine Colitis Panels for Adults and Neonates

The WVDL is continuing the process of validating an equine standard colitis real time PCR panel (> 3 months of age) and an equine neonatal colitis real time PCR panel (< 3 months of age). These panels include the following pathogens.

1. Equine Standard Colitis Panel which includes: Coronavirus, Clostridium difficile toxin A & B, Lawsonia intracellularis, Neorickettsia risticii, *Salmonella* species real time PCRs.
2. Equine Neonatal Colitis Panel: Coronavirus, Rotavirus, Clostridium difficile toxin A & B, Lawsonia intracellularis, *Salmonella* species, Clostridium perfringens, Rhodococcus equi, Cryptosporidium species real time PCRs.

We are extending the free testing until the end of January and looking for clients to send equine colitis fecal samples. Please use [this submission form](#) and send a request for a return label to supply.room@wvdl.wisc.edu and indicate you are receiving free testing for equine colitis. We hope to have this test available at WVDL in the coming months.

Johne's Antibody ELISA kit will Change Starting February 1, 2019

Microbiology serology section has completed an evaluation of a new Johne's antibody ELISA assay in an effort to provide the most reliable and cost effective results to our clients. Beginning around February 1, 2019, WVDL will begin using the VMRD Johne's antibody ELISA kit instead of the Zoetis kit for bovine and caprine serum samples. The VMRD Johne's antibody ELISA kit has increased specificity and sensitivity compared to previous manufacturers. The change in kit manufacturer will not result in a change in cost and the test will be run on the regular Johne's ELISA schedule. The Johne's antibody ELISA produced by IDEXX will be used for all bovine milk samples submitted to the WVDL. Feel free to contact the lab with any questions.

Virology

BVDV Testing Revisit

WVDL offers several diagnostic assays for reliable detection of bovine viral diarrhea virus (BVDV). The choice of diagnostic assay as well as the sample type used for BVDV testing is greatly influenced by the nature of the infection, i.e. transient infection versus persistent infection.

Transient (acute) infections are characterized by low levels of virus so the leukocytes in a whole blood sample provide the best chance of finding BVDV. Because of these low viral loads, the individual real-time PCR assay on a whole blood sample is the most sensitive and rapid assay. Virus isolation is another assay appropriate for transient infections but is a time consuming assay (minimum of 7-10 days) and has the potential for maternal antibody interference.

Persistent infection (PI) can be detected by real-time PCR using individual or pooled samples. Pooling (up to 24 animals/pool) significantly reduces testing costs but is only possible because of the high viral load found in PI animals. Following a positive pool result, individual samples within a positive pool are tested to identify the positive animal(s). The Ct

value (usually in the 20's) of an individual PCR indicates PI status but the animal should be re-tested in 3-4 weeks to confirm. Whole blood, ear notches or nasal swabs can be used for animals less than 2 months old. Serum can also be used once animals are older than 2 months.

For large herd testing, we encourage you to submit nasal swabs using the BVD Nasal Swab Kit (96-well format), which is designed for high throughput testing at WVVDL. BVD Nasal Swab Kit can be used for pooled samples (up to 24/pool) testing or for individual PCR at discounted pricing. Detail of sample collection using the BVD Nasal Swab Kit can be found on this video at <https://youtu.be/oG666ivbHg8>. Contact the virology lab if you are interested; we will send you the first kit free of charge to try out.

For abortion cases, placenta and fetal tissues tested by real-time PCR can have high level of virus load (Ct values in the 20's) in severe acute infections. Clients are reminded to include a fetal and dam ear notch for diagnostic testing in abortion cases. An ear notch can help distinguish between persistent infection and transient infection in abortion cases.

WVVDL also offers antigen capture ELISA (ACE) for detection of persistent infection, specifically for regulatory testing requirements. A negative ACE test only indicates the animal is not a PI, but does not provide information about transient infection status. ACE is not sensitive enough to detect low viral load associated with transient infection. Ear notch is the acceptable sample type for all ages, while serum is only acceptable for animal > 3 months old to avoid maternal antibody interference with ACE assay. Whenever the regulation permits, we recommend using real-time PCR assay, which is more sensitive, less expensive and has a shorter turnaround time.

Serum neutralization (SN) assay is the test used for detecting neutralizing antibody titer to type-1 and type-2 BVDV. SN can be used to detect antibody against BVDV from vaccination or from natural exposure. Acute and convalescent serum samples taken about 2-3 weeks apart can be submitted for paired testing. *This time spacing will help monitor any significant changes in antibody titers. Store the acute sample in a refrigerator and submit with the convalescent when taken. This ensures that the samples are set up on the same assay run.* A recent exposure is indicated by a greater than 4 fold rise in antibody titer.

A summary of the tests offered at WVVDL and sample type requirement is shown below.

Transient/Acute Infection (detection of virus)

Recommended Test: Individual PCR

- Could also use Virus Isolation

Recommended Sample Type: Whole Blood

- **NOTE:** Detection of acute infection requires use of whole blood because this sample contains white blood cells.

Inappropriate sample types: ear notch & serum

Persistent Infection (detection of virus)

Recommended Test: Pool PCR (screening herds) or Individual PCR

- Could also use Antigen Capture ELISA (ACE) or VI.
- NOTE: May be subject to maternal derived antibody interference. ACE should only be used for regulatory testing.

Recommended Sample Type: Nasal swabs, Whole blood, Ear notch, Serum

- NOTE: Serum only suitable for animals >9 wks old.

Inappropriate sample types: Serum in animals < 9wks due to potential immune clearance and ear notch contaminated with tattoo ink

Testing for antibody

Recommended Test: Serum Neutralization (SN)

- NOTE: SN samples should be taken 2-3 weeks apart for paired testing.

Recommended Sample Type: Serum

Sample Submission Reminder Guidelines

1. Serum samples:

- WVDL recommends serum separator tubes (aka tiger top tubes) over the non-additive red top blood tubes. Serum separator tubes help reduce hemolysis of samples and provide cleaner serum for testing.
- Currently we supply serum separator tubes at a very low cost. They can be ordered here: <https://www.wvdl.wisc.edu/index.php/forms/>

2. Nasal swab samples for BVDV PCR:

- WVDL recommends using the BVD Nasal Swab Kit for large submission of BVDV PCR testing.
- Currently we will supply the first kit free of charge for you to try out, please contact us to request the kit. They can also be ordered here: <https://www.wvdl.wisc.edu/index.php/forms/>

Barron

First Annual Poultry Conference

Cameron, Wis. will be the site of the First Annual Poultry Conference on May 29, 2019 from 8 a.m. - 4 p.m.. The morning focus will be on addressing disease prevention and biosecurity (with Veterinarian Credits and Veterinary Technician Credits available). The afternoon will offer an interactive multi-agency emergency response tabletop exercise. Registration will be available beginning in March, 2019.

Reminder

Submitting samples in gloves is **NOT** an acceptable container to utilize for sample submission. Please visit our [website](#) for specific information on [submitting](#) and shipping samples.

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