



Wisconsin Veterinary Diagnostic Laboratory

UNIVERSITY OF WISCONSIN-MADISON

Newsletter - Fall 2018

Message from the Director



Hello from all of us at the WVDL! We hope your fall is going well and harvest has not been negatively impacted by the flooding in several parts of the country. We have heard about several different issues with the corn crop in Wisconsin so please feel free to contact us about feed testing or any other issues that you may be dealing with due to the wet weather.

At WVDL we have been busy with an important project to replace our aging Laboratory Information Management System (LIMS). This will require 1-2 years to fully implement and deploy. We are excited about how it should vastly improve the interface with our clients and the workflow within the laboratory.

In this newsletter, you will find new information and reminders for diagnostic testing in our testing sections. We also have some testing statistics and antimicrobial susceptibility data that you might find helpful. We also report on our new staff, an interview with Brianna in IT, and the happy (but sad for WVDL) retirement of Dave Krueger after 36 years of service.

One last piece of news is that our CWD testing section is ramping up for full capacity as the deer hunting season is in full swing. Check out our Facebook page for a Facebook Live post from the Wisconsin DNR that walks through our CWD testing process. WVDL provides all of Wisconsin wild harvested and captive cervid CWD testing.

Dr. Ailam Lim Hired as Virology Section Head

Dr. Ailam Lim was named the WVDL's Section Chief of Virology in August. She holds a second appointment as a Clinical Assistant Professor with the Department of Pathobiological Sciences in the University of Wisconsin- Madison School of Veterinary Medicine.

Dr. Lim was born and raised in Malaysia, before moving to the United States in 2000. Her BS in Microbiology (1995) and MS in Molecular Virology (1998) degrees were obtained from the University of Malaya; and she spent several years of post-graduate work on Dengue virus research at the University of Malaysia Sarawak, on the Island of Borneo. She earned her PhD in Pathobiology (2010) at Michigan State University.

From 2001, she spent 15 years working at the VDL at Michigan State University, her primary role being in molecular assay development. She held the position as Virology Section Head at Brethitt Veterinary Center for two and a half years prior to coming to the WVDL.



Barron

Personnel from Barron decided to staff an information and education table at area County Fairs this past summer. The WVDL had a presence at four local fairs: Barron, Rusk, Sawyer and Washburn Counties. Information was provided on lab locations, hours of operation and services offered including the following brochures: The Tick APP, Poultry Health, Surgical Biopsies, Bovine Health and Genetic Export. In addition, several specimens (in formalin) were on display to generate interest in animal science among the students attending the fairs.

The Barron Lab is open Monday through Friday 7:45 am – 4:30 pm. and staffs a full -time pathologist, Holly Taylor, DVM, who is also available to answer questions.

The Barron staff had a lot of fun explaining the various specimens to children of all ages and seeing them become excited about what they were seeing and hearing. Questions were answered regarding what the WVDL does and the various services the lab offers both in Barron and Madison.



Client Services

In the last few months we've welcomed several new members to our section: Choua Xiong, Kim Vandenburg, and Taylor Truttmann. Choua joined the sample receiving team with previous accessioning and specimen processing experience at Exact Sciences, Kim is also in sample receiving and graduated from the Surgical Technician Program at MATC, and Taylor is the new face at the front desk with ten years of customer service experience.

The Client Services department has three Core Values:

1. We are committed to open communication, ongoing collaboration, and mutual respect.
2. We are the front line of quality and reliable results for WVDL.
3. As a team, we provide exceptional customer service to external and internal clients.

Recently we've been able to formally strengthen these values through courses offered at UW ALPS and Thrive@UW. We're so grateful to work on a campus that provides accessible workshops focused on team building and professional development.



Microbiology

Equine Colitis Panels are being validated- your help is needed! The WVDL is in the process of validating an equine standard colitis rtPCR panel (> 3 months of age) and an equine neonatal colitis rtPCR 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* spp real time PCRs.
2. Equine Neonatal Colitis Panel: Coronavirus, Rotavirus, *Clostridium difficile* toxin A & B, *Lawsonia intracellularis*, *Salmonella* spp., *Clostridium perfringens*, equi *Rhodococcus*, *Cryptosporidium* spp.

***Tritrichomonas foetus* Testing:** The WVDL would like to remind clients that bovine genital washings should be submitted in the Biomed InPouch™ TF transport medium. Samples must arrive at the lab within 48 hours of collection and should be maintained around room temperature in transport and in the dark. The InPouch™ TF Bovine is available through the WVDL by filling out the media request form (link below) and emailing supply.room@wvdl.wisc.edu.

<https://www.wvdl.wisc.edu/wp-content/uploads/2018/05/MICROBIOLOGYMEDIAFORM.pdf>

When submitting InPouch™ samples, please indicate if you require direct exam, which is an immediate microscopic analysis of the pouch, culture and/or PCR. The direct exam is performed when the genital washing is in the upper portion of the InPouch™. Unless requesting a direct exam, please make sure to expel the genital washing from the upper compartment into the media in the lower compartment. If you require both culture and PCR, please submit two InPouch™ samples. As a general rule, interstate travel requires PCR, while international travel requires culture. It is important to check the regulatory authority prior to samples submission.

The *T. foetus* culture takes 6 days. However, the PCR has a faster turnaround time, it is important to note that the PCR does require a 24-hour incubation prior to sample processing for PCR. PCR is currently run on Tuesdays and Thursdays. Additionally, please do not send genital washing samples in the Biomed TF Transit tubes. When validating this transport tube we observed a 6 CT loss in sensitivity and therefore the WVDL recommends all clients use the InPouch™ transport media even for PCR testing.

Johne's Testing: The WVDL would like to thank all the clients who have transitioned from the Johne's Testing Center to the WVDL for their Johne's disease diagnostic testing needs. After 28 years in the business of servicing the Johne's disease testing needs of veterinarians and animal owners across the country, the Johne's Testing Center (JTC) housed at the UW School of Veterinary Medicine under the direction of Dr. Michael Collins closed as of September 1. As clients continue to shift their testing here, please contact us with any questions you may have.

Bovine Respiratory Disease Update: As the temperature cools, BRD risk increases. The WVDL collects data on submitted respiratory samples in order to trend what pathogens are being detected and for antibiotic resistance. The WVDL evaluated 1,432 samples for respiratory viruses and bacteria using molecular diagnostics (Table 1) for bovine respiratory syncytial virus, respiratory corona virus, viral diarrhea virus, herpes virus, *Mycoplasma bovis*, *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*. The greatest percentage of positive samples were for *P. multocida* (30.3%), *M. bovis* (24%) bovine respiratory corona virus (24%), *M. haemolytica* (22.2%) and *H. somni* (17.8%). Despite a high detection rate for *M. bovis*, *M. bovis* positive samples decreased 5.8%, while bovine respiratory corona virus increased 4.1%. Due to the recent inclusion of bacterial organisms into this panel, we are unable to evaluate changes since 2016.

TABLE 1: Real time PCR positive samples for viruses (1432 submissions)

<u>Respiratory Pathogen</u>	<u>No. Positive</u>	<u>% Positive</u>	<u>Change from 2016</u>
Bovine respiratory syncytial virus	129	9.0%	Increase by 2.1%
Bovine respiratory corona virus	344	24.0%	Increase by 4.1%
Bovine viral diarrhea virus	42	2.9%	Increase by 1.1%
Bovine herpes virus 1	32	2.2%	Decrease by 0.1%
<i>Mycoplasma bovis</i>	344	24.0%	Decrease by 5.8%
<i>Histophilus somni</i>	255	17.8%	N/A
<i>Mannheimia haemolytica</i>	318	22.2%	N/A
<i>Pasteurella multocida</i>	434	30.3%	N/A
<i>Bibersteinia trehalosi</i>	79	5.5%	N/A

In addition, the WVDL also performed culture for bacteria organisms. Culture for *M. bovis* is performed when the submitting veterinarian submits only a swab stored in bacterial transport media; therefore, we did not include the culture rates for *M. bovis* as very few cultures were attempted. Bacteriology evaluated 1727 samples (Table 2). The greatest percentage of positive cultures were for *Pasteurella multocida* (23.6%) or *Mannheimia haemolytica* (15.3%).

TABLE 2: Culture positive samples for bacterial BRD pathogens (excluding *Mycoplasma*, 1727 samples).

<u>Bacterial Pathogen</u>	<u>No. Positive</u>	<u>% Positive</u>	<u>Change from 2016</u>
<i>Histophilus somni</i>	123	7.1%	Decrease by 0.4%

	408	23.6%	Increase by 4.1%
<i>Mannheimia haemolytica</i>	264	15.3%	Increase by 2.8%
<i>Bibersteinia trehalosi</i>	18	1.0%	Decrease by 1.7%
<i>Salmonella</i> species	116	6.7%	Increase by 0.1%
<i>Gallibacterium anatis</i>	9	0.5%	Decrease by 0.5%
<i>Trueperella pyogenes</i>	132	7.6%	Decrease by 0.4%
<i>Escherichia coli</i>	145	8.4%	Decrease by 7.3%

Additionally, the WVDL performs susceptibility testing using minimum inhibitor concentrations (Table 3). Notably, we observed significant reduction in susceptibility for *B. trehalosi* to neomycin (13%) as compared to 2016. Additionally, we observed significant reduction in susceptibility for *P. multocida* to gamithromycin (8%) as compared to 2016. We observed significant reduction in susceptibility for *M. haemolytica* to ampicillin (3%), penicillin (13%), tilmicosin (12%), tulathromycin (11%), chlortetracycline (8%) and for *H. somni* to tilmicosin (10%) and tulathromycin (4%), as compared to 2016. For *E. coli*, we observed a reduction in susceptibility to sulphadimethoxine (3%) while we observed a reduction for *Salmonella* species to chlorotetracycline (2%) and oxytetracycline (1%) as compared to 2016.

TABLE 3: Percent susceptibility of a microorganisms to the antimicrobials listed using the Clinical Laboratory Standards Institute (CLSI) breakpoints for minimum inhibitor concentrations (MIC). The table below represents data from all samples and was not exclusive to respiratory samples. Therefore, many *E. coli* and *Salmonella* species were isolated from feces or other sample types.

Antimicrobial	Microorganisms					
	<i>P. multocida</i>	<i>M. haemolytica</i>	<i>H. somni</i>	<i>E. coli</i>	<i>Salmonella</i> spp	<i>B. trehalosi</i>
Ampicillin	99%	87%	100%	46%	64%	80%
Ceftiofur	100%	99%	99%	60%	NI	NI
Chlortetracycline	96%	84%	98%	35%	57%	50%
Clindamycin	0%	0%	45%	0%	0%	0%
Danofloxacin	100%	100%	NI	NI	NI	NI
Enrofloxacin	92%	78%	91%	NI	NI	NI
Florfenicol	95%	89%	99%	12%	45%	77%
Gentamicin	92%	86%	100%	84%	100%	97%
Neomycin	54%	75%	4%	65%	84%	67%
Oxytetracycline	67%	71%	63%	34%	58%	17%
Penicillin	95%	57%	93%	0%	0%	0%
Spectinomycin	76%	79%	74%	3%	0%	0%
Sulphadimethoxine	59%	73%	61%	35%	42%	73%
Tiamulin	72%	91%	98%	1%	0%	87%
Tilmicosin	73%	73%	70%	0%	0%	80%
TMP/Sulfa*	0%	96%	100%	68%	92%	NI
Tulathromycin	89%	81%	72%	NI	NI	NI
Tylosin (Tartrate/Base)	3%	0%	76%	NI	NI	NI

*TMP/Sulfa- trimethoprim/sulfamethoxazole

TKT Media no longer available: In evaluating safety at the WVDL, we have decided to discontinue the sale of thallium crystal/krystal violet toxin (TKT) media used mostly for the identification of *Streptococcus agalactiae* from mastitis and bulk tank milk samples. We have found a comparable product for purchase and therefore, no changes to the mastitis or bulk tank milk cultures has occurred. We apologize for any inconvenience this has occurred. If you have any questions or concerns, please contact the WVDL (608-262-5432).

Mycoplasma bovis ELISA discontinued: The WVDL has discontinued the *Mycoplasma bovis* ELISA effective October 15, 2018. The kit that was received recently has not passed validation, and therefore, the WVDL has deemed that it is not fit for testing. We apologize for any inconvenience this has created. The WVDL continues to offer *M. bovis* PCR and *Mycoplasma* culture from various sample types including swabs, tissues, milk and semen. If you have any questions or concerns, please contact the WVDL (608-262-5432).

Changes in Brucellosis Testing: Starting December 1, 2018, the WVDL will be 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. In an effort to consolidate Brucellosis testing, starting November 1, 2018, Brucellosis testing will be discontinued at our Barron laboratory and all Brucellosis testing will be performed at the Madison laboratory. Samples can be sent to the Barron location, who will forward them onto the Madison location with a single day delay. Feel free to contact us with any additional questions.

Staff Spotlight: Brianna Miller, IT Help Desk Analyst

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

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- 2. What would your dream job be?
 - Professional puppy snuggler
- 3. What is one thing on your bucket list?
 - Have a pathologist at a veterinary diagnostic lab let me look at slides with them and explain what's going on in terms an IT person with no biology background would understand. *HINT*
- 4. What fictional place would you most like to go to?
 - Skyrim, Tamriel
- 5. What's something that you've been meaning to try but just haven't gotten around to?
 - Pay off my student loan
- 6. Describe your perfect ice cream sundae (ice cream flavor(s), toppings, etc.)
 - Ice cream sprinkles with a dollop of vanilla ice cream.
- 7. What's the best piece of advice you've ever received?
 - Turn it off and back on again.
- 8. What would your spirit animal be and why?
 - My dog Digglet - because I get bored easy and if you leave pizza unattended, I'm gonna eat it.
- 9. What was the best concert you ever saw?
 - Neutral Milk Hotel
- 10. What was your favorite pet growing up? (If you didn't have a pet, what pet did you always want?)
 - Bubba the guinea pig
- 11. What is one of your biggest pet peeves?
 - Gossip
- 12. What is one song that you've completely memorized?
 - "Barbra Streisand" by Duck Sauce



Virology

Sample Submission Reminder Guidelines

1. Acute and convalescent samples:

- When submitting samples for paired testing, it is best to send samples that are drawn approximately 2 weeks apart. 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

2. Avian samples

- For Gallinaceous Poultry (chickens, turkeys, pheasant, quail), submit oropharyngeal swabs. You may pool up to five swabs in 3 ml of viral transport media or up to 11 swabs in 5.5 ml of viral transport media.
- Here is a link to the WVDL Avian Swab kit for PCR order form: <https://www.wvdl.wisc.edu/wp-content/uploads/2017/04/AvianSwabKitOrderForm.pdf>

3. For all samples:

- Swab samples: WVDL recommends using viral transport media or sterile saline for any PCR testing.
- Samples should be sent on ice, overnight to WVDL, using our low-cost UPS shipping.
- See <http://www.wvdl.wisc.edu/index.php/optimize-your-diagnostic-testing-using-the-best-transport-media/> for more information.
- Fecal samples for Enteric PCR testing should be submitted, individually, in leak-proof containers. Specifically, exam gloves **MUST NOT** be used for submission of fecal samples! Currently we provide the 2oz sterile locking vials, free of charge, and they can be ordered here: <http://www.wvdl.wisc.edu/wp-content/uploads/2017/01/VETERINARYSUPPLIESORDER.pdf>
- Please contact WVDL for larger submissions so we can provide racks and insulated shippers.

first assay we are working on is validation to a larger platform for BVD PCR. This means that we will be able to perform testing on up to 384 samples at a time, which is 4 times more than we currently have the capacity to run. Due to this efficiency, we may move to testing BVD PCR three times a week. We will update our clients as we continue to move in this direction.

NAHLN: On August 20-23, 2018, WVDL participated in a tabletop Exotic Newcastle Disease outbreak scenario exercise. This exercise was designed to introduce an escalating outbreak of END in North America and address a variety of injects over several days. Specific goals were to determine the following:

- Provide an opportunity for laboratories to exercise their capability to enact enhanced biosafety protocols and identify any resource gaps impacting this.
- Practice coordination of communications between the laboratory and various entities involved with the laboratory during an outbreak situation.
- Identify resource gaps for outbreak response at the biosafety/biosecurity, technical and laboratory policy levels.

Staff Update: On Sept. 7, 2018, after 36 years with the State of Wisconsin, Dave Krueger retired from WVDL. Dave has been an integral part of the WVDL team since 1985. He was the go-to person for problem solving when clients encountered issues with their cases.

Dave went to great lengths to meet client expectations on a daily basis by consulting with clients on the phone regarding submissions and test results. Throughout Dave's 36 years of service, his many work flow improvements and efficiencies have led to improved customer service to the veterinarians, genetic industry leaders, businesses and farmers of Wisconsin.

We wish Dave well in retirement!



Pathology Science

Taurine Testing Update: Our testing caseload for the amino acid, Taurine, has risen sharply in recent months due to some important findings from several veterinary cardiologists about Dilated Cardiomyopathy (DCM) associated with grain-free boutique dog food diets. The Food and Drug Administration (FDA) is actively pursuing these findings for which the potential causes are not absolutely clear at this time.

There are two laboratories in the United States that perform taurine testing: the WVDL in Madison, Wis., and the University of California-Davis Amino Acid Laboratory in Davis, Calif. These two laboratories use different methodologies to prepare samples and to quantitate taurine.

In the past few weeks, we have had several questions as to why WVDL results are not the same as a result from UC-Davis. As part of our robust quality system, when we get inquiries about testing we always perform a thorough investigation to ensure our test results are reliable and accurate. At this point we will be temporarily suspending the taurine analysis assay. We plan to conduct a thorough Root Cause Analysis to reassess the analytical sensitivity and specificity of our method and instrumentation. We expect this process to take several months and will notify clients when the assay is back on-line.

Please send all samples for taurine analysis directly to the UC-Davis Amino Acid Laboratory. All samples received by WVDL will be referred to UC-Davis and clients will be charged \$76.00 for the analysis, a \$10.00 accession fee and \$20.00 referral fee.

If you have any questions regarding taurine testing, please don't hesitate to contact us.

TSE Testing: White-tailed deer archery season in Wisconsin opened September 15th and we are focusing heavily on decreasing turn-around time on Chronic Wasting Disease (CWD) test results for hunters that have the opportunity to harvest a deer. We work closely with the Wisconsin Department of Natural

hunter in the Wisconsin.

We also worked with the WI DNR to produce a [live video](#) on the details of the rapid test we employ to diagnose CWD. Please feel free to contact Dan Barr if you are interested in learning more about the process.

When Submitting Forensic and/or Insurance Claim Submissions: We have a new submission form that MUST be used for all legal, potentially legal or insurance claim cases -- [Forensic and Insurance Claim Submission Form](#). Submissions that involve possible litigation require a significant investment of time and resources by all sections at WVDL in order to provide results of sufficient detail for legal proceedings (including but not limited to chain of custody documentation, photodocumentation, in-depth interpretation, radiography, etc.). All other pathology cases can be submitted using the [General Submission Form](#).

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