



**OADDL**  
College of Veterinary Medicine



# 20 ANNUAL 23 REPORT

Diagnostic *Excellence* SINCE 1975

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Cover photos courtesy of Harley Fletcher, Meagan Garris, and Megan Loane.

# ACCREDITATION

The Oklahoma Animal Disease Diagnostic Laboratory is accredited as a full service laboratory for all species by the American Association of Veterinary Laboratory Diagnosticians (AAVLD).

Current certification expires December 31, 2024. A re-accreditation site visit has been scheduled for the last week of August 2024.



## MISSION STATEMENT

The Oklahoma Animal Disease Diagnostic Laboratory promotes human well-being through engagement in One Health and conducting diagnostic testing, instruction of professional veterinary students, and research on zoonotic and economically important diseases in Oklahoma and beyond.

## VISION STATEMENT

The Oklahoma Animal Disease Diagnostic Laboratory will be recognized as a leader in One Health and veterinary diagnostics through excellence in diagnostic service, research efforts to improve animal disease testing and surveillance, and sustained accreditation by the American Association of Veterinary Laboratory Diagnosticians.

# MESSAGE FROM THE DIRECTOR

We are delighted to share with you some of OADDL's achievements in 2023 through this annual report. Although OADDL, like many other laboratories, continued to experience some headwinds from inflation and staff hiring/retention difficulties, we had another year of strong productivity and expansion of services. The outstanding dedication and hard work of our amazing staff and faculty is responsible for a very successful year. I could not be happier serving as OADDL Team Leader. A special shout out to the faculty from the Department of Veterinary Pathobiology who provide parasitology and pathology services at OADDL, while training veterinary students and residents. I also wish to thank our clients and stakeholders for your partnership and support of our mission either through the diagnostic and surveillance cases you submit or through your advocacy for us with OSU Administration and State government. Major accomplishments in 2023 include:

- Implementation of an online submission process which allows clients logged into our client portal to pick services from our online catalog and build a submission form instead of hand-writing on paper submission forms. It also streamlines the receiving and data entry processes in the laboratory by eliminating the test selection step and typographical errors resulting from difficulties deciphering submitters' handwriting. We encourage our clients to use this new streamlined sample submission process.
- The state serology laboratory previously run by the Oklahoma Department of Agriculture, Food and Forestry (ODAFF) was integrated into OADDL in July 2023. The transition went smoothly and no issues were reported by any of the new clients. Taking responsibility for this additional service increased OADDL Serology test numbers by about 50%.

- OADDL onboarded a new industry client – a specialty veterinary pathology company – to provide a service preparing histology slides for them. Addition of this new service in the last 8 months of the year resulted in a growth of over 85% in Histology test numbers.
- OADDL continues to play a role in One Health through its partnership with the Oklahoma State Department of Health to undertake rabies and West Nile virus surveillance testing.

The first part of this report is rich with content we believe our clients can use, such as disease prevalence and anti-microbial susceptibility data. It also contains several metrics that portray how the lab is doing. Overall, in spite of the head winds of rising operational costs and recruitment/retention difficulties, the state of OADDL is strong. We look forward to continue providing our clients, sponsors, and stakeholders with timely and accurate test results. Immense thanks for your partnership and support. Enjoy our 2023 report.



**Jerry T. Saliki, DVM,  
PhD, DACVM**

*Professor and Director*

# WHAT OUR STAKEHOLDERS SAY ABOUT US

Thank you so much for the urgency! You guys are amazing!

– PROFESSIONAL ANIMAL HEALTH CENTER

05.19.2023

I also want to tell you that I have been very pleased with the customer service from all the personnel I have encountered at OADDL. You and they have been so very helpful with getting our account setup and diagnostic questions and we look forward to sending you more cases.

– ANONYMOUS

06.09.2023

Allison was patient with my elderly parents and assisted us with directions. She was kind and compassionate!

– OWNER'S DAUGHTER

07.14.2023

I will be displaying the paw print next to my pets' ashes. Thank you so much.

– CHRISTINE HANCOCK

05.12.2023

Everyone was kind and patient with me. I was very impressed.

– SUE GREEN

09.01.2023

Emily, Thank you so much for giving your time and expertise to show our visitors from the EU around OADDL last week. We sincerely appreciate everything you and your team do for Oklahoma agriculture, and we know how lucky we are to have you all as partners.

– JANLEE ROWLETT

10.09.2023

These slides are gorgeous. You guys are literal masters! Thank you so so so much!

– DR HARRISON

09.08.2023

You have gone above and beyond- thank you!

– DR JENNIFER THOMAS

10.24.23

Thank you so much for always going above and beyond to help us out at ODAFF and keep commerce moving. You are greatly appreciated.

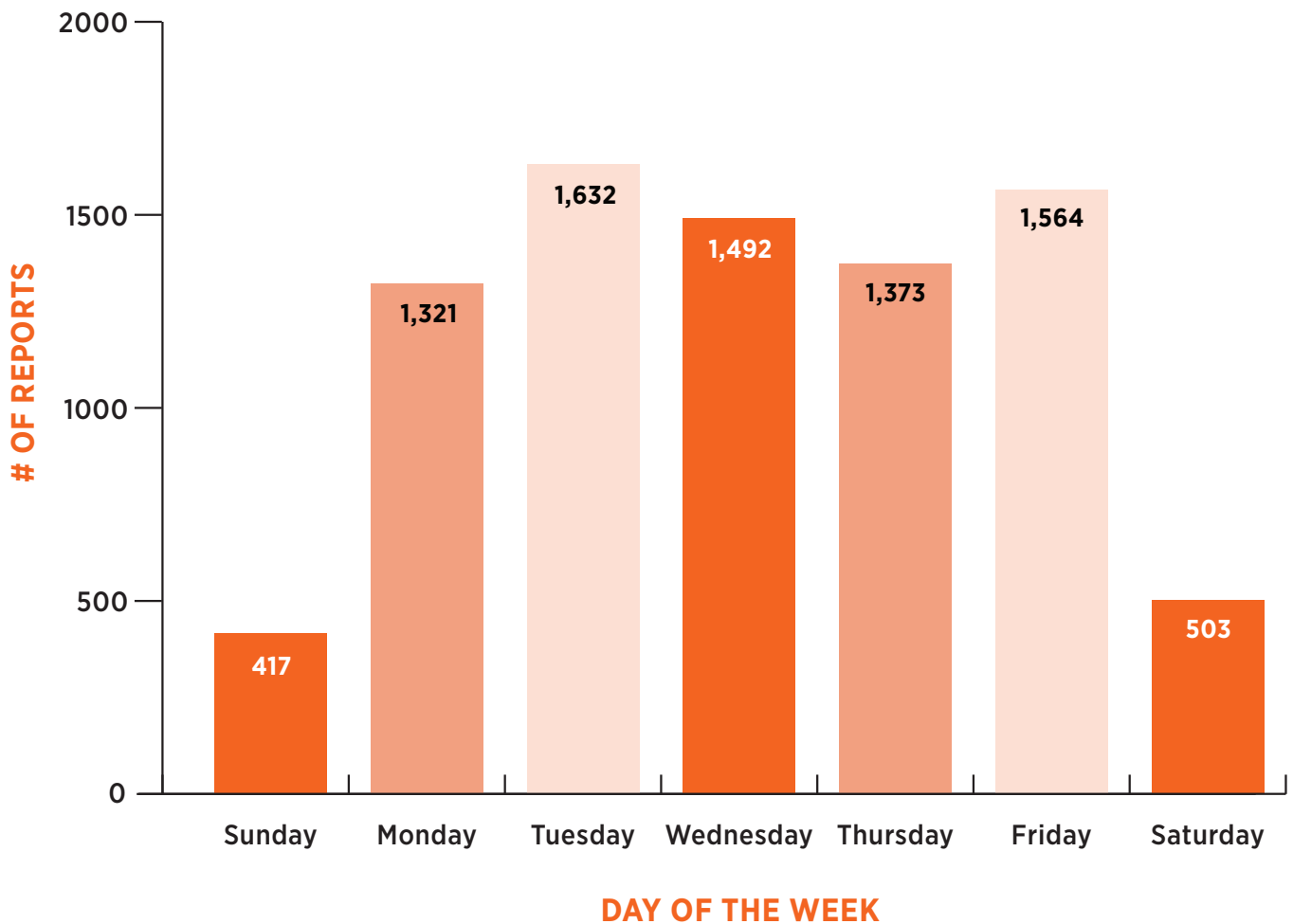
– DR BETH RUBY

12.11.23

# CLIENT SERVICE BEYOND BUSINESS HOURS

CY 2023

## NUMBER OF AFTER-HOUR REPORTS



TOTAL NUMBER OF AFTER-HOUR REPORTS IN 2023: **8,302**

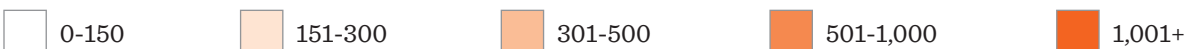
# COUNTIES OF OKLAHOMA SERVED

**CY 2023**

COUNTY	# OF ACCESSIONS
Adair	163
Alfalfa	98
Atoka	185
Beaver	85
Beckham	282
Blaine	129
Bryan	247
Caddo	269
Canadian	443
Carter	401
Cherokee	151
Choctaw	194
Cimarron	4
Cleveland	564
Coal	91
Comanche	394
Cotton	134
Craig	78
Creek	393
Custer	128
Delaware	66
Dewey	201
Ellis	167
Garfield	673
Garvin	484
Grady	297
Grant	157
Greer	52
Harmon	191
Harper	87

COUNTY	# OF ACCESSIONS
Haskell	126
Hughes	533
Jackson	208
Jefferson	303
Johnston	115
Kay	384
Kingfisher	165
Kiowa	196
Latimer	276
Le Flore	219
Lincoln	651
Logan	608
Love	110
Major	151
Marshall	129
Mayes	238
McClain	696
McCurtain	292
McIntosh	209
Murray	145
Muskogee	392
Noble	379
Nowata	73
Okfuskee	123
Oklahoma	2,591
Okmulgee	289
Osage	144
Ottawa	170
Pawnee	255
Payne	6,284

COUNTY	# OF ACCESSIONS
Pittsburg	244
Pontotoc	240
Pottawatomie	336
Pushmataha	91
Roger Mills	79
Rogers	469
Seminole	98
Sequoyah	460
Stephens	503
Texas	601
Tillman	17
Tulsa	1,126
Wagoner	468
Washington	205
Washita	95
Woods	70
Woodward	102

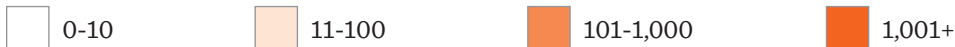


# STATES SERVED

CY 2023

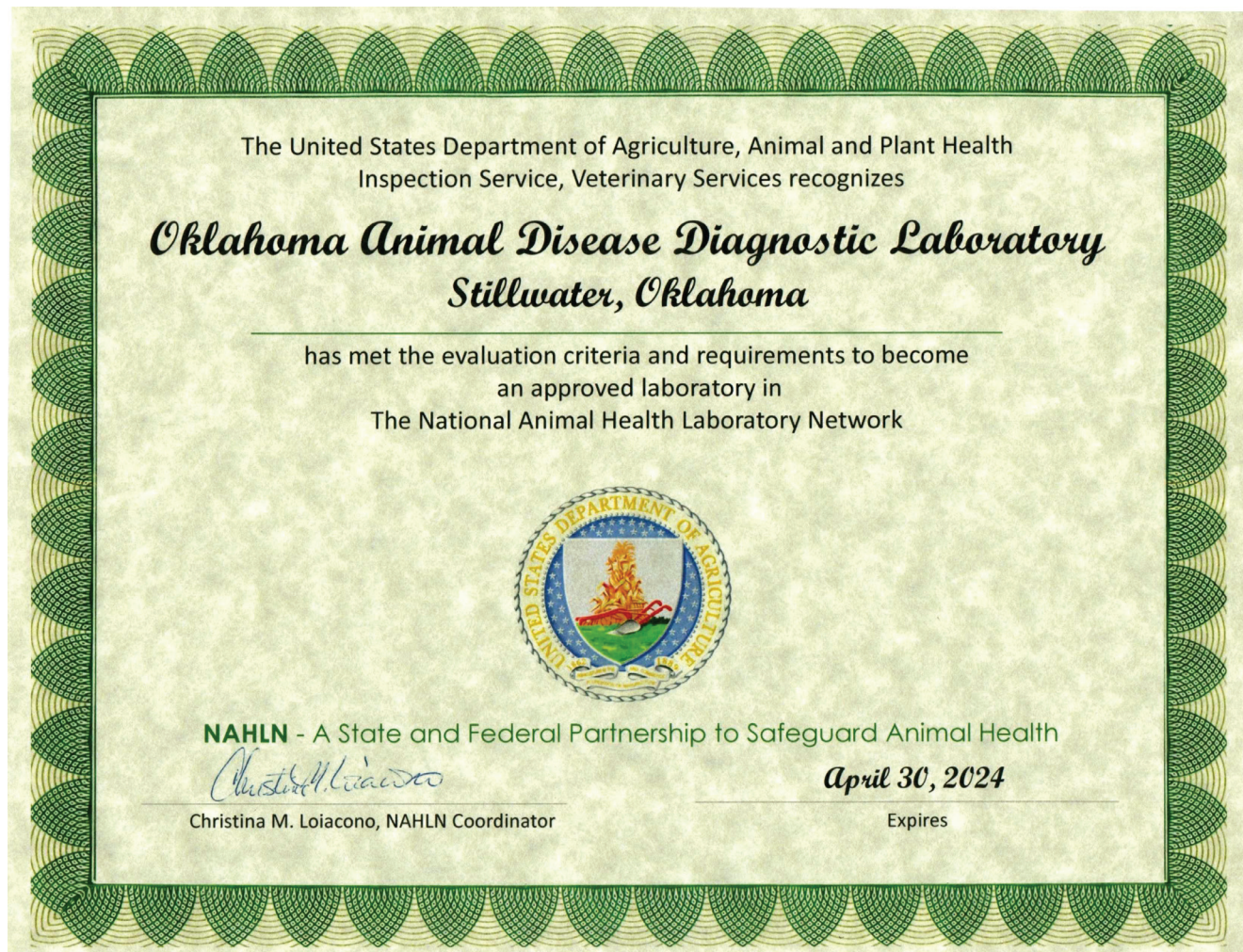
STATE	# OF ACCESSIONS
AK	1
AL	3
AR	1,224
AZ	64
CA	21
CO	74
CT	6
DE	1
FL	173
GA	7
IA	18
ID	1
IL	35
IN	6
KS	292
KY	9
MA	1
MD	4
MI	12
MN	71
MO	163
MS	1
MT	6
NC	9

STATE	# OF ACCESSIONS
ND	4
NE	10
NH	2
NJ	6
NM	13
NV	8
NY	21
OH	82
OK	21,739
OR	1
PA	42
SC	3
SD	23
TN	13
TX	1,639
UT	1
VA	22
WA	2
WI	4
WV	1





# NAHLN MEMBERSHIP AND VET-LIRN PARTICIPATION



## NAHLN MEMBERSHIP

In 2023, OADDL participated in the following activities in support of the NAHLN's missions:

- Foreign Animal Disease Investigation (FADI) Drill
- African Swine Fever Response Week
- Foreign Animal Disease Diagnostic Laboratory (FADDL) Weather Closure Drill
- Highly Pathogenic Avian Influenza (HPAI) Testing Capacity Drill

## VET-LIRN MEMBERSHIP

In 2023, OADDL participated in the following activities in support of FDA Vet-LIRN's missions:

- AMR testing of selected clinical bacterial isolates
- Bacterial isolate collection for whole genome sequencing

# NEW TESTS INTRODUCED

CY 2023

## PARASITOLOGY

### Double Centrifugal Fecal Flotation Test

Sample(s): fresh feces

Test Fee: \$24.00

TAT: 1-2 business days

## PATHOLOGY

### BSE Surveillance

Sample(s): fresh obex

Test Fee: Free

TAT: Referral Lab

## SEROLOGY

### *Brucella abortus* Testing- Standard Plate Test

Samples: serum

Test Fee: \$4.40

TAT: 1-2 business days

### Pseudorabies (PRV) g1 ELISA

Samples: serum

Test Fee: \$10.00

TAT: 1-2 business days



Photo By: Meagan Garris

# SERVICE TO THE OKLAHOMA HORSE RACING COMMISSION



OADDL maintains an annually renewable service contract with the Oklahoma Horse Racing Commission (OHRC). The service provided is to conduct complete necropsies of all horses that die or are euthanized at OHRC-licensed racetracks: Remington Park, Will Rogers Downs, and Fair Meadows. Additionally, drug screens are pursued when indicated. This service falls under the recommendation of the American Association of Equine Practitioners (AAEP) to not only detail the pathologic findings in each case but provide a database for epidemiological studies. The data is used in part to identify the catastrophic musculoskeletal injury (CMI) index, a number representing the rate of fatal musculoskeletal injuries to the number of horses that race. This Oklahoma-specific CMI can then be compared to the national rate of fatal injuries. Thoroughbred racing in the state also falls under the supervision of the Horseracing Integrity and Safety Authority (HISA), a bill passed by Congress that took effect in 2022.

Fifty-three horses were submitted to OADDL for necropsy during calendar year 2023. The number of submissions this year was above the previous 5-year average of 45 horses



*Photos By: Dustin Orona Photography*

per calendar year. The specifics for each case are compiled to describe the injuries, both musculoskeletal and non-musculoskeletal. From this data, attempts can be made to determine the cause of the injuries and possibly develop prevention strategies. Additionally, injury and fatality patterns may be detected that could prompt more thorough investigation by the OHRC. This collaboration between OADDL and OHRC helps enhance Oklahoma's equine racing industry, while assuring continual improvement in equine welfare.

# OADDL FUNDED CONTRACTS AND GRANTS

- NAHLN Level 1 Laboratory funding, OADDL: \$387,870
- Oklahoma Horse Racing Commission-renewed annual contract; fee-for-service.
- Oklahoma State Department of Health: West Nile virus surveillance testing in mosquitoes; \$60,000 for CY 2023.
- Oklahoma State Department of Health: animal rabies testing for the state of Oklahoma FY23 - \$107,646.
- Vidium Inc: specialized histology fee-for-service contract
- VET-LIRN FDA 5-Year Grant Award: \$ 234,430 (FY 2023: \$41,370); **Ramachandran, A**
- Development of a molecular point-of-care diagnostic test and a mapping platform for Foot and mouth disease (FMD) detection and tracking (FY22-24: \$473,289); **Ramachandran A**
- Increasing capacity to handle surge samples through online submissions and elimination of the manual data entry step in the laboratory (FY22-24: \$360,078); **Saliki J**
- FDA: MALDI-TOF equipment grant; \$50,000; **Ramachandran A**
- NAHLN – Firm Fixed Price Delivery Order for AMR AST Testing off IDIQ Contract; \$18,000.00



*Photo By: Harley Fletcher*

# QUALITY SYSTEM: PROFICIENCY TESTING

CY 2023 PROFICIENCY TEST	AGENCY	LAB SECTION*
IBQAS **	AAVLD	Bacteriology (Lab-wide)
African Swine Fever (ASF) Real-Time PCR	NAHLN	Molecular Diagnostics (5)
Anaplasmosis ELISA	USDA	Serology (Lab-wide)
Antimicrobial Susceptibility Proficiency Test	NAHLN	Bacteriology (Lab-wide)
Avian Influenza AGID	USDA	Serology (Lab-wide)
Avian Influenza ELISA	USDA	Serology (Lab-wide)
Avian Influenza (AIV) Real-Time PCR	NAHLN	Molecular Diagnostics (5)
Avian Paramyxovirus Type 1 Real-Time PCR	NAHLN	Molecular Diagnostics (5)
Bluetongue ELISA	NAHLN	Serology (Lab-wide)
<i>Brucella abortus</i> BAPA	USDA	Serology (4)
<i>Brucella abortus</i> Card	USDA	Serology (4)
<i>Brucella abortus</i> FPA	USDA	Serology (4)
<i>Brucella abortus</i> SPT	USDA	Serology (4)
Classic Swine Fever (CSF) Real-Time PCR	NAHLN	Molecular Diagnostics (5)
Equine Infectious Anemia (EIA) ELISA	USDA	Serology (Lab-wide)
Equine Piroplamosis caballi	USDA	Serology (3)
Equine Piroplamosis equi	USDA	Serology (3)
Foot and Mouth Disease Virus Real-Time PCR	NAHLN	Molecular Diagnostics (5)
Johne's Real-Time Direct PCR	USDA	Molecular Diagnostics (Lab-wide)
Johne's Real-Time Pooled Direct PCR	USDA	Molecular Diagnostics (Lab-wide)
MS/MG ELISA ***	PDRC ****	Serology (Lab-wide)
MS/MG PCR ***	PDRC ****	Molecular Diagnostics (Lab-wide)
NPIP Salmonella Group D Culture	NPIP	Bacteriology (Lab-wide)
Pseudorabies gB ELISA	USDA	Serology (5)
Pseudorabies g1 ELISA	USDA	Serology (2)
Rabies Direct Fluorescent Antibody (DFA)	WSLH ‡	Serology (4)
Swine Influenza Virus (SIV) Real-Time PCR	NAHLN	Molecular Diagnostics (5)

\* (Lab-wide) indicates the laboratory is certified. (#) indicates the number of individuals authorized.

\*\* Internal Bacteriology Quality Assurance Survey

\*\*\* *Mycoplasma synoviae* and *Mycoplasma gallisepticum*

\*\*\*\* Poultry Diagnostic and Research Center

‡ Wisconsin State Laboratory of Hygiene

# SURVEILLANCE AND REPORTABLE DISEASE TESTING

5-YEAR TREND

SURVEILLANCE AND REPORTABLE DISEASE TESTING	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
African Swine Fever (ASF) PCR ‡	4	7	-	-	-	N/A
<b>Avian Influenza</b>						
Avian Influenza ELISA	1,995	2,610	2,734	2,731	4,202	54%
Avian Influenza PCR ‡	183	196	243	763	429	-44%
Avian Influenza Agar Gel Immunodiffusion (AGID) *	11	6	2	2	18	800%
Avian Paramyxovirus-1 (END) PCR ‡	223	119	62	80	48	-40%
<i>Bacillus anthracis</i> Culture	7	4	29	2	8	300%
<b>Bluetongue Disease</b>						
Bluetongue c-ELISA	33	38	140	138	100	-28%
Bluetongue AGID *	13	45	1	-	6	N/A
Bluetongue Virus PCR *	91	48	33	59	45	-24%
Bluetongue Virus VI *	11	-	-	-	-	N/A
<b><i>Brucella</i> spp.</b>						
<i>Brucella abortus</i> BAPA *	22	58	154	23	7	-70%
<i>Brucella abortus</i> Card Agglutination Test	4,399	4,327	5,297	5,012	17,515	249%
<i>Brucella abortus</i> Complement Fixation (CF) *	33	12	-	-	1	N/A
<i>Brucella abortus</i> RAP *	4	-	-	-	-	N/A
<i>Brucella abortus</i> Standard Plate *	4	9	4	2	-	-100%
<i>Brucella abortus</i> Fluorescent Polarization Assay (FPA)	1	1,665	3,441	3,668	3,621	-1%
<i>Brucella canis</i> AGID *	1	2	-	25	17	-32%
<i>Brucella canis</i> Card Test	251	234	261	24	43	79%
<i>Brucella canis</i> IFA	19	37	36	395	341	-14%
<i>Brucella canis</i> 2-Mercaptoethanol Tube Agglutination *	1	2	-	11	17	55%
<i>Brucella melitensis</i> Card Test *	19	20	5	34	8	-76%
<i>Brucella ovis</i> ELISA *	20	17	11	31	57	84%

\* Includes In-house and Referral Laboratory testing  
‡ NAHLN Messaging Testing

# SURVEILLANCE AND REPORTABLE DISEASE TESTING (CONTINUED)

5-YEAR TREND

SURVEILLANCE AND REPORTABLE DISEASE TESTING	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
<i>Brucella</i> spp. Culture	76	59	57	66	66	0%
<i>Brucella</i> spp. PCR *	3	2	1	-	-	N/A
Chronic Wasting Disease (CWD) IHC PrP *	8	3	-	-	5	N/A
Classical Swine Fever (CSF) PCR ‡	4	7	-	-	-	N/A
<b><i>Coxiella burnetii</i> (Q-Fever)</b>						
<i>Coxiella burnetii</i> (Q-Fever) Complement Fixation (CF) *	10	1	-	15	-	-100%
<i>Coxiella burnetii</i> (Q-Fever) c-ELISA *	12	2	4	6	11	83%
<i>Coxiella burnetii</i> (Q-Fever) IFA *	-	1	-	-	-	N/A
<i>Coxiella burnetii</i> (Q-Fever) PCR *	17	7	2	24	28	17%
Eastern Equine Encephalomyelitis (EEE) IgM Capture ELISA *	28	16	24	33	29	-12%
<b>Equine Herpesvirus</b>						
Equine Herpesvirus 1 (EHV-1) Real-Time PCR	1,189	211	84	100	134	34%
Equine Herpesvirus 4 (EHV-4) PCR	6	4	8	15	19	27%
Equine Herpesvirus SN and VN *	1	5	4	7	5	-29%
<b>Equine Infectious Anemia (EIA)</b>						
Equine Infectious Anemia c-ELISA	2,155	1,994	2,436	2,787	3,613	30%
Equine Infectious Anemia AGID			1	-	7	N/A
Equine Infectious Anemia PCR *	1	-	-	-	-	N/A
Epizootic Hemorrhagic Disease (EHD) PCR *	21	1	-	7	10	43%
<b>Equine Piroplasmiasis</b>						
<i>Babesia caballi</i> c-ELISA	200	259	289	516	549	6%
<i>Theileria (Babesia) equi</i> c-ELISA	264	400	505	1,365	1,133	-17%
<b>Equine Viral Arteritis (EVA) Virus</b>						
Equine Viral Arteritis (EVA) PCR *	15	19	16	16	17	6%

\* Includes In-house and Referral Laboratory testing  
‡ NAHLN Messaging Testing

# SURVEILLANCE AND REPORTABLE DISEASE TESTING (CONTINUED)

5-YEAR TREND

SURVEILLANCE AND REPORTABLE DISEASE TESTING	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Equine Viral Arteritis (EVA) Virus Isolation *	16	2	-	-	-	N/A
Equine Viral Arteritis (EVA) SN and VN *	72	64	41	39	45	15%
<i>Francisella tularensis</i> (Tularemia)						
Tularemia PCR	6	3	21	9	5	-44%
Tularemia Plate Agglutination Test *	6		4	48	191	298%
Foot & Mouth Disease Virus Real-Time PCR ‡	10	6	2	-	-	N/A
Infectious Laryngotracheitis (ILT)						
Infectious Laryngotracheitis ELISA *	1	-	-	-	-	N/A
Infectious Laryngotracheitis Real-Time PCR *		3	1	2	4	100%
Johne's Disease						
Johne's Disease Complement Fixation (CF) *	13	3	-	-	-	N/A
Johne's Direct Fecal Real-Time PCR (single and pooled)	267	328	172	106	101	-5%
Johne's Disease ELISA	2,354	2,704	2,673	1,935	3,430	77%
Leptospirosis-canine						
<i>Leptospira</i> Microscopic Agglutination Test (canine)	53	25	32	19	21	11%
<i>Leptospira</i> sp. Real-Time PCR (canine) *	19	9	10	4	16	300%
<i>Mycoplasma</i> spp. (avian)						
<i>Mycoplasma gallisepticum</i> / <i>Mycoplasma synoviae</i> ELISA	18,445	21,599	23,705	24,712	34,800	41%
<i>Mycoplasma gallisepticum</i> / <i>Mycoplasma synoviae</i> PCR (single)	11	8	8	11	27	145%
<i>Mycoplasma gallisepticum</i> / <i>Mycoplasma synoviae</i> PCR (pooled)	33	43	1	-	-	N/A
<i>Mycoplasma gallisepticum</i> Hemagglutination Inhibition	318	216	161	161	-	-100%

\* Includes In-house and Referral Laboratory testing

‡ NAHLN Messaging Testing



# SURVEILLANCE AND REPORTABLE DISEASE TESTING (CONTINUED)

5-YEAR TREND

SURVEILLANCE AND REPORTABLE DISEASE TESTING	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
<i>Mycoplasma synoviae</i> Hemagglutination Inhibition	318	216	161	161	-	-100%
Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)						
PRRSV ELISA *	49	1,676	3,637	3,637	3,441	-7%
PRRSV Real-Time PCR (single and pooled samples) *	7,524	10,016	7,009	7,009	7,886	-15%
Pseudorabies Virus						
Pseudorabies gB and g1 ELISA *‡	3,647	5,462	7,958	8,313	17,605	112%
Pseudorabies g1 ELISA					26	N/A
Pseudorabies PCR *	4	7	4	2	3	50%
Rabies dFA *	59	53	250	717	795	11%
<i>Salmonella</i> spp.						
<i>Salmonella</i> spp. Culture	268	222	198	296	377	27%
<i>Salmonella pullorum</i> Agglutination-Rapid Serum Test	1	-	-	-	-	N/A
<i>Salmonella pullorum</i> Microagglutination Titer	2	-	6	8	2	-75%
<i>Salmonella pullorum/typhoid</i> Microagglutination Screen	18,302	21,957	23,700	25,200	34,801	38%
<i>Salmonella pullorum</i> Screening (NPIP culture)	32	6	5	33	18	-45%
SARS (CoV-2) N1 and N2 Gene Real-Time PCR ‡		22	44	12	-	-100%
<i>Streptococcus equi</i> PCR	40	20	42	45	54	20%
Swine Influenza Virus (SIV)						
Swine Influenza Virus (SIV) PCR-Domestic Swine ‡	3	4	-	1	-	-100%
Swine Influenza Virus (SIV) PCR (single and pooled samples) *	3,303	3,093	1,589	753	465	-38%
<i>Trichomonas foetus</i>						

\* Includes In-house and Referral Laboratory testing  
‡ NAHLN Messaging Testing

# SURVEILLANCE AND REPORTABLE DISEASE TESTING (CONTINUED)

**5-YEAR TREND**

SURVEILLANCE AND REPORTABLE DISEASE TESTING	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
<i>T. foetus</i> Real-Time PCR (single and pooled samples)	7,517	6,597	6,525	6,344	6,867	8%
<i>Tritrichomonas foetus</i> Culture	6	46	2	-	-	N/A
<b>Vesicular Stomatitis Virus</b>						
Vesicular Stomatitis Virus Neutralization-Indiana *	42	37	14	28	30	7%
Vesicular Stomatitis Virus Neutralization-New Jersey *	42	37	14	28	30	7%
<b>West Nile Virus</b>						
West Nile Virus IgM Capture ELISA *	37	23	43	41	43	5%
West Nile Virus PCR *	2	1	-	4	5	25%
<b>Total Number of Tests</b>	<b>74,177</b>	<b>86,955</b>	<b>93,916</b>	<b>98,316</b>	<b>143,780</b>	<b>46%</b>



Photo By: Meagan Garris

# PREVALENCE OF MAJOR DISEASE AGENTS IN DIAGNOSTIC SAMPLES

CY 2023

## DISEASE PREVALENCE BY SPECIES

### INTERPRETIVE NOTES:

1. This data includes only agent detection or antibody test results that indicate current infection with the disease agent as opposed to any antibody tests, which simply indicate exposure to the disease agent or vaccination.
2. The prevalence numbers shown here indicate only the prevalence in the diagnostic samples tested and not prevalence of the diseases in the general animal population.

## EQUINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
Equine Herpesvirus Type-1 PCR	62	2%
Leptospirosis MAT	6	67%
Leptospirosis PCR	1	0%
Rabies Direct FA	25	0%
<i>Salmonella spp.</i> Culture	32	38%

## CAPRINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
BRSV PCR	12	0%
CAE ELISA	487	5%
Johne's Disease ELISA	727	3%
Johne's Disease PCR	7	0%
Leptospirosis MAT	4	25%
Rabies Direct FA	5	0%

## OVINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
BVDV ELISA	4	0%
CAE cELISA	210	2%
Johne's Disease ELISA	215	5%
Johne's Disease PCR	2	0%
Rabies Direct FA	25	0%

## CANINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
Canine Distemper Virus PCR	25	36%
Leptospirosis MAT	21	29%
Leptospirosis PCR	18	6%
Parvovirus PCR	144	31%
Rabies Direct FA	333	1%

## FELINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
Cytauxzoonosis	65	2%
Rabies Direct FA	199	2%
Tritrichomoniasis PCR	2	50%

# PREVALENCE OF MAJOR DISEASE AGENTS IN DIAGNOSTIC SAMPLES (CONTINUED)

CY 2023

## BOVINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
Anaplasmosis cELISA	589	42%
Anaplasmosis PCR	123	45%
<i>Bibersteinia trehalosi</i> Culture	120	8%
BLV ELISA	1,432	27%
BLV PCR	11	36%
BRSV PCR	61	34%
BVDV ELISA	3,468	1%
BVDV PCR	154	16%
Coronavirus PCR	102	12%
<i>Histophilus somni</i> Culture	120	18%
IBR PCR	61	3%
Johne's Disease ELISA	1,182	6%
Johne's Disease PCR	73	22%
Leptospirosis MAT	256	57%
Leptospirosis PCR	7	0%
<i>Mannheimia haemolytica</i> Culture	120	14%
<i>Mycoplasma bovis</i> PCR	66	47%
<i>Pasteurella multocida</i> Culture	120	12%
Rabies Direct FA	40	10%
<i>Salmonella spp.</i> Culture	54	9%
Trichostrongylidosis PCR	13,951	0.2%
<i>Trueperella pyogenes</i> Culture	120	13%

## AVIAN DISEASES

DISEASE	# OF TESTS	% POSITIVE
Avian Influenza ELISA	4,202	0.4%
Avian Influenza PCR	436	0.5%
<i>Mycoplasma gallisepticum</i> / <i>Mycoplasma synoviae</i> ELISA	34,800	0%
<i>Mycoplasma gallisepticum</i> PCR	27	33%
<i>Mycoplasma synoviae</i> PCR	27	33%
<i>Salmonella spp.</i> Culture	94	0%
<i>Salmonella pullorum</i> Microagglutination Titer	2	0%
<i>Salmonella pullorum/typhoid</i> Microagglutination Screen	34,801	0%

## PORCINE DISEASES

DISEASE	# OF TESTS	% POSITIVE
<i>Brucella abortus</i> BAPA	6	0%
<i>Brucella abortus</i> CARD	14,005	< 1%
<i>Brucella abortus</i> FPA	3,615	2%
<i>Brucella spp.</i> Culture	65	0%
PEDV PCR	3,578	5%
PRRSV ELISA	2,805	41%
PRRSV PCR (Industry Clients)	6,689	2%
PRRSV PCR (Non-Industry Clients)	8	63%
PRV gB ELISA	17,589	< 1%
Rabies Direct FA	2	0%

# ANTIMICROBIAL SUSCEPTIBILITY PROFILES: BOVINES AND CANINES

CY 2023

**NOTE:** Data reported as: % susceptible (# isolates tested)

## BOVINES

ANTIBIOTIC	<i>Mannheimia haemolytica</i>	<i>Histophilus somni</i>	<i>Pasteurella multocida</i>
Ceftiofur	100% (39)	100% (20)	100% (14)
Danofloxacin	28% (36)	80% (20)	93% (14)
Enrofloxacin	28% (36)	80% (20)	93% (14)
Florfenicol	82% (39)	90% (20)	71% (14)
Gamithromycin	28% (39)	45% (20)	50% (14)
Gentamicin	44% (39)		
Penicillin	42% (36)	70% (20)	93% (14)
Spectinomycin	44% (36)	45% (20)	50% (14)
Tetracycline	19% (36)		
Tildipirosin	64% (39)	90% (20)	57% (14)
Tilmicosin	25% (36)	35% (20)	50% (14)
Trimethoprim/ Sulfamethoxazole	100% (39)		
Tulathromycin	28% (39)	50% (20)	50% (14)
Tylosin (Tartrate/ Base)	0% (39)		

## CANINES

ANTIBIOTIC	URINE		EARS		SKIN & WOUNDS
	<i>Escherichia coli</i>	<i>Staph. pseudintermedius</i>	<i>Pseudomonas aeruginosa</i>	<i>Staph. pseudintermedius</i>	<i>Staph. pseudintermedius</i>
Amikacin	97% (38)	60% (15)	78% (18)	77% (30)	62% (21)
Amoxicillin/ Clavulanic Acid	97% (31)	0% (10)	0% (18)	5% (22)	0% (16)
Ampicillin	100% (23)		0% (18)		
Cefalexin	72% (32)	60% (15)		77% (30)	62% (21)
Cefazolin	74% (38)	60% (15)	0% (18)	77% (30)	62% (21)
Cefovecin	73% (37)	60% (15)		77% (30)	60% (20)
Cefpodoxime	74% (38)				
Ceftazidime	82% (33)	60% (15)	100% (15)	79% (29)	62% (21)

# ANTIMICROBIAL SUSCEPTIBILITY PROFILES: BOVINES AND CANINES (CONTINUED)

**CY 2023**

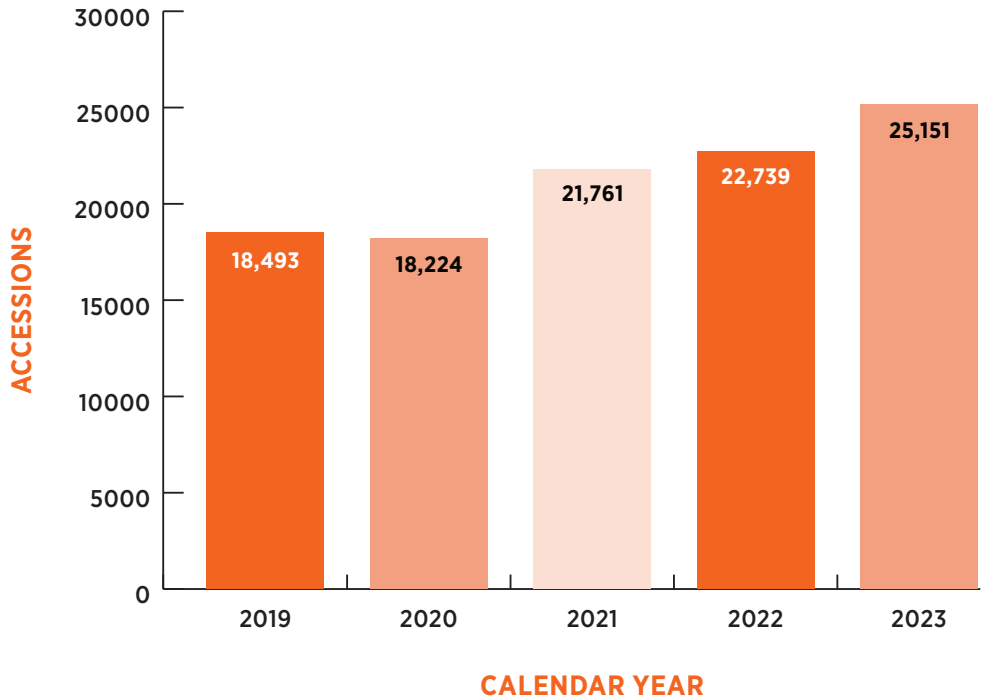
## CANINES (CONTINUED)

ANTIBIOTIC	URINE		EARS		SKIN & WOUNDS
	<i>Escherichia coli</i>	<i>Staph. pseudintermedius</i>	<i>Pseudomonas aeruginosa</i>	<i>Staph. pseudintermedius</i>	<i>Staph. pseudintermedius</i>
Cephalothin		87% (15)		83% (30)	86% (21)
Chloramphenicol	92% (38)	60% (15)	0% (18)	73% (30)	52% (21)
Clindamycin					
Doxycycline	79% (38)	47% (15)	0% (18)	57% (30)	55% (20)
Enrofloxacin	81% (37)	60% (15)		70% (30)	52% (21)
Erythromycin		53% (15)		83% (30)	48% (21)
Gentamicin	95% (38)	60% (15)	67% (18)	77% (30)	62% (21)
Imipenem	100% (38)	60% (15)	56% (18)	73% (30)	55% (20)
Marbofloxacin	84% (37)	47% (15)		72% (29)	65% (20)
Minocycline		100% (15)			
Nitrofurantoin					
Orbifloxacin	78% (32)	60%		77% (30)	62% (21)
Oxacillin + 2% NaCl		0% (15)		5% (22)	0% (16)
Penicillin		(10)			
Piperacillin/ Tazobactam	97% (33)	33% (15)	73% (15)	21% (29)	50% (16)
Pradofloxacin	88% (32)	100% (15)		100% (30)	100% (21)
Rifampin				69% (29)	50% (20)
Tetracycline	82% (33)	60% (15)	0% (15)	83% (30)	52% (21)
Trimethoprim/ Sulfamethoxazole	95% (37)	100% (15)	0% (18)	100% (29)	100% (21)
Vancomycin		100% (15)		100% (21)	100% (16)

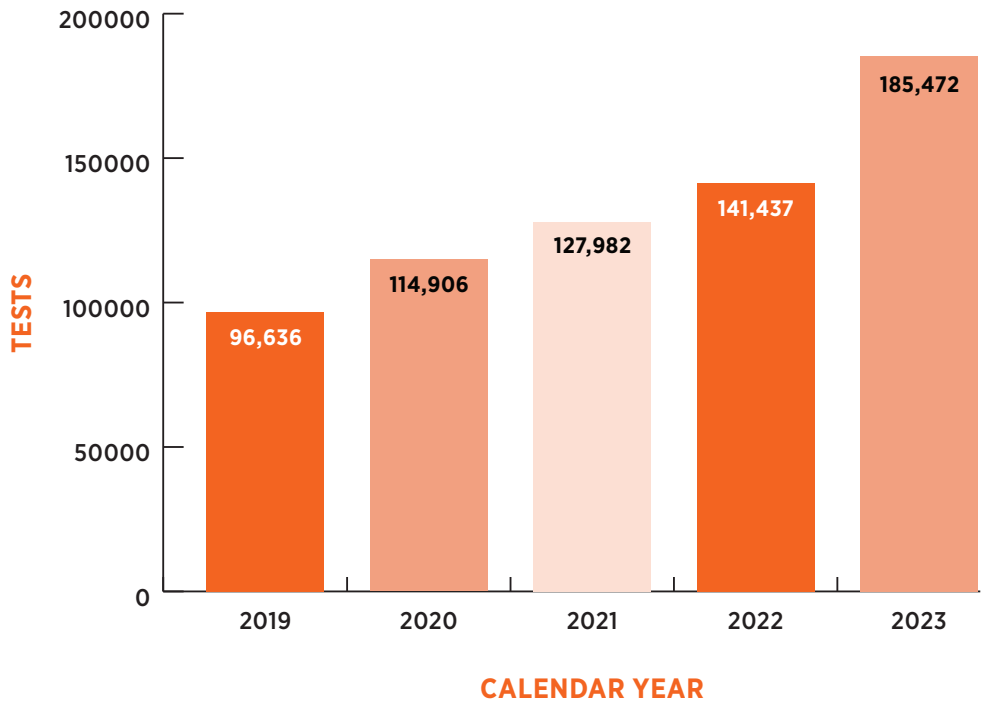
# ACCESSIONS AND GENERAL TESTING

5-YEAR TREND

## 5-YEAR ACCESSION TREND



## 5-YEAR TEST TREND

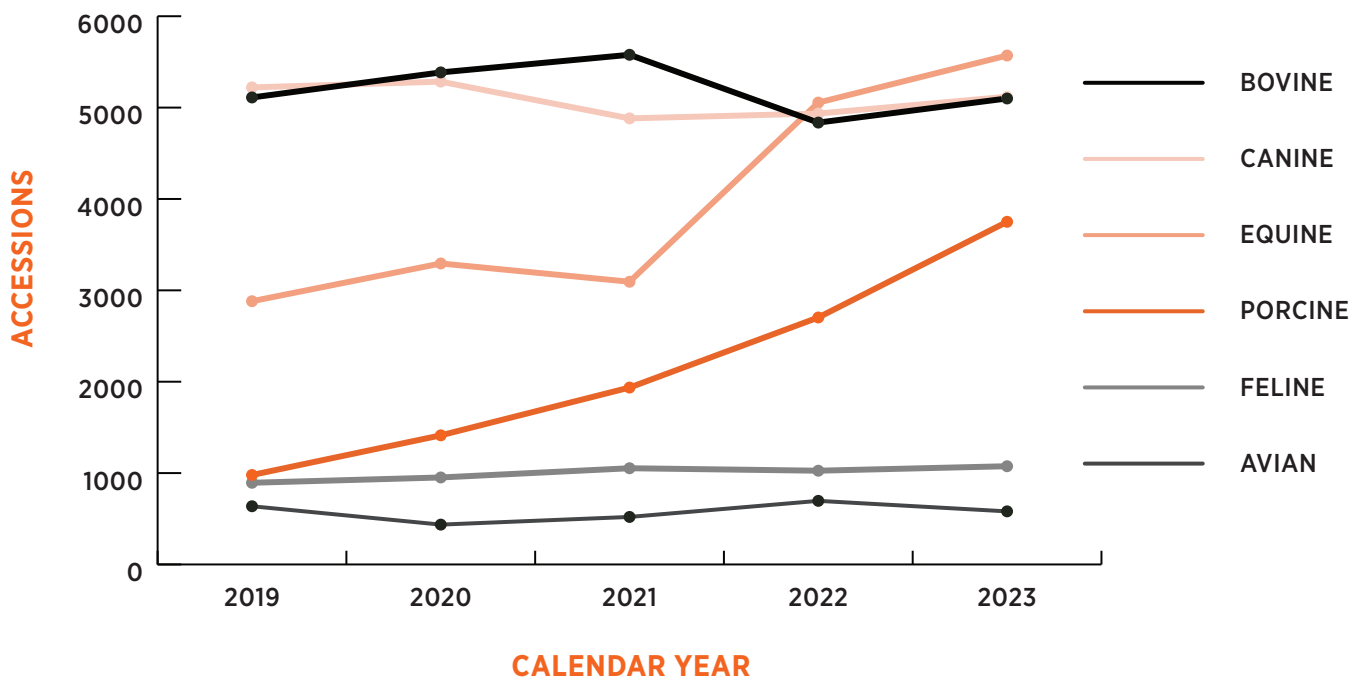


# ACCESSIONS BY SPECIES

**5-YEAR TREND**

SPECIES	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Equine	3,294	3,094	3,837	5,055	<b>5,570</b>	10%
Canine	5,284	4,882	5,127	4,935	<b>5,119</b>	4%
Bovine	5,385	5,578	5,251	4,836	<b>5,100</b>	5%
Porcine	1,413	1,936	2,718	2,703	<b>3,750</b>	39%
Feline	952	1,053	1,069	1,026	<b>1,075</b>	5%
Avian	637	436	520	696	<b>581</b>	-17%
Small Animal Other	350	280	344	499	<b>514</b>	3%
Caprine	391	322	435	469	<b>488</b>	4%
Ovine	81	81	115	138	<b>158</b>	14%
Alpaca/Llama	54	50	54	46	<b>70</b>	52%
Large Animal Other	61	49	53	35	<b>53</b>	51%
Multiple Species	40	27	38	35	<b>52</b>	49%
Camelid	16	11	16	12	<b>9</b>	-25%
Caged Pet Mammal	14	13	7	4	<b>2</b>	-50%

## 5-YEAR ACCESSION TREND: TOP 6 SPECIES





# ACCESSIONS BY LABORATORY UNIT

5-YEAR TREND

YEAR	MICROBIOLOGY*	MOLECULAR DIAGNOSTICS	PARASITOLOGY	PATHOLOGY**	SEROLOGY***	TOXICOLOGY	TOTAL # OF ACCESSIONS
2023	1,706	5,550	1,875	5,420	10,288	312	25,151
2022	1,906	5,763	1,570	5,286	7,916	298	22,739
2021	2,260	5,885	1,809	5,329	6,234	244	21,761
2020	2,200	5,317		5,093	5,353	261	18,224
2019	2,456	4,800		5,755	5,131	351	18,493

\* Includes Bacteriology, Mycology and Mycoplasma

\*\* Includes Histology and Pathology (Necropsy)

\*\*\* Includes Serology and Rabies



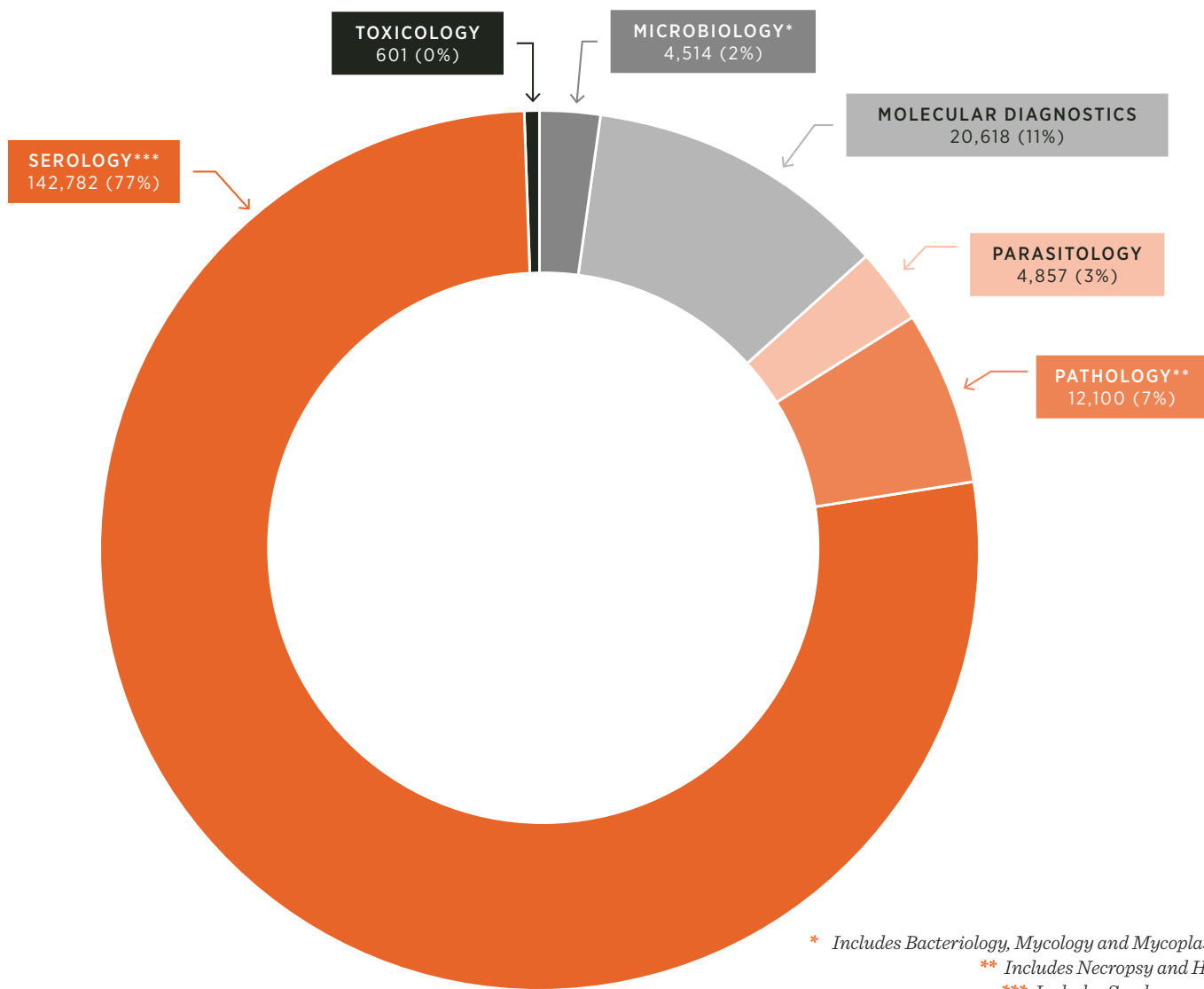
Photo By: Harley Fletcher

# TEST NUMBERS BY LABORATORY UNIT

5-YEAR TREND

YEAR	MICROBIOLOGY*	MOLECULAR DIAGNOSTICS	PARASITOLOGY	PATHOLOGY**	SEROLOGY***	TOXICOLOGY
2023	4,514	20,618	4,857	12,100	142,782	601
2022	4,799	30,988	2,881	6,970	93,312	465
2021	5,565	22,573	2,484	7,474	89,467	419
2020	4,866	26,708		6,663	76,170	499
2019	4,082	22,260		7,921	61,688	685

## NUMBER OF TESTS PER LAB UNIT: CY 2023



## MYCOLOGY AND MYCOPLASMOLOGY

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Fungal Culture *	111	124	117	106	<b>92</b>	-13%
Histoplasma Enzyme Immunoassay **			6	53	<b>0</b>	-100%
Referral Lab Fungal Testing				1	<b>1</b>	0%
Research Fungal Testing	30	12	8	0	<b>0</b>	N/A
<i>Mycoplasma spp.</i> Culture	11	8	15	7	<b>14</b>	100%
<b>Total Tests Per Year</b>	<b>141</b>	<b>136</b>	<b>131</b>	<b>160</b>	<b>93</b>	<b>-42%</b>

\* Includes individual testing from Test Package

\*\* In-house and Referral Laboratory Testing



Photo By: Meagan Garris

## BACTERIOLOGY TEST PACKAGES

### 5-YEAR TEST TREND

TEST PACKAGE	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Anaerobic Culture, Aerobic Culture and up to 2 Antibiotic Susceptibilities	498	374	409	389	<b>432</b>	11%
Aerobic Culture and up to 2 Antibiotic Susceptibilities	464	385	480	445	<b>369</b>	-17%
Urine Culture and up to 2 Antibiotic Susceptibilities	398	329	334	221	<b>213</b>	-4%
Fungal Culture, Aerobic Culture and up to 2 Antibiotic Susceptibilities	13	58	62	48	<b>50</b>	4%
Salmonella Culture with Antibiotic Susceptibility	61	29	34	36	<b>44</b>	22%
<b>Total Test Packages Per Year</b>	<b>1,434</b>	<b>1,175</b>	<b>1,319</b>	<b>1,139</b>	<b>1,108</b>	<b>-3%</b>



*Photo By: Meagan Garris*

# MICROBIOLOGY (CONTINUED)

## BACTERIOLOGY

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Aerobic Culture ‡	2,264	1,733	1,957	1,727	<b>1,223</b>	-29%
Antibiotic Susceptibility Test ‡	1,179	1,050	1,196	1,097	<b>1,210</b>	10%
Anaerobic Culture ‡	552	545	554	508	<b>388</b>	-24%
Research Testing	97	636	597	437	<b>413</b>	-5%
<i>Salmonella</i> spp. Culture ‡	181	168	149	246	<b>277</b>	13%
<i>Clostridium perfringens</i> Culture	157	119	213	204	<b>213</b>	4%
<i>Campylobacter jejuni</i> Culture	36	39	48	152	<b>169</b>	11%
Milk Culture	98	107	94	87	<b>112</b>	29%
Salmonella Culture (Environmental Sample)	87	54	49	50	<b>100</b>	100%
<i>Brucella</i> spp. Culture	76	59	57	66	<b>66</b>	0%
Blue Green Algae-Microscopic Screening	40	25	50	58	<b>65</b>	12%
<i>Campylobacter fetus</i> Culture	244	228	162	87	<b>61</b>	-30%
<i>Clostridium</i> sp. Culture	40	26	35	31	<b>45</b>	45%
Bacteria Whole-Gene Sequencing					<b>30</b>	N/A
<i>Salmonella pullorum</i> Screening	32	6	5	33	<b>18</b>	-45%
<i>Bacillus anthracis</i> Culture	7	4	29	2	<b>8</b>	300%
All Other Tests	20	67	196	14	<b>9</b>	-36%
<b>Total Tests Per Year</b>	<b>5,112</b>	<b>4,866</b>	<b>5,391</b>	<b>4,799</b>	<b>4,407</b>	<b>-8%</b>

‡ Includes individual tests from Test Packages

# MOLECULAR DIAGNOSTICS

## PANELS

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Bovine Respiratory Disease PCR Panel-Comprehensive *	43	49	71	71	<b>60</b>	-15%
Bovine Viral Respiratory PCR Panel-Basic **	3	0	3	0	<b>2</b>	N/A
<b>Total Panels Per Year</b>	<b>46</b>	<b>49</b>	<b>74</b>	<b>71</b>	<b>62</b>	<b>-13%</b>

\* Includes Bovine Viral Diarrhea Virus (BVDV), Bovine Respiratory Syncytial Virus (BRSV), Infectious Bovine Rhinotracheitis Virus (IBR), Bovine Coronavirus (BCV), and *Mycoplasma bovis*

\*\* Includes BVDV, BRSV, and IBR

## MOLECULAR DIAGNOSTICS

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
PRRS Virus Real-Time PCR (single and pooled) <b>r</b>	7,517	10,094	7,009	7,886	<b>6,689</b>	-15%
<i>Tritrichomonas foetus</i> Real-Time PCR	4,922	5,107	5,009	4,586	<b>4,830</b>	5%
Porcine Coronavirus Multiplex PCR (single and pooled)	2,114	4,627	4,784	11,744	<b>3,578</b>	-70%
<i>Tritrichomonas foetus</i> Real-Time PCR (pooled)	1,288	1,490	1,516	1,758	<b>2,037</b>	16%
Mosquito Identification and WNV PCR				370	<b>494</b>	34%
Swine Influenza Virus PCR (single and pooled) <b>r</b>	3,303	3,110	1,589	753	<b>465</b>	-38%
Avian Influenza PCR	183	196	243	763	<b>429</b>	-44%
Bovine Viral Diarrhea Virus PCR *	191	146	166	165	<b>156</b>	-5%
Canine Parvovirus PCR	44	53	50	139	<b>144</b>	4%
<i>Clostridium perfringens</i> Multiplex PCR	56	56	44	65	<b>144</b>	122%
Equine Herpesvirus 1 (EHV-1) Real-Time PCR	1,189	211	84	100	<b>134</b>	34%

**r** In-house and/or Referral Laboratory Testing

\* Includes individual testing from Molecular Diagnostics Panels

# MOLECULAR DIAGNOSTICS (CONTINUED)

## MOLECULAR DIAGNOSTICS (CONTINUED)

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Porcine <i>Mycoplasma hyopneumoniae</i> Real Time PCR (single and pooled)		5	412	677	<b>132</b>	-81%
<i>Anaplasma marginale</i> PCR	147	95	122	78	<b>127</b>	63%
Infectious Bovine Rhinotracheitis (IBR) Virus PCR *	112	91	110	111	<b>109</b>	-2%
Johne's Direct Fecal Real-Time PCR (single and pooled)	267	328	172	106	<b>101</b>	-5%
Bovine Coronavirus PCR *	104	93	90	101	<b>90</b>	-11%
Canine Respiratory Panel (qPCR) <b>r</b>		56	78	42	<b>70</b>	67%
<i>Mycoplasma bovis</i> PCR *	49	55	83	72	<b>67</b>	-7%
<i>Cytauxzoon felis</i> PCR	13	8	16	17	<b>65</b>	282%
BRSV PCR *	52	57	205	71	<b>62</b>	-13%
<i>Streptococcus equi</i> PCR	40	20	42	45	<b>54</b>	20%
Avian Paramyxovirus-1 (END) PCR	223	119	62	80	<b>48</b>	-40%
Feline Respiratory Panel (qPCR) <b>r</b>		24	8	25	<b>48</b>	92%
Bluetongue Virus PCR	82	48	33	59	<b>45</b>	-24%
Rotavirus Antigen ELISA	55	42	30	21	<b>34</b>	62%
<i>Leptospira sp.</i> Real-Time PCR	46	38	32	30	<b>33</b>	10%
Canine Distemper Virus PCR	66	31	46	50	<b>30</b>	-40%
<i>Coxiella burnetii</i> (Q-Fever) PCR	17	7	2	24	<b>28</b>	17%
<i>Mycoplasma gallisepticum/M. synoviae</i> PCR (single and pooled)	44	51	9	11	<b>27</b>	145%
16S Sequencing	18	35	30	28	<b>24</b>	-14%
Rickettsia			3	27	<b>22</b>	-19%
Canine Herpesvirus PCR	3	15	29	27	<b>21</b>	-22%
<i>Coxiella spp.</i> PCR <b>r</b>		7	5	8	<b>21</b>	163%
Equine Herpesvirus 4 (EHV-4) PCR	6	4	8	15	<b>19</b>	27%
Canine Influenza PCR	6	3	1	11	<b>19</b>	73%
<i>Chlamydophila spp.</i> PCR <b>r</b>		7	7	18	<b>17</b>	-6%

**r** In-house and/or Referral Laboratory Testing

\* Includes individual testing from Molecular Diagnostics Panels

# MOLECULAR DIAGNOSTICS (CONTINUED)

## MOLECULAR DIAGNOSTICS (CONTINUED)

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Equine Viral Arteritis PCR <b>r</b>		19	16	16	<b>17</b>	6%
Herpesvirus PCR	30	8	5	5	<b>16</b>	220%
Bovine Respiratory (Viral and Bacterial) Panel (qPCR)			18	19	<b>14</b>	-26%
Feline Parvovirus PCR	6	7	3	12	<b>13</b>	8%
Bovine Leukemia Virus PCR <b>r</b>		7	-	1	<b>11</b>	1000%
Epizootic Hemorrhagic Disease (EHD) PCR <b>r</b>	10	1	-	7	<b>10</b>	43%
All Other Tests	80	348	420	839	<b>124</b>	-85%
<b>Total Tests Per Year</b>	<b>22,283</b>	<b>26,719</b>	<b>22,573</b>	<b>30,988</b>	<b>20,618</b>	<b>37%</b>

**r** In-house and/or Referral Laboratory Testing

\* Includes individual testing from Molecular Diagnostics Panels



Photo By: Emily Cooper



# PARASITOLOGY

## PARASITOLOGY

### 3-YEAR TEST TREND

TEST	CALENDAR YEAR			% CHANGE
	2021	2022	2023	
Centrifugal Fecal Flotation	336	514	<b>1,515</b>	195%
Parasitology Research	62	219	<b>1,291</b>	489%
Centrifugal Flotation/Direct Smear	798	651	<b>771</b>	18%
Fecal Egg Count	380	453	<b>310</b>	-32%
Fecal Egg Count-McMaster Method	20	268	<b>168</b>	-37%
Canine Heartworm Antigen Test	319	219	<b>143</b>	-35%
Fecal Egg Count-Wisconsin Method	45	62	<b>122</b>	97%
Modified Knott's	252	126	<b>120</b>	-5%
Tick Identification	11	0	<b>111</b>	N/A
Fecal Sedimentation	63	88	<b>95</b>	8%
Heartworm Antigen Heat Reversal	4	0	<b>91</b>	N/A
Fecal Culture / ID	2	119	<b>38</b>	-68%
Giardia Antigen	39	41	<b>20</b>	-51%
Gross Parasite Identification	71	39	<b>19</b>	-51%
Centrifugal Fecal Flotation/Sedimentation	5	8	<b>14</b>	75%
Centrifugal Fecal Flotation/Baermann	5	1	<b>8</b>	700%
Fecal Egg Count-McMaster Method/Sedimentation	2	26	<b>6</b>	-77%
Feline Post Heat Treatment Heartworm Antigen	13	19	<b>5</b>	-74%
All Other Tests	57	28	<b>10</b>	-64%
<b>Total Tests Per Year</b>	<b>2,484</b>	<b>2,881</b>	<b>4,857</b>	<b>69%</b>

# PATHOLOGY

## NECROPSY

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Gross Necropsy	953	757	876	843	<b>830</b>	-2%
Tissue Preparation	7	4	2	16	<b>15</b>	-6%
Spinal Examination	14	10	6	21	<b>8</b>	-62%
Chronic Wasting Disease (CWD)	7	3	0	1	<b>5</b>	400%
Bovine Spongiform Encephalopathy (BSE)	0	0	0	0	<b>1</b>	N/A
Research/Special Studies Necropsy	37	0	0	0	<b>0</b>	N/A
Small Animal Limb Examination with Disposal	6	0	1	2	<b>0</b>	N/A
<b>Total Tests Per Year</b>	<b>1,096</b>	<b>827</b>	<b>1,135</b>	<b>883</b>	<b>859</b>	<b>-3%</b>

## NECROPSY ACCESSIONS BY SPECIES

### 5-YEAR TREND

SPECIES	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Canine	217	194	230	214	<b>170</b>	-21%
Bovine	213	165	141	146	<b>152</b>	4%
Equine	149	118	141	128	<b>135</b>	5%
Avian	77	65	99	108	<b>109</b>	1%
Caprine	83	46	70	69	<b>74</b>	7%
Feline	67	59	58	52	<b>71</b>	37%
Small Animal Other	51	58	57	54	<b>59</b>	9%
Porcine	93	18	25	23	<b>25</b>	9%
Ovine	21	23	28	24	<b>20</b>	-17%
Alpaca	9	5	5	10	<b>9</b>	-10%
Caged Pet Mammal	6	1	6	4	<b>6</b>	50%
Llama	1	1	1	2	<b>4</b>	100%
Large Animal Other	8	4	11	5	<b>1</b>	-80%
Non-Human Primate	0	0	3	2	<b>1</b>	-50%
Camel	1	0	1	2	<b>0</b>	-100%

# PATHOLOGY (CONTINUED)

## NECROPSY ACCESSIONS BY TEST TYPE

**5-YEAR TREND**

SPECIES	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Necropsy only	67	67	65	52	<b>51</b>	-2%
Necropsy + Histology only	313	287	340	322	<b>378</b>	17%
Necropsy + Histology + Other Testing	549	379	457	459	<b>365</b>	-20%
Necropsy + Other Testing (no Histology)	24	24	14	10	<b>36</b>	260%

## NECROPSY ACCESSIONS BY CLIENT

**5-YEAR TREND**

SPECIES	CALENDAR YEAR: JAN-DEC					% CHANGE
	2019	2020	2021	2022	2023	
Total # of Necropsy Accessions	953	757	876	843	<b>830</b>	-2%
VTH * Accessions	347	261	288	210	<b>225</b>	7%
Client Accessions (not VTH)	606	496	588	633	<b>605</b>	-4%

\* Veterinary Teaching Hospital



Photo By: Emily Cooper

# PATHOLOGY (CONTINUED)

## HISTOLOGY

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Slide Preparation-No Interpretation (Commercial Clients)	1	232	350	584	<b>4,870</b>	734%
Histo-Short Report	3,480	2,950	2,818	2,425	<b>2,683</b>	11%
Special Stains	1,465	1,177	1,456	1,556	<b>1,853</b>	19%
Histo Necropsy Workload	785	644	747	723	<b>691</b>	-4%
Decalcification	157	141	138	87	<b>258</b>	197%
H&E Recut	38	65	76	92	<b>180</b>	96%
Regress Biopsy-No Interpretation (Commercial Clients)					<b>123</b>	N/A
Histo-Long (Detailed) Report	233	195	231	174	<b>117</b>	-33%
Zoo Pathology Surveillance	131	88	113	104	<b>113</b>	9%
Additional Biopsy > 3 Tissues Submitted	140	71	105	104	<b>98</b>	-6%
Poultry Histopathology	43	20	53	49	<b>65</b>	33%
Immunohistochemistry (IHC) §	138	83	113	60	<b>61</b>	2%
H&E Slide for Research	111	74	41	67	<b>52</b>	-22%
Unstained Sections for Research	13	30	19	20	<b>19</b>	-5%
Special Stains for Research	6	7	16	16	<b>15</b>	-6%
Serial Sections, Unstained	-	-	-	3	<b>12</b>	300%
H&E Slide for Teaching	5	5	6	2	<b>9</b>	350%
Duplicate H&E	1	6	5	9	<b>6</b>	-33%
Process and Embed Only For Research	-	1	3	-	<b>6</b>	N/A
Special Stains for Teaching	3	4	12	4	<b>6</b>	50%
All Other Tests	137	71	39	14	<b>5</b>	-64%
<b>Total Tests Per Year</b>	<b>6,887</b>	<b>5,864</b>	<b>6,341</b>	<b>6,093</b>	<b>11,242</b>	<b>85%</b>

§ Referral laboratory testing

# PATHOLOGY (CONTINUED)

## MISCELLANEOUS BIOPSY-RELATED DATA

**5-YEAR TREND**

SPECIAL STAIN	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
GMS	473	357	413	429	<b>500</b>	17%
Gram's	287	321	346	392	<b>479</b>	22%
Fite's Acid Fast	79	73	83	139	<b>168</b>	21%
Toluidine Blue	44	39	51	46	<b>122</b>	165%
Giemsa	30	37	93	75	<b>101</b>	35%
PAS	37	48	104	114	<b>92</b>	-19%
Acid Fast (Ziehl-Neelsen)	236	148	137	99	<b>75</b>	-24%
Trichrome	52	27	40	58	<b>75</b>	29%
Iron (Prussian Blue)	40	27	42	38	<b>52</b>	37%
Melanin-Bleach	21	16	26	27	<b>40</b>	48%
Copper (Rhodanine)	24	19	25	27	<b>32</b>	19%
Congo Red	27	19	33	33	<b>31</b>	-6%
Fontana-Masson	17	10	18	16	<b>28</b>	75%
Von Kossa	26	13	13	21	<b>23</b>	10%
Steiner	55	14	15	11	<b>13</b>	18%
Bile/Bilirubin (Hall's)	11	9	5	7	<b>10</b>	43%
PTAH	4	-	12	12	<b>8</b>	-33%
PAS without Diatase	-	-	-	12	<b>4</b>	-67%
Alcian Blue 2.5	1	-	-	-	-	N/A
Luxol Fast Blue	1	-	-	-	-	N/A
<b>Total Stains</b>	<b>1,465</b>	<b>1,177</b>	<b>1,456</b>	<b>1,556</b>	<b>1,853</b>	<b>19%</b>

# PATHOLOGY (CONTINUED)

## MISCELLANEOUS BIOPSY-RELATED DATA (CONTINUED)

### 5-YEAR TREND

BIOPSY SLIDES	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Total Number of Biopsy Slides	18,233	14,039	14,720	13,166	10,729	-19%
Total Number of Biopsy Slides (Commercial Clients)					12,914	N/A
<b>H&amp;E Stains</b>						
Total Number of H&E Slides	15,902	12,253	12,312	11,095	21,894	97%
H&E From Biopsy	9,503	7,144	6,353	5,102	4,708	-8%
H&E From Biopsy (Commercial Clients)					11,718	N/A
H&E From Necropsy	5,132	3,634	4,382	3,780	3,413	-10%
H&E - Research	499	457	249	1,155	395	-66%
H&E - Teaching	206	170	216	68	12	-82%
<b>IHC Stains</b>						
IHC Slides for BVDV PI (Ear Notch)	36	8	6	-	2	N/A
IHC Slides (not including BVDV PI)	343	69	69	82	141	72%
IHC Slides (Commercial Clients)					85	N/A
<b>Unstained Slides</b>						
Unstained Slides - Research	195	484	916	452	426	-6%
Unstained Slides (Commercial Clients)					890	N/A
<b>Special Stains</b>						
Special Stains Slides	1,465	1,177	1,456	1,556	1,632	5%
Special Stains Slides (Commercial Clients)	-	-	-	4	221	5425%

BIOPSY DATA	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Biopsy Only Accessions	3,221	2,758	2,643	2,425	2,403	-1%
Biopsy + Other Testing (except Necropsy) Accessions	74	135	128	119	96	-19%
Number of Short-Format Reports	3,480	2,950	2,818	2,627	2,683	2%
Number of Detailed-Format Reports	233	195	231	174	117	-33%
Biopsy-No interpretation (Commercial Clients)	4	1	232	584	4,870	734%

# SEROLOGY

## PANELS AND PROFILES

### 5-YEAR TEST TREND

PANEL/ PROFILE	TESTS	CALENDAR YEAR					% CHANGE
		2019	2020	2021	2022	2023	
Pseudorabies gB ELISA & Brucella	Pseudorabies gB ELISA, <i>B. abortus</i> Card Test	3,646	3,773	4,466	4,596	<b>13,999</b>	205%
Swine Serology Panel 1 **	Brucella Fluorescence Polarization Assay (FPA), Pseudorabies gB ELISA, PRRSV ELISA		1,665	3,029	3,365	<b>3,173</b>	-6%
Bovine Respiratory SN Profile 2 *	IBR, BVDV Type 1, BVDV Type 2, PI-3, BRSV			179	183	<b>946</b>	417%
Bovine Serum ELISA Panel	BVDV Antigen Capture ELISA, BLV ELISA, Johne's ELISA	255	300	261	385	<b>658</b>	71%
Swine Serology Panel 2 *	Pseudorabies gB ELISA, <i>B. abortus</i> FPA			54	303	<b>413</b>	36%
Abortion Panel Bovine	BVDV Antigen Capture ELISA, BVD Type 1 SN, IBR SN, Lepto MAT, Neospora ELISA, <i>B. abortus</i>	306	224	185	161	<b>194</b>	20%
Small Ruminant Biosecurity Panel *	CAE/OPP cELISA, Johnes ELISA			68	200	<b>194</b>	-3%
Bovine Respiratory SN Profile 1 *	IBR, BVDV Type 1, PI-3, BRSV			11	290	<b>176</b>	-39%
Canine Tick Profile	<i>E. canis</i> SNAP, RMSF IFA, Lyme, <i>Anaplasma phagocytophilum</i> / <i>A. platys</i>	43	46	28	40	<b>75</b>	88%
Goat Abortion Panel **	Buetongue Virus AGID, <i>B. abortus</i> AGGL, Q-Fever ELISA, Toxoplasma IgG IFA, Leptosira MAT		3	1	1	<b>6</b>	500%
Tick Panel ELISA	<i>Anaplasma phagocytophilum</i> / <i>A. platys</i> , <i>Ehrlichia canis</i> / <i>E. ewingii</i> , <i>Borrelia burgdorferi</i>	-	2	1	-	-	N/A
Bovine Respiratory Panel **	BRSV VN, BVDV-1a VN, BVDV-1b VN, BVDV-2 VN, IBR VN, <i>H. somni</i> AGGL, <i>M. haemolytica</i> AGGL, PI-3 VN		10	-	-	-	N/A
<b>Total Panels/Profiles Per Year</b>		<b>4,250</b>	<b>6,023</b>	<b>8,283</b>	<b>9,524</b>	<b>19,834</b>	<b>108%</b>

\* Panel introduced in CY 2021

\*\* Panel introduced in CY 2020

# SEROLOGY (CONTINUED)

## SEROLOGY

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
<i>Salmonella pullorum/typhoid</i> Microagglutination Screen	18,302	21,957	23,700	25,200	<b>34,801</b>	38%
<i>Mycoplasma gallisepticum/ Mycoplasma synoviae</i> ELISA	18,445	21,599	23,705	24,712	<b>34,800</b>	41%
<i>Brucella abortus</i> BAPA, Card, CF, FPA and STP §*	4,370	6,065	9,081	8,705	<b>21,144</b>	143%
Pseudorabies (PRV) gB and g1 ELISA §*	3,647	5,462	7,958	8,313	<b>17,605</b>	112%
Avian Influenza ELISA	1,995	2,610	2,734	2,731	<b>4,202</b>	54%
Equine Infectious Anemia (EIA) ELISA, AGID and Western Blot §	2,155	1,994	2,437	2,787	<b>3,623</b>	30%
BVDV Antigen Capture ELISA *	3,295	3,446	2,829	2,558	<b>3,470</b>	36%
Johne's Disease ELISA and CF §*	2,354	2,707	2,673	1,935	<b>3,430</b>	77%
PRRS ELISA *		1,676	3,637	3,441	<b>3,198</b>	-7%
Bovine Pregnancy ELISA	737	1,406	1,676	1,880	<b>1,543</b>	-18%
Bovine Leukemia Virus (BLV) ELISA and AGID §*	1,507	1,754	1,580	1,425	<b>1,433</b>	1%
BVDV Type I Serum Neutralization SN and VN §*	465	446	824	860	<b>1,361</b>	58%
Infectious Bovine Rhinotracheitis (IBR) SN *	309	284	786	803	<b>1,359</b>	69%
Goat and Sheep Pregnancy ELISA	548	523	509	350	<b>1,299</b>	271%
<i>Theileria (Babesia) equi</i> c-ELISA §	264	400	505	1,365	<b>1,133</b>	-17%
BRSV SN and VN §*	-	31	249	496	<b>1,125</b>	127%
Parainfluenza 3 SN and VN §*	166	144	204	473	<b>1,124</b>	138%
BVDV Type II Serum Neutralization SN and VN §*	-	11	404	377	<b>977</b>	159%
Rabies dFA Test				717	<b>816</b>	14%
CAE c-ELISA / OPP c-ELISA	533	422	555	566	<b>710</b>	25%
Anaplasma c-ELISA *	546	563	805	561	<b>601</b>	7%
<i>Babesia caballi</i> c-ELISA §	200	259	289	516	<b>549</b>	6%
<i>Neospora</i> c-ELISA §*	330	239	448	403	<b>454</b>	13%
<i>Brucella canis</i> Card Test, AGID, IFA and Tube Agglutination §*	270	279	307	533	<b>384</b>	-28%
<i>Leptospira</i> Microscopic Agglutination (MAT) *	665	542	389	242	<b>304</b>	26%
Caseous Lymphadenitis SHI §		160	173	231	<b>203</b>	-12%
Tularemia ( <i>Francisella tularensis</i> ) Plate Agglutination §**		3	4	48	<b>191</b>	298%
Rocky Mountain Spotted Fever (RMSF) IFA *	82	107	95	110	<b>156</b>	42%

§ In-house and/or Referral Laboratory Testing

\* Includes individual tests from Serology Panels and Profiles



# SEROLOGY (CONTINUED)

## SEROLOGY (CONTINUED)

### 5-YEAR TEST TREND

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Bluetongue c-ELISA and AGID § *		86	141	138	<b>106</b>	-23%
Lyme Disease SNAP *	43	48	29	40	<b>75</b>	88%
<i>E. canis/E. ewingii</i> SNAP *	43	48	29	40	<b>75</b>	88%
<i>Anaplasma phagocytophilum/A. platys</i> SNAP *	43	48	29	40	<b>75</b>	88%
Heartworm ELISA *	13	46	28	40	<b>75</b>	88%
Vesicular Stomatitis Virus VN (Indiana and New Jersey) §		74	28	56	<b>60</b>	7%
<i>Brucella ovis</i> ELISA §		17	11	31	<b>57</b>	84%
Equine Viral Arteritis (EVA) SN and VN § *		64	41	39	<b>45</b>	15%
West Nile Virus (WNV) IgM ELISA §		23	43	41	<b>43</b>	5%
Equine Protozoal Myeloencephalitis (EPM) IFAT §		40	72	69	<b>35</b>	-49%
Eastern Equine Encephalitis (EEE) IgM ELISA §		16	24	33	<b>33</b>	0%
Pseudorabies (PRV) g1 ELISA					<b>26</b>	N/A
Avian Influenza AGID	8	6	2	2	<b>18</b>	800%
Canine Herpesvirus VN §		24	14	-	<b>13</b>	N/A
<i>Toxoplasma gondii</i> IgG ELISA and IFA §		9	3	2	<b>12</b>	500%
Q-Fever ( <i>Coxiella burnetti</i> ) c-ELISA, CF and IFA §		11	4	22	<b>11</b>	-50%
End Point Titration IFA					<b>10</b>	N/A
All Other Tests	353	521	431	381	<b>39</b>	-90%
<b>Total Tests Per Year</b>	<b>61,688</b>	<b>76,170</b>	<b>89,485</b>	<b>93,312</b>	<b>142,782</b>	<b>53%</b>

§ In-house and/or Referral Laboratory Testing

\* Includes individual tests from Serology Panels and Profiles

# SEROLOGY (CONTINUED)

## RABIES TESTING

**5-YEAR TREND**

SPECIES	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Canine	20	12	98	304	<b>339</b>	12%
Feline	8	10	70	168	<b>200</b>	19%
Small Animal Other *	12	15	41	162	<b>194</b>	20%
Bovine	8	11	19	36	<b>36</b>	0%
Equine	5	3	12	30	<b>26</b>	-13%
Large Animal Other **	0	1	3	9	<b>9</b>	0%
Caprine	4	1	6	5	<b>5</b>	0%
Alpaca/Llama	1	0	0	1	<b>3</b>	200%
Ovine	0	0	0	1	<b>2</b>	100%
Porcine	1	0	1	1	<b>2</b>	100%
<b>Total Tests Per Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>187%</b>

\* CY 2023 Small Animal Other: bat (91), skunk (50), raccoon (41), squirrel (8), opossum (2), ground hog (1), rat (1)

\*\* CY 2023 Large Animal Other: coyote (5), deer (2), fox (1), monkey (1)



Photo By: Harley Fletcher



Photo By: Megan Loane

# SEROLOGY (CONTINUED)

## RABIES TESTING BY SPECIES

**CY 2023**

SPECIES	TOTAL # OF TESTS	POSITIVE RESULT	NEGATIVE RESULT	NO RESULT †
Canine	339	4	329	6
Feline	200	3	196	1
Bat	91	6	75	10
Skunk	50	21	27	2
Raccoon	41	0	40	1
Bovine	36	4	32	0
Equine	26	0	25	1
Squirrel	8	0	8	0
Caprine	5	1	4	0
Coyote	5	0	5	0
Llama/Alpaca	3	0	3	0
Deer	2	0	2	0
Opossum	2	0	2	0
Ovine	2	0	2	0
Porcine	2	0	2	0
Fox	1	0	1	0
Ground Hog	1	0	1	0
Monkey	1	0	1	0
Rat	1	0	1	0
<b>Total</b>	<b>816</b>	<b>39</b>	<b>756</b>	<b>21</b>

† Unsatisfactory sample per OSDH

# OUTSOURCED TESTING

## 4-YEAR TEST TREND

**NOTE:** Outsourced Testing is testing not affiliated with one of the primary laboratory units of OADDL. All Outsourced Testing is performed at referral laboratories.

TEST	CALENDAR YEAR					% CHANGE
	2019	2020	2021	2022	2023	
Cytology (only, slides)	119	246	107	107	<b>117</b>	9%
Urinalysis	15	8	17	14	<b>21</b>	50%
Complete Blood Count (CBC only/CBC with Path Review)	17	29	65	17	<b>19</b>	12%
Urinary Calculi Analysis		15	25	11	<b>12</b>	9%
CBC and Blood Chemistry Panel	36	36	32	22	<b>11</b>	-50%
Thyroid Testing ( T3, T4, Panel)	19	10	27	32	<b>10</b>	-69%
Progesterone Level	15	18	18	8	<b>9</b>	13%
Fluid Analysis with Cytology		11	7	16	<b>7</b>	-56%
Ruminant Chemistry					<b>6</b>	N/A
Genetic Testing	9	0	0	5	<b>5</b>	0%
Equine Blood Chemistry Panel	12	2	23	20	<b>4</b>	-80%
Phenobarbital Level	6	1	4	13	<b>4</b>	-69%
Potassium Bromide Level	5	8	8	5	<b>4</b>	-20%
All Other Tests	65	82	87	54	<b>11</b>	-80%
<b>Total Tests Per Year</b>	<b>318</b>	<b>466</b>	<b>420</b>	<b>324</b>	<b>240</b>	<b>-26%</b>

# TOXICOLOGY

## 5-YEAR TEST TREND

**NOTE:** Except where indicated as In-house all Toxicology testing is performed at a referral laboratory.

TEST	CALENDAR YEAR: JAN-DEC					% CHANGE
	2019	2020	2021	2022	2023	
Mineral Panel *	116	98	92	110	<b>133</b>	21%
Nitrate Quantitation-Aqueous Fluid	120	72	55	76	<b>91</b>	20%
Drug Screen/Quantitation	17	24	17	22	<b>82</b>	273%
Water Quality	55	98	63	32	<b>64</b>	100%
Toxicology - Special Testing	14	12	14	8	<b>24</b>	200%
Nitrate Quantitation-Forage	27	11	25	40	<b>19</b>	-53%
Cyanide (In-house)	5	8	9	48	<b>17</b>	-65%
Mycotoxin Screen	17	10	17	11	<b>17</b>	55%
Mass Spectrometry Toxicant Screen				7	<b>15</b>	114%
Vitamin E Analysis	0	0	3	4	<b>15</b>	275%
Trace Mineral - Lead	30	17	20	15	<b>12</b>	-20%
Bone Marrow Fat Analysis	7	11	7	15	<b>11</b>	-27%
Ammonia			2	1	<b>10</b>	900%
Vitamin A Analysis	16	8	5	3	<b>9</b>	200%
Anticoagulant/Rodenticides	6	11	10	6	<b>8</b>	33%
Magnesium	7	16	2	2	<b>8</b>	300%
Petroleum Hydrocarbon Screen	28	4	12	3	<b>8</b>	167%
Nitrate Quantitation-Water	3	0	1	0	<b>7</b>	N/A
GC/MS Toxicant Screen		7	17	14	<b>6</b>	-57%
Nitrate Quantitation-Serum	8	0	0	6	<b>6</b>	0%
Salt Screen	14	0	0	0	<b>6</b>	N/A
Trace Mineral - Copper	74	30	5	2	<b>5</b>	150%
Trace Mineral - Selenium	55	16	4	3	<b>5</b>	67%
All Other Testing	66	46	39	37	<b>22</b>	-41%
<b>Total Tests Per Year</b>	<b>685</b>	<b>499</b>	<b>419</b>	<b>465</b>	<b>600</b>	<b>29%</b>

\* **Mineral Panel** includes Trace Mineral Panels, Metal and Mineral Panels and Heavy Metal and Mineral Panels

# TEST RELATED SUPPLIES SENT TO CLIENTS

5-YEAR TREND

TEST	CALENDAR YEAR: JAN-DEC					% CHANGE
	2019	2020	2021	2022	2023	
<i>Tritrichomonas foetus</i> PBS Transport Tube	9,157	11,028	11,339	12,319	<b>14,440</b>	17%
3 oz. 10% Buffered Formalin Jar	722	720	954	850	<b>930</b>	9%
BHI Broth Media	130	35	32	134	<b>442</b>	230%
Histo Mailers			111	303	<b>355</b>	17%
Molecular Avian Influenza Swabs	141	62	34	129	<b>308</b>	139%
<i>Campylobacter fetus</i> Media	207	228	106	69	<b>27</b>	-61%
Bacterial Culturette w/o Charcoal	208	52	104	93	<b>26</b>	-72%
Sm. Ruminant Biosecurity Sample Collection Kit					<b>1</b>	N/A
Barrel			20	8	-	-100%
<i>Tritrichomonas foetus</i> Transport Medium Pouch	2,315	28	-	-	-	N/A
<b>Total Supplies</b>	<b>12,609</b>	<b>12,153</b>	<b>12,680</b>	<b>13,905</b>	<b>16,529</b>	<b>19%</b>



Photo By: Meagan Garris



Photo By: Megan Loane

# OADDL BOARD OF ADVISORS

## BOARD MEMBER

**Dr. Rosslyn Biggs**

**Dr. Kelly Black**

**Dr. K. Shawn Blood**

**Dr. Becky Brewer**

**Dr. Rod Hall**

**Dr. Steve Hart, (Past Chair)**

**Dr. Michael Johnston**

**Dr. W. H. Mitchell, (Board Chair)**

**Dr. Ken Powell**

**Dr. Fawn Reely**

**Dr. Carlos Risco**

**Dr. Donna Slater**

**Dr. Mike Tripp, (Vice-Chair/Secretary)**

**Dr. Bret White**

**Dr. Barry Whitworth**

**Mr. Scott Yates**

## GROUP REPRESENTED

Oklahoma Cattlemen's Association, Member, Vice Chair Beef Production Committee

Director, CVM Veterinary Teaching Hospital

Pharmaceutical Industry

USDA APHIS Area Veterinarian in Charge

State Veterinarian

Small Ruminant Industry

Equine Industry

Mixed Animal Practice

Poultry Industry

OVMA Representative, Sr. Territory Sales Manager at Boehringer-Ingelheim Animal Health

Dean, College of Veterinary Medicine

Small Animal Practice

Swine Industry

Food Animal Practice

Oklahoma Cooperative Extension

Director of Food Safety Services, ODAFF

# PERSONNEL: ADMINISTRATION, FACULTY, PATHOLOGY RESIDENTS AND STAFF

CY 2023

## ADMINISTRATION

## POSITION

Jerry Saliki	Professor OADDL Director (May 2020 to Present) Section Head: Serology Section Head: Histology
Emily Cooper	Assistant Director/Quality Manager Section Head: Receiving Office
Ryan Van Fleet	Coordinator of Business Office Coordinator of Human Resources Section Head: General Office
Janisue Coleman	Associate Quality Manager & Biosafety Officer

## FACULTY

## POSITION

## AREAS OF INTEREST

Giselle Cino *	Assistant Professor Anatomic Pathologist Section Head: Pathology Services	Infectious Disease Swine Diseases Emerging and Transboundary Diseases Ocular Pathology
Alexandra Ford	Assistant Professor Pathologist	Infectious Disease Exotics
Valerie McElliott	Clinical Assistant Professor Pathologist	Musculoskeletal Pathology Neuropathology Electron Microscopy
Craig Miller *	Assistant Professor Pathologist	Infectious Disease Neoplastic Disease Immunopathology
Sunil More	Assistant Professor Pathologist	Respiratory Disease Infectious Disease
Akhilesh Ramachandran	Associate Professor Section Head: Microbiology Section Head: Molecular Diagnostics	Bacteriology Molecular Diagnostics
Ruth Scimeca	Assistant Professor Clinical Parasitologist Section Head: Parasitology Diagnostics	Host-response to Parasitic Diseases Tick-borne Pathogens Parasitology Diagnostics
Tim Snider *	Professor Pathologist	Gastrointestinal Disease Reproductive Pathology Infectious Pathology
Brianne Taylor *	Clinical Assistant Professor Pathologist	Infectious Disease Equine Pathology

\* Left OADDL in CY 2023

\*\* Joined OADDL in CY 2023



# PERSONNEL: ADMINISTRATION, FACULTY, PATHOLOGY RESIDENTS AND STAFF (CONTINUED)

**CY 2023**

STAFF	LABORATORY UNIT	POSITION
Allen, Noah	Microbiology	Senior Laboratory Technologist
Caseltine, Shannon	Rabies	Laboratory Supervisor
Crockett, Taytum	Serology	Senior Laboratory Technologist
Deal, Clay	Microbiology	Senior Laboratory Technologist
Fletcher, Harley **	Receiving Office; Necropsy	Lab Technician
Gupta, Sushim	Microbiology	Post Doctoral Fellow
Hahn, Raina	Molecular Diagnostics	Senior Laboratory Technologist
Hamilton, Brianne	Histology	Laboratory Manager
Hergenreder, Katie **/*	Histology	Senior Laboratory Technologist
Hoyt, Amy	Serology	Laboratory Manager
Johns, Carolyn *	Receiving Office; Necropsy	Receiving Office and Necropsy Supervisor
Krueger, Alexandria **	Receiving Office; Necropsy	Lab Technician
Kiyuna, Emily	Histology	Laboratory Supervisor
Lawrence, Allison	Receiving Office; Necropsy	Diagnostic Technician
Loane, Megan	Receiving Office; Necropsy	Laboratory Manager
Looper, Emily **	Parasitology	Laboratory Supervisor
Madden, Robin	Molecular Diagnostics	Laboratory Manager
Maloney, Shannon	General Office	Medical Records Technician
McConnell, Sean **/*	Histology	Senior Laboratory Technologist
Medellin, Alejandra	Molecular Diagnostics	Laboratory Supervisor
Morrow-Williams, Makinzi **	Histology	Senior Laboratory Technologist
Norris, Callie **/*	Serology	Senior Laboratory Technologist
Randall, Jordan **	Serology	Senior Laboratory Technologist
Rowden, Michele	Accounting	Accounting Specialist
Smith, Sara	Molecular Diagnostics	Senior Laboratory Technologist
Stair, Eron	Histology	Senior Laboratory Technologist
Stanley, Crystal	Serology	Senior Laboratory Technologist
Talent, Scott	Microbiology	Laboratory Manager
Taylor, Stephanie	General Office	Medical Records Data Entry Technician
Windiate, Victoria	OADDL Informatics; CVM Laboratory Safety	Coordinator
Woods, Brittany **	Histology	Senior Laboratory Technologist

\*Left OADDL in CY 2023

\*\* Joined OADDL in CY 2023

# INSTRUCTION OF VET MED AND OSU STUDENTS

- VMED 7253 – Veterinary Immunology/**Ford A**
- VMED 7264 – General Pathology/**Ford A, Taylor B, More S**
- VMED 7323 – Veterinary Parasitology II/**Scimeca R**
- VMED 7354 – Bacteriology and Mycology/**Ford A**
- VMED 7454 – Veterinary Virology/**Ford A, More S, McElliott V**
- VMED 7563 – Veterinary Musculoskeletal system/**McElliott V**
- VMED 7662 Urinary System/**Taylor B**
- VMED 7674 Theriogenology/**Taylor B**
- VCS 7532 Applied Diagnostic Medicine and Laboratory Investigations III/**Taylor B (IOR), Ford A, McElliott V**
- VCS 7072 – Veterinary Diagnostics I/**Ford A, McElliott V (IOR), Scimeca R, Narayanan S, More S, Taylor B**
- VCS 7912 Grand Rounds (co-moderators)/**Taylor B & Ford A**
- HONR 1000 Future of Veterinary Medicine/**Taylor B (IOR), Scimeca R**

# AWARDS, HONORS, CERTIFICATIONS

- **Taylor B**, Zoetis Distinguished Veterinary Teacher Award
- **Taylor B**, Outstanding Class Teaching Award (Class of 2026)
- **Taylor B**, Davis-Thompson Foundation Newsletter monthly cover photograph winner (July)
- **Ford A**, Veterinary Leadership Conference Early Career Scholarship (travel)
- **Ford A**, Image Challenge, Veterinary Pathology (in progress, Paraneoplastic Syndrome theme)
- **McElliott V**, Vice Chair, American College of Veterinary Pathology (ACVP), Pathology Training Committee (PTC)
- **Narayanan S**, Molecular Diagnostics and Bioinformatics Poster Presentation Award, AAVLD 2023

# OUTREACH AND PRESENTATIONS TO THE PUBLIC AND CLIENTS

- **Taylor B**, OADDL representative, OVMA annual convention (January)
- **Taylor B**, Speaker, American Dairy Goat Association (October)
  - » Caprine Pathology
  - » Toxicology
- **Taylor B**, Speaker, OSU Fall Conference (November)
  - » Equine Pathology
  - » Small Animal Pathology and Toxicology
- **Ford A**, “Careers in Veterinary Medicine” OSU Medicine PreHealth Roundup, Tulsa, OK
- **Ford A**, “Forensic Pathology: Overview of a Growing Field” Association of Shelter Veterinarians, student chapter
- **McElliott V**, Exhibitor representing OSU-CVM at the 2023 Annual Biomedical Research Conference for Minoritized Scientists in Phoenix, AZ November 15 – 18, 2023
- **McElliott V**, “The Life of a Veterinarian”. Oral presentation and interactive bandaging lab with second graders. Stillwater Christian School, Stillwater, OK March 21, 2023
- **McElliott V**, 2023 Abstract Reviewer, American College of Veterinary Pathology (ACVP), Late-Breaking Abstract Committee (LBA)
- **Scimeca, R**, TV interview for Tulsa news. *Cytauxzoon felis* in cats. 2023
- **Scimeca, R**, Interview for DVM360 article on ticks and tick-borne diseases. 2023

# ATTENDANCE AT MEETINGS

- **Taylor B, Ford A**: American College of Veterinary Pathology (ACVP) annual meeting (October, Chicago, IL)
- **Ford A**: American Veterinary Medical Association (AVMA) Veterinary Leadership Conference, Winter 2024
- **Ford A**: American Veterinary Medical Association (AVMA) Chapter Summit, Fall 2023
- **McElliott V**: 2023 Annual Biomedical Research Conference for Minoritized Scientists in Phoenix, AZ November 15 – 18, 2023
- **Scimeca R**: - American Association of Veterinary Parasitologists. June 10-13, 2023. Lexington, KY.
- **Scimeca R**: 29th International conference of the world association for the advancement of veterinary parasitology. August 20-24, 2023. Chennai, India.
- **Scimeca R, Saliki J, Madden R, Cooper E, Ramachandran A, Narayanan S**: American Association of Veterinary Diagnosticians AAVLD, Washington DC. October 2023
- **Narayanan S**: INTERACT 2023

# POSTERS, SCIENTIFIC PRESENTATIONS, SCIENTIFIC PUBLICATIONS

- “Dematiaceous fungal placentitis in two horses” (ACVP annual meeting). **Taylor B**
- Weeraratne P, Maker R, Huang C, **Taylor B**, Cowan SR, Hyatt J, Tamil Selvan M, Shatnawi S, Thomas JE, Meinkoth JH, **Scimeca R**, Birkenheuer A, Liu L, Reichard MV, **Miller CA**. A Novel Vaccine Strategy to Prevent Cytauxzoonosis in Domestic Cats. *Vaccines (Basel)*. 2023 Mar 2;11(3):573.
- Rhabdomyosarcoma in the oral cavity of an 8-month-old dog (Poster, ACVP Annual Meeting – **AK Ford** and **BM Taylor**)
- Field-deployable PCR assays for foot and mouth disease (FMD), **Gupta, S. K.**, Gaffney, C., Kisner, T., **Saliki, J.**, and **Ramachandran, A.**, 66th AAVLD, National Harbor, MD, October 12-18, 2023.
- Microbe Finder® (MiFi®) – A novel platform for pathogen detection by metagenome sequencing, **Narayanan, S.**, Espindola, A., Malayer, J., Cardwell, K., **Ramachandran, A.** 66th AAVLD, National Harbor, MD, October 12-18, 2023.
- Systemic mycosis in two captive red deer (*Cervus elaphus*), **Cino-Ozuna, A. G.**, **Narayanan, S.**, **More, S. N.**, **Mitchell, S. D.**, **Ramachandran, A.**, 66th AAVLD, National Harbor, MD, October 12-18, 2023.
- **Mitchell, S. D.**, **Ramachandran, A.**, **Gupta, S. K.**, Olson, D., & **Ford, A. K.** (2023). Acute gastrointestinal disease in a young bobcat (*Lynx rufus*). *Journal of the American Veterinary Medical Association* (published online ahead of print 2023). Retrieved Dec 12, 2023, from <https://doi.org/10.2460/javma.23.07.0380>
- Design of SARS-CoV-2 papain-like protease inhibitor with antiviral efficacy in a mouse model. Bin Tan, Xiaoming Zhang, Ahmadullah Ansari, Prakash Jadhav, Haozhou Tan, Kan Li, Ashima Chopra, **Alexandra Ford**, Xiang Chi, Francisc Xavier Ruiz, Eddy Arnold, Xufang Deng, Jun Wang.
- **Narayanan, S.**, Couger, B., Bates, H., **Gupta, S. K.**, Malayer, J., & **Ramachandran, A.** (2023). Characterization of three *Francisella tularensis* genomes from Oklahoma, USA. *Access Microbiology*, 5(6), 000451.
- **Narayanan, S.**, Espindola, A. S., Malayer, J., Cardwell, K., & **Ramachandran, A.** (2023). Development and evaluation of Microbe Finder (MiFi)®: A novel in silico diagnostic platform for pathogen detection from metagenomic data. *Journal of Medical Microbiology*, 72(6), 001720.
- Hung, C.-C., Varga, C., Reinhart, J. M., Maddox, C. W., Dilger, R. N., Forsythe, L., Stevenson, A. K., Franklin-Guild, R. J., Paul, N. C., & **Ramachandran, A.** (2023). Assessing the urinary concentration of nitrofurantoin and its antibacterial activity against *Escherichia coli*, *Staphylococcus pseudintermedius*, and *Enterococcus faecium* isolated from dogs with urinary tract infections. *Frontiers in Veterinary Science*, 10.
- Merchioratto, I., Mendes Peter, C., **Ramachandran, A.**, Maggioli, M. F., & Vicoso Bauermann, F. (2023). Viability of Veterinary-Relevant Viruses in Decomposing Tissues over a 90-Day Period Using an In-Vitro System. *Pathogens*, 12(9), 1104.
- Hanzlicek, A. S., KuKanich, K. S., Cook, A. K., Hodges, S., Thomason, J. M., DeSilva, R., **Ramachandran, A.**, & Durkin, M. M. (2023). Clinical utility of fungal culture and antifungal susceptibility in cats and dogs with histoplasmosis. *Journal of Veterinary Internal Medicine*.
- *Klebsiella pneumoniae* Co-infection Leads to Fatal Pneumonia in SARS-CoV-2-infected Mice. Crystal Villalva, **Girish Patil**, **Sai Narayanan**, Debarati Chanda, Roshan Ghimire, **Timothy Snider**, **Akhilesh Ramachandran**, Rudragouda Channappanavar, **Sunil More**. bioRxiv 2023.07.28.551035; doi: <https://doi.org/10.1101/2023.07.28.551035>.

# POSTERS, SCIENTIFIC PRESENTATIONS, SCIENTIFIC PUBLICATIONS (CONTINUED)

- Trehan S, Ramachandran U, **Scimeca R** and Aakur SN. ProtoKD: Learning from Extremely Scarce Data for Parasite Ova Recognition. Meeting: International Conference on Machine Learning and Applications. 2023 Florida. (Accepted-Oral presentation)
- **Scimeca RC**, Carpenter A, Caron M, Matt CL, Brandao J, O'Connell TJ, Reichard MV. Prevalence and genetic characterization of *Toxoplasma gondii* strains isolated from 31 wild Passeriformes collected in North-Central Oklahoma. J Parasit Dis 47, 140-145. 29<sup>th</sup> International conference of the world association for the advancement of veterinary parasitology. August 20-24, 2023. Chennai, India. (Poster)
- **Scimeca RC** and Reichard MV. Differential gene expression response to acute and chronic *Cytauxzoon felis* infection in domestic cats (*Felis catus*). 29<sup>th</sup> International conference of the world association for the advancement of veterinary parasitology. August 20-24, 2023. Chennai, India. (Poster)
- Furman H and **Scimeca RC**. Detection of *Babesia conradae* in Coyotes (*Canis latrans*) and Coyote-Hunting Greyhound Dogs (*Canis familiaris*). American association of veterinary parasitologists. June 10-13, 2023. Lexington, KY. (Oral)
- **Scimeca RC**, Beall M, Bowman D, Carithers D, Jimenez Castro P, Edmonds J, Guerino F, Little S, Peregrine A, Reichard M, Starkey M, Verocai G, Young L. The National Center for Veterinary Parasitology: supporting parasitologists, advancing parasitology. American Association of Veterinary Parasitologists. June 10-13, 2023. Lexington, KY. (Oral) and American Association of Veterinary Diagnosticians AAVLD, Washington DC. October 2023 (Oral)
- Duncan K, Little S, Hunter A, Allen K, **Scimeca R**, Guerino F. Comparing sublethal effects of fluralaner on adult *Ixodes scapularis* and *Amblyomma Americanum*. American Association of Veterinary Parasitologists. June 10-13, 2023. Lexington, KY. (Oral)
- Differential gene expression response to acute and chronic *Cytauxzoon felis* infection in domestic cats (*Felis catus*). **Scimeca RC** and Reichard MV. 2023. J Ticks and Tick-borne dis. 14, 102242.
- Detection of *Babesia conradae* in coyotes (*Canis latrans*) and coyote-hunting greyhound dogs (*Canis familiaris*). Furman H and **Scimeca RC**. 2023. Pathogens. 12 (4), 528.
- Multicenter evaluation of the VETSCAN IMAGYST™ system using the Grundium Ocus 40 scanner to detect gastrointestinal parasites in feces of dogs and cats. Nagamori Y, **Scimeca RC**, Hall-Sedlak Ruth, Blagburn B, Starkey L, Bowman D, Lucio-Forster A, Little S, Loenser M, Larson B, Rhodes A, Goldstein R. 2023. J Vet Diagn Invest. 36(1):32-40
- A Novel Vaccine Strategy to Prevent Cytauxzoonosis in Domestic Cats. Weerathne P, Maker R, Huang C, **Taylor B**, Cowan SR, Hyatt J, Tamil Selvan M, Shatnawi S, Thomas JE, Meinkoth JH, **Scimeca RC**, Birkenheuer A, Liu L, Reichard MV, **Miller CA**. 2023. Vaccines. 11(3), 573.
- Ashar H, Singh A, Ektate K, **More S**, Ranjan A. Treating methicillin-resistant Staphylococcus aureus (MRSA) bone infection with focused ultrasound combined thermally sensitive liposomes. Int J Hyperthermia. 2023;40(1):2211278. doi: 10.1080/02656736.2023.2211278. PMID: 37437891.
- Kerr CM, Parthasarathy S, Schwarting N, O'Connor JJ, Pfannenstiel JJ, Giri E, **More S**, Orozco RC, Fehr AR. PARP12 is required to repress the replication of a Mac1 mutant coronavirus in a cell- and tissue-specific manner. J Virol. 2023 Sep 28;97(9):e0088523. doi: 10.1128/jvi.00885-23. Epub 2023 Sep 11. PMID: 37695054; PMCID: PMC10537751.

# POSTERS, SCIENTIFIC PRESENTATIONS, SCIENTIFIC PUBLICATIONS *(CONTINUED)*

- Alhammad YM, Parthasarathy S, Ghimire R, Kerr CM, O'Connor JJ, Pfannenstiel JJ, Chanda D, **Miller CA**, Baumlin N, Salathe M, Unckless RL, Zuñiga S, Enjuanes L, **More S**, Channappanavar R, Fehr AR. SARS-CoV-2 Mac1 is required for IFN antagonism and efficient virus replication in cell culture and in mice. Proc Natl Acad Sci USA. 2023 Aug 29;120(35):e2302083120. doi: 10.1073/pnas.2302083120. Epub 2023 Aug 22. PMID: 37607224; PMCID: PMC10468617.
- Ashar H, Singh A, Kishore D, Neel T, **More S**, Liu C, Dugat D, Ranjan A. Enabling Chemo-Immunotherapy with HIFU in Canine Cancer Patients. Ann Biomed Eng. 2023 May 10. doi: 10.1007/s10439-023-03194-1. Epub ahead of print. PMID: 37162696.
- Roshan Ghimire, Titus Patton, Rakshya Shrestha, Debarati Chanda, **Sunil More**, Rudragouda Channappanavar; Differential role of TLR7 signaling in SARS-CoV-2-induced antiviral and inflammatory responses. J Immunol 1 May 2023; 210 (1\_Supplement): 72.17.
- Reesman, C, Sullivan, G, Danao, M, Pfeiffer, M, **More, S**, Mafi, G & Ramanathan, R. (2023) 'Use of High-Pressure Processing to Improve the Redness of Dark-Cutting Beef', Meat and Muscle Biology. 7(1) :1-12. doi: 10.22175/mmb.15716



*Photo By: Harley Fletcher*

# GLOSSARY

AAVLD	American Association of Veterinary Laboratory Diagnosticians	IBR	Infectious Bovine Rhinotracheitis
ACVP	American College of Veterinary Pathology	IFA/IFAT	Indirect Fluorescent Antibody/IFA Test
AGGL	Agglutination Test	IgG	Immunoglobulin G
AGID	Agar Gel Immunodiffusion Assay	IgM	Immunoglobulin M
AIV	Avian Influenza Virus	IHC	Immunochemistry
ASF	African Swine Fever	ILT	Infectious Laryngotracheitis
AVMA	American Veterinary Medical Association	IOR	Instructor of Record
BAPA	Buffered Acidified Plate Antigen	MAT	Microscopic Agglutination Test
BCV	Bovine Coronavirus	MS/MG	<i>Mycoplasma synoviae</i> / <i>Mycoplasma gallisepticum</i>
BHI	Brain Heart Infusion Medium	NPPI	National Poultry Improvement Plan
BLV	Bovine Leukemia Virus	OHRC	Oklahoma Horse Racing Commission
BRSV	Bovine Respiratory Syncytial Virus	OPP/OPPV	Ovine Progressive Pneumonia/OPP Virus
BSE	Bovine Spongiform Encephalopathy	OSDH	Oklahoma State Department of Health
BVD/BVDV	Bovine Viral Diarrhea/BVD Virus	OSU	Oklahoma State University
c-ELISA	Competitive ELISA	OVMA	Oklahoma Veterinary Medical Association
CAE	Caprine Arteritis Encephalitis	PAS	Periodic Acid-Schiff stain
CBC	Complete Blood Count	PBS	Phosphate-buffered Saline
CF	Complement Fixation	PCR	Polymerase Chain Reaction
CSF	Classical Swine Fever	PI	Persistently Infected
CVM	College of Veterinary Medicine	PI-3	Parainfluenza-3 Virus
CWD	Chronic Wasting Disease	PrP	Protease resistant Protein
CY	Calendar Year (January -December)	PRRS/PRRSV	Porcine Reproductive and Respiratory Syndrome/ PRRS Virus
dFA	Direct Fluorescent Antibody	PRV	Pseudorabies Virus
EEE	Eastern Equine Encephalitis	PTAH	Phosphotungstic Acid Hematoxylin stain
EHD	Epizootic Hemorrhagic Disease	qPCR	quantitative Polymerase Chain Reaction
EHV	Equine Herpesvirus	RAP	Rapid Automated Presumptive
EIA	Equine Infectious Anemia	RMSF	Rocky Mountain Spotted Fever
ELISA	Enzyme-Linked Immunosorbent Assay	SARS-CoV2	Severe Acute Respiratory Syndrome-Coronavirus 2
END	Exotic Newcastle Disease	SHI	Synergistic Hemolysin Inhibition
EU	European Union	SIV	Swine Influenza Virus
EVA	Equine Viral Arteritis	SN	Serum Neutralization
FA	Fluorescent Antibody	sp./spp.	Specie/Species
FMD	Foot and Mouth Disease	SPT	Standard Plate Test
FPA	Fluorescence Polarization Assay	TAT	Turnaround Time
GC/MS	Gas Chromatography/Mass Spectrometry	VMH/VTH	OSU CVM Veterinary Teaching Hospital
GMS	Grocott's Methenamine Silver stain	VN	Virus Neutralization
H&E	Hematoxylin and Eosin stain	WNV	West Nile Virus
HI	Hemagglutination Inhibition		