

### Utah Veterinary Diagnostic Laboratory Funding Request

<b>Position</b>	<b>Salary</b>	<b>Benefits</b>	<b>Total</b>
Veterinary Pathologist	\$105,000	\$42,000	\$147,000
Chemist	\$55,000	\$22,000	\$77,000
Laboratory Technicians (2)	\$54,000	\$22,000	\$76,000
<b>Total Request</b>			<b>\$300,000</b>

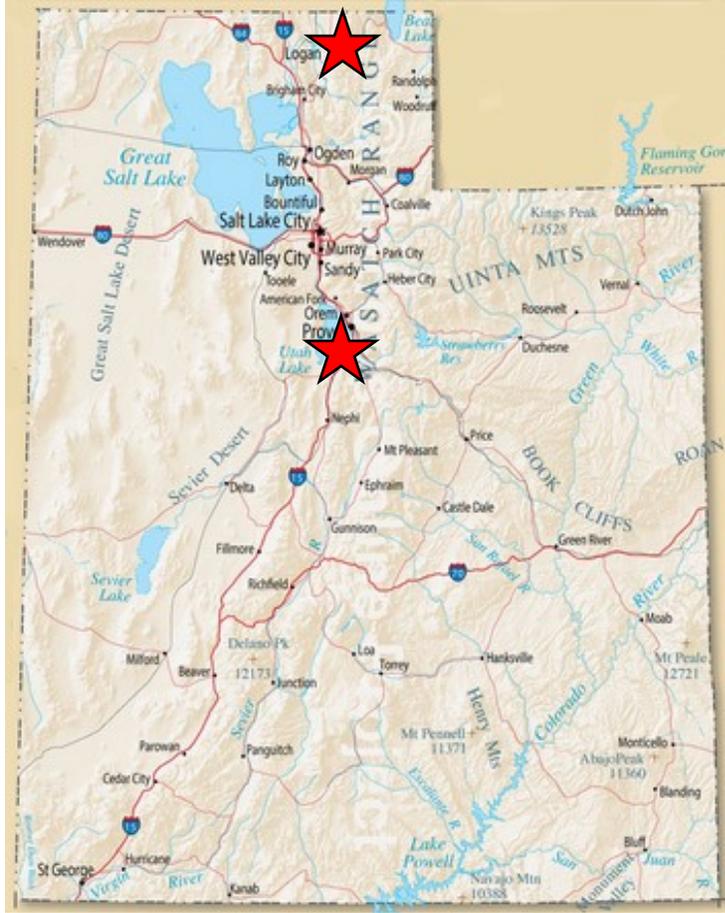
## Utah Veterinary Diagnostic Laboratory Income and Expenses

2019	UDAF	USU	Fee-for-service	NAHLN	Total
<b>Income by Source</b>	<b>\$783,921.41</b>	<b>\$474,482.61</b>	<b>\$1,155,801.41</b>	<b>\$136,999.85</b>	<b>\$2,551,205.28</b>
<b>Expenses by Source</b>					
Personnel	\$468,921.41	\$466,282.06	\$472,196.29	\$64,842.14	\$1,472,241.90
Facilities Operations & Maintenance	\$315,000.00	-	\$1,585.42	-	\$316,585.42
Laboratory supplies	-	\$6,389.51	\$366,303.15	-	\$372,692.66
Equipment	-	-	\$189,455.68	\$59,698.20	\$249,153.88
Equipment maintenance	-	-	\$72,095.23	-	\$72,095.23
Operating	-	\$1,811.04	\$221,332.70	\$12,459.51	\$235,603.25
<b>Total Expenses</b>	<b>\$783,921.41</b>	<b>\$474,482.61</b>	<b>\$1,322,968.47</b>	<b>\$136,999.85</b>	<b>\$2,718,372.34</b>
<b>Difference</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>-\$167,167.06</b>	<b>\$0.00</b>	<b>-\$167,167.06</b>

UDAF = Utah Department of Agriculture and Food

USU = Utah State University

NAHLN = National Animal Health Laboratory Network



Utah Veterinary  
Diagnostic Laboratory:  
Serving the state of  
Utah

## Annual Report

2019

January 1, 2019 through December 31, 2019

Utah Veterinary Diagnostic Laboratory  
950 East 1400 North  
Logan, UT 84341  
Phone (435) 797-1895  
FAX: (435) 797-2805  
<http://www.usu.edu/uvdl/>

Spanish Fork Branch Laboratory  
514 West 3000 North  
Spanish Fork, UT 84660  
Phone: (801) 798-5435  
FAX: (801) 798-7009

## Personnel, 2019

At the close of 2019, personnel in the Utah Veterinary Diagnostic Laboratory (UVDL) consisted of nine veterinary specialists, two post-DVM veterinary pathology residents/PhD candidates, and 12 support staff divided between two laboratories, a main laboratory in Logan and a branch laboratory in Spanish Fork. Staffing by section is shown below. Please note that individuals often serve in more than one section.

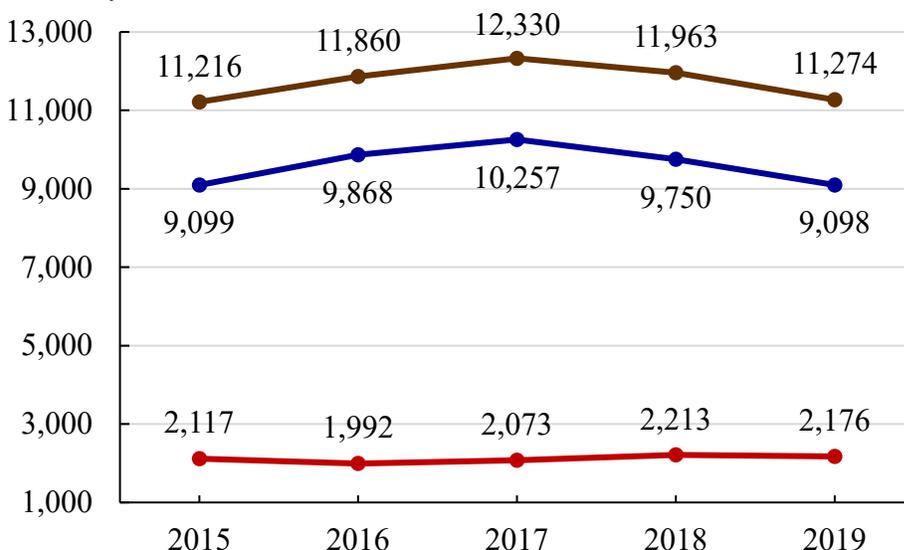
Laboratory Section	Name	Position
Administration/Office	Baldwin, Tom	Laboratory director
	Bunker, Kaitlyn	Staff assistant/technician
	DeVries, Jodi	Staff assistant
	Erickson, Marcia	Staff assistant
	Kelly, E. Jane	Branch laboratory director
Case Accessioning	Bunker, Kaitlyn	Staff assistant/technician
	Jensen, Hailee	Medical technologist
Avian Health	Frame, David	Poultry diagnostician
Bacteriology	Jensen, Hailee	Medical technologist
	Kelly, E. Jane	Section head
	Nicholes, Samuel	Laboratory technician
	Tarbet, Bart	Supervisor, Logan
Clinical Pathology	Conrad, Tina	Medical technologist
	Kurz, Jacqueline	Section head
Epidemiology	Wilson, David	Veterinary epidemiologist
Histology/Immuno-histochemistry	Conrad, Tina	Medical technologist
	Hullinger, Gordon	Section head
	Iodice, Sheri	Histotechnician
Molecular Diagnostics	Van Wettere, Arnaud	Section head
	Wilhelm, Amanda	Laboratory technician
Parasitology	Baldwin, Tom	Supervisor, Logan
	Kelly, E. Jane	Section head
	McMillan, Lauren	Laboratory technician
Pathology	Baldwin, Tom	Section head
	Clayton, Michael	Veterinary pathology resident
	Hullinger, Gordon	Veterinary pathologist
	Kelly, E. Jane	Veterinary diagnostician
	Kurz, Jacqueline	Veterinary pathologist
	Mainenti, Marta	Veterinary pathology resident
Van Wettere, Arnaud	Veterinary pathologist	
Quality Control	Johnson, Deborah	Quality assurance manager
Serology	Baldwin, Tom	Section head
	Bunker, Kaitlyn	Staff assistant/technician
	Kelly, E. Jane	Supervisor, Spanish Fork
	McMillan, Lauren	Laboratory technician

Laboratory Section	Name	Position
Toxicology	Hall, Jeffery	Section head
	Hubbard, Mary	Analytical chemist
	Winger, Harold	Laboratory technician
Virology	Tarbet, Bart	Section head

### Laboratory accessions (cases), 2019

In 2019, laboratory accessions (a submission that requires one or more laboratory assays) totaled 11,274, down 689 (5.8%) from 2018. The Logan laboratory accessed 9,098 cases (80.7%) while the Spanish Fork laboratory accessed 2,176 (19.3%). Laboratory accessions at Logan decreased by 652 (6.7%) while accessions at Spanish Fork decreased by 37 (1.7%). Accessions for the past five years are shown in the graph below.

Laboratory accessions, 2015 – 2019



### Accessions by state

In 2019, the UVDL accessioned cases from 39 different states. As expected, accessions originating in Utah were most numerous at 9,390 (83.3%), followed by Idaho (872; 7.7%), Wyoming (391; 3.5%), California (131; 1.2%) and Montana (82; 0.7%). Number of accessions by state are provided in the table below.

State	No.	State	No.	State	No.	State	No.
Arizona	47	Kansas	2	Nevada	21	So. Carolina	5
Arkansas	4	Kentucky	1	New Jersey	2	So. Dakota	12
California	131	Louisiana	12	New York	34	Tennessee	27
Colorado	17	Massachusetts	22	North Carolina	4	Texas	5
Florida	24	Michigan	4	North Dakota	12	Utah	9,390
Georgia	11	Minnesota	3	Ohio	1	Washington	6
Idaho	872	Mississippi	9	Oklahoma	2	West Virginia	1
Illinois	1	Missouri	19	Oregon	37	Wisconsin	4
Indiana	1	Montana	82	Pennsylvania	7	Wyoming	391
Iowa	36	Nebraska	11	Rhode Island	4	Total	11,274

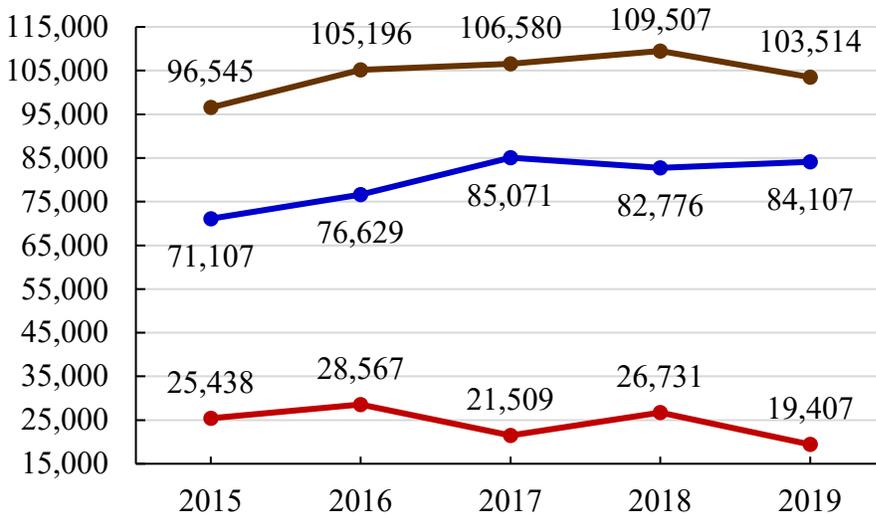
Utah accessions by county

Within Utah, submissions from 10 counties (Cache, Utah, Box Elder, Salt Lake, Uintah, Duchesne, Weber, Sanpete, Washington and Sevier, listed in decreasing order) account for 7,559 (80.5%) of Utah accessions. Laboratory accessions from counties within Utah are provided in the table below.

County	No.	County	No.	County	No.
Beaver	210	Grand	20	Sevier	273
Box Elder	843	Iron	207	Summit	33
Cache	2,436	Juab	76	Tooele	156
Carbon	105	Kane	61	Uintah	534
Daggett	1	Millard	203	Utah	1,164
Davis	131	Morgan	206	Wasatch	174
Duchesne	505	Rich	95	Washington	356
Emery	69	Salt Lake	564	Wayne	81
Garfield	1	Sanpete	386	Weber	498
				Total	9,390

**Total laboratory tests (assays)**

Laboratory assays performed in 2019 total 103,514, down 5,993 (5.5%) from 2018. In the main laboratory, a total of 84,107 (81.3%) assays were performed, while in the Spanish Fork laboratory 19,407 (18.7%) were done. Number of assays at the Logan laboratory increased by 1,331 (1.6%) but were offset by a 7,324 (27.4%) decrease in the Spanish Fork laboratory. Number of assays completed each of the past five years is provided graphically below.



Laboratory tests performed, 2015 – 2019

Each section within the laboratory contributes toward the total testing effort. Number of individual tests or procedures performed in each section at both laboratories for the past five years is provided below.

Section	2015	2016	2017	2018	2019
Bacteriology	5,128	4,243	4,239	4,121	3,531
Clinical pathology	3,508	5,053	3,112	3,691	2,455
Immunohistochemistry	4,861	4,577	3,884	6,690	902
Molecular diagnostics	23,877	26,113	26,716	26,659	28,019
Parasitology	611	1,074	1,028	1,237	929
Pathology	2,253	2,530	2,716	3,260	3,414
Serology	52,973	57,628	59,345	59,417	60,725
Toxicology	3,334	3,978	5,540	4,432	3,539
Total	96,545	105,196	106,580	109,507	103,514

Number of assays performed in each section by laboratory for 2019 is provided in the tables below. Where only the Logan laboratory is listed, testing is performed at that location only.

### Bacteriology

Test or procedure	Logan	Sp. Fork	Total
Aerobic culture	576	352	928
Anaerobic culture	162	16	178
Antimicrobial susceptibility testing	181	31	212
<i>Campylobacter</i> culture	532	1	533
Coliform count	0	67	67
Environmental culture	17	0	17
Fungal culture	19	6	25
<i>Listeria</i> culture	3	0	3
Milk culture	38	8	46
Mold and yeast count	0	63	63
<i>Salmonella</i> culture	63	1,319	1,382
<i>Vibrio cholerae</i> culture	0	53	53
Water culture	24	0	24
Total	1,615	1,916	3,531

### Clinical pathology

Test or procedure	Logan	Test or procedure	Logan
ACTH stimulation	5	Dexamethasone suppression	2
Alanine transaminase	2	Estradiol	74
Beta-hydroxybutyrate	167	Fecal occult blood	8
Bile acids	2	Fibrinogen	2
Calcium	3	Hemogram	9
Chemistry profile, large animal	351	Liver profile, large animal	9
Chemistry profile, small animal	135	Liver profile, small animal	90
Cholesterol	3	Metabolic profile, large animal	3
Complete blood count	259	Phenobarbital	25
Cortisol	15	Phosphorus	1
Creatine kinase	2	Plasma protein	1
Creatinine	46	Potassium	1
Progesterone	1,141	Thyroxine, free	5
Renal profile	1	Thyroxine, total	22
Cytology	4	Reticulocyte count	1

Test or procedure	Logan	Test or procedure	Logan
Testosterone	22	Urinalysis	17
Thyroid profile	8	Urine creatinine	15
Thyroid stimulating hormone	2	Total	2,455
Triglyceride	2		

### Immunohistochemistry (IHC)

Test or procedure	Logan
Chronic wasting disease	792
IHC special stains	15
Scrapie	95
Total	902

### Molecular diagnostics

Test or procedure	Logan	Test or procedure	Logan
Avian paramyxovirus	49	Johne's disease	23
Avian influenza	702	<i>Leptospira</i> spp.	13
Bluetongue virus	2,012	Mycoplasmas	30
Bovine abortion panel	7	Pigeon virology panel	9
Bovine diarrhea virus	46	<i>Salmonellosis</i>	129
Bovine respiratory panel	34	Sequencing	2
Calf enteric panel	203	Trichomoniasis	24,687
Chlamydiaceae	13	Vesicular stomatitis	2
Equine herpesvirus	25	West Nile virus	23
Exotic Newcastle disease	8	Total	28,019
IBR virus	2		

### Parasitology

Test or procedure	Logan	Sp. Fork	Total
Cryptosporidium	31	15	46
Fecal egg count	18	5	23
Fecal float	202	68	270
<i>Giardia</i>	68	0	68
Trichomoniasis culture	522	0	522
Total	841	88	929

### Pathology

Test or procedure	Logan	Sp. Fork	Total
Biopsies	1,537	0	1,537
Brain removal	28	5	33
Cremation	183	82	265
Disposal	31	3	34
Euthanasia	5	2	7
Incineration	79	68	147
Necropsy, avian	173	364	537
Necropsy, non-avian*	492	316	808

Test or procedure	Logan	Sp. Fork	Total
Rabies	38	7	45
Spinal cord removal	1	0	1
Total	2,567	847	3,414

\*Of the 808 non-avian necropsies, 61 were performed in support of research at Utah State University.

Number of necropsies by species							
Addax	1	Deer	15	Kite	1	Pigeon	78
Alpaca	1	Dog	94	Koi carp	1	Quail	1
Antelope	1	Dove	7	Lion	1	Rabbit	11
Bear	1	Duck	6	Lizard	1	Raccoon	3
Beaver	3	Eagle	3	Llama	1	Rat	16
Bighorn sheep	10	Elk	9	Mink	100	Raven	1
Bison	1	Falcon	9	Moose	4	Sheep	81
Bobcat	1	Ferret	1	Mountain goat	2	Snake	2
Canary	2	Finch	12	Mouse	10	Sugar glider	1
Cat	78	Goat	43	Ostrich	2	Swan	1
Chicken	75	Goose	2	Owl	2	Turkey	219
Chukar	17	Grouse	6	Ox	228	Turtle	8
Cockatiel	2	Guinea pig	3	Parakeet	10	Yak	3
Cockatoo	1	Hamster	4	Parrot	5	Zebra	1
Cougar	2	Hawk	5	Passerine	4	Total	1,345
Coyote	1	Hedgehog	1	Pheasant	64		
Crow	2	Horse	39	Pig	25		

### Serology

Test or procedure	Logan	Sp. Fork	Total
Anaplasmosis	98	0	98
Avian encephalomyelitis virus	0	699	699
Avian ELISA plates	0	333	333
Avian infectious bronchitis virus	0	1,200	1,200
Avian influenza	152	3,702	3,854
Avian mycoplasmas	0	1,545	1,545
Avian Newcastle disease	0	1,470	1,470
Avian salmonellosis	0	51	51
Bluetongue ELISA	2,648	0	2,648
Bovine leukemia virus ELISA	8,566	0	8,566
Bovine viral diarrhea virus ELISA	1,368	0	1,368
Brucellosis	10,897	1,607	12,504
Bovine pregnancy testing	9,280	1,018	10,298
Caprine arthritis & encephalitis ELISA	346	77	423
Chronic wasting disease	2,906	0	2,906
Equine immunoglobulin-G	2	0	2
Equine infectious anemia ELISA	4,752	4,589	9,341
Johne's Disease ELISA	1,421	0	1,421
Piroplasmosis	1,088	165	1,253

Test or procedure	Logan	Sp. Fork	Total
Small ruminant pregnancy testing	564	141	705
Vesicular stomatitis	11	0	11
West Nile Virus IgM ELISA	29	0	29
Total	44,128	16,597	60,725

### Toxicology

Test or procedure	Logan	Test or procedure	Logan
Aluminum	38	Nickel	84
Arsenic	2	Nitrate	30
Calcium	1	pH	2
Calcium/phosphorous	5	Plant identification	1
Chromium	5	Selenium	1,482
Copper	53	Sodium	1
29 element screen	1,803	Titanium	6
Lead	15	Zinc	2
Magnesium	3	Total	3,539
Mercury	6		

### UVDL quality system

The UVDL quality assurance/quality control (QA/QC) system maintains the integrity of all assays performed and is based on standards of the American Association of Veterinary Laboratory Diagnosticians (AAVLD). A summary of QA/QC activities in 2019 is provided below.

Activity	Number
Active standard operating procedures	432
Corrective actions	47
Inter- intra-laboratory test comparisons completed	15
Assay proficiency tests completed	20
Audits performed	50

### Inter- intra-laboratory assay validations completed, 2019

#### Bacteriology

- *Citrobacter freundii* identification
- *Staphylococcus epidermidis* identification
- Submitting an isolate to NVSL for serotyping
- *Trueperella pyogenes* identification
- *Vibrio fluvialis* identification

#### Parasitology

- *Cryptosporidium* spp. oocysts identification
- Internal parasite ID protocol
- Trichomonas culturing protocol

#### Serology

- Caprine arthritis & encephalitis virus ELISA
- Bovine virus diarrhea ELISA
- Equine infectious anemia virus AGID

- Bovine pregnancy
- West Nile virus IgM ELISA
- *Brucella canis* RSAT
- Equine IgG quantification

Proficiency tests passed, 2019	Agency	Laboratory section
African swine fever	NVSL <sup>1</sup>	Molecular
Anaplasmosis ELISA	NVSL	Serology
Avian influenza AGID	NVSL	Serology
Avian influenza matrix, H5 & H7 PCR	NVSL	Molecular
Avian paramyxovirus-1 PCR	NVSL	Molecular
Bluetongue virus ELISA	NVSL	Serology
Bovine leukosis virus ELISA	NVSL	Serology
<i>Brucella abortus</i> SPT	NVSL	Serology
<i>Brucella ovis</i> ELISA	NVSL	Serology
Chronic wasting disease ELISA	NVSL	Serology
Classic swine fever PCR	NVSL	Molecular
Equine infection anemia ELISA	NVSL	Serology
Foot and mouth PCR	NVSL	Molecular
Interlaboratory bacteriology quality assurance survey	AAVLD <sup>2</sup>	Bacteriology
Johne's disease ELISA	NVSL	Serology
Johne's disease fecal PCR	NVSL	Molecular
Piroplasmosis ELISA	NVSL	Serology
<i>Salmonella</i> Group D culture	NVSL	Bacteriology
Scrapie IHC	NVSL	Immunohistochemistry
Vesicular stomatitis CF	NVSL	Serology
Vesicular stomatitis PCR	NVSL	Molecular

<sup>1</sup>National Veterinary Services Laboratories, United States Department of Agriculture (USDA)

<sup>2</sup>American Association of Veterinary Laboratory Diagnosticians

**End of report**