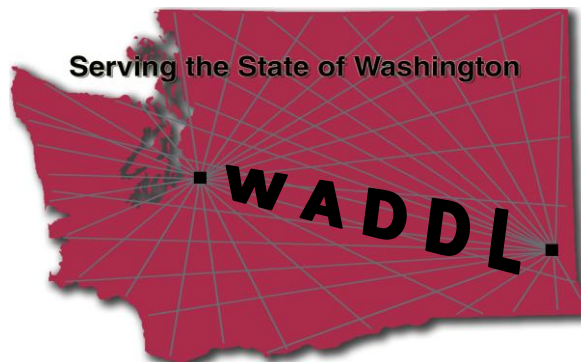




*World Class. Face to Face.*



# WASHINGTON ANIMAL DISEASE DIAGNOSTIC LABORATORY

Annual Report

FY 2011

July 1, 2010 through June 30, 2011

Washington Animal Disease Diagnostic Laboratory  
Washington State University  
College of Veterinary Medicine  
Bustad Hall 155N  
P.O. Box 647034  
Pullman, WA 99164-7034

Avian Health and Food Safety Laboratory  
Washington State University  
2607 W. Pioneer Way  
Puyallup, WA 98371-4990

**SUMMARY OF DIAGNOSTIC LABORATORY WORK**

July 1, 2010 – June 30, 2011

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## **Mission**

Our mission is to provide accurate, state-of-the-art, timely, and cost-effective diagnostic services, consultation, disease surveillance and outreach in order to safeguard animal health, the food supply and public health and to contribute to the University and College of Veterinary Medicine through discovery, scholarly activity, and education.

## **Values**

As a combined service and educational unit within a land grant university, the Washington Animal Disease Diagnostic Laboratory (WADDL) occupies a unique position that links the University to public and private stakeholders. We recognize and value the importance of our role in providing a positive, responsive interface between Washington State University and the animal and public health community, and between our stakeholders and the academic community.

We value *service and outreach* to our constituents, which include the practicing veterinary community, the agricultural animal industry, animal and public health regulatory agencies, companion animal owners, and the general public. We also place a high value on *quality*, both in service to and communication with our clientele.

The WADDL Quality System follows the accreditation standards of the American Association of Veterinary Laboratory Diagnosticians (AAVLD) “Requirements for An Accredited Veterinary Medical Diagnostic Laboratory” and World Organization for Animal Health (OIE) “Quality Standard and Guidelines for Veterinary Laboratories: Infectious Diseases 2008”. The objective of the quality system is to assure the scientific reliability of laboratory data. Management, administrative, statistical, investigative, preventative and corrective techniques are employed to maximize reliability of the data.

In addition to general diagnostics, we endorse and highly value the critical role we play in surveillance and detection of emerging and exotic diseases, whether introduced accidentally or deliberately with intention to disrupt the nation’s food supply. We value our role as a reference laboratory, our role in helping to assure a safe food supply, the critical importance of our surveillance for early detection of disease agents impacting public health, our vital contribution to maintaining international trade of agricultural animal products, and our ability to contribute to the discipline of diagnostic medicine through training of professional veterinary diagnosticians and discovery of new knowledge.

The Washington Animal Disease Diagnostic Laboratory is guided by a commitment to excellence, and endorses the core values of Washington State University, including *inquiry and knowledge, application, leadership, character, stewardship, and diversity*.

## **WADDL Highlights**

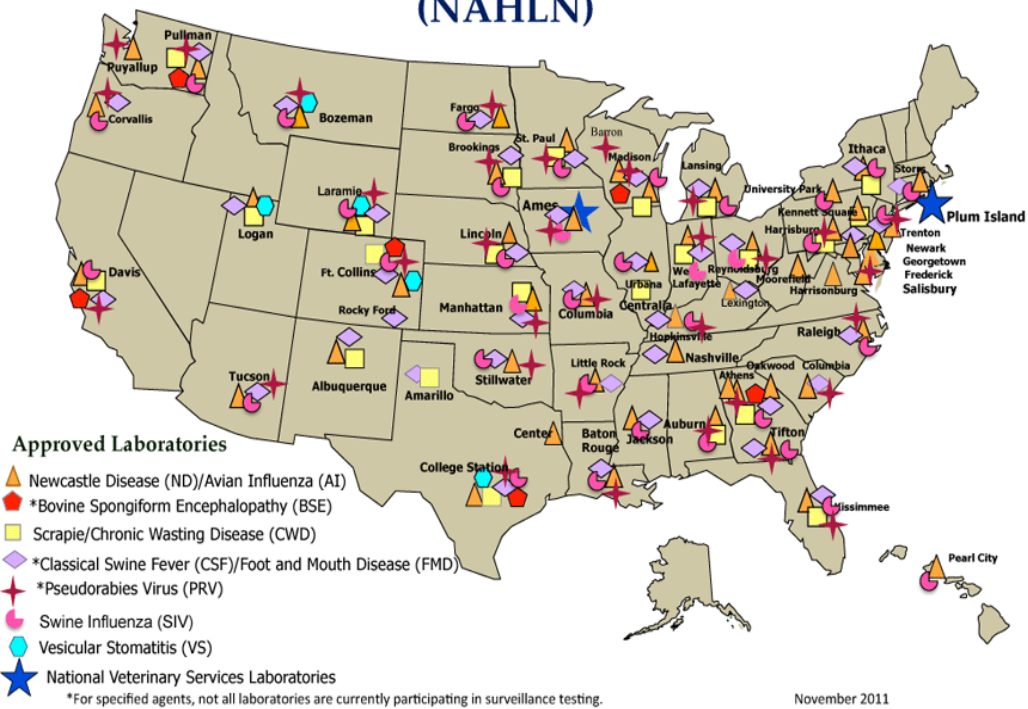
### **1. Animal Health and Zoonotic Disease Surveillance Testing (Animals Tested):**

Aquatic Health Viral Culture screening	8,382
Epizootic hematopoietic necrosis virus	
Infectious hematopoietic necrosis virus	
Infectious pancreatic necrosis virus	
Oncorhynchus masou virus	
Viral hemorrhagic septicemia virus	
Infectious salmon anemia virus	
Spring Viremia of Carp	
Aquatic Health Bacterial screening	7,458
Aquatic Health Bacterial Kidney Disease	4,073
Aquatic Health <i>Myxobolus cerebralis</i> (Whirling Disease)	3,338
Avian influenza	8,553
Bovine anaplasmosis	4,489
Bovine brucellosis	116,528
Bovine Johne's disease	6,216
Bovine Spongiform Encephalopathy (BSE)	5,089
Bovine trichomoniasis	1,952
Bovine Virus Diarrhea Virus-Persistent Infection-Cattle	6,663
Caprine Arthritis Encephalitis Virus	13,761
Caseous Lymphadenitis (sheep and goats)	6,493
Equine viral arteritis	3,146
Leptospirosis (multiple species)	10,511
<i>Mycoplasma ovipneumoniae</i> (Bighorn Sheep)	2,879
Selenium (multiple species)	2,074
Sheep Scrapie	1,389
Trace Element Screen (multiple species)	1,105

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Program surveillance testing at WADDL is done through WSU-WADDL programs, specific state or regional interagency agreements or contracts, and WADDL participation in the federal laboratory networks for animal health (National Animal Health Laboratory Network (NAHLN) of the United States Department of Agriculture (map below)), public health (Laboratory Response Network of the Centers of Disease Control and Prevention) and animal foods and feeds (US Food and Drug Administration (FDA) Veterinary Response Network (FDA Vet LRN)).

**National Animal Health Laboratory Network  
(NAHLN)**



## **2. New or Continued Surveillance Contracts/Agreements**

- USDA National Animal Health Laboratory Network Disease Surveillance (Avian Influenza, Exotic Newcastle's Disease, Classical Swine Fever, Bovine Spongiform Encephalopathy, Scrapie, Chronic Wasting Disease, African Swine Fever, Rinderpest, Foot and Mouth Disease, Pseudorabies)
- USDA Brucellosis Slaughter Surveillance
- Washington Department of Agriculture (WSDA)-WADDL Interagency Agreement
  - Disease Surveillance (Bovine and cervid brucellosis, Porcine pseudorabies, Bovine trichomoniasis)
  - Foreign Animal Disease Outbreak Investigation
- Washington Horse Racing Commission Postmortem Examination Program
- Washington State Department of Health
  - Avian West Nile Virus Testing Program
  - Laboratory Response Network Surveillance
- Aquatic Health
  - California Department of Fish and Game
  - Montana Whirling Disease Testing Program
  - Texas Veterinary Medical Diagnostic Laboratory Aquatic Diagnostic Program
  - Nebraska Game and Parks Commission Fish Health Inspection Program
  - New Mexico Fish and Game Department
- Arizona National Poultry Improvement Plan Surveillance
- California Department of Fish and Game Bighorn Sheep Surveillance
- Nevada Department of Agriculture Diagnostic Services
- Nevada Department of Wildlife: Bighorn Sheep Surveillance
- Arizona Department of Game and Fish: Bighorn Sheep Surveillance
- Alaska North Slope Borough Wildlife Management: Avian influenza Surveillance

**3. Personnel Changes (New or Lateral Hires):**

Retired Staff

Joyce Wisinger, Bacteriology

Departures

Jacob Stone, Histology

Debra Davidson, Serology

Nicole Mazur, Aquaculture

New permanent staff

Denise Aukerman, Business Office

Joseph Beier, Histology

Phoebe Jensen, Bacteriology

Joetta Reno, Aquaculture

**4. Capital and Equipment Improvements**

Capital Improvements

- Bustad 156 (Necropsy Amphitheater)- Renewal of necropsy amphitheater floor, ceiling, walls.

Major Equipment

WADDL – Puyallup (Avian Health and Food Safety Laboratory)

- Autoclave replacement for biowaste

WADDL-Pullman

- Replace histology solvent recycler
- Information system server upgrades

**5. Discovery:**

Scholarly Activity

WADDL faculty and staff in FY2011 wrote 41 peer-reviewed publications and 6 book chapters, and made 17 presentations at regional, state, or national / international meetings (details in “Publications in WADDL by Faculty and Staff, pages 24-29).

## **DEFINITIONS:**

Accession: specimen(s) of one animal species or miscellaneous substances belonging to one owner, and submitted at one time

Aquatic Laboratory Exams : each fish or tissue pool tested

Bacteriologic Examinations: each tissue sample cultured or examined

CY: calendar year (January 1 – December 31)

Examination: individual laboratory test or slide examined

Fixed Tissue: biopsy or necropsy tissue submitted in a fixed state

FY: Fiscal year (July 1 – June 30)

Pathology slides: number of slides examined by histopathology

Pathology tissues: number of tissues examined by histopathology

Immunohistochemistry slides: number of slides examined by immunohistochemistry

Laboratory Animal: rabbits, mice, hamsters, monkeys, rats, guinea pigs, etc.

Molecular Diagnostics: each test performed

Necropsy: each whole animal examined

Parasitology: each test performed

Serology: each test performed

Toxicology: each analysis performed

Virus Isolation: each specimen cultured

**WADDL Personnel**

**Faculty and Staff**

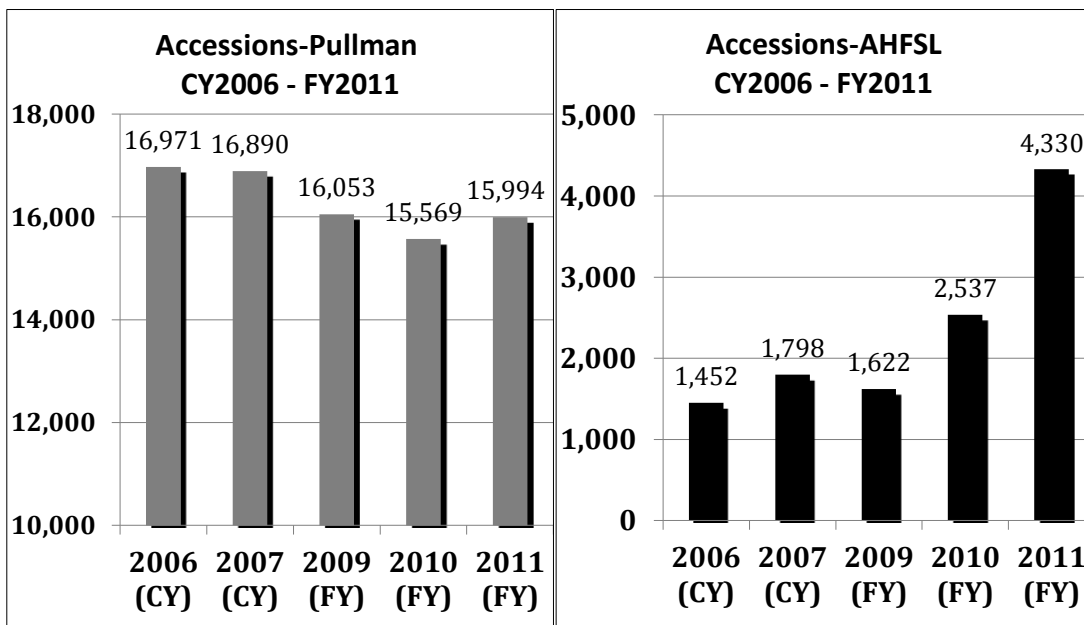
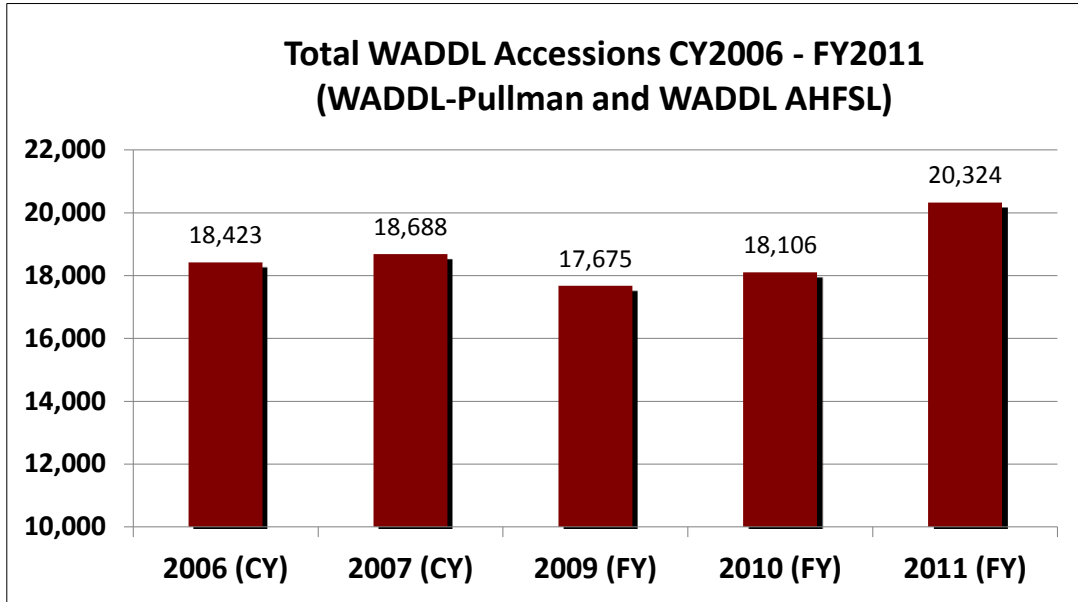
<b>Laboratory Section</b>	<b>Name</b>	<b>Position</b>
<b>Administration</b>		
	McElwain, Terry	Professor, Executive Director
	Baszler, Tim	Professor, Director
	Leathers, Charles	Professor, Associate Director
<b>Administration Support</b>		
	Hagen, Kathleen	Administrative Manager
Budget and Finance	Weber, Judy	Fiscal Officer
Front Office	Olson, Diana	Patient Services Supervisor
	Yager, Patricia	Patient Services Representative
	Aukerman, Denise	Office Assistant 3
Quality System	Lukens, Pat	Quality Manager
	Evans, Lusha	Quality Assistant
<b>Avian Health and Food Safety Laboratory</b>		
	Crespo, Rocio	Associate Professor and Branch Chief
	Perry, Stu	Microbiologist 1
	Schaberg, Dennis	Microbiologist 3
	Warren, Claire	Microbiologist 1
	Weber, Sylvia	Microbiologist 2
	Williams, Cheryl	Microbiologist 1
<b>Aquatic Health</b>		
	Snekvik, Kevin	Associate Professor, Section Head, ACVP Diplomate
	Thompson, Jim	Laboratory Manager
	Hudspeth, Holly	Microbiologist 1
	McMenamin, Katie	Microbiologist 2
	Rockefeller, Joe	Microbiologist 2
	Ryan, Laurie	Microbiologist 1
<b>Bacteriology / Central Processing/Parasitology</b>		
	Besser, Tom	Professor, Section Head, ACVM Diplomate
	Teitzel, Charlene	Laboratory Manager
	Alexander, Trevor	Microbiologist 1
	Mellick, Dena	Microbiologist 2
	Jensen, Phoebe	Microbiologist 1
	Baisley, Jennifer	Lab Tech 2

**Faculty and Staff (Continued)**

<b>Laboratory Section</b>	<b>Name</b>	<b>Position</b>
ImmunoDiagnostics / Virology	Evermann, James	Professor, Section Head
	Schlee, Sara	Microbiologist 3/Lab Supervisor
	Davidson, Debra	Scientific Assistant
	Merritt, Catherine	Microbiologist 1
	Newcomer, Ryan	Microbiologist 1
	Noble, Kathy	Microbiologist 1
	Tanaka, Lorraine	Microbiologist 2
Information Systems	Reichardt, Niles	Head, Medical Informatics
	Ford, Ben	Info Systems Coordinator
	Whiteman, Aaron	Info Systems Coordinator
Histology / Immunohistochemistry	Leathers, Leathers	Professor, Section Head
	Leonard, Cassie	Laboratory Supervisor
	Bailey, Gisela	Histotechnologist
	Marlatt, Heather	Histologic Technician 1
	Smith, Lon	Histotechnologist
	Beier, Joseph	Histology Technician 1
Molecular Diagnostics	Besser, Tom	Professor, Section Head, ACVM Diplomate
	Bradway, Dan	Laboratory Manager
	Lusha Evans	Microbiologist 2
	Williams, Kelli	Scientific Assistant
	Stern, Nicole	Microbiologist 1
Necropsy / Pathology	Baszler, Tim	Professor, ACVP Diplomate
	Haldorson, Gary	Assistant Professor, ACVP Diplomate
	Lahmers, Kevin	Assistant Professor, ACVP Diplomate
	Leathers, Charles	Professor, ACLAM Diplomate
	Nelson, Danielle	Assistant Professor
	Potter, Kathleen	Associate Professor, ACVP Diplomate
	Snekvik, Kevin	Associate Professor, ACVP Diplomate
	Stanton, James	Assistant Professor, ACVP Diplomate
	Prahinski, Kip	Lab Tech 2
	Toxicology	Talcott, Patricia

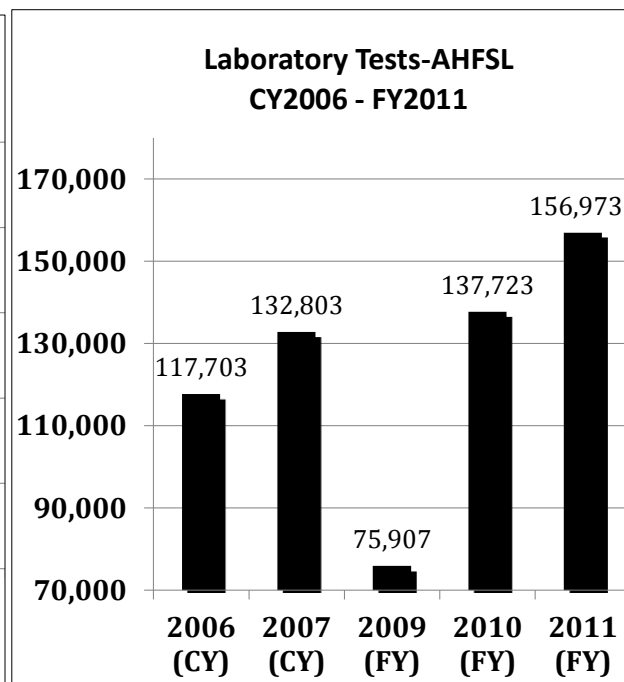
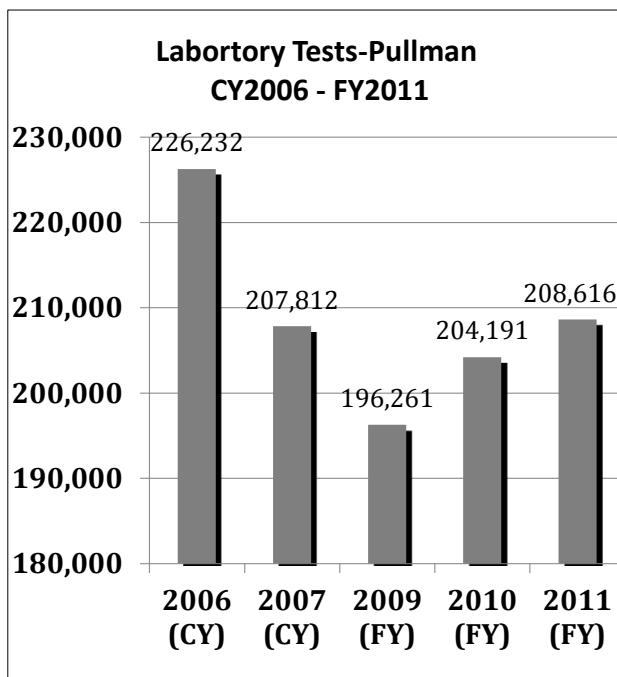
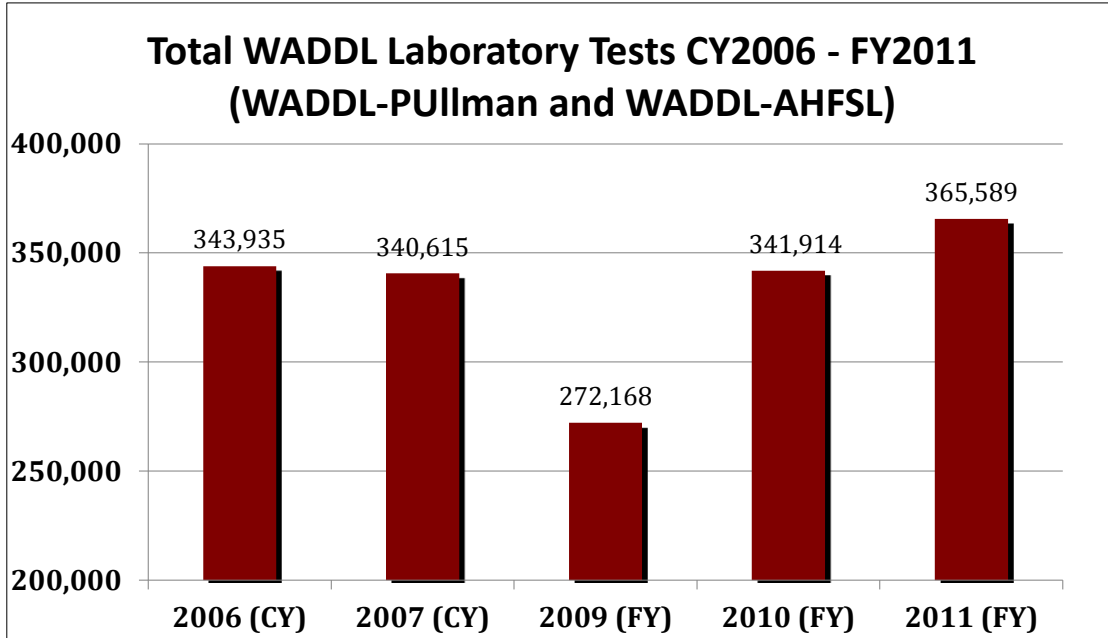
**Annual Total Accession (Case) Information**

The 5-year trend from CY2006 - FY2011 in WADDL accessions (client cases processed) was upward increasing from 18,423 in 2006 to 20,324 in 2011 (10.3%). In FY 2011 WADDL-Pullman received 79% of total accessions and WADDL-AHFSL received 21% of total accessions. Compared to FY 2010, FY 2011 total WADDL accessions increased 12.2% (2,218 accessions), reflecting a 2.7% increase at Pullman (425 accessions) and a 71% increase at AHFSL (1,793 accessions).



**Annual Total Laboratory Examination (Test) Information**

The 5-year trend from CY2006 - FY2011 in WADDL laboratory tests conducted increased from 343,935 to 365,589 (6.3% - 21,654 tests). In FY 2011 WADDL-Pullman conducted 57% of total laboratory tests and WADDL-AHFSL conducted 43% of total laboratory tests. Compared to FY 2010, FY 2011 total WADDL laboratory tests increased 6.9% (23,675 tests), reflecting a 2.2% increase at Pullman (4,425 tests) and a 14% increase at AHFSL (19,249 tests).



**Total WADDL Accessions by State**

State	Accession	%	State	Accession	%
Alaska	435	2.14%	Nebraska	137	0.67%
Alabama	11	0.05%	Nevada	161	0.79%
Arkansas	21	0.63%	N. Hampshire	21	0.10%
Arizona	129	0.63%	New Jersey	20	0.10%
California	432	2.13%	New Mexico	101	0.50%
Colorado	83	0.41%	New York	146	0.72%
Connecticut	0	0.00%	North Carolina	29	0.14%
Delaware	0	0.00%	North Dakota	12	0.06%
District of Columbia	3	0.01%	Ohio	88	0.43%
Florida	67	0.33%	Oklahoma	16	0.08%
Georgia	36	0.18%	Oregon	857	4.22%
Hawaii	17	0.08%	Pennsylvania	40	0.20%
Idaho	1763	8.67%	Rhode Island	1	0.00%
Illinois	21	0.10%	South Carolina	16	0.08%
Indiana	45	0.22%	South Dakota	63	0.31%
Iowa	179	0.88%	Tennessee	25	0.12%
Kansas	0	0.00%	Texas	104	0.51%
Kentucky	8	0.04%	Utah	116	0.57%
Louisiana	9	0.04%	Vermont	12	0.06%
Maine	62	0.31%	Virginia	40	0.20%
Maryland	249	1.23%	Washington	13347	65.67%
Massachusetts	64	0.31%	West Virginia	13	0.06%
Michigan	53	0.26%	Wisconsin	24	0.12%
Minnesota	25	0.12%	Wyoming	11	0.05%
Mississippi	53	0.26%	Other	477	2.35%
Missouri	42	0.21%			
Montana	640	3.15%	<b>Total</b>	<b>20,324</b>	<b>100.00%</b>

**Total Washington Accessions by County**

County	Accessions	%	County	Accessions	%	County	Accessions	%
Adams	24	0.18%	Island	20	0.15%	Skagit	1160	8.69%
Asotin	200	1.50%	Jefferson	28	0.21%	Skamania	0	0.00%
Benton	190	1.42%	King	986	7.39%	Snohomish	870	6.52%
Chelan	47	0.35%	Kitsap	71	0.53%	Spokane	793	5.94%
Clallam	40	0.30%	Kittitas	74	0.55%	Stevens	119	0.89%
Clark	750	5.62%	Klickitat	157	1.18%	Thurston	1383	10.36%
Columbia	26	0.19%	Lewis	249	1.87%	Wahkiakum	7	0.05%
Cowlitz	12	0.09%	Lincoln	113	0.85%	Walla Walla	253	1.90%
Douglas	0	0.00%	Mason	4	0.03%	Whatcom	459	3.44%
Ferry	11	0.08%	Okanogan	142	1.06%	Whitman	3167	23.73%
Franklin	374	2.80%	Pacific	21	0.16%	Yakima	256	1.92%
Garfield	0	0.00%	Pend Oreille	3	0.02%	Not reported	82	0.61%
Grant	290	2.17%	Pierce	920	6.89%			
Grays Harbor	17	0.13%	San Juan	29	0.22%	<b>TOTAL</b>	<b>13,347</b>	<b>100%</b>

Whitman County includes WSU Veterinary Teaching Hospital

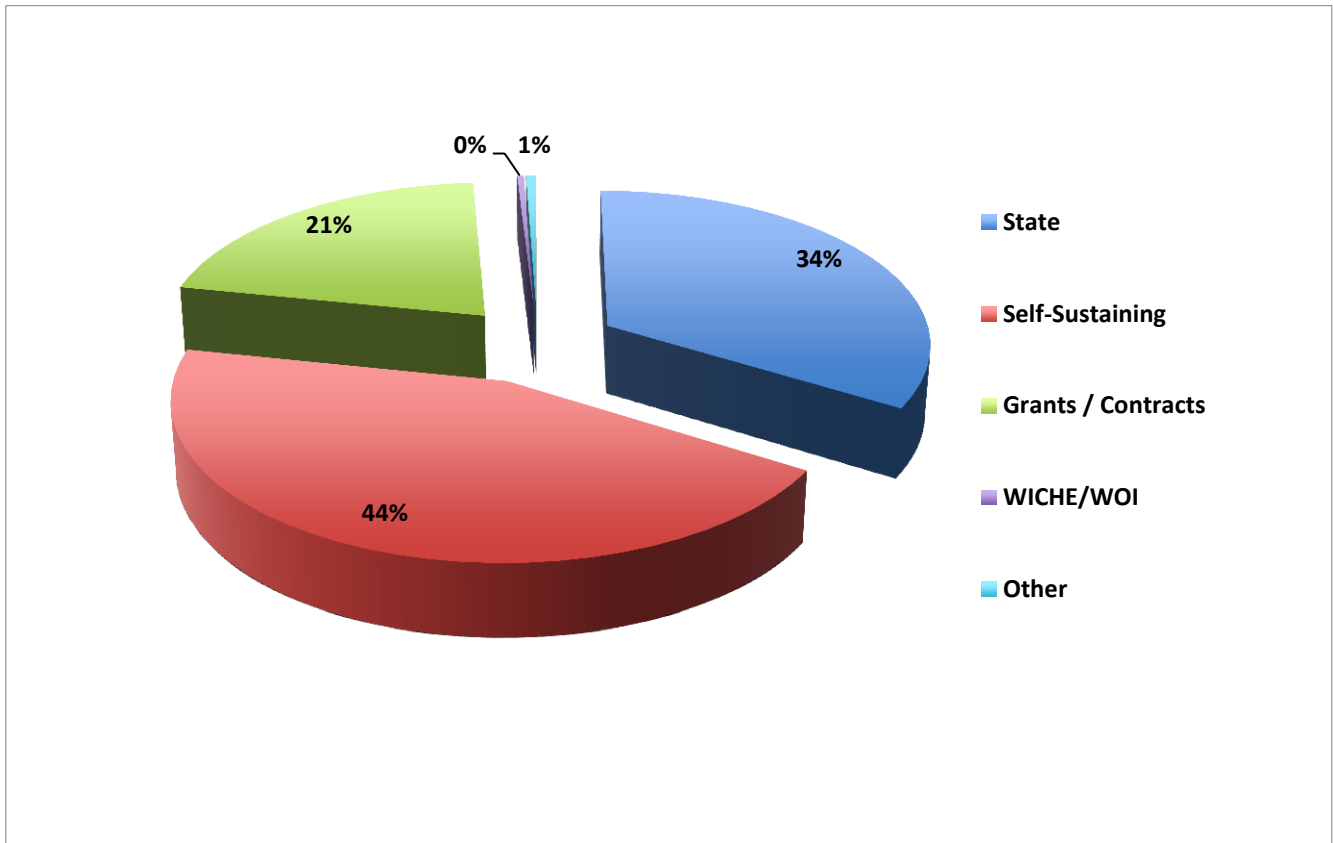
### **FY 2011 WADDL Budget and Budget Sources**

In FY 2011, the total WADDL budget from all budget sources (State, Revenue, Grants and Contracts, and other) was \$4,823,071. The majority of the WADDL Budget (65%) was provided by non-State sources and includes revenue generated from general fees for service (44%), and Grants and Contracts (21%) for state and federal surveillance testing programs.

WADDL receives no state funding for operations. All state funding is expended for faculty and staff salaries; state funding covers approximately 70% of total personnel expenses.

Every state dollar invested in WADDL results in \$3 output from WADDL through revenue generation or extramural grants and contracts (300% return on investment).

**Fiscal Year 2011 WADDL Funding Sources  
\$4.8 Million**



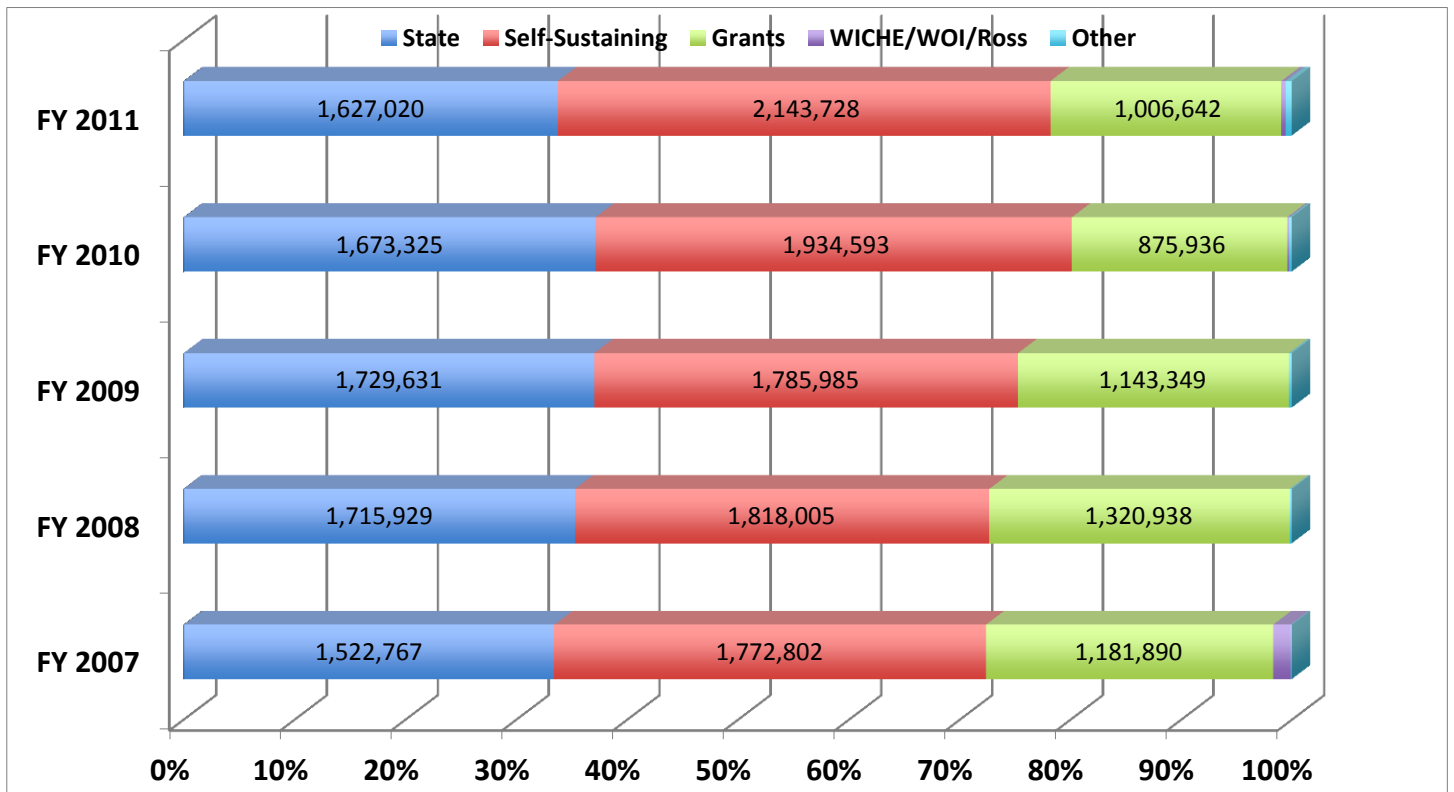
**5 Year Trend for WADDL Budget and Budget Sources (FY2007 - FY2011)**

The 5-year trend in total WADDL budget from FY07 – FY11 in actual dollars was an increase of \$698,916 (16.9%). Budget growth for the 5 year period occurred primarily from self-sustaining revenue sources.

On a percentage of total budget basis, the 5-year budget trend was relatively constant for state support (blue bars), increasing for self-sustaining revenue (red bars), and decreasing for direct grants and contracts support (light green bars).

In FY 2011, the increased self-sustaining revenue was generated from surveillance and diagnostic testing from grants and contracts, animal disease testing from within WSU, and private animal disease and food safety testing submitted from veterinarians and animal owners primarily in the Pacific Northwest region of the USA.

Compared to FY 2010, FY 2011 total self-sustaining revenue increased 10.8% (\$209,125).



**Total WADDL Tests by Laboratory Section (CY2006 - FY2011)**

	<b>CY2006</b>	<b>CY2007</b>	<b>2009 (FY)</b>	<b>2010 (FY)</b>	<b>2011 (FY)</b>
<b>Avian Health Food Safety Lab</b>	117,703	132,803	75,907	137,723	156,973
<b>Aquatic Health</b>	28,378	26,097	26,236	24,424	27,502
<b>Bacteriology</b>	13,588	12,163	12,536	11,691	10,042
<b>BSE Lab (BSE and CWD)</b>	12,095	1,741	7,117	8,607	5,617
<b>Histopathology (Necropsy and Surgical Biopsy)</b>	5,598	5,989	5,252	5,164	5,307
<b>Immunohistochemistry</b>	3,447	2,428	1,945	2,753	1,762
<b>Molecular Diagnostics</b>	5,819	8,764	14,985	11,415	15,557
<b>Necropsy</b>	1,253	1,348	1,164	982	1,022
<b>Parasitology</b>	2,775	3,891	3,228	3,570	2,910
<b>Pathology Tissues</b>	65,108	70,073	60,476	63,087	68,343
<b>Serology</b>	78,650	67,952	56,485	65,700	62,652
<b>Toxicology<sup>1</sup></b>	5,583	4,950	3,903	4,474	4,975
<b>Virology (Electron Microscopy, Isolation and ELISA)</b>	3,938	2,416	2,934	2,324	2,927
<b>Total</b>	<b>343,935</b>	<b>340,615</b>	<b>272,168</b>	<b>341,914</b>	<b>365,589</b>

1. WADDL Veterinary Toxicology Tests done by University of Idaho Analytical Sciences Laboratory

**Total WADDL Accessions by Species of Animal (FY2010 - FY2011)**

<b>Total WADDL-Pullman Accessions by Species</b>	<b>FY 2011</b>	<b>FY 2010</b>
Avian	634	815
Bovine	2,678	2,222
Camelid	638	430
Canine	4,962	4,780
Caprine	2,133	2,075
Equine	1,798	1,650
Fish	491	
Feline	782	842
Ovine	868	358
Porcine	66	54
Wildlife/Other	944	2,343
<b>Total</b>	<b>15,994</b>	<b>15,569</b>

<b>Total WADDL-AHFSL Accessions by Species</b>	<b>FY 2011</b>	<b>FY 2010</b>
Avian	1,364	1,178
Domestic Cow	1,560	182
Domestic Goat	9	7
Environmental	233	115
Food Product	739	674
Pig	36	49
Water	222	235
Other	167	97
<b>Total</b>	<b>4,330</b>	<b>2,537</b>

**Laboratory Examinations by Individual Branch / Section**

**WADDL Avian Health and Food Safety Laboratory-Puyallup**

	<b>FY2011</b>	<b>FY2010</b>
Bacteriology	2,999	1,241
Brucellosis	122,858	107,251
Food Safety	12,810	12,068
Histopathology	131	96
Molecular Diagnostics	5,795	6,581
Necropsy	680	811
Parasitology	19	24
Serology	11,460	9,599
Virology	220	52
<b>TOTAL</b>	<b>156,972</b>	<b>137,723</b>

**WADDL – Pullman Laboratory**

<b>PATHOLOGY FY 2011 SPECIES</b>	<b>NECROPSIES</b>		<b>HISTOPATHOLOGY FROM NECROPSIES</b>		<b>SURGICAL BIOPSIES</b>	
Avian	64	6.3%	49	7.2%	40	0.9%
Bovine	135	13.2%	65	9.6%	287	6.2%
Canine	203	19.9%	167	24.7%	3,032	65.5%
Caprine	36	3.5%	25	3.7%	47	1.0%
Equine	88	8.6%	47	6.9%	277	6.0%
Feline	106	10.4%	89	13.1%	442	9.5%
Lab Animal	195	19.1%	92	13.6%	295	6.4%
Ovine	91	8.9%	69	10.2%	35	0.8%
Porcine	19	1.9%	12	1.8%	27	0.6%
Other	85	8.3%	62	9.2%	148	3.2%
<b>FY 2011 Totals</b>	<b>1022</b>	<b>100%</b>	<b>677</b>	<b>100%</b>	<b>4,630</b>	<b>100%</b>

<b>PATHOLOGY FY 2010 SPECIES</b>	<b>NECROPSIES</b>		<b>HISTOPATHOLOGY FROM NECROPSIES</b>		<b>SURGICAL BIOPSIES</b>	
Avian	88	9.0%	51	7.7%	51	1.1%
Bovine	72	7.3%	58	8.8%	265	5.9%
Canine	194	19.8%	171	25.9%	2,981	66.2%
Caprine	34	3.5%	25	3.8%	48	1.1%
Equine	140	14.3%	69	10.4%	352	7.8%
Feline	74	7.5%	64	9.7%	454	10.1%
Lab Animal	152	15.5%	50	7.6%	44	1.0%
Ovine	99	10.1%	75	11.3%	69	1.5%
Porcine	11	1.0%	7	1.1%	39	0.9%
Other	118	12.0%	91	13.8%	200	4.4%
<b>FY 2010 Totals</b>	<b>982</b>	<b>100%</b>	<b>661</b>	<b>100%</b>	<b>4,503</b>	<b>100%</b>

**WADDL – Pullman Laboratory**

<b>PARASITOLOGY</b>	<b>FY2011</b>	<b>FY2010</b>
Baermann	389	571
Fecal Flotation	2,342	2,643
Liver Fluke Sedimentation	46	143
Parasite Identification	133	213
<b>TOTAL PARASITOLOGY</b>	<b>2,910</b>	<b>3,570</b>

<b>AQUATIC HEALTH LABORATORY EXAMINATIONS</b>	<b>FY2011</b>	<b>FY2010</b>
<b>Health Inspection Testing</b>		
Aquatic bacterial screen	7,458	6,317
BKD	4,073	3,808
<i>Piscirickettsia salmonis</i>	2,158	1,829
Aquatic viral culture	8,382	6,825
<b>Diagnostic Testing</b>		
Aquatic aerobic culture	137	172
Aquatic anaerobic culture	0	0
Aquatic susceptibility	0	0
Aquatic fungal culture	0	7
Aquatic Viral Isolation	12	4
<b>Pathology</b>		
Aquatic necropsy	13	11
Aquatic histopathology	446	799
<i>M. cerebralis</i> histopathology	3,338	3,294
External Parasite (Histo)	0	0
<b>Parasitology</b>		
<i>M. cerebralis</i> digest		928
<i>C. shasta</i> smear	1,010	383
External Parasite Screen	444	0
Amoebic Gill Disease	0	47
<b>TOTAL AQUACULTURE</b>	<b>27,502</b>	<b>24,424</b>

<b>TERRESTRIAL ANIMAL VIROLOGY</b>	<b>FY2011</b>	<b>FY2010</b>
Viral Identification-EM	439	412
Viral Isolation	361	346
<b>TOTAL VIROLOGY*</b>	<b>800</b>	<b>758</b>

\*No Viral antigen ELISA, See ImmunoDiagnostics

**WASHINGTON ANIMAL DISEASE DIAGNOSTIC  
LABORATORY - ANNUAL REPORT FY 2011**

**WADDL – Pullman Laboratory**

<b>MOLECULAR DIAGNOSTICS</b>	<b>FY 2011</b>	<b>FY2010</b>
<b><u>Standard and Real time PCR</u></b>		
<i>Anaplasma marginale</i>	505	84
Aquaculture PCR	27	55
Bacterial PCR	37	37
Bluetongue virus	23	18
Bovine virus diarrhea virus	6,663	4,675
<i>Clostridium perfringens</i>	108	110
Classical Swine Fever	10	11
<i>E. coli</i> virulence genes	102	85
Avian Influenza	2,934	3,206
Equine Herpesvirus 1	353	19
Exotic Newcastle's Disease	0	27
Canine Influenza	0	1
Enzootic Hemorrhagic Disease	12	14
Influenza A virus	0	22
Malignant Catarrhal Fever	67	40
<i>Mycobact. avium</i> spp. <i>paratb.</i>	120	77
<i>Mycoplasma</i> spp.	16	22
<i>Mycoplasma ovipneumoniae</i>	1,549	825
<i>Neospora caninum</i>	9	11
Nested PCR	5	26
PCR from tissue	70	47
<i>Rhodococcus equi</i>	10	22
<i>Toxoplasma gondii</i>	11	13
<i>Tritrichomonas foetus</i>	1,952	1,699
West Nile Virus	115	161
<b><u>Organism ID / Sequencing</u></b>		
DNA sequencing	24	35
Fungal ID	22	41
<i>Mycobacterium</i> ID	0	32
<b><u>Select Agent PCR</u></b>		
African Swine Fever	150	
Foot and mouth disease	452	
<i>Francisella tularemia</i>	19	
Rinderpest virus	192	
<b>TOTAL MOLECULAR DIAG.</b>	<b>15,557</b>	<b>11,415</b>

<b>BACTERIOLOGIC EXAMINATIONS</b>	<b>FY 2011</b>	<b>FY 2010</b>
<b><u>Cultures &amp; Identifications</u></b>		
Aerobic culture	3,714	3,974
Anaerobic culture	1,003	1,187
Blood culture	240	92
Bulk tank culture	14	5
<i>Campylobacter</i> culture	189	123
<i>Cl. difficile</i> culture	93	124
<i>Cl. perfringens</i> culture	192	215
Cold enrichment culture	0	0
<i>Enterococcus</i> culture	13	17
Fecal culture	964	957
Feed culture	15	16
Johne's culture	153	589
<i>Listeria</i> culture	164	300
Mastitis culture	70	85
<i>Mycobacterium</i> culture	23	28
Mycology culture	279	334
<i>Mycoplasma</i> culture	394	985
<i>Salmonella</i> culture	0	1
<i>Tritrichomonas</i> culture	83	58
<i>Ureaplasma</i> culture	8	4
<b><u>Susceptibilities</u></b>		
K/B Susceptibility	0	0
MIC Susceptibility	878	864
<b><u>Other Bacteriology</u></b>		
Bacteriologic Stains	1,208	1,356
<i>Cl. difficile</i> Toxin Test	91	113
Clostridium F/A	8	11
Leptospirosis F/A	179	203
<i>Salmonella</i> Serotyping	67	50
<b>TOTAL BACTERIOLOGY</b>	<b>10,042</b>	<b>11,691</b>

**WADDL – Pullman Laboratory**

<b>IMMUNODIAGNOSTICS / SEROLOGIES</b>	<b>FY2011</b>	<b>FY2010</b>
<i>Anaplasma marginale</i>	4,489	3,424
Bluetongue Virus	686	285
Bovine Leukosis Virus	1,975	2,203
Bovine Parainfluenza-3	468	1,039
BRSV	504	878
Bovine Viral Diarrhea Virus	993	1,488
<i>Brucella abortus</i>	8,041	7,842
<i>Brucella canis</i>	34	54
<i>Brucella ovis</i>	89	130
Canine adenovirus	98	99
Canine coronavirus	40	70
Canine Distemper Virus	511	433
Canine Herpesvirus	74	84
Canine Parainfluenza	192	172
Canine Parvovirus	422	392
Caprine Arthritis Encephalitis Virus	13,034	13,761
Caseous Lymphadenitis	5,917	6,493
Epizootic Hemorrhagic Disease	495	256
Equine Herpes Virus	98	103
Equine Infectious Anemia	738	1,413
Equine Viral Arteritis	1,583	3,146
Feline Calicivirus	20	46
Feline Coronavirus/FIP	58	71
Feline Herpesvirus	35	33
Feline Immunodeficiency	9	3
Feline Panleukopenia	33	77
Infect. Bovine Rhinopneumonitis Virus	782	1,188
Johne's Disease ( <i>Mycobact. avium subspp paratuberculosis</i> )	6,216	5,598
Leptospirosis Serology	10,852	10,511
Malignant Catarrhal Fever Virus	444	311
<i>Mycoplasma ovipneumoniae</i>	1,330	275
<i>Neospora caninum</i>	1,213	2,117
Ovine Progressive Pneumonia Virus	874	1,218
Porcine Parvovirus	3	10
Pseudorabies Virus	1	57
<i>Toxoplasma gondii</i>	122	103
Vesicular Stomatitis Virus	138	162
West Nile Virus	41	154
	<b>62,652</b>	<b>65,700</b>

**WADDL – Pullman Laboratory**

<b>IMMUNOHISTOCHEMISTRY</b>	<b>FY2011</b>	<b>FY2010</b>	<b>IMMUNODIAGNOSTICS</b>	<b>FY2011</b>	<b>FY2010</b>
			<b>ANTIGEN DETECTION</b>		
<b>Infectious agents-Viruses</b>			BSE by ELISA	5,089	8,607
IHC for Adenovirus	0	3	BRSV	195	122
IHC for Bovine Coronavirus	0	1	BVDV by ELISA	1,246	879
IHC for BRSV	8	32	Bovine Enteric Viruses	79	155
IHC for BVD	35	58	Canine Distemper Virus	511	433
IHC for Canine Coronavirus	1	1	<i>Chlamydophila</i> spp.	60	2
IHC for Canine Distemp. Virus	13	43	CWD by ELISA	528	180
IHC for Canine parvovirus	9	6	Feline Leukemia Virus	36	33
IHC for EHV-1	2	0	<b>TOTAL</b>	<b>7,744</b>	<b>10,411</b>
IHC for IBR	15	22			
IHC for Feline coronavirus (FIP)	16	19			
IHC for Feline parvovirus (Panleukopenia)	7	0			
IHC for PI3	0	20			
IHC for Prions (CWD)	45	37			
IHC for Prions (Scrapie)	1,389	359			
<b>Infectious agents-Bacteria &amp; Protozoa</b>					
IHC for Chlamydiaceae	0	4			
IHC for <i>Coxiella</i> spp.	12	5			
IHC for <i>Leptospira</i> spp.	14	17			
IHC for <i>Listeria</i> spp.	0	7			
IHC for <i>Sarcocystis/Toxo.</i>	0	0			
<b>Tumor Cell Markers</b>					
IHC for B-lymphocyte	57	31			
IHC for Chromatogranin	6	4			
IHC for Collagen IV	0	0			
IHC for Cytokeratin	20	28			
IHC for Desmin	3	8			
IHC for Factor VIII	6	11			
IHC for GFAP	1	1			
IHC for Lamda Light Chain	5	11			
IHC for Lysozyme	1	2			
IHC for Mac 387	0	6			
IHC for Melan A	15	11			
IHC for Muscle Actin	3	8			
IHC for Neurofilament	3	3			
IHC for Synaptophysin	3	5			
IHC for T-lymphocyte	54	30			
IHC for Vimentin	18	26			
<b>TOTAL IHC EXAMINATIONS</b>	<b>1,762</b>	<b>819</b>			

**University of Idaho Analytical Sciences Laboratory**

<b>Toxicology</b>	<b>2011 (FY)</b>	<b>2010 (FY)</b>		<b>2011 (FY)</b>	<b>2010 (FY)</b>
Acetylcholinesterase - blood	2	8	Macro/micro elements - tissue	405	530
Acetylcholinesterase - brain	-	-	Manganese	7	-
Aflatoxin	8	15	Melamine	1	-
Alkalinity - water	-	2	Mercury	16	29
Ammonia	2	-	Metaldehyde	2	6
Anticoagulant rodenticide -blood	4	3	Micro elements - feed	4	10
Anticoagulant rodenticide - tissue	7	8	Moisture percent	1	-
Arsenic - blood	4	2	Molybdenum	4	4
Carbamate pesticide screen	20	37	Mycotoxin screen	-	-
Carbon & Nitrogen	4	-	Nitrate - feed	6	19
Chlorinated acids - water	-	1	Nitrate - ocular fluid / serum	18	20
Conductance - water	-	2	Nitrate/nitrite & ammonia - water / soil	1	1
Cyanide - feed	3	15	Nitrate/nitrite - water	2	4
Deoxynivalenol - feed	-	2	Organochlorine pesticide screen	22	14
Dry & Grind	22	77	Organophosphorus/nitrogen pest. screen	39	37
Water metals - ICP - Dissolved	1	12	PCB Congener	8	-
Water metals - ICP - Total	9	1	pH	3	-
Water metals - ICPMS - Dissolved	1	-	Phosphine gas [Zn-Mg-Al phosphide]	26	7
Water metals - ICPMS - Total (Extended)	1	-	Plant / Mushroom identification	13	20
Fluoride - water	-	10	Selenium	2,074	2,078
Fumonisin - feed	-	2	Special request analysis	41	84
Glutathione peroxidase	19	15	Strychnine	23	25
Glycol - ethylene/other	13	6	Total dissolved solids - water	-	-
Hardness - water	-	2	Toxicology organic [GCMS] screen	23	23
Heavy metals screen -ICP - tissue	229	221	Trace elements - serum	1,105	1,262
Heavy metals screen - ICPMS - feed	-	-	Trace elements - ocular fluid	4	8
Heavy metals screen-ICPMS - tissue	27	30	Trace elements, including Na+K	-	80
Heavy metals screen-ICPMS - tissue, single analyte	6	49	Trace elements, Na + K only	25	20
Ion screen - water	-	12	Trace elements - soil	1	2
Ionophores	7	5	Total nitrogen - water	-	-
Lead - blood	62	76	Urea	-	-
Macro elements - feed	-	3	Vitamin E - serum	135	48
Macro & Micro elements - feed	14	28			
Macro elements - tissue	-	-			
			<b>TOTAL</b>	<b>4,474</b>	<b>4,975</b>

## **WADDL Quality System**

### **External Audits Successfully Passed**

- American Association of Veterinary Laboratory Diagnosticians (AAVLD) Accreditation Site Visit September 2010 (full 5 year accreditation audit)
- Washington State Department of Agriculture (WSDA) National Poultry Improvement Plan (NPIP) audit of AHFSL PCR AI testing in September 2010
- Washington State Department of Agriculture (WSDA) audit of Molecular Diagnostics PCR AI testing in October 2010
- APHIS/USDA Inspection of Aquaculture for BSL for export – July 2010
- USDA BSL Inspection of Aquaculture for BSL2 – May 2011
- USDA Equine Infectious Anemia (EIA) Testing lab inspection June 2011
- BSL2 Inspection WSU Institutional Biosafety Committee (IBC) March 2011
- BSL3 Inspection WSU Institutional Biosafety Committee (IBC) March 2011

### **Successful WADDL Proficiency Testing**

<b>Proficiency Test</b>	<b>Agency</b>	<b>Lab Section</b>
Anaplasmosis cELISA	USDA	Immunodiagnosics – Serology
Anthrax	LRN	Molecular Diagnostics
Avian Influenza AGID	USDA	AHFSL
Avian Influenza PCR	USDA	Molecular Diagnostics and AHFSL
Avian Paramyxovirus PCR	USDA	Molecular Diagnostics and AHFSL
Bluetongue	USDA	Immunodiagnosics – Serology
Bovine Leukosis (BLV)	USDA	Immunodiagnosics – Serology
BSE	USDA	Immunodiagnosics – TSE Lab
Bacteriology Interlaboratory Survey	AAVLD	Bacteriology
Brucellosis Serologic Tests (SPT, BAPA, STT, Rivanol and Card)	USDA	Immunodiagnosics – Serology and AHFSL
Classical Swine Fever Virus	USDA	Molecular Diagnostics
Equine Infectious Anemia (EIA)	USDA	Immunodiagnosics – Serology
Equine Viral Arteritis (EVA)	USDA	Immunodiagnosics – Serology
Foot and Mouth Disease PCR	USDA	Molecular Diagnostics
Johne's Disease Milk ELISA	USDA	Immunodiagnosics – Serology
Johne's Fecal PCR (individual)	USDA	Molecular Diagnostics
Johne's Fecal PCR (pooled)	USDA	Molecular Diagnostics
Johne's Disease Fecal Test (Solid media)	USDA	Bacteriology
Johne's Disease Serologic	USDA	Immunodiagnosics – Serology
Newcastle Disease Virus (NDV) PCR	USDA	Molecular Diagnostics and AHFSL
<i>Salmonella enteritidis</i> culture	USDA	AHFSL
Scrapie / Chronic Wasting Disease (CWD) by IHC	USDA	Pullman Pathologists
Swine Influenza Virus (SIV) PCR	USDA	Molecular Diagnostics
Unknown Environmental Pathogens PT	LRN	Molecular Diagnostics

PUBLICATIONS BY WADDL FACULTY, RESIDENTS and STAFF

Peer-reviewed Journal Articles

1. **Besser TE**, Cassirer EF, Yamada C, **Potter KA**, **Oaks JL**, Herndon C, **Foreyt WJ**, Shanthalingam S, Knowles DP, Srikumaran S: Survival of Bighorn Sheep Commingled with Domestic Sheep in the Absence of *Mycoplasma ovipneumoniae*. In Press, J Wildlife Dis, 2011
2. Biggs PJ, Fearnhead P, Hotter G, Mohan V, Collins-Emerson J, Kwan E, **Besser TE**, French NP: Whole-genome comparison of two *Campylobacter jejuni* isolates indistinguishable on the basis of MLST and flaA SVR reveals multiple loci of different ancestral lineage. In Press, PLoS ONE, 2011
3. Boonyayatra S, Fox LK, **Besser TE**, Sawant A, Gay JM, Raviv Z: A PCR assay and PCR-RFLP combination identifying the three primary *Mycoplasma* species causing mastitis. In Press, Journal of Dairy Science, 2011
4. Brandt SM, King N, Cornelius AJ, Premeratne A, **Besser TE**: On SLW. Molecular Risk Assessment and Epidemiological Typing of Shiga toxin-producing *Escherichia coli* using a Novel PCR Binary Typing (P-BIT) System. Applied Environ Microbiol. 77: 2458-70, 2011
5. Broschat SL, Call DR, Davis MA, Meng D, Lockwood S, Ahmed R, **Besser TE**: Improved identification of epidemiologically related strains of *Salmonella enterica* by use of a fusion algorithm based on pulsed-field gel electrophoresis and multiple-locus variable-number tandem-repeat analysis. J Clin Microbiol. 48:4072-4082, 2011
6. Burek KA, Gill V, and **Bradway DS**: Disseminated Histoplasmosis in a Free-ranging Northern Sea Otter in Alaska (*Enhydra lutris kenyoni*). In Press, J. Wild. Dis., 2011
7. Byers S, Barrington GM, **Nelson DD**, **Haldorson GJ**, Holt T, Callan R: Neurologic causes of diaphragmatic paralysis in eleven alpacas (*Vicugna pacos*). J Vet. Intern. Med., Epub ahead of print, January 31, 2011
8. Byers SR, **Evermann JF**, **Bradway DS**, et al: Evaluation of commercial bovine viral diarrhea virus vaccine in nonpregnant female alpacas (*Vicugna pacos*). Vaccine 28:591-593, 2010
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10. **Crespo, R.** and H. L. Shivaprasad. Rupture of gastrocnemius tendon in broiler breeder hens. Avian Diseases 55: 495-498, 2011
11. Dassanayake RP, Shanthalingam S, Herndon C, Subramaniam R, Lawrence PK, Cassirer EF, **Haldorson GJ**, **Foreyt WJ**, **Rurangirwa FR**, Knowles DP, **Besser TE**, Srikumaran S: *Mycoplasma ovipneumoniae* can predispose bighorn sheep to fatal *Mannheimia haemolytica* pneumonia. Vet Microbiol 145:354-359, 2010
12. Davies JL, **Haldorson GJ**, **Bradway DS**, and Britton AP: Fatal protozoal hepatitis in a captive black bear (*Ursus americanus*) associated with *Sarcocystis canis*-like infection. J. Vet. Diag. Invest. 23:379-83, 2011

13. Davis MA, Baker KN, Orfe LH, Shah DH, **Besser TE**, Call DR: Discovery of a gene conferring multiple-aminoglycoside resistance in *Escherichia coli*. *Antimicrob Agents Chemother* 54:2666-2669, 2010
14. Davis MA, **Besser TE**, Orfe L, Kaya K, Lanier A, Broschat S, New D, Call DR: Genotypic-phenotypic discrepancies between antibiotic resistance characteristics of *Escherichia coli* from calves in high and low antibiotic use management settings. *Appl Environ Microbiol.* 77:3293-3299, 2011
15. Davis MA, Lim JY, Soyer Y, Harbottle H, Chang YF, New D, Orfe LH, **Besser TE**, Call DR: Development and validation of a resistance and virulence gene microarray targeting *Escherichia coli* and *Salmonella enterica*. *J Microbiol Methods.* 82:36-41, 2010
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21. Kersh GJ, Lambourn DM, Self JS, Akmajian AM, **Stanton JB**, **Baszler TV**, Raverty SA, Massung RF: *Coxiella burnetii* infection of a Stellar Sea Lion (*Emetopias jubatus*) found in Washington state. *Journal of Clinical Microbiology* 48: 3428-3431, 2010
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23. Lau AOT, Cereceres K, Palmer GH, Fretwell DB, Pedroni MJ, Mosqueda J, **McElwain TF**: Genotypic diversity of merozoite surface antigen 1 of *Babesia bovis* within an endemic population. *Mol. Biochem. Parasitol.* 172:107-112, 2010. (Epub 2010, Apr 2)
24. **McElwain TF**: Laboratory preparedness: building a cornerstone for global surveillance. *Future Micro.*, 5:531-533, 2010
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28. **Potter KA**, Weston JF, Munday JS, Johnstone AC: Spina bifida with associated malformations of the central nervous system in Dorper-cross sheep. *New Zealand Vet J* 58:315-318, 2010
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**Book Chapters, Books, Book Reviews**

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2. **Evermann JF**, Kennedy M. Viral Infections In Small Animal Pediatrics. The first 12 months of Life, 1<sup>st</sup> ed. Petersen M., Kutzler M., eds. Elsevier, St. Louis 2011, pp 119-129
3. **Evermann JF**, Ledbetter E, Maes R. Canine Herpesvirus: Reproductive, Respiratory and Ocular Disease. *Vet Clin No America: Small Ani Prac* (in press) 2011
4. **Evermann JF**, Sellon RK, Sykes JE. Laboratory Diagnosis of Viral and Rickettsial Infections and Clinical Epidemiology of Infectious Disease. In *Infectious Diseases of the Dog and Cat.* 4<sup>th</sup> ed. Greene C., ed. (in press) 2011
5. **Evermann JF**, Wills TB. Immunologic Development and Immunization In Small Animal Pediatrics. The first 12 months of Life, 1<sup>st</sup> Ed. Petersen M., Kutzler M., eds. Elsevier, St. Louis 2011, pp 104-112
6. **Evermann JF**. Canine Herpesvirus In *Clinical Veterinary Advisor: Dogs and Cats*, 2nd ed. E. Cote ed. Elsevier, St. Louis 2011, pp 525-527

**Abstracts, Poster Sessions, Letters, Invited Addresses**

1. **Baszler TV**, **Besser TE**, Cassirer EF, Mathison, BA, Srikumaran S, **VanderSchalie J**: Serological diagnosis of *Mycoplasma ovipneumoniae* infection in Rocky Mountain bighorn sheep and domestic sheep by monoclonal antibody-based competitive inhibition ELISA. American Association of Veterinary Laboratory Diagnosticians, Minneapolis, MN November 11-15, 2010
2. **Baszler TV**, **Besser TE**, Cassirer EF, Mathison, BA, Srikumaran S, **VanderSchalie J**: Monoclonal antibody-based blocking ELISA for detection of antibodies to *Mycoplasma ovipneumoniae* in Rocky Mountain bighorn sheep and domestic sheep. United States Animal Health Association, Committee on Sheep and Goats, American Association of Veterinary Laboratory Diagnosticians, Minneapolis, MN November 14-17, 2010
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