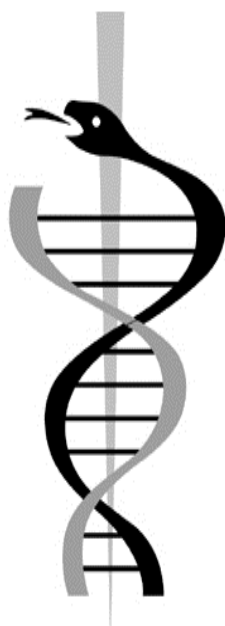


COLORADO STATE UNIVERSITY VETERINARY DIAGNOSTIC LABORATORIES

ANNUAL REPORT 2013



**Colorado State University
Diagnostic Laboratories
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MISSION STATEMENT

The mission of Colorado State University Veterinary Diagnostic Laboratories is to provide timely, accurate, and pertinent animal disease diagnostic services and educational outreach to veterinarians, animal industries, and animal interests. The Diagnostic Laboratories also will strive to meet the goals of the College of Veterinary Medicine and Biomedical Sciences, and the University, by contributing to research to develop new approaches to disease identification, investigation, and prevention and by contributing to the education of professional veterinary medical, graduate, undergraduate, and postdoctoral students.

VISION

To be a globally recognized leader in veterinary laboratory diagnostics.

VALUES

Accountability
Collaboration
Team
Transparency
Respect
Continuous Improvement

MESSAGE FROM THE DIRECTOR

Every year, we assemble a summary of the activities of the CSU Veterinary Diagnostic Laboratories. We hope you find this information interesting and of use. The activities of the faculty and staff are listed by the calendar year 2013. The testing and disease statistics are by the fiscal year July 1, 2012 to June 30, 2013. Data from all three laboratories of the system are included, although listed separately. Our goal, as always, is to provide quality timely service and meet our Mission as stated above. Please do not hesitate to contact us about this annual report or any other issue.

Respectfully,

Barbara E. Fowles

DIAGNOSTIC LABORATORY PERSONNEL

FORT COLLINS Office Staff	Barbara Powers, DVM/ PhD/DACVP	Director
	Connie Heighes	Business Officer/Asst. to Director
	Carrie Schmer	Computer Services (CRG)
	Tracy Baszler	Computer Services (CRG)
	Nancy Ault	Office Manager/Receiving
	Elaine Andersen	Word Processing/Special Projects
	Tracy Toberman	Sample Receiving
	Cassandra Grothe	Sample Receiving
	Kim Speaker	Sample Receiving
	Michelle McHugh	Client Services/Phone
	Pete Grabel	Client Services/Phone
	Lisa Monzingo	HR Liaison
	Tina Kane	Office Manager/Client Services
	Janice Inman	Accounting/Grant Manager
	Lisa Jackson	Transcription/Admin Assistant
	Cindy Arrieta	Transcription/Admin Assistant
	Julie Wright	Transcription/Admin Assistant
Michelle Miller	Reception/Admin Assistant	
Avian Diagnostics and BSL3 Operations	Kristy Pabilonia, DVM/PhD/DACVM	Section Head
	Christina Weller	Microbiologist
	Sarah Millonig	Avian Program Assistant
	Jeruesha Nichols	Avian Program Assistant
Chemistry/Toxicology	Kyran Cadmus	Research Associate
	Dwayne Hamar, PhD	Section Head
	Thomas Davis	Research Associate
Endocrinology & Special Serology	Kevin Daniels	Lab Support
	Mike Lappin, DVM/PhD/DACVIM	Lab Supervisor
	Melissa Brewer	Research Associate
Microbiology	Jennifer Hawley	Research Associate
	Arianne Morris	Research Associate
	Hana Van Campen, DVM/PhD/DACVM	Virology Section Head
	Doreene Hyatt, PhD	Bacteriology Section Head
	Denise Bolte	Microbiologist
	Monica Estay	Microbiologist
	Cindy Hirota	Microbiologist
	Mike Russell	Microbiologist
	David Hicks	Microbiologist
	Anita Schiebel	Microbiologist
	Lisa Snelling	Microbiologist
	Christina Gates	Microbiologist
	Kathi Wilson	Microbiologist/TSE Testing
Leah Powers	Lab Assistant/TSE Testing	
Molecular Diagnostics	Jeanette Bishop	Research Associate
Parasitology	Lora Ballweber, DVM/MS/DACVM	Section Head
Pathology	Barbara Powers, DVM/PhD/DACVP	Pathologist/Director
	Gary Mason, DVM/PhD/DACVP	Pathologist/Section Head
	Terry Spraker, DVM/PhD/DACVP	Pathologist
	EJ Ehrhart, DVM/PhD/DACVP	Pathologist
	Sushan Han, DVM/PhD/DACVP	Pathologist
	Pat Cole, DVM/PhD/DACVP	Pathologist
	Chad Frank, DVM/MS/DACVP	Pathologist
	Paula Schaffer, DVM/MS/DACVP	Pathologist
	Tawfik Aboellail, MVSc/PhD/DACVP	Pathologist
	Colleen Duncan, DVM/MSc/PhD/DACVP/DACVPM	Pathologist

DIAGNOSTIC LABORATORY PERSONNEL-cont.

Pathology-continued:	Charlie Davis, DVM Lee DeBuse Lisa Wolfe Phillip Buxton Dennis Madden Erik K. Themm	Case Coordinator Lab Technician Lab Support Lab Support Lab Coordinator Lab Technician
Clinical Pathology	Andrea Bohn, DVM/PhD/DACVP Paul Avery, DVM/PhD/DACVP Christine Olver, DVM/PhD/DACVP Linda Vap, DVM/DACVP	Clinical Pathologist Clinical Pathologist Clinical Pathologist Lab Coordinator
Histology	Todd Bass Grant Evans Matthew Garber Bruce Cummings Amy Boyd Joe McDowell	Lab Supervisor Lab Technician Lab Technician Research Associate Lab Technician Lab Technician
Quality Assurance	Dwayne Hamar, PhD Christina Weller Bob Kaempfe	QA Manager QA Asst Manager QA
ROCKY FORD Laboratory	Gene Niles, DVM/MS Loxi Proctor Jennifer Boden Dayla Pearl Sandra Bandimere Jane Carman-Wharry Jose Aragon	Director Lab Support Lab Technician Lab Technician Lab Technician Microbiologist Custodian
GRAND JUNCTION Office Staff Laboratory	Don Kitchen, DVM/PhD/DACVP Antonia Histia Kim Hannafious Chris Kline Caroline Moravek	Director Admin Assistant Microbiologist Lab Support Lab Support

AWARDS, HONORS, AND SERVICE MILESTONES - 2013

PATRICIA COLE – FACULTY OF THE YEAR –Colorado Veterinary Medical Association, 2013
COLLEEN DUNCAN – EXCELLENCE IN FACILITATION FOR EPIDEMIOLOGY –University of Sydney, 2013

5 Years of Service

Christina Gates
Donald Kitchen
Michelle McHugh
Jordan Spaak
Erik Themm

10 Years of Service

Brown, Kathryn
Powers, Leah
Weller, Christina

15 Years of Service

Scott Ratchford

20 Years of Service

Todd Bass
Tina Kane

25 Years of Service

Patricia Cole
Anita Schiebel

30 Years of Service

Elaine Andersen

50 Years of Service

Dwayne Hamar

EXTERNAL ADVISORY COMMITTEE MEMBERS

Member/Industry Representing:

Dr. Joan Bowen/Small Ruminant	5036 ECR 60	Wellington, CO 80549
Mr. Norm Brown/Equine	8167 NCR 11	Wellington, CO 80549
Dr. Gregg Dean/MIP Dept Head	CSU Dept of MIP	Fort Collins, CO 80523
Mr. Terry Fankhauser/Exe Dir/CCA	8833 Ralston Road	Arvada, CO 80002
Dr. Karen Fox/Wildlife/CDOW	6060 Broadway	Denver, CO 80216
Dr. Sunny Geiser-Novotny/USDA/APHIS	755 Parfet, Suite 136	Lakewood, CO 80215
Dr. Mike Gotchey/Equine	1878 Lincoln Avenue	Steamboat Springs, CO
Dr. Tim Hackett/VTH Director	CSU VTH	Fort Collins, CO 80523
Dr. Marv Hamann/Mixed Practice	183 Domingo Drive	Pueblo West, CO 81007
Mr. Ed Hansen/Beef Cattle	4554 CR 74E	Livermore, CO 80636
Dr. Jennifer House/Public Health	CO Dept of Public Health & Environment	Denver, CO 80216
Dr. Ron Kollars/Small Animal	1336 W. Elizabeth	Fort Collins, CO 80521
Dr. Larry Mackey/Large Animal	PO Box 336204	Greeley, CO 80632
Dr. Leesa McCue/Mixed Animal	124 Main	Limon, CO 80828
Dr. Del Miles/Beef Cattle	5626 W. 19th St, Suite A	Greeley, CO 80634
Dr. Mike Miller/Wildlife/CDOW	317 W. Prospect	Fort Collins, CO 80526
Ms. Kellee Mitchell/CO Livestock Assoc.	822 7 th Street, Suite 210	Greeley, CO 80631
Dr. Chris Orton/Clin Sci Dept Head	VTH/Dept of Clinical Sciences	Fort Collins, CO 80523
Dr. Keith Roehr/State Vet	CO Dept of Agriculture	Denver, CO 80215
Mr. Kenny Rogers/CCA	5151 CR 34	Yuma, CO 80759
Dr. Lou Swanson/Extension	CSU Extension	Fort Collins, CO 80523
Dr. Steve Wheeler/Small Animal	3550 S. Jason Street	Englewood, CO 80110

Our External Advisory Committee members volunteer their time to meet with us annually and assess our progress, as well as provide input to our future directions. We are grateful for their time and advice, and hope they feel that they are an integral part of the laboratory.

The Diagnostic Laboratories in conjunction with the Department of Microbiology, Immunology, and Pathology provides hands-on educational experiences to senior Professional Veterinary Medical Students in the areas of Pathology, Microbiology, and Parasitology. We also are educating the next generation of veterinary pathologists and microbiologists. Below is a listing of our residents.

Pathology Residents

Deanna Dailey, DVM
Elijah F. Edmondson, DVM
Greta M. Krafur, MSc, DVM
Jennifer L. Malmberg, DVM, MA
Travis Meuten, DVM
Craig Miller, DVM
Dan Regan, DVM
Seung Yoo, DVM

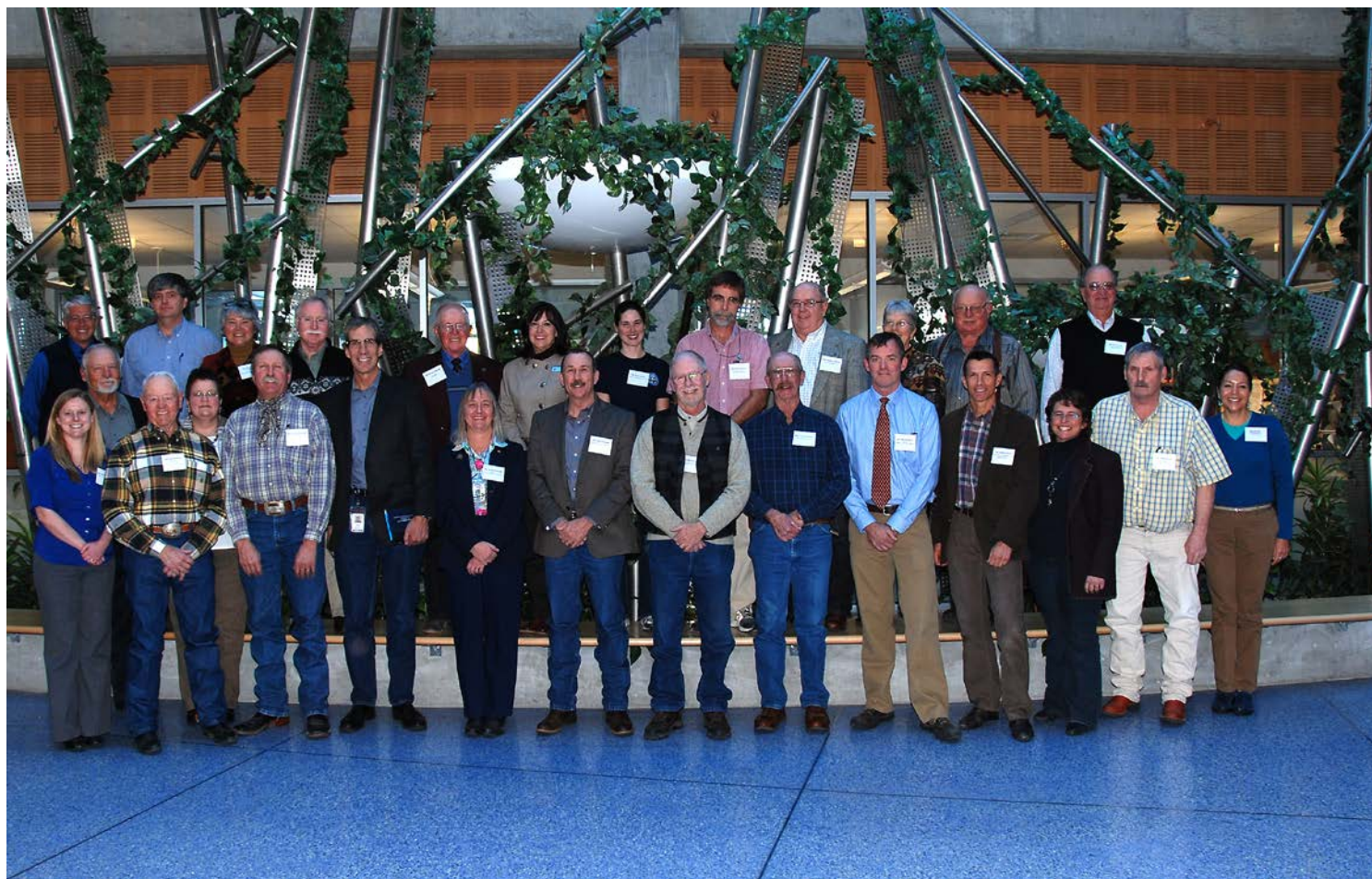
Microbiology

Ashley Malmlov, DVM

Comparative Lab Animal Medicine

Ryan Curtis, DVM
Carmen Ledesma, DVM
Wendy Tuttle, DVM
Kelly Walton, DVM

EXTERNAL ADVISORY COMMITTEE MEMBERS



Back Row: Dean Mark Stetter, Ron Kollars, Hana Van Campen (Section Head), Lou Swanson, Norm Brown, Kellee Mitchell, Karen Fox, Gary Mason (Section Head), Charlie Davis (Case Coordinator), Lora Ballweber (Section Head), Dwayne Hamar (Section Head), and Del Miles.

Front Row: Jennifer House, Marv Hamann, Ed Hansen, Doreene Hyatt (Section Head), Kenny Rogers, Chris Orton (Department Head), Barb Powers (VDL Director), Keith Roehr, Don Kitchen (Western Slope Director), Larry Mackey, Tim Hackett (VTH Director), Gregg Dean, Leesa McCue, Gene Niles (Rocky Ford Director), and Tolani Francisco.

Absent: Joan Bowen, Terry Fankhauser, Sunny Geiser-Novotny, Mike Gotchey, Mike Miller, and Steve Wheeler.

Attended, but not in photograph: Tracy Baszler, Jeanette Bishop, Mike Lappin, Scott Novogoratz, Kacie Reed, and Terry Spraker.

DIAGNOSTIC LABORATORY FACULTY TEACHING CONTRIBUTIONS - 2013

ERH510	Cancer Biology/E. Ehrhart
MIP192	Microbiology First-Year Seminar/D. Hyatt
MIP334	Food Microbiology/D. Hyatt, T. Spraker
MIP335	Food Microbiology Laboratory/D. Hyatt
MIP420	Medical and Molecular Virology/H. Van Campen
MIP540	Biosafety in Research Laboratories/K. Pabilonia
MIP636	Mechanisms of Viral Infection and Disease/T. Aboellail, H. Van Campen
MIP555	Principles and Mechanisms of Disease/T. Aboellail, P. Cole, E. Ehrhart, Sushan Han, G. Mason
MIP778	Pathobiology of Laboratory Animals/E. Ehrhart, G. Mason
MIP786A	Practicum--Comparative Gross and Histologic Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, T. Spraker
MIP786B	Practicum--Surgical Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, T. Spraker
MIP786C	Practicum for Clinical Pathology Residents/P. Avery, A. Bohn, C. Olver
MIP792C	Bioanalytical and Microscopy Seminar/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, T. Spraker
MIP792D	Seminar Anatomic Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, T. Spraker
MIP796V	General Pathology Group Study/T. Aboellail
MIP796V	Surgical Pathology/B. Powers
MIP615	Ophthalmological Histopathology/E. Ehrhart
VM601	Perspectives in Veterinary Medicine/K. Pabilonia, T. Spraker
VM603	Veterinary Science: Research and Methods/K. Pabilonia
VM610	Foundations Veterinary Medicine/C. Duncan, E. Ehrhart, S. Han
VM623	Veterinary Nutrition and Metabolism/K. Pabilonia
VM638	Veterinary Parasitology/L. Ballweber
VM639	Veterinary Virology/H. Van Campen
VM640	Biology of Disease I/E. Ehrhart, G. Mason
VM648	Food Animal Production and Food Safety/K. Pabilonia
VM650	Veterinary Microbiological Laboratory Techniques/H. Van Campen
VM707	Emerging Infectious Diseases/C. Duncan, K. Pabilonia
VM711	Foundations in Veterinary Medicine/C. Duncan, T. Spraker
VM714	Veterinary Preventive Medicine/C. Duncan
VM722	Veterinary Pharmacology/L. Ballweber
VM724	Bioanalytic Pathology/P. Cole
VM741	Biology of Disease II/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, G. Mason, T. Spraker
VM742	Biology of Disease III/ T. Aboellail, P. Cole, C. Duncan, S. Han, E. Ehrhart, G. Mason, T. Spraker, H. Van Campen
VM751	Veterinary Clinical Toxicology/D. Hamar
VM786A	Junior Practicum--Food-Animal Diagnostics and Surgery/G. Mason
VM786A	Junior Practicum—Diagnostic Veterinary Parasitology/L. Ballweber
VM786A	Junior Practicum—Emerging and Exotic Diseases of Animals/C. Duncan, K. Pabilonia
VM786B	Senior Practicum--Clinical Service Necropsy Block/ T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, D. Hyatt, G. Mason, T. Spraker, H. Van Campen
VM796V	Dermatopathology/P. Cole

TEACHING CONTRIBUTIONS-continued:

VS313	Prevention and Control of Livestock Diseases/L. Ballweber, K. Pabilonia
VS626	Infertility and Genital Diseases/H. Van Campen
VS642	Ophthalmology/E. Ehrhart
VS703	Postgraduate Medicine III/E. Ehrhart
VS718	Cancer Biology Clinical Practicum/E. Ehrhart

SCIENTIFIC PUBLICATIONS BY FACULTY MEMBERS AND STUDENTS - 2013

Aboellail TA. Pathologic and Immunophenotypic Characterization of 26 Camelid Malignant Round Cell Tumors. *J Vet Diagn Invest* 25 (1): 168-172. 2013.

Aboellail TA, Naikare HK, Mahapatra D. A Naturally Occurring Enterotyphlocolitis Associated with Dual Infection by *Clostridium piliforme* and Enteropathogenic Attaching and Effacing *Escherichia coli* in Syrian Hamsters. *J Vet Sci Med*, Vol. 1. 2013.

Ballweber LR, Cebra C, Anderson D, Tibart, Van Saan R, Johnson L. Endoparasite Control in Llama and Alpaca Care, 1st Ed. Elsevier, St. Louis, MO. 2013.

Barrera JS, Bernard F, **Ehrhart EJ**, Withrow SJ, Monnet E. Evaluation of Risk Factors for Outcome Associated With Adrenal Gland Tumors With or Without Invasion of the Caudal Vena Cava and Treated via Adrenalectomy in Dogs: 86 cases (1993-2009). *J Am Vet Med Assoc.* 242(12):1715-21. 2013.

Clarke L, Simon A, **Ehrhart EJ**, Mulick J, **Charles B, Powers B, Duncan C.** Histologic Characteristics and KIT Staining Patterns of Equine Cutaneous Mast Cell Tumors. *Vet Pathol.* 2013.

Collier JR, Byers SR, **Schaffer PA**, Worley DR, **Ehrhart EJ, Duncan CG**, Grossman AN, Holt T, Callan RJ. Infiltrative Cutaneous Hemangiolipoma in a Goat. *Vet Med Int.* 2013.

Corbin EE, Cavanaugh RP, Fick JL, McAbee KP, **Powers B.** Foreign Body Reaction to a Retained Surgical Sponge (Gossypiboma) Mimicking an Implant Associated Sarcoma in a Dog After Tibial Plateau Levelling Osteotomy. *Vet Comp Orthop Traumatol* 26; 147-53. 2013.

Dailey DD, Anfinsen KP, Pfaff LE, **Ehrhart EJ, Charles JB**, Bønsdorff TB, Thamm DH, **Powers BE**, Jonasdottir TJ, Duval DL. HES1, a Target of Notch Signaling, is Elevated in Canine Osteosarcoma, But Reduced in the Most Aggressive Tumors. *BMC Vet Res.* 9(1):130. 2013.

Dhaliwal RS, Kitchell BE, **Ehrhart EJ**, Valli VE, Dervisis NG. Clinicopathologic Significance of Histologic Grade, p53 Expression in Canine Lymphoma. *J Am Anim Hosp Assoc.* 49(3):175-84. 2013.

Dhaliwal RS, Kitchell BE, Valli VE, **Ehrhart EJ.** Expression of p-glycoprotein, p53, bcl-2 as Multiple Drug Resistance Markers in Spontaneous Canine Lymphoma. *Journal of the American Animal Hospital Association.* June 2013.

Dirsmith K, VanDalen K, Fry T, **Charles B**, VerCauteren K, **Duncan C.** Leptospirosis in Fox Squirrels (*Sciurus niger*) of Larimer County, Colorado, USA. *J Wildl Dis.* 49(3):641-5. 2013.

Duncan C, Goldstein T, Hearne C, Gelatt T, **Spraker T.** Novel Polyomaviral Infection in the Placenta of a Northern Fur Seal (*Callorhinus ursinus*) on the Pribilof Islands, Alaska. *Journal of Wildlife Disease;* 9(1):163-7. 2013.

Duncan C, Savage K, Guerrero J, Williams M, Dickerson B, Kondas, A, **Spraker T**, Kersh G. Multiple Strains of *Coxiella burnetii* are Present in the Environment of St. Paul Island, Alaska. *Transbound Emerg Dis;*60(4):345-50. 2013.

Engel S, Randall EK, Cuddon PA, **Webb BT, Aboellail TA.** Imaging Diagnosis: Multiple Cartilaginous Exostoses and Calcinosis Circumscripta Occurring Simultaneously in the Cervical Spine of a Dog. *Vet Radiol Ultrasound.* 2013.

Epple LM, Bemis LT, Cavanaugh RP, Skope A, Mayer-Sonnenfeld T, **Frank C**, Olver CS, Lencioni AM, Dusto NL, Tal A, Nar-Noy M, Lillehei KO, Katsanis E, Graner MW: Prolonged Remission of Advanced Bronchoalveolar Adenocarcinoma in a Dog Treated with Autologous, Tumor-Derived Chaperone-Rich Cell Lysate (CRCL) Vaccine. *International Journal of Hyperthermia* 29(5):390-398. 2013.

Fox KA, Martin LE, **Baeten LA, Webb BT**, LeVan IK, **Ballweber LR**, Wolfe LL. *Filaria taxideae* in Striped Skunks (*Mephitis mephitis*) of Colorado, USA, and Commonly Associated Filarial Dermatitits. *J Wildl Dis.* 49(3):738-40. 2013.

SCIENTIFIC PUBLICATIONS 2013–continued:

Frank CB, Valentin SY, Scott-Moncrieff JC, Miller MA. Correlation of Inflammation with Adrenocortical Atrophy in Canine Adrenitis. *J Comp Pathol.* 149(2-3):268-79. 2013.

Fry TL, Vandalen KK, **Duncan C**, Vercauteren K. The Safety of ONRAB(®) in Select Non-Target Wildlife. *Vaccine.* 31(37):3839-42. 2013.

Goncarovs-Gran KO, **Frank CB**, Baird AN, Couetil LL, Ramos-Vara JA: Pathology in Practice—Embryonal Rhabdomyosarcoma of the Shoulder in an Alpaca. *J Am Vet Med Assoc* 243(8):1113-1115. 2013.

Hart SK, Barrett JG, Brown JA, Papich MG, **Powers BE**, Sullins KE. Elution of Antimicrobials From a Cross-Linked Dextran Gel: In Vivo Quantification. *Equine Vet J* 45:148-53. 2013.

Hoon-Hanks LL, **Regan D**, Dubey JP, Porter MC, **Duncan CG**. Hepatic Neosporosis in a Dog Treated for *Pemphigus foliaceus*. *Journal of Veterinary Diagnostic Investigation*; 25: 807-810. 2013.

Kuzmina TA, Kuzmin YI, Tkach VV, **Spraker TR**, Lyons ET. Ecological, Morphological, and Molecular Studies of *Acanthocheilonema odendhali* (Nematoda: Filarioidea) in Northern Fur Seals (*Callorhinus ursinus*) on St. Paul Island, Alaska. *Parasitol Res.* 112(9):3091-100. 2013.

Lacerda CMR, Maclea HB, **Duncan CG**, Kisiday JD, Orton EC. Human Myxomatous Mitral Valves Exhibit Focal Expression of Cartilage-Related Proteins. *Journal of Hypertension and Cardiology.* 2013.

Laus F, Passamonti F, Paggi E, Cerquetella M, **Hyatt DR**, Tesei B, Piergili F. Prevalence of Tick-Borne Pathogens in Horses from Italy. *JVMS* 75(6):715-720. 2013.

Madl JE, **Duncan CG**, Stanhill JE, Tai PY, **Spraker TR**, Gulland FM. Oxidative Stress and Redistribution of Glutamine Synthetase in California Sea Lions (*Zalophus californianus*) with Domoic Acid Toxicosis. *J Comp Pathol.* 2013.

McGrew AK, **Ballweber LR**, Moses SK, Stricker CA, Beckmen KB, Salman MD, O'Hara TM. Mercury in Gray Wolves (*Canis lupus*) in Alaska: Increased Exposure Through Consumption of Marine Prey. *Sci Total Environ.* 2013.

McHuron EA, Greig DJ, Colegrove KM, Fleetwood M, **Spraker TR**, Gulland FMD, Harvey JT, Lefebvre KA, Frame ER. Domoic Acid Exposure and Associated Clinical Signs and Histopathology in Pacific Harbor Seals (*Phoca vitulina richardsii*). *Harmful Algae.* 23:28-33. 2013

McLeland SM, Imhoff DJ, Thomas M, **Powers BE**, Quimby JM. Subcutaneous Fluid Port-Associated Soft Tissue Sarcoma in a Cat. *J Feline Med Surg.* 15(10):917-20. 2013.

Minor C, Kersh GJ, Gelatt T, Kondas AV, **Pabilonia KL**, **Weller CB**, Dickerson BR, **Duncan CG**. *Coxiella burnetii* in Northern Fur Seals and Steller Sea Lions of Alaska. *J Wildl Dis.* 49(2):441-6. 2013.

Monello RJ, Powers JG, Hobbs NT, **Spraker TR**, O'Rourke KI, Wild MA. Efficacy of Antemortem Rectal Biopsies to Diagnose and Estimate Prevalence of Chronic Wasting Disease in Free-Ranging Cow Elk (*Cervus elaphus nelsoni*). *J Wildl Dis.* 49(2):270-8. 2013.

Myers E, **Ehrhart EJ**, Charles B, **Spraker T**, Gelatt T, **Duncan C**. Apoptosis in Normal and *Coxiella burnetii*-Infected Placentas from Alaskan Northern Fur Seals (*Callorhinus ursinus*). *Vet Pathol* 50 (4); 622 - 625. 2013.

Nadler SA, Lyons ET, Pagan C, Hyman D, Lewis EE, Beckmen K, Bell CM, Castinel A, DeLong RL, Duignan PJ, Farinpour C, Huntington KB, Kuiken T, Morgades D, Naem S, Norman R, Parker C, Ramos P, **Spraker TR**, Berón-Vera B. Molecular Systematics of Pinniped Hookworms (Nematoda: Uncinaria): Species Delimitation, Host Associations and Host-Induced Morphometric Variation. *Int J Parasitol.* 43(14):1119-32. 2013.

Newkirk KM, Hendrix DV, Anis EA, Rohrbach BW, **Ehrhart EJ**, Lyons JA, Kania SA. Detection of Papillomavirus in Equine Periocular and Penile Squamous Cell Carcinoma. *J Vet Diagn Invest.* 2013.

SCIENTIFIC PUBLICATIONS 2013–continued:

Nichols TA, **Spraker TR**, Rigg TD, Meyerett-Reid C, **Hoover C**, Michel B, Bian J, Hoover E, Gidlewski T, Balachandran A, O'Rourke K, Telling GC, Bowen R, Zabel MD, VerCauteren KC. Intranasal Inoculation of White-Tailed Deer (*Odocoileus virginianus*) with Lyophilized Chronic Wasting Disease Prion Particulate Complexed To Montmorillonite Clay. *PLoS One*. 8(5):e62455. 2013.

Pablonia KL, **Cadmus KJ**, Lingus TM, **Bolte DS**, **Russell MM**, Van Metre DC, Erdman MM. Environmental Salmonella in Agricultural Fair Poultry Exhibits in Colorado. *Zoonoses Public Health*. 2013.

Pablonia KL, Podell BK, **Powers BE**. Mast Cell Tumor of the Oral Mucosa With Submandibular Lymph Node Metastasis in a Dog. *J Am Vet Med Assoc*. 243(6):795-7. 2013.

Phillips AT, Stauff CB, **Aboellail TA**, Toth AM, Jarvis DL, Powers AM, Olson KE. Bioluminescent Imaging and Histopathologic Characterization of WEEV Neuroinvasion in Outbred CD-1 Mice. **Plos One** DOI: 10.1371. January 2013.

Pilon JL, Rhyan JC, Wolfe LL, Davis TR, McCollum MP, O'Rourke KI, **Spraker TR**, VerCauteren KC, Miller MW, Gidlewski T, Nichols TA, Miller LA, Nol P. Immunization with a Synthetic Peptide Vaccine Fails to Protect Mule Deer (*Odocoileus hemionus*) From Chronic Wasting Disease. *J Wildl Discharge*. 49(3):694-8. 2013.

Powers J, **Duncan C**, Schuler B, **Spraker T**, Hess S, Faford J, **Han S**. Environmental Conditions Associated With Lesions in Introduced Free-Ranging Sheep in Hawai'i. *Pacific Science*; 68 (1). Online first. 2013

Ramos-Vara JA, **Frank CB**, Dusold D, Miller MA. Immunohistochemical Expression of Melanocytic Antigen PNL2, Melan A, S100, and PGP 9.5 in Equine Melanocytic Neoplasms. *Vet Pathol*. Jan 31. 2013.

Regan DP, Dubielzig RR, Zeiss CJ, **Charles B**, Hoy SS, **Ehrhart EJ**. Primary Primitive Neuroectodermal Tumors of the Retina and Ciliary Body in Dogs. *Vet Ophthalmol*. 16 Suppl 1:87-93. 2013.

Rhyan J C, **Van Campen H**, McCollum M, Nol P, Salman M. Rabies in Two Bison from Colorado. *Case Reports in Veterinary Medicine*, Article ID 906782. 2013.

Roe WD, **Spraker TR**, **Duncan CG**, Owen M, **Charles JB**. Postmortem Stability of S100B in the Aqueous Humor of Northern Fur Seals (*Callorhinus ursinus*). *J Vet Diagn Invest*. 25(5):627-9. 2013.

Schaffer PA, Lifland B, Van Sommeran S, Casper DR, and **Davis CR**. Meningoencephalitis Associated With *Carnobacterium maltaromaticum*-Like Bacteria in Stranded Juvenile Salmon Sharks (*Lamna ditropis*). *Veterinary Pathology* 50:412-417. 2013.

Schaffer PA, **Weishaar KM**, **Han S**. Endobronchial Metastasis in a Dog with Sarcoma. *J Vet Diagn Invest*. 2013;25(4):546-50. 2013.

Schaffer PA, Wobeser B, Dennis MM, **Duncan CG**. Non-neoplastic Lesions of Equine Skin in the Central United States and Canada: A Retrospective Study. *Can Vet J*. 54(3):262-266. 2013.

Schaffer PA, Wobeser B, Martin L, Dennis M, **Duncan C**. Neoplastic Lesions of Equine Skin in the Central U.S.A. and Canada: A Retrospective Study. *J Am Vet Med Assoc*; 242(1):99-104. 2013.

Schwartz AL, Custis JT, Harmon JF, **Powers BE**, Chubb LS, LaRue SM, Ehrhart NP, Ryan SD. Orthotopic Model of Canine Osteosarcoma in Athymic Rats for Evaluation of Stereotactic Radiotherapy. *Am J Vet Res*. 74(3):452-8. 2013.

Van Campen H, **Davis C**, Flinchum JD, **Bishop JV**, **Schiebel A**, **Duncan C**, **Spraker T**. Epizootic Hemorrhagic Disease in Yaks (*Bos grunniens*). *Journal of Veterinary Diagnostic Investigation*. 25(3):443-6. 2013.

SCIENTIFIC PUBLICATIONS 2013–continued:

Weller CB, Cadmus KJ, Ehrhart EJ, Powers BE, and Pabilonia KL. Detection and Isolation of Influenza: A Virus Subtype H1N1 From a Small Backyard Swine Herd in Colorado. *Journal of Veterinary Diagnostic Investigation*, 25(6):782-4. 2013.

Woolums AR, Berghaus RD, Smith DR, White BJ, Engelken TJ, Irsik MB, Matlick DK, Jones AL, Ellis RW, Smith II, **Mason GL**, Waggoner ER. Producer Survey of Herd-Level Risk Factors for Nursing Beef Calf Respiratory Disease. *J Am Vet Med Assoc*. 243(4):538-47. 2013.

Yoshikawa H, **Ehrhart EJ, Charles JB**, Custis JT, Larue SM. Assessment of Predictive Molecular Variables in Feline Oral Squamous Cell Carcinoma Treated with Stereotactic Radiation Therapy. *Vet Comp Oncol*. 2013.

ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS - 2013

Aboellail TA, Phillips AT, Powers AM, Olson KE, Rico Amber B. Pathologic Lesions and Pathogenesis of Percutaneous Infection of CD-1 Mice with Western Equine Encephalitis Virus(WEEV). American Association of Veterinary Laboratory Diagnosticians Annual Meeting, San Diego, CA. October 2013.

Aboellail, TA. Pathology at the Cross Roads of Service, Teaching, and Research. Cairo University, Giza, Egypt. January 2013.

Avery P, Avery A, Lana S, **Ehrhart EJ.** Flow Cytometric Characterization of Distinct Forms of Canine T-cell Lymphoma. Platform presentation. Europ Soc Veterin Oncol Annual Congress. (EVSONC). Lisbon, Portugal. May 30-June 1, 2013.

Azeem S, Brade-Tretheway B, **Pabilonia KL**, Baroch J, Tewari D, McElwain T, Yoon K. Molecular Characterization of non-H5 and non-H7 Avian Influenza Viruses from Wild Birds of the North American Migration Flyways. American Society for Virology Annual Meeting, University Park, PA. July 2013.

Azeem S, Baroch J, Brade-Tretheway B, **Pabilonia KL**, Tewari D, Killian M, McElwain T, Yoon K-J. Molecular Characterization of non-H5 and non-H7 Influenza A Virus Isolates from Wild Birds of the North American Migration Flyways During 2006-2011. Conference of Research Workers in Animal Diseases, Chicago, IL. December 2013.

Barbieri M, Kashinsky L, Raverty S, Kaufman A, Antonelis G, Gilmartin W, Fleetwood M, Rotstein D, **Spraker T, Duncan C**, Work T, Littnan C. Retrospective Study of Pathologic Findings and Causes of Mortality in Hawaiian Monk Seals (*Monachus schauinslandi*), 1982-2012. 20th Biennial Conference on the Biology of Marine Mammals, Dunedin, New Zealand. 2013.

Bates KE, Weaber RL, Bormann JM, Moser DW, Salak-Johnson JL, Chase CCL, Pee RK, **Van Campen H**, Loneragan GH, Wagner JJ, Bodhireddy P, Prayaga K, and Enns RM. Relationships Among Temperament, Immune Function, and Carcass Merit in Beef Cattle. Vol. 64, Proceedings, Western Section, American Society of Animal Science. 2013.

Dailey DD, Ehrhart EE, Bass T, Powers BE. DOG1 is a Sensitive and Specific Immunohistochemical Marker for Diagnosis of Canine Gastrointestinal Stromal Tumors (GISTS). Platform presentation. ACVP Annual Meeting. Montreal, Quebec, Canada. Nov 16-20, 2013.

Ehrhart EJ, Fielding L, Santoni AL, Satoni BG, Puttlitz CM, Ruehlman DR, Siem HB, Turner AS. In vivo Response to a Paraspinous Tension Band with Titanium Coil: An Ovine Implantation Study. Poster. International Society for the Study of the Lumbar Spine (ISSLS). Scottsdale, AZ. May 13-17, 2013.

Frank CB. Diseases Affecting 4H Pigs. Colorado Veterinary Medical Association Meeting, Loveland, CO. 2013.

Frank CB. Diseases Affecting 4H Sheep and Goats. Colorado Veterinary Medical Association Meeting, Loveland, CO. 2013.

Hamar D. Sampling for Selenium Toxicity. American Association of Veterinary Laboratory Diagnosticians/AAVCT Annual Meeting, San Diego, CA. October 2013.

Hamar D. Sampling for Selenium Toxicity. Colorado Veterinary Medical Association Annual Meeting, Loveland, CO. September 2013.

Han, S. Metastatic Mineralization in 18 captive Two-Toed Sloths. American Association of Zoological Medicine, Salt Lake City, UT. October 2013.

Han S. Heartbreak at the Zoo, Endocarditis in a Golden-Cheeked Gibbon. American Association of Zoological Medicine, Salt Lake City, UT. September 2013.

ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS 2013-continued:

Hatzel JN, McCue PM, **Ehrhart EJ**, Ferris RA. Immunohistochemical Localization of Early Pregnancy Factor (HSP10) in Equine Embryos. Poster. 8th International Symposium on Equine Embryo Transfer. Vancouver, BC, Canada. July 26-29, 2013.

Hazenfield KM, Nylund A, Valdez-Martinez A, Griffin L, Goh C, Chris Mackay C, **Duncan C**, Palmer R, Duerr F. Validation of a Novel Method to Measure Tibial Plateau Angle in Large and Giant Breed Dogs. Veterinary Orthopedic Society, Salt Lake City, Utah. 2013.

Johnson S, Gill V, Burek K, **Ehrhart EJ**, Charles B, **Orton C**, **Duncan C**. Degenerative and Infectious Change in Heart Valves from Northern Sea Otters. Colorado Veterinary Medical Association Annual Conference, Loveland, CO. 2013.

Kersh GJ, **Malmlov A**, Fitzpatrick KA, Priestley RA, Minor C, Kondas A, Self JS, Rea L, DeLong R, Gelatt T, Lambourn D, MassungRF, **Duncan C**. Infection of Marine Mammals with *Coxiella burnetii*. 26th Meeting of the American Society of Rickettsiology, Portland, Maine. June 17, 2013.

Kraft S, Kato R, Randall E, Ehrhart NP, LaRue S, Guth A, **Ehrhart EJ**, Hetrick L, McMillan D, Shang D, Furukawa R, Fujibayashi Y. Cu64-ATSM PET/CT of Naturally Occurring Canine Soft Tissue Sarcomas: A Translational Model for Hypoxic Tumor Imaging and Therapy. Platform presentation. World Molecular Imaging Congress (WMIC). Savannah, GA. September 18-21, 2013.

Kuzmina T, Lyons ET, and **Spraker TR**. Gastrointestinal Helminthes of Northern Fur Seals (*Callorhinus ursinus* linnaeus, 1758) on St. Paul Island, Alaska: Current Changes in Parasite Community Structure. Alaska Marine Science Symposium, Anchorage, Alaska. January 2013.

Linke L, Wilusz J, Fruehauf J, Landolt G, Magnuson R, **Pabilonia KL**, **Han S**, Olea-Popelka F, and Salman M. Progress Towards a Novel Avian Influenza Antiviral Technology using RNAi Targeting Avian Epithelium. American Society for Virology Annual Meeting, University Park, PA. July 2013.

Linke LM, Wilusz J, Fruehauf J, Landolt G, Magnuson R, **Pabilonia KL**, **Han S**, Olea-Popelka F, Salman MD. A Novel Avian Influenza Antiviral Technology Using RNAi Targeting Avian Epithelium and Respiratory Tissues. Conference of Research Workers in Animal Diseases, Chicago, IL. December 2013.

Lyons ET, Kuzmina TA, and **Spraker TR**. *Uncinaria lucasi* in Northern Fur Seals (*Callorhinus ursinus*) on St. Paul Island, Alaska: "Endangered Species" or Hidden Danger. Alaska Marine Science Symposium, Anchorage, Alaska. January 17-23, 2013.

Malmlov AM, **Ballweber LR**. Confirmation of *Echinococcus canadensis* in Wolves and Elk in Idaho. American Association of Veterinary Parasitologists, 58th Annual Meeting, Chicago, IL. July 2013.

Malmlov AM, Evans RE, **Ballweber LR**. Public Health Implications of *Echinococcus* in Wolves and Elk in Idaho. American Association of Veterinary Laboratory Diagnosticians, 56th Annual Meeting, San Diego, CA. October 2013.

McLeland SM, Lunn KF, **Duncan CG**, Refsal KR, Quimby JM. Characterization of Gastric Histopathology in Cats with Chronic Kidney Disease. American College of Veterinary Pathologists, Montreal PQ. 2013.

Mills SW, Musil KM, Davies JL, Hendrick S, **Duncan CG**, Jackson ML, Kidney BA, Philibert H, Wobeser B, Simko E. Prognostic Value of Histologic for Feline Mammary Carcinoma: A Retrospective Survival Analysis. American College of Veterinary Pathologists, Montreal, Canada. 2013.

Musil KM, Mills SW, Davies JL, Hendrick S, **Duncan CG**, Jackson ML, Kidney BA, Philibert H, Wobeser B, Simko E. Prognostic Significance of pAKT, E-cadherin, and Ki-67 Expression in Feline Mammary Carcinomas. American College of Veterinary Pathologists, Montreal, Canada. 2013.

Nylund A, Hazenfield KM, Valdez-Martinez A, Griffin L, Goh C, Chris Mackay C, **Duncan C**, Palmer R, Duerr F. Validation of a Novel Method to Measure Tibial Plateau Angle in Large and Giant Breed Dogs. CVMBS Research Day, Fort Collins, CO. 2013.

ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS 2013-continued:

Pabilonia KL, Cadmus KJ, and Slota K. Characteristics of Backyard Poultry and Upland Gamebird Flocks in the United States. CDC Selected Zoonotic Diseases monthly meeting, Centers for Disease Control and Prevention. 2013.

Pabilonia KL. Impacts of Food Production Systems on infectious Disease in Southeast Asia. IGNITE Biodiversity, Fort Collins, CO. April 2013.

Pabilonia KL, Setiyaningsih S, Muljono A, Widyastuti M, Arief R, Aminah, **Weller C**, Wibawan I, and Bowen R. Maintenance of Influenza A Viruses by Domestic Ducks in West Java, Indonesia. Options for the Control of Influenza VIII Conference, Cape Town, South Africa. September 2013.

Pabilonia KL, Cadmus KJ, Millionig SM, Lingus TM, Bolte DS, Russell MM, Van Metre DC and Erdman MM. Salmonella in Non-Commercial Poultry. United States Animal Health Association Annual Meeting, San Diego, CA. October 2013.

Palomares J, **Ballweber LR**, Salmon MD. Assessment of Diagnostic Tests for Identification of Giardia spp and Cryptosporidium spp. Detection in Dogs and Cats in the Absence of a Gold Standard: a Bayesian Approach. CVMBS Research Symposium, Fort Collins, CO. January 2013.

Scotch M, **Pabilonia KL**, Anderson T, Baroch J, Kohler D, Deliberto TJ, Espy M, Black K, Pritt B and Seville MT. Phylogeography of H3N2 and Pandemic H1N1 Influenza Among Human and Avian Species in the Southwest United States. Influenza 2013: One Influenza, One World, One Health Conference, Oxford, UK. September 2013.

Spraker TR. Bacterial Diseases of Wild European Boar. Workshop on Diseases of Wild European Boar and Other Diseases of Birds and Mammals. Kiev, Ukraine. April 2013.

Spraker TR. Chronic Wasting Diseases in Cervids in North America and Suggestions on How to Prevent it from Entering Ukraine. Workshop on Diseases of Wild European Boar and Other Diseases of Birds and Mammals. Kiev, Ukraine. April 2013.

Spraker T, Lyons ET, Kuzmina T, and Gelatt T. Histological Features of the Gastrointestinal Tract of Northern Fur Seals (*Callorhinus ursinus*) associated with Helminthes at St. Paul Island, Alaska. Alaska Marine Science Symposium, Anchorage, Alaska. January 17-23 2013.

Spraker TR. Parasitic Diseases of Wild European Boar. Workshop on Diseases of Wild European Boars and Other Diseases of Birds and Mammals. Kiev, Ukraine. April 2013.

Spraker TR. Patterns of Distribution of Prion in the Obex and Body in Elk with Chronic Wasting Disease. Prion New Horizons, Fort Collins CO. October 2013.

Spraker TR. Viral Diseases of Wild European Boar. Workshop on Diseases of Wild European Boar and Other Diseases of Birds and Mammals, Kiev, Ukraine. April 2013.

Van Campen H, Bergin B, Holman A, Craig AM, Thompson G, and **Spraker T**. Wainaku Grass (*Panicum maximum*) Endophyte Toxicosis in Horses. AAVLD Annual Meeting, San Diego, CA. 2013.

Worley DR, Venable RO, Gustafson DL, Hansen RJ, **Ehrhart EJ**, Sai S, Coen MS, Forrest ML. Hyaluronan-cisplatin conjugate in five dogs with soft tissue sarcoma. Poster. Joint International Oncology (JIOC) Annual Meeting, San Francisco CA. May 27-29, 2013.

PRESENTATIONS/OUTREACH TO THE PUBLIC - 2013

Ballweber, LR. Animal Shelters and Parasites – Efforts of Increasing Transport. 4th ASPCA/CSU Shelter Medicine Mini-Conference. Fort Collins, CO. 2013.

Ballweber, LR. Fecal Diagnostics in Parasitology. Veterinary Technicians, Casper Veterinary Clinic, Fort Collins, CO. 2013.

Niles G. Overview of the CSU VDL System. Calhan Veterinary Clinic, Calhan, CO. November 2013.

Niles G. Nitrate Poisoning in Livestock. Calhan Veterinary Clinic, Calhan, CO. December 2013.

Niles G. Nitrate Levels in 2013 Forage Crops. Ark Valley Research Center. Rocky Ford, CO. December 2013.

Pabilonia, KP. Raising Healthy Poultry Flocks. CSU Veterinary Teaching Hospital, Fort Collins, CO. 2013.

Powers BE, Orton C, Pond K. Update from CVMBS and College of Agriculture. Joint Colorado Cattlemen's Association and Colorado Livestock Association, Breckinridge, CO. June 2013.

ONGOING FUNDED CONTRACTS AND GRANTS - 2013

- Ballweber, LR. (PI).** Anthelmic Resistance in US Beef Cattle. University of Minnesota. 7/1/12-8/21/13. \$23,562.
- Ballweber, LR. (PI).** Intervet/Schering-Plough Clinical Trial. Intervet, Inc. 11/27/12-12/31/13. \$64,386.
- Ballweber, LR. (PI).** Intervet/Schering-Plough Clinical Trial. Intervet, Inc. 11/26/13-12/31/14. \$60,000.
- Ballweber, LR. (PI), McArt, JAA (Co-Invest), and Callan, RL (Co-Invest).** National Center for Veterinary Parasitology. Individual Animals Versus the Dung Pile: Which Sampling Strategy is Best for Herd-Based Fecal Egg Count Surveillance Programs? Merck Animal Health. 11/1/13-10/31/14. \$6,350.
- Duncan, CG. (PI).** Coxiella and Brucella in Northern Fur Seals. North Pacific Research Board. 6/17/13-6/30/15. \$55,242.
- Duncan, CG. (PI).** *Coxiella burnetii* in Northern Sea Otters in Alaska. North Pacific Research Board. 7/1/13-6/30/15. \$47,413.
- Duncan, CG. (PI), Spraker, TS, (Co-Invest), and Pabilonia, K. (Co-Invest).** Estimation of Prevalence Optimization of Diagnostic Strategies for *Coxiella burnetii* in Pacific Marine Mammals. National Oceanic and Atmospheric Administration. 8/1/12-7/31/14. \$100,000.
- Duncan, CG. (PI) and Spraker, TS. (Co-Invest).** Histopathology and Selective Immunohistochemistry Analysis of Tissues Collected from Arctic Marine Mammals. North Slope Borough of Alaska. 1/1/12-6/30/14. \$49,348.
- Ehrhart, E. (PI).** Instructive Biologic Scaffold for Tissue Regeneration following Trauma to Extremities. ACell, Inc. 7/1/12-8/30/15. \$1,500,000.
- Ehrhart, E. (PI).** Immunohistochemical Evaluation of KIT Activation in Canine Mast Cell Tumor in Response to Toceranib Phosphate. CSU CRC. 7/1/12-6/30/13. \$12,000.
- Ehrhart, E. (Co-Invest).** Biodegradable Polymers for Injury Treatment. Department of Defense. 6/2011-6/2014. \$1,286,000.
- Ehrhart, E. (Co-Invest).** Discovery of Novel Protein, Blood, and Epigenetic Biomarkers of Lymphoma Risk, Classification, and Prognosis in Golden Retrievers. AKC Canine Health Foundation. 6/2013-6/2016. \$385,086.
- Ehrhart, E. (Co-Invest).** Erectile Dysfunction Following Radiation Therapy: A Canine Model. Varian, Inc. 6/2009-6/2013. \$744,300.
- Ehrhart, E. (Co-Invest).** Survivin' Inhibition with EXN-3042 for Canine Lymphoma Therapy – Morris Animal Foundation. 6/2013-6/2015. \$106,911.
- Ehrhart, E. (Co-Invest).** The Role of Adhesion Molecules During CNS-Endothelial Cell Infection with Equine Herpesvirus-1. Morris Animal Foundation. 12/1/11-11/30/13. \$106,228.
- Han, S. (PI).** Pathology of Zoo Animals. Denver Zoological Foundation. 7/1/13-12/31/13. \$15,120.
- Hyatt, D. (Co-I).** *E. coli* O157 Super-shedding in Colorado Dairies. CSC CRS. 7/1/13-6/30/14. \$25,000.
- Hyatt, D. (Co-Invest).** *E. coli* O157 Shedding and Antimicrobial Susceptibility in Colorado Dairies. HICAHS Pilot Project. 11/1/13-9/14/14. \$25,000.
- Mason, G. (Co-Invest).** An Evaluation of the Suitability of Porcine Lung Tissue for Human Consumption. National Pork Board. 12/15/13-12/14/14. \$79,786.
- Pabilonia, K. (PI).** Avian Health Program 2013-14. USDA/APHIS. 4/1/13-3/31/14. \$254,375.
- Pabilonia, K. (PI).** Antibody Response to Influenza Virus in Mallards. USDA/APHIS. 9/15/13-9/14/14. \$4,400.

ONGOING FUNDED CONTRACTS AND GRANTS 2013-continued:

Pabilonia, K. (PI). Avian Influenza Virus Isolation and Sequencing Agreement. USDA/APHIS through WSU 9/29/11-9/28/13. \$26,420.

Pabilonia, K. (PI). CSU VDL Participation in the Vet LRN. HHS-FDA. 9/1/12-8/31/17. \$82,500.

Pabilonia, K. (PI). Isolation and Sequencing of Avian Influenza Virus. USDA/APHIS through WSU. 9/24/12-9/23/14. \$8,872.

Pabilonia, K. (PI). Leptospirosis Testing: A Cooperative Agreement. USDA/APHIS. 5/14/12-5/13/14. \$105,935.

Pabilonia, K. (PI). Notifiable Avian Influenza Prevention and Control Program. USDA/APHIS. 4/2012-3/2013. \$275,000.

Pabilonia, K. (PI). National Avian Influenza Tissue Archive and Genotyping. USDA/APHIS. 5/1/12-4/30/14. \$247,399.

Pabilonia, K. (PI). Using Conservation Genetics to Improve Ex Situ Management of the Critical Endangered Buffon Macaw. Association of Avian Veterinarians. 7/1/12-6/30/13. \$3,892.

Pabilonia, K. (PI) and Hyatt, D. (Co-Invest). Evaluation of Salmonella Shedding From Symptomatic and Asymptomatic Pets. FDA. 9/16/11-9/15/14. \$108,387.

Powers, B. (PI). Classical Swine Fever Surveillance. USDA. 4/1/12-3/31/13. \$45,595.

Powers, B. (PI) and Pabilonia, K. (Co-Invest). National Animal Health Laboratory Network—Core Animal Diagnostic Laboratory. USDA. 8/15/12-8/14/14. \$182,000.

Powers, B. (PI) and Pabilonia, K. (Co-Invest). USDA Equine Enhanced Passive Surveillance Pilot Project – Laboratory Connectivity. USDA/APHIS. 6/6/13-3/30/14. \$22,406.

Spraker, T. (PI). Dissemination of Abnormal Prion Protein in White-Tailed Deer and Elk Naturally Infected with Chronic Wasting Disease. ARS/USDA. 06/19/08-06/23/13. \$56,970.

Spraker, T. (PI). Epidemiology of Rabies in Northern Colorado. USDA/APHIS. 9/1/13-8/31/14. \$77,000.

Spraker, T. (PI). Sinus Tumors of Rocky Mountain Bighorn Sheep. CO Division of Wildlife. 6/2/10-6/30/13. \$283,500.

Spraker, T. (PI). Technical Assistance for Veterinary Pathology and Diagnostic Service for NPS Wildlife Species. National Park Service. 9/1/11-12/31/14. \$288,000.

Spraker, T. (PI). Chronic Wasting Disease: Characterization of Disease Transmission. USDA/APHIS. 9/1/11-8/31/13. \$196,390.

Spraker, T. (PI) and Duncan, CD (Co-Invest). Technical Assistance to the National Park Service Wildlife Health Team. National Park Service. 8/31/09-7/31/14. \$940,700.

STATE OR NATIONAL COMMITTEES - 2013

Aboellail T, Andrews J, Ballweber LR, Cole PC, Duncan C, Hamar D, Han S, Hyatt D, Kitchen D, Mason G, Niles G, Pabilonia K, Powers BE, Spraker TR, Van Campen H. Members, American Association of Veterinary Laboratory Diagnosticians

Aboellail T, Andrews J, Ballweber LR, Cole PC, Duncan C, Ehrhart EJ, Han S, Mason G, Niles G, Pabilonia K, Powers BE, Kitchen D, Spraker T, Van Campen H. Members, Colorado Veterinary Medical Association

Aboellail T, Andrews J, Cole PC, Duncan C, Ehrhart EJ, Frank C, Han S, Kitchen D, Mason G, Powers BE, Spraker TR. Members, American Collage of Veterinary Pathologists

Ballweber LR. Co-Chair, Parasitology Committee, American Association of Veterinary Laboratory Diagnosticians

Ballweber LR. Board of Governors, American College of Veterinary Microbiologists

Ballweber LR. Member, European Veterinary Parasitology College

Ballweber LR. Member, World Association for the Advancement of Veterinary Parasitology

Ballweber LR. National Board of Veterinary Medical Examiners

Ballweber LR. Chair, Outreach/Research Committee, American Association of Veterinary Parasitologists

Cole PC. Member, American Veterinary Medical Association

Duncan CD. Member, Publications Committee, American Association of Veterinary Laboratory Diagnosticians

Ehrhart EJ. Member, American College of Veterinary Pathologists Oncology Initiative

Ehrhart EJ. Member, American College of Veterinary Pathologists Training Committee

Hamar D. Member, Publication, Membership, Veterinary Analytical Toxicology and Quality Systems Subcommittees, American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Auditor, Accreditation Committee. American Association of Veterinary Laboratory Diagnosticians.

Hyatt D. Co-Chair, Bacteriology Steering Committee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, American Society of Microbiology

Hyatt D. Member, Antimicrobial Susceptibility Subcommittee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, Bacteriology Committee and Anaerobic Bacteriology Subcommittee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, Colorado Laboratory Forum

Hyatt D. Member, International Association for Food Protection

Niles G. Member, National Animal Health Laboratory Network Coordinating Council

Pabilonia K. Member, Accreditation Committee. American Association of Veterinary Laboratory Diagnosticians

Pabilonia K. Chair, Colorado Avian Influenza Task Force

Pabilonia K. Chair, Publications Committee, American Association of Veterinary Laboratory Diagnosticians

Pabilonia K. Coordinator, Colorado Avian Disease Surveillance Program

Pabilonia K. Coordinator, Colorado State Agency for the National Poultry Improvement Plan

Pabilonia K. Member, AAVLD/USAHA Joint Special Committee on the National Animal Health Laboratory Network

Pabilonia K. Member, American College of Veterinary Microbiologists

Pabilonia K. Member, Colorado Egg Producers

Pabilonia K. Member, Conference Planning Committee. Colorado Veterinary Medical Association

Pabilonia K. Member, United States Animal Health Association, Transmissible Diseases of Poultry Committee

Pabilonia K. Member, United States Animal Health Association, Committee on Animal Emergency Management

Pabilonia K. Member, US-Indonesian Joint Council on Higher Education

Pabilonia K. Member, USDA Live Bird Marketing System Working Group

STATE OR NATIONAL COMMITTEES-continued:

Powers BE. Chair, Committee on Advocacy and Outreach, Colorado Veterinary Medical Association
Powers BE. Co-Chair, AAVLD/USAHA Joint Special Committee on the National Animal Health Laboratory Network
Powers BE. Co-Chair, Government Relations Committee, American Association of Veterinary Laboratory Diagnosticians
Powers BE. Member, American Veterinary Medical Association
Powers BE. Member, Animal Health and Welfare Committee, Colorado Cattlemen's Association
Powers BE. Member, Board of Directors, Colorado Veterinary Medical Association
Powers BE. Member, Colorado Livestock Association
Powers BE. Member, Financial Advisory Committee, American Association of Veterinary Laboratory Diagnosticians
Powers BE. Member, Foundation Committee American Association of Veterinary Laboratory Diagnosticians
Powers BE. Member, Government Coordinating Council, USDA/FDA/DHS
Powers BE. Member, National Animal Health Information Technology Board, USDA

Spraker TR. Member, Wildlife Disease Association

Van Campen H. Editorial Board, American Association of Veterinary Laboratory Diagnosticians
Van Campen H. Member, American College of Veterinary Microbiologists
Van Campen H. Member, American Society of Microbiology
Van Campen H. Member, American Society of Virology
Van Campen H. Member, American Veterinary Medical Association
Van Campen H. Member, Colorado Chapter of the Wildlife Society
Van Campen H. Member, Committee on Education, Colorado Veterinary Medical Association
Van Campen H. Member, Rocky Mountain Branch of the American Society for Microbiology
Van Campen H. Southwest Representative, Executive Board, American Association of Veterinary Laboratory Diagnosticians

ONGOING DIAGNOSTIC LABORATORY INVESTIGATIONS

Below is a list of disease surveillance and investigation projects that the Diagnostic Laboratory personnel are conducting. Many projects serve teaching and research functions, as well as outreach and service. Those with student involvement are indicated by PVM, MS, PhD. It is worth noting that many projects involve research that would be either very expensive or impossible to do under laboratory conditions. The collaboration with producers or other government agencies usually involves a large “in-kind” contribution of animal procurement, care, and facilities costs. The list excludes simple investigations directed at making a field diagnosis.

Livestock and Poultry

- Race horse catastrophic bone failure
- Trichomonas beef-herd investigations
- Anthelmintic resistance in cattle
- Respiratory disease in llamas/alpacas
- Digital photography to aid in diagnosis during bovine field necropsies
- Antimicrobial susceptibility patterns of *E. coli* and Salmonella in domestic animals
- Johne’s disease diagnosis and immunopathogenesis of cattle
- Teaching hospital nosocomial infections
- Characterization of backyard poultry flocks in the US (PVM/MS)
- *Salmonella* surveillance in commercial and backyard poultry flocks

Small Animals

- MRSA investigations and documentation
- Canine liver disease and iron accumulation
- Multiple oncology projects with many VTH and extramural clinicians and students (PhD)

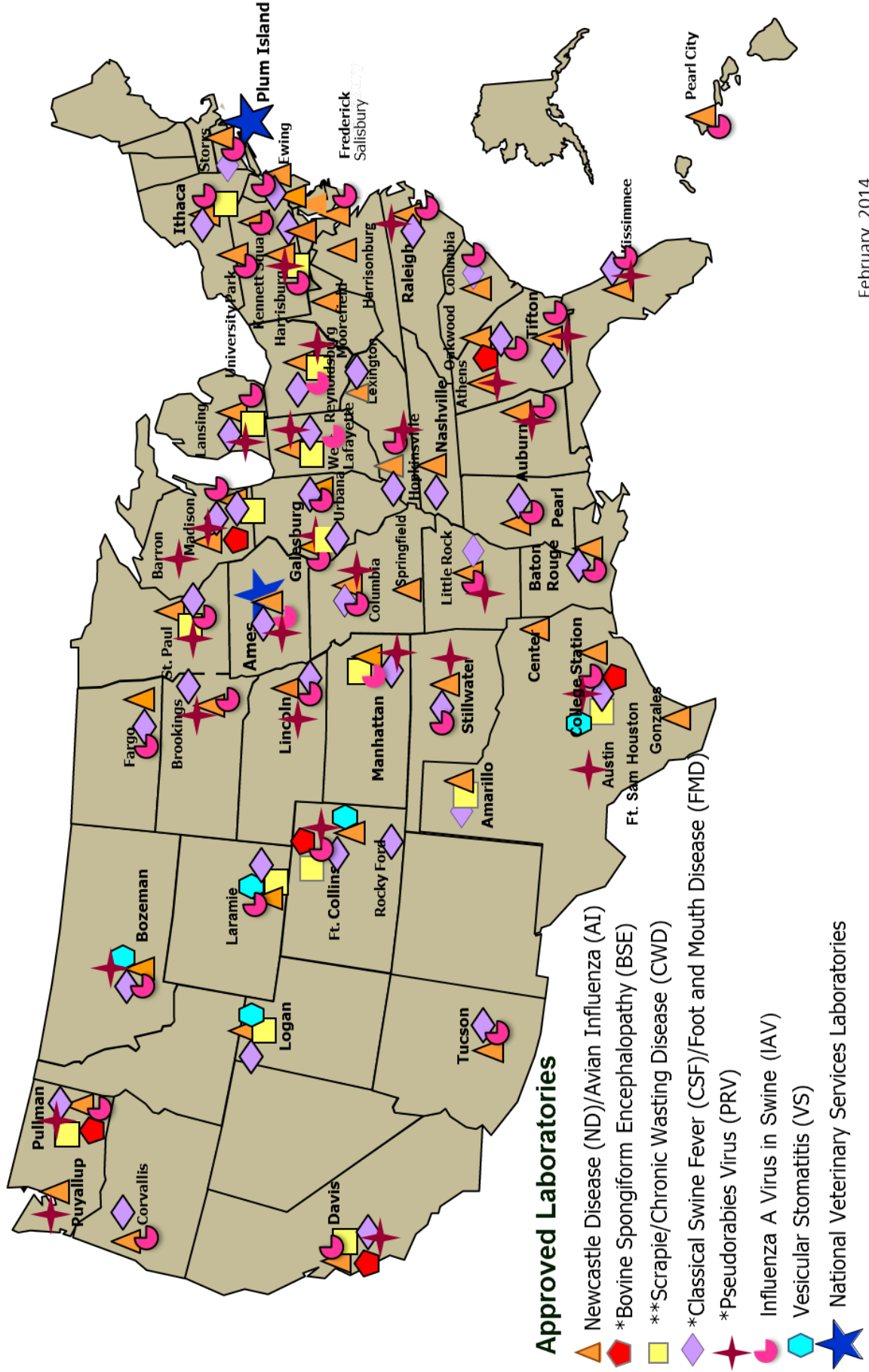
Wildlife and Epidemiology

- Patterns and causes of skin cancer in sea turtles
- Epidemiology of Echinococcus in canids and cervids
- *Baylisascaris procyonis* and other zoonotic diseases in raccoons
- Marine mammal mortalities
- Wildlife disease surveillance: the role of diagnostic laboratories
- Exotic Newcastle disease and avian influenza Surveillance in wild birds and domestic poultry (PVM/MS)
- Isolation and characterization of avian influenza viruses from wild birds
- Prevalence and epidemiology of avian influenza viruses in domestic duck populations in Indonesia (PhD)
- Transmissible Spongiform Encephalopathy
 - Chronic wasting disease of deer and elk surveillance
 - Chronic wasting disease of deer and elk pathogenesis (MS/PhD)
 - Bovine (BSE) surveillance: USDA reporting
 - Scrapie surveillance: USDA reporting

2013 PROFICIENCY TESTS COMPLETED

Disease	Test	Section	Administering Agency
Avian Influenza Virus	AGID	Fort Collins Avian Diagnostics	NVSL/NPIP
Avian Influenza Virus - Matrix, H5, H7	Real-time RT-PCR	Fort Collins BSL3	NVSL
Avian Paramyxovirus-1, vNDV	Real-time RT-PCR	Fort Collins BSL3	NVSL
Bovine Leukosis Virus	AGID	Fort Collins Virology	NVSL
Bovine Leukosis Virus	AGID	Rocky Ford	NVSL
Bovine Spongiform Encephalopathy	ELISA	Fort Collins TSE	NVSL
Bluetongue Virus	AGID	Fort Collins Virology	NVSL
Bluetongue Virus	AGID	Rocky Ford	NVSL
Brucellosis	Card Test	Fort Collins Bacteriology	CO Dept. of Ag
Brucellosis	Card Test	Rocky Ford	CO Dept. of Ag
Contagious Bovine Pleuropneumonia	Real-time PCR	Fort Collins BSL3	FADDL
Contagious Equine Metritis	Culture	Fort Collins Bacteriology	NVSL
Classical Swine Fever Virus	Real-time RT-PCR	Fort Collins BSL3	FADDL
Equine Infectious Anemia	AGID	Fort Collins Virology	NVSL
Equine Infectious Anemia	AGID	Rocky Ford	NVSL
Equine Infectious Anemia	AGID	Western Slope (Grand Junction)	NVSL
Foot-and-Mouth Disease Virus	cELISA	Fort Collins BSL3	FADDL
Foot-and-Mouth Disease Virus	Real-time RT-PCR	Fort Collins BSL3	FADDL
Johne's (<i>M. avian</i> paraTB)	Direct PCR from feces	Fort Collins Bacteriology	NVSL
Johne's (<i>M. avian</i> paraTB)	Direct PCR from feces	Rocky Ford	NVSL
Johne's (<i>M. avian</i> paraTB)	ELISA	Fort Collins Bacteriology	NVSL
Johne's (<i>M. avian</i> paraTB)	ELISA	Rocky Ford	NVSL
Johne's (<i>M. avian</i> paraTB)	Solid Media	Fort Collins Bacteriology	NVSL
Johne's (<i>M. avian</i> paraTB)	TREK	Fort Collins Bacteriology	NVSL
Lead (Blood)	Graphite Furnace Atomic Absorption Spectrophotometry	Fort Collins Chemistry/Toxicology	Wisconsin State Laboratory of Hygiene
Lumpy Skin Disease Virus	Real-time PCR	Fort Collins BSL3	FADDL
Piroplasmiasis	cELISA	Fort Collins BSL3	NVSL
Pseudorabies Virus	ELISA	Fort Collins BSL3	NVSL
Quantitative Coliforms	IDEXX Colilert	Rocky Ford	NSI
<i>Salmonella</i> Group D	Culture	Fort Collins Bacteriology	NVSL/NPIP
<i>Salmonella</i> spp. (dog feces)	Culture	Bacteriology	Vet LIRN
Scrapie	Immunohistochemistry	Fort Collins TSE	NVSL
Swine Influenza Virus H1N1	Real-Time RT-PCR	Fort Collins BSL3	NVSL
Vesicular Stomatitis Virus	Complement Fixation	Fort Collins BSL3	NVSL

National Animal Health Laboratory Network (NAHLN)



**COLORADO STATE UNIVERSITY
VETERINARY DIAGNOSTIC LABORATORIES
2012-13 ACCESSION STATISTICS**

FORT COLLINS

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Accessions	89,289	89,176	86,202	108,938	100,624	111,123	131,750
Animals	161,449	NA	NA	158,759	151,372	161,213	152,965
Tests Performed	374,314	391,040	330,372	339,123	314,507	319,930	341,400

BY SECTION

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Administrative	4,333	7,634	7,386	45,903	44,838	46,148	41,006
Avian	7,245	6,911	6,140	6,234	5,067	6,935	5,497
Bacteriology	52,946	60,637	29,138	19,464	19,169	17,368	17,665
Bacti-Serology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	6,527	10,591	10,671	11,965
BSL3	1,862	2,819	3,990	10,698	445		
Chemistry	4,883	4,863	4,919	8,515	7,984	7,849	8,038
Clinical Path	7,997	7,822	8,244	9,314	9,392	9,106	9,158
Endocrinology	2,783	2,948	2,680	3,218	2,843	2,762	2,742
Food Safety	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	1,246	2,284	2,699	4,016
Histology	171,743	165,130	155,159	85,900	76,570	75,210	76,159
M. Diagnostics	5,943	4,268	4,088	2,555	3,398	3,571	4,574
Necropsy	1,870	1,686	1,762	1,678	1,543	1,609	1,526
Pathology	33,114	33,414	32,001	37,527	35,746	38,149	41,441
Parasitology	8,138	8,050	8,435	6,524	7,876	7,289	5,132
Special Sero	8,067	8,052	9,026	14,441	13,989	14,853	14,852
TSE	31,627	32,259	20,192	33,976	25,078	30,440	50,106
Virology	31,763	44,547	37,212	4,286	4,328	5,140	6,762
Viro Serology	Combined w/ virology	Combined w/ virology	Combined w/ virology	40,732	43,366	39,209	40,625

The Fort Collins Laboratory had an increase in accessions (0.1%) and a decrease in number of tests (-4.3%). There were increases in avian diagnostics, histology, necropsy, and molecular diagnostics while bacteriology, virology, BSL3, and administration (send-outs and media) decreased. The other sections had minor increases or decreases.

ROCKY FORD

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Accessions	9,922	11,281	12,948	13,808	13,248	13,461	10,483
Animals	76,358	NA	NA	82,909	111,150	102,111	118,594
Tests Performed	195,954	170,404	107,971	92,219	122,581	112,542	125,328

BY SECTION

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Administrative	22,507	20,512	15,504	3,634	4,024	4,363	3,648
Bacteriology	38,253	8,334	3,213	1,731	1,483	1,438	1,461
Bacteriology-Serology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	630	762	2,199	1,723
Chemistry	892	634	560	895	740	817	809
Clin Path	368	474	585	746	738	805	799
Endocrinology	205	185	146	242	251	346	336
Pathology	288	220	593	356	423	479	424
Parasitology	17,636	19,858	17,006	16,839	19,635	19,227	3,872
Virology	115,805	120,187	70,348	57,475	78,403	73,470	98,627
Virology-Serology	Combined w/ virology	Combined w/ virology	Combined w/ virology	9,670	16,054	9,368	13,678

The Rocky Ford Laboratory had a decrease in accessions (-12.0%), but an increase in the number of tests performed (15.0%). The largest increase was in bacteriology due to export testing.

WESTERN SLOPE

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Accessions	2,710	2,847	3,195	3,608	3,528	3,799	3,479
Animals	16,528	NA	NA	20,770	16,879	16,366	16,395
Tests Performed	17,828	18,784	19,488	24,073	20,408	19,585	19,131

BY SECTION

	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Administrative	2,266	2,619	1,981	3,736	2,147	1,523	1,91
Bacteriology	10,791	11,181	11,288	1,448	1,292	1,410	1,266
Bacti-Serology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	11,458	8,765	9,119	9,446
Clinical Path	14	52	109	138	104	4	1
Pathology	661	790	918	918	1,005	1,071	774
Parasitology	2,297	2,533	2,961	3,120	3,453	2,988	2,894
Virology	1,799	1,608	2,225	487	567	469	554
Viro-Serology	Combined w/ virology	Combined w/ virology	Combined w/ virology	2,351	2,619	2,874	2,903

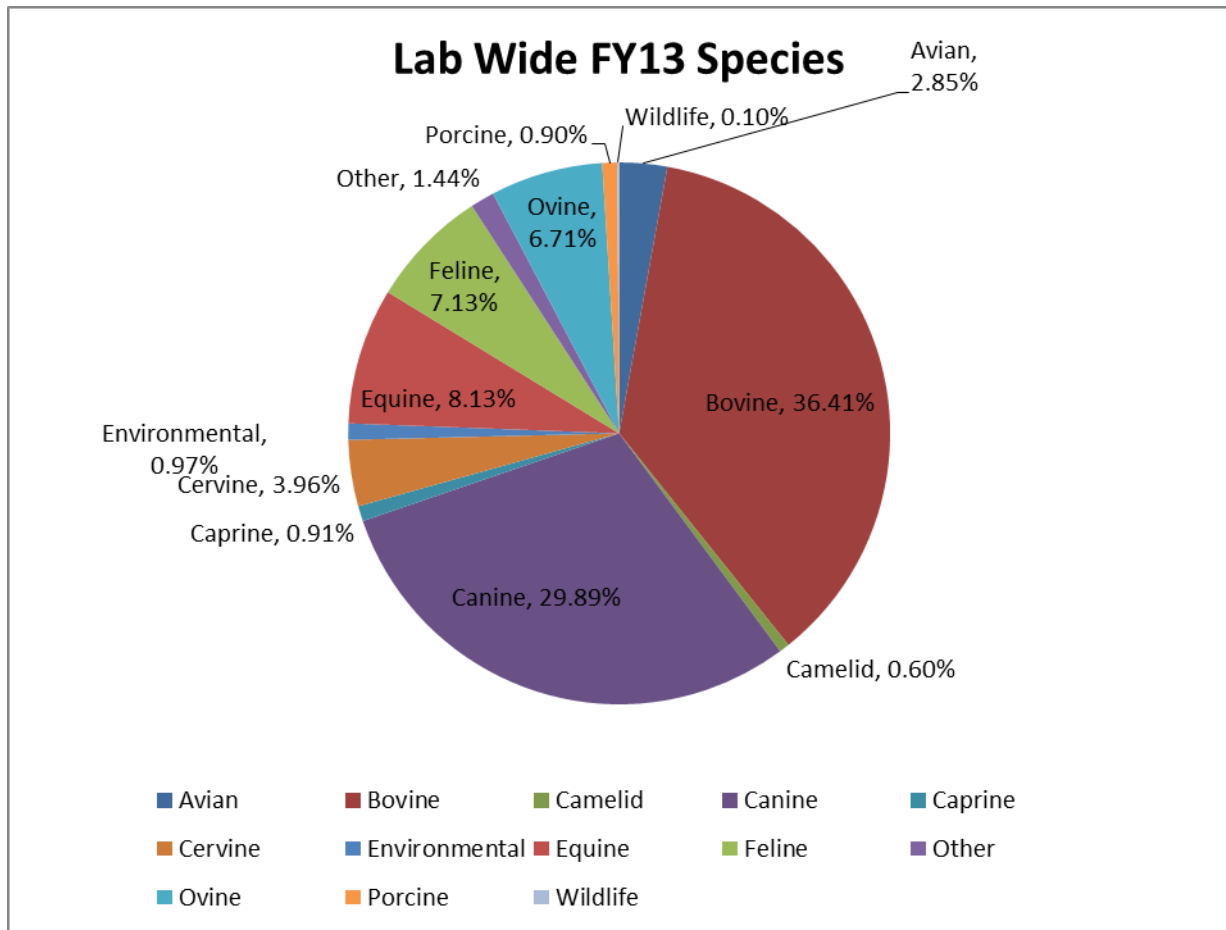
The Western Slope Laboratory had a decrease in accessions (-4.8%) and a decrease in the number of tests performed (-5.1%). There was a slight decrease in all sections but virology, which increased.

ALL LABS

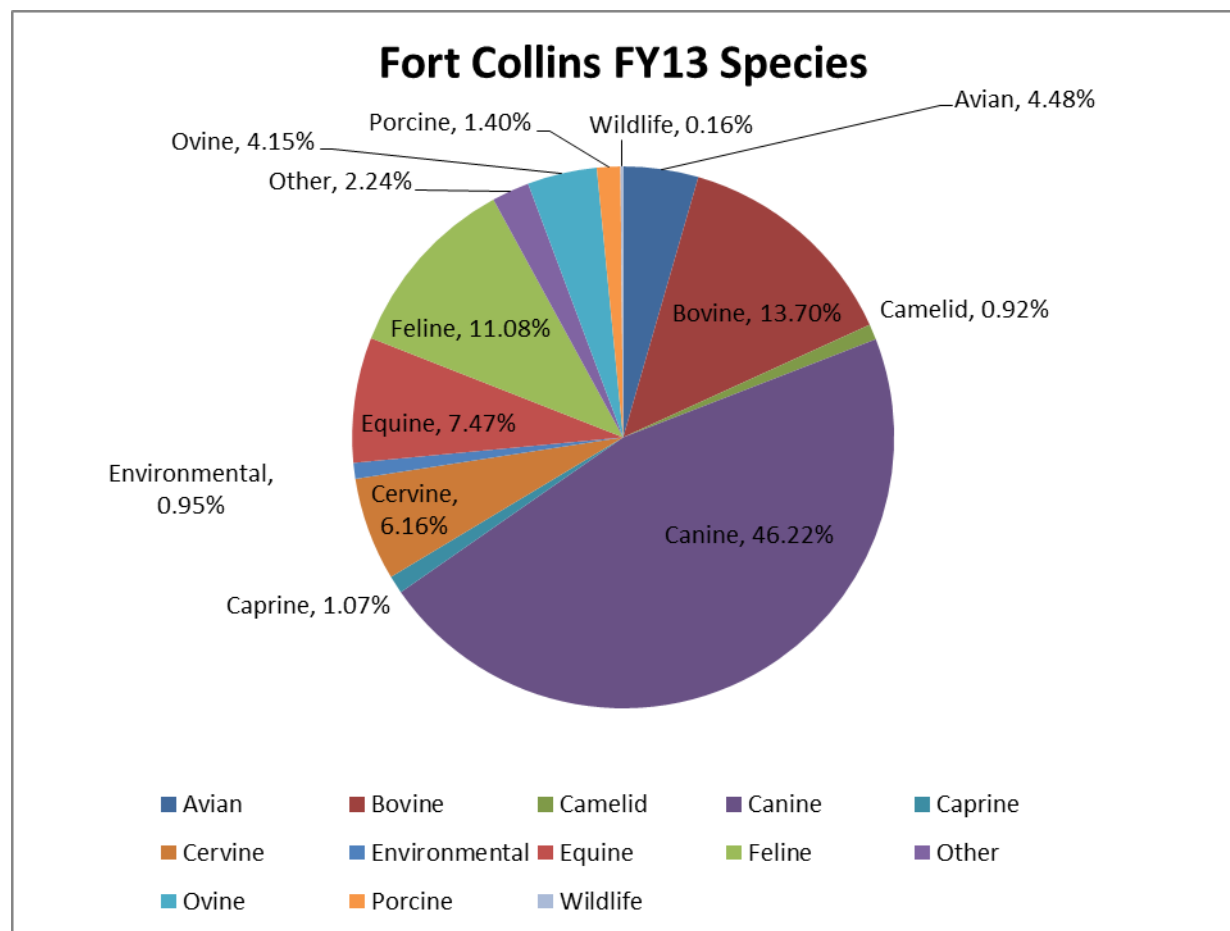
	12-13	11-12	10-11	09-10	08-09	07-08	06-07
Accessions	101,921	103,304	102,345	126,354	117,400	128,383	145,712
Animals	254,335	NA	NA	262,438	279,401	279,690	287,954
Tests Performed	588,096	580,228	457,831	455,415	457,976	452,057	485,769

All laboratories combined had a decrease in number of accessions (-1.3%), but an increase in number of tests performed (1.4%).

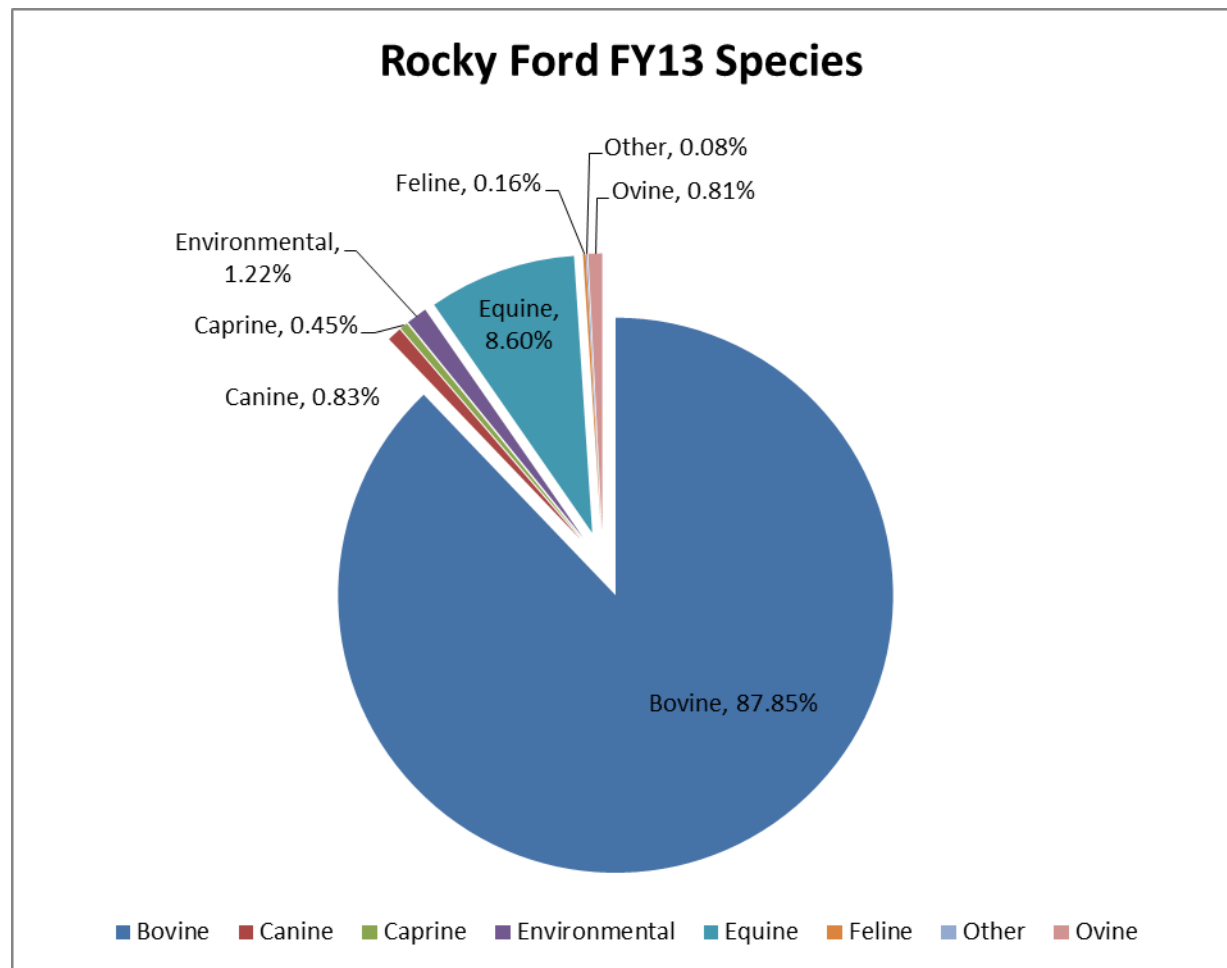
FY13 Species Statistics based on Animal ID's and Species identified on Accession			
LAB WIDE			
SPECIES	COUNT	% of Total	
Avian	7,250	2.85%	
Bovine	92,616	36.41%	
Camelid	1,535	0.60%	
Canine	76,018	29.89%	
Caprine	2,306	0.91%	
Cervine	10,065	3.96%	
Environmental	2,467	0.97%	
Equine	20,688	8.13%	
Feline	18,126	7.13%	
Other	3,660	1.44%	
Ovine	17,065	6.71%	
Porcine	2,278	0.90%	
Wildlife	261	0.10%	
Total	254,335		



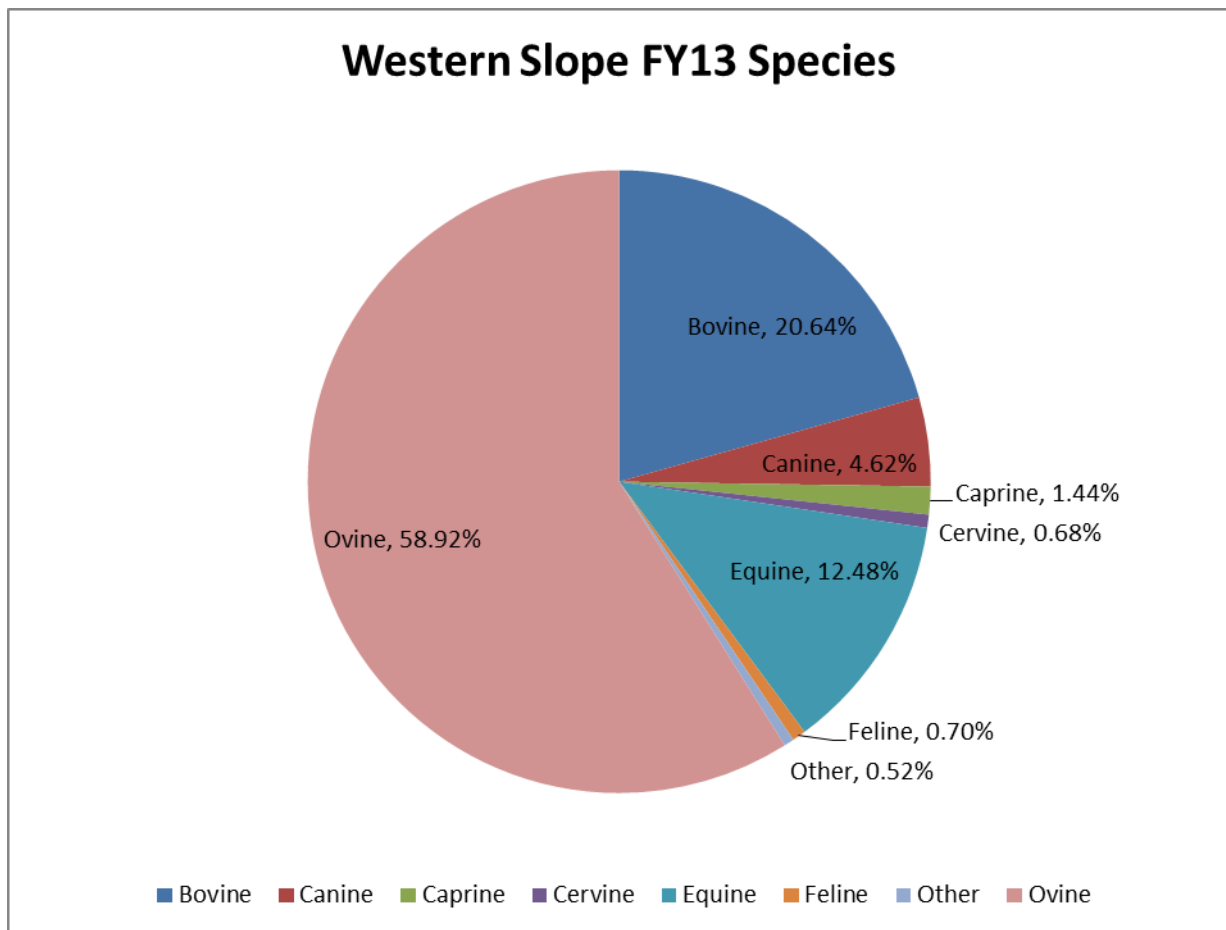
FY13 Species Statistics based on Animal ID's and Species identified on Accession			
FORT COLLINS			
	SPECIES	COUNT	% of Total
	Avian	7,225	4.48%
	Bovine	22,124	13.70%
	Camelid	1,489	0.92%
	Canine	74,618	46.22%
	Caprine	1,723	1.07%
	Cervine	9,950	6.16%
	Environmental	1,537	0.95%
	Equine	12,059	7.47%
	Feline	17,890	11.08%
	Other	3,616	2.24%
	Ovine	6,707	4.15%
	Porcine	2,253	1.40%
	Wildlife	258	0.16%
	Total	161,449	



FY13 Species Statistics based on Animal ID's and Species identified on Accession			
ROCKY FORD			
	SPECIES	COUNT	% of Total
	Bovine	67,081	87.85%
	Canine	637	0.83%
	Caprine	345	0.45%
	Environmental	930	1.22%
	Equine	6,567	8.60%
	Feline	120	0.16%
	Other	59	0.08%
	Ovine	619	0.81%
	Total	76,358	



FY13 Species Statistics based on Animal ID's and Species identified on Accession			
WESTERN SLOPE			
	SPECIES	COUNT	% of Total
	Bovine	3,411	20.64%
	Canine	763	4.62%
	Caprine	238	1.44%
	Cervine	113	0.68%
	Equine	2,062	12.48%
	Feline	116	0.70%
	Other	86	0.52%
	Ovine	9,739	58.92%
	Total	16,528	



PATHOLOGY

The table below indicates the number of necropsies performed for the listed species. The first column is cases derived from the Veterinary Teaching Hospital (VTH) and the second column is cases from the state or region. The next two columns are the totals for the last two fiscal years and the final column is the percent change from the fiscal year 12/13 compared to fiscal year 11/12. Cases from the VTH increased by 9 (1.0%), while cases from the state and region increased by 169 (21.2%).

NECROPSY

Species	VTH 7/12-6/13	State/Region 7/12-6/13	TOTAL 7/12-6/13	TOTAL 7/11-6/12	% Change
Bovine	69	66	135	153	-11.7
Equine	129	50	179	129	38.8
Porcine	4	7	11	7	57.1
Ovine/Caprine	16	43	59	55	7.3
OLA*/OSA*	33	41	74	69	7.2
Canine	448	333	781	812	-3.8
Feline	112	132	244	232	5.2
Avian	27	140	167	74	125.7
Wildlife/ Exotics	59	155	214	155	38.1
TOTAL	897	967	1864	1686	10.6

*OLA = Other Large Animal

*OSA = Other Small Animal

+ 76 Canine/Feline/Equine Legal or Insurance Cases

TRANSMISSIBLE SPONGIFORM ENCEPHALOPATHY TESTING

Test	# Tests 7/12-6/13	# Cases 7/12-6/13	# Tests Positive (%)	Number 7/11-6/12	% Change
Captive Elk Surveillance	2,221	1,463	12 (0.5)	2,585	-14.1
CWD Surveillance+	2,220	1,616	135 (8.4)	2,287	-2.9
CWD—ELISA CO & Others*	6,525	6,525	94 (1.4)	7,546	-13.5
USDA TSE	12,733	6,482	0 (0.0)	11,772	8.2
USDA BSE	7,928	7,928	0 (0.0)	8,069	-1.7
TOTAL	31,627	24,014	NA	32,259	-2.0

*2,106 Colorado only [90 (4.3%) positive]

+Includes rectal biopsies

The top table indicates the number of abortion screens for the listed species for the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 12/13 from fiscal year 11/12. The bottom table indicates the number of specific diagnoses or causative agents identified for abortions in fiscal year 12/13. The last column of the bottom table indicates the number and percentage of abortions with undetermined cause.

ABORTION SCREENS

Species	Number 7/12-6/13	%	Number 7/11-6/12	% Change
Bovine	84	61.3	96	-12.5
Equine	17	12.4	13	30.8
Porcine	2	1.5	0	200.0
Ovine	11	8.0	10	10.0
Caprine	6	4.4	5	20.0
Camelid	10	7.3	6	66.7
Other	7	5.1	4	75.0
TOTAL	137	100.0	134	2.2

Species	Number Examined	Viral (%)	Bacterial (%)	Other (%)	Undeter- mined(%)
Bovine	84	25 (29.8) ^a	10 (11.9) ^b	8 (9.5) ^b	45 (53.6)
Equine	17	0 (0.0)	0 (0.0)	3 (17.6)	14 (82.4)
Porcine	2	0 (0.0)	0 (0.0)	0 (0.0)	2 (100.0)
Ovine	11	0 (0.0)	5 (45.5) ^c	2 (18.2) ^c	4 (36.4)
Caprine	6	0 (0.0)	2 (33.3)	1 (16.7) ^d	3 (50.0)
Camelid	10	0 (0.0)	1 (10.0)	0 (0.0)	9 (90.0)
TOTAL	130	25 (19.2)	18 (13.8)	14 (10.8)	77 (59.2)

^a 8 with IBR, 17 with BVD (4 both IBR and BVD)

^b 1 Campylobacter, 1 fungal, 2 Neospora, 1 congenital, 1 pine needle toxicity, 2 mineral toxicity.

^c 3 Campylobacter, 1 toxoplasmosis, 1 congenital abnormality.

^d Congenital

The top table indicates the number of diarrhea screens performed in the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 12/13 compared to fiscal year 11/12. The bottom table indicates the determined causes of the diarrhea over the number of times the agents were tested for, and the percentages of detection of the agent are given in parentheses. In many cases, more than one agent was detected.

DIARRHEA SCREENS

Species	Number 7/12-6/13	%	Number 7/11-6/12	% Change
Bovine	156	71.6	97	60.8
Equine	9	4.1	6	50.0
Porcine	1	0.1	3	-66.7
Ovine/Caprine	5	2.3	5	0.0
Canine	28	12.8	47	-40.4
Feline	10	4.6	6	66.7
Cervids	1	0.1	2	-50.0
Other	8	3.7	3	166.7
TOTAL	218	100.0	169	29.0

Species	Rota	Corona	E. coli	Salmonella	Clostridia	Cryptosporidia and/or Giardia	Other	Undeter- mined
Bovine	39/156 (25.0)	15/156 (9.6)	18/156 (11.5)	29/156 (18.6)	16/156 (10.3)	62/156 (39.7)	8/156 (5.1)	24/156 (15.4)
Equine	1/9 (11.1)	0/9 (0.0)	0/9 (0.0)	2/9 (22.2)	0/9 (0.0)	0/9 (0.0)	2/9 ^b (22.2)	0/9 (0.0)
Ovine/ Caprine	1/5 (20.0)	0/5 (0.0)	0/5 (0.0)	1/5 (20.0)	0/5 (0.0)	0/5 (0.0)	3/5 ^c (60.0)	0/5 (0.0)
Camelid	0/2 (0.0)	0/2 (0.0)	0/2 (0.0)	0/2 (0.0)	0/2 (0.0)	0/2 (0.0)	1/2 (50.0)	1/2 (50.0)
Canine	0/28 (0.0)	1/28 (3.6)	2/28 (7.1)	0/28 (0.0)	6/28 (21.4)	6/28 (21.4)	3/28 ^d (10.7)	13/28 (46.4)
TOTAL	41/200 (20.5)	16/200 (8.0)	20/200 (10.0)	32/200 (16.0)	22/200 (11.0)	68/200 (34.0)	17/200 (8.5)	38/200 (19.0)

^aCoccidia (2), unidentified bacteria (18)

^bStrongyles

^cCoccidia (2) and hyperthyroid (1)

^dParvovirus (3)

The first two columns of the top table indicate the number of biopsies performed for each of the listed species for the Veterinary Teaching Hospital (VTH) and the state or country. The last three columns indicate the total for the last two fiscal years and the percent change of fiscal year 12/13 compared to fiscal year 11/12. The VTH cases increased by 37 cases (2.7%) while the state/country cases increased by 516 cases (1.7%). The bottom table indicates the number and percentage of certain diagnoses given for both the VTH and state/country.

BIOPSY

SPECIES	VTH 7/12-6/13	State/Country 7/12-6/13	Total 7/12-6/13	Total 7/11-6/12	% Change
Canine	1,131	24,899	26,030	25,661	1.4
Feline	115	3,809	3,924	4,009	-2.1
Other/Exotics	22	564	586	371	60.0
Avian	18	62	80	54	48.1
Equine	94	513	607	629	-3.5
Bovine	5	259	264	199	32.7
Porcine	1	6	7	10	-30.0
Ovine/Caprine	2	56	58	62	-6.5
Camelid/Cervine	3	58	61	69	-11.6
TOTAL	1,391	30,226	31,617	31,064	1.8

*Of this total, 346 were 2nd opinion consultations from outside the Laboratory, and 182 were dermatology-specific cases.

Diagnosis	VTH (%)	State/Country (%)	TOTAL (%)
Benign Tumor	319 (23.7)	9,240 (31.4)	9,559 (31.1)
Sarcoma	430 (32.0)	8,765 (29.8)	9,195 (29.9)
Carcinoma	193 (14.3)	3,529 (12.0)	3,722 (12.1)
Skin Disease	160 (11.9)	2,601 (8.8)	2,761 (9.0)
Liver Disease	122 (9.1)	3,012 (10.2)	3,134 (9.8)
GI Disease	121 (9.0)	2,245 (7.6)	2,366 (7.7)

*2,974 (32.3%) of these were mast cell tumors. There were 462 mast cell tumor profiles and 676 c-Kit mutation PCRs.

- There were 240 biopsies referred from the Rocky Ford Branch Laboratory in fiscal year 12/13 compared to 191 in fiscal year 11/12. These were mostly canine, feline, or equine.

UTERINE BIOPSIES

The top table indicates the number of uterine biopsies for the last two fiscal years, and the percent change of fiscal year 12/13 compared to fiscal year 11/12. The bottom table indicates the distribution and percentages of the different grades given to the uterine biopsies.

Species	Number 7/12-6/13	%	Number 7/11-6/12	% Change
Equine	612	100.0	709	-13.7
Other	0	0.0	1	0.0
TOTAL	612	100.0	710	-13.7

Grade	Number	%
1A	153	25.0
1B	215	35.1
2A	102	16.7
2B	122	19.9
3A	26	4.2
3B	0	0.0
NA/Unknown	2	0.3

HISTOLOGY

The table below lists the number of slides, special stains and immunohistochemical (IHC) stains performed by the Histology Laboratory (not including Scrapie or CWD).

Procedure	Number 7/12-6/13	%	Number 7/11-6/12	% Change
H&E Slides/Biopsy & Necropsy	155,315	90.4	149,199	4.1
H&E Slides/Research	12,269	7.1	11,885	3.2
Special Stains	2,887	1.7	2,929	-1.4
IHC Stains		% of IHC		
Actin	18	1.4	14	28.6
BVD	23	1.8	25	-8.0
CD3/CD79a	475	37.3	440	8.0
CD18	140	11.0	126	11.1
c-Kit	76	6.0	61	24.6
Chromogranin	26	2.0	15	73.3
Cytokeratin	79	6.2	93	-15.1
Desmin	77	6.1	61	26.2
DOG-1	56	4.4	31	80.6
FIP	28	2.2	22	27.3
Factor 8	76	6.0	34	123.5
Leptospirosis	7	0.6	4	75.0
Melan A	46	3.6	45	2.2
MUM-1	40	3.1	26	53.8
Synaptophysin	34	2.7	20	70.0
Vimentin	56	4.4	87	-35.6
Other	15	1.2	7	114.3
Subtotal IHC	1,272	0.7	1,117	13.9
TOTAL	171,743	100.0	165,130	4.0

BACTERIOLOGY

This table lists the different cultures and other selected tests performed by the bacteriology or molecular diagnostics sections. The total number of tests performed in fiscal year 12/13 is compared to the total number of tests performed in fiscal year 11/12. The last column is the percent change between the fiscal years.

Test	Number 7/12-6/13	Number Positive %	Number 7/11-6/12	% Change
Aerobic Culture	5,118	NA	5,218	-2.0
Aerobic & Anaerobic Culture	1,438	NA	1,574	-8.6
Fecal Culture	3,234	NA	2,719	18.9
Clostridial Fecal Culture	368	180 (48.9)	396	-7.1
PCR Clostridial Genotype	14	12 (85.7)	18	-22.2
Clostridial Perfringens/ Difficile Toxin	51	8 (15.7)	69	-26.1
PCR <i>E. coli</i> multiplex	1	0 (0.0)	13	-92.3
Mycobacterial Culture/PCR	82	10 (12.2)	70	17.1
Blood Culture	117	NA	71	64.8
Campylobacter Culture	341	2 (0.6)	303	12.5
Mycoplasma Culture	167	19 (11.4)	212	-21.2
CEM Culture	164	0 (0.0)	236	-30.5
Strept equi PCR	131	29 (22.1)	15	58.2
Fungal Culture	402	163 (40.5)	389	3.3
PCR Leptospirosis	256	19 (7.4)	79	224.1
Antimicrobial Susceptibility	5,474	NA	5,813	-5.8
Environmental Culture	1,602	129 (8.1)	1,022	56.8
PFGE	220	NA	NA	NA
MRSA Culture	57	3 (5.3)	45	26.7
Biolog Bacti ID	21	NA	4	425.0
TOTAL	19,258	NA	18,266	5.4

*12 type A, 0 type C, 0 type E

The table below lists a breakdown of selected culture tests by species.

SPECIES	Aerobic Culture	Aerobic/Anaerobic Culture	Fecal Culture	Clostridial Fecal Culture	Mycoplasma Culture	Fungal Culture	TOTAL 7/12-6/13	%
Bovine	262	44	517	219	13	1	1,056	9.8
Equine	817	165	2,101	54	1	36	3,174	29.6
Porcine	10	2	12	1	1	0	26	0.2
Ovine/ Caprine	91	25	75	12	6	2	211	2.0
Camelid	54	12	150	5	0	3	224	2.1
Canine	2,807	960	303	44	120	208	4,442	41.4
Feline	848	134	47	12	17	113	1,171	10.9
Avian	32	9	6	4	0	5	56	0.5
Cervine	12	3	4	4	1	0	24	0.2
Non-Animal	64	0	0	0	0	1	65	0.6
Other	121	84	19	13	8	33	278	2.6
TOTAL	5,118	1,438	3,234	368	167	402	10,727	100.0

The table below lists the serology tests performed in the bacteriology section with the number of tests performed in fiscal year 12/13 compared to the number of tests performed in fiscal year 11/12. The last column is the percent change between the fiscal years. In the middle column are selected results for some of the serologic tests.

TEST	Number 7/12-6/13	Positive (%)	Number 7/11-6/12	% Change
Mycobacterium paratuberculosis (ELISA)	18,075	Suspect-5 (0.0) Low pos-73 (0.4) Pos-90 (0.5)	23,853	-24.2
M. paratuberculosis AGID	300	6 (2.0)	241	24.5
Brucella abortus	280	0 (0.0)	167	6.8
Brucella canis	197	3 (1.5)	107	84.1
Leptospirosis (5 serovars)	2,344x5=11,720 ^a	1,100 (9.4)	2,889x5=14,445	-18.9
Lepto Bratislava	1,697	155 (9.1)	2,202	-22.9
Aspergillosis	85	1 (1.2)	100	-15.0
Blastomycosis	77	0 (0.0)	95	-18.9
Coccidioidomycosis	112	11 (9.8)	148	-24.3
Histoplasmosis	77	4 (5.2)	92	-16.3
Cryptococcus	173	12 (6.9)	173	0.0
IgG Estimate	24	NA(-)	35	-31.4
IgG Quantitation	166	NA(-)	296	-43.9
IgA&IgM Quantitation	234	NA(-)	274	-14.6
Protein Electrophoresis	87	NA(-)	137	-36.5
Immunofixation	20	NA(-)	29	-31.0
ANA Titer	22	2 (9.1)	28	-21.4
TOTAL	33,346	--	42,422	-21.4

^a 471 (32.6%) bovine, 0 camelids, 116 (5.7%) canine, 0 caprine, 7 (9.3%) cervids, 16 (14.5%) equine, 10 (1.4%) feline, 6 (1.4%) other, and 474 (7.0%) porcine had titers \geq 1:100.

The table below lists the food safety diagnostic testing for the last two fiscal years and the percent change between the two fiscal years.

Test Performed	Number 7/12-6/13	Number 7/11-6/12	% Change
Milk Culture	5	9	-44.4
Bovine Pregnancy Test	131	NA	NA
Milk Mycoplasma Culture/PCR	26*	1	2500.0
Milk bacteria ID/counts	174	596	-70.8
Aerobic feed culture	6	135	-95.6
TOTALS	342	741	-53.8

*1 positive

Lepto serology results for each of the 5 serotypes for serological samples submitted between July 1st 2011 and June 30th in 2012 and all of 2004 through 2011 for ALL animal species. The total number of samples tested (N) and the number of positive results (P) as defined as a titer greater than or equal to 1:100 as well as the highest titer reported during the year (High) is given below.

Year	N	<i>L. canicola</i>		<i>L. grippo.</i>		<i>L. hardjo</i>		<i>L. ictero.</i>		<i>L. pomona</i>	
		P	High	P	High	P	High	P	High	P	High
2004	467	49	800	76	819,200	33	800	102	3200	87	102,400
2005	858	152	1600	135	51,200	117	1600	165	3200	123	12,800
2006	264	51	800	34	6400	21	1600	26	800	38	6400
2007	597	90	1600	105	6400	42	3200	89	3200	98	6400
2008	766	107	6400	157	6400	116	3200	149	6400	128	6400
2009/2010	798	137	3200	118	6400	99	6400	60	3200	126	6400
2010/2011	1105	218	6400	144	6400	143	6400	119	6400	149	6400
2012/2013	2344	209	3200	215	6400	167	6400	288	6400	221	6400

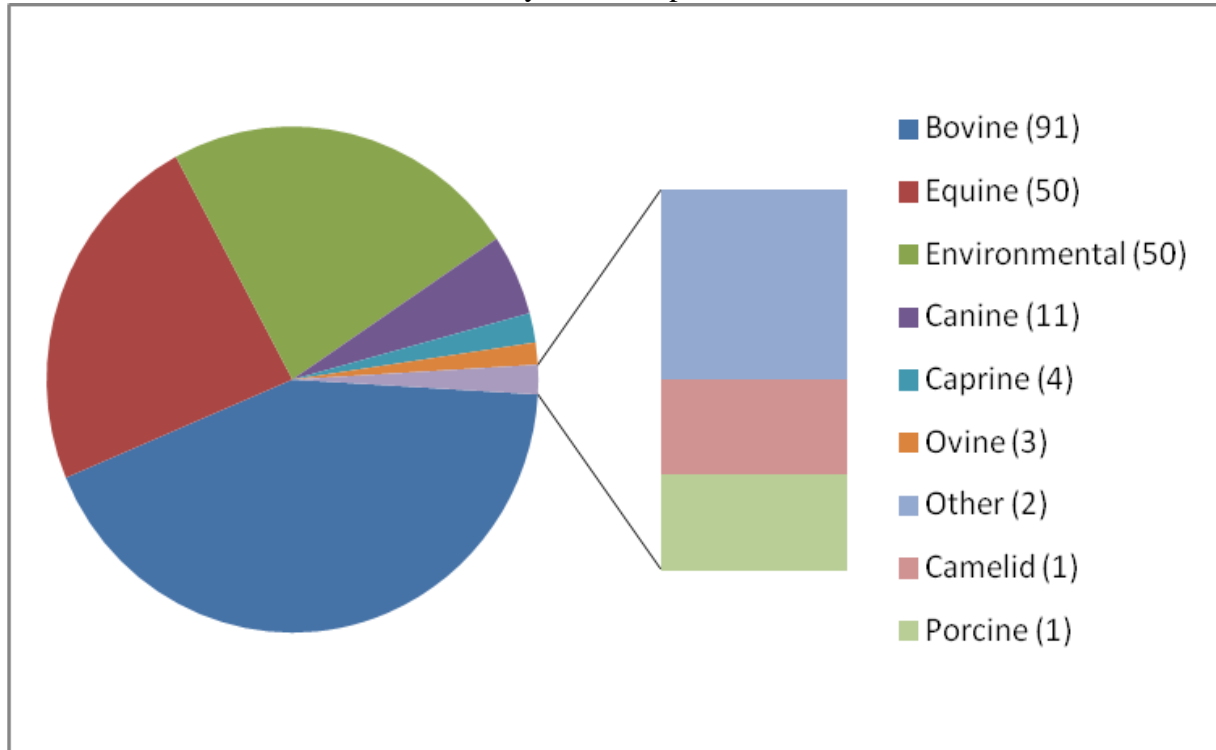
From July 1st 2012 to June 30th 2013 a total of 1697 tests for *L. bratislava* were conducted and 155 were positive with the highest titer being 1:6400.

From July 1st 2010 to June 30th in 2011 a total of 167 tests for *L. bratislava* were conducted and 5 were positive with the highest titer being 1:800.

From July 1st 2009 to June 30th in 2010 a total of 108 tests for *L. bratislava* were conducted and 17 were positive with the highest titer being 1:6400.

A total of 256 *Leptospira* PCR tests were performed between the dates of 07/01/12 – 06/30/13. The PCR was positive for DNA in 15 samples, suspect in 4 samples.

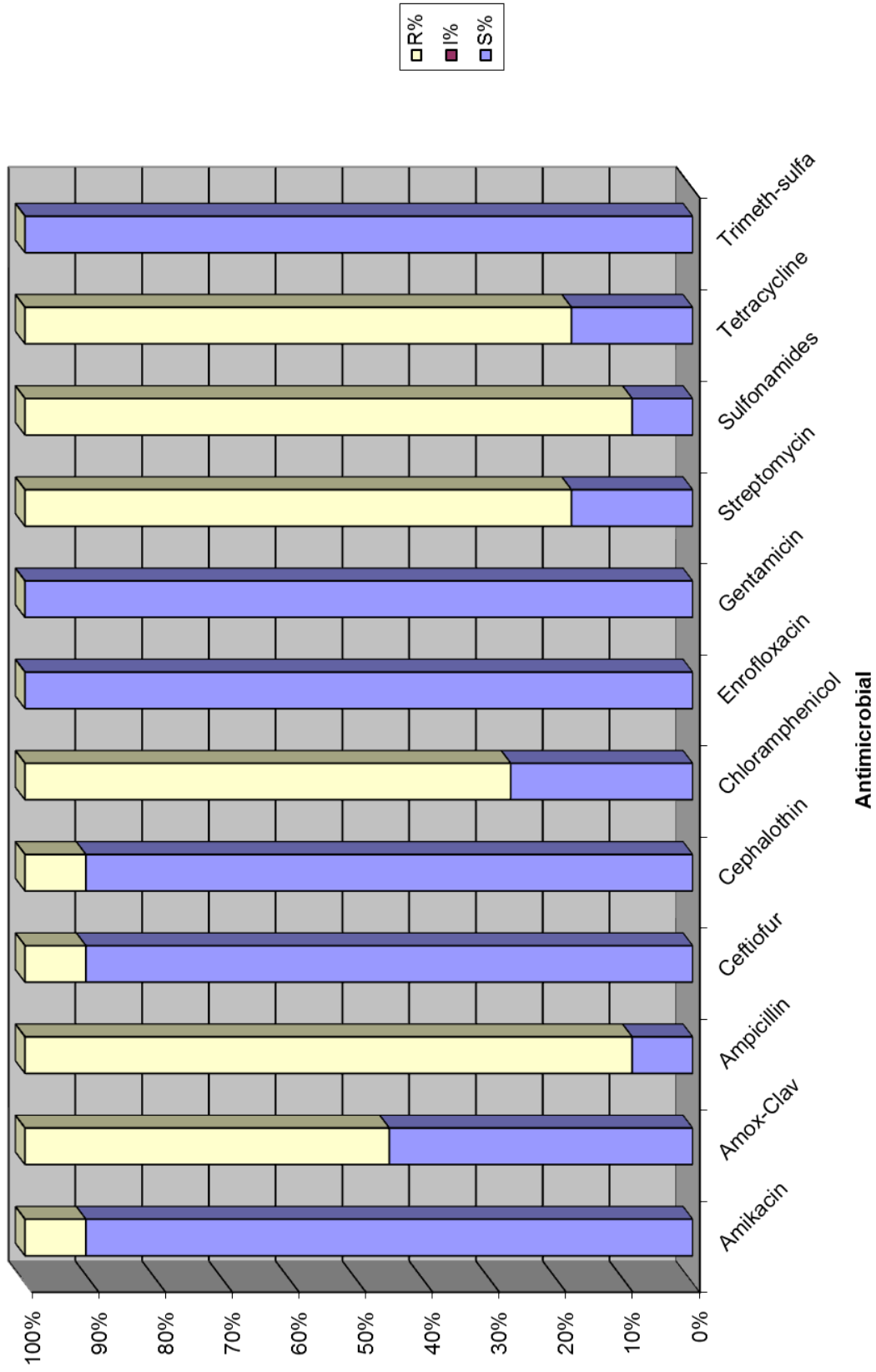
Salmonella Isolations by Animal Species – 07/01/12 - 06/30/13



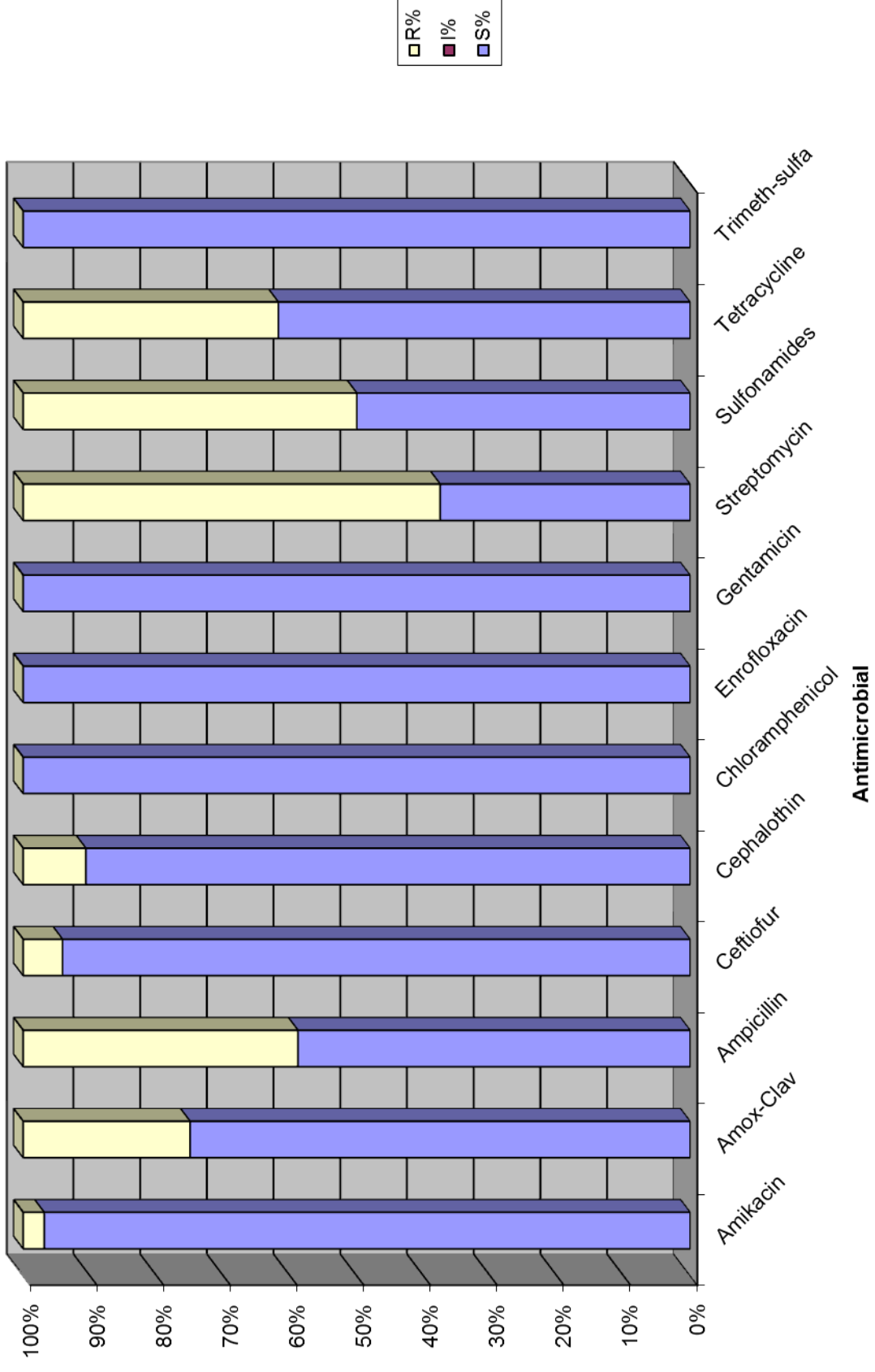
Salmonella isolations at the CSU-VDL between July 1, 2012 and June 30, 2013. Serotypes that are the top 5 found are in bold script.

3,19:-z27, 4,12:i- , 4,5,12:i-, 6,7:k-, 6,7:r- , Agona, Altona, Anatum, Bareilly, Barranquilla, Braenderup, Cannstatt, Cerro, **Dublin**, Enteritidis, Give_var._15+, **Hadar**, Hartford, III_61:-:1,5,7, III_61:I,v:1,5,7, Infantis, Kentucky, Liverpool, Ill_48:z52:z, Mbandaka, Miami, **Montevideo**, **Muenchen**, Newport, Paratyphi_B_var._L - tartrate +, Putten, Schwarzengrund, Senftenberg, Thompson, Typhimurium, **Typhimurium var 5-**, Weslaco

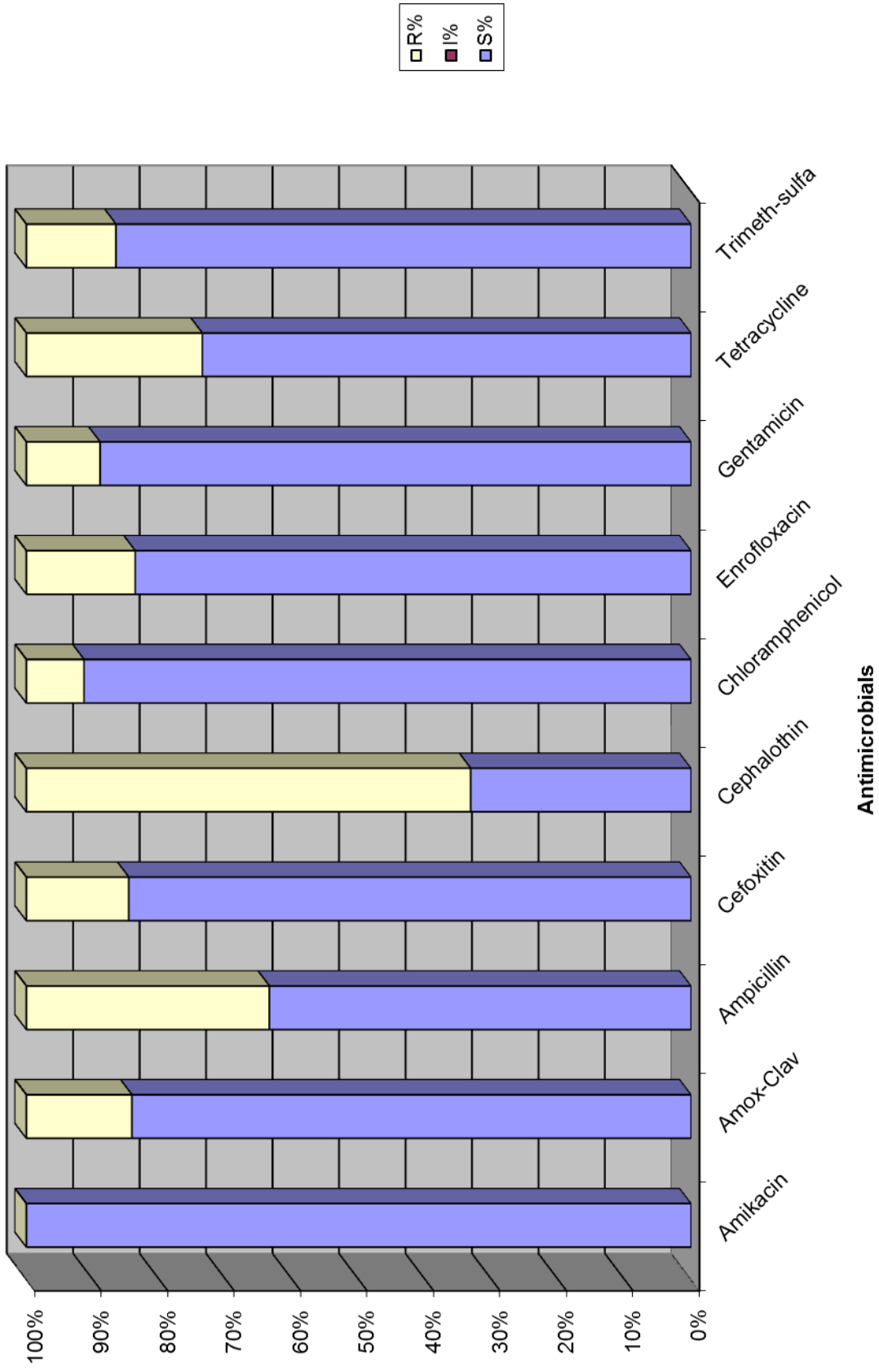
Bovine Salmonella Group B Antibigram (N=11)



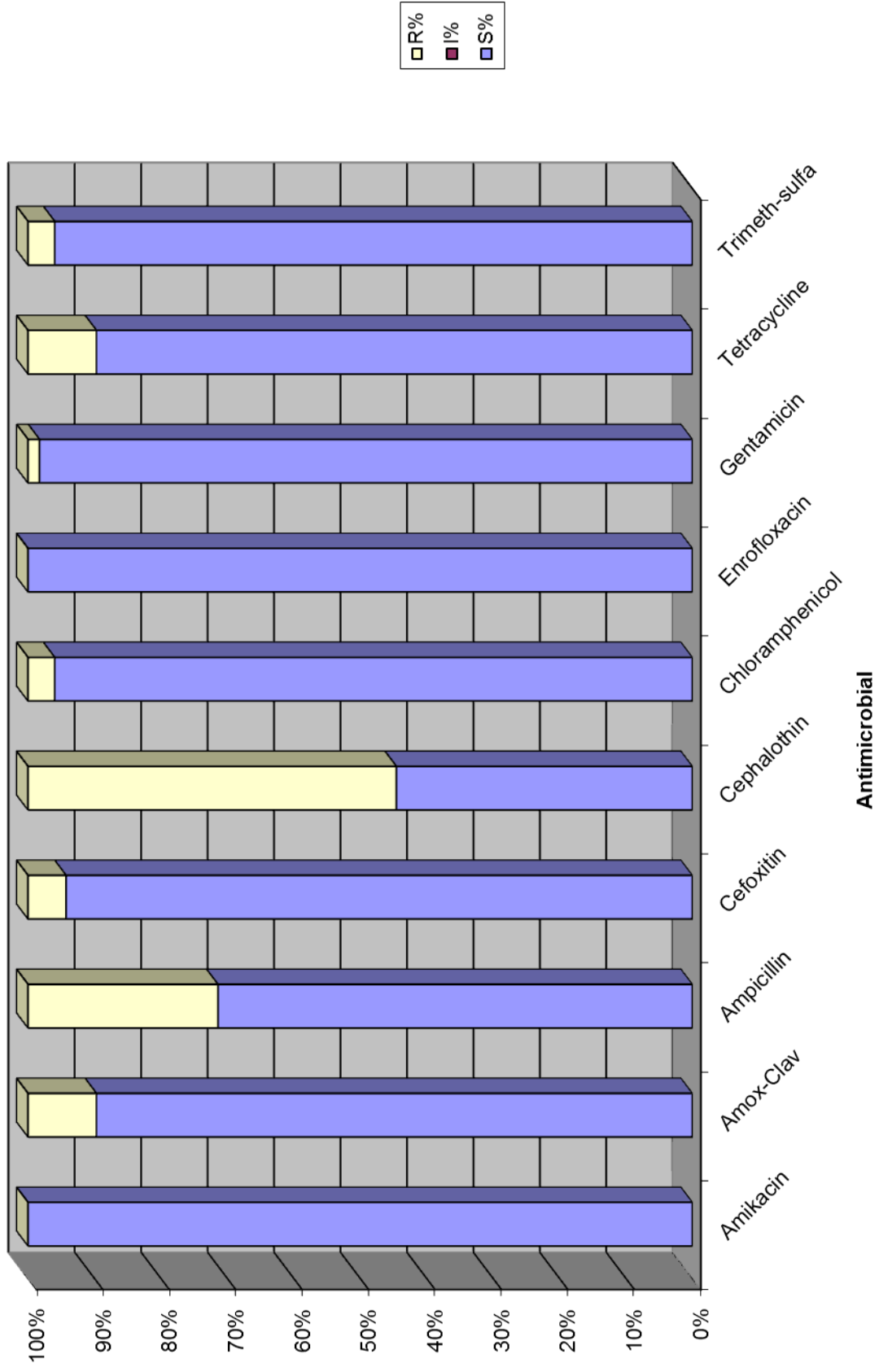
Bovine Salmonella Group C2 Antibiogram (N=32)



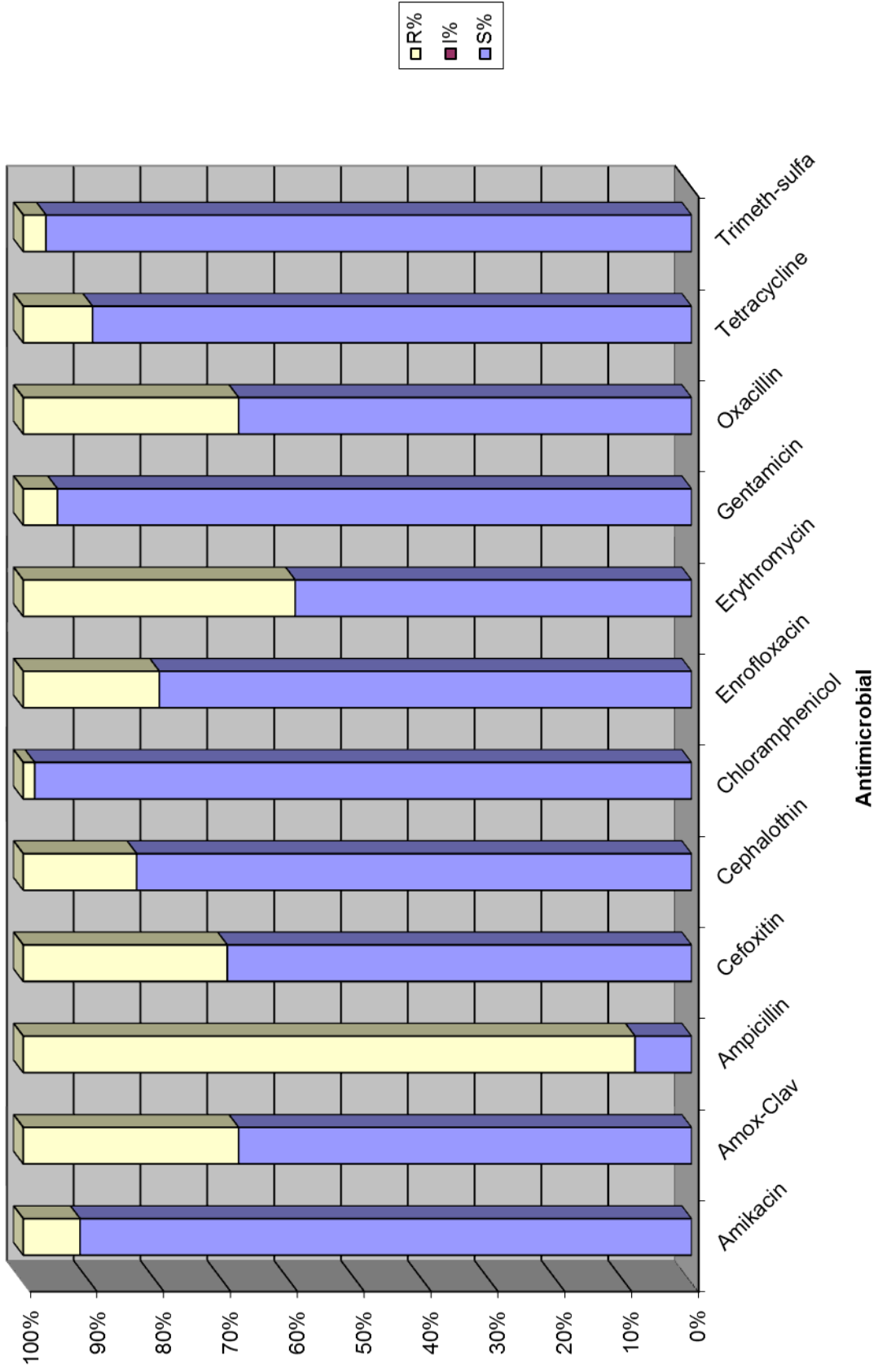
Canine *E. coli* Antibiogram (N=208)



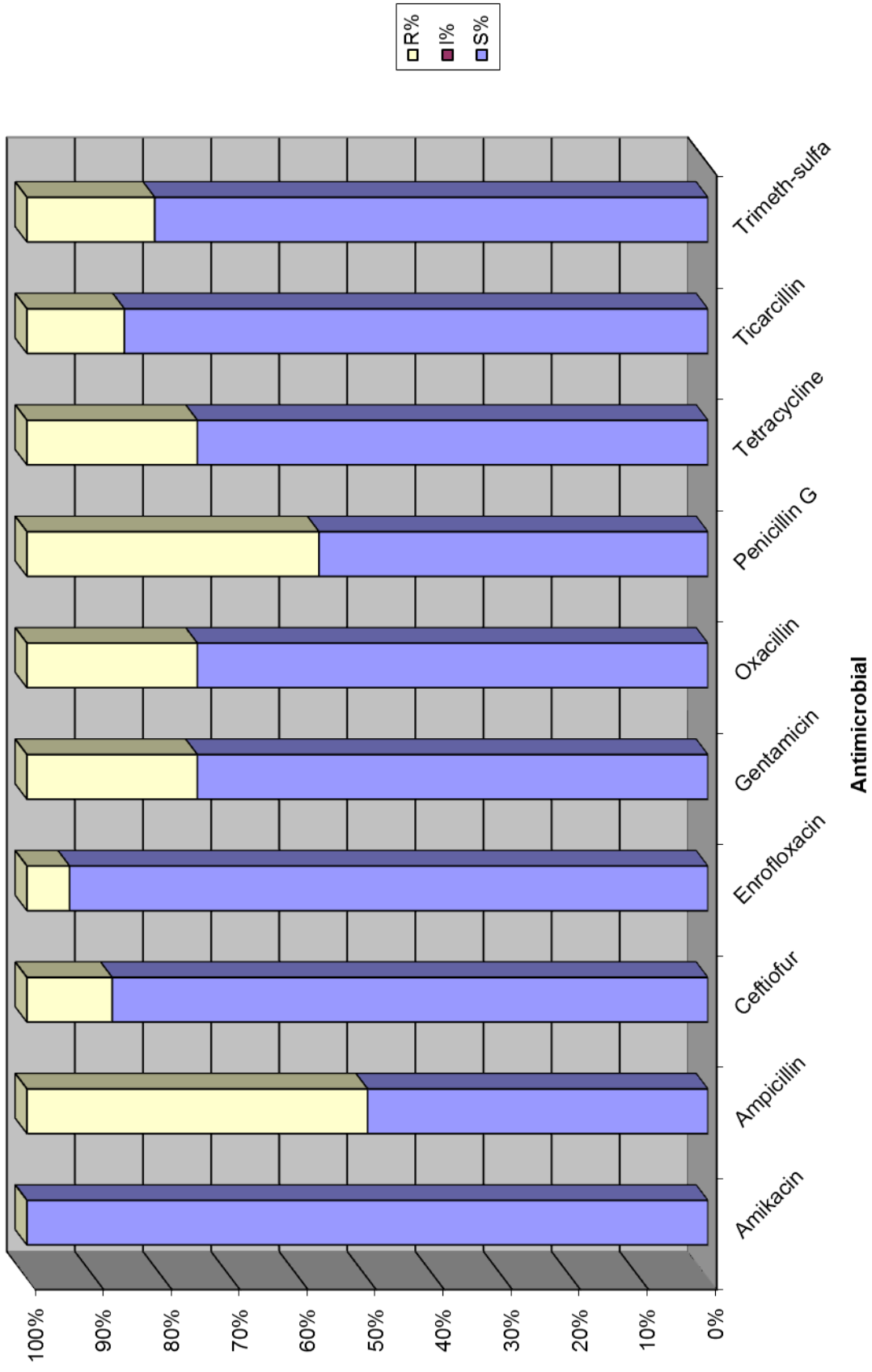
Canine Hemolytic *E. coli* Antibiogram (N=175)



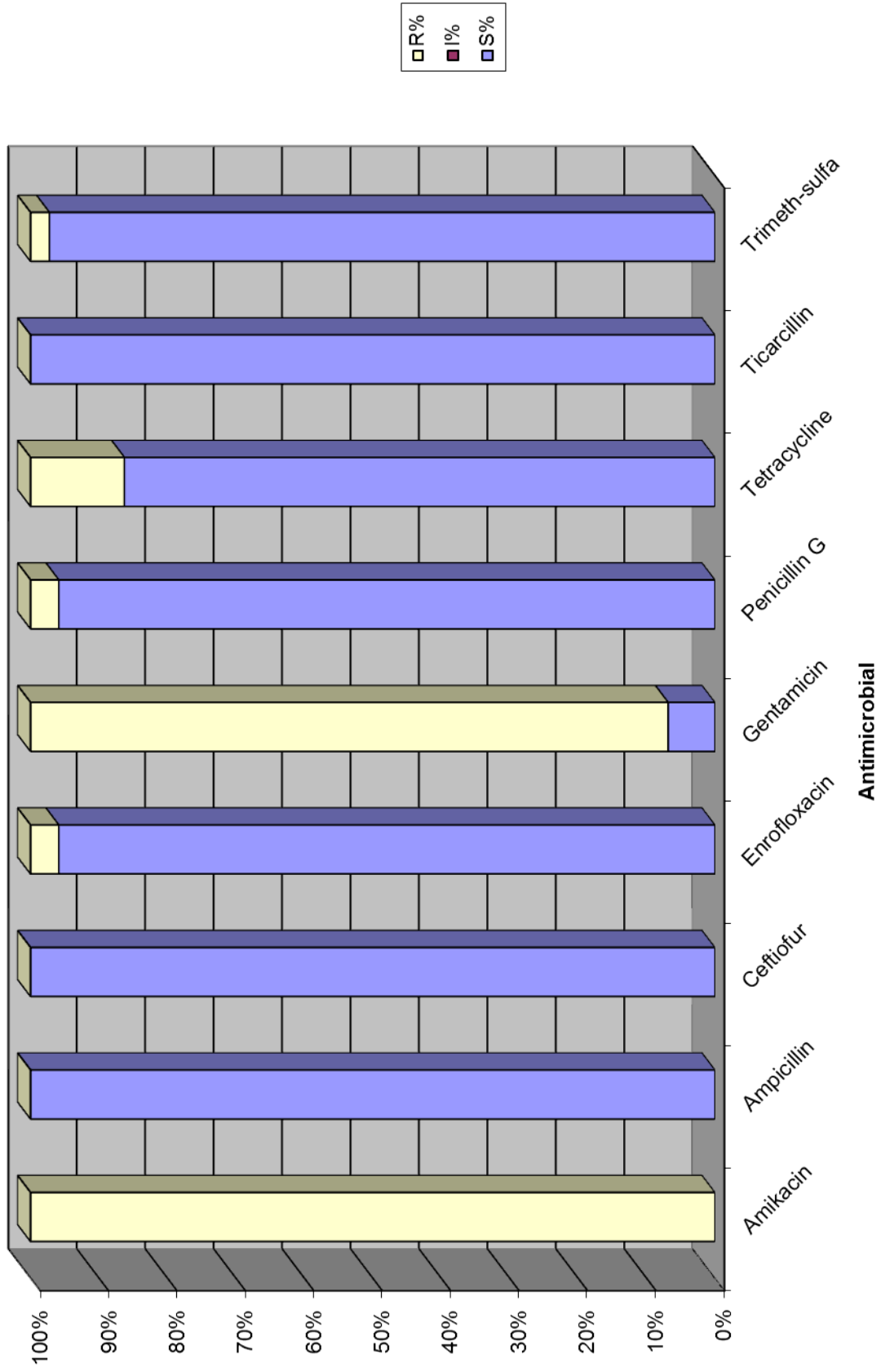
Canine Staph. aureus Antibiogram (N=59)



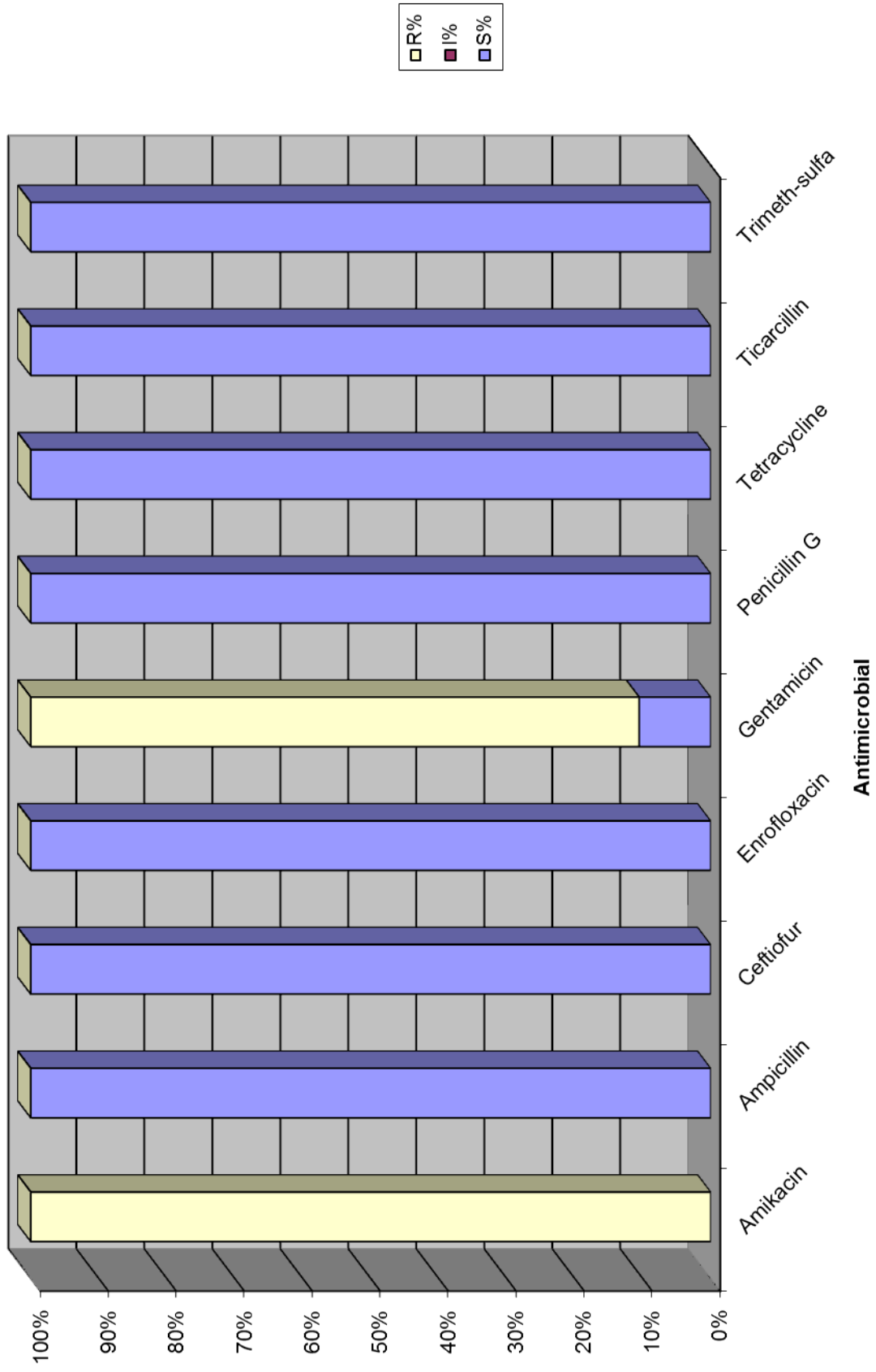
Equine *Staph. aureus* Antibiogram (N=16)



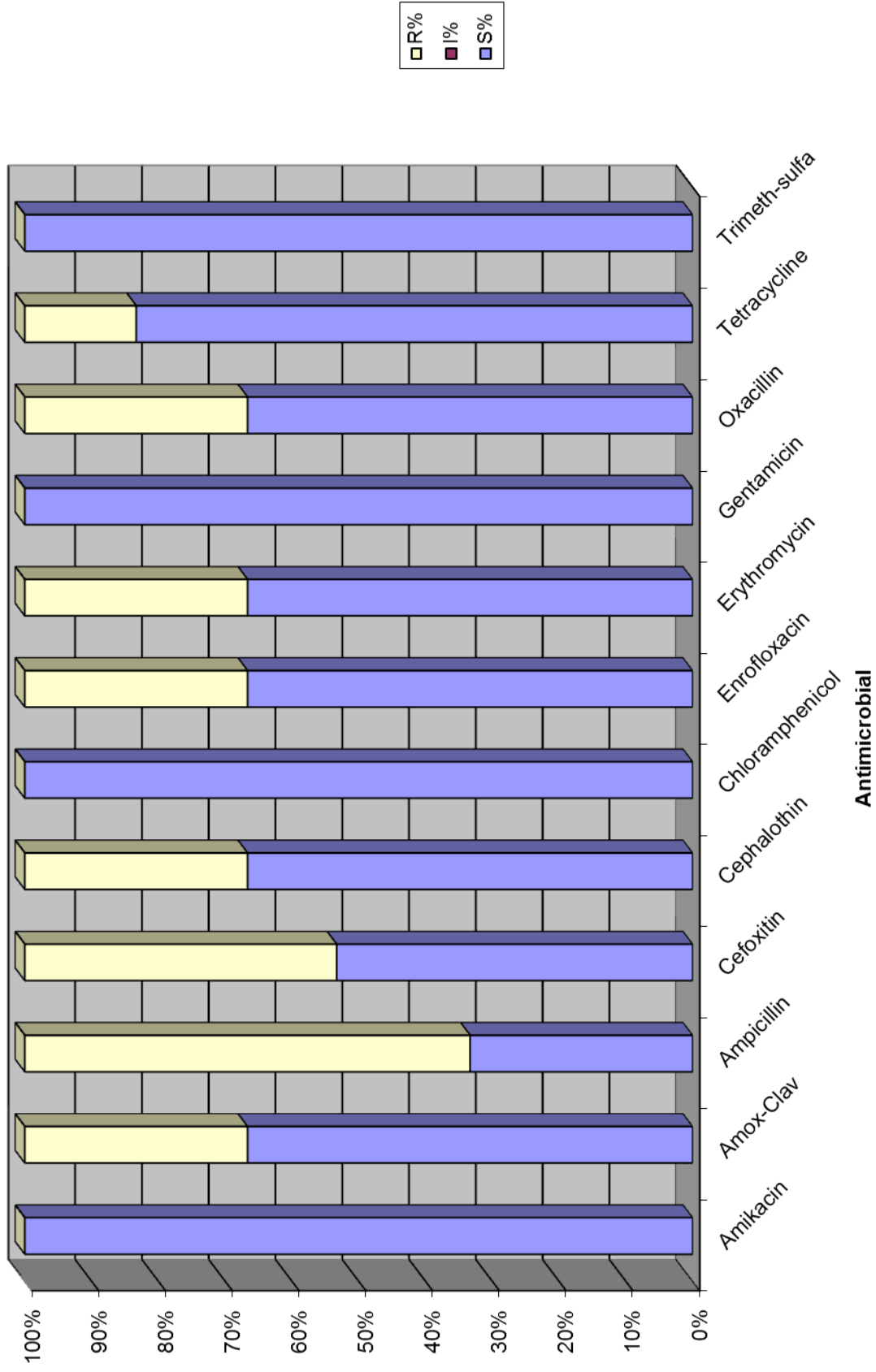
Equine *Strep. zooepidemicus* Antibiogram (N=73)



Equine Strep. equi Antibigram (N=19)



Feline Staph. aureus Antibiogram (N=15)



VIROLOGY

These tables indicate the number of different tests done for viruses by the virology and molecular diagnostics for the last two fiscal years, and the last columns indicate the percent change of fiscal year 12/13 compared to fiscal year 11/12. The middle column of some tables indicate the number (and percentage) of positive tests.

BOVINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive	Number 7/11-6/12	% Change
BVDV	VI	141	15 (10.6)	154	-8.4
BVDV	PCR	418	2 (0.5)	539	-22.4
BVDV	IHC	23	0 (0.00)	25	-8.0
BVDV	FA	500	42 (8.4)	522	-4.2
BVDV	Capture ELISA	867	6 (0.7)	1,229	-29.5
IBRV	VI	141	1 (0.7)	154	-8.4
IBRV	FA	316	76 (24.1)	385	-17.9
BHV	PCR	100	0 (0.0)	571	-82.5
BRSV	VI	141	0 (0.0)	154	-8.4
BRSV	PCR	13	0 (0.0)	5	160.0
BRSV	FA	66	3 (4.5)	48	37.5
PI3	VI	141	0 (0.0)	154	-8.4
PI3	FA	67	0 (0.0)	50	34.0
Coronavirus	FA	219	16 (7.3)	175	25.1
Rotavirus	ELISA	218	83 (38.1)	195	11.8
Chlamydia	PCR	3	0 (0.0)	6	-50.0
Bluetongue	PCR	2,376	1 (0.01)	436	445.0
EHD	PCR	95	3 (3.2)	94	1.1
Mycoplasma	PCR	66	40 (60.6)	28	135.7
OHV-2	PCR	25	17 (68.0)	14	78.6
BLV	PCR	45	0 (0.0)	28	60.7
TOTALS	--	5,558	--	4,504	23.4

BOVINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/12-6/13	Number 7/11-6/12	% Change
BVD-I	SN	576	2,168	-73.4
BVD-II	SN	575	2,168	-73.5
BRSV	SN	35	1,922	-98.2
IBR	SN	544	2,104	-74.1
PI-3	SN	51	1,926	-97.4
VSV (2 strains)	SN	244	248	-1.6
BLV	AGID	311 ^a	567	-45.1
BT/EHD	AGID or cELISA	157 ^b	361	-56.5
TOTALS		2,493	11,464	-78.3

^a58/311 (18.6%) positive

^b114/157 (72.6%) positive

EQUINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
EHV-1	VI	5	0 (0.0)	3	66.7
EHV-1	FA	1	0 (0.0)	4	-75.0
EHV-1/-4	PCR	286	5 (1.7)	226	26.5
Influenza	PCR	36	8 (22.2)	28	28.6
West Nile	PCR	9	0 (0.0)	1	800.0
EVA	PCR	20	0 (0.0)	37	-45.9
Rotavirus	ELISA	13	2 (15.4)	10	30.0
TOTALS		370	--	309	19.7

EQUINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/12-6/13	Number 7/11-6/12	% Change
EHV-1	SN	120	129	-7.0
EHV-4, EHV-3	SN	66	74	-10.8
EVA	SN	203	457	-55.6
Influenza/A1&A2	HI	58	36	61.1
EIA	AGID or ELISA	3,765 ^a	4,681	-19.6
VSV	SN(2 strains)	30	28	7.1
West Nile	IgM ELISA	95 ^b	57	66.7
TOTALS		4,337	5,462	-20.6

^a Zero positive

^b 26/95 (27.4%) positive

PORCINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
Influenza	PCR	0	0 (0.0)	1	-100.0
Mycoplasma	PCR	1	0 (0.0)	1	0.0
Rotavirus	ELISA	6	5 (83.3)	7	-14.3
PPV	FA	7	0 (0.0)	0	100.0
PRRS	PCR	2	0 (0.0)	5	-60.0
TGE	FA	1	0 (0.0)	3	-66.7
TOTALS		17	--	17	0.0

OVINE/CAPRINE/LLAMA/CERVID/WILDLIFE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
BVDV	VI	3	0 (0.0)	2	50.0
BVDV	FA	84	7 (8.3)	62	35.5
BVDV	PCR	430	4 (0.9)	282	52.5
BVD	SN	238	NA	227	4.8
BRSV	SN	129	NA	200	-35.5
BRSV	FA/PCR	5	0 (0.0)	5	0.0
IBR	FA/PCR	13	1 (7.7)	4	225.0
IBR	SN	133	NA	159	-16.4
PI3	FA	3	0 (0.0)	0	100.0
PI3	SN	131	NA	151	-13.2
BT	cELISA/AGID	134	46 (34.3)	286	-53.1
BT	PCR	86	9 (10.5)	17	405.9
EHD	AGID	205	70 (34.1)	193	6.2
EHD	PCR	63	10 (15.9)	6	950.0
EHV	FA/PCR	14	0 (0.0)	12	16.7
Coronavirus	FA	8	0 (0.0)	4	100.0
Rotavirus	ELISA	32	5 (15.6)	23	39.1
OPP	AGID	120	15 (12.5)	171	-29.8
OPP	PCR	5	0 (0.0)	38	-86.8
CAE	ELISA/AGID	367	31 (8.4)	349	5.2
CAE	PCR	71	15 (21.1)	140	-49.3
Caprine Herpes	PCR	6	2 (33.3)	0	100.0
Chlamydia	PCR	69	0 (0.0)	38	81.6
Mycoplasma	PCR	16	6 (37.5)	5	220.0
OHV-2	PCR	17	1 (5.9)	10	70.0
West Nile	PCR	2	0 (0.0)	2	0.0
VSV	SN(2 strains)	72	NA	89	-19.1
TOTAL		2,456	--	2,475	-0.8

FELINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
FHV-1	PCR	119	14 (11.8)	131	-9.2
FHV-1	VI	84	0 (0.0)	126	-33.3
Calicivirus	PCR	44	9 (20.5)	44	0.0
FPV	SNAP/PCR	23	10 (43.5)	17	35.3
FeLV	ELISA	114	5 (4.4)	73	56.2
FIV	ELISA	114	11 (9.6)	73	56.2
FIV	PCR	66	32 (48.5)	21	214.3
Chlamydia	PCR	88	14 (15.9)	103	-14.6
Mycoplasma	PCR	60	8 (13.3)	67	-10.4
Corona/FIP	PCR/FA	37	3 (8.1)	39	-5.1
TOTALS		749	--	694	7.9

FELINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/12-6/13	Number 7/11-6/12	% Change
FIP	IFA	49	93	-47.3
FCV	SN	401	493	-18.7
FHV	SN	456	584	-21.9
FPV	HI	1,512	1,687	-10.4
TOTALS		2,418	2,857	-15.4

CANINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
CDV	FA	77*	17 (22.1)*	99	-22.2
CDV	PCR	891	226 (25.4)	899	-0.9
CCV	FA	31	1 (3.2)	49	-36.7
CPV	FA/SNAP/PCR	45	8 (17.8)	82	-45.1
CHV	VI	0	0 (0.0)	0	0.0
CHV	FA/PCR	20	1 (5.0)	33	-39.4
ICH	PCR	3	0 (0.0)	11	-72.7
Influenza	PCR	41	0 (0.0)	10	310.0
Mycoplasma	PCR	33	7 (21.2)	42	-21.4
TOTALS		1,141	--	1,225	-6.9

* 44/77 are raccoons or other exotics/wildlife, 12 (27.3%) positive.

CANINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/12-6/13	Number 7/11-6/12	% Change
CDV	SN	8,889	9,615	-7.6
CDV IgG/IgM	IFA	229	272	-15.8
CHV	SN	55	62	-11.3
CPV	HI	8,448	9,138	-7.6
Influenza	HI	17	12	41.7
TOTALS		17,638	19,099	-7.6

RABIES TESTING

Species	Number 7/12-6/13	Number Positive	Number 7/11-6/12
Bat	84	13	95
Bovine/Llama/Caprine/Ovine	34	0	21
Canine	135	0	128
Coyote/Fox	24	2	23
Deer/Elk	4	0	4
Equine/Burro	29	3	22
Feline	63	0	95
Lynx/Mt Lion	6	0	4
Bear	5	0	3
Rabbit/Rodent/Unknown	17	1	19
Raccoon	47	2	20
Skunk	64	39	45
TOTALS	512	60	479

AVIAN DIAGNOSTICS

The table below indicates the number of different tests done by the Avian Diseases Section for the last two fiscal years and the last column indicates the percent change of fiscal year 12/13 compared to fiscal year 11/12. The middle column indicates the number (and percent) of positive tests. Necropsy is also listed in Pathology.

Agent Name	Test Performed	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
Influenza	AGID/HI	3,255	NA	1,868	74.3
Influenza	PCR	1,155	NA	1,252	-7.7
Any	VI	43	NA	688	-93.8
Infectious Bronchitis	ELISA	0	0 (0.0)	0	0.0
West Nile	PCR	30	14 (46.7)	6	400.0
APMV-1	PCR	67	4 (6.0)	11	509.1
Chlamydia	PCR	14	0 (0.0)	33	-57.6
Mycoplasma (MG/MS)	PCR	43	22 (51.2)	60	-28.3
Mycoplasma	Serology	19	0 (0.0)	2	850.0
Pullorum/ Typhoid	Serology	1,932	NA	2,318	-16.7
Salmonella Mortality/ Environmental	Culture	516	NA	598	-13.7
Newcastle Disease	Serology or PCR	4	0 (0.0)	1	300.0
Any	Necropsy	167	NA	74	125.7
TOTALS		7,245		6,911	4.8

BSL3 TESTING

Below are tests performed in the BSL3 section, usually in conjunction with testing through the National Animal Health Laboratory Network (NAHLN) overseen by the United States Department of Agriculture or with the Laboratory Response Network overseen by the Center for Disease Control. The last column indicates the percent change of test numbers of FY 12/13 compared to FY 11/12.

Agent Name	Test Performed	Number 7/12-6/13	Number Positive	Number 7/11-6/12	% Change
Classical Swine Fever	PCR	598	0 (0.0)	1,048	-42.9
H1N1 Influenza	PCR	12	2 (20.0)	4	200.0
Q Fever (<i>Coxiella burnetii</i>)	PCR	85	1 (1.2)	34	150.0
Piroplasmosis (<i>B. caballi</i>; <i>T. equi</i>)	cELISA	885	0 (0.0)	1,609	-45.0
Vesicular Stomatitis	Complement fixation	4	0 (0.0)	2	100.0
<i>Francisella tularensis</i>	PCR	28	1 (3.6)	8	250.0
<i>Yersinia pestis</i>	PCR	34	2 (5.9)	11	209.1
<i>Bacillus anthracis</i>	PCR	40	7 (17.5)	6	566.7
<i>Brucella sp.</i>	PCR	21	0 (0.0)	15	40.0
Pseudorabies	ELISA	0	0 (0.0)	3	-100.0
Foot & Mouth Disease	PCR	0	0 (0.0)	0	0.0
Rinderpest	PCR	0	0 (0.0)	0	0.0
Salmonella spp	PCR	155	1 (0.6)	NA	NA
TOTAL		1,862	--	2,740	-32.0

PARASITOLOGY

This table indicates the number of different tests done for the last two fiscal years. The last column indicates the percent change of fiscal year 12/13 compared to fiscal year 11/12.

Test	Number 7/12-6/13	% of Total	Number 7/11-6/12	% Change
Trich - Culture Food Animal	714	8.8	858	-16.8
Trich - PCR Food Animal	603 (individual) 199 (pools of 5)	9.9	1,590	-49.6
Trich - Culture Small Animal	28	0.3	14	100.0
Trich - PCR Small Animal	170	2.1	96	77.1
<i>Neospora</i> Serology	464	5.7	385	20.5
<i>Toxoplasma</i> Serology	45	0.6	30	50.0
Knott's Test	12	0.1	8	50.0
Heartworm Serology	502	6.2	396	26.8
<i>Ehrlichia/Lyme/ Anaplasma</i>	585(195 each)	7.2	471	24.2
Parasite ID	40	0.5	37	8.1
Fecal Exam	2,516	31.0	2,370	6.2
<i>Giardia</i> ELISA/IFA	644	7.9	433	48.7
<i>Cryptosporidium</i> AF/IFA	853	10.5	644	32.5
Baermann	86	1.1	79	8.9
Fluke exam	2	0.0	43	-95.3
Giardia/Crypto PCR	14	0.2	5	180.0
Soil Analysis (includes feed, water, sediment)	24	0.3	31	-22.6
Occult Blood	45	0.6	30	50.0
Strongyle/ Nematode PCR	96	1.2	530	-81.9
Bovine Coccidia ID	474	5.8	NA	NA
TOTAL	8,116	100.0	8,050	0.8

PARASITOLOGY

The following tables indicate the results of fecal examinations for the listed host group. Results are given as the number of samples positive over the number of fecal specimens examined with the percentages in parentheses.

COMPANION ANIMAL/EXOTICS FECAL EXAMINATIONS

Species	Ascarids	Hookworms	Whipworms	Coccidia	Lungworms / <i>Strongyloides</i>	Other
Canine (includes wild species)	11/882 (1.2)	9/882 (0.1)	5/882 (0.6)	80/882 (9.1)	0/10 (0.0)	12/882 (1.4)
Feline (includes wild species)	1/223 (0.4)	0/223 (0.0)	0/223 (0.0)	9/223 (4.0)	0/2 (0.0)	6/223 (2.7)
Reptiles/Zoo/Other	1/31 (3.2)	1/31 (3.2)	--	5/31 (16.1)	1/9 (11.1)	8/31 (25.8)

FOOD & FIBER ANIMALS/EQUINE FECAL EXAMINATIONS

Species	Ascarids	Coccidia	Strongyles	<i>Nematodirus</i>	<i>Trichuris</i>	Tapeworms	Other	Lungworms
Bovine	- ^a	449/561 (80.0)	425/561 (75.8)	104/561 (18.5)	42/561 (7.5)	43/561 (7.7)	8/561 (1.4)	0/0 (0.0)
Ovine / Caprine	-	98/112 (87.5)	48/112 (42.9)	19/112 (17.0)	12/112 (10.7)	1/112 (0.9)	12/112 (10.7)	0/3 (0.0)
Camelids	-	178/135 ^b (131.9)	45/135 (33.3)	38/135 (28.1)	17/135 (12.6)	1/135 (0.7)	28/135 (20.7)	0/7 (0.0)
Cervids/ Wildlife/Zoo	0/61 (0.9)	6/61 (9.8)	49/61 (80.3)	8/61 (13.1)	4/61 (6.6)	4/61 (6.6)	0/61 (0.0)	18/52 (34.6)
Equine	3/472 (0.6)	0/472 (0.0)	216/472 (45.8)	--	--	14/472 (3.0)	5/472 (1.1)	0/3 (0.0)

^adash = not applicable

^bmore than 1 species in many samples

96 Strongyle PCR were performed on bovines. There were 78/96 (81.3%) *Cooperia*, 79/96 (82.3%) *Haemonchus*, 30/96 (31.3%) *Oesophagostomum*, 46/96 (47.9%) *Ostertagia*, and 10/96 (10.4%) *Trichostrongylus*.

PARASITOLOGY

The following table indicates the results of fecal tests for *Cryptosporidium* and *Giardia* using various methods.

Species	<i>Giardia</i> (Fecal Exam)	<i>Giardia</i> (ELISA)	<i>Giardia</i> (IFA)	<i>Cryptosporidium</i> (Acid Fast)	<i>Cryptosporidium</i> (IFA)
Canine	46/882 (5.2)	0/3 (0.0)	24/241 (10.0)	5/58 (8.6)	31/241 (12.9)
Feline	2/223 (0.9)	0/1 (0.0)	3/87 (3.4)	0/1 (0.0)	7/87 (8.0)
Bovine/Caprine/Ovine/ Porcine	10/679 (1.5)	— ^a	0/15 (0.0)	81/148 (54.7)	4/15 (26.7)
Camelids	0/135 (0.0)	--	0/12 (0.0)	0/0 (0.0)	0/2 (0.0)
Equine	0/472 (0.0)	--	0/22 (0.0)	0/0 (0.0)	0/22 (0.0)
Reptiles/Zoo/ Wildlife/Other	0/92 (0.0)	--	17/263 (6.5)	3/6 (50.0)	17/263 (6.5)

^adash = not applicable

The following table indicates the results for serology, molecular diagnostics and other tests for the listed host group. Results are given as the number of positive tests over the number of tests performed with the percentages in parentheses.

Species	Trich Culture	Trich PCR	Neospora	Knotts Test	Heartworm	<i>Ehrlichia</i> / <i>Lyme</i> / <i>Anaplasma</i>	<i>Toxoplasma</i>
Bovine	1/714 (0.1)	19/802 (2.4)	32/237 (13.5)	— ^b	-	-	-
Canine	0/0 (0.0)	1/7 (14.3)	24/172 (14.2)	0/12 (0.0)	17/464 (3.7)	17/582 (2.9)	-
Feline	0/0 (0.0)	26/162 ^a (16.0)	0/7 (0.0)	-	0/35 (0.0)	-	-
Avian/Zoo/ Wildlife	-	0/1 (0.0)	2/48 (4.2)	-	0/2 (0.0)	0/0 (0.0)	4/15 (26.7)

^aIncludes all trichomonads.

^bdash = not applicable

- There were 30 tests for Toxoplasmosis in ovine, caprine, and porcine; 0 were positive.

CHEMISTRY/TOXICOLOGY

The top table indicates the number of tests for nutrients or elements performed for the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 12/13 compared to fiscal year 11/12. The bottom table indicates the results of testing for copper for the given species and tissue sample.

Nutrient	Number 7/12-6/13	%	Number 7/11-6/12	% Change
Copper	2,007	46.8	1,842	9.0
Zinc	493	11.5	464	6.3
Iron	500	11.7	432	15.7
Selenium + GSH.Px	470	11.0	426	10.3
Other trace minerals (Mo,Co,Mn)	88	2.1	172	-48.8
Vitamin A	162	3.8	363	-55.4
Vitamin E	524	12.2	415	26.3
Macro elements (Ca,Mg,K,Na, P,Cl)	33	0.8	29	13.8
Special Request	11	0.3	9	22.2
TOTAL	4,288	100.0	4,152	3.3

COPPER

Species	Tissue	TOTAL	Results
Bovine	Serum	110	66 < 0.6ppm (deficient)
Bovine	Liver	62	2 < 40ppm deficient 5 > 600ppm toxic
Canine	Liver	1,670	228 > 1,500ppm (toxic)

There were 195/446 (43.7%) canine liver iron > 2000ppm

CHEMISTRY/TOXICOLOGY

This table lists the number of tests for toxicants for the last two fiscal years. The last column of the table indicates the percent change of fiscal year 12/13 compared to fiscal year 11/12.

Toxicant	Number 7/12-6/13	%	Number 7/11-6/12	% Change
Calculi	137	23.8	174	-21.3
Bromide	166	28.8	172	-3.5
Cadmium	6	1.0	9	-33.3
Cholinesterase	3	0.5	5	-40.0
Cyanide	11	1.9	4	175.0
Nitrate/Nitrite	94	16.3	108	-13.0
Strychnine	6	1.0	3	100.0
Sulfate/Sulfur	60	10.4	108	-44.4
Arsenic	11	1.9	16	-31.3
Lead	54	9.4	84	-35.7
Mercury	13	2.3	23	-43.5
Alpha- Mannosidase or Swainsonine	2	0.3	4	-50.0
Other	13	2.3	1	1200.0
TOTAL	576	100.0	711	-19.0

There was 1 positive Strychnine from 6 samples.

There were 2 cases of lead toxicity.

SPECIAL SEROLOGY

The top table indicates the number of tests performed for the listed species for the last two fiscal years. The percent change of fiscal year 12/13 compared to fiscal year 11/12 is given in parentheses. Toxo stands for Toxoplasmosis and RMSF stands for Rocky Mountain Spotted Fever. The bottom table indicates the number of positive results over the total number of tests done, with the percent in parentheses.

Species	Toxo IgG/M 7/12-6/13	Toxo IgG/M 7/11-6/12 (%change)	Toxo CSF IgG/M 7/12-6/13	Toxo CSF IgG/M 7/11-6/12 (% change)	RMSF IgG 7/12-6/13	RMSF IFA 7/11-6/12 (%change)
Canine	2,472	2,984 (-17.2)	63	62 (1.6)	16	12 (33.3)
Feline	4,033	3,915 (3.0)	17	12 (41.7)	NA	NA
TOTAL	6,505	6,899 (-5.7)	80	74 (8.1)	16	12 (33.3)

Species	Positive Toxo IgG	Positive Toxo IgM	Positive Toxo CSF IgM	Positive RMSF IFA
Canine	301/2,472 (12.2)	81/2,472 (3.3)	1/63 (1.6)	3/16 (18.8)
Feline	477/4,033 (11.8)	521/4,033 (13.0)	0/17 (0.0)	NA
TOTAL	778/6,505 (12.0)	602/6,505 (9.3)	1/80 (1.3)	3/16 (18.8)

The table below indicates the number of PCR tests done in the Special Serology section for the last two fiscal years. The number of positive results and the percentages in parentheses is given in the third column. The last column indicates the change in the number of tests from fiscal year 12/13 compared to fiscal year 11/12.

Test	Number 7/12-6/13	Number Positive (%)	Number 7/11-6/12	% Change
IgG Bartonella	35	19 (54.3)	NA	NA
PCR Bartonella	88	8 (9.1)	90	-2.2
PCR Cryptosporidia	17	5 (29.4)	26	-34.6
PCR Giardia	24	7 (29.2)	14	71.4
PCR <i>M. haemocanis</i> / <i>M. haematoparvum</i>	24	1 (4.2)	26	-7.7
PCR <i>M. haemofelis</i> / <i>M. haemominutum</i>	104	14 (13.5)	202	-48.5
PCR <i>Neospora caninum</i>	23	0 (0.0)	53	-56.6
PCR <i>Toxoplasma gondii</i>	320	0 (0.0)	331	-3.3
PCR Ehrlichia/Wolbachia/ Anaplasma/Neorickettsia	392	8 (2.0)	270	45.2
PCR <i>Rickettsia</i> sp.	11	0 (0.0)	21	-47.6
<i>E. canis</i> IFA	28	10 (35.7)	28	0.0
TOTAL	1,066	--	1,061	0.5

CLINICAL PATHOLOGY

The Clinical Pathology Service is directed by the Veterinary Teaching Hospital, but samples from non-Veterinary Teaching Hospital patients are processed through the Diagnostic Laboratory. The table indicates the number of tests performed for the given species for non-Veterinary Teaching Hospital cases only. Fiscal year 12/13 is compared to fiscal year 11/12 and the percent change is given in parentheses.

Species	CBC 7/12-6/13	CBC 7/11-6/12 (%change)	Chemistry Panel 7/12-6/13	Chemistry/Panel 7/11-6/12 (%change)	Fluid & Cytology 7/12-6/13	Fluid & Cytology ^a 7/11-6/12 (%change)	Other 7/12-6/13	Other 7/11-6/12 (%change)
Canine	920	753 (22.2)	545	470 (16.0)	3,644	3,266 (11.6)	557	543 (2.6)
Feline	203	207 (1.9)	127	143 (-11.2)	735	743 (-1.1)	146	211 (-30.8)
Equine	306	335 (-8.7)	326	366 (-10.9)	105	106 (-0.9)	39	23 (69.6)
Bovine	11	35 (-68.6)	30	151 (-80.1)	2	5 (-60.0)	0	13 (-100.0)
Other	135	216 (-37.5)	80	131 (-38.9)	26	24 (8.3)	40	42 (-4.8)
Avian/ Reptile	11	20 (-45.0)	5	14 (-64.3)	0	5 (-100.0)	0	0 (0.0)
TOTAL	1,586	1,566 (1.3)	1,113	1,275 (-12.7)	4,512	4,149 (8.7)	782	832 (-6.0)

^a There were 740 additional site cytologies in FY 12/13 compared to 625 in 11/12.

- There were 2,104 submissions of tissue for PCR to detect lymphoid malignancies (compared to 1,846 in FY 11/12), and 1,876 submissions for flow cytometry (compared to 1,582 in FY 11/12).

ENDOCRINOLOGY

This table indicates the number of tests performed for the listed species for the last two fiscal years. The percent change from fiscal year 12/13 compared to fiscal year 11/12 is given in parentheses. TDM stands for therapeutic drug monitoring, and is primarily for phenobarbital.

Species	Pituitary Adrenal Axis	Pituitary Thyroid Axis	Insulin	Total 7/12-6/13	Total 7/11-6/12 (% change)	TDM 7/12-6/13	TDM 7/11-6/12 (% change)
Equine	215	43	107	365	506 (-27.9)	0	0(0.0)
Canine	667	1,036	12	1,715	1,709 (0.4)	234	284 (-17.6)
Feline	3	420	0	423	395 (7.1)	14	10 (40.0)
Other	5	27	0	32	44 (-27.3)	0	0(0.0)
TOTAL	890	1,526	119	2,535	2,654 (-4.5)	248	294 (-15.6)

ROCKY FORD

Agent Name	Test Performed	Number 7/12-6/13	Number Positive	% Positive	Number 7/11-6/12	% Change
BLV	ELISA	58,388	-	-	61,365	-4.9
BVD	FA	107	3	2.8	85	25.9
BVD PCR Pools	PCR	1,150	-	-	1,102	4.4
BVD Samples Pooled	PCR	39,632	-	-	44,412	-10.8
BVD	C-ELISA	9,312	50	7.4	2,154	332.3
IBR	FA	81	5	6.2	67	20.9
BT	ELISA	10	7	70.0	2,956	-99.7
Rota	ELISA	35	10	28.6	1	3400.0
Corona	FA	35	9	25.7	12	191.7
BRSV	FA	23	1	4.3	23	0.0
<i>B. abortus</i>	Card Test	19	0	0.0	39	-51.3
<i>M. paratuberculosis</i>	ELISA	33,511	-	-	5,334	528.3
Trichomonas	Culture	281	3	1.1	242	16.1
Trichomonas	PCR	5,479	-	-	6,356	-13.8
Trichomonas pooled	PCR	3,034	-	-	2,613	16.1
Trichomonas control program	PCR	8,730	-	-	10,583	-17.5
CAE	cELISA/AGID	139	8	5.8	104	33.7
OPP	cELISA/AGID	612	115	18.8	654	-6.4
EIA	AGID	5,615	0	0.0	6,736	-16.6
EIA	ELISA	577	0	0.0	477	21.0
Campylobacter	Culture	3,451	NA	NA	1,714	101.3
Various Bacteria	Culture	753	NA	NA	962	-21.7
Nitrate	EMQ Strip	742	NA	NA	473	56.9
Various	Clinical Pathology	368	NA	NA	NA	NA
Total T4	ELISA	193	NA	NA	NA	NA
Various	Necropsy	46	NA	NA	NA	NA
TOTAL		172,323			148,464	16.1

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WESTERN SLOPE

Test Performed	Number 7/12-6/13	Number Positive	% Positive	Number 7/11-6/12	% Change
Aerobic culture	463	NA	NA	444	4.3
Anaerobic culture	74	NA	NA	69	7.2
Milk culture	97	NA	NA	145	-33.3
Antibiotic susceptibility	251	NA	NA	275	-8.7
Fungal culture	17	6	35.3	19	-10.5
Campylobacter culture	33	2	6.1	30	10.0
Mycoplasma culture	0	0	0.0	0	0.0
Bovis ELISA	9,774	526 positive 141 indeterminate	5.4 positive 1.4 indeterminate	10,199	-4.2
<i>B. abortus</i>	6	0	0.0	2	200.0
<i>M. paratuberculosis</i>	51	1	2.0	0	100.0
EIA (Coggins)	1,795	0	0.0	1,577	13.8
CAE AGID	0	0	0.0	26	-100.0
OPP AGID	0	0	0.0	7	-100.0
BVD cELISA/PCR	0	0	0.0	12	-100.0
Bluetongue AGID	0	0	0.0	0	0.0
FA Corona	0	0	0.0	3	-100.0
Trichomonas Culture/PCR	2,233	4	0.2	2,462	-9.3
Fecal exam	64	NA	NA	53	20.8
Neospora Serology	0	0	0.0	0	0.0
Chemistry	0	NA	NA	7	-100.0
Necropsy	60	NA	NA	93	-35.5
Histopathology	528	NA	NA	636	-17.0
Cytology	8	NA	NA	4	100.0
TOTAL	15,454	NA	NA	16,102	-4.0

* 57% Food Animal, 8% Equine, 17% Wildlife, 18% Pets.

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