

LAB LINES

Diagnostic news and trends from the Colorado State University Veterinary Diagnostic Laboratories
 Volume 18, Number 1 Spring/Summer 2013

Lab Updates

An Export Testing Success Story. How the Lab Enhances Opportunity

— Gene Niles, DVM, Director of Rocky Ford Veterinary Diagnostic Lab

Colorado State University's Veterinary Diagnostic Lab system performs several hundred thousand regulatory tests each year to facilitate the intrastate, interstate and international movement of livestock. But the recent record number of animal tests moved through the VDL's Rocky Ford Lab, in conjunction with the Fort Collins lab and the Rocky Mountain Regional Animal Health Laboratory in Denver, has eclipsed the scope of what we have accomplished in the past. During the past two years, Rocky Ford has tested 55,422 head of breeding cattle purchased from cattlemen throughout the western United States for export to Russia. To the best of our knowledge, the November 2012 shipment on which Rocky Ford processed the regulatory testing was the largest single shipload of live cattle ever exported from the United States. The numbers are staggering:

Cattle	2011-12	2012-13
■ Bovine Leukemia Virus ELISA	54683	57887
■ Johne's ELISA	22311	32911
■ Campylobacter Cultures	877	3415
■ T. foetus PCR, pooled	176	650

Horses:

■ EIA AGID	96
■ Equine Viral Arteritis Virus SN	24

It requires quite an effort to get something like this done. We did all inspections, wrote all the health papers, and ran all the health tests on the cattle, often in batches numbering in the thousands, running on a biweekly basis from August through May.

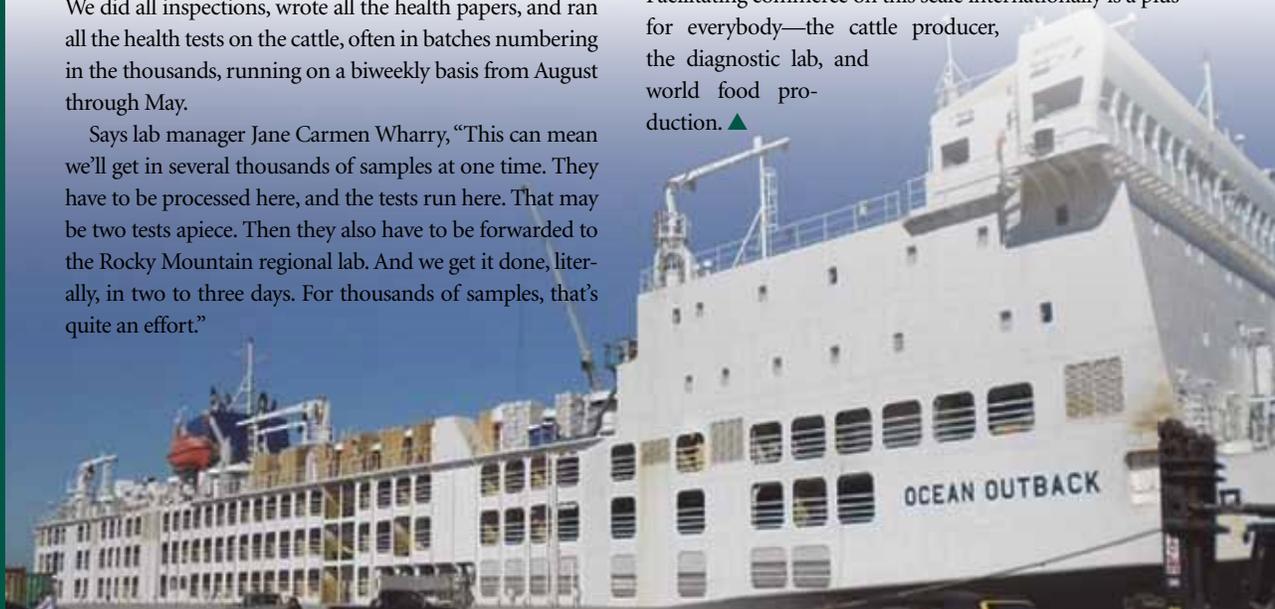
Says lab manager Jane Carmen Wharry, "This can mean we'll get in several thousands of samples at one time. They have to be processed here, and the tests run here. That may be two tests apiece. Then they also have to be forwarded to the Rocky Mountain regional lab. And we get it done, literally, in two to three days. For thousands of samples, that's quite an effort."

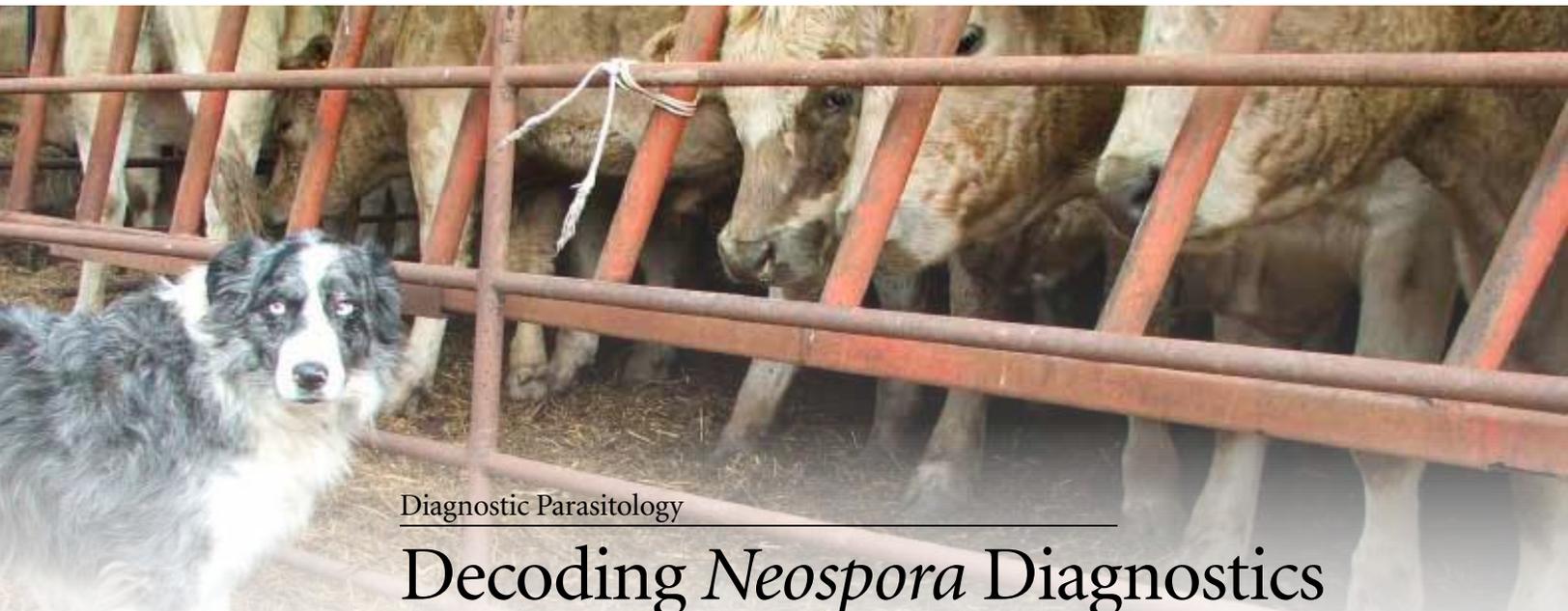


The testing generated much needed income for the 2012-2013 fiscal year, but more importantly, the work demonstrates the valuable role the public diagnostic lab plays in facilitating private enterprise in the important animal agriculture sector.



In addition to wearing our hat as a diagnostic facility, we also wear a hat in a regulatory function. This fulfills the university's public responsibility to help import/export. Facilitating commerce on this scale internationally is a plus for everybody—the cattle producer, the diagnostic lab, and world food production. ▲





Diagnostic Parasitology

Decoding *Neospora* Diagnostics

Further reading
 Dubey JP, Schares G.
Neosporosis in animals
 – The last five years.
Vet Parasitol. 2011 Aug
 4;180(1-2):90-108.

NEOSPOORA TESTING THROUGH CSU VDL ELISA SEROLOGY

- Submit 1-2ml serum on ice
- Cost: \$10 each for 1-10 tests
\$7 each for >10 tests

FETAL TESTING

- Submit entire fetus or tissue.
- Cost: \$60 includes complete work-up for other abortifacive agents

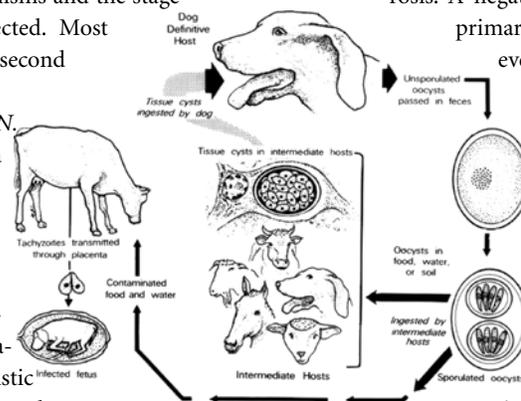
Although the worldwide protozoan *Neospora caninum* infects both dogs and cattle, canids are the definitive host, responsible for excretion of oocysts into the environment. Cattle are an intermediate host and become infected through one of two routes: by consuming oocysts in contaminated feed or water, or by transplacental transmission. Although transmission by oocysts does occur, vertical transmission is associated with the primary clinical issue, abortion. During pregnancy, replication can increase drastically; the parasite invades the placentome and multiplies. It then enters the fetal bloodstream, with subsequent invasion of fetal tissues, particularly those of the central nervous system. The consequences of infection vary with the number and strain of organisms and the stage at which the fetus is infected. Most abortions occur during the second trimester.

Determining whether *N. caninum* is the cause of a particular abortion event is problematic. If available, submission of the aborted fetus is best. The brain is the preferred tissue, followed by heart, liver and placenta. Finding the characteristic lesions in an aborted fetus can be supportive of a diagnosis. Even better is demonstration of the organisms through immunohistochemical staining. Fetal peritoneal fluid or blood can be tested with an ELISA. This test provides only a yes/no answer—whether the animal does or doesn't have IgG antibodies against the parasite.

— Ashley Malmlov, MS, CSU Microbiology, Immunology and Pathology Postdoctoral Fellow; and Lora R. Ballweber, DVM, MS, CSU VDL Parasitology Section Head

A positive result indicates the fetus was infected and made antibodies to the organism; therefore, the likelihood of an *N. caninum*-induced abortion increases. Unfortunately, a negative result is not very informative. In young fetuses, the immune system may not yet be mature enough to mount an immune response. If the fetus is old enough, the infection may be in the acute phase and not yet producing IgG. Blood from the dam can also be tested by ELISA. A positive result, however, only raises the index of suspicion for neosporosis. A negative result may imply another primary cause for the abortion; however, antibody levels do fluctuate during pregnancy and may drop below detection limits.

Thus, a single test on an aborting cow is not helpful. A better approach is to evaluate the herd. Identify two sets of animals: those that have aborted and a second set of pregnant animals matched to the first set in stage of gestation and animal age. If the prevalence of *N. caninum* antibodies of the aborting group is higher than the control group, then neosporosis is the probable cause of abortions. However, if the prevalences are similar in both groupings of animals, then *N. caninum* is probably not the cause of abortion. ▲



CSU VDL in the Field: Case Study

Sampling Hooves to Confirm Selenium Toxicity

During autumn 2012, 24 performance horses that were not being used were grazing a summer pasture northwest of Ft. Collins. In late August, one horse was lame and removed from the pasture. By the end of September, X-rays revealed a severe rotation of the coffin bone. The animal was euthanized and necropsied at the CSU Veterinary Diagnostic Lab. At that time, various tissues were sampled and frozen.

CAREFUL TARGETING IS CRITICAL

The first week in October, two additional horses were lame. Both animals exhibited horizontal hoof separation about 2 cm from the hair line and severe tail hair loss. Blood samples for selenium analysis were

obtained from the two affected horses and three clinically normal horses from the herd.

Hoof samples for selenium analysis were obtained at the area of the hoof separation from the two affected horses and from the hoof of the horse that was euthanized. The blood selenium concentrations averaged 0.41 ppm, with a range of 0.39 to 0.47 ppm. Normal equine blood selenium concentrations range from 0.17 to 0.25 ppm. Blood selenium concentrations greater than 1.10 ppm are considered toxic. The hoof selenium concentrations averaged 5.64 ppm, with a range of 4.78 to 6.82 ppm. Normal equine hoof selenium concentrations range from 0.60 to 1.20 ppm, with concentrations greater than 5.00 ppm considered toxic.

These results clearly demonstrate the importance of carefully targeting the area of the hoof that is sampled for selenium analysis. When the hoof is sampled too far above or below the horizontal separation, the ability to confirm selenium toxicity is impeded.

We recommend submitting whole blood (GTT or PTT) and hoof taken from the separation line to confirm suspected cases of selenosis. ▲

- Selenium is an essential micronutrient.
- The major known function is its incorporation into glutathione peroxidase.
- Selenium can exist in tissues as either the inorganic or organic form.
- In the organic form, it may replace sulfur in amino acids. Because seleno-amino acids don't form disulfide bonds, excess selenium decreases the mechanical strength of hair and hooves.

— Dwayne Hamar, PhD, Chemistry and Toxicology Section Head; Cathy Bedwell, Chemist; and Charlie Davis, DVM, CSU VDL Lab Coordinator



The hoof of the euthanized horse. The sample for selenium analysis was taken at the horizontal separation line.



The hoof of the euthanized animal with three core samples removed for selenium analysis. The Se concentrations from the top, middle and bottom cores were 2.13, 6.30 and 0.52 ppm, respectively.

SELENIUM TESTING THROUGH CSU VDL

- Submit 1 to 2 mL whole blood or hoof tissue
- Cost: \$20





Food Animal Production Medicine

Our Dairy Production Focus Grows

The preface to the 2011 edition of *Dairy Production Medicine* recognizes the reality today's veterinarian faces when serving modern, intensive animal operations: "During the last 30 years, the role of veterinarians working with dairy cattle has changed.... Dairy production medicine...is multidisciplinary and includes clinical medicine, economics, epidemiology, food safety, genetics, human resource management, nutrition, preventive medicine, and reproduction. These specialities must work in concert to harmonize management of the individual dairy farm in order to obtain a profit...."

— Dave Van Metre, DVM, DACVIM, Professor, CSU Animal Population Health Institute

To fulfill its role, CSU's Department of Clinical Sciences and Veterinary Diagnostic Lab now offer access to the services of two new dairy production medicine specialists in the Dairy Population Health Management program. They are on-site to work through local veterinarians to address herd-level issues that might be aided by their skills in records analysis, cow mortality, epidemiology, transition-cow management and other skills. ▲

Jessica McArt, assistant professor in Dairy Population Health Management, received her DVM in 2007 from Cornell, where she spent two years as an intern and resident in the school's Ambulatory and Production Medicine Clinic. While there, she investigated the efficacy of assessing corpus luteum function through ultrasonography to improve reproductive synchronization programs. She received her PhD in December 2012, focusing on the epidemiology, economics and treatment of early lactation subclinical ketosis and postpartum immune function. She hopes to continue her work in transition-cow wellbeing and management, herd-level risk factors for excessive negative energy balance, and preventive measures during the dry and early postpartum periods.

Craig McConnel, a Washington State 2002 DVM, interned in ruminant medicine at University of Sydney before completing a clinical studies masters investigating pinkeye and *Moraxella bovis* vaccinal antigens. At CSU, he completed a PhD exploring epidemiology of dairy cow mortality, examining management and pathologic aspects and record-keeping options regarding culls. As former lecturer in ruminant health at Australia's Charles Stuart University, he was involved in research quantifying *E. coli* O157:H7 shedding patterns. Now an assistant professor in Dairy Population Health Management, he will continue that research, as well as pursue his interests in mortality and dairy-cow welfare that began with the Colorado Dairy Health Management Survey initiated within the Integrated Livestock Management program.

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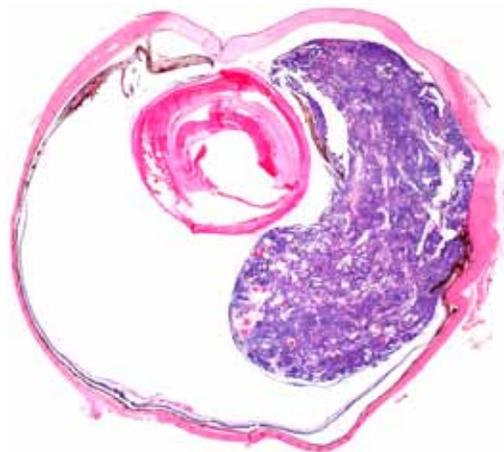


Canine Oncology Innovations

Neuroectodermal Retinal Tumors

A study in a special July ocular pathology issue of *Veterinary Ophthalmology* describes the clinical, histological and immunohistochemical features of primary intraocular primitive neuroectodermal tumors in eight dogs. Four of eight tumors exhibited histological features similar to human retinoblastomas characterized by Flexner-Wintersteiner rosettes and fleurettes, and demonstrated variable immunoreactivity for retinal markers opsin, S-antigen (S-Ag) and interphotoreceptor retinoid binding protein (IRBP). All dogs with tumors displaying histological and immunohistochemical features of retinal differentiation were 2 years old or younger. All four tumors diagnosed as medulloepitheliomas did not display histological and immunohistochemical features of retinal differentiation, and were present in dogs 7 years or older. Age of onset, in conjunction with immunohistochemistry for opsin, S-Ag and IRBP, is an important aid in the differentiation of primary, primitive neuroectodermal tumors arising within the canine ciliary body and retina. ▲

— Daniel P. Regan, DVM, PhD, CSU Microbiology, Immunology and Pathology Postdoctoral Fellow



Tumors evaluated in the study arose from either the ciliary body or retina and consisted of a large, nodular expansile mass which partially filled the anterior and posterior segments, frequently displacing the iris and lens.

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.* 2013 Jul;16 Suppl s1:87–93.

Exotics Medicine

Metastatic Mineralization in Sloths

Metastatic mineralization was diagnosed in 16 captive two-toed sloths ranging in age from 2 months to 26 years old (mean 11.9 years), housed at facilities throughout the United States. Gross and histological lesions were characterized as well as concurrent disease processes. Gross mineralization was detectable at necropsy in five of 16 sloths, and was most prominent in the great vessels, particularly the aorta. Affected vessels were diffusely dilated, firm and brittle with tan plaques that partially occluded the lumen.

Histologically, vascular mineralization was detected in nine of 16 sloths and varied from moderate to severe, including osseous metaplasia, smooth muscle hyperplasia and degeneration consistent with arteriosclerosis. Mineralization was detected throughout viscera, most commonly in the stomach mucosa (13 of 16 sloths), kidneys (12 of 16 sloths) and lungs (six of 15 sloths), and was associated with mononuclear inflammation and local tissue destruction. Fourteen of 16 sloths had significant renal disease, including two treated for clinical renal failure prior to death. Nine of 12 had mild to severe cardiomyopathy, possibly

— Sushan Han DVM, PhD, DACVP, CSU VDL Pathologist; and Michael M. Garner, DVM, Dipl ACVP, Northwest ZooPath

secondary to severe vascular compromise. Metastatic mineralization is caused by prolonged hypercalcemia. Common causes include high calcium diets, dietary or metabolic calcium-to-phosphorus imbalance, hypervitaminosis D, and primary or secondary hyperparathyroidism. Severe vascular mineralization occurred in sloths in the absence of renal disease. ▲



Hoffmann's two-toed sloth. © 2011 Geoff Galilee, via Creative Commons Attribution license

CSU VDL In Press

A Roundup of VDL Faculty Research



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.* 2013 In press.

CSU Veterinary Diagnostic Lab Pathologist Chad Frank cooperated with a team of Purdue pathologists in this study, first reported at the 2012 annual meeting of the American College of Veterinary Pathologists in December and now in press at *Veterinary Pathology*. The study searched both Purdue's and CSU's diagnostic lab databases for cases of either poorly pigmented or unpigmented excisional biopsies of equine melanocytic neoplasms. The team eventually identified 50, which were then tested against four human and canine markers:

- Mouse monoclonal antibody antimelanoma marker clone PNL2
- Mouse monoclonal antibody anti-Melan A, clone A 103m
- Rabbit polyclonal antibody anti-S100 protein
- Rabbit polyclonal antibody anti-PGP 9.5

The study followed published procedures validated in canine tissues, and semiquantitatively evaluated immunoreactivity to evaluate possible cross-reactivity of monoclonal antibody PNL2, normal tissues and various nonmelanocytic tumors. They also evaluated immunoreactivity for all four markers based on cell phenotype and whether the cell location was superficial vs. deep.

They found PNL2, PGP 9.5, and S100 protein were detected in all 50 neoplasms. PNL2 was not expressed in 62 nonmelanocytic tumors (equine sarcomas, schwannomas, carcinomas, sarcomas, endocrine tumors, sex-cord stromal tumors, germ cell tumors, and leukocytic tumors) or in normal tissues other than epidermis. They showed antibody PNL2 to be a sensitive marker and more specific than S100 protein or PGP 9.5. In contrast, none of the neoplasms expressed Melan A.

Aboellail TA. Pathologic and immunophenotypic characterization of 26 camelid malignant round cell tumors. *J Vet Diagn Invest.* 2013 Jan;25(1):168-72.

VDL Pathologist Tawfik Aboellail's study of 20 alpaca and 6 llama lymphoma or leukemia cases from the VDL database over a seven-year period employed immunohistochemistry using four markers:

- A T-cell marker (cluster of differentiation [CD]3)

- A B-cell marker (paired box protein [PAX]-5)
- A leukocyte integrin beta-2 marker (CD18)
- A neuroendocrine marker (synaptophysin)

Aboellail broadly categorized clinical disease and postmortem findings in the animals into two syndromes in each species:

- T-cell juvenile disseminate in alpacas, in 40 percent
- Adult multicentric lymphomas in alpacas, in 60 percent
- Adult multicentric lymphomas in llamas, in 83 percent
- Adult epitheliotrophic lymphomas in llamas, in 17 percent.

He suggests further work using human markers to continue refining classification of camelid lymphoma and leukemia, especially the lymphoblast non-B-cell, non-T-cell lymphomas, using CD7, B-NKL, M/NKL, and CD4+ and CD56+.

Frank CB, Valentin SY, Scott-Moncrieff JC, Miller MA. Correlation of Inflammation with Adrenocortical Atrophy in Canine Adrenitis. *J Comp Pathol.* 2013 In press.

VDL's Chad Frank leads another study with his former residency colleagues at Purdue, which compared sections of adrenal glands from 33 dogs with adrenitis against those of 37 dogs without adrenal lesions. The affected dogs were classified clinically as having hypoadrenocorticism, or Addison's disease (AD), suspected of having AD, not having AD or unclassified. The adrenal inflammation was lymphoplasmacytic in 17 dogs, lymphocytic in four, lymphohistiocytic in one, granulomatous in three and neutrophilic in eight cases.

Adrenal glands from control dogs lacked leukocyte infiltration and had a cortical-to-medullary area ratio of 1.1-to-7.2. All three dogs with AD, eight of the 17 dogs with suspected AD and one of the 11 dogs without AD had a cortical-to-medullary area ratio less than 1.1. Because the area ratio was correlated ($r = 0.94$) with a linear cortical-to-medullary thickness ratio, a thickness ratio of less than 1.1 could also indicate severe adrenocortical atrophy. Severe adrenocortical atrophy was associated typically with lymphoplasmacytic infiltration and nearly complete loss of cortical cells; however, the zona glomerulosa was partially spared in three dogs with lymphoplasmacytic adrenitis and severe cortical atrophy. In contrast, non-lymphoid inflammation was generally part of systemic disease, multifocal and was unaccompanied by severe adrenocortical atrophy.

Mclelland S, Duncan C, Spraker T, Wheeler E, Lockhart SR, Gulland F. *Cryptococcus albidus* infection in a California sea lion (*Zalophus californianus*). J Wildl Dis. 2012 Oct;48(4):1030-4.

VDL Pathology Resident Shannon Mclelland and Pathologists Colleen Duncan and Terry Spraker help detail this case of an approximately 1-year-old male California sea lion found in a canal adjacent to San Francisco Bay and brought to the Marine Mammal Center in Sausalito, where it was examined and treated supportively with oral fluids by stomach tube and IM penicillin G before ultimately dying three days after admission. *Cryptococcus albidus*, a ubiquitous fungal species not typically considered to be pathogenic, was recovered. Yeast morphologically consistent with a *Cryptococcus* spp. was identified histologically in a lymph node and *C. albidus* was identified by an rDNA sequence from the lung. Infection with *C. albidus* was thought to have contributed to mortality in this sea lion, along with concurrent bacterial pneumonia.

To the best of the authors' knowledge, this is the first report of cryptococcosis in pinnipeds, more specifically in a California sea lion, and the first report of *C. albidus* infection in any species of marine mammal. Animals have served as good sentinels of cryptococcal disease in the current emergence of *C. gattii* in the Pacific Northwest and British Columbia. Morbidity and mortality of cetaceans recently contributed to the recognition of *C. gattii* infection within these regions. Surveillance for infectious organisms in marine mammals is logistically challenging; however, even novel fungal organisms should be considered a potential primary, or at least contributing, pathogen. Given the current emergence of *C. gattii* in the region where the sea lion was found, without careful mycologic examination this case might have been attributed to *C. gattii*, and *C. albidus* may not have been recognized as a potential pathogen of pinnipeds. Thus, culture is always recommended to confirm organisms that are identified histologically, and *C. albidus* should be considered as a potential pathogen with a role in marine mammal morbidity and mortality.



Cole PA. Association of canine splenic hemangiosarcomas and hematomas with nodular lymphoid hyperplasia or siderotic nodules. J Vet Diagn Invest. 2012 Jul;24(4):759-62.

Lab Pathologist Pat Cole evaluated histologic sections from 120 cases of splenic hemangiosarcoma and 100 cases of splenic hematoma, along with accompanying information about age, sex, breed and clinical history provided by the submitting veterinarian. Cases were collected from a 30-week period and were selected in consecutive order. Hemorrhagic lesions caused by splenic torsion, trauma or other types of tumors were not included in the study, as well as splenic masses interpreted as hemangiomas, because this diagnosis represented only about 2 percent of the canine splenic masses evaluated at CSU's VDL during the year of the study. The submissions included either the whole spleen or portions selected by the submitting veterinarian. Information about gross appearance was not available for all cases, but many hemangiosarcomas were a single nodule, and some of the hematomas were over 6 cm in diameter.



Lymphoid hyperplasia was present in none of the hemangiosarcoma cases and in 27 percent of the hematoma cases. Siderotic nodules in the capsule or trabeculae were present in 25 percent of hemangiosarcoma cases and in 36 percent of hematoma cases. Hemoabdomen was noted in the clinical history of 54 percent of hemangiosarcoma cases and in 22 percent of hematoma cases. The average age (10.3 and 9.6 years, respectively), sex ratios (slightly more males), and most common breeds (Labrador Retriever, Golden Retriever, and German Shepherd Dog) were similar for the hemangiosarcoma and hematoma cases.

Since lymphoid hyperplasia is much more common in cases of hematoma, the presence of this feature lends support to a diagnosis of hematoma rather than hemangiosarcoma. Signalment, history of hemoabdomen, and presence of siderotic nodules do not point to one diagnosis over the other. In the present series of cases, lymphoid hyperplasia was commonly associated with splenic hematoma but was not seen in hemangiosarcoma cases. This suggests that the presence of lymphoid hyperplasia is supportive of a diagnosis of hematoma, although not diagnostic in itself. Of the factors reviewed, only the presence of lymphoid hyperplasia appeared useful for increasing confidence that a lesion is truly a hematoma and that hemangiosarcoma hadn't been overlooked.

Schaffer PA, Wobeser B, Martin LE, Dennis MM, Duncan CG. Cutaneous neoplastic lesions of equids in the central United States and Canada: 3,351 biopsy specimens from 3,272 equids (2000-2010). J Am Vet Med Assoc. 2013 Jan 1;242(1):99-104.

VDL Pathology post-doctoral fellow Paula Schaffer and Pathologist Colleen Duncan searched the computerized records of CSU's VDL and the teaching hospital at University of Saskatchewan, for 5,141 reports of equine cutaneous biopsy specimens over a 10-year period. A total 3,351 showed histologic evidence of neoplastic disease. They found sarcoid, squamous cell carcinoma, and melanoma were the most common tumors diagnosed. Tumors associated with UV radiation were 2.3 times as common in biopsy specimens received by CSU. Appaloosas and Paints, respectively, were 7.2 and 4.4 times as likely as other breeds to have tumors associated with UV radiation. Thoroughbreds were predisposed to cutaneous lymphoma; Arabians were more likely to have melanomas. Draft and pony breeds were 3.1 times as likely as other breeds to have benign soft tissue tumors. Morgans and pony breeds more commonly had basal cell tumors. Tumors in the perianal region were significantly more likely to be SCC or melanoma while tumors on the limbs were more likely to be giant cell tumor of soft parts. ▲

Diagnostic Sample Quality Assurance

Laboratory Reminders and Updates

Check this quick update on a few quality-assurance reminders from your team at CSU's Veterinary Diagnostic Laboratory:

■ When

submitting swabs for PCR

LAB NEWS

testing, please keep these guidelines in mind:

- ✓ Use sterile polyester (Dacron) tipped swabs with a plastic shaft. Wooden shafts may inhibit PCR.
- ✓ Do not use bacterial transport media (ex - Culturette tube).
- ✓ Send the swab in a sterile red-top tube or other sterile capped tube.
- ✓ Consult CSU VDL website for detailed submission information, including information on transport media to use for PCR samples.
- ✓ Please submit samples as soon as possible and ship overnight; degradation can affect results.
- ✓ Keep samples refrigerated before shipment.
- ✓ Keep samples cold during transport, with the exception of *Tritrichomonas*.

■ Both the Fort Collins and Rocky Ford laboratories are approved to receive submissions of Equine Infectious Anemia (Coggins) test forms and report the results back to veterinarians electronically, via either the Global Vet Links or USDA's Veterinary Services Process Streamlining system. However, it's important that you have all your information submitted to the system at the time your sample is submitted to the lab. Many times the tests are completed, but we are unable to post results to the system because the information is not yet there.

■ A new name has again been adapted for the bacterium *Arcanobacterium pyogenes*. The proposed new name, *Trueperella pyogenes*, has been introduced because the genus *Arcanobacterium* is not monophyletic. *Trueperella* has been proposed in honor of the German microbiologist Hans Georg Trüper. *Trueperella pyogenes*, also formerly referred to as *Corynebacterium pyogenes* and *Actinomyces pyogenes*, may cause abscesses, mastitis and pneumonia in ruminants and in pigs. ▲

The CSU Veterinary Diagnostic Laboratory welcomes all questions regarding sample submission to ensure the most accurate results for your testing needs. Please call with any questions or if you require further information at (970) 297-1233, or visit our website at csu-cvmb.colostate.edu/vdl.

Get to Know the Laboratory

New Members Join the Lab Team

Amy Boyd joins the CSU VDL histopathology lab, where she will be working toward full certification as a histopathology technician upon completion of her training and certification testing.



A native of Greeley, she came to Fort Collins to attend CSU, graduating with a bachelor of science degree in zoology in 2004. She and her husband live in Wellington, where they enjoy all Colorado has to offer, spending their free time snowmobiling, snowboarding, hiking, camping, jet skiing and touring the mountains by motorcycle.

Cassy Grothe joined the lab in September in a lab support position, working in both sample receiving and the virology lab. She earned a Bachelor of Science degree in biology from the University of Texas at Austin and moved to Colorado from Texas in 2008.



Lisa Jackson joined the VDL in March as an administrative assistant II—veterinary transcriptionist. Before recently relocating to Colorado, Lisa worked as an office specialist with the Clark County Office of the Coroner and Medical Examiner in Las Vegas for six years. She has done medical transcription for the past 28 years and brings a wealth of knowledge and experience to the job. She is excited to be here in Colorado and working with the team.



Phil Buxton has a bachelor of science degree from CSU in biology. He has previously worked in two biotech labs in the field of molecular diagnostics, as well as a toxicology lab where he was the quality-assurance officer. He now works for VDL in sample receiving and tissue trimming. He lives in Wellington with his wife, son and daughter.



Wendy Hart joined the VDL in February in lab support, where she handles sample receiving. Originally a native of Palo Alto, Calif., she was raised in Loveland, and eventually began her veterinary career as a veterinary technician at a small animal hospital for five years. She has one daughter who lives in Yuma, who shares her interest in raising and showing American Paint horses. She enjoys working with the people of the lab and the variety of activities she experiences in her daily work.



Lisa Snelling joined the Veterinary Diagnostic Lab in March in a lab support position, working with all of the individual laboratory sections. Lisa is a Colorado native from Kersey. She earned both a bachelor of science as well as a master of science degree in microbiology from the University of Colorado. Prior to joining the VDL, she worked as the biology lab director and instructor for six years at the University of Denver department of biological sciences. ▲





The CSU VDL Advisory Board met in early January to discuss the AAVLD site visit report, future directions, suggestions for new test offerings, suggestions to improve our website, results reporting and billing. Overall they were very complimentary of the service we are providing. Members included:
(Front, from left) Marv Hamann, Dwayne Hamar, Kenny Rogers, Keith Roehr, Sunny Geiser-Novotny, Ed Hansen,

Larry Mackey, Steve Wheeler, Joan Bowen, Norm Brown, Tim Hackett and Barb Powers.
(Back, from left) Gene Niles, Del Miles, Leesa McCue, Don Kitchen, Charlie Davis, Kellee Mitchell, Connie Heighes, Jan Carroll, Kristy Pabilonia, Bob Davies and Gary Mason. Also in attendance, but not pictured: Gregg Dean, Mike Gotchey, Pete Hellyer, Ron Kollers, Elisabeth Lawaczek and Chris Orton.

Guardians of Public Health

Farm Bill Provision Would Help Assure Continued NAHLN Resources

As of presstime, Colorado Senator Michael Bennet was urging the U.S. House of Representatives to find a path forward on a full five-year reauthorization of the Senate-passed Farm Bill, which included his provision to provide a more stable flow of resources for the National Animal Health Laboratory Network (NAHLN). NAHLN monitors animal-borne illnesses that pose significant threats to animal and public health, such as mad cow disease and foot-and-mouth disease. Bennet’s provision, first introduced as the Animal and Public Health Protection Act, creates a funding authorization for NAHLN that protects it against the uncertainty of Congress’ yearly budgeting process.

“The proper funding authorization for the NAHLN is critical,” said Barb Powers, director of CSU’s Veterinary Diagnostic Laboratories, “so states, including Colorado with its NAHLN member laboratory, Colorado State University Veterinary Diagnostic Laboratories, can protect their agriculture industries from emerging and

foreign animal diseases that can cause economic devastation, and also address our nation’s need for a safe, stable and nutritious food supply by protection of not only animal health, but public health.”

“Livestock production sits at the heart of Colorado’s \$40 billion agriculture sector,” said Bennet, a member of the Senate Agriculture Committee. “Labs, like the ones at CSU, help support the economic vitality of our livestock industry and protect the public by identifying diseases early and preventing the consequences of potentially devastating outbreaks. This commonsense, yet vital, research yields tremendous economic and public health benefits to Colorado and the entire country.”

CSU’s VDL is one of the core member laboratories in the NAHLN. State and university laboratories in the NAHLN perform animal-disease diagnostic tests as well as targeted surveillance and response testing for foreign animal diseases. Network labs share information with other labs and public health officials. ▲

CSU VDL International Outreach

VDL Faculty Visit Egypt

In January, CSU Veterinary Diagnostic Lab Pathologist Tawfik Aboellail and VDL Avian Diagnostics and BSL3 Operations Section Head Kristy Pabilonia escorted three veterinary students to Cairo. Aboellail coordinated the experience with Cairo University, his alma mater. Pabilonia serves as the faculty advisor of the International Veterinary Student Association at CSU. The veterinary students spent time learning about veterinary medicine in Egypt, which included meetings with the faculty of Cairo University and tours of dairy, camel and Arabian horse production facilities.

Clockwise, from top left:

- Veterinary students April Zander, Jenn Perez and Edwina Gutierrez visit Cairo University
- Cairo University faculty member Alaa Eldiin Eissa, Tawfik Aboellail, Edwina Gutierrez and Jenn Perez at the Alexandria library
- Kristy Pabilonia at the Great Pyramid of Giza



CSU VDL ON THE ROAD: UPCOMING CONFERENCES, SYMPOSIA AND APPEARANCES

Look for CSU VDL pathologists **Colleen Duncan**, **Tawfik Aboellail** and **EJ Ehrhart** attending the **American College of Veterinary Pathologists** annual meeting, Nov. 16-20 in Montreal.

VDL pathologist **EJ Ehrhart** just returned from a week guest lecturing at New Zealand's **Massey University**.

VDL Western Slope Laboratory Director **Don Kitchen**, Rocky Ford Laboratory Director **Gene Niles**, Pathologist **Tawfik Aboellail**, Avian Diagnostics and BSL3 Operations Section Head **Kristy Pabilonia**, VDL Director **Barb Powers** and others will be in attendance at the annual meeting of the **American Association of Veterinary Laboratory Diagnosticians**, Oct. 17-23, in San Diego. **Aboellail** will offer an oral presentation on an investigative pathology study, Pathologic lesions and pathogenesis of percutaneous infection of CD-1 mice with western equine encephalitis virus (WEEV)

Pabilonia attended a **National Poultry Improvement Plan** contact representative meeting, June 18-20 in Athens, Ga., and will be at a workshop on **Regional Surveillance and Research for Wildlife-Borne Diseases**, Aug. 6-8 in Fort Collins, and a conference on **Options for the Control of Influenza**, Sept 4-10 in Cape Town, South Africa.

VDL Chemistry and Toxicology Section Head **Dwayne Hamar** will present on his work regarding selenium at this year's **Colorado Veterinary Medical Association** annual meeting, Sept. 19-22 in Loveland. Also in attendance will be **Kristy Pabilonia** and VDL Lab Coordinator **Charlie Davis**. Stop by the booth to meet him.

Davis attended the **Western States Livestock Health Association** meeting, March 20-21 in Salt Lake City, where new animal ID requirements dominated discussion of regulatory issues at the meeting. He also represented the lab and its services with a booth at the **Colorado Livestock Association/Colorado Cattlemen's Association** annual meeting, June 17-19 in Breckenridge, and at the summer meeting of the **Colorado Wool Growers Association**, July 16-18 in Montrose. VDL Director **Powers** also attended the CCA meeting.

Davis and **VDL Virology Section Head Hana Van Campen** hosted a University of Nebraska animal science student group with a guided tour of the lab on May 15.

VDL Pathologists **Colleen Duncan** and **Terry Spraker** traveled to Saint Paul Island, Alaska, to conduct research on northern fur seals. **Duncan** will also return to Anchorage in August for polar bear research, and along with **Pabilonia** will travel to Hawaii for a reproductive disease study in Hawaiian monk seals.



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Colorado is well represented by these VDL members on the move internationally.



Update from the Director

I hope summer is going well for all of you. Please find within this issue some exciting news on export testing that has been done at Rocky Ford over the last year or two, truly an amazing feat for this branch laboratory to complete these high volumes of tests under tight, short deadlines. Also you will find interesting articles on cattle *Neospora* and equine selenium toxicosis. A new section in *LabLines* will highlight cases of exotic animal conditions and diseases. Also included, some interesting articles on retinal tumors in dogs and a summary of a variety of research lab residents and faculty have published.



BARBARA POWERS, DVM, PHD, DACVP DIRECTOR

We have new additions to the laboratories, and these new staff members are listed on page six. A number of the staff previously in these positions have either retired or moved out of state for other opportunities.

We are also very excited to announce that early this year, two new clinicians in Clinical Sciences Dairy Population Health Management joined the college. Although in the Department of Clinical Sciences, we will work closely with them to meet dairy diagnostic needs. Our previous *LabLines* highlighted some of the new tests we offer.

On the federal level, our own Colorado Senator Michael Bennet introduced a bill that was added to the Farm Bill authorizing the National Animal Health Laboratory Network. CSU VDL has been a core laboratory in this network since 2002, but federal funding has been inconsistent and difficult, especially in the last few years. We are extremely pleased that Senator Bennet was able to introduce this bill into the Farm Bill, which the Senate eventually passed. This helps not only the State of Colorado, but also the entire nation to protect our food supply. Earlier in 2013, we met with our Advisory Committee, who offered many useful suggestions for further improvement. Please feel free to contact them or us at any time if you have suggestions for our continued improvement.

We hope to see many of you at the Colorado Veterinary Medical Association Meeting in September or at the American Association of Veterinary Laboratory Diagnosticians Meeting in San Diego in October. I hope your summer and fall goes well.

Sincerely,

Barbara E. Powers



Our thanks to the Colorado Cattlemen's Association and the Racing Associates of Colorado for the generous donation of a new microplate absorbance reader for the lab. The reader will help improve the speed and efficiency of our ELISA testing services.