Guardians of Public Health

CSU VDL now houses wild bird influenza tissue reference archive

The Wildlife Services’ National Wildlife Disease Program Wild Bird Tissue Reference Archive was initiated in 2006 as a partnership between USDA’s Animal and Plant Health Inspection Services’ Wildlife Services and the National Animal Health Laboratory Network (NAHLN). The archive consists of swab samples collected for avian influenza surveillance, and has grown to be a valuable repository now housing over 250,000 samples. This collaboration has been a critical piece of Wildlife Services’ effort to establish a network for early detection of highly pathogenic avian influenza (HPAI) in the United States. While highly pathogenic H5N1 avian influenza (AI) has not been found in North America, many of the samples have been critical in characterizing the distribution and movement of low pathogenic avian influenza in North American wild birds, and in assay development.

The Wild Bird Tissue Reference Archive is open and accessible to other agencies, universities, and organizations. We believe it will prove to be an invaluable resource for a variety of studies including: AI-related research, assay validation, emerging disease diagnostics, and retrospective disease studies. The archive was originally located at the National Wildlife Disease Program offices in Fort Collins, Colo. During the summer of 2010, the collection was relocated to the CSU VDL. The archive is jointly administered through a cooperative agreement between Wildlife Services and Colorado State University.

The CSU VDL is excited to house this valuable archive. We are already collaborating with the National Wildlife Disease Program on a research project focused on isolated and sequencing avian influenza virus from these samples.
Case Study

An outbreak of aborted and weak calves associated with leptospirosis

A well managed, mixed breed beef herd began experiencing early parturition. Calving began in the first week of March, 30 days prior to the earliest potential calving date established by bull exposure. During this time the mountain ranch received multiple wet snows that melted, resulting in standing water where cattle where kept. Calves were weak. In spite of nursing attempts, including oral electrolyte supplements, antibiotics and anti-inflammatories, 16 had died by mid-March. Most died within a few hours of birth and never rose to nurse. Death didn’t appear to correlate with age of the mother; half were from heifers and half from cows.

Necropsy and Other Observations

After consultation with his herd veterinarian, the owner submitted a whole calf to the CSU VDL at Rocky Ford. Gross necropsy provided no insight into the cause of death nor the herd problem. Observations included:

- The calf’s lungs were inflated, indicating live birth
- The gut contained a commercial electrolyte and glucose drench; however, no colostrum/milk was noted.
- Vaccine history indicated a well-vaccinated herd with repeated doses of MLV viral products, the last administered in November. *Campylobacter* and *Leptospira* vaccinations were given with the MLV product. Mid-January a multivalent killed vaccine for Rota-Corona viruses, *E. coli* and *Clostridium* type C and D toxoid was given to the pregnant animals.
- Animals were fed bailed native mountain meadow hay, supplied well water in a tank, and provided a commercial mineral supplement.

Diagnostic Findings

- Feed and water analysis indicated normal ranges with no indications of toxins.
- Bacterial cultures from tissues submitted provided no significant specific growth.
- FA results for IBR and BVD were negative on the initial submission; however, a positive BVD FA was found on the Pfizer representative’s submission. The presence of the virus could not be confirmed on PCR, though.
- Initial blood samples drawn from four affected cows on March 15 were paired with follow-up samples on the same cows collected on March 30. Single blood samples were also collected on March 21 with no paired samples. Samples from the initial collection were saved and tested in parallel with the convalescent samples (see table).
- Fecal examinations indicated a significant internal parasitic load in the samples submitted to the Rocky Ford Diagnostic Laboratory, while samples submitted to the Grand Junction Diagnostic Laboratory showed only a slight level of parasitism.

Based on laboratory results, a recommendation to de-worm the cattle and administer a sustained-release tetracycline to all cows and heifers was made to the owner. The owner agreed. Additionally it was suggested the owner provide an additional source of protein, which he did via incorporating a pelleted feed into his program.

At the time the treatment/prevention was carried out, a pharmaceutical-company representative collected additional samples and hand-carried them to the CSU Veterinary Diagnostic Laboratory at Grand Junction. The results of diagnostic studies are summarized from the initial report on that submission: “Laboratory results do not indicate any clear single cause for the problem. There are likely several factors contributing to the premature calves’

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Jim Kennedy, DVM, MS, Director, CSU VDL Rocky Ford Branch.

Results do not indicate any clear single cause for the problem. There are likely several factors contributing to the premature calves’

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REFERENCE

Fall/Winter 2010

LAB LINES

ural exposure.” No follow-up diagnostics have been requested or completed.

DIAGNOSTIC INTERPRETATIONS OF RESULTS

With the exception of the FA positive for BVD and serological results, no diagnostic test confirms a specific etiological agent as the cause of this herd’s weak calf/abortion storm. The FA positive BVD was not supported by PCR or by tissues from multiple calves. Serological evidence for BVD or IBR also does not support either of these two etiological agents, but indicates a well-vaccinated animal, as IBR and BVD titers are found in vaccinated cattle for extended periods when recommended vaccinations are carried out per label instructions. However, the titers for the various serovars of *Leptospira* are significant.

Titers associated with *Leptospira* vaccines are short term and do not reach levels seen in these serum samples. In this case, multiple cows exhibited titers above 1:400, with the highest titer reported at 1:6400. These levels were seen with four-fold variations in acute and convalescent samples. Although no urine samples were collected from cows for culture or PCR for *Leptospira*, one kidney was tested by PCR, which failed to detect the organism. A second sample is being held for follow-up testing, although the need to confirm the etiological agent by culture or PCR is questionable based on the overwhelming serological evidence. Treatment with sustained-release tetracycline resulted as you would expect with *Leptospiral* infection. Little data support the effectiveness of *Leptospira* vaccines as being preventive for disease, in spite of widely accepted use. The most likely serovars associated with this herd problem are uncertain, although Pomona and Grippotyphosa did show consistent increased titers and are associated with the clinical history of abortion storms.

<table>
<thead>
<tr>
<th>Cow ID</th>
<th>LEPTO HARTJO</th>
<th>LEPTO ICTERO</th>
<th>LEPTO CANICOLA</th>
<th>LEPTO GRIPO</th>
<th>LEPTO POMONA</th>
<th>BVD II</th>
<th>BVD</th>
<th>IBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3030 ACUTE</td>
<td>1:200</td>
<td>Negative</td>
<td>1:400</td>
<td>1:800</td>
<td>1:1600</td>
<td>1:1024</td>
<td>1:1024</td>
<td>1:4096</td>
</tr>
<tr>
<td>3030 CONV</td>
<td>1:400</td>
<td>1:400</td>
<td>1:800</td>
<td>1:800</td>
<td>1:6400</td>
<td>1:1024</td>
<td>1:512</td>
<td>1:2048</td>
</tr>
<tr>
<td>7045 ACUTE</td>
<td>1:200</td>
<td>Negative</td>
<td>1:100</td>
<td>1:200</td>
<td>1:200</td>
<td>1:8192</td>
<td>1:8192</td>
<td>1:4096</td>
</tr>
<tr>
<td>7045 CONV</td>
<td>1:200</td>
<td>1:200</td>
<td>1:400</td>
<td>1:800</td>
<td>1:1600</td>
<td>1:16384</td>
<td>1:4096</td>
<td>1:4096</td>
</tr>
<tr>
<td>8007 ACUTE</td>
<td>1:200</td>
<td>1:200</td>
<td>1:800</td>
<td>1:1600</td>
<td>1:3200</td>
<td>1:1024</td>
<td>1:2048</td>
<td>1:4096</td>
</tr>
<tr>
<td>8007 CONV</td>
<td>1:1600</td>
<td>1:400</td>
<td>1:1600</td>
<td>1:1600</td>
<td>1:6400</td>
<td>1:512</td>
<td>1:4096</td>
<td>1:4096</td>
</tr>
<tr>
<td>8013 ACUTE</td>
<td>Negative</td>
<td>Negative</td>
<td>1:100</td>
<td>1:100</td>
<td>1:100</td>
<td>1:4096</td>
<td>1:512</td>
<td>1:4096</td>
</tr>
<tr>
<td>8013 CONV</td>
<td>Negative</td>
<td>1:100</td>
<td>1:200</td>
<td>1:100</td>
<td>1:200</td>
<td>?</td>
<td>1:8192</td>
<td>1:2048</td>
</tr>
</tbody>
</table>

Four-fold variation
Any sample being submitted for culture should optimally be received as soon as possible; unfortunately, samples can’t always reach the lab as quickly as we would like. Therefore, a common concern is urine stability. Clients sometimes worry their sample wasn’t submitted in time or that the sample sat in the refrigerator for too long. Should they?

We performed a small investigation by re-culturing 17 urines, received at different times during a 10-day period, that had bacterial growth. The amount of time elapsed before re-culturing ranged from six days to 14 days. All samples were held at 39º F.

Re-culture showed 14 (83 percent) had the same organism(s) with the same amount of growth—even one that was two weeks old. Three (17 percent) had no growth. A possible explanation for that lack of growth could be that two of the three urines had only 0.25 and 0.5 mL submitted. We recommend sending at least 1 mL if possible. The third urine had such a small amount of growth the first time that perhaps the organism was unable to be detected because of low numbers in the second culture.

Based on this small-scale study, it is fairly safe to assume that as long as you send enough sample and keep it refrigerated there shouldn’t be an effect on the results if the urine is held over the weekend.

### CONCLUSION

It is safe to assume that as long as you send 1 mL of sample and keep it refrigerated there shouldn’t be an effect on the results if the urine is held over the weekend.

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**SUBMISSION GUIDELINES FOR SUCCESS**

**Urine Cultures**

- Submit at least 1 ml in sterile container
- Refrigerate, unless using port-a-cul for transport media
- Deadline 4:30 p.m. weekdays, noon weekends
- Allow three to five days

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**Bacteriology Quality Assurance**

Urine cultures: Are results time- or volume-dependant? Which is better?

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<table>
<thead>
<tr>
<th>Amount Submitted</th>
<th>Species</th>
<th>Date Collected</th>
<th>Date Received</th>
<th>First Culture</th>
<th>Second Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.25 ml</td>
<td>Canine</td>
<td>7/13/2010</td>
<td>7/13/2010</td>
<td>Enterococcus sp. 20,000 cfu/ml</td>
<td>No growth 14 days</td>
</tr>
<tr>
<td>=0.25 ml</td>
<td>Canine</td>
<td>7/14/2010</td>
<td>7/15/2010</td>
<td>E. coli 500 cfu/ml 500 cfu/ml</td>
<td>Same 13 days</td>
</tr>
<tr>
<td>=0.3 ml</td>
<td>Canine</td>
<td>7/15/2010</td>
<td>7/15/2010</td>
<td>E. coli &gt;100,000 cfu/ml</td>
<td>Same 12 days</td>
</tr>
<tr>
<td>=0.3 ml</td>
<td>Canine</td>
<td>7/14/2010</td>
<td>7/16/2010</td>
<td>Proteus mirabilis 1,000-10,000 cfu/ml</td>
<td>Same 13 days</td>
</tr>
<tr>
<td>0.5 ml</td>
<td>Canine</td>
<td>7/13/2010</td>
<td>7/13/2010</td>
<td>Staph. pseudintermedius &gt;100,000 cfu/ml</td>
<td>Same 14 days</td>
</tr>
<tr>
<td>=0.5 ml</td>
<td>Canine</td>
<td>7/16/2010</td>
<td>7/16/2010</td>
<td>Klebsiella pneumoniae 1,000-10,000 cfu/ml</td>
<td>No growth 11 days</td>
</tr>
<tr>
<td>=0.5 ml</td>
<td>Canine</td>
<td>7/19/2010</td>
<td>7/20/2010</td>
<td>Hemolytic E. coli 20,000 cfu/ml</td>
<td>Same 8 days</td>
</tr>
<tr>
<td>=0.5 ml</td>
<td>Canine</td>
<td>7/20/2010</td>
<td>7/20/2010</td>
<td>Enterococcus &gt;100,000 cfu/ml</td>
<td>Same 7 days</td>
</tr>
<tr>
<td>=0.6 ml</td>
<td>Canine</td>
<td>7/20/2010</td>
<td>7/20/2010</td>
<td>E. coli &gt;100,000 cfu/ml</td>
<td>Same 7 days</td>
</tr>
<tr>
<td>=0.75 ml</td>
<td>Feline</td>
<td>7/15/2010</td>
<td>7/16/2010</td>
<td>Enterococcus sp. &gt;100,000 cfu/ml</td>
<td>Same 12 days</td>
</tr>
<tr>
<td>=0.8 ml</td>
<td>Feline</td>
<td>7/19/2010</td>
<td>7/21/2010</td>
<td>Hemolytic E. coli &gt;100,000 cfu/ml</td>
<td>Same 8 days</td>
</tr>
<tr>
<td>=1 ml</td>
<td>Canine</td>
<td>7/21/2010</td>
<td>7/22/2010</td>
<td>E. coli and Beta Streptococcus 300 cfu/ml</td>
<td>Same 6 days</td>
</tr>
<tr>
<td>1.5 ml</td>
<td>Feline</td>
<td>7/15/2010</td>
<td>7/16/2010</td>
<td>Corynebacterium sp. and CNS &lt;1,000 cfu/ml</td>
<td>No growth 12 days</td>
</tr>
<tr>
<td>=1.5 ml</td>
<td>Canine</td>
<td>7/19/2010</td>
<td>7/20/2010</td>
<td>Staph. pseudintermedius &gt;100,000 cfu/ml</td>
<td>Same 8 days</td>
</tr>
<tr>
<td>=2.5 ml</td>
<td>Canine</td>
<td>7/16/2010</td>
<td>7/19/2010</td>
<td>Klebsiella pneumoniae &gt;100,000 cfu/ml</td>
<td>Same 11 days</td>
</tr>
<tr>
<td>=2.5 ml</td>
<td>Canine</td>
<td>7/19/2010</td>
<td>7/20/2010</td>
<td>Enterococcus sp. 20,000 cfu/ml</td>
<td>Same 8 days</td>
</tr>
<tr>
<td>=3.5 ml</td>
<td>Canine</td>
<td>7/13/2010</td>
<td>7/19/2010</td>
<td>Acinetobacter sp. 10,000-100,000 cfu/ml</td>
<td>Same 14 days</td>
</tr>
</tbody>
</table>
Canine Oncology Innovations

Expression of HES-1 in canine osteosarcoma

HES-1, a basic helix-loop-helix (bHLH) transcriptional repressor, is a downstream target of the Notch signaling pathway. Additionally, Notch-independent HES-1 expression has been reported in some human tissues. Notch signaling and HES-1 expression have been linked to growth and survival in a variety of human cancer types. Increased expression of HES-1 has been shown to be associated with increased metastasis and invasiveness in human osteosarcoma. Objectives for this study included confirmation and exploration of HES-1 expression in canine osteosarcoma (OSA).

Quantitative RT-PCR was utilized to quantify HES-1 gene expression in tumor and normal bone samples taken from dogs treated for appendicular OSA at the CSU Veterinary Teaching Hospital with surgical amputation of the affected limb and adjuvant chemotherapy. HES-1 gene expression was elevated in tumor samples relative to matched normal bone, but decreased in tumor samples from dogs with a disease free interval (DFI) of less than 100 days relative to those with a DFI of greater than 300 days.

Immunohistochemistry was utilized to confirm translation of mRNA and expression of HES-1 protein in a subset of the same tumors analyzed by RT-PCR. Protein expression of HES-1 varied across tumors and within individual tumors, with neoplastic cells showing predominantly nuclear and less frequently diffuse cytoplasmic immunostaining. Immunostaining appeared to correlate with quantitative RT-PCR results. Changes in HES-1 gene and protein expression within these tumor samples suggest that alterations in the Notch signaling pathway occur in canine OSA. Furthermore, an inverse relationship of HES-1 expression and DFI warrants additional exploration of the correlation of HES-1 expression with patient survival in canine OSA. ▲

Diagnostic Bacteriology

Should you request anaerobic cultures on urine?

Urinary tract infections pose a significant risk to animals, resulting in inappropriate urination, bladder stones or acute cystitis. So urine cultures are commonly performed.

We retrospectively studied all urine cultures submitted to the CSU VDL between January 2004 and December 2009. The 10,901 urine culture samples were submitted from bovines, equines, canines and felines.

Results showed more than 65 percent of urine samples were reported as no growth. The most common organisms isolated were E. coli (11.78%), hemolytic E. coli (10.56%), and Enterococcus spp. (5.3%). Although anaerobic cultures were requested on 1187 of the urines received by the VDL, only 23 urines had anaerobes isolated (0.006% of all bacteria isolated from urines). ▲

At the VDL, anaerobic cultures of urine are requested and there are concerns as to whether this is a relevant test. This retrospective study clearly illustrates that the recovery of anaerobes from urine is very low, and a specific set of criteria should be developed to determine when urine should be cultured anaerobically. ▲

— Deanna D. Dailey, DVM, VDL Pathology Resident, Liza O’Donoghue, CSU Graduate Student, Kristin P Anfinsen, Norwegian School of Veterinary Science, and Dawn Duval, PhD, CSU Assistant Professor of Cancer Genomics

PRESENTED AT
American College of Veterinary Pathologists

FOCUS
ON PCR

— Denise S. Bolte, Microbiologist, Mike M. Russell, BS, bacteriology technician, and Doreene R. Hyatt, PhD, CSU VDL Bacteriology Section Head

No growth 65%

E. coli 11.78%

Hemo. E. coli 10.56%

Enterococcus 5.3%

Anaerobic .006%

— Denise S. Bolte, Microbiologist, Mike M. Russell, BS, bacteriology technician, and Doreene R. Hyatt, PhD, CSU VDL Bacteriology Section Head

Fall/Winter 2010
Data collected from recent surveys of beef cattle indicate the prevalence of BVD Persistently Infected (BVD-PI) animals in the U.S. cattle population is less than or equal to 0.3 percent. The prevalence of BVD-PI-infected beef herds, as defined by any PI animal detection within the herd is estimated at 4 percent for beef cattle. The prevalence of BVDV-infected dairy herds ranges from 15 percent, based on BVD-PI cattle detected in Michigan herds, to 1.7 percent in a national survey based on detecting BVD virus by reverse transcriptase-polymerase chain reaction in bulk milk samples. In that report, the percent of BVD positive dairy herds ranged from 0 percent in herds with less than 100 cows to 12.8 percent in herds with 500 cows.

Although the apparent prevalence of BVD-PI cattle is low in U.S. dairies, beef herds and feedlots, diagnosis by PI-animal detection is likely to be an underestimate of true herd prevalence. Some BVDV-infected beef herds may be misclassified as uninfected herds if there is no PI animal alive at the time of testing.

OBSTACLES TO CONTROL

Unlike several European countries, which are moving toward mandatory, systematic BVD control programs, the concept of BVD control by eradication has been slow to find acceptance in the United States. Impediments include reluctance to institute a government-regulated control program, available data indicating a low prevalence of BVDV infection in beef and dairy herds, and uncertainty on the part of individual producers about the economic benefits of BVD-control. The lack of a clear danger is compounded by the “Gambler’s” mentality among individual cattle producers. The low herd prevalence validates the general belief that the application of BVDV vaccines is...
Clinical trials now underway at the Animal Cancer Center

**Maintenance Therapy with Palladia Following Doxorubicin-based Chemotherapy for Canine Splenic Hemangiosarcoma**

The purpose of this study is to evaluate the benefit of Palladia (toceranib phosphate) for the treatment of splenic hemangiosarcoma in dogs. In order to be eligible, dogs must have a diagnosis of splenic hemangiosarcoma, have undergone splenectomy, and have received five doses of single-agent Doxorubicin (one treatment every two weeks). Two weeks following the last dose of Doxorubicin, full staging is performed (thoracic radiographs, abdominal ultrasound), and if no evidence of metastasis is found, dogs are eligible to start treatment with Palladia. The study will cover the costs of Palladia, bloodwork, and restaging once enrolled.

**Stereotactic Radiation Therapy for Feline Oral Squamous Cell Carcinoma (SCC)**

This study is designed to evaluate the benefit of stereotactic radiation therapy in the treatment of cats with oral SCC. A biopsy-confirmed diagnosis of squamous cell carcinoma is required, as well as appropriate staging tests (bloodwork, urinalysis, thoracic radiographs). A PET-CT will be obtained to determine the extent of the tumor and to generate a computerized treatment plan for radiation therapy. One dose of stereotactic radiation therapy will be delivered to the tumor. Measurements of tumor oxygen levels will be taken using oxygen probes prior to and the day following treatment. A brief recheck evaluation is required two weeks after treatment, and a second PET-CT will be performed four weeks following treatment. The client is required to contribute $1000 towards staging and treatment; the remainder of the costs will be covered by the study.

We also have several clinical trials available for dogs with osteosarcoma, soft tissue sarcoma, and lymphoma. For more information, a list of all currently available clinical trials, and contact information, please visit us at www.CSUAnimalCancerCenter.org.

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<table>
<thead>
<tr>
<th>Test</th>
<th>Submission</th>
<th>Container</th>
<th>Coolant</th>
<th>Deadline</th>
<th>Results in</th>
<th>Results as</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serology Type I</td>
<td>1 ml serum</td>
<td>RTT</td>
<td>Refrigerate</td>
<td>Mon and Thurs by 5 p.m.</td>
<td>4 days later</td>
<td>SN test, Titors reported and interpreted $7</td>
<td></td>
</tr>
<tr>
<td>and II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorescent Antibody</td>
<td>Fresh lung, liver, kidney, spleen, lymph node, small intestine</td>
<td>Whirlpak</td>
<td>Refrigerate</td>
<td>Mon-Thurs by 5 p.m.</td>
<td>24 Hours</td>
<td>Positive or negative $6</td>
<td></td>
</tr>
<tr>
<td>Virus Isolation</td>
<td>Various tissues listed above, semen</td>
<td>Tissues in whirlpak, semen straw in LN2 or dry ice</td>
<td>Refrigerate; semen in LN2, Dewar or dry ice</td>
<td>Tues. by noon</td>
<td>1-3 weeks</td>
<td>Virus(es) are identified $30</td>
<td></td>
</tr>
<tr>
<td>Antigen Capture Elisa</td>
<td>1 ml serum/ear notch</td>
<td>RTT, RTT with 2 ml PBS</td>
<td>Refrigerate</td>
<td>Wed by noon</td>
<td>Same day</td>
<td>Positive or negative $7</td>
<td></td>
</tr>
<tr>
<td>PCR Type I and II</td>
<td>Tissues listed under FA and/or ear notch or PTT</td>
<td>Whirlpak</td>
<td>Refrigerate</td>
<td>Mon-Thurs by 5 p.m.</td>
<td>1 week</td>
<td>If positive, typing $30 or $70 (Post)</td>
<td></td>
</tr>
<tr>
<td>Bulk Tank Milk PCR</td>
<td>600 cc bulk tank</td>
<td>Screw cap bottle</td>
<td>Refrigerate</td>
<td>Mon-Thurs by 5 p.m.</td>
<td>1 week</td>
<td>Positive or negative, No typing $36</td>
<td></td>
</tr>
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</table>

It has been proposed that inflammation induced by infectious disease agents could trigger formation of the benign, inflammatory polyps that affect the nasopharynx and auditory canal of cats. The objective of this pilot study was to determine the prevalence of feline herpesvirus-1 (FHV-1), feline calicivirus (FCV), Mycoplasma species, Bartonella species and Chlamydophila felis nucleic acids in polyp tissues collected from 30 clinically affected cats. Samples collected from the tympanic bulla from 12 clinically normal cats were also assayed. DNA or RNA of some of the target agents were amplified from samples from 25 percent of normal cats and 33 percent of affected cats. Statistical associations were not detected for individual agent results or grouped results. The study documents that common oropharyngeal or blood borne agents can be detected in the tympanic bullae of normal cats; however, failure to consistently amplify RNA or DNA of the select agents from polyp tissues suggests the agents studied were not directly associated with the pathogenesis of this syndrome in the cats tested. Alternately, the inflammatory response may have cleared microbial nucleic acids to undetectable levels by the time of sample collection.


Individuals of three species of cervids, with varying degrees of alopecia, were examined for ectoparasites: Rocky Mountain elk (Cervus elaphus nelsoni) and mule deer (Odocoileus hemionus hemionus) in Colorado and white-tailed deer (Odocoileus virginianus) in South Dakota. Hair follicle mites were recovered and identified as Demodex kutzeri, a species originally described from the European red deer (Cervus elaphus, from Austria) and the sika deer (Cervus nippon pseudaxis, captive in Germany).

These findings expand the geographic range of D. kutzeri to North America and extend its host range to include the genus Odocoileus. Thus, the host range for D. kutzeri spans two subfamilies of cervids. Additionally, D. kutzeri was identified in material from a white-tailed deer collected in South Carolina in 1971, indicating this parasite has been present, but unrecognized, on U.S. cervids for some time.


This case series presents a unique and unreported variant of feline intestinal mast cell tumour recognized at the CSU VDL. Fifty cases of feline intestinal mast cell tumours described as having a significant stromal component were reviewed. Neoplastic cells formed a trabecular pattern admixed with moderate to abundant dense stromal collagen (sclerosis). Neoplastic cells had poorly discernible intracytoplasmic granules which demonstrated metachromasia with special histochemical stains consistent with mast cell granules. Additionally, a subset of cases stained for mast cell-specific tryptase and c-kit demonstrated positive immunoreac-
tivity. Eosinophilic infiltrates were moderate to marked in almost all cases. Lymph node and hepatic metastases were present in 66 percent of the cases.

In the 25 of 50 cases where treatment and clinical outcome was available, 23 of the patients died or were euthanized within two months of initial diagnosis. This is the first case series to characterize a sclerosing variant of intestinal mast cell tumour in the cat which appears to have a high propensity for metastasis and a guarded prognosis.

Lab Updates

To err is human; to really foul things up requires a computer

You have heard that old saying, “Change is never easy.” Truer words were never spoken. On July 1, we implemented a new Laboratory Information Management System (LIMS). Despite what we thought was adequate preparation, soon we discovered many glitches that made it difficult for us to communicate with you, especially affecting invoicing.

The new system actually takes us longer to enter cases and send results, so while we could perform tests accurately, results were delayed. Then, the new system did not sync well with the fax system, so when we thought we sent results, they sometimes disappeared into cyber space. We have corrected these issues and are working on the results-page format to be more easily interpreted.

One of the biggest glitches was on the invoicing system. At first, it did not work well at all. Then, it had issues interfacing with the university. Now, it is difficult to make adjustments. This caused marked delay in billing. Then, it took us a while to get caught up with the backlog. These invoicing issues are now almost all resolved, we have a new format that is easier to interpret and we are nearly all caught up with sending invoices.

Finally, web access was interrupted for a few weeks, and while now available, doesn’t have all the previous features.

You may wonder why we embarked on this new system. Our old system was over 20 years old, “home-grown,” poorly-documented and simply too old to handle the volume of information we need to operate. An upgrade was a requirement of the last audits by the American Association of Veterinary Laboratory Diagnosticians, as well as by the university system. The switchover certainly did not go as well as we hoped and we sincerely apologize for the inconvenience we caused. We realize this was difficult for you and greatly appreciate your patience.

We are continuing to modify the new system so it will be better than the old system. This requires time and interaction with the corporation that designed the system. Already, significant progress has been made, and we will continue to make more. We also appreciate the feedback many of you have given us to make the system more useful for you. We greatly appreciate your patience and apologize for the inconvenience we caused.

IF YOU HAVE A COMPUTER-RELATED QUESTION, COMMENT OR COMPLAINT
Please don’t hesitate to contact us:
Colorado State University
Diagnostic Laboratories
300 West Drake
Fort Collins, CO 80523
Phone (970) 297-1281
Fax (970) 297-0320
Email: dlab@colostate.edu

CSU VDL’s previously unreported variant of feline intestinal mast cell tumours showed (clockwise from top left) the sclerosing component comprised at least 30 percent of the tumour in most cases, neoplastic cell morphology ranged from round, to polygonal, to spindle-shaped. A moderate to marked eosinophilic infiltrate was identified in 82 percent of the cases.
The Fort Collins and Rocky Ford laboratories now are approved to receive submissions of Equine Infectious Anemia (Coggins) test forms and report the results back to veterinarians electronically. Follow these four steps to begin submitting samples electronically:

1. Obtain level 1 e-authentication by applying for a user ID and a password at: https://vsps.aphis.usda.gov/vsps/

2. After you have received approval for your user ID and password, then you may submit test requests through the following Web site: https://vsps.aphis.usda.gov/vsps/public/Login.do. Through this Web site, you can set up your name and address, a list of animals with owner addresses, and digital photos of the animals if desired. The electronic eEIA form is filled out automatically and sent electronically to us by selecting “Veterinary Teaching Hospital - Ft. Collins” toward the bottom of the pull-down list of laboratories.

3. Serum samples should be sent to us as you usually do with a regular accession form indicating that you are requesting the EIA AGID or ELISA and that you submitted the electronic form. This information will alert the technicians to look for your form on the Web site. You will receive the results electronically through the VSPS Web site.

4. If you require a copy of the form with the technician’s signature, please indicate that on the accession form. The technician will print and sign the official form and the signed form will be faxed to you. Both the e-authentication Web site and the VSPS Web site have “help desk” links, if you have any problems. If you get completely lost, please call Hana Van Campen at (970) 297-1287 and she will be happy to help you or find someone who can.

**SUBMISSION GUIDELINES FOR SUCCESS**

- EIA testing
  - Submit 1ml serum
  - Fees: AGID $8, ELISA $13

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**Four Steps to Automate and Speed your Coggins Test Results**

– Hana Van Campen, DVM, PhD, DACVM, CSU VDL Virology Section Head
Get to Know the Laboratory

New Members Join the Lab Team

Paula Schaffer received her DVM from the University of Tennessee at Knoxville, after which she completed an internship in small animal rotating medicine, surgery and emergency. Pathology has been her long-time passion, and she is thrilled to be in CSU’s anatomic pathology residency program. In her free time, she trail rides with her mustang and swings dances at local venues.

Alana Pavuk Garner grew up in eastern North Carolina, received her bachelor of science degree from Clemson University and her DVM from North Carolina State University. She then practiced small animal medicine in private practice for one year before moving to Colorado. She is interested in naturally occurring diseases in wildlife and their interface with domestic species. Alana is looking forward to a career in academia. In her spare time, she enjoys running, hiking and exploring Colorado.

Clare Hoover grew up in central Pennsylvania. She received her undergraduate degree from Washington and Lee University, and her DVM from Ohio State University. Her research interests include infectious viral diseases and neurodegenerative diseases. In her free time, she likes to play tennis, cook, garden, and spend time with her cat, Oscar.

Diana Sierra Alzate comes originally from Colombia, and has lived in Fort Collins for five years. A biologist, she has worked for almost fifteen years with insects, specifically sand flies. At CSU VDL, she will focus on work involving nematodes, working in coordination with Parasitology Section Head Lora Ballweber.

Valerie Johnson grew up in New Hampshire and received her undergraduate training at Boston University and veterinary training at Tufts University. Following veterinary school, she completed an emergency and critical care residency at the New England Animal Medical Center in West Bridgewater, Mass., and worked there in the ICU for several years. Having had enough excitement on the clinical front, she joined Colorado State as a microbiology resident and graduate student, where she is pursuing an interest in studying the immune response during sepsis. She enjoys yoga, hiking, watching movies and cuddling with her dog.

Michelle McHugh, born in San Antonio, has lived in Fort Collins since 1983 and graduated from CSU with a bachelor of science in zoology. She is glad to be a part of the Veterinary Diagnostic Lab, and looks forward to learning all the services the lab has to offer to its clients and patrons. She enjoys fly fishing with her husband and their three boys, as well as running with her German Shorthair Pointer.

Brandy Nagamine, a Honolulu native and CSU alumnus, joins the VDL as a parasitology technician. She obtained her master of science degree in animal and veterinary sciences from the University of Wyoming’s state veterinary laboratory. Brandy is excited and grateful to be back from Laramie to Fort Collins, working for her alma mater.

CONGRATULATIONS TO OUR 2010 ACVP DIPLOMATES

- Greg Wilkerson
  Anatomic pathology
- Karen Fox
  Anatomic pathology
- Amy Miller
  Clinical pathology
Welcome to the Fall/Winter issue of LabLines. It is snowing outside as I compose this, and the holiday season is upon us. Although economic times are tough, we are all hanging in there, and we actually have been quite busy. Our laboratories’ accessions and tests were increased last fiscal year, reflecting the beginnings of the recovery in the economy. We have a new group of residents that arrived July 1 and new staff that have replaced those that have left. See inside for these updates.

Also, see inside for an update on our new Laboratory Information Management Systems (i.e., computer system) which you undoubtedly noticed. We apologize profusely for the difficulty the change has caused and are working hard to refine the system to work for you and us. We greatly appreciate your loyalty and patience as we work through these issues.

This new system has not affected our ability to perform quality diagnostic testing and see inside for interesting articles on leptospirosis, urine cultures, BVD and oncology.

It was great to see many of you at the Colorado Veterinary Medical Association annual meeting in Loveland and the American Association of Veterinary Laboratory Diagnosticians meeting in Minnesota.

Respectfully

Barbara E. Powers