Diagnostic Insights

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KANSAS STATE VETERINARY DIAGNOSTIC LABORATORY

Accredited by the American Association of Veterinary Laboratory Diagnosticians **March 2011**

Personnel profile — Dr. Kelli Almes

Dr. Kelli Almes has recently been named the faculty supervisor of Necropsy & Receiving at the KSVDL.

Dr. Almes is originally from Hope, Kansas and is a 2005 graduate of the Kansas State University College of Veterinary Medicine after which she completed a residency in Anatomic Pathology. She is board certified by the American College of Veterinary Pathologists.

She joined KSVDL in October 2008 performing routine diagnostic duties and working to increase contract research opportunities for the laboratory. She has recently been promoted to a full-time position and continues those duties along with overseeing the Necropsy & Receiving area of the laboratory. "Within the necropsy and receiving areas we strive to promote excellent customer service which includes answering questions, getting samples where they need to go in a timely manner, and helping our clients take away an overall positive experience when they choose KSVDL for their diagnostic needs."

"We are constantly evaluating and trying to improve these parts of our daily routine with things like a user friendly website and submission forms to assist clients for ease of shipping specimens to the lab."

Dr. Almes may be contacted at kalmes@vet.k-state.edu or 785-532-3995.

D-Dimer testing now available at KSVDL — Dr. Lisa Pohlman

D-dimer is a plasmin-mediated breakdown product of crosslinked fibrin.

D-dimer is more specific for fibrinolysis than FDPs because its formation requires the action of thrombin to produce crosslinked fibrin and subsequent cleavage of this fibrin by plasmin. Thus, the purpose of the D-dimer assay is to detect increased fibrinolysis secondary to excessive coagulation. In contrast, traditional FDP assays cannot distinguish between plasmin action on fibrinogen(fibrinogenolysis) and fibrin (fibrinolysis). As such, FDPs can be increased when plasmin is simply cleaving fibrinogen and there is no clot present.

D-dimer will be increased whenever there is thrombosis and fibrinolysis.

For example in DIC the D-dimer is often very high. In fact, D-dimer values may increase in early DIC before any other coagulation assays, such as PT and aPTT, become abnormal. But high D-dimer is not specific for DIC since any disorder resulting in crosslinked fibrin formation and breakdown can potentially increase D-dimer. This includes both physiologic and pathologic fibrinolysis such as surgical wound-healing and thrombosis of any cause, respectively. Also, if thrombin is activated in extravascular tissues in which fibrinogen is present (for example, a hemorrhagic pleural effusion), crosslinked fibrin could form in these extravascular sites. Subsequent activation of plasmin or release of proteolytic enzymes from neutrophils could then degrade this crosslinked fibrin, and result in production of D-dimer. If this D-dimer is resorbed into the blood, plasma D-dimer concentration will increase.

The D-dimer concentration in healthy dogs and cats is < 250 ng/ml. The D-dimer concentration in most healthy horses is < 500 ng/ml, but has been reported to be as high as 1000 ng/ml in normal horses.

For pricing and instructions regarding sample submission please see our web site.

http://www.vet.k-state.edu/depts/dmp/service/clinpath/clinpath.htm

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Milk cultures — Dr. Gregg Hanzlicek

The European Union has established new somatic cell limits on milk and milk products imported from the U.S.

Although the U.S. legal limit for somatic cell count (750,000 SCC/ml) will not change, the EU's limit is 400,000 SCC/ml.

Milk or milk products from herds with counts above this will **NOT** be allowed to enter Europe.

Because processors many times sell milk to companies that market milk products to Europe, many milk processors have begun to enforce this new limit. In the U.S., about 25% of all herds have at least one month's bulk tank average above 400,000 SCC/ml.

A good first step in helping clients reduce their somatic cell counts is performing milk cultures.

Culturing bulk tanks and clinical cases will help identify the bacteria involved and allow for appropriate preventive measures to be initiated.

Pricing

Individual cow—$4.50

Mycoplasma—$10.50

Bulk tank—$23.50

Turn around time is 36-48 hours for bulk tank and individual cow cultures and 14 days for Mycoplasma cultures.

Contact Dr. Brian Lubbers at 785-532-4012 for Information concerning sampling for milk cultures.

Sulfur Toxicity — Dr. Deon van der Merwe

Steer exhibiting classic symptoms of PEM.
(Photo by Dr. Guy Loneragan)

Sulfur poisoning in ruminants is associated with excessive sulfur in feed or drinking water.

It causes a condition called polioencephalomalacia (PEM). Animals that suffer from PEM may appear blind, and they display various abnormal behaviors such as lethargy and anorexia. The symptoms are similar to those seen in lead poisoning, and lead poisoning should always be considered as a possible alternative diagnosis. The disease typically gets progressively worse. Affected animals become ataxic and eventually lose the ability to stand. Convulsions and coma often precede death. The contents of the digestive tract may become dark grey or black due to staining from iron and copper sulfides.

Common sources of sulfur include contaminated ground water, excessive use of sulfur-containing feed supplements, errors in supplement formulation, and accidental exposure to sulfur-containing fertilizers and medications. In addition to these sources, problems occasionally occur when by-products from industries that use sulfur in their manufacturing processes are used as animal feed.

Examples of such industrial byproducts include molasses, and more recently, **distiller's dried grains (DDG)** from ethanol manufacturing plants. DDG has become an important component in some rations because of its availability, nutritional value, and relatively low cost. The average sulfur content of DDG is around 0.5%, but it is variable and can be as low as 0.1%, or as high as 1.0%, on a dry weight basis.

Cattle require sulfur in the diet at about 0.15% dry weight, and they can usually tolerate up to 0.4% without becoming poisoned. Other sources of sulfur, such as drinking water, and unidentified interactions with other feed components may make animals more susceptible; therefore, 0.3% dietary sulfur is considered to be a safer upper limit.

When DDG is used as a major part of the diet, the variability of sulfur in DDG makes sulfur poisoning a possibility. It is therefore prudent to verify the sulfur concentration of DDG if it is used as a major feed component.

Dr. van de Merwe may be contacted at : dmerwe@vet.k-state.edu or 785-532-4457.

KSVDL Specializations

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Dr. Bill Fortney
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Clinical Pathology
Dr. Lisa Pohlman
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Comparative Hematology
Dr. Gordon Andrews
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Field Investigations
Dr. Gregg Hanzlicek
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Histopathology
Dr. Brad DeBey
785-532-4461

Immunology
Dr. Melinda Wilkerson
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Molecular Diagnostics
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Toxicology
Dr. Deon van der Merwe
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Virology
Dr. Richard Hesse
785-532-4457

Help us help you:

- E-mail and Fax: Please make sure we have your correct email and fax information.

Livestock Rabies — Dr. Mike Moore

In 2010 cattle and cats represented the most commonly diagnosed domestic species with rabies in Kansas (Cattle 5/60 (8.3%), cats 5/42(1.2%)).

To access the full 2010 report go to www.vet.ksu.edu/rabies.

Rabies in livestock is not considered a herd disease and is typically only found in isolated instances. Rabies is transmitted by the bite of a rabid animal or saliva in an open wound. Skunks and bats are our reservoir species and they do not mind sharing.

Vocalization, excessive salivation, tenesmus and aberrant sexual behavior are the most common clinical signs that are observed in bovine positives.

Although these are the most common clinical signs, many times large animals show none of these signs. A bovine case that Dr. M confirmed while in practice was a steer that was being treated for BRDC. The steer appeared comatose while observed from outside the pen. When approached he jumped to his feet and charged blindly around the pen. Side note from Dr. M: do not pierce your hand with a bone shard while removing the brain.

Some states have recommended rabies vaccination for livestock in areas of concentrated wildlife rabies. While this would not be cost efficient in most cattle operations, there are times when we would advise vaccination.

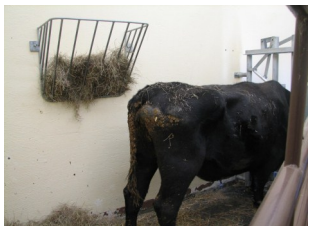
Show animals, 4-H livestock, dairies and hobby-farms all have the potential for above average human interface with their animals. In the past, the greatest human exposure threat from livestock has been from positive animals at fairs, petting zoos and livestock shows. Therefore, we recommend vaccination in these populations. Rule of thumb: If it has a name, vaccinate it.

Current rabies vaccine is inexpensive and highly efficacious. Some rabies vaccines are not labeled for use in livestock, but off- label use has very little risk and a high probability of immunization.

While the veterinarian assumes the liability when using a rabies vaccine off- label, in our opinion, along with good client communication, the benefits of vaccination could be high.

We may be reached for questions or comment at: mcmoore@vet.ksu.edu or 785-532-4503.

Johne's Case Report — Dr. Amanda Hartnack



An 8 year old Angus cow presented to the KSU VMTH because of a one-month history of diarrhea and weight loss. On presentation, her body condition score was 3 out of 9. Submandibular edema was present, and she had pipe-stream diarrhea.

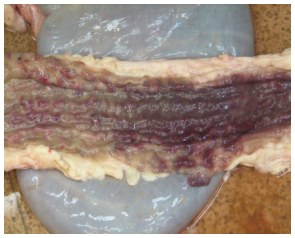
Serum biochemistry revealed a hypoproteinemia (4.6 g/dl) characterized by a hypoalbuminemia (1.7gdl). Johne's Disease (*Mycobacterium avium* ssp. *paratuberculosis or MAP*) was suspected based on the clinical exam and initial laboratory findings.

A rectal mucoscal scraping was performed, which revealed 3+ acid fast rods on microscopic examination. This finding is consistent with Johne's disease.

A fecal sample was submitted for Johne's PCR, and it was positive. Blood was submitted for Johne's and bovine leukemia virus AGID, and both tests were positive.

The prognosis for cows in the clinical stages of Johne's disease is poor; therefore, the cow was euthanatized. On necropsy examination, the mucosa of the duodenum, jejunum, and ileum was severely and diffusely thickened, bright red, and roughened.

Histopathologic examination of the small intestine revealed moderate to large numbers of macrophages, epithelioid cells and some multinucleated giant cells in the lamina propria and submucosa of the duodenum, jejunum, and ileum, some of which contained numerous acid fast test positive rods within the cytoplasm.



Classical gross intestinal appearance of Johne's disease

Histopathologic examination of the lymph nodes revealed mild multifocal granulomatous lymphadenitis, with intralesional intracytoplasmic rods.

Dr. Hartnack may be reached at: 785-532-2700.

Help us help you:

- **Please make sure you are using the current KSVDL forms: go to www.ksvdl.org for the latest version.**

Canine Brucellosis Testing Options Part 2—Dr. William Fortney

While a definitive diagnosis of canine brucellosis can be made by culturing the organism from infected tissues or whole blood, serologic testing continues to be the most commonly submitted diagnostic screening tool despite the discordant results. Interpretation of the various serological test results or bacterial cultures can be challenging and confusing when screening a newly acquired potentially infected dog prior to entry into a breeding colony, or attempting to identify all of those infected breeding animals in a kennel disease eradication program.

Transmission of *B. canis* occurs after ingestions of the organism or from contact with the organism through mucus membranes or broken skin. The incubation period is variable from 2 weeks to several months. This "incubation window" is problematic for identification of **early** infections.

Various antibody titer-based agglutination *B. canis* serology tests are commercially available for use as diagnostic screening tools. The KSVDL currently uses a commercial two-step rapid slide agglutination test; **Canine Brucellosis Antibody Test Kit D-Tec CB** (Symbiotics Corp, San Diego, CA). All **positive** serum samples are routinely sent to the Cornell University Diagnostic Laboratory for confirmation by AGID testing and/or culturing whole blood is recommended.

1. The Rapid Slide Agglutination Test **(RSAT)** is a very sensitive test for *B. canis* approximately 3- 4 weeks following infection once significant patient antibody titers have developed. After that point in time, **negative** test results are considered reliable in identifying **non-infected** dogs, but the test lacks specificity resulting in numerous false positive tests. Consequently any **positive** RSAT test results should always be verified with additional testing methodologies.

2. Adding 2-mercapto-ethanol to the serum, **2-Mercapto-Ethanol Tube Agglutination Test (2ME-RSAT)**, will reduce the number of **false positive** RSAT test results. Therefore a **negative** 2ME-RSAT test result indicates the initial **positive** RSAT test result was in fact a **false positive** test OR that the dog is in the **very early stages** of *B. canis* infection and re-testing is indicated. If the 2ME-RSAT test is **positive**, then the sample should be retested using the **AGID** test and/or a blood culture.

3. **Agar-Gel Immunodiffusion (AGID)** is the most accurate serologic test and is currently available through the Cornell University Diag. Laboratory, Ithaca, NY 607-253-3900. Unfortunately AGID test only become positive 12 weeks after infection, making the AGID testing less sensitive than the **RSAT / 2-ME RSAT** in detecting **very early** *B. canis* infections.

Additional reading;

Johnson, Shirley D.; *Canine and Feline Theriogenology*, 2008, pg 319–21. Elsevier, Phil, PA.

Tilley, Larry, P.; *The 5 Minute Veterinary Consultant*, 2009, pg 408-09. Lea & Febiger, Phil, PA

Wanke, W. W.; *Animal Reproduction Science*; 2004, pg 195-206. Elsevier, Phil, PA.

Canine Brucellosis in Kansas—Dr. Paul Grosdidier, Kansas Animal Health Dept.

The Kansas Animal Health Department (KAHD) received reports of Canine Brucellosis dogs from 8 facilities last year. In most cases these dogs had already been confirmed infected with brucellosis by AGID or Brucellosis culture.

Canine Brucellosis is a reportable disease in Kansas, so ALL positive tests run at Veterinary Diagnostic Labs or veterinary clinics in the state are to be reported toKAHD.

Kennels seem to be particularly at risk, especially those that do not require prior testing of new dogs.

When Brucellosis is found in a kennel, the dogs from this premise are restricted from being moved until the owner and veterinarian have established a testing and biosecurity protocol designed to eliminate brucellosis from the premise. Experience has shown that once established, Canine Brucellosis can be a difficult and costly disease to eliminate. By the time the clinical signs of abortions or infertility in males and females are noted, it has often spread to numerous others. For this reason, it is advisable for anyone breeding dogs to test all new dogs prior to breeding them. Maintaining closed operations or using only stock from operations that have similar testing practices as your own are also helpful to prevent this disease from being introduced.

To report Canine Brucellosis, contact the Kansas Animal Health Department at 785-296-2326.

Developing, Delivering Accurate, Innovative Diagnostic Services

The mission of the Kansas State Veterinary Diagnostic Laboratory (KSVDL) is to develop and deliver accurate, innovative, and timely diagnostic and consultative services to the veterinary and animal health community while providing support for teaching, training, and research programs.

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We're on the web!
www.ksvdl.org

Continuing Education

March 27, 2011
28th Annual Frank W. Jordan Seminar
For more information and registration go to:
Frank W Jordan Seminar

June 5-8, 2011
73rd Annual Conference for Veterinarians

Test Results & Schedules

Laboratory results may be accessed online 24 hours a day, 7 days a week!!

To set up an account go to:
www.ksvdl.org

KSVDL will be closed on the following days:

Memorial Day: May 30, 2011
Independence Day: July 4, 2011
Labor Day: September 5, 2011
Thanksgiving: November 24 and 25, 2011

TO RECEIVE THIS NEWSLETTER BY E-MAIL, CONTACT: DlabOffice@vet.k-state.edu