The primary 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 in Kansas and the nation. The KSVDL is a full-service, AAVLD-accredited laboratory, offering a complete range of diagnostic services for all species.

Diagnostic INSIGHTS

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Christine Chainey, Microbiologist II, Bacteriology Section of KSVDL

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***Diagnostic Insights* welcomes your suggestions for future articles or comments about current articles.**
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Gary Anderson, DVM, MS,PhD

It is a pleasure to begin this issue with an introduction of new KSVDL personnel. As many of you know, we have given considerable emphasis to our Molecular Diagnostics section during recent months, and that effort continues with the recent hiring of Jianfa Bai, MS, PhD, Assistant Professor, Sean Smith, BA and Scott Hahn, BS, MS who are Research Associates. Our Pathology section has also made recent additions with Dr. Mary Wight-Carter as our new pathologist and Jessica Anderson, BS, and Michael Dinwiddie, BS, as Research Assistants working in the histo/immunopathology area. Our Rabies section has hired Samaria Alston, BS, in client communications and Brandy Gowdy, BS, and Florence Wang, BS, as Research Assistants. Chasity McDonough, BS, is an Accounting Specialist in our Business Office. Our courier route is now in the capable, experienced hands of Jim Hartigan. We are very pleased to welcome all of these co-workers to our KSVDL team and firmly believe that each of them will allow the KSVDL to better serve you, our valued clients and stakeholders.

I want to take this opportunity to remind you KSVDL will be closed on the following dates: Veterans Day (11/12), Thanksgiving Holiday (11/22 and 11/23), and Christmas (12/25/07).

We always appreciate your business and the efforts you make to partner with us – thank you! Please do not hesitate to contact me or any of our personnel if there is any way we may be of help to you. I may be contacted directly at 785-532-4454 or ganders@vet.k-state.edu and any of us may be reached through our Administrative Office toll-free 866-512-5650 or 785-532-5650 or dlaboffice@vet.k-state.edu

ANNOUNCING

Global VetLink Online EIA Testing

The KSVDL has been pleased to offer online EIA (Coggins) testing through GlobalVetLink (GVL) for more than a year now. After thorough review of GVL's web-based application, K-State supports and encourages practitioners to take advantage of the benefits that the online process has to offer. Practitioners around the country have been generating e-Health Certificates and EIA Certificates for six years so the process has been well tested.

The core advantages to converting your current certificate process into an electronic process include the elimination of paper, faster results, digital pictures and savings of administrative time and money. As practitioners, GVL's application allows you to store all your data (owner information, animal information, and certificates) in a secure on-line location that can be accessed at your convenience. GVL also automatically sends all certificates generated through them directly to the proper animal health officials. Certificates are recognized in all 50 states and 3 US Territories.

We recognize that not all practitioners currently have the capabilities to make the transition from paper to electronic certificates; however, we encourage you to embrace this new technology to ease your paperwork! If you have questions about the online certificate process and what it entails, contact GlobalVetLink at 515-296-0860 or go to www.globalvetlink.com to learn more about the products. GlobalVetLink applications include online Health Certificates (OCVIs), EIA (Coggins) Certificates, electronic Veterinary Feed Directives (VFDs), and For Sale Certificates (for small animals).

Kansas State Veterinary Diagnostic Laboratory (KSVDL) Policy Statement Regarding Live Animal Receiving and Euthanasia

KSVDL will receive and provide euthanasia for live food production animals (cattle, sheep, goats, pigs) being presented for diagnostic testing services during regular business hours only (8:00 am – 5:00 pm Monday – Friday). No live food production animals will be accepted after hours without prior notification of the necropsy pathologist on Receiving duty that day so that adequate staff can be present to handle the animal(s).

KSVDL will not accept or euthanize any other live animals at any time including companion animals, horses, wildlife, and exotic species that are intended for postmortem examination and diagnostic testing. These animals must be euthanized prior to submission to the diagnostic laboratory.

K-State College of Veterinary Medicine - Continuing Education Opportunities

November 2-3, 2007 - *Veterinary Career Opportunities Workshop*
January 11, 2008 - *Evaluation, Selection and Management of Breeding Bulls*
January 26, 2008 - *Canine Care Workshop*
February 10, 2008 - *16th Annual Small Animal Conference on Clinical Hematology and Hemostasis*
March 1-2, 2008 - *Equine Reproduction Conference for Veterinarians*
June 1-4, 2008 - *70th Annual Conference for Veterinarians and KVMA Veterinary Trade Show*

For more information on these conferences, contact:
Linda M. Johnson, PhD or Marci Ritter - Phone: 785-532-5696 - E-Mail: VMCE@vet.k-state.edu
Visit our website: www.vet.k-state.edu - Click on Continuing Education

Annual Boosters for Horses Should Include Rabies Prophylaxis

by Elizabeth Davis, DVM, PhD, DACVIM - Large Animal

Effective control of infectious disease is a critical issue for health maintenance. Zoonotic diseases are of paramount importance with regards to diseases control. In particular, immunization strategies that limit the spread of diseases that can be spread from domestic species to humans are a goal of all veterinary professionals.

A disease of particular concern which has significant zoonotic potential is Rabies. Rabies is large cylindrical viral disease classified in the genus Lyssavirus, family Rhabdoviridae. Rabies virus is heat-labile and sensitive to destruction by most disinfectant agents. Disease transmission is a result of virus laden saliva contaminating a wound or mucous membrane of a susceptible host. Common hosts in the United States include skunks, raccoons, red fox and bats. The incubation period in horses is reported to be from 9 days to 1 year. Clinical signs vary and may include colic, behavior change, ataxia, or paralysis. Three manifestations of disease include the cerebral (furious) form, the brainstem or "dumb" form, and the paralytic form.

Human Health Concerns: Annually we see horses included in this list, both in the state of Kansas as well as in our Veterinary Medical Teaching Hospital. The KSVDL Rabies laboratory report for 2006 revealed a total of 1250 animal samples were tested with 74 (5.9%) animals testing positive. Most commonly, horses that suffer from rabies virus infection are those which have not been properly or recently (annual booster) vaccinated. Poorly vaccinated individuals maintained in an environment with human contact represent a risk for human exposure to this fatal virus. So far in 2007, the KSVDL has tested 921 animal samples in Kansas with 90 positives being identified. Refer to chart.

2006 KSVDL Rabies Report		2007 KSVDL Rabies Report (YTD)	
Sample/Animal	# Positives	Sample/Animal	# Positives
Skunks	53	Skunks	65
Bovine	9	Bovine	7
Bats	5	Bats	6
Equine	4	Equine	3
Canine	2	Canine	
Coyote	1	Feline	8
		Goat	1
TOTAL	**74**	**TOTAL**	**90**

It is the recommendation that immunization of all domestic species, including horses, is an important prophylactic strategy to reduce the incidence of disease and the potential for human exposure.

Equine Polysaccharide Storgage Myopathy (EPSM)

by Kristen Patton, DVM, PhD, DACVP

ESPM has various clinical manifestations vary from over tying up to vague muscle atrophy to single limb recurrent lameness. This disease has been reported in numerous horse breeds :

- Draft breeds and derivations of draft breeds including the older lines of many warmblood breeds and American Warmbloods that are derived from draft horses
- Quarter Horses and Quarter Horse-related breeds including Quarter horse cross breeds, Paints and Appalossas
- Some lines of Thoroughbred horses.

In all cases, muscles from affected horses contain increased free glycogen and complex polysaccharide.

EPSM Diagnosis: Confirmation of the disease can be performed by the use of three concurrent methods: 1) muscle biopsy with PAS and PAS + amalyase staining, 2) blood chemistry analysis comparing pre and post exercise muscle enzyme analysis including aspartate transaminase (AST) and creatine kinase (CK) , and 3) dietary changes including feeding a high fat, low carbohydrate diet.

Performing the biopsy: Muscle biopsies are taken from standing, sedated horses using local anesthetic. The site of choice is the semimembranosis or semitendonosis muscle. Locate the muscle adjacent to the tail. To make sure that the tail will cover the scar for cosmetic reasons, biopsy the muscle medially on the thigh under the tail hair. Infiltrate local anesthetic around the site of biopsy. Incise the skin and underlying fascia. Then localize a section of the muscle undermining a region approximately 1 cm in diameter and 2 cm long, leaving the ends attached while performing the localization. Clamp the muscle at the proximal end using forceps and incise the muscle belly just proximal to the clamp. Then hold the muscle firmly with the clamp and cut the distal end. Without proper retraction technique the muscle will retract and the localized piece will be difficult to retrieve.

Submitting the sample: Following removal of the section of muscle, place the piece of tissue onto a dry wooden popsicle stick, this prevents retraction artifact. Leave the tissue on the stick to adhere for 5 minutes and place the stick with attached tissue in formalin. To ensure adequate fixation, make sure there are 10 parts 10% neutral buffered formalin to 1 part tissue. Submit formalin fixed specimens in wide mouthed shipment jars with complete history packaged in a separate plastic bag to KSVDL. Please clearly note on history that testing for EPSM is to be performed.

Deborah Oehme Rainbolt and Dr. Fred Oehme

Professor's Children Establish Scholarship

The children, and their families, of Dr. Frederick Oehme have made a gift to the Kansas State University Changing Lives Campaign to establish the Dr. Frederick W. Oehme Toxicology Scholarship. The scholarship is designed to honor Oehme and provide assistance to students properly enrolled in the College of Veterinary Medicine at Kansas State University.

First preference will be given to a graduate student doing research specific to toxicology in the departments of Diagnostic Medicine and Pathobiology or Anatomy and Physiology. Second preference will be given to a senior student intending to work in an area of applied toxicology upon receiving his/her doctor of veterinary medicine degree.

Dr. Oehme is a professor in Diagnostic Medicine and Pathobiology at K-State. He received his bachelor's and doctoral degree in veterinary medicine from Cornell University and his master's degree from the College of Veterinary Medicine at K-State. He also earned doctorate degrees in veterinary medicine from Justus-Liebig University, Germany, and toxicology from the University of Missouri, Columbia.

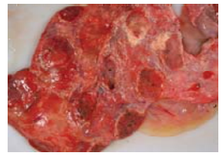
Dr. Oehme's lifelong achievement has brought much notoriety to the College of Veterinary Medicine. Through this scholarship, Dr. Oehme will continue to inspire students, and it will serve to attract the best of the best to this important field. Gifts and donations from alumni and friends create opportunities for students to grow and to challenge themselves. They also play a key role in supporting our faculty and improving our facilities. Gifts like this prove unequivocally that people truly make all the difference!

Coxiella burnetii (Q Fever) Abortion in Goats

by Jerome C. Nietfeld, DVM, PhD, DACVP

In July 2007, we identified *Coxiella burnetii* (rickettsia) infection in the placenta from twin aborted goats. They were from the second female to abort late in pregnancy out of the first 10 females to kid. Many animals are susceptible, but cattle, sheep, and goats are the most common carriers. In ruminants most infections are subclinical, but the most common clinical manifestation is abortion, especially in goats. A study from California found *C. burnetii* to be the second most common cause of abortion, with *Chlamydophilia* (Chlamydia) *abortus* being first. Typically the abortions are late in pregnancy, the fetuses are fresh, and there is placentitis. The placenta contains very high numbers of rickettsia, and humans can be infected by aerosol or ingestion. The organism is also shed in milk—the pasteurization temperatures and times for milk are set where they are to kill *C. burnetii*.

Human Health Concerns: *Coxiella burnetii* is a rickettsia that causes Q (Quey) fever in humans. It is very contagious to humans and is very resistant to environmental deactivation. I know of two instances where there were human infections associated with aborting goats with Q fever. In humans, *C. burnetti* causes flu-like symptoms that vary greatly in severity and occasionally myocarditis; many cases are subclinical. *C. burnetii* is considered to be a potential bioterrorism agent and the department of health should be notified, but this is not mandatory at this time.



Purulent inflammation in the placenta from a goat infected with *Coxiella burnetii*

Congenital Goiter in Goats

by Brad M. DeBey, DVM, PhD, DACVP

Goiter (thyroid hyperplasia) in neonatal goats and sheep can occur due to maternal dietary deficiency of iodine or consumption of goitrogens, and due to inheritance. The neonatal kids or lambs will be born with grossly enlarged thyroid glands, and may also have alopecia and a swollen tongue due to the hypothyroidism. Consumption of goitrogenic compounds such as thiouracil, sulfonamides, and plants of the Brassicaceae family may contribute to or cause congenital goiter. Plants in the Brassicaceae family have glucosinolates that are degraded in the rumen to goitrin, which is responsible for inhibition of the organification of iodine (inhibiting the formation of thyroid hormones). Specific plants in the Brassicaceae family include cabbage, broccoli, kale, turnip, and rapeseed. Inherited congenital hypothoroidism and goiter formation is also known to occur in several breeds of goats, including Boer goats. Congenital goiter in goat kids may result in prolonged gestation, and larger goiters may cause dystocia.

A stillborn Boer goat with congenital goiter and alopecia.

Bovine Viral Diarrhea Virus Infections in Llamas and Alpacas

by David E. Anderson, DVM, MS, DACVS, Professor and Head, Agricultural Practices

Although BVD is a widely recognized pathogen in cattle, information about the disease in llamas and alpacas is lacking. Antibodies to BVDv have been detected in blood from llamas and alpacas for more than 20 years; however, clinical disease has only recently been recognized. Persistent viremia has been found in some young alpacas with chronic weight loss or "ill thrift" syndrome.

Clinical signs reported from known persistently viremic camelids are ill thrift, diarrhea, and abortion. It is not well understood if crias can become persistently infected (PI) like calves, but persistent viremia (4 weeks) has been documented in alpacas. The route of transmission in camelids is not known, but it is believed to occur through direct contact with secretions from an infected animal (saliva, urine, nasal discharge, tears, feces). Most camelids having been classified as "persistently viremic" eventually test negative suggesting that "PI" is rare. If PI crias do exist then transplacental transmission of BVDv must also be a route of transmission. Most reported cases of BVD in alpacas occurred in animals that had close contact with cattle, raising the question of whether the most likely source of BVDv infection in camelids is cattle.

Currently, tests recommended for use in llamas and alpacas include the PCR test and virus isolation. The antigen-enzyme-linked immunoabsorbent assay (Ag-ELISA), does not seem reliable based on preliminary testing with few known infected alpacas. Multiple tests may be important for diagnosing BVDv in New World camelids. Currently, pooling of samples should be minimized so that accuracy can be maximized. It is recommended that a necropsy and test be performed for BVDv on all aborted or stillborn crias and blood samples from the respective dam be tested.

Recommendations for decreasing BVDv infections in llama and alpaca herds include:

- maintaining a closed herd,
- employing strict biosecurity protocols,
- screening the herd for BVDv,
- quarantining new arrivals for a minimum of 30 days
- testing for BVDv using PCR on whole blood.
  - If negative, then the animal can be added to the resident herd.
  - If positive, then the animal should remain in quarantine and be retested in 4 to 6 weeks to determine if the animal has a persistent or transient infection.

Prevention of BVDv through vaccination has been considered in llamas and alpacas; however, there is no BVDv licensed vaccine for use in camelids. Currently it is not recommended to vaccinate llamas and alpacas with the bovine BVDv vaccine because the vaccine may interfere with identifying truly infected animals. If vaccination is chosen in a herd, only killed virus vaccine should be used.

As llama and alpaca populations in the US grow, it is important for producers and veterinarians to be aware BVDv infections are possible in both species and that chronic disease in juvenile alpacas has been documented.