

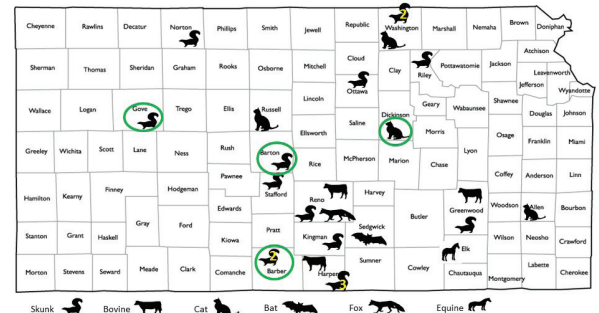
# DIAGNOSTIC INSIGHTS

## Rabies in Cattle

By Ingrid C. Garrison, DVM, MPH, DACVPM, State Public Health Veterinarian, KDH and Susan Moore, PhD, MS, MT(ASCP)SBB, Director, KSVDL

### What you need to know

- Rabies should be on the differential diagnosis list for: abnormal behavior, inability to swallow, lameness, and central nervous system abnormalities.
- Rabies virus is shed in saliva: wear personal protective equipment (gloves, goggles, mask) during physical exam, necropsy, and collecting specimens.
- Cattle are considered exposed to rabies if:
  - A calf is nursing a rabid cow
  - A cow is nursing a rabid calf
  - A cow has been bitten by a rabid animal
- Rabies, in animals, is reportable to the Kansas Department of Health and Environment at 1-877-427-7317.
- The local health officer, with the local health department, has legal authority to determine quarantine location.
- Fresh, intact brain is needed for the rabies diagnostic test. Please call KSVDL Client Care @ 866-512-5650.



Numbers within silhouettes indicate total number of cases (>1) for that species

### Clinical Disease

Cattle have been the primary domestic animal species with rabies in Kansas for the last 3 years. There were 10 cattle diagnosed with rabies in Kansas in 2015 and 3 cattle to date in 2016. The rabies virus is a lyssavirus and is highly neurotropic; the virus travels from the peripheral nerves to the spinal cord and into the brain. The incubation period is variable, usually 1-2 months, and depends upon the location of inoculation site. In Kansas rabies is typically transmitted through the bite of an infected skunk; the closer the bite is to the head of the cow the shorter the incubation period. The rabies virus causes encephalitis with rapid progression of the disease over the course of a few days to a week culminating in death. The initial signs are non-specific and can make diagnosing rabies challenging. Clinical signs are variable and can include anorexia, pruritis, ataxia, lameness,

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**TO SET UP AN ACCOUNT GO TO:**  
[www.ksvdl.org/accounting-and-billing/](http://www.ksvdl.org/accounting-and-billing/)

### **Rabies in Cattle (continued from page 1)**

tenesmus, hypersalivation, and aggression. Rabid cattle may appear to be choking which prompts owners, and veterinarians, to insert a hand into the mouth in an attempt to remove a foreign body. Distinct vocalization, bellowing, that some veterinarians say is specific to rabies is a common sign. Rabies should be on the differential diagnosis list for cattle that exhibit abnormal behavior, inability to swallow or choke, neurological abnormalities, and lameness.

### **Prevent Exposure**

The rabies virus is found in saliva and neural tissue (e.g. brain, spinal cord, nerves). Cattle can shed rabies virus in their saliva and can potentially infect other animals and humans. Veterinarians should wear personal protective equipment (PPE) when examining a suspect rabid animal, or when collecting/handling specimens, to prevent exposure to saliva. PPE should include disposable gloves and goggles or mask to prevent contact of mucous membranes or open cuts on skin with saliva or neural tissue. If you are exposed, immediately wash the wound or cut with soap and water. If saliva comes into contact with mucous membranes immediately flush with fresh clean water. Consult your healthcare provider for bite wound management to include; appropriate antimicrobial therapy, a tetanus immunization (if not current), and an evaluation for rabies post-exposure prophylaxis.

Veterinarians and others at frequent risk of rabies exposure, should be vaccinated and have their rabies titer checked every two years; a booster vaccine is recommended if the titer is below 0.1 IU/mL. If you have been previously immunized against rabies, and have been exposed, you will only need two doses of vaccine. For unvaccinated people after exposure, the complete post exposure treatment consists of administration of rabies immunoglobulin at the site of the bite and a series of rabies vaccinations. The Kansas Department of Health and Environment can provide recommendations for post-exposure prophylaxis to veterinarians and healthcare providers.

### **Public Health**

Rabies in animals is reportable, by state statute, to the Kansas Department of Health and Environment. The

brain tissues of rabies suspect animals are examined for the presence of rabies infection at the KSVDL Rabies Laboratory. The laboratory notifies KDHE of all rabies positive animals. The local health department will conduct an investigation to identify people, and animals, that were potentially exposed to the rabid cow and provide recommendations for rabies post-exposure prophylaxis for people. The local health department also has the authority to quarantine unvaccinated animals that were exposed to the rabid animal. If a rabid cow is nursing a calf the calf is considered exposed to rabies. If a nursing calf is rabid, the cow is considered exposed to rabies. The exposed animals (if not vaccinated against rabies) can be immediately euthanized or quarantined for 6 months. Cattle exposed to rabies cannot be processed at a USDA facility; however, they may be custom slaughtered. Rabies vaccination is recommended for valuable stock, and show cattle, or for livestock that has frequent contact with the public.

If you suspect rabies in any animal, contact your local health department or KDHE at 1-877-427-7317 or [EpiHotline@kdheks.gov](mailto:EpiHotline@kdheks.gov). More information about rabies, including management of other animal species and post-exposure prophylaxis, can be found at; [http://www.kdheks.gov/epi/human\\_animal\\_health.htm](http://www.kdheks.gov/epi/human_animal_health.htm)

### **Diagnostic Test**

Fresh, intact brain is needed for rabies testing. Contact the Rabies Laboratory for instructions to submit a rabies suspect specimen or to submit a serum sample for rabies titer check at 1-785-532-4483 or [rabies@vet.k-state.edu](mailto:rabies@vet.k-state.edu); submission information and information on rabies occurrence in Kansas and Nebraska can be found at <http://www.ksvdl.org/rabies-laboratory/diagnostic-test/index.html>. A video on bovine rabies sample collection is available on the KSVDL YouTube Channel; <https://www.youtube.com/watch?v=01gXa8KkuPA>

## **Extraordinary KSU College of Veterinary Medicine Student Efforts**

Starting in the fall of 2015, a small group of dedicated students from the class of 2017 have been spending time after class with the KSVDL advancing their education and perfecting their clinic skills.

These students have spent after class time on Friday afternoon (18 sessions) rectal palpating cows to improve their pregnancy diagnosis skills. All have become very proficient at pregnancy diagnoses that include pregnancies of gestational lengths of less than 40 days to third trimester!

Many of the same students also spent their Monday evenings learning about practical cow-calf nutrition. In all, eight sessions were conducted, and students gained experience building and critiquing rations, formulating appropriate mineral supplements, using BRANDS™ nutrition software. They have the necessary skills to be able to provide nutritional services to their cow-calf clients upon graduation!

The students who participated in these activities included:

### **Pregnancy palpation wet labs:**

Lauren Christensen  
Chris Eckert  
Jennifer Fallon  
Kaitlin Foley  
Savannah Isley  
Erin Jobman  
Alissa Kirchhoff  
Jacey McDaniel  
Lorna McPeek  
Landon McQuilliams  
Erin Schmidt  
Bobbi Ann Shanks  
Quynn Steichen  
Ben Suchsland  
Elli Unruh  
Joanna Wilson

### **Cow-calf nutrition wet labs:**

Lauren Christensen  
Chris Eckert  
Kaitlin Foley  
Savannah Isley  
Alissa Kirchhoff  
Jacey McDaniel  
Lorna McPeek  
Landon McQuilliams  
Bobbi Ann Shanks  
Quynn Steichen  
Elli Unruh  
Anamarie Weber



*Students enjoy an appreciation dinner.*

*If you will be looking for a new graduate to join your practice in 2017, these would be excellent choices!*

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## **KSVDL to Host Wet Lab at Annual Conference:**

### **BRDC Case-Based Diagnostic Sampling and Result Interpretation**

This wet lab will focus on hands-on exercises concerned with appropriate sampling techniques for both ante and post mortem BRDC diagnostic workups. In addition, this lab will include discussions concerning the interpretation of PCR Ct test results, using real-life cases.

**Saturday, June 4, 2016 • 1:00 p.m. - 4:00 p.m.**

**Location:** Mosier Hall KSVDL Necropsy Floor and Conference Room D-103

***We're only accepting 12 attendees to this exercise, so sign-up today!***

**Registration:** \$100 (Handouts and snack breaks included!)

To register, contact the *Office of Continuing Education: [vmce@vet.k-state.edu](mailto:vmce@vet.k-state.edu) or 785-532-4528*

## Johne's Testing Guidelines

When testing cattle for Johne's disease it is important to select the appropriate test animals, consider the purpose for testing, and then select the diagnostic test that matches the testing purpose.

For screening purposes, the serum ELISA is the best test. The PCR is best used as a confirmatory test.

The KSVDL reports out both a test interpretation and the ELISA S/P ratio. The S/P ratio provides much more information than the test interpretation; therefore, the ratio-values should be used to help manage individual animals.

In the table below are guidelines that can be used with the S/P to help producers manage Johne's disease.

For most herds, the most practical testing plan would include using ELISA for initial screening and PCR to confirm shedding is occurring. Using the PCR as a screening test may miss positive animals because animals in the earlier courses of the disease may be antibody positive but not shedding, and some animals will either be shedding at low levels or perhaps be intermittent shedders, both increasing the possibility of false negatives.<sup>1</sup>

<sup>1</sup>Rebecca Mitchel, et al. Differences in intermittent and continuous fecal shedding patterns between natural and experimental Mycobacterium avium subspecies paratuberculosis infections in cattle. Veterinary Research (2015) 46:66.

Recommendations for using the Johne's ELISA S/P test results (used only with IDEXX ELISA)*			
S/P Ratio	Test Interpretation	Test follow-up	Comment
0.0 - 0.09	Negative	Blood test in one year to confirm	
0.10 - 0.24	Suspect	Blood test of PCR in 6 months to one year	15 times more likely to be positive compared to negative animal
0.25 - 0.39	Low positive	Blood test of PCR in 6 months to one year	Can be either - or + by fecal PCR
0.40 - 0.99	Positive	PCR if confirmation is necessary	Likely shedding in feces, colostrum and milk
1.0 - 10.00	Strong Positive	PCR if confirmation is necessary	Shedding is likely; is in later stages of disease; clinical disease may follow

\*Adapted from Dr. M.T. Collins and IDEXX Corporation.

### Available Johne's disease tests:

- Johne's Antibody ELISA (SES-1059)**  
**Sample:** 0.5 ml serum (red top) or 0.5 ml whole blood (purple top)  
**Cost:** \$5.00
- Johne's Fecal PCR (BMB-1200)**  
**Sample:** Fresh feces (5 gms)  
**Cost:** \$32.00  
 Laboratory can pool up to 5 samples for \$32.00.

## Free Full Text Journal Articles Available for KSVDL Clients

Many practitioners do not have access to or have to pay for access to full text journal articles. The KSVDL is now offering free full text journal articles from almost any journal as a service to our clients.

As a KSVDL client, if you have articles which you either do not have access or free-access to full text and would like to read them, we will provide a copy at no charge.

Please send your request to: Gregg A. Hanzlicek at either 785-477-2001 (call or text) or email gahanz@vet.k-state.edu with the appropriate information.



## Alternative Bovine Trichomonas Sample Collection Method

Recently, an alternative method for collecting smegma samples from bulls for Trichomonas testing has been communicated through the popular press.

Instead of using a pipette to collect smegma, this technique utilizes a 4X4 gauze sponge. The sponge is then placed in the InPouch™ TF pouch and submitted to the laboratory for testing.

To read more about the alternative method please follow:

<http://www.bovinevetonline.com/advice-and-tips/practice-tips/alternative-trich-sampling-method>

When using this alternative collection method, the Kansas State Veterinary Diagnostic Laboratory will accept only those samples submitted InPouch™ TF pouch (i.e., will not accept gauze samples submitted in saline, etc.)

Although we will accept samples collected using the traditional method or the alternative method, at this time we recommend the traditional method.

If you have any questions, please contact *KSVDL Client Care* at 866-512-5650 or [clientcare@vet.k-state.edu](mailto:clientcare@vet.k-state.edu).

## KSVDL Personnel Activities

### Publications:

- Raghavan RK, Goodin DG, Neises D, Anderson GA, Ganta RR (2016) Hierarchical Bayesian Spatio–Temporal Analysis of Climatic and Socio–Economic Determinants of Rocky Mountain Spotted Fever. PLoS ONE 11(3): e0150180. doi:10.1371/journal.pone.0150180
- Hanzlicek GA, Raghavan RK, Ganta RR, Anderson GA (2016) Bayesian Space-Time Patterns and Climatic Determinants of Bovine Anaplasmosis. PLoS ONE 11(3): e0151924. doi:10.1371/journal.pone.0151924
- Niederwerder, M. C., C. J. Jaing, J. B. Thissen, A. G. Cino-Ozuna, K. S. McLoughlin, and R. R. Rowland. 2016. Microbiome associations in pigs with the best and worst clinical outcomes following co-infection with porcine reproductive and respiratory syndrome virus

(PRRSV) and porcine circovirus type 2 (PCV2). Vet Microbiol, 188: 1-11

### Presentations:

- Dr. Jamie Henningson presented at Academy of Veterinary Consultants meeting in Irving, TX on cases of hepatic necrosis in calves secondary to mineral over supplementation.
- Dr. Jianfa Bai presented “Molecular Diagnostic Technologies and Assay Development” at the College of Agriculture and Applied Sciences, Langston University.
- Drs. Ram Raghavan, Dave Rethorst, and Gregg Hanzlicek presented at the Bovine Anaplasmosis Symposium in Salina, KS.
- Dr. Gregg Hanzlicek spoke at the 102nd Annual K-State ARCH roundup in Hays, KS on bovine anaplasmosis.

**Visit the KSVDL booth at the  
78th Annual Conference Exhibits!**

## Developing and 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.*

**1800 Denison Avenue  
Manhattan, KS 66506**

**Phone: 785.532.5650  
Toll Free: 866.512.5650**

### Continuing Education

[www.vet.k-state.edu/education/continuing/](http://www.vet.k-state.edu/education/continuing/)

**June 4-7, 2016**

**78th Annual Conference for  
Veterinarians**

Manhattan, Kansas

[http://www.vet.k-state.edu/education/  
continuing/conferences/annual-conf16/](http://www.vet.k-state.edu/education/continuing/conferences/annual-conf16/)

**August 6-9, 2016**

**American Veterinary Medical  
Association Annual Convention**

San Antonio, Texas

[http://www.avmaconvention.org/avma2016/  
public/enter.aspx](http://www.avmaconvention.org/avma2016/public/enter.aspx)

**Visit the KSVDL booth at the AVMA exhibition hall!**

For more information call the Continuing Education Office  
at 785-532-4528.

### Test Results and Schedules

**Laboratory results available  
online, all the time!**

**Holiday Schedule:**

**Memorial Day:** Closed: Monday, May 30th

**Independence Day:** Closed: Monday, July 4th

To receive this newsletter by email,  
contact: [ksvdloutreach@vet.k-state.edu](mailto:ksvdloutreach@vet.k-state.edu).

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