Kansas State Veterinary
DIAGNOSTIC LABORATORY

DIAGNOSTIC *INSIGHTS*

NOVEMBER 2017

KSVDL Welcomes Five New Members to the Diagnostic Team

The Kansas State Veterinary Diagnostic Laboratory (KSVDL) is announcing the addition of a "Fab Five" to its diagnostic team.

Four pathologists and one parasitologist have been hired in recent months to help expand the services provided by the lab.

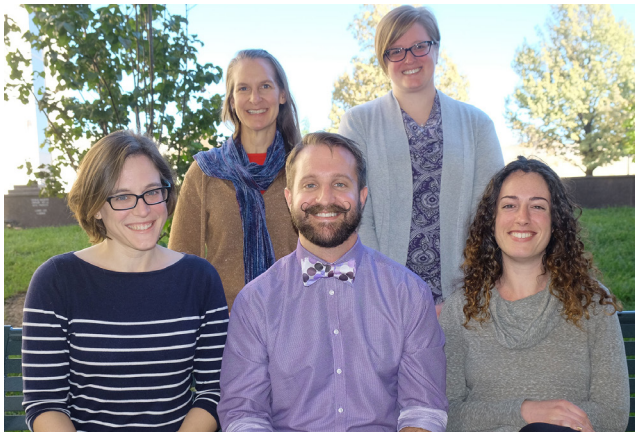
"This is a diverse group that will ultimately help us shorten turnaround time as well develop new tests and protocols in both pathology and parasitology," said Dr. Jamie Henningson, interim director of the lab.

Additionally, their knowledge base and enthusiasm will help KSVDL grow into new areas of diagnostic medicine.

The new faculty are:

Dr. Sarah Schneider, an anatomic pathologist, who attended veterinary college at the University of Tennessee. She then practiced small animal medicine in Beaufort, South Carolina, for three years before returning to a residency in anatomic pathology at Texas A&M University. Dr. Schnieder was board certified in anatomic pathology in 2013, and continued teaching on the necropsy service at Texas A&M while pursuing a doctorate focused on cardiomyopathy in the golden retriever model of muscular dystrophy.

Dr. Cindy Bell, an anatomic pathologist, who grew up in hog and corn country in northwestern Illinois. She said she found veterinary medicine to be the ideal intersection for someone with a brain for biology and a heart for promoting healthy rural economies. As an anatomic pathologist, Dr. Bell spent five years at the Wisconsin Veterinary Diagnostic Laboratory where dairy cattle constituted the majority of case work. She also augments her credentials as a poultry pathologist and has distinguished herself in veterinary oral/dental pathology. She is currently faculty supervisor of the KSVDL histology and immunohistochemistry laboratory.



From left to right: Drs. Sarah Schneider, Cindy Bell, Brian Herrin, Nora Springer and Diana Schwartz.

Dr. Brian Herrin, a parasitologist, is originally from Lindsay, Oklahoma, and has completed both his Doctor of Veterinary Medicine and doctorate at Oklahoma State University. While his current research focus is on the epidemiology of Lyme borreliosis in humans and dogs in North America, he is also interested in

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Accredited by the American Association of Veterinary Laboratory Diagnosticians

TO SET UP AN ACCOUNT GO TO:
www.ksvdl.org/accounting-and-billing/

A Possible Fallacy of Anaplasmosis Control

The Concept of "Endemic Stability"

By Dr. Gregg Hanzlicek

Most practitioners and their producers would agree that Anaplasmosis control at the herd level is very difficult.

A common control recommendation suggests that *Anaplasmamarginale* positive herds residing in endemic areas let their herds become "endemically stabile".

The definition for endemic stability is: an anaplasmosis positive herd where the number of animals experiencing clinical signs is minimal.

Australian researchers recently completed a multi-year study examining anaplasmosis positive herds to address the concept of stability.[1] Their study resulted in some very interesting concepts.

There are two primary ways for herds to experience endemic stability. One, is to reduce the number of new infections to a very low level. The fewer number of animals becoming initially infected with *A.marginale*, logically the fewer the number of animals that will express clinical signs. The second way stability can occur is when a very large number of animals each year are infected. In this scenario, logically, after a few years of a high infectivity rate (force of infection), only young animals will be able to become infected, Figure 1. Young animals (usually less than 2 years of age) rarely express clinical signs when infected. The research indicated that when the force of infection is not small or great, but moderate, the risk of clinical outbreaks is greatest.

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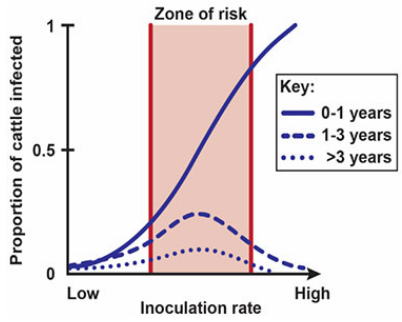


Figure 1. When infection rates of all ages of animals are very low (left side of the graph) endemic stability can occur. When infection rates are very high (right side of the graph) then only those animals from birth to 1 year of age are likely to become infected, thus resulting in endemic stability. When the infection rate is moderate (graph red area) herds are most likely to be unstable.

NEW FACULTY *(continued from previous page)*

the evaluation of diagnostic assays for tick-borne diseases and surveillance of ticks and tick-borne diseases from horses. Dr. Herrin said he enjoys working with all parasites of veterinary importance through the diagnostic service and teaching/ outreach opportunities. He is currently overseeing the KSVDL parasitology laboratory and has already made a change to improve antigen detection in heartworm testing.

Dr. Nora Springer, a clinical pathologist, is a 2008 graduate of the Kansas State University College of Veterinary Medicine. She subsequently completed residency training in veterinary clinical pathology and a doctorate in comparative oncology and translational medicine, both at Cornell University. Dr. Springer's clinical and research interests are focused on hematopathology and hematopoietic neoplasia, particularly lymphoma and acute leukemias.

Dr. Diana Schwartz, a clinical pathologist, earned her Doctor of Veterinary Medicine from the University of Minnesota in 2013. She then participated in a clinical rotating small animal internship at the Sacramento Veterinary Referral Center prior to completing a residency in clinical pathology at the University of California, Davis. Dr. Schwartz's main focus is on diagnostic service, with particular areas of interest including acute phase proteins and central nervous system neoplasia in dogs and cats. She recently, August 2017, passed the American College of Veterinary Pathologists board examination for clinical pathology.

An Injection Site Reaction

Post-Rabies Vaccination Panniculitis in a Toy Poodle

By Dr. Charan Ganta

What is Post Rabies Vaccination Panniculitis?

An injection site reaction secondary to post-rabies vaccination is a relatively common canine skin disease often characterized by a focal area of hair loss, thickened skin with minimal gross inflammation. In one study it was reported that the presence of rabies viral antigen in the walls of cutaneous vessels could cause vasculitis and ischemic dermatopathy (2).

Breeds of Dogs Affected

This condition is most frequently diagnosed in Toy or Miniature Poodles and Bichon Frises, as well as other long-haired small breeds are affected with less frequency which include Shih Tzu, Lhasa Apso, Maltese, Silky Terrier, Yorkshire Terrier, Chihuahua, Toy Manchester Terrier, American Eskimo, Poodle crossbreeds, and Miniature Dachshunds. The susceptibility of these breeds had been attributed to enhanced genetic susceptibility and a long anagen hair growth cycle. This condition was very rarely reported in large breed dogs with only one case reported to date.

Clinical Presentation

Clinically, the time interval between vaccination and observation of the lesion was generally 2 to 4 months, but the interval may be longer. The lesion manifests slowly as a variably-sized area of alopecia with irregular margins that subsequently become erythematous, scaly, and hyperpigmented. A small subgroup of dogs may develop widespread alopecia and skin lesions which is called "generalized vaccine-induced ischemic dermatopathy"

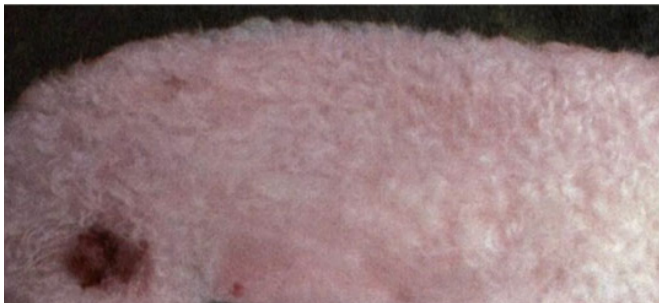


Figure 1. Post rabies vaccination panniculitis in a Toy Poodle. Alopecia with hyperpigmented area developed at the site of prior subcutaneous rabies vaccination above the right hip area. Image courtesy of Dr. Darla Dwyer, Countryside Vet Clinic.

Biopsy Sample Collection and Histopathology

A deep biopsy sample of the affected epidermis and subcutis just within the outer margin of the lesion is recommended, often samples collected from the central affected area is of less diagnostic value.

Histopathological examination often reveals dermal pallor, smudging, and follicular atrophy in the superficial dermis and moderate to severe nodular perivascular accumulations of lymphocytes, fewer histiocytes, and occasional plasma cells in the deep dermis and panniculus (figure 2). Occasionally, an amorphous basophilic foreign material presumably constituting vaccine product (figure 3) can be noticed histologically within the deep macrophages. Eosinophils are usually present in reactions due to other types of vaccines, but are inconspicuous in post-rabies vaccination.

Precautions:

Revaccination with subcutaneous rabies vaccine is not recommended, as the syndrome may exacerbate in response to further antigenic exposure. Therefore, for a dog with prior history of post-rabies vaccination panninulitis, it is advisable to use rabies virus vaccines that require administration every three years. It is also advised to avoid administration of multiple vaccines at one time, and inject the vaccines intramuscularly rather than subcutaneously.

Continued next page

BRD Antimicrobial Resistance Trends are Updated!

By Dr. Brian Lubbers

Why summarize antimicrobial susceptibility test data?

Cumulative antimicrobial susceptibility test summaries (also known as antibiograms) provide practitioners with information on local antibiotic resistance patterns, as an aid to adjusting empiric therapy recommendations. KSVDL routinely publishes the antibiotic susceptibility test summaries for *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*, and these summaries have been updated on the KSVDL website to include data from 2015 and 2016.

What do the summaries show?

While there is significant value in the big picture of these summaries, it should also be understood that there is significant "noise" in the data. Geography, disease status and prior exposure to antimicrobials are all factors that can introduce bias worth considering when interpreting these summaries. So without over / under – stating the data, some points of note:

Antimicrobial resistance in *Mannheimia haemolytica* remains very high (≥50% of isolates) to almost all drugs used to treat BRD. Many of these isolates will be multi-drug resistant (MDR).

Antimicrobial resistance in *Pasteurella multocida* is: very low (<10% of isolates) for enrofloxacin, florfenicol and penicillin; moderate (10 -25% of isolates) for tilmicosin and tulathromycin; high (>30% of isolates) for oxytetracycline.

Antimicrobial resistance in *Histophilus somni* very low (<10% of isolates) for florfenicol and penicillin; moderate (10 -25% of isolates) for tilmicosin and tulathromycin; high (>30% of isolates) for enrofloxacin; and very high (≥50% of isolates) for oxytetracycline.

Ceftiofur is not included in the summaries. In vitro resistance to ceftiofur is rare in isolates recovered at KSVDL; however, there are clinical concerns with the established breakpoint. A recent publication* reported a significant number of ceftiofur-intermediate and ceftiofur-resistant isolates recovered from a group of stocker cattle. KSVDL will continue to closely monitor resistance to ceftiofur in the BRD pathogens.

Comparing antimicrobial resistance rates within the macrolide class (tilmicosin & tulathromycin) shows a very close correlation for all 3 BRD pathogens. Use of 2 macrolides in the same treatment protocol is NOT advised.

Some antimicrobials appear to show a decrease in resistance in the past few years; however, this should be interpreted VERY cautiously given the potential confounding factors associated with this data. There are occasional reports of decreasing antibiotic resistance in the human medical literature; however, I (BVL) am not ready to go there yet – if you have thoughts otherwise, give me a call....

Where can I find this information?

The KSVDL antimicrobial susceptibility test summaries can be accessed from our laboratory homepage by clicking "BRD Antimicrobial Resistance Trends" (under the "Search KSVDL website" box) or directly at www.ksvdl.org/ab-resistance.html. If you have questions regarding the summaries, please contact Dr. Brian Lubbers at blubbers@vet.k-state.edu or 785-532-5650.

**Snyder E, Credille B, Berghaus R, Giguere S. (2017) Prevalence of multi drug antimicrobial resistance in Mannheimia haemolytica isolated from high-risk stocker cattle at arrival and two weeks after processing. J Anim Sci. 95.*

For more information please contact KSVDL Client Care at 866-512-5650 or clientcare@vet.k-state.edu.

PANNICULITIS *(continued from page 3)*

Spontaneous hair regrowth may occur but can take up to 1 year and may be associated with altered pigmentation. In this case, the skin lesion was surgically removed and the patient recovered completely and doing well.

Reference:

1. TL, Ihrke PJ, Walder EJ, et al. Diseases of the panniculus. In: Skin diseases of the dog and cat. 2nd ed. Ames, Iowa: Blackwell, 2005;538–558.

2. Wilcock BP, Yager JA. Focal cutaneous vasculitis and alopecia at sites of rabies vaccination in dogs. J Am Vet Med Assoc 1986;188:1174–1177.

3. Medleau L, Hnilica KA. Cutaneous vasculitis. In: Small animal dermatology: a color atlas and therapeutic guide. 2nd ed. Philadelphia: WB Saunders Co, 2001;216–217.

Acknowledgements:

Dr. Darla Dwyer and Dr. Amanda Allison: Countryside Vet Clinic

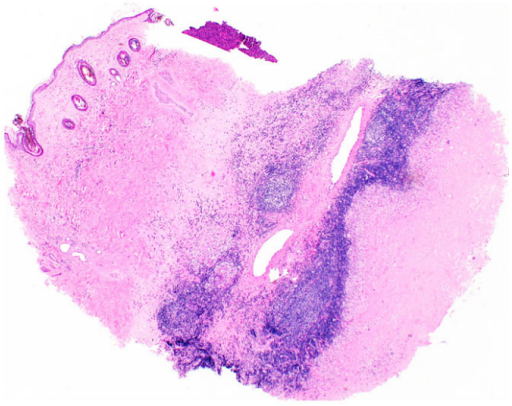


Figure 2. Post rabies vaccination panniculitis with characteristic nodular aggregates of perivascular lymphocytes in the subcutis with follicular atrophy in the dermis.

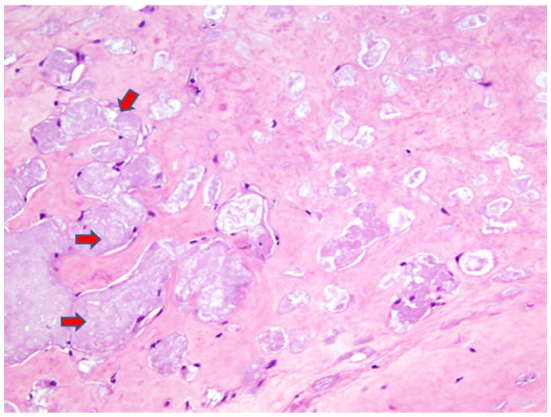
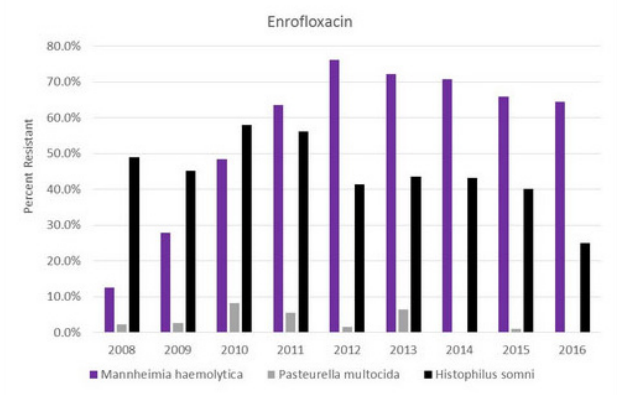


Figure 3. Necrosis surrounds foci of amphophilic homogeneous extracellular, intravascular and intrhistiocytic material (vaccine product). Arrows represent vaccine material. Image source: askjpc.org

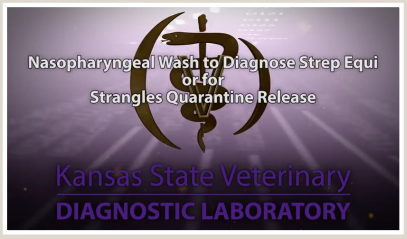
BRD Antimicrobial Resistance Results 2008-2016



Follow this link to view graphs highlighting the most common BRD antimicrobials and resistance trends over the last 9 years.

http://www.ksvdl.org/ab-resistance.html

Timely Videos on YouTube!



- Collecting Nasal Swabs in Dogs to Diagnose Canine Influenza Virus https://www.youtube.com/watch?v=mhBL2XzQCeo&feature=em-subs_digest
- Bovine Lung Sampling for PCR Testing https://www.youtube.com/watch?v=8fiBz8yKI30
- Bovine Lung Sampling for Bacterial Culture https://www.youtube.com/watch?v=llz_QiXX0lI

ANAPLASMOSIS CONTROL *(continued from page 2)*

Because this is a vector-borne disease (can also be iatrogenic) and if the results of this research are correct, then the amount of vectors and disease transmission must be consistently either low or high every/most years for the herd to become endemically stable. That this consistency is likely required, but biologically not likely (tick and fly populations are not usually stable from year to year), may explain why endemic herds periodically experience clinical anaplasmosis including dead adults.

The KSVDL every year investigates herds that have been infected for many, many years and are in an endemic area, have not observed any clinical signs for years, and now this year have experienced anaplasmosis death losses. One of the plausible explanations for this is the concept explained above about the force of infection not being consistent across years. Another plausible explanation is that a new more virulent strain has been introduced into the herd. We now know that individual animals can carry more than one *A. marginale* strain at a time—the significance of this is unknown.

The concept of a herd maintaining endemic stability consistently may not be possible given the biology of transmission. It might make sense that practitioners and producers use other tools available to reduce clinical signs, including the legal use of chlortetracycline in feed or mineral, the use of the experimental *A. marginale* vaccine, and practicing appropriate biosecurity through pre-purchase *A.marginale* blood tests.

1Is endemic stability of tick-borne disease in cattle a useful concept? Trends in Parasitology, Vol. 28, Issue 3, 2012, pages 85-89 Nicholas N. Jonsson, Russell E. Bock, et al.

KSVDL Personnel Activities

Activities

Drs. Gary Anderson and **Mike Moore** represented the KSVDL at the American Holistic Veterinary Medical Association Conference in San Diego, CA.
Dr. Brad Njaa attended the American College of Veterinary Pathologists Conference in Vancouver, British Columbia, Canada to present two topics: "Comparative Anatomy and Physiology of the External and Middle Ear" and "Otic Pathology of Domestic Animals".
Dr. Cindy Bell presented "Oral mucosal diseases in dogs" at the American College of Veterinary Pathologists Conference in Vancouver, British Columbia, Canada.
Dr. Brian Lubbers attended the CanWest Veterinary Conference in Banff, Alberta, Canada.
Dr. Mike Moore represented the KSVDL at the Southwest Veterinary Symposium in San Antonio, TX.
Dr. Kelli Almes chaired the Laboratory Emergency Management Committee at the American Association of Veterinary Laboratory Diagnosticians in San Diego, CA.
Drs. Megan Niederwerder and **Dick Hesse** will be presenting at the Kansas State University Swine Day in Manhattan, KS.
Dr. Brian Lubbers attended the Central Plains Expo (Human Healthcare Professionals group) in Wichita, KS.
Dr. Kelli Almes provided a necropsy demonstration for Shawnee Mission STEM students in Manhattan, KS.
Dr. Brian Lubbers was a voting member at the Food Armor Foundation Board meeting in Madison, WI.
Dr. Gregg Hanzlicek attended the KSU-ASI Extension Conference in Manhattan, KS.
Dr. Brian Lubbers attended the AVMA Council on Biologic and Therapeutic Agents meeting as a voting member in Schaumburg, IL.

Grants Funded

Dr. Cindy Bell was co-awarded a grant from the Academy of Veterinary Dentistry for research titled, "Analysis and Assessment of Pulp Vitality in Intrinsically Stained Teeth in Dogs.

Future Activities

Drs. Brad Njaa and **Gregg Hanzlicek** will be presenting at the Southeast District of the Kansas Veterinary Medical Association in Cherryvale, KS.
Dr. Gregg Hanzlicek will be presenting at the Academy of Veterinary Consultants in Kansas City, MO.

Field Investigations

Milk quality issues on a Kansas dairy

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.

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Continuing Education

www.vet.k-state.edu/education/continuing/

January 11-13, 2018
KVMA Annual Winter Conference
Manhattan, Kansas
http://www.ksvma.org/

January 18-20, 2018
Missouri VMA Conference
Columbia, Missouri
http://www.movma.org/general/custom.asp?page=20

January 25-27, 2018
Oklahoma 103rd Annual Veterinary Medical Association Conference
Oklahoma City, Oklahoma
http://www.memberleap.com/members/evr/eventreg_login.php?mid=415642205&evid=10214377&md=&

February 16, 2018
KSU-CVM Beef Cattle Veterinarian Conference
Manhattan, Kansas
http://www.vet.k-state.edu/education/continuing/

March 4-6, 2018
Western States Veterinary Conference
Las Vegas, Nevada
https://www.wvc.org/

Test Results and Schedules

Laboratory results available online, all the time!

Holiday Schedule:

Thanksgiving: Closed Thursday, Nov. 23 and Friday Nov. 24
Open: Saturday Nov. 25, normal business hours (8 a.m. to 12 noon)

Christmas: Open Saturday, Dec. 23;
Closed Monday Dec. 25

New Year's Day: Open Saturday Dec. 30;
Closed Monday Jan. 1
Open Tuesday, Jan. 2

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