

OADDL E-News

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Bovine Theileriosis

Bovine theileriosis caused by *Theileria orientalis* is an emerging tick-borne disease of cattle in the United States. Although historically regarded as benign, the emergence of pathogenic Ikeda and Chitose genotypes have resulted in clinical outbreaks characterized by anemia, fever, weakness, lethargy, jaundice, weight loss, abortion, reduced production, and death. Transmission is primarily associated with ticks, particularly the Asian longhorned tick (*Haemaphysalis longicornis*). Over the past several years, *T. orientalis* infection has been documented in cattle populations in Oklahoma, indicating the establishment and ongoing circulation of this hemoprotozoan parasite within the state.

Clinical symptoms caused by *T. orientalis* can closely resemble other infections such as bovine anaplasmosis and leptospirosis; therefore, laboratory confirmation is essential for accurate diagnosis. The Oklahoma Animal Disease Diagnostic Laboratory (OADDL) offers a rapid PCR assay that detects *T. orientalis* and differentiates between the Ikeda and Chitose genotypes. Whole blood (EDTA; purple top)

TESTING OPTIONS & PRICING

TEST	PRICE
 <i>Theileria orientalis</i> PCR	\$45
 <i>Anaplasma</i> PCR	\$45
 +  <i>Theileria orientalis</i> & <i>Anaplasma</i> PCR Panel	\$55
Save with the panel!	

and spleen are the recommended specimens for testing. From May through mid-August 2026, OADDL received 70 specimens for *T. orientalis* PCR testing, of which 19 were positive. Among the *T. orientalis*-positive cases, 84.2% were positive for the Ikeda genotype, 37% for the Chitose genotype, and 21% were positive for both Ikeda and Chitose. A map illustrating the geographic distribution of positive cases is shown in **Figure 1**.

— Sushim Gupta, Ruth Scimeca,
Robin Madden, Jerry Saliki,
Akhilesh Ramachandran

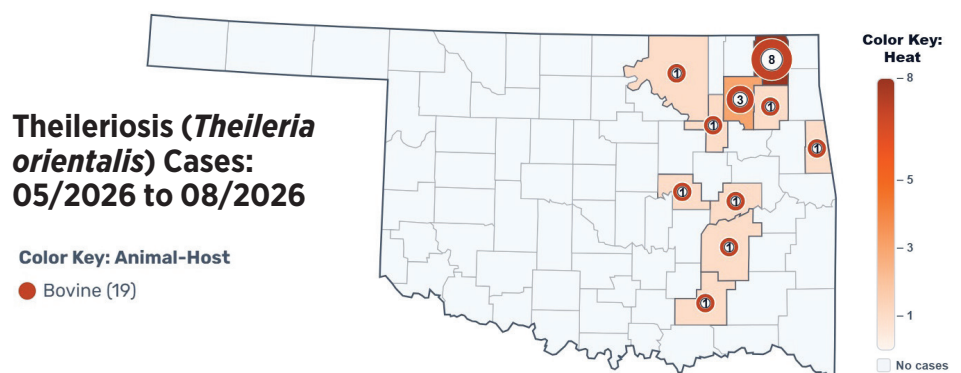


Figure 1. Geographical Distribution of Theileriosis +ve Cases in Oklahoma



VETERINARY MEDICINE

Blackleg Season is Back!

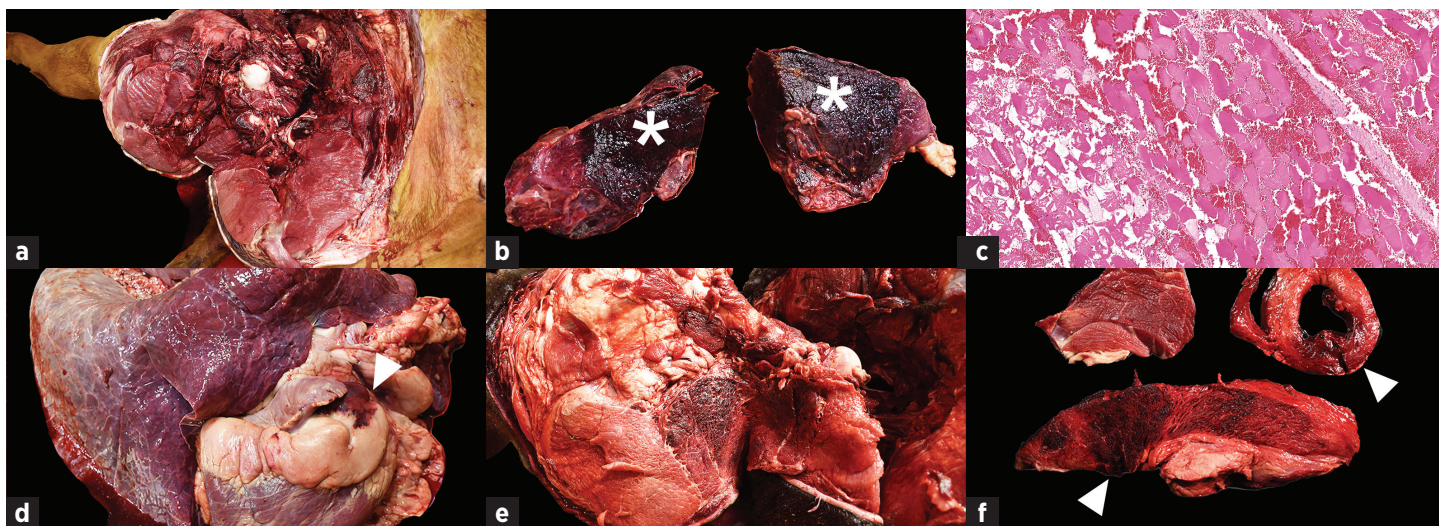


Figure 1. Blackleg gross and microscopic features in two cows. **a)** Case 1: 1-year-old, 350 kg, intact female Balancer cow with extensive hemorrhagic and necrotizing myositis in the right hindlimb muscles. **b)** Necrotic muscles have large black discolored areas (asterisks). **c)** Necrotic muscle fibers are fragmented, hyper-eosinophilic, with loss of cross-striations and surrounded by abundant hemorrhage. **d)** Focal cardiac hemorrhage (arrowhead). **e)** Case 2: 1-year-old, 280.5 kg, female intact cow with extensive necrotizing and emphysema within the right hindlimb muscles. **f)** Multiple cross sections with extensive hemorrhage and necrosis of the right hindlimb muscles and left ventricular wall (arrowheads).

With the end of August and fall approaching, blackleg cases have appeared in recent months, showing the known seasonality of this disease in summer.

What is blackleg disease?

Blackleg disease is a severe, fatal necrotizing and emphysematous myositis diagnosed in ruminants that is caused by the proliferation of the spore-forming bacterium *Clostridium chauvoei* within the affected muscles.

How do animals get blackleg?

Animals ingest *Clostridium chauvoei* spores from the environment, which disseminate into tissues following several germinative cycles within the intestinal mucosa. The spores reach distant tissues, including the skeletal muscles, via the bloodstream and may remain latent for long periods of time. The latent spores germinate during episodes of injury to the muscle and decreased oxygen within the tissues, which occurs most commonly after working the herd. The focus of muscle hemorrhage or degeneration by trauma will lead to bacterial spore activation and tissue damage. The disease is more prevalent in cattle between 9 months and 2 years, with a tendency in the summer. The disease is

not contagious between cattle; however, outbreaks commonly occur within herds due to common exposure and vaccination status.

What are the clinical signs associated with blackleg?

The course of the disease is usually sudden and fatal, with animals found dead without premonitory signs. If the animals are seen sick, they usually present with lameness, crepitus, and swelling in the skin overlying the lesions. The swellings increase and become hot; some animals develop fever and depression. Death will occur between 12–36 hours after the onset of lameness. Commonly affected muscle groups are the hindquarters and pectorals; however, blackleg lesions can be found at any muscle group. Occasionally, necrosis of the heart and diaphragm and fibrinopurulent pleuritis are also seen.

How is blackleg diagnosed?

The presence of crepitus (gas-pocketing) and swelling on large muscles is highly suggestive; muscle damage can be evidenced by ultrasound. However, since most cases are fatal, a definitive diagnosis is made through autopsy and anaerobic culture of the affected

tissue. Other diagnostic tests include the fluorescent antibody test, immunohistochemical staining in formalin-fixed paraffin-embedded tissues, and PCR assays. Due to the rapid degeneration of the carcass, the autopsy needs to be performed within 24 hours after death. Postmortem gas production and introduction of gas pockets during field necropsy prosection can confound evaluation; this must be seen in association with supporting lesions to diagnose blackleg.

How to prevent blackleg?

Prophylactic vaccination using multivalent vaccines containing *Clostridium chauvoei*, *C. septicum*, and *C. novyi*, before the high-risk season (later spring and summer) aids in prevention. Vaccination of pregnant cows also provides neonatal protection via colostrum prior to the time calves are immunized. Move the cattle away from the contaminated pastures during outbreaks, when feasible. Spores can persist endemically in the soil for years and are difficult to eliminate from the environment.

— Daniel Felipe Barrantes Murillo, DVM, MS, PhD, DACVP and Clare Brown, DVM, DACVP

References: Stämpfli HR, Oliver-Espinosa OJ. Blackleg in Animals. 2021. Merck Manual Veterinary Manual. Accessed August 25th, 2026.

<https://www.merckvetmanual.com/infectious-diseases/clostridial-diseases/blackleg-in-animals>

Uchida K, Kobayashi Y. Muscle and Tendon. In Jubb, Kennedy and Palmer's Pathology of Domestic Animals. 7th ed. Vol 1. Maxie MG (ed). 2026. P164–249.

New World Screwworm Update: How to Protect Your Livestock and Pets

The New World Screwworm (NWS) is an obligate parasitic fly whose larvae invade and feed on living tissue. It is responsible for significant production losses and poses risks to both human and animal health. Infestations caused by these larvae can severely impact



Image 1. NWS (*Cochliomyia hominivorax*) larvae in a cow from Mexico, infesting the ear tag area.

the economy and livestock production, leading to high morbidity and mortality if cases are not promptly detected and treated (**Image 1**).

In the USA, the NWS was detected on June 3, 2026, in Zavala County Texas. Since then, a total of 47 cases have been detected (data from September 1, 2026, USDA). Of these, 22 have been in cattle, 16 in sheep, 6 in goats and 3 in dogs (1 in New Mexico and 2 in Texas).

Rapid response by health authorities, veterinarians and producers has helped limit geographic spread. Key actions include detecting and reporting infested animals, providing appropriate treatment, inspecting animal movements, and monitoring infested zones. In addition to these efforts the release of sterile flies is being used to help prevent outward spread and to reduce the size of infested zones. The use of this technique is currently being enhanced with the goal of eliminating this parasitic fly

from the USA and southern countries, as was achieved in the past.

As a producer and veterinarian, it is essential to:

- Keep monitoring animals, including pets and wildlife
- Stay in contact with your state veterinarian
- Submit larvae for proper identification
- Stay informed

How to submit samples?

Place larvae in a sealed container with 70% ethanol. Use clean forceps to remove larvae from the deepest, active pocket of live tissue in the wound. It is important to note that other fly larvae can cause secondary myiasis and be co-infesting the wound. Therefore, proper collection and identification are essential. For updated information on the current status, visit the USDA website: [screwworm.gov](https://www.screwworm.gov).

— Ruth Scimeca, VMD, MSc, PhD,
DACVM-Parasitology.

New In-House ELISA for Caseous Lymphadenitis

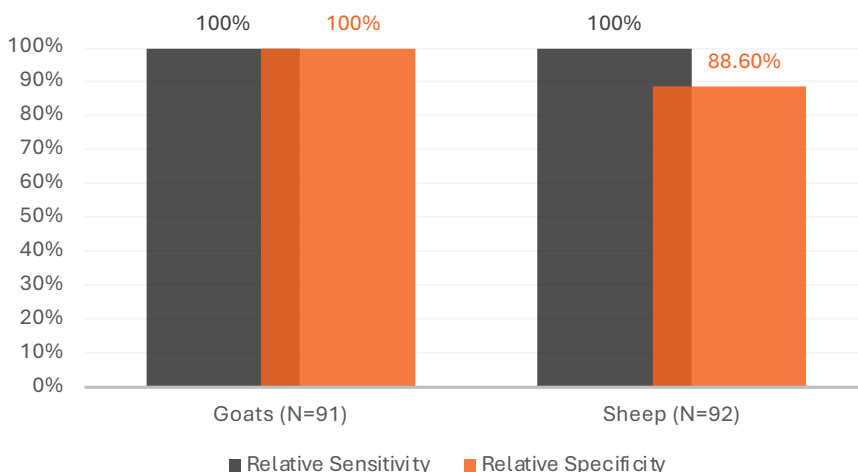
Good news for our small ruminant clients!

OADDL now offers an in-house ELISA for *Corynebacterium pseudotuberculosis*, the causative agent of caseous lymphadenitis (CL) in sheep and goats. CL antibody testing is one of the components of our Serology small ruminant biosecurity panel, which also includes CAE/OPP and Johne's diseases.

Caseous lymphadenitis is a chronic, infectious disease and is a major concern for small ruminant producers in North America. CL is recognized when abscesses form in the external lymph nodes that will, if left untreated, eventually mature into open, draining abscesses.

C. pseudotuberculosis can survive for 8 months in the soil and for 2 months on materials such as bedding and wood. The bacteria can enter the body by penetrating the skin (this is the most common route of infection), by ingestion, or by coming into contact with mucus membranes via inhalation. The incubation

Caseous lymphadenitis ELISA Validation Using as SHI as reference Test



period for this bacteria varies from 1 to 3 months.

Using reagents produced by VMRD, our in-house ELISA testing of goat samples yielded 100% sensitivity/100% specificity while sheep samples yielded 100% sensitivity/88.6% specificity when compared to the standard Synergistic Hemolysin Inhibition (SHI) test.

The CL ELISA and our Biosecurity panel are now both offered with results in 2 to 3 business days. Two mLs of serum (or a red-top tube of blood) are needed for testing. We require 11+ samples to be submitted for the Biosecurity panel, and we offer a 10% volume discount when 20+ samples are submitted for the CL ELISA on its own.

Rabies Diagnostic Testing Oklahoma – 2026 Update

Rabies is a fatal zoonotic disease caused by *Rabies lyssavirus*, a rhabdovirus that targets the central nervous system. In infected animals, the virus is primarily present in brain and spinal cord tissues and saliva.

The Oklahoma Animal Disease Diagnostic Laboratory (OADDL), in collaboration with the Oklahoma State Department of Health (OSDH), provides rabies diagnostic testing service in animals. Whole animals and suitable head or brain tissue specimens can be submitted during regular business hours, Monday through Friday, 8:00 a.m. to 5:00 p.m. Specimens appropriately packaged in the state-provided rabies shipping box (**Figure 1**) may be dropped off in

the laboratory 24/7/365. For detailed instructions on collecting, packaging, shipping, and submitting specimens, visit [the OADDL website](#).

From January through mid-August 2026, a total of 33 rabies-positive cases from 21 Oklahoma counties were identified among 739 specimens submitted for diagnostic testing, representing submissions from 71 Oklahoma counties (**Table 1**). A map depicting the geographic distribution of rabies-positive cases in Oklahoma in 2026 (through mid-August) is shown in **Figure 2**.

— Sushim Gupta, Shannon Caseltine,
Amy Hoyt, Robin Madden, Jerry Saliki,
Akhilesh Ramachandran

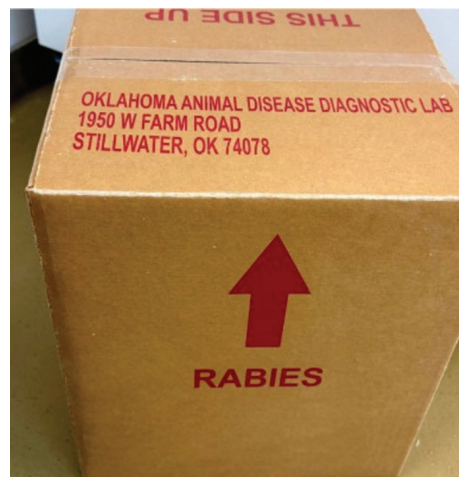


Figure 1. Rabies Shipping Box

TABLE 1: Rabies Testing and Positive Cases by Animal Species in Oklahoma

Animal	Tested	Positive	Unsatisfactory	Positive Case Counties
Bat	116	1	9	Creek
Bovine	36	6	3	Beckham, Bryan, Choctaw, Garvin, Jackson, Payne
Canine	270	2	11	Cherokee, Oklahoma,
Equine	11	1	0	McIntosh
Feline	201	5	1	Comanche, Custer, Kingfisher, Roger Mills
Skunk	49	18	1	Beckham, Cherokee, Choctaw, Custer, Ellis, Garvin, Grady, Jefferson, LeFlore, Noble, Oklahoma, Pawnee, Payne, Woods
Others	56	0	3	
Total	739	33	28	

Test results shown as *Unsatisfactory* are from brain samples that were too deteriorated post-mortem or from animals shot in the head.

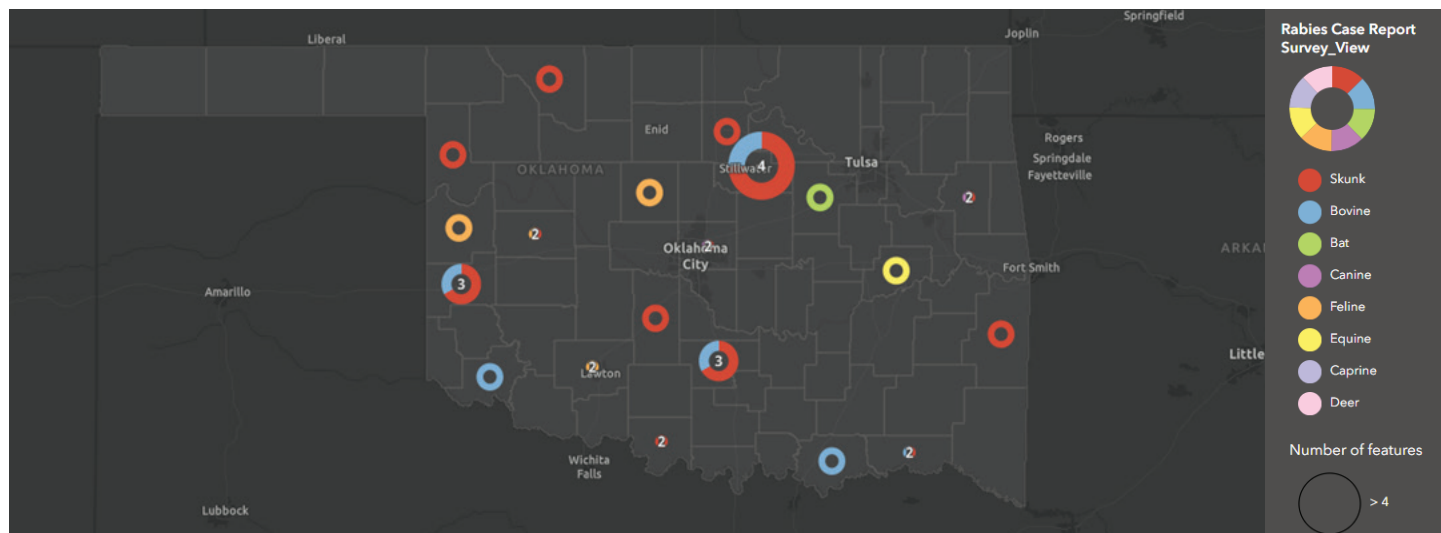


Figure 2. Geographical Distribution of Rabies Positive Cases in 2026 (through mid-August).

Bats and Rabies: What You Need to Know

Rabies is spread to humans and pets primarily through bites from an infected animal. If you have physical contact with a bat or wake up to find one in your home, don't wait. Call the OSDH Epidemiologist-on-Call at 405-426-8710 (available 24/7) to discuss your potential exposure and next steps.

While bats are one of the main carriers of rabies in Oklahoma, less than one percent of wild bats carry rabies. Bats play a significant ecological role as pest controllers. In Oklahoma, the avoided cost value of bats is estimated to range from \$6 million to \$24 million per year.* Removing a bat or bat colony can be done safely and humanely. There is no need to kill a bat or bat colony for rabies testing if you or your pet(s) have not been bitten or scratched by one.

— Janisue Coleman

* Boyles, J.G., P.M. Cryan, G.F. McCracken, and T.H. Kunz. 2011. *Economic Importance of Bats in Agriculture*. *Science* 332 (6025): 41-42



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A Look Into Bovine Leukosis Virus Infection in Cattle

Bovine leukosis virus (BLV) is a chronic disease that affects lymphocytes (white blood cells). It is a common cause of multicentric lymphoma, or lymphosarcoma, in adult cattle. The estimated prevalence of BLV in cattle herds across the US varies between 40-90%, with a significantly higher prevalence seen in dairy than beef (USDA APHIS). As seen in the tables below, the prevalence is significant in cattle within the state of Oklahoma. Approximately 48.5% of all cattle tested at the OADDL during January through November of 2025 were positive for the virus serologically (ELISA). Oklahoma cattle tested at a referral laboratory by Polymerase Chain Reaction (PCR) show similar prevalence at 48.6% positive for the virus in the same timeframe across a smaller sample size.

BLV is a blood-borne virus that is transmitted through many routes. Farm practices that break the skin, such as blood collection, injections, ear tagging, tattooing, and dehorning, are an important route of transmission. Avoiding the reuse of needles and sanitizing equipment between procedures can help prevent the transmission of this virus between cattle in the same herd. Less commonly, transmission via natural breeding, certain biting flies, and between dam and calf are implicated. The virus replicates slowly over a long period of time and evades the immune system, thus, clinical signs manifest years after initial infection. Unfortunately, therapeutic options remain limited and there is no vaccine for BLV.

About one third of cattle infected with the virus will have persistently elevated lymphocytes in the blood (lymphocytosis). Approximately 2-5% of cattle infected with BLV will develop lymphoma. Some of the most common organs affected other than the lymph nodes include the heart, uterus, abomasum, spinal canal, kidney, and behind the eye. However, the neoplasm can arise in almost any organ, some of which are pictured here! The clinical signs seen in cattle vary depending on the organ affected and can often be nonspecific, progressing slowly over time. For example, a mass

TABLE 1:

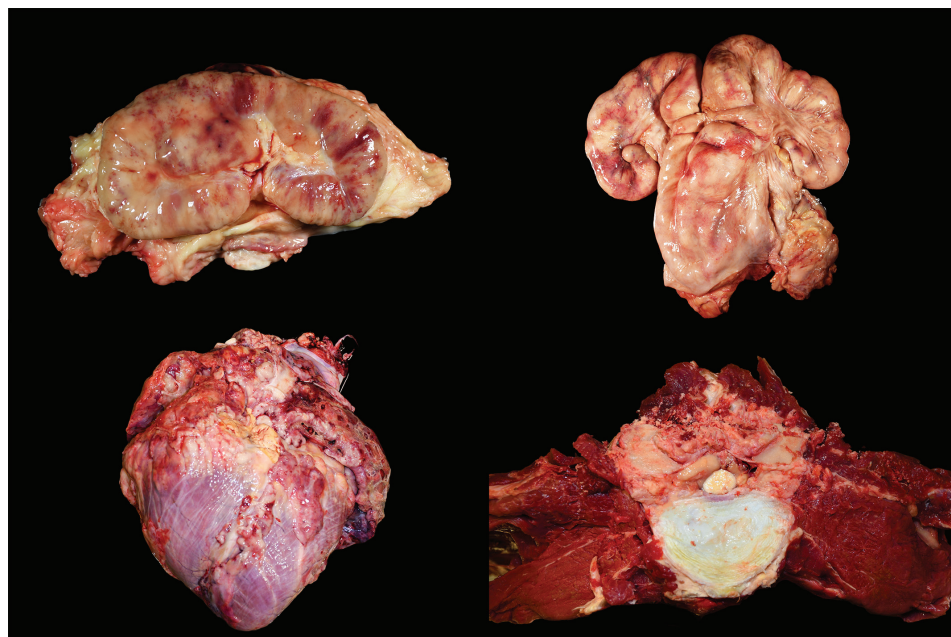
Seroprevalence of BLV in Animals Tested at the OADDL

Operation Type	ELISA Tested	Positive	Negative	Tested Prevalence (%)
Beef	698	347	351	49.7%
Dairy	58	15	43	25.9%
Unprovided	68	38	30	55.9%
Total	824	400	424	48.5%

TABLE 2:

Molecular Prevalence of BLV in Animals Tested at referral lab

PCR Tested	PCR Positive	PCR Negative	Tested Prevalence PCR (%)
35	17	18	48.6%



Top left: Enlarged inguinal lymph node with multiple areas of hemorrhage

Top right: Uterus diffusely enlarged from lymphocyte infiltration

Bottom left: Heart with multiple nodules of lymphoma

Bottom right: Lymphoma within the spinal canal causing compression of the spinal cord

Picture credit: Dr. Daniel Felipe Barrantes Murillo (top row), Dr. Cassie McDonald (bottom row)

behind the eye will cause it to protrude (exophthalmos) and a mass within the spinal canal will cause hindlimb weakness (ataxia, paresis). Masses within the heart compromise its function, leading to brisket edema, jugular distension, and labored breathing. Decreased milk production and infertility are also seen and can have negative impacts on reproductive performance.

As of April 2026, OADDL now offers BLV PCR in-house in addition to ELISA

testing. Screen your cattle to identify BLV positive animals and prevent further spread in your herd. For ELISA, submit 1-2 mL of serum or a clot (red top) tube. For PCR, submit at least 2mL of EDTA (purple top) tube of blood. You can also read more about BLV on [the USDA website!](#)

— Dr. Cassie McDonald, Blaine Bennett,
Dr. Sunil More, Dr. Jerry Saliki

Message from the Director

We are very excited to share with you this issue of the OADDL eNewsletter. On July 1, 2026, we welcomed Dr. Richard Prather as our new Dean and look forward to tapping into his 40 years' experience as a practitioner to further enhance the services we provide to you.



Dr. Richard Prather, Dean of the College of Veterinary Medicine

At OADDL, we are committed to quality control and continuous improvement. We understand that maintaining quality is an ongoing endeavor and will continually explore ways to improve our services. I will use this space to highlight recent developments that demonstrate this commitment to you.

For five consecutive years, from 2021 through 2025, OADDL received cases from all 77 counties in Oklahoma and from 44-47 of the 50 states. In this five-year period, the number of tests performed increased by 53%, led by surveillance tests for diseases of economic importance to Oklahoma, which increased by 63% over the same period. We are extremely proud of these statistics, which demonstrate OADDL's value to our state and the nation.

To better serve our clients, we recently brought several new in-house tests online. We now offer an ELISA for

Diagnostic Excellence

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caseous lymphadenitis testing in sheep and goats, as well as a PCR test for bovine leukosis virus. Additionally, in response to the rapid westward expansion of bovine theileriosis caused by *Theileria orientalis*, we now offer a PCR test that differentiates between the highly pathogenic Ikeda and the mild Chitose genotypes. Please see the related article in this issue for more information.

We are always happy to hear from you about how we can better serve you. In this regard, please plan to complete our next client survey in the first quarter of 2027. Your feedback is invaluable in helping us identify opportunities for continued improvement.

— Dr. Jerry Saliki

Getting to Know Us:

Kaitlyn Voth is from Enid, OK. She moved to Stillwater and started working for OADDL in July of 2024 as an Administrative Support Specialist for Data Entry and Accounting. She spends a lot of her time with family back home and going to church. Most of her free time is spent being with friends and siblings or working on the next modification to her car.



Kami Voth grew up in Enid, OK. In September 2024, she moved to Stillwater with her sister and started working at OADDL in April of 2026 as a receptionist in general office. When she's not at work, she likes to spend time with her cats and watch TV. When she gets the chance, she likes to go to Enid to visit family and friends.



Ideas/Suggestions for Future Content

We want to hear from you. Send your ideas and suggestions to oaddl@okstate.edu.

Contact Us

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