

OADDL E-News

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Case Report: Oak Toxicity in a Zebu Calf

A 3 month old, female, Zebu calf presented to Oklahoma Animal Disease Diagnostic Laboratory (OADDL) in October with a history of being normal when put out to pasture at 7:30 AM and found dead under a tree at 10:00 AM. The most significant post-mortem finding was marked pleural, pericardial, and peritoneal effusions. Histologically, the proximal convoluted tubules of the kidneys exhibited diffuse epithelial necrosis and were filled with homogenous eosinophilic material (cellular debris) that often has basophilic stipples to islands (mineralization) as depicted in Figure 3.

Kidney lesions in this calf resulted in acute renal failure and death. Histologically, the renal lesions were consistent with nephrotoxicity. Based on the time of year (fall), ingestion of acorns was the likely source of toxin

exposure; ingestion of leaves was also a possibility, but tends to be more common in the spring. Ingestion of other nephrotoxic plants including *Amaranthus retroflexus* (pigweed) was also a potential cause of this type of renal lesion. The effusions in pleural, peritoneal and pericardial cavities are

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Figure 1: Oak leaves and acorns.
Photo courtesy of <http://www.arborillogical.com>.



Figure 2: Petechial hemorrhages visible on surface of kidney.
Photo courtesy of Dr. Roger Panciera, OSU Center for Veterinary Health Sciences.



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Oak Toxicity in a Zebu Calf continued from page 1

presumed to be secondary to fluid dysregulation seen in acute renal failure and also support the diagnosis of oak toxicity or other acute nephrotoxin exposure.

Oak poisoning in cattle occurs sporadically in Oklahoma, with ingestion of acorns more common in the fall and bud and leaf poisoning in the spring (Figure 1). Affected animals are commonly calves or young animals in the 100-300 kg range, rather than mature animals in the same pasture. The metabolites gallic acid and pyrogallol of oak tannins and volatile phenols cause the toxicosis. Clinical signs occur one day to 2-3 weeks prior to death and may include anorexia, depression, subcutaneous edema, diarrhea that is dark and bloody, and hemoglobinuria. Blood urea nitrogen and creatinine are significantly elevated. In some animals, petechial hemorrhages may be observed in the kidneys at necropsy (Figure

2); petechial hemorrhages were not observed in this Zebu calf. Chronically the disease causes debilitating illness and renal decompensation, with mortality rates up to 85%. Treatment is largely symptomatic and of

questionable efficacy. Control consists of managing animals to avoid toxic quantities of ingestion during high-risk seasons.

*Drs. Alix M. Dieterly &
Melanie A. Breshears*

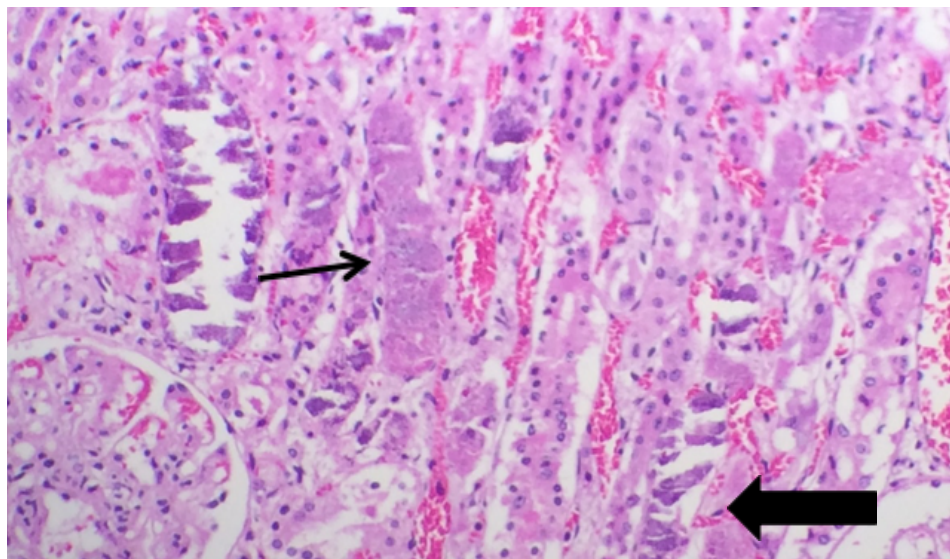


Figure 3: Histopathology of kidney showing necrosis (small arrow) and mineralization (bold arrow) of the proximal convoluted tubules.

Leptospirosis Reminder!!

Pathogenic leptospires belong to a genus with more than 250 known serovars, and OADDL continues to screen for the 5 most common veterinary serovars using the Microscopic Agglutination Test (MAT) that detects antibody. The laboratory has also expanded testing for Leptospirosis by introducing a Polymerase Chain Reaction (PCR) test, which will identify bacterial antigen in urine, uterine secretions and fresh kidney. The PCR test is currently under validation at OADDL and testing is offered free of charge during the validation process.

Leptospira remains an important cause of abortion, stillbirth and infertility in cattle in Oklahoma and can also affect dogs, humans and a variety of vertebrate animals. The main modes of transmission are mucous membrane exposure to infected water, moist soil or vegetation. The primary reservoirs of the bacteria are rats, mice and moles; however, there is a very large host range including many other mammals in Oklahoma. The incubation period is generally 7-10 days. Leptospirosis incidence can be influenced by weather with increases noted in times of flood-

ing and drought (1). OADDL has seen increased numbers of seropositive and PCR-positive animals during 2014 (see table). Since August, we have seen several cases in cattle and dogs with titers greater than 1:20,000. Many of these animals had increased antibody levels to several different serovars.

Please remember to continue testing for this important zoonotic disease in your veterinary patients.

Case 1: A three year old female Schnauzer presented to clinician on October 28, 2014 in acute renal failure.

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OADDL Leptospirosis Cases Detected by Serology and PCR Testing in 2014

Species	Number of positives	Leptospira serovar positive by MAT (positive > 1:1600)					PCR (antigen)
		<i>canicola</i>	<i>grippotyphosa</i>	<i>hardjo</i>	<i>icterohemorrhagiae</i>	<i>pomona</i>	
Bovine	20	2	4	13	3	11	4
Canine	5		3	1	2	5	2
Porcine	1				1		
Equine	1			1			

¹ "Epidemics after Natural Disasters," Watson, JT et al, in *Emerging Infectious Diseases*; January 2007; 13(1): 1-5.

Leptospirosis Reminder continued from page 2

Serum submitted to OADDL for the Leptospirosis MAT revealed positive antibody titers to: *L. grippotyphosa* (1:51,200), *L. icterohemorrhagiae* (1:6400) and *L. pomona* (1:51,200).

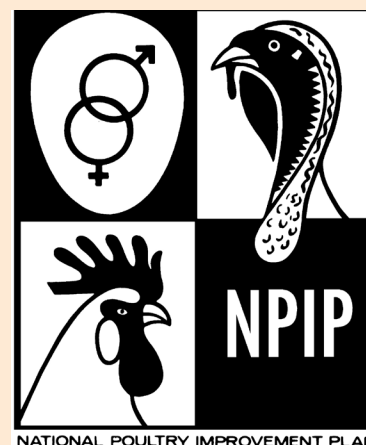
Case 2: A practitioner made a field visit to a producer who had several open heifers on December 2, 2014. Serum and urine were obtained from one animal that aborted at 7 months gestation. The leptospirosis MAT was negative for all serovars on acute submission: (*L. canicola* 1:200; *L. grippotyphosa* < 1:100; *L. hardjo* 1:800; *L. icterohemorrhagiae* 1:200; and *L. pomona* 1:400). The urine sample, however, was positive for leptospirosis by PCR. (NOTE: OADDL interprets

the MAT as positive when antibody titers are equal to or greater than 1:1600. Some literature suggests titers of 1:800 are positive in *L. hardjo* abortions. A second, convalescent serum sample should be considered in many of these cases).

Case 3: A 21.8 kg, spayed female dog presented to the veterinary clinic on October 27, 2014 with acute kidney injury. Serum tested by MAT revealed positive reaction to two serovars (*L. grippotyphosa* 1:25,600 and *L. pomona* 1:6400). The urine was also tested by PCR for leptospirosis and was positive.

*Dr. Grant B. Rezabek, Kristin M. Lenoir,
& Brooke Golay*

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National Poultry
Improvement Plan (NPIP)
Authorized Laboratory**



Parasitology Findings in Feces of Companion Animals, Ruminants and Horses (2011-2014)

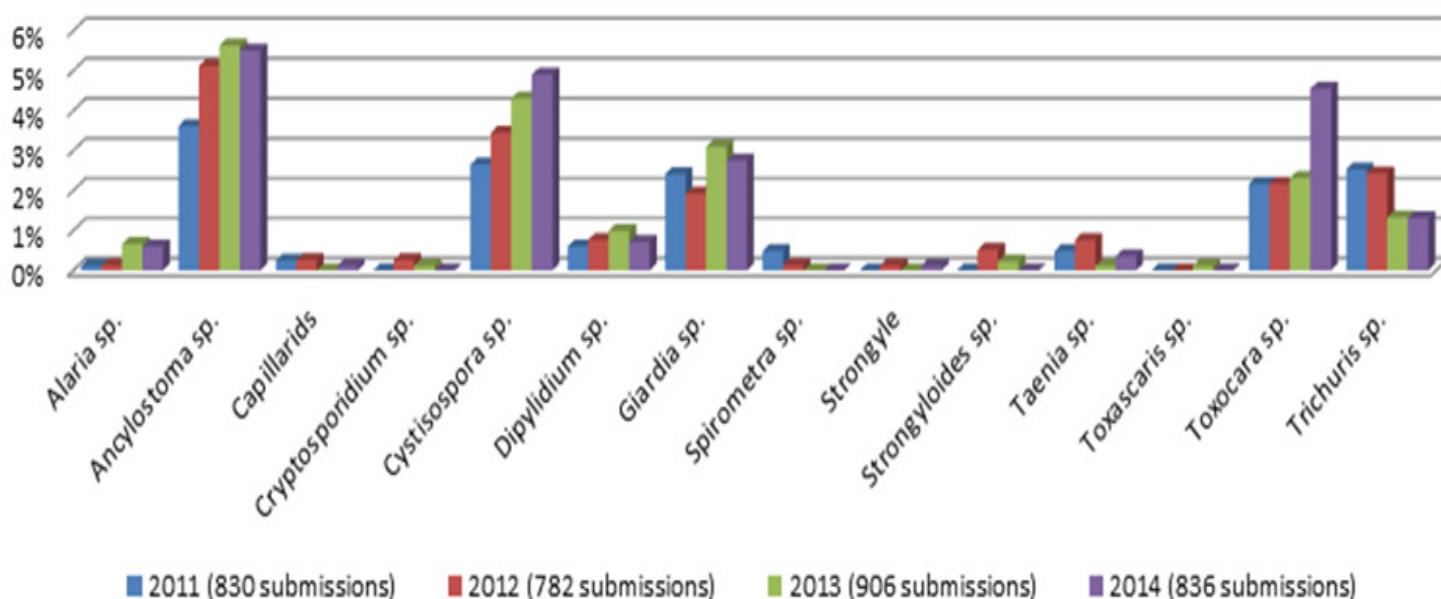
Diagnostic parasitology fecal examination results from client-owned animals over several years can often reflect trends that are occurring. The following graphs compare yearly parasite preva-

lence for companion animals (dogs and cats), ruminants (cattle, sheep, goats, and camelids), and horses for 2011-2014. All fecal testing was conducted in the Parasitology Laboratory on sam-

ples submitted by the Boren Veterinary Medical Teaching Hospital (BVMTH) and the Oklahoma Animal Disease Diagnostic Laboratory (OADDL).

Companion Animals

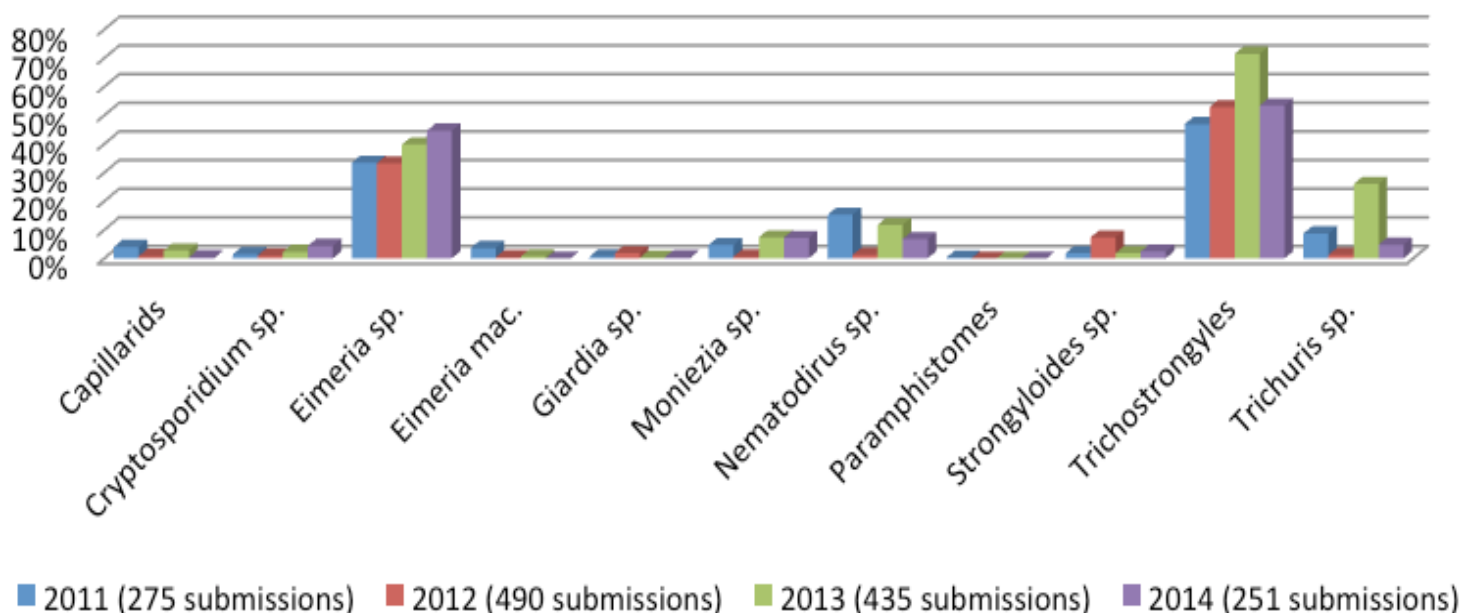
Ancylostoma spp., *Cystispora* spp., *Giardia duodenalis*, *Toxocara* spp., and *Trichuris vulpis* were the most common parasites found in dogs and cats. *Dipylidium caninum* and *Taenia* spp. infections were probably under-represented because eggs are not shed directly into the intestinal contents. An interesting finding was an increased number of *Alaria* spp. infections predominantly in cats, although some dogs were also positive for this parasite.



Parasitology continued from page 3

Ruminants

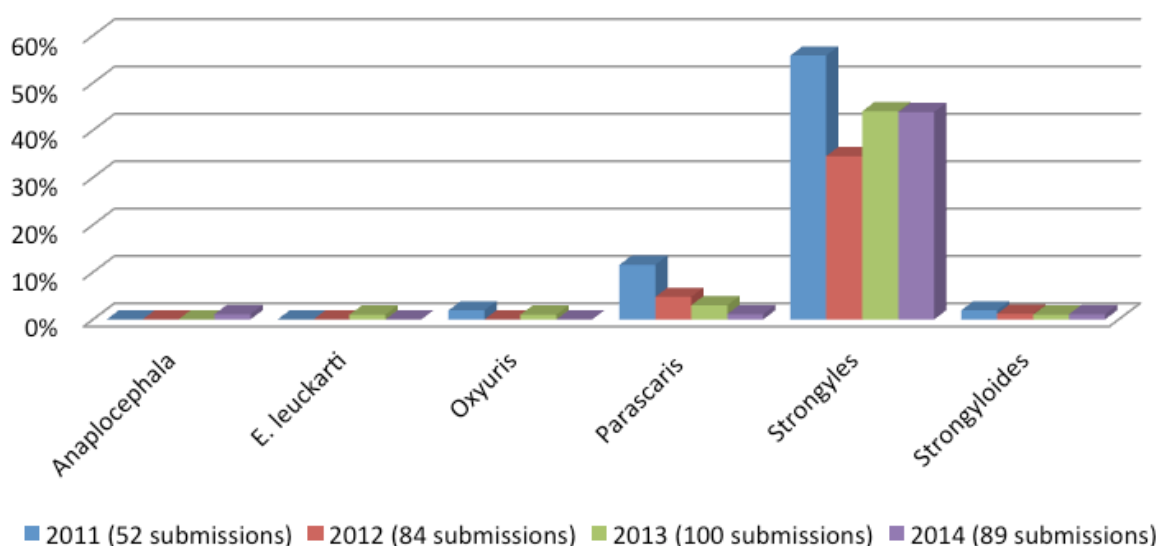
The majority of 2011 samples were from camelids, the majority of 2012 samples from cattle, the majority of 2013 samples from goats and the majority of the 2014 samples from cattle. Trichostrongyle eggs, *Eimeria* spp. oocysts and *Trichuris* spp. eggs were the most common findings in ruminants. A trend toward increasing prevalence of these parasites over the 4 year span could possibly reflect emerging anthelmintic resistance.



Equine

Strongyles and *Parascaris* spp. were the most common parasite infections in horses. Parasite prevalence over the 4 year period may not accurately reflect what is actually occurring in horse populations in Oklahoma because sampling size/year was small.

Rebecca Duncan-Decocq & Dr. Eileen Johnson



Message from the Director

January is traditionally a month of reflection and planning. OADDL had several significant accomplishments in 2014 including the rollout of an electronic newsletter, upgraded equipment, expanded diagnostic testing, and a focus on outreach efforts at regional at state meetings.

While we take a moment to reflect on our accomplishments in 2014, it is imperative that we to continue to plan for success in 2015. A key element in our success this year will be open communication and engagement with our clients and key stakeholders. We realize that you have several options for veterinary diagnostics in this

competitive environment.

Your input is extremely important to us. In the next 2 months, you will receive an electronic survey from OADDL. We ask that you take 5 minutes to complete the survey. The survey is intended to provide us with input on your diagnostic needs and shine light on what we can do better. In addition to the client survey, we ask that you provide direct comments and suggestions to us by telephone, email, fax, or by visiting OADDL in person.

We thank you for your support in 2014 and look forward to working more closely with you this year.

Dr. Keith L. Bailey



CONGRATULATIONS

to Dr. Rinosh Mani on successful completion of the board certification examination by the American College of Veterinary Microbiologists in the specialty of Bacteriology and Mycology!

He was one of only five successful candidates to be certified in this specialty in 2014. Dr. Mani serves a dual role at the Center for Veterinary Health Sciences where he is the bacteriology lab manager at the Oklahoma Animal Disease Diagnostic Laboratory and also lab manager for the infectious disease and immunology teaching labs in the Department of Veterinary Pathobiology.

Ideas/Suggestions for Future Content

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

Contact Us

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Getting to Know Us

Shanley Payton has worked as the Receiving Supervisor at OADDL since the end of 2013. She grew up in Fayetteville, Arkansas and came to Stillwater to obtain her Bachelor of Science degree in Biological Sciences at Oklahoma State University. She has a 4 year old daughter and five big dogs. Her family loves spending time outside hiking or going to the zoo.



Carolyn Johns was born in Drumright, OK and has lived in several other states including KS, AZ, FL, GA, TX. She has two daughters, one biological age 21 and one adopted, age 18. She has owned and operated an equine boarding stable since 1999 and is certified through OSU in Cervidae Wildlife Management. In her spare time, Carolyn enjoys the outdoors, hunting, riding horses, 4-wheelers, fitness and hiking.

