Virginia Animal Diagnostics

A joint publication between the Virginia Department of Agriculture and Consumer Services and the Virginia Tech Animal Laboratory Services

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WHO WE ARE

The Virginia Regional Animal Health Laboratory System (RAHLS) and the Virginia Tech Animal Laboratory Services (VITALS) are veterinary diagnostic laboratories located in the state of Virginia. The mission of these laboratories is to provide accurate, high-quality, and timely veterinary diagnostic services to maintain the health and well-being of production and companion animals.

Each of the laboratories has modern facilities and significant expertise, providing regulatory and routine diagnostic services to veterinarians, animal and food producers, and pet owners. A wide variety of services are offered in each of these laboratories, including necropsy, bacteriological culture and antimicrobial susceptibility testing, parasitology, hematology, molecular diagnostics, and histopathology, helping veterinarians keep animals healthy in the Commonwealth of Virginia and aiding in the control and eradication of foreign animal diseases.

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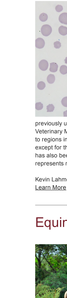
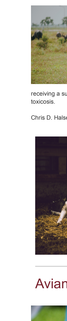


Theileria orientalis Ikeda genotype 2 in Virginia

In early fall 2017, a Virginia veterinarian received a call from a beef producer with a previously healthy adult beef cow acutely affected with severe lethargy, weakness, and anemia. The veterinarian, who highly suspected anaplasmosis, collected serum, and the affected cow anecdotally improved with oxytetracycline therapy. The serum was negative for *anaplasmosis*, but was positive for a *Theileria* species *(spp)*. Follow-up testing of the index animal and a representative sample of herd mates resulted in confirmation by the National Veterinary Services Laboratory (NVSL) of *Theileria orientalis*, a previously undiagnosed blood-borne parasite in Virginia. Further workup at the VA-MD College of Veterinary Medicine identified this as the virulent Ikeda genotype. Most *Theileria spp.* are confined to regions in Asia and Africa associated with the geographical distribution of their vector ticks, except for the worldwide distribution of the apathogenic *T. orientalis* Buffalo genotype. The parasite has also been found in Australia and New Zealand with some increased virulence. This disease represents no threat to human health.

Kevin Lahmers, Virginia Tech
Learn More

Equine



Salmonellosis

An adult Standard Donkey jenny was presented for necropsy after a history of sudden decline and vague clinical signs of lethargy and inappetance. A neutropenia with a left shift was documented. There were multiple hemorrhagic regions in the mucosa of the large colon and cecum, as well as the small intestine, with moderate enterocolitis evident histologically. Culture of ileal contents yielded *Salmonella spp*, which was further typed. This is a case of *per acute salmonellosis*, with minimal development of specific clinical signs before euthanasia.

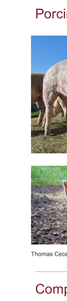
Phillip Sponenberg, Virginia Tech

Theiler's disease

Theiler's disease was diagnosed in a 24-year-old horse that was euthanized due to neurologic signs. The liver was small and slightly firm, due to sub massive centrilobular to midzonal hepatocellular necrosis. Equine serum sickness (or Theiler's disease) is an idiopathic acute hepatic disease that primarily affects adult horses. The disease is still not completely understood, but in many horses, it is associated with receiving an equine-origin biologic within 4-10 weeks, such as vaccines made from fetal tissue or pregnant mare serum, and other biologics, such as Clostridium perfringens toxoids and tetanus antitoxin. A new parvovirus has been suggested as the etiology for this condition, which is now under investigation.

Jaime Weisman, RAHL Warrenton

Bovine



Copper toxicity

Copper toxicity was the cause of death in a 10-week-old Water Buffalo calf. The bottle-fed calf presented with abrupt loss of appetite and open-mouth breathing. did not respond to therapy, and ultimately died. Necropsy revealed dark, chocolate-brown blood, extremely icteric peritoneal fluid, and a diffusely orange liver. A mineral panel revealed liver copper levels of 3255 ug/g (normal levels are 40-650 ug/g). It was later determined that the calf had been receiving a supplemental oral hematinic in each of his milk bottles, ultimately resulting in copper toxicosis.

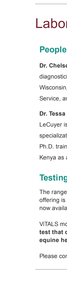
Chris D. Halsey, RAHL Wytheville

Hemorrhagic abomasitis

Hemorrhagic abomasitis was identified in an 8-day-old Holstein heifer calf that died suddenly. The calf was in good body condition, but the wall of the abomasum was necrotic and hemorrhagic and contained numerous gas bubbles. The cause of death was attributed to abomasal tympany as a result of overgrowth of *Clostridium spp.* and *Sarcina spp.* bacteria. Abomasal tympany is most common in dairy calves and is frequently seen in well-managed herds. Risk factors include delayed abomasal emptying and ingestion of milk replacer with excessive fermentable carbohydrates, which allows for overgrowth of commensal bacteria, including *Clostridium, Campylobacter* and *Sarcina spp.*

Tanya LeRoith, Virginia Tech

Avian



Marek's disease

Marek's disease was diagnosed in a 6-month-old pullet with a history of unilateral lameness. Gross necropsy revealed severe enlargement of the right sciatic nerve and right sciatic plexus with a soft white to yellow tissue that effaced the nerve structure, plus mild thickening of the proventriculus and splenomegaly. Histopathology of the nerve showed a severe lymphoproliferative disease, which is indicative of Marek's disease virus infection. Marek's Disease Virus is a herpesvirus that often causes tumors in chickens between the ages of 14 weeks and 1 year. Due to the virus's ubiquitous nature, vaccination seems to only be effective at 1 day of age although research has shown that booster of vaccination later in life can help decrease clinical signs and prevent tumor development.

Jessica Walters, RAHL Harrisonburg

Ovarian adenocarcinoma

Ovarian adenocarcinoma was detected in a 3-year-old hen from a backyard flock. The hen had been declining in general health. The hen had very depleted skeletal muscle stores and no body fat. The coelomic cavity had an excess of clear, transparent yellow fluid and numerous firm, pale, and yellow nodules up to 2 cm diameter. The ovary was the site of confluent nodules, and the site of the primary neoplasm. The histologic diagnosis was adenocarcinoma of the ovary, with carcinomatosis throughout the coelomic cavity. This neoplasm is one of the more common neoplasms of older hens.

Phillip Sponenberg, Virginia Tech

Porcine

Streptococcus suis

Streptococcus suis was cultured in a young, Landrace-cross pig as the causative agent of suppurative otitis media, otitis interna, and meningoencephalitis. The lesion was unilateral and severe. *S. suis* colonizes the tonsils of asymptomatic carriers and can extend into the middle ear via the Eustachian tubes. This is a disease of high zoonotic concern, with veterinarians at particular risk for contracting *S. suis* meningitis.

Vanessa Oakes, Virginia Tech

Lymphoma

Lymphoma involving the liver, kidneys, visceral lymph nodes, and adrenal glands caused chronic weight loss and abortion in a 4-year-old Landrace/Yorkshire-cross sow. Although neoplasia is less commonly encountered in commercial swine than in companion animals, lymphoma is one of the more common neoplasms in pigs and is often multicentric, as in this case.

Thomas Cecere, Virginia Tech

Companion animals

Canine distemper virus

A 6-week-old, female, mixed-breed dog presented for progressive respiratory signs and acute onset of seizures. Testing for canine parvovirus was negative, but a blood smear revealed suspect distemper inclusions in leukocytes. The puppy was submitted for necropsy and found to have lesions and viral inclusions in the lungs, liver, pancreas, and brain consistent with canine distemper virus, which was later confirmed with PCR. Over the next three weeks, a total of four additional puppies from the same animal shelter were euthanized for similar clinical signs.

Sheryl Coutermarsh-Ott, Virginia Tech

Cytauxzoonosis

Cytauxzoonosis was diagnosed in a domestic cat that originated from a neighborhood with increased feline mortality. The carcass was severely icteric and numerous developmental stages of Cytauxzoon felis were identified in the cytoplasm a of macrophages in multiple organs. This tick-borne disease is generally considered fatal in the domestic cat; however, there are reports in the more-recent literature of survival of infected cats, perhaps due to a less pathogenic strain or improved therapy. Domestic cats are considered a dead-end host.

Joseph Garvin and Lisa Crofton, RAHL Lynchburg

Laboratory News

People:

Dr. Chelsea Crawford began Dec. 10, 2019, as the laboratory director and veterinary diagnostician in the Lynchburg Regional Animal Health Laboratory. Dr. Crawford, a native of Wisconsin, has experience in dairy-testing laboratories, in USDA, Food Safety and Inspection Service, and most recently as the assistant state veterinarian of Utah.

Dr. Tessa LeCuyer joined the VITALS team in July as the new clinical microbiologist. Dr. LeCuyer is board-certified by the American College of Veterinary Microbiology with specializations in bacteriology/mycology and virology. Dr. LeCuyer did her microbiology and Ph.D. training at the Washington Animal Disease Diagnostic Laboratory and spent a year in Kenya as a Cunningham Fellow before joining VITALS.

Testing:

The range of molecular tests being offered in the RAHLs is continuing to expand. The newest offering is a polymerase chain reaction **(PCR) test for strangles *(Streptococcus equi equi)*** now available at the Warrenton RAHL.

VITALS molecular diagnostics section is also expanding. The lab currently offers a duplex **PCR test that detects both *Theileria orientalis* and *Anaplasma marginale***. A **PCR test for equine herpes virus 1** is also offered.

Please contact the individual laboratories for more information.