TVMDL Texas A&M Veterinary Medical Diagnostic Laboratory

Diagnosing Toxic and Nutritional Conditions

The Texas A&M Veterinary Medical Diagnostic Laboratory (TVMDL) Analytical Chemistry Section has the ability to offer toxicology and drug testing services to livestock producers and practitioners. The lab offers a variety of tests to aid in diagnosing many conditions of both toxic and nutritional origin. Our highly trained and qualified personnel use state-of-the-art analytical techniques to obtain results using cutting edge methodologies; inductively-coupled plasma – mass spectrometry (ICP/MS), gas chromatography – mass spectrometry (GC/MS), liquid chromatography – mass spectrometry (LC/MSn), high performance liquid chromatography (HPLC), atomic absorption (AA) and microscopy. TVMDL focuses on precision and accuracy, and takes pride in the agency's ability to offer a broad diversity of test procedures. The agency's priorities are to produce timely results in emergency situations and work with clients to offer the quickest turnaround times possible with accurate and reliable results.

Toxins

TVMDL is equipped to identify a variety of toxicants that include pesticides, herbicides, rodenticides (anticoagulants, bromethalin and strychnine), mycotoxins (aflatoxin and fumonisin), ionophores, heavy metals (see below), petroleum products, blister beetles (cantharidin), and antifreeze (ethylene glycol). We can test for these poisons in an assortment of biological sample types including whole blood, serum, urine, gastrointestinal (GI) content, and tissues, as well as non-biological samples such as water, grass/hay, and soil. Please refer to TVMDL's website for specific sample requirements for each test, or call if we can help you with a specific case. Additionally, TVMDL can test forages and hay for unsafe levels of nitrates and cyanide.

Nutritional Testing

We provide results that can be utilized in evaluating an animal's nutritional status. We can measure vitamins A and E, as well as trace minerals (see below) in blood, serum and liver. We also measure bone ash to determine the percentage of mineral in either femoral or humeral bone.

Microscopy

Microscopy is performed daily by highly trained scientists using microscopic characteristics to identify a wide range of materials. Different plant species have distinct cellular structures that make many recognizable microscopically. Microscopy is used to confirm toxic plant ingestion by evaluating fragments in GI content. Microscopy is also used to identify toxic algae, blister beetles, pesticide bait formulations, and a variety of plants. This special expertise is known nationwide, and the agency's toxicologists provide training to other scientists and receive samples from all over country.

Heavy Metals and Trace Minerals

TVMDL utilizes inductively-coupled plasma – mass spectrometry (ICP/MS) and atomic absorption spectroscopy (AAS) to detect and measure concentrations of heavy metals and trace minerals in blood or serum and tissues. While arsenic usage is mostly historical, we are still diagnosing cases related to animals exposed to old storage containers and burn piles. We test for lead regularly in companion and food animals. The ICP/MS allows us to run multiple minerals simultaneously, and we now offer a mineral panel on liver, including ALL of these:

Arsenic (As)	Cobalt (Co)	Molybdenum (Mo)
Cadmium (Cd)	Copper (Cu)	Selenium (Se)
Lead (Pb)	Iron (Fe)	Zinc (Zn)
Thallium (Tl)	Manganese (Mn)	

Therapeutic Drug Monitoring (Potassium Bromide)

TVMDL uses ultraviolet (UV) spectroscopy to measure potassium bromide levels in blood serum. This test allows veterinarians to monitor the therapeutic drug regimen and ensure the animal is receiving the proper therapeutic dose.

Urolith Analysis (Calculi ID)

Fourier transform infrared (FTIR) spectroscopy is used to analyze bladder stones and identify their components. Calculi identification is quick and can assist the veterinarian by determining the stone composition so that the proper protocol to prevent reformation can be implemented.

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