



Newsletter



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From the Director:

Homeland Security

We have recently received a major grant from the USDA as a result of a congressional mandate to increase our surveillance and preparedness for the possible accidental or intentional introduction of foreign animal diseases. This program, which is in its infancy, will consist of pilot projects at twelve state diagnostic laboratories across the country. Procedures will be coordinated with USDA laboratories and will provide a much broader base for surveillance for foreign animal diseases. These efforts will be carefully coordinated with state and federal regulatory officials within the state of Arizona. Our ultimate goal is to provide much more accessible and responsive diagnostic services to provide earlier detection of any possible foreign animal disease introduction. Participating laboratories will also be expected to develop capabilities to assist in management of an outbreak should one occur. Our ability to take advantage of this opportunity will be limited somewhat by cutbacks in funding from state sources. This hampers us to some extent because of our inability to hire additional personnel or to fill open positions in some cases. We do look at this as a real opportunity to provide better service to the livestock owners in this state and to participate in a national effort that should greatly improve our capabilities.

Toxicology

We have experienced some changes in our toxicology and nutritional testing section as a result of short-term budget cuts as well as long-term inability to secure significant funding to replace some of our aged equipment. Therefore, we will be limiting some of the more complex services that we have provided in the past such as gas chromatography with mass spectroscopy. We may also have to reduce some other services as old equipment may become inoperative. In the meantime, we hope to maintain the capability of providing most routine analytical services for poisonings and nutritional questions. We have contracts with other accredited laboratories for support in the event that we must reduce some of our services. Dr. Ted Noon has served as our local source of expertise on toxicology and he will be in charge of the laboratory section with Barbara Rickert remaining as the analyst. Questions about toxicology and nutritional testing should be directed to Dr. Noon at 621-2356 extension 17.

Robert Glock, Director



Veterinary Diagnostic Laboratory

Diagnostic Services offered at AzVDL:

- ◆ **Pathology:** gross necropsy, histopathology, cytology, or other diagnostic tools used to determine the cause of disease
- ◆ **Microbiology:** the use of microbiological techniques to identify bacteria, viruses, parasites, and other infectious agents, and their relationships to animal diseases
- ◆ **Toxicology:** identification of toxic substances (toxins) and their involvement in animal diseases
- ◆ **Chemistry:** chemical analysis of feed, forage, and body tissue samples into finite compositions
- ◆ **Serology:** analysis of serum to monitor animals' prior exposure to diseases

Arizona Veterinary Diagnostic Laboratory

Access to the AzVDL: Take Tucson Interstate 10 to the Miracle Mile exit #255. Travel approximately 1/4 mile on the south bound frontage road between Miracle Mile and Grant Rd. Turn west onto the farm at the signed entrance.

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Submission Tip

Good carcass preservation in hot weather is possible. The AzVDL routinely recommends bagging smaller carcasses in plastic (to prevent water logging) and promptly packing them in ice to cool them down rapidly. Carcasses can usually be held for several days if the ice is periodically replenished. The ice should be replaced by ample leak-proof "cool packs" when a specimen is shipped in an insulated container by common carrier. The "icing down" method of preliminary cooling is preferable to refrigeration in a conventional household refrigerator, which is usually neither cold enough nor cools rapidly enough to prevent decomposition.

Large carcasses can be similarly cooled by placing them in a large poly-tarp in the bed of a trailer or pick up and packing an ample supply of bagged ice around them. The carcass should then be covered with the loose flaps of the tarp and ideally, an old blanket for insulation. Carcasses as large as those of a horse, for example, should be packed with 30 - 40 bags of ice (a mix of cubes and blocks) placing most of the ice around the abdomen, chest, and head. In some vehicles, placing an insulating pad or blanket under the carcass (under the poly-tarp) may be advisable to minimize heating from the vehicle's exhaust system. Icing large carcasses while awaiting or during transport is well worth the trouble and expense to avoid making a long drive to the Arizona Veterinary Diagnostic Lab and arriving with a decomposed carcass. The poly-tarp containing ice can be most easily secured around the carcass with bungee cords.

By T. H. Noon

The following are selected samples of cases submitted to the AzVDL during the spring months of March, April, and May.


Bovine

Ammonia intoxication was diagnosed in a three-year-old Hereford. The heifer was one of forty that died suddenly after being moved to a new pasture. Symptoms included opisthotonus and paddling. Many animals were severely emaciated and dehydrated. Most deaths occurred near a water tank. Range (protein) blocks were present in the pasture. Range blocks are often made with urea or ammonia salts as a source of non-protein nitrogen. There is the potential for these to be converted to ammonia in the rumen under certain conditions resulting in ammonia intoxication. These conditions include: animals not adapted to consumption, animals on a low nutritional plane, and animals that are water deprived or that over-consume the blocks.

Diffuse bronchointerstitial pneumonia was found at necropsy in a six-month-old Holstein steer that had been on feed for approximately one hundred days. Organisms isolated were *Mycoplasma bovis* and *Arcanobacterium (Corynebacterium) pyogenes*. *Mycoplasma bovis* has long been identified as a participant in various bovine disease complexes but it appears that there is an increased incidence of concern about *Mycoplasma bovis* in the feedlot with resulting subacute to chronic pneumonias and arthritic problems.


Abortion due to *Neospora* sp. was diagnosed in a Holstein fetus.

Neospora infection was diagnosed in four other aborted feti from a large dairy. They were part of an "abortion storm" of almost one hundred abortions in a few weeks. In contrast to the common observation in most



Compiled by Greg Bradley, Sharon Dial, Bob Glock, Ted Noon, Barbara Pickard, and Carlos Reggiardo

Comments on Diagnostic Update can be directed to Dr. Greg Bradley via e-mail at: azvdl@ag.arizona.edu



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of the country, most cases of *Neospora*-induced abortion were "storms" of high morbidity when the first cases of the disease were diagnosed in Arizona. Cases have been more sporadic in recent years, although explosive cases with many abortions are still observed as the present case illustrates.

Equine

A presumably metastatic **cerebral melanoma** was the cause of blindness in a fourteen-year-old gray mule. The animal was euthanized after two weeks of unsuccessful treatment. The tumor was a discoidal mass approximately two inches in diameter located just dorsal to the brain stem, between the occipital pole of the left cerebral hemisphere and the rostral lobe of the cerebellum.

An abdominal hemorrhage produced by a **liver fracture** was the cause of death of a neonatal Quarter-horse foal. The lesion was most likely traumatic, caused by the mare.

Small Ruminants

Coccidioidomycosis was diagnosed in a two-week-old Nubian kid that died after a relatively short episode of severe dyspnea and weakness. The gross necropsy findings reported by the attending veterinarian included a diffusely consolidated lung, dilated heart, hepatomegaly, and ascites. Histologic examination of the lung revealed diffuse, chronic pyogranulomatous pneumonia with numerous *Coccidioides immitis* spherules throughout the sections. This was considered an intrauterine infection given the age of the goat, and the extension and chronicity of the pulmonary lesions.

Campylobacter jejuni was the cause of abortion in an ewe.

Avian

A five-year-old female Lilac Crown Amazon parrot was seen copulating. It then began to "move strangely" and appeared to have no motor control of

the head or body. At necropsy, a one-centimeter area of acute hemorrhage was found in the left cerebral cortex. The diagnosis was **acute hemorrhagic stroke**.

A female Sulfur Crested Cockatoo had a history of weight loss, regurgitation, and scant feces. Contrast radiographs demonstrated no passage of material beyond the ventriculus. At necropsy, **intestinal obstruction** by masses of synthetic fibers suggestive of carpet was found. There was deep ulceration of the adjacent intestinal mucosa.

Verminous gastritis due to gizzard worm *Amidostomum anseris* was the cause of weight loss in a two-year-old Indian Fantail pigeon.

Scaly leg mites were the cause of thick scaly skin on the legs of a chicken. Multiple chickens in the flock were affected.

Acute pancreatic necrosis was the cause of death in a Quaker parrot that died after an acute onset of illness characterized by lethargy and a "fluffed" appearance. There was a recent history of a dietary change.

Polyomavirus infection was the cause of acute illness and death of a juvenile Alexandrian parakeet and a seven-week-old Solomon Island Eclectus parrot from separate premises.

Pigeon paramyxovirus (paramyxovirus type I) was the cause of torticollis in a three-week-old Blue Modina rock dove.

An adult Mourning dove was one of a number of birds found dead in an urban area. There were no significant lesions but grain was found in the digestive tract and **strychnine** was identified in the ingesta. This would appear to be a case of inadvertent poisoning of wild birds in an attempt to control rodents.

Airsacculitis and polyserositis due to aspiration of foreign material (probably ingesta) were diagnosed in a one-and-one-half week-old Yellow Nape Amazon that died after an illness of one day dura-

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tion. The bird was being hand-fed. At necropsy, the proventriculus and crop were distended with watery ingesta and there were no other gross lesions. Microscopically, there were plant fragments, bacteria, and amorphous eosinophilic material on the air sac membrane and these were accompanied by leukocytic infiltrates.

A chronic **esophageal candidiasis** caused emaciation and death in an adult Severe macaw.

An acute *Pseudomonas aeruginosa* **septicemia** was the cause of death of two, five-day-old conures from a group with high mortality. This is not a contagious disease. It is more likely the result of environmental contamination.

Environmental contamination was the source of aspergillosis in three parrot embryos in late stages of development. *Aspergillus fumigatus* was isolated in pure culture from all three embryos. There was a necrotizing omphalitis in all three embryos, and skin infiltration by fungal hyphae was observed in one.

A *Salmonella typhimurium* **septicemia** caused the death of three Amazon parrots in an outdoors aviary.

Feline

The non-effusive form of **feline infectious peritonitis** was the cause of death of a one-year-old female cat from a rescue shelter. It had a history of anterior uveitis, high serum total protein and globulin, and a 1:1600 FCV titer. Necropsy findings included severe granulomatous meningitis, interstitial nephritis, and perivascularitis in heart, liver, and brain.

Feline leukemia virus infection and **disseminated lymphoma** were diagnosed in the necropsy of a one-year-old female cat. Gross necropsy findings included emaciation, a very enlarged thymus taking roughly 80% of the thoracic volume, enlargement of virtually every lymph node, and nodular tumors in the spleen.

Two cases of **oxalate nephrosis** consistent with anti-freeze poisoning were diagnosed in feline necropsies in this reporting period.

Feline herpesvirus infection was diagnosed in a five-week-old kitten. The animal had been a stray and de-

veloped chronic diarrhea and a respiratory infection. Neurologic signs were also reported and included: "circling, rolling, dementia". Brain tissue was submitted for rabies testing, which was reported as negative. Microscopically, there was an exudative pneumonia. Cultures of lung tissue were reported as negative for bacterial growth. PCR testing of lung tissue, however, was positive for nucleic acid sequences specific for feline herpesvirus.

Hypertrophic cardiomyopathy and a saddle thrombus of the aortic bifurcation was the cause of death in a six-year-old male cat. The cat was in pain and dragging the right hind limb prior to death. Necropsy lesions included marked thickening of the left ventricular wall, and left atrial dilatation. A saddle thrombus occluded the internal iliac arteries at the aortic bifurcation.

Endomyocarditis was the cause of death in a two-and-one-half-year-old female cat presented with acute respiratory distress, pulmonary edema, pleural effusion, and hemoptysis and in a female domestic shorthair that died six days post ovariohysterectomy. The disease is characterized by inflammatory infiltrates of the endocardium and myocardium, especially in the dorsal septal wall of the left ventricle. The inflammation is associated with variable amounts of endocardial fibrosis. This is an idiopathic disorder of young cats (mean - 3.4 years) without a breed predilection. Many cats have a history of some stressful event such as surgery or boarding within two weeks prior to presentation.

Canine

Canine distemper continues to be diagnosed in cases of unvaccinated puppies or puppies of unknown vaccination history. The disease was diagnosed in three unrelated cases during this reporting period; a one-week-old Australian-Cocker mix, a four-month-old Chihuahua, and a thirteen-week-old Queensland Heeler. CNS signs (head-tilt, seizures) were reported in the first two cases and respiratory disease in the third case.

Myocardial ischemia caused by **mural amyloidosis of coronary artery** branches in the left ventricle was the cause of death in a seven-year-old, female Labrador retriever. The dog died suddenly during recovery from an elective surgical procedure. There had been no prior sign of cardiac problems. The amyloid deposition was restricted to the coronary arteries of the left ventricle.

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Vascular thrombosis with myocardial, renal, and pulmonary infarction was the cause of death in an eleven-year-old, spayed female Chow that died while under treatment for immune mediated hemolytic anemia. Thrombosis is a common sequelum to hemolytic anemia.

A **gastric carcinoma** was the cause of anorexia and vomiting in a ten-year-old, spayed female Chow.

Several typical cases of **canine parvovirus** were seen during this quarter. One case of parvovirus enteritis was noteworthy in that it involved the death of a twelve-year-old animal that, according to the owner, was up-to-date on vaccinations. Clinical signs included a three-day history of anorexia and vomiting. The dog became hypoglycemia (blood glucose < 40 g/dl) and seizures developed. The dog died. Intestinal lesions were characteristic of the infection.

Another **canine parvovirus** infection was diagnosed in a six- to eight-week-old pup. The submitting veterinarian described lethargy and anorexia. No diarrhea or vomiting was observed. The litter mates had been previously diagnosed with parvo. Necropsy and microscopic lesions were typical of canine parvovirus infection and PCR testing of spleen and small intestine were positive for nucleic acid sequences specific for the virus.

Rabies encephalitis was diagnosed in a three-month-old puppy from a rescue shelter. The pup was found wandering in a rural area. It was placed on display and up for adoption in a pet-superstore where many people visiting the store handled it. It later developed seizures. Eventually, over one hundred people at the shelter, the veterinarian's office, store employees, and shoppers underwent rabies prophylaxis.

Irradiation-related neuropathy was diagnosed in a Labrador-mix canine that was submitted for necropsy by a veterinarian who stated that the dog had been irradiated for a neoplasm that had metastasized to the lumbosacral lymph nodes and the lungs. Following irradiation the dog suffered pain in the hindquarters. Necropsy findings included nodular tumorous lesions in the parenchyma of both lungs. Microscopic examination of the spinal cord revealed a neuropathy compatible with that described for irradiation injury in dogs, which might have accounted for

the hindleg pain. The tumorous lung lesions were consistent with metastatic apocrine gland (anal sac) adenocarcinoma.

Chronic staphylococcal pneumonia was diagnosed in a ten-year-old spayed female Australian Shepherd canine that developed "progressive respiratory problems". The submitting veterinarian suspected neoplasia. At necropsy consolidated areas were evident in lung that were consistent with pneumonia. Microscopically there was an exudative pneumonia, and gram-stained smears of lung tissue contained large numbers of gram-positive coccoid organisms. Aerobic bacterial cultures of the lung tissue yielded *Staphylococcus aureus*. PCR testing of lung tissue for canine distemper virus was reported as negative.

Urolithiasis with pyelonephritis, cystitis, and urethritis was the cause of urinary obstruction with perforation of the bladder and an acute, fatal peritonitis in a four-year-old Rottweiler/Labrador mix, without any prior history of urinary disease.

A **deep bacterial pyoderma** was diagnosed in a three-year-old Labrador mix that was euthanized following the peracute appearance of numerous "bite-like wounds that increased in number overnight, and swollen scrotum." Necropsy findings included multiple discrete skin ulcerations, 0.5 to 1.0 centimeters in diameter widely disseminated throughout the dorsal aspects of the body and subcutaneous edema. *Staphylococcus aureus* was isolated from the skin ulcerations and internal viscera. Given the absence of obvious hormonal, parasitic, or traumatic predisposing causes, an immune deficiency or specific predisposition was suspected.

A **hemangiosarcoma** originating in the fibula was suspected in an eleven-year-old Sheltie with over a month-long history of a large bleeding hematoma behind the left stifle joint, and an abnormal coagulation profile. Although the extensive necrosis of the fibula and the soft tissue did not allow a conclusive histologic diagnosis, the clinical history and the presence of hypercellularity of the periosteum and pockets with numerous vascular spaces lined by plump endothelial cells were highly suggestive of hemangiosarcoma. Liver failure, rodenticide poisoning, and other common causes of hemorrhagic diathesis were ruled out.

A three-year-old Cairn terrier was found dead with no

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evidence of trauma. The animal was in good overall condition but there was extensive hemorrhage in the pericardial sac. There was also free blood in the thorax. Further investigation revealed an **aneurysm** of the pulmonary artery near the base of the heart. This aneurysm apparently resulted in a dissecting lesion that eventually ruptured the wall of the pulmonary artery.

Acute hemorrhagic gastroenteritis was identified in a ten-month-old Sheltie with a history of progressive vomiting and diarrhea. There was histiologic evidence of necrosis of the intestinal mucosa and numerous large rod-shaped bacteria were present in the lesions. *Clostridium perfringens* type A was isolated in heavy populations. Cause and effect is uncertain but there is increased interest in *Clostridium perfringens* type A as a cause of acute enteritis in various species.

Exotics

A **disseminated coccidioidomycosis** was the cause of death of a two-year-old female Rock Hyrax from a private zoo.

An acute **herpes viral hepatitis** was diagnosed in a captive Chuckwalla. The etiology was confirmed by electron microscopy of liver sections.

Enterobacter sakazakii was the only isolate from the kidneys and viscera of a two-year-old rabbit with acute **pyelonephritis** and **septicemia**.

Granulomatous myocarditis due to *Salmonella* sp. infection was the cause of death in a six-year-old male Green Iguana. The lizard had been treated for a bacterial infection of the intestine that had resulted in weight loss. There was initial improvement with treatment with about a half-pound weight gain in a month. The death was sudden and unexpected. The necropsy lesions were restricted to the heart, the intestinal lesions having apparently resolved.

A three-year-old male guinea pig had a history of weight loss and anorexia of three weeks duration. Nine days of antibiotic treatment resulted in a slight weight gain and improvement in appetite. One week later, the animal stopped eating and droppings became scant. It

died spontaneously. Necropsy findings included **bilateral urolithiasis of the renal pelvices and ureters with obstruction of the ureters resulting in hydronephrosis**. Most uroliths in the guinea pig are composed of calcium and magnesium carbonates and phosphates. They are more common in the female.

Pseudomembranous typhlitis was the cause of death in a one-year-old male guinea pig following a one-week history of illness. Pseudomembranous typhlitis in the guinea pig is associated with stress, rapid dietary change, dietary imbalances, or the use of broad-spectrum antibiotics. *Clostridium difficile* is thought to play a role in the pathogenesis in some cases.

Pasteurella multocida was cultured from the lung of a four-year-old Mini Rex rabbit that died from pneumonia following acute onset of respiratory distress. Another bunny on the premises exhibited snuffling and wheezing.

Wildlife

Aspergillosis by *Aspergillus fumigatus* was the cause of death in a wild Red-tailed hawk from central Arizona. Numerous aspergillomas were present in the lungs and in the thoracic and abdominal air sacs.

A rehabilitator treated a newborn javelina for chronic respiratory infection and diarrhea but the javelina failed to respond, became weak, and died. At necropsy, a thick, white pseudomembrane covered the mucosal surface of the tongue, esophagus, and squamous portion of the stomach. The diagnosis was **oral, esophageal, and gastric candidiasis** that was likely the result of long-term use of broad-spectrum antibiotics.

A female raccoon was rescued from a Tucson area yard when it was unable to climb a wall. Physical examination revealed that the raccoon had draining fistulas down the spine and was in thin body condition. She developed head pressing and torticollis. Necropsy lesions were those of disseminated **coccidioidomycosis** with severe involvement of the cerebrum, skin, and lung.

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Head trauma was diagnosed in a three-month-old female coyote that had been euthanized after being observed "seizuring". At necropsy, there was locally extensive hemorrhage in the subcutis over the top of the skull and over the dorsal aspect of the cerebrum and cerebellum. There was no gross or histologic evidence of infectious disease and a rabies check was negative, as was PCR testing of spleen and brain tissue for canine distemper virus.

The AZVDL received two emaciated mule deer from separate areas in southern Arizona for necropsy. Given the degree of emaciation seen in these animals, the Arizona Game and Fish Department was naturally concerned about the possibility of Chronic Wasting Disease in these animals. We are happy to report that both animals were negative for the PrP protein of Chronic Wasting Disease. Testing of brain tissue was conducted at the Wyoming State Veterinary Laboratory. The emaciation was determined to be due to **starvation** in one of the deer and **epizootic hemorrhagic disease (EHD)**

in the other.

An adult mule deer buck was presented for necropsy after being found "crawling on four limbs in a trailer park". Arizona Game & Fish Department personnel euthanized the animal. At necropsy, there was a large nearly hairless, scaly skin lesion over the dorsum of the nose and the forehead. Examination of tissue sections and scrapings of the lesion was negative for ectoparasites. Histologically, there was a dermatitis that might have been secondary to the feeding activities of blood-feeding flying insects (e.g. deerflies). It was speculated that the lesion was likely to have been pruritic (itchy) and perhaps the buck attempted to relieve the irritation by rubbing against something. Stunning from a sub-lethal electrical shock to the head might explain the "crawling" behavior report by the wildlife manager. The submitting Arizona Game & Fish Department officer reported that there was an electric fence for elk control about two miles from where the deer was found. Contact by the animal with this fence was not observed, however.

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