



Newsletter

Volume 4, Issue 2

June 1999

A Quarterly Publication of the **Arizona Veterinary Diagnostic Laboratory**

From the Director:

Diagnostic needs vary from time to time and we're continually looking for ways to operate more efficiently while providing services that are needed. Recently we have seen an increase in the number of diagnoses of Johne's Disease (*Mycobacterium paratuberculosis*). There has also been an increased interest in acid fast bacteria testing because of increasing interest for herd evaluations. A certain level of usage is required to make some tests practical. This would include the ELISA test for Johne's disease. We feel we are reaching the point where demand will justify efficient utilization of available kits. Therefore we hope in the next few weeks to begin ELISA testing for Johne's disease. Also, we have added agar gel immunodiffusion tests for ovine progressive pneumonia and caprine arthritis and encephalitis.

We'd appreciate hearing from you with regards to any services or testing that you think we should be offering on a regular basis. We are often able to employ the skills of our colleagues on the campus to help us with test development or with actual testing. Dr. Glenn Songer is currently providing support for the differentiation and typing of pathogens such as *Clostridium perfringens* and *E. coli*. In this newsletter you will notice that there are several reported cases of clostridial diseases in which specific typing has been useful.

Robert D. Glock, Director

Diagnostic Update

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



Bovine

Increasing death losses in dairy cows at various stages of lactation were characterized by rapid progression from "normal" one day, to "death" the following day. The unifying clinical sign was diarrhea with some blood present. Necropsy findings in several cows included some degree of enteritis with areas of edema and cellular infiltration in the submucosa. The presence of numerous *Clostridium perfringens* type A has been the only consistent finding from these animals. The cause and effect is somewhat questionable. We are hearing more reports of apparent sudden death in high producing cows with associated identifiable populations of *Clostridium perfringens* type A. We still need to learn more about this condition. It is important to note that none of the available commercial vaccines include *Clostridium perfringens* type A. It is presently incorporated only in autogenous products. Also, there are no convincing studies to indicate whether any type of immunization is effective in preventing this condition. Some authors have suggested that high production and possible nutritional factors may be involved.

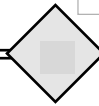


Equine

A skull fracture accounted for the "sudden death" of a fourteen-month-old horse identified by the owner as a Spanish colonial mare. When presented for necropsy the horse had blood draining from the down side ear canal which is suggestive of a skull fracture. The external aspect of the horse was otherwise unremarkable but two large circular bruises were found in the subcutis of the forehead. Dissection of the head revealed a very large hematoma extending from the ventral aspect of the cranium into the retropharyngeal tissues. Further examination revealed a transverse fracture of the ventral cranium near the junction of the basilar part of the occipital bone and the body of the sphenoid bone. The fracture then extended posteriorly along the right side of the affected occipital bone to and including the right occipital condyle. Locally extensive hemorrhage was present on the meningeal surfaces of the medulla oblongata and cerebellum. Known causes of skull fractures in the horse include: blows, kicks, running into fences and posts, and rearing and falling over backwards and striking the head.

In this issue:

New testing offered	page 1
Diagnostic case update - March to May	page 1
Toxicology quality assurance	page 5



Photosensitization or, alternatively, contact dermatitis were suggested as possible causes of cracking, thickened skin lesions of unpigmented skin around the muzzles of horses being fed a new lot of alfalfa hay. The lesions would heal when the horses were taken off the hay. A hay sample was received for examination and UA Herbarium personnel reported that it was composed almost entirely of alfalfa (*Medicago sativa*) and contained only a small amount of *Eragrostis* sp. (lovegrass). Known photosensitizing plants were not found in the sample but it also contained a quantity of dark insect parts that appeared to be aphids. Further inspection of the hay revealed that the plant stems were partially cemented together by a sticky substance that was probably aphid “honeydew”. The photosensitizing potential of aphids infesting alfalfa and their “honeydew” is unknown but a literature reference was found that indicated that “unidentified photodynamic agents were reported to occur in *Medicago denticulata* (Burr trefoil) and the aphids that infest it” (Veterinary Medicine, 8th edition). The owner reported having fed hay produced by the same grower for many years with no problem. The farmer did not use any pesticides on his crops.

Clostridium perfringens type C enteritis was diagnosed in a five-day-old Quarter horse foal with sudden onset of hemorrhagic diarrhea and abdominal discomfort. The foal had adequate levels of IgG in the serum, and aerobic cultures of the feces were negative. Large numbers of *Cl. perfringens* were isolated in anaerobic culture, and the isolate was identified as a type C strain by genotyping.



Porcine

Rodenticide poisoning was the cause of death of a three-year-old Vietnamese pot-bellied pig. The animal died with disseminated hemorrhages following a short clinical course which included inappetence, inactivity, nasal bleeding and terminal seizures. Bromadiolone (290 ppb) was detected in the liver. The source of the Bromadiolone could not be established.



Small Ruminants

Ovine progressive pneumonia (OPP) was diagnosed in two Suffolk rams from a large flock in central Arizona. The owner observed progressive weight loss, weakness and death in young rams, two to three years old. Both necropsied rams had slightly “rubbery” lungs that failed to collapse when the thorax was opened. Histologic lesions included follicular lymphocytic infiltration of the lung parenchyma, thickened alveolar septa and smooth muscle hyperplasia, changes typical of OPP. A serological examination of 62 sera collected at random from rams and ewes in the flock yielded 36% seropositive animals by the AGID test. In spite of the dissemination of the infection, the owner had

not observed any of the typical signs classically associated with OPP; namely respiratory signs, arthritis, mastitis and in some occasions CNS signs.

An **acute *E. coli* septicemia** was the cause of the sudden death of a six-week-old Nubian goat. No other animals were affected in the herd and no concurrent infections, nutritional deficiencies or any other obvious precipitating conditions were identified.

We received a 3½ year-old Pygmy goat with a history of sudden death. The abomasum was diffusely inflamed with extensive infiltration and hyperemia of the mucosa plus some mucosal necrosis. Multiple isolates were typed and found to be ***Clostridium perfringens* type A**.



Avian

Botulism was diagnosed, by the mouse protection assay, in nine ducks from a golf course pond. The birds were found floating on the water unable to hold their heads up with their wings and legs spread.

Zinc poisoning was the cause of death in a female goose. The owner reported that the goose was being noisy the night before and was found dead in the morning. No other clinical signs were noted. At necropsy, numerous metal fragments including a post-1983 penny were found in the ventriculus. The copper surface was eroded away revealing the underlying zinc core. The zinc level in the pancreas was 437 ppm (normal = 50-125 ppm).

Avian tuberculosis was diagnosed in a captive female Mexican parrotlet which had been “acting lethargic for three days”. Typical microscopic lesions containing aggregates of macrophages laden with phagocytized acid-fast bacilli were found in sections of liver and in lamina propria of gut. Avian tuberculosis is considered a low hazard zoonotic disease.

Pasteurella multocida septicemia was the cause of death of a young Eclectus parrot. There was a history of a recent cat bite, the most likely source of the infection.

Chlamydiosis, acute aspergillosis of the abdominal air sacs and **intestinal candidiasis** were found in a female Indian Ringneck parakeet recently purchased for breeding. The chlamydiosis was a disseminated relatively chronic infection. The aspergillosis was an acute necrotizing infection (the cause of death), most likely precipitated by a chlamydia-associated immunosuppression.

Psittacine proventricular dilation syndrome was diagnosed at necropsy in an eleven-month-old Blue and Gold macaw with nonsuppurative encephalitis and ganglioneuritis of the proventriculus, ventriculus, and

small intestine. The history was of regurgitation, slow crop, weight loss, and progressive anorexia. The same diagnosis was made in a four-year-old male Green Wing macaw with identical lesions. This bird had a history of chronic wasting, anorexia, intermittent ataxia, and right sided paralysis.

Psittacine herpesvirus (Pacheco's disease) was the cause of severe necrotizing hepatitis, splenitis, and enteritis in a five-month-old Lilac Crowned Amazon parrot. The bird died suddenly after arriving in a shipment from out-of-state.



Canine

We received tissue from a five-year-old Shar Pei with a history of dermatitis which was most pronounced ventrally. Smears of raised lesions indicated the presence of what appeared to be mucus. Histopathology confirmed the presence of **cutaneous mucinosis** of the Shar Pei breed.

Canine distemper was diagnosed in two separate cases of abandoned puppies placed in foster homes, one a six-week-old, the other an eleven-week-old. We have no information on maternal immunity, and neither puppy was likely to have received immunizations prior to their placement in foster homes. It is noteworthy nonetheless that both had low levels of liver selenium: 0.177 ppm in the older puppy (a deficient level) and 0.387 ppm in the younger one (marginal). Published "normal" liver selenium levels of in dogs are in the range of 0.5 to 1.5 ppm. Selenium deficiencies are known to have profound effects on the immune function in farm animals, but little is known about their occurrence and clinical impact in dogs.

Disseminated coccidioidomycosis was diagnosed in a thirteen-year-old female Cocker Spaniel with a one year history of treatment for the disease. The most severe findings at necropsy included a coccidioidal osteomyelitis of the atlas, and a more recent but severe multifocal, granulomatous pneumonia. Milder granulomatous lesions were found in liver, kidney, adrenals and meninges.

Calcium oxalate urolithiasis was the cause of oliguria and vomiting in a five-year-old male Pomeranian. The uroliths were lodged in the distal urethra at the os penis. The urinary bladder was distended, thick walled and hemorrhagic.

Severe, suppurative cellulitis cause by **group G Streptococcus sp.** was the cause of death in a four-month-old male Greyhound. The pup was originally presented for swelling of the right front and right rear legs and fever of 106.7°F. At necropsy, the fascial planes of the anterior and medial right thigh contained thick, yellow, purulent exudate. The stifle joint was filled with similar exudate.

A spayed female, mixed breed dog, had a 24 hour history of proprioceptive deficits, weakness, and dementia progressing to loss of vision and generalized paresis. Radiographs, blood work, and an ethylene glycol test were all negative. At necropsy, the pericardial sac contained 50 ml of unclotted blood. There was a three cm diameter, dark red, friable mass on the right atrium. The lungs contained a small number of 1-2 mm, dark red masses. The brain contained numerous, 1-3 mm diameter, dark red masses. The diagnosis was **hemangiosarcoma** of the right atrium with metastasis to the brain.

Cryptococcosis was diagnosed in a 5½ year-old female Labrador canine which had been euthanized and submitted for necropsy. The dog had severe involvement of the muzzle and nasal structures with an ulcerated, granulomatous lesion which obliterated the nostrils and also extensively involved the lateral aspects of the left upper and lower lips. The diagnosis had been previously established via biopsy of the skin lesion. Submandibular lymph nodes were enlarged, discolored yellowish and contained partially liquefied central areas. The nasal turbinates of the right nasal cavity had been obliterated by extension of the lesion and there was lesser involvement of the turbinates of the left nasal cavity. Microscopic examination of sections of the lesions revealed intense granulomatous inflammation with numerous phagocytized fungal organisms having morphology compatible with *Cryptococcus neoformans*. Destruction of the microscopic tissue architecture was essentially complete. The source of the dog's infection was unknown. *Cryptococcus neoformans* is reported to be common in manure. Infection of the nasal structures in animals is reported to be common.

Coccidioidomycosis was diagnosed in a four-year-old Collie mix weighing 35 pounds. The dog was being treated with amphotericin B but was euthanized after its condition continued to worsen. At necropsy, the abdomen was filled with ascitic fluid. The thorax was also filled with clear, amber fluid. The lungs were atelectatic and lung parenchyma contained multiple small, (~1-2 mm) firm, nodular lesions. The pericardial sac was thickened, fibrotic and was firmly adhered to the epicardial surface of the heart. Microscopically, mild chronic inflammation was present in both pericardium and epicardium. Although fungal organisms were not seen microscopically, they were isolated from a swab of the remnant of the pericardial sac. A few degenerate coccidioidal spherules were present in a section of a pulmonary granuloma.

Gross and microscopic lesions compatible with **parvovirus** infection were found in a three-year-old Yorkshire terrier which suddenly began vomiting about six days following a visit to the veterinarian for routine re-vaccination. Two other dogs from the same household were re-vaccinated at the same time and were asymptomatic.

atic as of this writing. The owner suspected that the vaccination somehow induced the disease but a review of the history with the owner revealed that the re-vaccination of the dog had been omitted in 1998. The dog received 3 vaccinations as a puppy and was re-vaccinated in 1997.



Feline

Feline infectious peritonitis was diagnosed at necropsy in a thirteen-year-old domestic short-haired feline following an illness of two to three days duration during which the owner noted abdominal distention and anorexia. Necropsy lesions were typical with filling of the abdominal cavity with yellow, gelatinous ascitic fluid and histologic findings were consistent with FIP. As an incidental finding, a large tumorous mass containing multiple cysts that contained yellowish fluid was present in one liver lobe. Microscopic examination revealed the tumor to be a biliary cystadenoma. Another incidental finding was infection of the bone marrow with feline leukemia virus as determined by fluorescent antibody staining of imprints.

A four-month-old female domestic feline developed acute respiratory distress three days after returning home following a routine ovariohysterectomy. It died shortly after signs were noted. Grossly, there was red-tinged fluid on the hairs around the nares. The thorax was filled with clear, red-tinged fluid. There was a slight excess of pericardial fluid. The heart had an accentuated apex and the left atrium was enlarged. The lungs were red, firm and exuded watery red fluid. Microscopically, the heart contained a diffuse, endomyocardial inflammatory infiltrate of neutrophils and macrophages. Alveoli of the lungs contained edema fluid and some fibrin and leukocytes. The heart lesion and the history are compatible with the **endomyocardial form of feline cardiomyopathy**. The condition is idiopathic and tends to develop in young cats. A history of a recent (within two weeks) stressful event is often present. The early lesions are inflammatory and affect the endocardium and adjacent myocardium. More chronic lesions exhibited fibrosis and thickening of the endocardium with restricted left ventricular volume, so called restrictive cardiomyopathy.

Panleukopenia was the diagnosis in a one-year-old female domestic shorthair from a rescue facility that died following a two day history of lethargy, weakness, vomiting and ataxia.

An eight-week-old male domestic cat died following a four day history of lethargy and pulmonary congestion. Necropsy revealed diffuse consolidation of the left lung and portions of the right middle and caudal lung lobes. Microscopically there was diffuse bronchopneumonia with necrotizing bronchiolitis. Virus isolation yielded feline **calicivirus** from the lungs.

A ***Pasteurella multocida* septicemia** with associated DIC was the cause of death of a one-year old DSH female. An outside cat, it exhibited infected penetrating wounds in a leg, apparently the result of bites.



Wildlife

Avian tuberculosis was diagnosed in a wild Great Egret found dead in the Sun City area. There was severe hepatic tuberculosis with multiple, coalescing yellow tuberculomas in a liver that was two to three times larger than normal. There was a localized enteric lesion.

Generalized burning of the haircoat with locally extensive deep burns and sloughing of the skin of the right hip and thigh areas as well as a probable burn of the cornea of the right eye was diagnosed in a wild skunk from southeastern Arizona. The animal was found staggering and behaving abnormally. Most of its haircoat consisted only of charred stubble. The cause of the burns was unknown. An incidental finding was numerous nematodes of the genus *Physaloptera* in the lumen of the animal's stomach. These worms infest a variety of wild hosts and are reported to require arthropods as intermediate hosts (e.g. beetles and cockroaches).

Rabies was diagnosed in a skunk from southeastern Arizona. Fluorescent antibody testing was performed on brain tissue collected at necropsy by Arizona State Department of Health Services laboratory in Tucson.

Subacute to chronic **pneumonia and a rotavirus infection of the intestine** was diagnosed in a three-week-old collared peccary submitted for necropsy by a rehabilitator. The animal was one of six which had died. Some had diarrhea. The animal that was necropsied had fecal soiling of the perineum and loops of small intestine were dilated and filled with yellowish, mucoid content. Mucoid *E. coli* were isolated in cultures of the gut content.

Severe intestinal **coccidiosis** was the cause of death in a juvenile Cooper's hawk. Grossly, the bird was dehydrated and had no fat stores. The intestinal epithelium was loaded with coccidia. Partially digested blood, coccidia, and exfoliated epithelial cells were present in the intestinal lumen.



Exotics

Pasteurella multocida was isolated from a four-day-old Congo parrot with a history of having been removed from the mother for hatching. Lesions included small degenerate foci in the spleen and the liver. It is not uncommon to see *Pasteurella multocida* as a cause of disseminated infection in young birds.

We received a stomach biopsy from a Rosie boa constrictor. There was a history of chronic regurgitation. Proliferative gastritis was confirmed by histopathology. Numerous *Cryptosporidia* sp. were present within the stomach. These are sometimes associated with proliferative gastritis in snakes.

Numerous *Clostridium perfringens* type A were isolated from a ten-year-old javelina with necrotizing enteritis.

Scurvy was diagnosed in a three-month-old guinea pig with typical gross lesions of periarticular hemorrhages, and microscopic changes of reduced osteoid formation and bony trabeculae in the leg bones. It had been fed pelleted feed without vitamin C supplementation.

Salmonella arizona was the cause of an acute gastritis and septicemia in a Red Tail boa.

Campylobacter laridis was isolated from the intestine of a ferret with suppurative enterocolitis. The ferret was one of four sick ferrets in a pet store. Two eventually died. All exhibited clinical signs of listlessness, crusty eyes, increased respiratory effort, diarrhea and dehydration. Fluorescent antibody stains were negative for canine distemper virus.

A 3½ year-old spayed female ferret was originally presented for lethargy and anorexia. Two weeks later an aspirate of a lytic lesion on the right humerus contained *Coccidioides immitis* spherules. There was no response to treatment with Nizoral and the ferret died one week later. At necropsy there was a 1.5 cm swelling of the right distal humerus which contained purulent exudate. The mediastinal, sternal and hepatic lymph nodes all contained purulent foci and were markedly enlarged. Miliary, pinpoint foci were present in the lungs and liver. Microscopic lesions in these organs were pyogranulomatous inflammation with spherules. Disseminated coccidioidomycosis was the final diagnosis.

*compiled by Greg Bradley, Bob Glock,
Carlos Reggiardo, T. H. Noon*

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

Toxicology Quality Assurance

The toxicology section of the AzVDL participates in a voluntary quality assurance program offered through the Veterinary Laboratory Association. This is separate from and in addition to our AAVLD accreditation. The Veterinary Laboratory Association is a group of people who work in and are interested in the field of veterinary clinical testing. They have formed an association which provides a variety of services to participating members including quality assurance programs and various forms of continuing education and accreditation.

Quarterly testing is conducted with the objective of assuring accuracy of various chemical assays used in the toxicology section. For example, we recently received two test serums which had known levels of analytes (but unknown to us) which were analyzed according to our protocols. The results were reported back to the Veterinary Laboratory Association quality assurance referees. The quality assurance referees then compiled a report based on the results submitted by all participating laboratories and from these data we are able to evaluate our protocols for accuracy. We do this for your benefit and it provides you as the user of our services an assurance of quality results.

In the recent test cycle protocols for serum electrolytes including calcium, phosphorus, sodium, magnesium, and trace minerals of nutritional interest (Cu, Fe, Zn, and Se) were evaluated. Two organics (urea and total protein) were also evaluated. We are happy to report that the first quarter of 1999 evaluation the AzVDL values fell within two standard deviations of the mean of all reporting labs. In fact, our selenium values were the mean of those reported by five different laboratories.

Practitioners using in house clinical chemistry analyzers should consider periodically splitting serum samples and submitting them to another laboratory that is enrolled in a quality assurance program to ensure that the values generated with their equipment are within acceptable limits.

By T. H. Noon, Dana Betzer, Barbara Rickert

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.

The University of Arizona
College of Agriculture

Department of Veterinary Science/Microbiology
2831 N. Freeway

Tucson, Arizona 85705-5021

Fax: (520) 626-8696 Phone: (520) 621-2356

We welcome any subscriptions, comments or suggestions.

Editor:

Natalie Furrey

Contributing editors:

Jeannie Barnitz

Greg Bradley

Robert Glock

Ted H. Noon

Carlos Reggiardo

Sarah Swanson

Faculty and Staff of the AzVDL

Director: Robert D. Glock DVM, PhD, Diplomate ACVP

Diagnosticians:

Greg Bradley DVM, Diplomate ACVP

Ted H. Noon DVM

Carlos Reggiardo DVM, PhD, Diplomate ACVM

Administrative Staff: Jeannie Barnitz

Sarah Swanson

Necropsy: Melvin Perry

Owen Halferty

Chemistry: Dana Perry Betzer MS

Barbara Rickert

Histology: Esther Kerr MT(ASCP)

Denise Giordano

Microbiology: Natalie Furrey MT(ASCP)

Virology: Mark Shupe

Thea Meeker

Adjunct Faculty:

Sharon Dial DVM, PhD

Howard Frederick PhD, PAS

Emeritus Faculty: Raymond E. Reed DVM, Diplomate ACVP

This newsletter can be accessed electronically via <http://microvet.arizona.edu>

The University of Arizona College of Agriculture is an equal opportunity employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to sex, race, religion, color, national origin, age, Vietnam Era Veteran's status, or disability.

The University of Arizona
Dept of Veterinary Science and Microbiology
Arizona Veterinary Diagnostic Laboratory
2831 N. Freeway
Tucson, AZ 85705-5021

