



Newsletter

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Cooperative Extension and the Arizona Veterinary Diagnostic Laboratory



FROM THE DIRECTOR OF THE AzVDL

It has been well over a year since we moved to our new building. Unfortunately, highway construction is still proceeding and direct access from I-10 will not be possible until the frontage road is completed, hopefully around the end of the year. Until then, the only access to AzVDL is from the north side of the West Campus Agricultural Center (WCAC), at La Cholla and Fort Lowell (see diagram).

The new building has state-of-the-art facilities and much more space to serve the veterinary profession and the animal industry in Arizona. We are still organized in five basic services: Pathology; Virology/Serology; Bacteriology/Mycology; Toxicology and Administration. All these services will be described in detail in the next few issues of this newsletter. In the meantime, we will be very glad to give the grand tour of the new facilities to any one brave enough to follow the yellow brick road (a.k.a. the bumpy, dusty road) of the WCAC.

DROUGHT-RELATED DEATHS IN ARIZONA RANGE CATTLE

Increased numbers of range cattle deaths are to be expected this summer due to the severe, prolonged drought affecting Arizona. The extreme drought has prompted a few calls concerning sudden deaths among range cattle. The following are selected topics that we feel might be of interest to veterinarians having clients with range cattle as a part of their practice:

Milkweed Intoxication: Limited feed availability sometimes forces animals to consume normally unpalat-

able toxic plants. Two instances of milkweed intoxication causing the deaths of large numbers of range cattle on ranches in northern Arizona have occurred, one recently and one last fall. In both cases, efforts were made to rule out other possible causes of death, and the final diagnosis was made with the assistance of the Range Laboratory, the personnel of which were able to identify milkweed plant parts in the rumen ingesta of the dead cattle. This invaluable service has enabled us to establish a diagnosis in cases where otherwise determination of the cause of death would not have been possible.

Milkweed intoxication, in this case caused by ingestion of *Asclepias asperula*, is often characterized by animals simply being found dead. If observed before death, affected animals may be severely depressed, ataxic, weak, and have muscle tremors and respiratory difficulty. Hyperthermia, arrhythmias, and convulsions may occur prior to death. Mortality approaches 100% once animals become recumbent. There are no diagnostic lesions. Diagnosis depends on identification of milkweed plant tissue in the rumen ingesta. One reference states that consumption of approximately 1.2% of an animal's body weight can cause death.

Ammonia Intoxication: In an attempt to reduce the effects of drought, many ranchers are wisely providing supplemental feed for their livestock. However, some elect to use protein supplements containing urea and sometimes other non-protein nitrogen sources (NPN) which, if not managed properly, can result in ammonia intoxication and death. We have received several calls in which deaths among range cattle seemed to be circumstantially linked to urea-containing supplements. This remains speculative as valid specimens for testing are difficult to collect in the field and none were received. Some factors that are reported to predispose ruminants to ammonia toxicosis are (1) fasting, (2) high roughage diets, (3) lack of adaptation to NPN diets, (4) low water intake, (5) high rumen and body temperature, and (6) hepatic insufficiency. It is easy to imagine any combination of these circumstances being present this summer in stressed, hungry range cattle on suboptimal diets associated with the prolonged drought. "All-natural", urea-free protein supplements would certainly be preferable. Also, provision of supplemental dry matter in the form of hay or straw is essential if available forage is inadequate. Preferred specimens for diagnostic testing for ammonia intoxication include blood,



ruminal fluid, and urine collected and **frozen** promptly after death. Prompt collection of specimens soon after death is essential as ammonia levels will increase naturally as putrefaction occurs in the carcass.

Illegal Livestock Mutilations and Killings: The specter of suspected illegal range livestock killing and mutilation resurfaced recently. Typically, as in the past, no attempt was made to diagnose the cause of death by the individual reporting this case. A frequent finding by inexperienced people is the absence of bleeding from wounds that appear to have been inflicted by a very sharp instrument, usually of the genitalia or mammary areas of cows. A “bloodless wound” means only that it happened after death when the blood circulation has stopped. Most people would be surprised at the “surgical” skills of scavengers such as buzzards and coyotes, which go after easily accessible tissues covered by thinner, more delicate skin such as the udder, teats, or sexual organs. The eyes and tongue are also among the first tissues consumed by these scavengers. There is a long list of causes of “unexpected” death losses of adult range cattle including both noninfectious and infectious causes as well as the occasional untreated dystocia. Livestock owners sometimes get caught up in the hysteria of the moment when the power of suggestion reigns supreme. The odds favor a natural cause of death unless you can prove otherwise (i.e. hard evidence of suspicious human activity in the area). Determination of the cause of death may be desirable for a number of reasons, including the possibility that unwarranted blame for the deaths may be placed on innocent parties. The AzVDL has complete large animal necropsy facilities and stands ready to provide diagnostic assistance in all such cases. All that is needed is the will and the means to transport a suitable specimen to us for examination. We have received large animal carcasses for necropsy from as far away as Kayenta, Arizona.

by T.H. Noon D.V.M.

DIAGNOSTIC UPDATE

The following are a selected sample of diagnoses made by the AzVDL over the last 90 days:

Equine



Two cases of **cutaneous habronemiasis** were diagnosed by histopathology. The horses had raw cutaneous lesions with granulation tissue located on the lips, urethral orifice and nictitans membrane.

A 13 year old Quarterhorse gelding became acutely recumbent, somnolent and had dilated and nonresponsive pupils. The pulse was greater than 100 bpm. Prior medical history included failure to shed its winter hair coat during the summer and a recent increase in water consumption. The horse was euthanized. At necropsy, the horse had a 4

cm, hemorrhagic mass replacing the pituitary gland.

Pituitary adenoma was confirmed histologically.

A 12 year old Arabian mare had multiple ulcerated foci in the skin of the perineum and lips of the vulva. The lesions were 3-4 mm deep and covered by a crust. The mare had been bred, by natural service, six days prior. Microscopically, skin biopsies contained ulcerated areas. Degenerating epithelial cells contained intranuclear inclusion bodies consistent with a herpesvirus. **Coital exanthema** due to Equine Herpesvirus III was diagnosed. Further investigation by the referring veterinarian demonstrated similar lesions on the penis of the stallion and on the genital skin of several other mares on the property.

Equine herpesvirus-I infection was diagnosed in a two day old Quarterhorse filly. The filly was born at 315 days of gestation. It was presented to the referring veterinarian at 14 hours of age, weak, icteric and had diarrhea. The foal developed respiratory acidosis which progressed to mixed metabolic acidosis in 24 hours. The foal died 36 hours after presentation. Necropsy lesions included severe bronchointerstitial pneumonia, lymphocytolysis in the thymus and necrotizing hepatitis with intranuclear, herpesvirus type inclusion bodies.

Malformation of the atlanto-occipital joint was diagnosed at necropsy of a 10 day old Arabian foal which exhibited spasticity and uncoordinated gait. There was asymmetry of the articular surfaces of the occipital condyles and atlas. Wallerian degeneration was seen in sections of the cervical spinal cord.

Three horses from the same pasture in northeastern Arizona ranging from 2-12 years old, exhibited clinical signs of anorexia, shaking, ataxia and weight loss. Two other horses had died following onset of similar signs. Blood samples from the three horses were tested. No detectable lead was present; blood cholinesterase levels were normal. Mouse inoculation tests for botulinum toxin were negative and EEE, WEE serology was negative for antibody in all three horses. However, blood smears from all three had vacuolated monocytes suggestive of swainsonine (locoweed) intoxication. Site investigation by the referring veterinarian identified locoweed in the pasture. Blood samples have been sent to the USDA Poisonous Plants Lab in Logan, Utah for swainsonine assay to confirm the diagnosis. The brain is the preferred tissue for post-mortem diagnosis of locoism.

Bovine



Beef Cattle: A case of acute **bloat** in a 500 lb. holstein calf was diagnosed at necropsy recently. The owner was feeding high-quality new alfalfa hay and found his animal dead after a neighbor reported it to be “staggering around”, after which it soon died. Prominent lesions included extreme bloating of the carcass including, of course, the rumen, a diffuse subcutaneous accumulation of gas, a prominent “bloat line” in the esophageal mucosa located approximately at the level of

thoracic inlet, and extreme congestion of blood vessels and lymph nodes of the anterior aspect of the carcass, and a pale liver. The chambers of the heart were nearly devoid of blood. Acute bloat is a true bovine emergency that often cannot await the arrival of a veterinarian. Veterinarians should consider educating their clients on the emergency treatment of bloat and, most importantly, its prevention.

Dairy Cattle: We have seen an increase in young calf morbidity and mortality in many dairies. These losses have been associated with vitamin A and/or E deficiency which results in increased susceptibility to infection. In most cases, the problem has been related to poor quality milk replacers, especially those having high tallow levels. We have also seen cases in calves fed unsupplemented whole milk. In milk-fed or recently weaned calves serum levels of vitamins A and E should be checked in herds having an increase in diarrhea or respiratory disease.

Small ruminants

A flock of 1000 whiteface ewes had ten stillborn lambs in two days. Two fetuses received for necropsy had subacute placentitis; one also had a subacute meningitis. **Chlamydia** was isolated in tissue culture.

Chlamydia was also isolated from a four month gestation, aborted pygmy goat fetus received from a herd that had experienced three such abortions in the past eight months.

An eleven year old pygmy goat died after a brief illness characterized by recumbency, anorexia and puffy eyes. A **pheochromocytoma** of the left adrenal gland was diagnosed at necropsy.

Swine

One of four, four month old Yorkshire X pigs exhibited chronic diarrhea. The diarrhea was explosive but was not grossly bloody. Serpulina hyodysenteriae; the agent of swine dysentery, was isolated from the feces. Direct smears demonstrated large numbers of spirochetes in the feces.

E. coli septicemia was the cause of death in 50; three week old weanling, crossbred pigs from a 550 sow operation. All deaths occurred within 72 hours of weaning. No antemortem signs of illness were noted by the owner.

Vitamin A and E deficiency has been diagnosed in sows giving birth to stillborn pigs. This is a common observation in summer in Arizona, when the fat content of the feed is increased to improve palatability, but without increasing the concentration of lipid soluble vitamins to reduce oxidative loss.

Canine and feline



Cutaneous **coccidioidomycosis** was the cause of the multiple, firm subcutaneous masses on the caudal ventral abdomen of a 9 1/2 year old cat.

Strychnine poisoning continues to be the most common cause of malicious poisoning in dogs submitted for necropsy at the AzVDL. The stomach contents typically contain dog food, meat or other table scraps laced with green dyed grain kernels. Confirmation of strychnine poisoning can be made by thin layer chromatography using suspected bait, stomach contents or urine.

Ciliary dyskinesia was diagnosed on electron microscopy of nasal epithelium in a six year old Bichon with a history of chronic recurrent respiratory infections.

Transmissible venereal tumor was the diagnosis in a two year old mixed breed dog with a red, ulcerated, golf ball sized mass in the vulva.

Three of ten, 11 day old Basset puppies died over a three day period. Necropsy of one puppy revealed bacterial septicemia with hepatic abscesses, meningitis, peritonitis and pneumonia. Staphylococcus aureus was isolated from the tissues.

Large numbers of sporulated, Clostridium perfringens-like organisms were identified on fecal smears from a 1 1/2 year old, female Schnauzer with chronic large bowel diarrhea and occasional vomiting. The dog came from a breeding kennel in California. The finding was considered compatible with Clostridium perfringens-associated enterotoxigenesis.

Spherules of Coccidioides immitis with pyogranulomatous inflammation were found in biopsy specimens from a dog with an 11 x 11 x 5 cm diameter mass over the lumbar area. The center of the mass contained 250 ml of serosanguineous fluid.

Two cases of **canine distemper** were diagnosed at necropsy in puppies from pet stores. Both exhibited signs of diarrhea and occasional vomiting. A third case was seen in a litter of ten purebred puppies all of which died at a breeding kennel.

Three cases of feline infectious peritonitis were seen in young cats.

One case of pug encephalitis was diagnosed in a three year old Pug with a two year history of neurologic disease.

Four cases of hypertrophic cardiomyopathy in cats were found. None of the four cats had exhibited clinical signs. Two were found dead by their owners. One died 15 minutes following vaccination and one died 15 minutes after eating, preceded by a brief seizure. Cardiac arrhythmia due to cardiomyopathy was the presumed cause of death in all four instances.

A postvaccinal sarcoma was diagnosed in a cat with a 2 cm diameter, slow growing, subcutaneous mass between the shoulders.

Ethylene glycol poisoning was diagnosed in a six year old, male German Shepherd dog that died following acute onset of ataxia, depression, and uremia. Another dog had died the month before after a similar illness. The dogs were allowed to run at large. The diagnosis was confirmed by positive identification of ethylene glycol in a rawhide



chew found in the dog's stomach and in urine using gas chromatography. Tubular nephrosis with oxalate crystals was present in histologic sections of kidney.

Avian



Hepatic cirrhosis was diagnosed in a two year old, female Pacific Parrotlet that died unexpectedly. Cultures were negative for an infectious agent and there was no history of exposure to toxins. However, cirrhosis is a chronic disorder and the causative agent is frequently not identifiable at the time of diagnosis. Hepatotoxins including those found in rapeseed as well as aflatoxin which can be present in moldy grain and oil seeds are associated with hepatic cirrhosis in birds. Chronic bacterial, viral or chlamydial infections may also result in an end stage liver.

Psittacosis was diagnosed at necropsy of an 6-8 year old Alexandrian Ringneck Parrot from an aviary. Two other birds had died recently. Clinical signs included weakness and loss of body weight. Necropsy findings included air sacculitis, hepatitis and splenomegaly.

Psittacosis was again the cause of an aviary problem involving birds of various ages and species (cockatiels, conures and cockatoos). Young birds exhibited signs including slow crop, weight loss, dehydration, dyspnea, fluffing and somnolence. Hepatitis and splenitis were found at necropsy.

Retained yolk was diagnosed in a one week old ostrich chick received for necropsy. A large yolk sac filled with green viscous fluid filled the abdominal cavity. Bacterial cultures were negative. Poor ventilation in the incubator is the suggested cause.

Anasarca (wet chick) was the cause of death prior to hatching in an ostrich embryo. Excess fluid expanded subcutis over the entire body. Excess humidity in the incubator is the probable cause.

Exotic



Boid inclusion disease was diagnosed at necropsy of a male, albino Burmese python which had a history of neurologic signs.

Typical, eosinophilic intracytoplasmic inclusion bodies were present in neurons, hepatocytes, intestinal and renal tubular epithelium. The agent of Boid inclusion disease has not been isolated but a retrovirus is suspected.

Herpes stomatitis was the diagnosis in a leopard tortoise. Several tortoises in the group were sick. The oral mucosa was covered by thick collections of tan, fibrinous material. Herpesvirus inclusions were present in histologic sections of the oral epithelium.

SUBMISSION TIPS

Specimens can be shipped from the Phoenix area to the Arizona Veterinary Diagnostic Lab at no cost via the U of A courier. Pick ups are made at the Maricopa County Cooperative Extension Service, 4341 E. Broadway, Phoenix, AZ 85040 about 11:00 AM. Monday through Friday. Clients need to pay special attention to the packaging of their specimens. The quality of the results we obtain depends directly on your care in this regard.

Packing of specimens for shipment will not be done by extension or courier personnel. Live animals will not be accepted under any circumstances. Specimens including blood samples must be presented for shipment in a sealed, leakproof, insulated container (use ice packs if they are required). Be sure to properly address (including a return address) the package. The extension staff may refuse to hold, and courier may refuse to transport, any specimens that are of excessive size, weight, are odorous, or exhibit any leakage. We treat all specimens received as if they have the potential to transmit disease to humans. Our intent is that all personnel are able to handle your sample safely.

A number of commercial couriers are available who will pick up at your place of business. For your convenience, many of them accept COD submissions and will bill our account. We will add the shipping charge to our service fees. There are potential significant savings on shipping by using couriers who offer special discounts to the U of A. Call the AzVDL for information at (520) 621-2356. Our staff will be happy to help you.

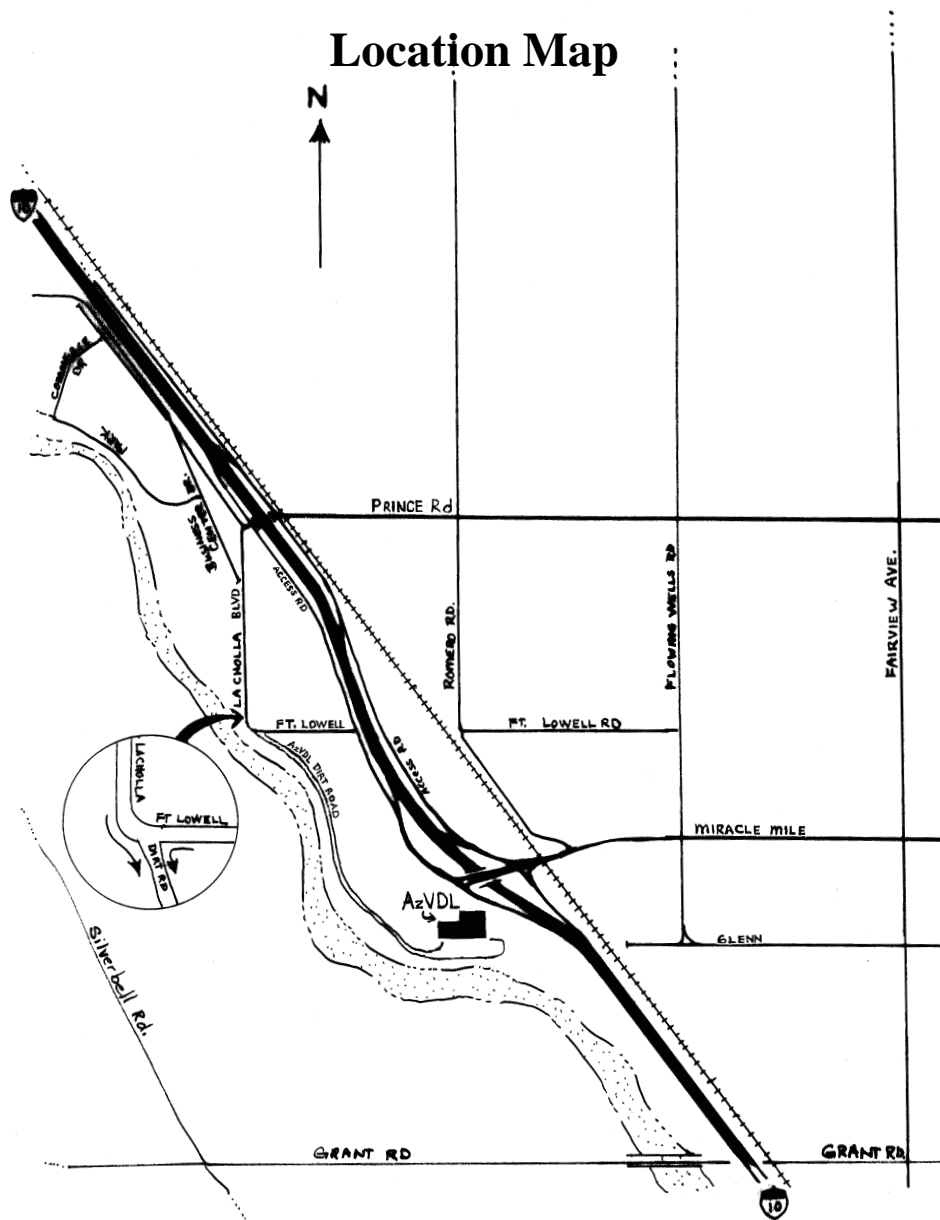
From the Contributors:

The intent of this newsletter is to communicate and inform our clientele about the activities of the AzVDL.

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Location Map



Arizona Veterinary Diagnostic Laboratory

The only access to the AzVDL is via Prince Road (I-10 exit 254), south on La Cholla to the West Campus Agricultural Center Farm. Follow the signs and the dirt road to the facility.

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