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VETERINARY MEDICINE

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Kent C. Roberts, DVM  
Extension Veterinarian

## EQUINE DIARRHEA

Fecal or intestinal culture or immunological techniques are considered by some to be the only way to diagnose the cause of fatal diarrhea in horses. Prolonged antibiotic therapy, improper handling of culture samples or extended post mortem interval all potentially interfere with the accuracy of culture results. There are, however, characteristic gross lesions of some of the more common causes of fatal diarrhea in horses that permit the prosector to be reasonably certain of the diagnosis at the time of necropsy.

Salmonella spp. is one of the more common causes of diarrhea. Horses may die acutely or following a clinical course of diarrhea of variable length. The major lesion is a segmental, fibrinous enterocolitis. Sheets of yellow green to grey friable material are adherent to the intestinal mucosa. In severe cases there may be solid cores of fibrinous material in the intestinal lumen. The segmental distribution of the lesion means that the fibrinous enterocolitis may be seen only in portions of the small intestine or only in the large intestine. Affected areas of intestine may be separated by areas of normal appearing intestine. The presence of the lesion in the small intestine only does not rule out salmonellosis. Another characteristic of salmonellosis is a distinct "septic tank odor" of the intestine and its contents. Almost every animal that dies with the disease has gross lesions. Animals that are euthanized sometimes do not have gross lesions. Tied off loops of bowel may be submitted for culture. The specimens should be kept cold and it should be specified that Salmonella spp. is suspected as often special media is required to grow the organism.

Potomac Horse Fever (PHF) is another cause of equine diarrhea that has recently received much publicity. Most of the cases of PHF that were first recognized were fatal. Now several years since its description there are relatively fewer fatal cases. PHF is caused by Ehrlichia risticii. It is a "seasonal disease" occurring most frequently in the late spring, summer, and early fall. Affected horses have profuse watery diarrhea that may alternate with periods of normal stool. Horses that die have markedly watery gastrointestinal contents that do not smell bad. There may be some edema of portions of the small and large intestine, but this is usually pronounced. In spite of a relatively normal appearing cecum and colon there is often a slight to moderate necrotizing typhlitis and colitis that can be seen histologically. Multiple samples of cecum and colon should be taken and put in formalin for histologic examination. Immunoperoxidase staining may be used to support the diagnosis of PHF. If suspected, blood samples for determination of E. risticii titers should be taken prior to death.

Colitis X or exhaustion colitis is often an overlooked cause of diarrhea in the horse. Horses usually die following a stressful episode. They may have a short clinical course of diarrhea or they may die before diarrhea is clinically evident. The major lesion at necropsy is marked edema of the colon. The colon wall may be several centimeters thick due to edema. The mucosal surface may appear normal or slightly dull. A careful, complete necropsy examination is the best way to diagnose colitis X. A specific cause of colitis X has not been determined, although some suspect that it might be a hypersensitivity to different antigens.—Lois Roth, D.V.M., Ph.D., D.A.C.V.P., Assistant Professor of Pathology, VA-MD Regional College of Veterinary Medicine.

### Thought for the Month

What we obtain too cheap we esteem too little, it is dearness only that gives everything its value.

Thomas Paine

## DIAGNOSTIC ULTRASOUND

Ultrasonography is a rapidly emerging technique in large and small animal medicine. By the emission of sound waves into an organ, and the detection of reflected sound waves, the internal architecture can be visualized. The technique is non-invasive, with no exposure to ionizing radiation. No unusual preparation is needed other than mild restraint during the scanning procedure (the animals is usually in dorsal recumbency), and removal of hair from the area examined.

While organ size and outline are visible on radiographs, an ultrasound scan is able to show internal parenchymal detail. Abdominal masses seen radiographically or detected during physical exam can be scanned to determine the site of origin, the internal architecture, and the presence of metastatic lesions in surrounding organs. Ultrasound examination of the liver and spleen can demonstrate focal masses consistent with cysts, abscesses, or neoplasia. The gall bladder and biliary tract can be easily imaged and checked for evidence of dilatation and obstruction. Kidneys can also be scanned for the presence of tumorous masses, cysts, calculi, or hydronephrosis. Ultrasound is especially useful when renal disease prevents opacification of the kidneys during excretory urography. Prostatic cysts, abscesses, and neoplastic masses can also be visualized. Ultrasound is used extensively in cardiac workups to determine cardiac function, chamber enlargement, and the presence of some congenital defects. Ultrasound is also useful in the diagnosis of tendon disease in the horse. "Bowed" tendons can be examined to determine which tendons are involved, the extent of the injury, and the response to therapy.

Ultrasonography does have its disadvantages. The ultrasonographic appearance of focal masses in an organ may be nonspecific, and unable to differentiate between neoplasia, abscess, or other focal lesions. Sound waves cannot penetrate gas (in the lungs or bowel) or bone, so that artifacts result when these structures are in the scanning field. However, combined with physical exam and laboratory workup, ultrasound can be an extremely useful, non-invasive diagnostic technique.--**Martha Moon, D.V.M., Assistant Professor of Radiology, VA-MD Regional College of Veterinary Medicine.**

## HANDLING BRUCELLOSIS VACCINE

Controlled research and field data indicate the reduced dose of Strain 19 vaccine (in use since 1980) produces good immunity. However, this depends on the animal receiving an adequate dose of live Strain 19 organisms. In order to insure that the proper dose is given, the vaccine must be protected from environmental conditions that can rapidly kill the organisms. Heat is probably the most critical factor. The vaccine must be kept cold, both while in the lyophilized state and after reconstitution. The most critical time appears to be after final dilution of the vaccine. Once the final dilution is made, the vaccine should be used within 1 hour, provided it is kept at refrigerator temperature. If this final dilution is allowed to become warm or is exposed to sunlight, it will be killed in a shorter period of time. Administration of less than the calculated dose may produce reduced immunity, or no immunity whatsoever.--**University of Nebraska-Lincoln, Nebraska Veterinary Extension Newsletter, Vol. 15, No. 9, September 1986. Animal Health Beat, University of Nevada-Reno, September 1986.**

### **XYLAZINE (ROMPUN) FOR DOGS AND CATS**

Xylazine has been classified as a tranquilizer but more accurately should be placed in the sedative/hypnotic class. Xylazine is a potent sedative which produces good muscle relaxation and a short period of good analgesia. Xylazine's actions occur within 10-12 minutes after I.M. injection. The onset of xylazine's sedative action may be slow and sedation poor if induction is carried out in noisy surroundings. Sedation may seem more profound in pained animals given xylazine because of the agent's analgesic properties. Xylazine may be given in low doses to combat postoperative pain and to ensure smooth recovery periods.

Vomiting can occur following I.M. or S.Q. injection. Xylazine reportedly sensitized the myocardium to catecholamines when given as a preanesthetic prior to thiamylal-halothane anesthesia in the dog. Myocardial sensitization may also occur in the cat. xylazine's peripheral cardiovascular actions and CNS sedative effects can be antagonized effectively with alpha 2 antagonists such as yohimbine (Antagonil) or tolazoline (Priscoline).

#### **Contradictions:**

1. Avoid using xylazine in cases which involve severe respiratory and cardiovascular disease. Bradycardia can be prevented by giving atropine.
2. Xylazine is metabolized by the liver and excreted in the urine. It should not be used in animals with hepatic or renal pathology (e.g. urethral obstruction).
3. Avoid using xylazine in anemic or hypovolemic patients.
4. Blood samples taken for glucose and insulin concentrations, and perhaps other hormones as well, may be altered by xylazine's actions upon alpha 2 receptors.
5. G.I. peristalsis and emptying times are drastically altered by xylazine, so the results of a G.I. series would be suspect.

<b>Dosages</b>	<b>I.M.</b>	<b>I.V.</b>
Dog and Cat	0.25-1.5 mg/lb	not recommended

(Drs. Paul & Tranquilli, The Pennsylvania State University Veterinary News, Vol. 86, No. 3, July 1986). Animal Health Beat - University of Nevada-Reno, September 1986.

### **NEW STRAIN OF PARVOVIRUS**

Canine Parvovirus, a disease which killed thousands of dogs between 1978 and 1980 before it was controlled, is cropping up again around the United States.

But cooperating researchers at Washington State University and the New York State College of Veterinary Medicine have isolated the new strain of the disease and expect an improved vaccine to be on the market early this year.

The disease causes vomiting, diarrhea and severe dehydration in dogs, often followed by death within a few days. James Evermann, a virologist in the Animal Disease Diagnostic Laboratory at Washington State University, said the new virus strain is not as often deadly as the original strain, but it causes severe distress to the animal and is extensive to treat.

Evermann said veterinarians around the country were puzzled two years ago when the parvo symptoms started showing up in dogs which had been vaccinated.

Evermann conducted laboratory tests on the blood samples sent to him by veterinarians in Washington State and discovered that the virus had evolved into a new strain. Three researchers at the New York State College of Veterinary Medicine, Colin R. Parrish, Priscilla H. O'Connell and Leland E. Carmichael, performed an analysis of the genes of the virus and pinpointed a minor mutation which nevertheless made the new strain resistant to existing vaccines.

Evermann and the three New York researchers describe the new parvo strain in the November 29 issue of "Science", the official weekly journal of the American Association for the Advancement of Science.

Once a new virus is isolated, Evermann said, it is usually a simple matter to create a vaccine to protect against it.

—from Hill Topics, Washington State University, Jan-Feb, 1986 as printed in the Feb. 1986 issue of the University of Florida's Veterinary Newsletter. Veterinary Topics, University of Illinois, Vol. 11 #2, 1986.

### CATS AND PHARMACEUTICALS

With the increasing popularity of cats as housepets, it is inevitable that the veterinary practitioner will have occasion to use drugs in a greater number of feline patients in the future. Considering the cat's unique deficiencies in capacity for drug metabolism, it is essential that cats not be thought of as simply "small dogs" when medicated. It is the aim of this article to discuss certain compounds which are considered to be relatively safe in other species but which are toxic to cats. These drugs are some of the most potentially dangerous because an unsuspecting practitioner who has had little trouble with the drug in a dog might be tempted to use it without caution in a cat.

Because the pharmacological and toxicological effects of a chemical substance are usually directly proportional to the concentration of that compound in the animal's body fluids and tissues, pharmacokinetic factors are of primary importance in determining responses to exogenous chemicals. The concentration of a given compound in an animal's body fluids and tissues is determined by its dosage and pharmaceutical form, as well as the absorption, distribution, biotransformation, and excretory properties of the drug.

It has become increasingly apparent that cats differ markedly from other species in the rate at which they biometabolize compounds and that this often accounts for their unique sensitivity to many drugs and chemicals. Biotransformation is usually a two-step process involving oxidation, reduction or hydrolysis followed by conjugation of a compound. These processes occur for the most part

in the liver, utilizing enzymes associated with the smooth endoplasmic reticulum of the hepatocyte. Metabolites are formed which may have activities similar to or markedly different from that of the parent compound. These drug metabolites tend to be more polar and less lipophilic than the original drug and hence are more readily excreted from the body. Among the common domestic animals, cats are unique in that they have low levels of hepatic glucuronyl transferase, an enzyme essential for the conjugation of compounds such as alcohols, phenols, carboxylic acids, amines, amides, and thiols with glucuronic acid. Examples of drugs representing these groups of compounds include morphine, acetaminophen, acetylsalicylic acid, and chloramphenicol. Hence, a decreased ability to convert these drugs into inactive, readily excretable metabolites explains, at least in part, the observed accumulation and toxicity of drugs such as these in cats.

**Editors Note:** This is the first of a series of articles on Cats and their special pharmaceutical problems. These articles are taken from *Veterinary Topics, University of Illinois, Vol. 11 #1, 1986.*

### DEALING WITH THE FeLV-POSITIVE CAT AND ITS OWNER

The lipid envelope makes FeLV a very labile virus. It is very susceptible to drying, sunlight, and common disinfectants. Therefore, routine cleanliness in the clinic will be enough to prevent you from transmitting the virus from cat to cat. This includes cleaning surfaces and cages with disinfectants. Remember that this is an infectious disease and stress and disease increases susceptibility, so do not house known positive cats next to negative cats.

When a cat tests FeLV-positive, you'll need to counsel the owner about the ramifications of the disease. The owner of the symptomatic cat has two choices. First of all, the owner can select treatment--but prognosis is poor and very few cats respond to treatments. The other choice is euthanasia.

The owner of the asymptomatic cat also has two choices. Euthanasia is one choice, although it is a difficult thing to ask an owner to do to an apparently healthy cat. Personally, I do not recommend this unless there is a baby in the household or a severely immunosuppressed individual. If the owner elects to keep the cat, you should explain the different diseases that may occur and that their cat:

1. Must remain an indoor cat or it becomes a public health hazard in terms of the feline population.
2. Will probably develop a FeLV-associated disease some time in the next 2-4 years.
3. Is a source of infection to other cats and they should not bring new cats into the household.
4. Is highly susceptible to stress in that by stressing the cat it may become symptomatic.

When bringing a new cat into a house in which a FeLV-positive cat has died, thoroughly clean the premises, including food dishes, litter box, etc. Wait one month before introducing a new cat.--(Washington State University, *Animal Health Notes, Vol. 8, #7, July 1986*). *Animal Health Beat, University of Nevada-Reno, September 1986.*

## GOAT NOTES

Psoroptes cuniculi affects the ears of about 90% of dairy goats. Head tilt and scratching at the ear are common clinical signs. Scabbiness of the ear is rare, but infection can spread to the head and neck. Treatment with Ivomec at 300 ug/kg is reported to be an effective treatment. Ivomec should not be used in lactating dairy goats when milk is consumed by humans.

--John H. Greve, DVM, Iowa State University, April 1986, University of Georgia Veterinary Newsletter, September 1986.

## VETERINARY COLLEGE NEWS

Recent new faculty member arrivals on the Blacksburg campus are:

**David Sprecher, DVM.** Dave Sprecher is a member of the Production Management Medicine (PMM) team specializing in food animals, particularly dairy cattle and swine. A graduate of the University of Illinois, he practiced in Illinois and Wisconsin and comes to Virginia Tech from the directorship of the Wisconsin Animal Health Laboratories. He is a Diplomate of the ACT.

**Martha Moon, DVM.** Marty is a graduate of Ohio State and works as an assistant professor of radiology. She did an internship and residency at the Animal Medical Center in NYC followed by a residency in radiology at Ohio State. She has a special interest in nuclear medicine and ultrasonography.

## CONTINUING EDUCATION OPPORTUNITIES

November 21-22, 1986	Small Animal Eye/Ear Surgery Lecture/Wet Lab - Blacksburg, VA
December 17, 1986	Small Animal Surgery Update Neurosurgical Problems - Charlottesville, VA
January 25, 1987	Impaired Performance in the Equine Athlete Dulles Marriott - Fairfax, VA
March 8, 1987	Exotic Animal Medicine Seminar College of Veterinary Medicine-Blacksburg, VA

For more information please contact:

Kent Roberts, DVM  
VA-MD Regional College of Veterinary Medicine  
Blacksburg, VA 24061  
(703)961-7666

Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen - Extension Specialist - Equine  
Dr. C.T. Larsen - Extension Specialist - Avians  
Dr. K.C. Roberts - Extension Specialist - Companion Animals  
Dr. W. Dee Whittier - Extension Specialist - Cattle

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