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REGIONAL COLLEGE
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WHAT'S INSIDE!

K C Roberts

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Extension Veterinarian

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Public Health Significance of Toxoplasma gondii

Toxoplasmosis, a zoonotic disease, has the potential for severe manifestations, most importantly in fetuses of humans and several domestic animal species. Because this is an emotionally charged issue, and physicians often are not well informed about the disease, it is important that veterinarians understand the life cycle of Toxplasma gondii (T. gondii) and how it relates to cats and the transmission to other species.

The public health significance of toxoplasmosis is most critical to women of child bearing age. Transplacental transmission is the most important and common route of fetal infection in species other than cats. Approximately 25-45% of women in the U.S. aged 20 to 39 have chronic asymptomatic toxoplasmosis and are immune to re-infection. If a woman in this group becomes pregnant, the fetus will not become infected. To endanger the fetus, the initial infection must occur after conception. Acute maternal infections are responsible for the transplacental infection of more than 3,000 infants each year in the U.S. In the human fetus, as in other species, T. gondii has a predilection for the brain, often producing choreoretinitis, microcephaly, mental retardation, or other abnormalities. If a woman who plans to conceive is already seropositive, there is no danger of infecting the fetus. Routine serologic testing of pregnant women is done in several countries, but not in the U.S.

The role of cats in transmission of the disease was not discovered until 1970. Only members of the Felidae family have been shown to shed Toxoplasma oocysts. Cats shed this infective stage in their feces usually only once in their lives, for approximately 14 days after original infection. Transmission to humans can occur not only by ingestion of infective oocysts, but also by ingesting raw or rare pork or lamb containing tissue cysts (bradyzoites). Eating raw beef has not been shown to produce infection, since cattle have not been found to experience clinical infection from T. gondii.

Herbivores and carnivores become infected by ingesting oocysts directly in contaminated feed. Carnivores also become infected by ingesting bradyzoites in raw or poorly cooked meat from herbivores with tissue cysts. After ingestion, the organism can encyst in many tissues, including the fetus. In sheep, goats, and swine, this can lead to abortions, stillbirths and fetal resorption.

Because of the role of the domestic cat veterinarians should be able to answer their clients' questions about this disease. Some recommendations are:

- serologic testing of prospective mothers before they become pregnant
- eat only cooked meat
- wash hands after handling raw meat and before eating, especially if you own a cat
- feed cats only cooked or commercially prepared foods
- cover children's sand boxes when not in use
- dispose of cat feces on a 24 hour basis
- wear gloves when emptying the cat litter box
- pregnant women should not clean the cat litter box --

Ms. Cynthia Boscian, Senior Student, Virginia-Maryland Regional College of Veterinary Medicine.

Occult Heartworm Disease

Occult heartworm disease occurs in 20-60% of all cases of heartworm infection. At least four types of occult disease have been documented.

Prepatent D immitis infections, caused by the relatively long life cycle, permit adult worms to be in the pulmonary arteries for 2-3 months before they begin producing microfilaria.

Unisexual infestations, either all male or all female adults, have been reported.

Drug-induced sterility of adult worms has been shown to occur after thiacetarsamide or levamisole therapy. Young female adults appear to be highly resistant to thiacetarsamide and levamisole therapy. Several may survive adulticide therapy, but as a result of exposure to the drugs, they become sterile. This results in the false impression of a successful course of adulticide and microfilaridal therapy. Subsequently, the animal may be represented with exercise intolerance and right heart failure. Thoracic radiographs and angiography will reveal the presence of live adults.

Immune-mediated sterility of adult worms occurs when the animal develops antibodies to the circulating microfilaria, clearing the microfilaria from the peripheral blood.

In general, if the animals are exhibiting clinical signs of heartworm disease and are amicrofilaremic, thoracic radiographs should be performed. If the classic radiographic signs of D immitis infection are present, the animal should be treated with thiacetarsamide.

Immunological tests, such as the IFA, are still useful tools for confirming the immune mediated occult disease. However, the new Elisa tests, which detect antibodies to the adults, will be very useful for the other types of occult disease. At the present time, only a few laboratories are using the seral titer determinations form of the test, and until this form is available to private practitioners the Elisa's usefulness is limited. -- James C. Keith. DVM. Ph.D., Virginia-Maryland Regional College of Veterinary Medicine.

Editors Note: This is the first of a series of articles on heartworm disease by Dr. Keith. They will provide the current knowledge on various aspects of this serious disease.

AVMA Sponsors Meeting on FDA's Revised Drug-Use Policy

SCHAUMBURG, IL -- A recently announced change in Food and Drug Administration (FDA) policy on the use of drugs in food-producing animals resulted in a conference called by the American Veterinary Medical Association (AVMA) at its Schaumburg, Illinois, headquarters on September 27.

Twenty-five members of national veterinary organizations, livestock producers, and FDA attended the conference at AVMA's invitation. The meeting was

organized in response to an outcry of concern from veterinarians and producers that a new policy announced by FDA's Bureau of Veterinary Medicine last July would impose excessive restrictions on extra-label use of food-animal drugs. Under FDA's revised policy, a finding of illegal drug residues will no longer be the only reason for initiating punitive action. The revised policy states that use of a drug in food animals for a purpose or in a dosage not spcified on the product's label directions will also be justification for punitive action.

The changes recommended at the meeting yesterday would assure that FDA will not interfere when, in the veterinarian's professional judgment, there is a need to treat a food animal with a drug or a dosage not specifically approved by FDA for an existing disease condition.

It is expected that the recommended changes will be reviewed for possible endorsement by AVMA and other national groups, and hopefully acted upon in the next few weeks by FDA authorities.

If FDA fails to amend its revised policy, it is possible that veterinarians will be practicing under a regulatory cloud of impropriety when they decide to use a drug for purposes not exactly stated on the label.

If the recommended changes are adopted, FDA authorities would continue to take action against veterinarians in cases where drugs are illegally used and/or distributed for purposes not stated on the product label, and in the absence of a veterinarian-client-patient relationship. FDA authorities would respect the veterinarian's professional prerogatives when a veterinarian-client-patient relationship has been established so that the veterinarian is familiar with the owner, the animal, and the premises and knows the management conditions. FDA authorities, however, will still hold the veterinarian and the client responsible for any drug residues in food products that may occur following treatment regimens that do not follow label directions.

Members of the following groups attended yesterday's meeting: Americna Veterinary Medical Association, American Association of Bovine Practitioners, National Pork Producers Council, National Cattleman's Association, American Association of Swine Practitioners, National Milk Producers Federation, National Wool Growers, Academy of Veterinary Consultants, American Association of Sheep and Goat Practitioners, Livestock Conservation Institute, American Veal Association, Professional Veterinary Products Laboratory, and FDA Bureau of Veterinary Medicine. As reported in News, American Veterinary Medical Association, September, 1983.

Wildlife Surgery

A common complaint from veterinary practitioners concerning wild birds is that the surgery is a success, but the patient dies within a few days. It would be worthwhile to discuss surgical care of the wild bird. The same principles used in small animal practice apply equally well to birds, but because of unfamiliarity with the patient these principles are often overlooked.

Most of the wild birds seen by the private practitioner that are sugrical candidates have fractured a bone in an extremity, usually the humerus, radius, or ulna. If the fractured bones are freely moveable it is probably a recent fracture, but often there will be boney proliferation holding the bone fragments in an abnormal position in older fractures. The fracture may be simple or compound. Either way the surgical correction should not be attempted until the bird is in good condition. Often these birds haven't eaten in twenty-four hours or longer. Small birds won't survive much longer than a day without eating. You can palpate the pectoral muscles to evaluate how thin the bird is. A starving bird will be very weak, offer little resistance to restraint, and often refuse to stand or perch. The condition of the bird can be evaluated hematologically by collecting a small sample from the wing vein or a clipped nail and checking the packed cell volume and total protein. Most birds have normal PCV's of 40-55% and a total protein between 3-6 gm%. A blood smear may reveal blood parasties such as Plasmodium or Leukocytozoon, but unless present in large members, they usually aren't clinically significant.

Don't be in any great hurry to perform surgery on the debilitated patient. Build the bird up by offering fresh food and water. There are water soluble bird vitamins available which may help. If the bird won't or can't eat on its own don't be afraid to force feed it by tubing or pushing prey down its throat. You could use Normosol R, Nutrical, or Emeraid I, a commercially available bird product. If the bird has no other medical problems you will probably see a change in its attitude. As it gains weight and shows more signs of life then it is ready for the surgical repair.

While under anesthesia you should take some precautions against hypothermia. The normal body temperature of birds ranges from 106-108°F. Hypothermia will deepen the plane of anesthesia and could contribute to anesthetic death.

The bird should be allowed to recover in a dark, warm, quiet place. The bird can be wrapped loosely in a towel and placed in a small cage or pet carrier. Once up and alert it can be offered food and water. If it should refuse to eat post surgically force feeding should be considered. Most wild birds will eat well in captivity if offered the proper food. Raptors like hawks and owls prefer animal prey like rats or mice, but will accept road kills or chicks. Insect eaters will readily accept mealworms, earthworms, or insects. The closer the offered food resembles the natural diet the more chance the bird will feed itself.

Prophylactic antibiotic therapy is somewhat controversial, but it's worthwhile if the fracture was compound. A broad spectrum antibiotic like ampicillin, gentocin, or chloramphenicol is best.

Bird fractures should be radiographed weekly although if proper external immobilization is used malallignment problems should be minimal. Bird fractures heal rapidly. Patient may use fractured extremities within two weeks of treatment. Allow at least three weeks before removing the bandages and allowing the bird to use the part. The bird now needs to be put in an environment where it can use its flight muscles again. Rehabilitation is a very important step in returning birds to the wild. Since most veterinary hospitals don't have flight cages the bird should be turned over to a reputable rehabilitation center before it is released. In uncomplicated cases birds can easily be returned to the wild within two weeks of bandage removal.

The Shenandoah Valley Wildlife Treatment and Rehabilitation Center will take in wild birds pre or post-operatively. The number is 703-934-WILD. -- Stuart L. Porter, VMD., Blue Ridge Community College, Weyers Cave, VA.

Editors Note: This is the third in a series of articles on treating wildlife by Dr. Stuart Porter, Director of the Animal Technology Program at Blue Ridge Community College, Weyers Cave, VA.

Potomac Fever Research Grant Awarded

A grant from the Morris Animal Foundation in Englewood, CO., will increase support for "Potomac Fever" research underway in the Virginia-Maryland Regional College of Veterinary Medicine. The money will enable veterinary researchers to focus attention on affected farms in Virginia.

"Potomac Fever", or Acute Equine Diarrhea Syndrome, is a mysterious disease which has affected horses in areas of Virginia, Maryland and Pennsylvania.

In 1983, Maryland reported 112 cases with 39 fatalities; Virginia, 32 cases ith ten fatalities; and Pennsylvania, 25 cases with four fatalities.

The disease, which has an apparent mortality rate over 30 percent, affects horses of all ages. Symptoms include lack of appetite, high fever and acute diarrhea. In severe cases, the horse goes into shock and dies. "Potomac Fever" appears to be a seasonal disorder with most cases occuring during the spring, summer and fall months.

"We appreciate the support of the Morris Animal Foundation and the state and national horse associations which have contributed so generously in an effort to help find a cure for this disease." said Dr. Bruce H. Ewald, associate dean for research at the new regional veterinary college.

The Morris Animal Foundation research funding was awarded to veterinary epidemiologist Brian Perry and gastroenterologist H. Fred Troutt, co-principal investigators on the project.

Last summer, a team from the Virginia-Maryland Regional College launched a survey of farms in the area affected by Potomac Fever. Researchers and senior veterinary students assigned to the project collected extensive medical history and farm management data from farms participating in the survey as well as feed, water, fecal and blood samples.

Information gained from site visits, as well as scientific data generated from laboratory study of field samples, is being computerized for future analysis and comparison.

Although the cause or causes of "Potomac Fever" have thusfar eluded scientists at several cooperating universites, data collected last summer will provide the basis for continued study throughout the winter months.

Researchers hope that field samples gathered last summer will provide new insight into the possible cause or causes of the disease before field investigations begin again next spring. -- As reported in News Release, VA-MD Regional College of Veterinary Medicine. November-December, 1983.

Off The Cuff

Ivermectin continues to be the heartworm topic of greatest interest. I am recieving reports of (1) Susceptibility of collies to ivermectin *per se*, and (2) Reactions to Eqvalan® (the product for horses).

Based on these reports and my own experience I urge the following precautions:

(a) Do not give ivermectin in any form to collies. I am aware of four fatal cases in Florida. The evident breed susceptibility of collies to ivermectin is being investigated in the College of Veterinary Medicine, University of Florida.
(b) Do not inject Eqvalan® into dogs. Give it orally. It is equally effective. Reaction to polysorbate 80 is less likely following oral administration.
(c) Use the lowest dose to destroy the parasite of stage or the parasite you want to eliminate.
(d) Hospitalize the dog for six hours after administering ivermectin as a microfilaricide. The rapid destruction of the microfilariae sometimes results in a shock-like reaction. Early detection and treatment with steroids results in rapid and uneventful recovery in most cases. -- Ron Jackson, American Heartworm Society Bulleitn, as reported in Georgia Veterinary Newsletter, July, 1983, No. 183., *Veterinary Medicine Newsletter*, University of Florida, September, 1983.

Mobility And Fixation Of The Early Equine Conceptus

The conceptus is highly mobile, and fixation patterns are consistent.

Among 40 pasture-bred Appaloosa and Quarter Horse mares, 10/34 (29%) were diagnosed pregnant by ultrasound on day 11 and 34/34 by day 14, vs 11/26 (42%) by rectal palpitation on days 15-16 and 26/26 by day 24. As indicated by ultrasound exam, transuterine movement occured at least once daily from day 11-15, and at 66% of observations the conceptus was in the left horn, regardless of side of ovulation, while final fixation occured on the right side in 63% of mares. No migration was noted after day 17.

The vesicle grew in width from about 7mm on day 10 to 21 on day 15, more slowly to 31 mm at day 27, then more rapidly to 89 mm on day 48. Vesicle shape was predominatly spherical on days 11-15, oblong on day 17, triangular on days 18-27, and irregular (100%) on days 29-48. Embryo movement from ventral aspect to mesometrial attachment occurred between days 21-36 in association with growth of the allantois.

In a study of Quarter Horse farm records, 47% of 633 lactating mares ovulated on the left side, while in 53% the embryo attached on the left; in 46%

mares, however, the left ovary ovulated in 63%, and attachment was on the left in only 28%. -- O. J. Ginther, University Wisconsin, Madison, Theriogenology 19:603-611, 1983, as reported in Horses, 1983; Veterinary Medicine Newsletter. University of Florida, September, 1983.

Clinical Pharmacology Tips

- Aminoglycosides are much more active at an alkaline pH, optimum is 8.
- Cattle secrete 100-190 liters of saliva per day; many drugs are recycled from serum to saliva to rumen to serum.
- Reticular grove reflex is functional in cattle up to 2 years of age; triggered by suckling; can also be triggered by use of 10% sodium bicarbonate or 10% sodium sulfate in cattle or copper sulfate in sheep.
- Oral administration of antibiotics in calves is best absorbed when given in electrolyte solution; less well absorbed when given with milk. --Dr. Wm. Jenkins, AABP Conf., 12/82, as reported in Herd Health Memo, University Park, PA.

Three (3) injections at 3-day intervals of long acting oxytetracycline (20 mg/kg) was successful in eliminating the carrier state of anaplasmosis in cattle. -- B. L. Swift, JAVMA, Vol. 183, No. 1, July 1, 1983, as reported in Agriculture & Natural Resources Information, Auburn University, Alabama.

Aflatoxin Alert

Preliminary testing indicates that aflatoxin may be a problem in drought stressed corn this year. A blacklight screening test should be done on new corn by a person familiar with the test. The blacklight screen checks for the presence of Aspergillus flavus, the mold which may or may not have produced aflatoxin. Positive corn samples should be sent to a qualified lab to quantitate any aflatoxin that may be present.

Poultry, horses, young animals, and breeding animals are very sensitive to aflatoxin. The total ration for these animals should be as low as practically possible in aflatoxin content and certainly should not contain more than 50-100 ppb aflatoxin. Since finishing cattle, swine, and sheep are more resistant to aflatoxin, their total ration should not contain more than 100-150 ppb aflatoxin. Additional information may be obtained by calling Drs. Dennis Blodgett or Blair Meldrum at (703)961-7666. Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech.

Soil Conservation

About half of the annual cropland loss in the U.S. is because of urbanization. The country is losing more than five million acres of rural land each year to non-agricultural uses such as housing, highways, factories, shopping centers, etc. Unfortunately, cropland that is easily farmed is usually easily built upon, too. The other half of cropland loss is due to erosion. Each year,

about 3 billion tons of soil erode from our nation's cropland. In Virginia that annual loss is about 6.6 tons per acre. Land with thinner topsoil is less productive. Not only is the potential productive quality of our land degrading but each year we have less of it. At present rates, all farm topsoil could be gone in 160 years unless we act now to save it. Nature can replenish soil naturally but man must help nature as it has helped him when he chooses to utilize its resources. -- As reported in News Commonwealth of Virginia, Commission of Game and Inland Fisheries, #23, October, 1983.

Veterinary College News

New Faculty

Dr. Michael Leib has joined the clinical staff after completing an internal medicine residency at Colarado State. A graduate of the University of Georgia, Dr. Leib practiced in Atlanta following graduation. He is a specialist in gastro-enterology, particularly diseases of the stomach.

Dr. Dennis Blodgett is a native of Illinois and received his DVM at the University of Illinois. After three years in a mixed practice in Tremont he returned to the University for his Ph.D. in toxicology. He serves as a clinical toxicologist on the College staff.

The Marion duPont Scott Equine Medical Center has been turned over to the College by the contractor. Construction is complete and equipping and staffing are now under way. The Center should be ready to admit patients before the end of winter 1984.

Success Is No Accident

The experts tell us that clients judge us and our office or clinic within the first 15 seconds of visual contact. That means our building, parking area, reception room and receptionist have a great deal to do with our impression on clients. Since people are making what may be a lasting judgment of your practice before they even meet you, perhaps there is an important message here.

If you haven't done so recently, drive up to the front of your office, go in the front door and try objectively to assess what you see, hear, and smell during the first 15 seconds.

It can't do any harm and it might be very enlightening. -- K. C. Roberts, DVM, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech.

Thought for the Month

It is one of the most beautiful compensations of life that no man can sincerely try to help another without helping himself.

Ralph Waldo Emerson

Meetings

Virginia Horse Convention

The Annual Virginia Horse Convention will be held on January 20-22 in Richmond, Virginia. This event will feature 12 super seminars on Friday, Saturday and Sunday and the annual meeting and awards banquet for the Virginia Horse Council. All horse owners are invited to attend and the program is open to the public. Seminar topics will include breeding management and marketing. The event will be held at the Holiday Inn-Midtown, 3200 West Broad Street, Richmond, Virginia 23230. Lodging reservations should be made direct to the Holiday Inn. Mrs. Alice Alley, Rt. 3, Riner, Virginia 24149 (703/382-3071) is in charge of program reservations and may be contacted for programs and program registration. Programs will be available by early December.

Third Mid-Atlantic States Avian Seminar

April 10-12, 1984 will bring an excellent opportunity for both the novice and experienced clinicians to once again sharpen their skills and enjoy the fellowship of their colleagues at the Annual Mid-Atlantic States Avian Medicine Seminar. The third of these successful seminars will be held at the exciting, newly renovated Caesar's Boardwalk Regency Hotel and Casino in Atlantic City. Currently, plans include: wet labs, basic psittacine husbandry and species identification, avian radiology and hematology up-dates, well-developed case reports, and practical veterinary tips for backyard poultry, waterfowl and pigeons.

Membership in the Pennsylvania Association of Avaian Veterinarians (PAAV) will ensure earliest receipt of program and registration details. Dues are $10/year, payable to PAAV, c/o Dr. James Beebe, Northview Animal Hospital, Pittsburg, PA 15237.

November 18-19, 1983	Orthopedic Short Course - Fracture Repair Virgnia Tech - Blacksburg, VA
December 4, 1983	Animal Technicians Seminar Critical Care - Small Animals Blue Ridge Community College - Weyers Cave, VA
December 13-15, 1983	The Small Business Computer: A Shirtsleaves Approach to Computer Use By Small Business Owners and Professionals - Richmond, VA
January 13-14, 1984	Equine Lameness Workshop Virginia Tech - Blacksburg, VA
February 17-19, 1984	Virginia Veterinary Medical Association Convention Springfield Hilton - Springfield, VA

ROBERTS-U

PHARMACOLOGIC BASIS OF GLAUCOMA THERAPY

In management of glaucoma, cholinergics, hyperosmotics, carbonic anhydrase inhibitors and adrenergics reduce intraocular pressure (IOP) by reducing aqueous production and/or increasing aqueous outflow. Cholinergics (minotics) contract the iris, allowing aqueous drainage from the anterior chamber; pilocarpine is an example of a direct-acting cholinergic. Carbachol, a direct-and indirect-acting cholinergic, can be used if the eye becomes refractory to pilocarpine. Isfluropate (Floropryl:MSD, echothiophate (Phospholine Iodide: Ayerst), and demecarium bromide (Jumorsol:MSD) are indirect-acting miotics.

Hyperosmotics such as mannitol, glycerol and urea are used systemically to decrease IOP by moving water from the eye to the vascular system. Mannitol is most popular for treatment of acute glaucoma; the primary contraindication is the poorly compensated cardiac patient. Carbonic anhydrase anide: MSD), and methazolamide (Neptazane: Lederle), lower IOP by decreasing production of aqueous. They may cause hypokalemia, which can be corrected by oral supplementation.

Topical adrenergics, e.g., epinephrine HC1 (Epifrin: Allergan), epinephrine bitartrate (Epitrate: Ayerst), and epinephrine borate (Epinal: Alcon), lower IOP by increasing aqueous outflow and decreasing production. Used alone these will not maintain normal IOP; they are best used in conjunction with cholinergics. Timolol (Timoptic: MSD) is a synthetic adrenergic that decreases aqueous production.

Proper selection and use of medications is essential when treating acute glaucoma, in which a pressure of 50-60 mm Hg for > 24-48 hr. can permanently impair vision. Acute glaucoma is often treated with a direct-acting cholinergic, long-term management should begin with a direct-acting cholinergic. If insufficient along, a carbonic anhydrase inhibitor or adrenergic can be added, and more potent indirect miotics can be used if this fails. Surgery may become necessary if medical management is unsuccessful.--J.E. Thomas, Sch. Vet. Med., Auburn Univ., Auburn Vet. 38 (3): 12/82.; Veterinary Medicine Newsletter, Univ. of Florida, VM 2520, July, 1983; as reported in Notes form the Extension Vet., Kansas State Univ., September, 1983.

NOTE

For further information concerning meetings that are listed in this publication contact Kent C. Robert, D.V.M., VA-MD Regional College of Veterinary Medicine, Va. Tech, Blacksburg, VA 24061.

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