



# VIRGINIA VETERINARY NOTES

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE

SEP 10 1990

BLACKSBURG, VA

## VPI Publications

September-October, 1990

No. 47

### WHAT'S INSIDE!

|   |        |
|---|--------|
| ANTITHROMBIN III . . . . .  | Page 2 |
| NEW LYME DISEASE VACCINE . . . . .  | Page 2 |
| UNDERSTANDING PSEUDOPREGNANCY IN THE BITCH . . . . .                        | Page 3 |
| THOUGHT FOR THE MONTH . . . . .   | Page 3 |
| LUMBOSACRAL SYNDROME: ANOTHER CAUSE OF HIND LIMB LAMENESS IN DOGS . . . . . | Page 4 |
| EQUINE PARASITE - TAPEWORMS . . . . .                                       | Page 5 |
| EQUINE BOTULISM VACCINE . . . . .   | Page 5 |
| U.S. AGRICULTURE EFFICIENCY . . . . .                                       | Page 6 |
| FOOD SAFETY ISSUES . . . . .  | Page 6 |
| VETERINARY COLLEGE - TENTH ANNIVERSARY . . . . .                            | Page 6 |
| CONTINUING EDUCATION OPPORTUNITIES . . . . .                                | Page 7 |
| VETERINARY COLLEGE NEWS . . . . .   | Page 7 |
| ALUMNI MEETING . . . . .  | Page 7 |

Kent C. Roberts, DVM  
Extension Veterinarian



### ANTITHROMBIN III

Thrombosis is hemostasis in the wrong place. The importance of hemostasis and thrombosis in thromboembolic disease is now acknowledged to be a major cause of morbidity and mortality in veterinary medicine. Plasma contains many agents that inhibit the activity of activated coagulation proteins and fibrinolytic enzymes. Among the well-characterized inhibitors are proteins C and S, and antithrombin III (ATIII; heparin cofactor).

ATIII is an alpha-2-globulin with a molecular weight of 58,000 to 65,000 daltons. It inhibits thrombin by forming a stable 1:1 complex between an arginine residue of ATIII and the serine active site of thrombin. Its action is greatly accelerated by heparin, an acidic mucopolysaccharide present in mast cells. Heparin appears to bind to ATIII and to induce a conformational change in antithrombin that renders arginine at the reactive site more accessible to the active serine site of thrombin. ATIII is a major inhibitor of thrombin, but it also inhibits active factors XII, XI, X, IX, plasma kallikrein and plasmin. Its physiological importance is best recognized by repeated episodes of thrombosis when ATIII concentrations are reduced as little as fifteen to twenty percent below normal.

Determination of ATIII concentration is indicated in animals with recurrent thrombosis, gastrointestinal torsion, disseminated intravascular coagulation, colic, cerebrovascular disease, glomerulopathy, hyperlipidemic diseases, hemolytic disease, neoplasia and in critical care patients with intravenous catheter placement exceeding twenty four continuous hours. In these states, an awareness of alterations in ATIII concentrations provides a logical basis for improving both patient management and prognostic decisions. In view of the life-threatening nature of many disease states causing ATIII deficiency, monitoring ATIII concentration is invaluable in evaluating the patient's response to therapy.

A functional ATIII determination is now available from the clinical pathology laboratory in collaboration with the biochemistry laboratory. Values will be reported as a percentage of our normal species specific pools. The pools have been arbitrarily assigned a value of 100%. Current reference intervals suggest that patients values less than 80% of normal place a patient at thrombotic risk. We will establish our own reference intervals in the next several months and report these to you.

Submit citrated blood (1 to 2 mls), taken in the proper ratio of nine parts of blood to one part 3.8% citrate, to the laboratory on ice or an ice pack. --  
**Notes from the Clinical Pathology Laboratory, Feb. 1990, Bernard Feldman, DVM, VA-MD Regional College of Veterinary Medicine, Blacksburg, VA.**

### NEW LYME DISEASE VACCINE

The National Association of State Public Health Veterinarians has been advised by an official in the United States Department of Agriculture that the canine Lyme disease vaccine being marketed by Fort Dodge has received a conditional license because its efficacy has not been established. --**Suzanne Jenkins, VMD, Virginia Department of Health, Richmond, VA.**



## UNDERSTANDING PSEUDOPREGNANCY IN THE BITCH

The bitch is different from all other domestic species in her estrous cycle. The cycle in the bitch includes a proestrus, estrus, diestrus, and anestrus each cycle regardless of pregnancy status. The proestrus period is characterized by vulvar swelling and bleeding, but non-acceptance of the male's advances. The estrus period is characterized by the acceptance of breeding by the male dog. Usually during estrus, the vulvar swelling and bleeding has diminished from the proestrus period. The diestrus period which follows is unlike any seen in the other species. Specifically, the diestrus period lasts the length of a pregnancy regardless of the pregnancy status of the bitch. Therefore, the bitch undergoes a hormonal pregnancy with each cycle.

When looking at the wild canidae, a possible explanation can be found for this unusual cycle of the bitch. For example, in the wolf packs, all females cycle once a year. Due to pack hierarchy, only the alpha bitch and male breed. The other females could get pregnant, but are so submissive as to not allow breeding. All females undergo the hormonal pregnancy, which includes mammary development and milk production. When the alpha bitch whelps, there are other suitable "wet nurses" to care for the pups if the need arises. The domestic dog has retained this cycle pattern.

The pseudopregnancy is a normal phenomenon and occurs in all bitches each time they cycle. Some bitches show more pronounced signs of pseudopregnancy than others. For that reason, some authorities refer to "overt" versus "covert" pseudopregnancies. The most common signs seen in canine pseudopregnancies are mammary development/fluid secretion, nesting behavior, and personality changes.

The signs seen in pseudopregnant bitches are related to the dropping of the progesterone levels of diestrus. This occurs 2-3 months following estrus or approximately at the time the bitch should whelp if she were pregnant. The same signs can be seen following ovariohysterectomy during diestrus or following progestogen therapy. The condition is normal, natural, and self-limiting. No treatment is necessary, nor is the condition related in any way to reproductive problems. Bitches which show pronounced signs of pseudopregnancy are not more likely to develop reproductive problems than bitches which show minimal signs of pseudopregnancy.

Occasionally a clients insists that a bitch be treated for pseudopregnancy. It is usually the mammary development or behavioral changes which cause the client concern. Reposital testosterone can be used once IM at a dose of 0.3 mg/lb. Mibolerone (Cheque Drops) also can be used at 16 ug/kg orally SID for 5 days. Megestrol acetate (Ovaban) is labelled for this use, but due to its progesterone-like action, a rebound of signs may occur following the end of therapy. --B. J. Purswell, DVM, PhD, Diplomate ACT, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA 24060.

## THOUGHT FOR THE MONTH

"To attain excellence, you must care more than others think is wise, risk more than others think is safe, dream more than others think is practical."

--President Frank Rhodes  
Cornell University



## **LUMBOSACRAL SYNDROME: ANOTHER CAUSE OF HIND LIMB LAMENESS IN DOGS**

Arthritis secondary to hip dysplasia is a common cause of rear limb weakness and lameness in middle age to older large breed dogs. Clinical signs include trouble rising, stiffness, reluctance to exercise and limping. Many of these dogs can be treated conservatively with rest and antiinflammatory or analgesic drugs. Some dogs will benefit from one of several surgical procedures. Unfortunately, there are dogs that may eventually reach a point where they are always in pain and can hardly walk.

There is another disease in dogs that can result in clinical signs similar to those of hip dysplasia. This disease is called lumbosacral syndrome. The dog's lower back consists of 7 lumbar vertebrae and 3 sacral vertebrae. The space between the last lumbar vertebrae and the first sacral vertebrae is called the lumbosacral space. As a dog ages, the intervertebral disk between these vertebrae, and the other soft tissue structures surrounding the lumbosacral space, may undergo degenerative changes and put pressure on the nerves that course through the spinal canal. Pressure on these nerves can cause pain and irritation which can make the dog sore, stiff, lame, or reluctant to get up or move. Sometimes the dog will hold one hind leg up, because the nerve irritation causes pain. Occasionally lumbosacral syndrome will affect the nerves going to the bladder and rectum. If this happens, the dog may not be able to control its urination and defecation. In some cases, the dog will not be able to urinate at all.

There are other diseases that can cause similar signs in dogs. It is important to thoroughly examine these dogs to determine exactly what is causing the problem. A dog can have more than one disease; for example, it is not uncommon for a dog to have hip dysplasia and lumbosacral syndrome. In that cases, it is important to try to decide which disease is causing most of the trouble.

Lumbosacral syndrome can be treated successfully if it is diagnosed early. Medical therapy may result in short-term relief, but the treatment of choice is surgery. The surgery that is usually performed is called a dorsal laminectomy. It is a fairly extensive procedure, but most dogs handle it very well, and are often much improved just a few days after surgery. The convalescent period is usually 6-8 weeks, in which time most dogs can resume normal activities.

Dogs that present signs of hind leg lameness, weakness, or pain; or reluctance to run and play; or intermittent pain should not be automatically assumed to be dysplastic. there can be other causes of these signs, and one of them is lumbosacral syndrome. --Susan R. Yanoff, DVM, Small Animal Surgery Resident, College of Veterinary Medicine, Texas A & M University, College Station, Texas, as reported in Notes From the Extension Veterinarian, Kansas State University, July, 1990.

### **TRUE FACTS**

An inch of water spread over an acre of land is the equivalent of 27,154 gallons.

In 1987, less than 3% of all farms used computers, while 15% of "large" farms used them. --Economic Research Service - USDA.



## EQUINE PARASITE - TAPEWORMS

Tapeworms of the horse include Anoplocephala perfoliata, Anoplocephala magna and to a lesser extent, Paranoplocephala mamillana. They occur in horses of all ages.

The life cycle requires an intermediate host (oribatid mites) that are free living in pasture grasses. The terminal tapeworm segments detach internally and are passed out with the feces. The segments dry and burst open to release the eggs. The Mites ingest the eggs in the manure, and the horse eats the mites while grazing the pasture. The mite continues as a host for the tapeworm, and the infective cysticeroids mature within 2-4 months. Maturity of the parasite is reached after months inside the horse. Therefore, the tapeworm doesn't reach maturity until the foal becomes a weanling or yearling or as a much older adult. The mite population can be supported in low-lying or wet pastures as well as areas that have been grazed for many years.

The pathology for tapeworms is primarily confined to the cecum and surrounding intestines. The worms can form clusters that attach around the ileocecal valve or produce a catarrhal enteritis of the distal portion of the small intestine.

The majority of horses show no clinical signs of tapeworm infection. The digestive disturbances are obscure, but there is local ulceration of the cecal mucosa. This erosion can perforate and lead to peritonitis in severe cases. The intestinal wall of the ileum thickens, including a typical diphtheritic membrane. Several sequelae occur such as obstruction/occlusion of the ileocecal valve, rupture of the cecum and intussusception of the ileum and cecum.

Diagnosis can be obtained by fecal flotation or sedimentation exam. The tapeworm egg is angular-shaped with a hyaline-thickened wall. The embryo has 6 hooklets. Several fecal samples should be taken over several days since the release rate is inconsistent. The proglottides or portions of the tapeworm are rarely seen in a fecal because the worm's integrity is lost in passage.

No specific product has been labelled for equine tapeworms. However, drugs that have been found effective include niclosamide, praziquantel, fenbendazole, mebendazole and double dosage of pyrantel pamoate. Control can be maintained by deworming a week before the grazing season and again afterwards. --R. Bruce Hollett, DVM, Extension Veterinarian - Equine, Veterinary Newsletter, No. 262, July 1990, University of Georgia, Athens, GA.

## EQUINE BOTULISM VACCINE

Neogen Biologics is currently manufacturing a Clostridium botulinum Type B Toxoid. This particular product is primarily recommended for the prevention of Shaker Foal Syndrome in neonates. However, adult immunity would be available for Forage Poisoning from Type B toxin. The vaccine has USDA licensure and is approved for sale in Georgia. Until local distribution has been arranged, orders can be placed directly with the company (see address) The vaccination schedule includes an initial three-dose program (2 cc, IM) followed by an annual booster. A multi-valent vaccine for C. Botulinum Type A, B, and C is being tested. --R. Bruce Hollett, DVM, Extension Veterinarian - Equine, Veterinary Newsletter, No. 262, July 1990, University of Georgia, Athens, GA.

Address:

Bot Tox-B, Neogen Biologics Corp., 620 Leshner Place, Lansing, MI  
48912-1509 (800) 234-5444 - ATNN Cara Warne



### U.S. AGRICULTURE EFFICIENCY

| Percentage<br>of population<br>in Country<br>agriculture | Percentage<br>of income<br>spent<br>on food | Telephones<br>per<br>1,000<br>people | Radios<br>per<br>1,000<br>people | TVsets<br>per<br>1,000<br>people |
|--|---|--------------------------------------|----------------------------------|----------------------------------|
| United States 2  | 11  | 604                                  | 1623                             | 449                              |
| India 68   | 64  | 2                                    | 22                               | 0.08                             |
| Yugoslavia 53  | 39  | 40                                   | 169                              | 100                              |
| Brazil 44  | 47  | 24                                   | 61                               | 68                               |
| Russia 32  | 38  | 49                                   | 408                              | 160                              |
| France 14  | 26  | 185                                  | 313                              | 227                              |

(AP, 12/89)

### FOOD SAFETY ISSUES

Researchers from the Centers for Disease Control and the Food and Drug Administration (FDA) estimate that from 6.5 million to 33 million Americans become ill each year from microorganisms in their food. This is roughly 3 to 14 percent of the population. An estimated 9,000 of these cases result in death each year. In contrast, the Environmental Protection Agency's (EPA) worst-case estimate is that pesticides in food cause potentially about 6,000 cases of cancer each year, or two in every 100,000 people. Most toxicologists and food scientists believe that microbial pathogens are a more serious hazard than chemical residues in the food supply.

Medical costs and time lost from work for individuals are estimated at around \$1 billion annually for salmonellosis. Campylobacteriosis, an intestinal disease similar to salmonellosis, also has medical and productivity costs of around \$1 billion a year. A third disease, congenital toxoplasmosis, which causes mental retardation in fetuses, is conservatively estimate to cost \$215-\$323 million annually. Individuals' medical costs and productivity losses for all foodborne disease could reach several billion dollars a year. --Excerpted from: T. Roberts & E. van Ravenswaay, "The economics of food safety", National Food Review. 12, 3 (1989) as reported in Notes from the Extension Veterinarians, August 1990, Kansas State University, Manhattan, KS.

### VETERINARY COLLEGE - TENTH ANNIVERSARY

The Virginia-Maryland Regional College of Veterinary Medicine will celebrate the successful completion of ten years of growth and development as a fully accredited institution September 14-15. Starting in June 1984, seven classes of graduating veterinarians have started their professional careers from the Virginia Tech campus in Blacksburg.

On Friday, September 14, a barbecue for students, staff, faculty and alumni will be held on the College grounds with musical entertainment, volleyball, horseshoe pitching and a large birthday cake.

An anniversary dinner at the Donaldson Brown Center on Saturday evening will complete the celebration. The celebration is funded entirely with contributions from private and corporate donors.



**CONTINUING EDUCATION OPPORTUNITIES  
VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE  
FALL 1990**

| <u>Date</u>   | <u>Program</u>                      | <u>Location</u> | <u>Contact Hours</u> |
|---------------|-------------------------------------|-----------------|----------------------|
| Sept 27       | Small Animal Medicine Update        | Charlottesville | 4                    |
| October 4-5   | Bovine Practitioners Conference     | Frederick, MD   | 12                   |
| *October 11   | Cardiodiagnostics                   | Charlottesville | 6                    |
| *Nov 9-10     | Gastrointestinal Endoscopy          | Blacksburg      | 9                    |
| *Nov 16-17    | Orthopedic Surgery/Canine Hindlimb  | Blacksburg      | 10                   |
| *Nov 30-Dec 1 | Practical Eye/Ear Surgery           | Blacksburg      | 10                   |
| *Dec 7-8      | Acute Abdomen in the Dog and Cat    | Blacksburg      | 10                   |
| *Dec 14-15    | The Computer in Veterinary Practice | Blacksburg      | 10                   |

\*Limited enrollment course

NOTE: Program brochures are mailed six-eight weeks prior to the course date.  
For course information or assistance, please contact:

Kent Roberts, DVM  
VA-MD Regional College of Veterinary Medicine  
Blacksburg, VA 24061  
(703) 231-7181

#### **VETERINARY COLLEGE NEWS**

Two new clinicians joined the staff of the Veterinary Teaching Hospital and the VMRCVM faculty on August 1. **Dru Forrester** is a native of Alabama and received her DVM at Auburn University. She interned and completed her MS and residency in small animal medicine at Texas A & M. As a diplomate of the ACVIM, she has a special interest in renal diseases, oncology and endocrinology.

**Spencer Johnston** graduated from the University of Pennsylvania, interned at the University of Georgia and did a residency in small animal surgery at Michigan State. The Pennsylvania native has special interests in cardiac, reconstructive and orthopedic surgery.

#### **OCTOBER CE PROGRAMS**

On Saturday, October 20, the student chapter AAEP and the Food Animal Practice Club of the VMRCVM will sponsor a program on embryo transfer in cattle and horses which will include a wet lab on harvesting embryos from reproductive tracts.

On Sunday, October 21, the student chapter AAZV, VMRCVM, will sponsor a program on non-domestic animal medicine featuring a zoo veterinarian.

#### **ALUMNI MEETING**

The VMRCVM Alumni Association is having a meeting in conjunction with the anniversary celebration September 14-16. This gathering of College alumni will feature continuing education on Saturday morning, a Saturday dinner and a Sunday brunch. Alumni are cordially invited to the Friday evening anniversary barbecue.



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

K.C. Roberts, Editor

Maura M. Wood, Production Manager of VIRGINIA VETERINARY NOTES

VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY  
VIRGINIA COOPERATIVE EXTENSION  
BLACKSBURG, VIRGINIA 24061-0512

---

Nonprofit Org.  
U. S. Postage  
**PAID**  
Blacksburg, VA 24061  
Permit #28

---