EIPH in Race Horses

After racing or a demanding work-out, many horses will have blood in their airways. Most of the animals show no outward evidence, though some may have blood in their nostrils. For many years it was thought that the condition affected only a small number of horses. It was speculated that the bleeding occurred in the nasal cavities. In the early 1970s, a study was published in Britain by Dr. W. R. Cook. He suggested that the blood originated in the lungs. As the flexible fiberoptic endoscope became available to veterinary medicine, the upper airways of horses could be examined. It was discovered that a large number of animals had evidence of bleeding after racing or work-outs. The disorder was named exercise-induced pulmonary hemorrhage (EIPH).

Dr. Corinne R. Sweeney and Dr. Lawrence Soma at the University of Pennsylvania School of Veterinary Medicine have studied EIPH in a large number of horses at Pennsylvania and New Jersey race tracks.

The initial studies were conducted in 1980, and 191 Thoroughbred horses were examined within two hours of racing. In 147 horses endoscopic evidence of bleeding was found, 13 of which had blood in the nostrils. An additional 107 horses were examined after training "work-outs" and it was found that 41 showed endoscopic evidence of bleeding, while only one horse had blood in the nostrils. The researchers then examined horses after steeplechase, flat turf, and timber races and found that a large number of these animals, too, showed evidence of EIPH. It was found that a relationship existed between the age of the horse and the distance raced. Older horses bled with greater frequency, and as the distance raced increased the likelihood of bleeding was greater.

Dr. Soma indicated that the cause of EIPH is unknown. "It occurs in race horses when high speed is demanded in a short period of time," he said. "It has not been found in horses which cover long distances, such as 50- or 100-mile endurance races. When maximum performance is demanded by racing, the increase in resistance to the flow of air may contribute to pulmonary hemorrhage. One theory is that in horses with EIPH the small airways which terminate into the minute alveoli (air sacs), which handle the gas exchange in the lungs, may be partially obstructed. When the horse is breathing hard during racing, these small terminal airways may collapse during exhalation and not reopen during the next breath. The consequence of this is that the alveoli (air sacs) will not re-expand during this inhalation. Because of this unequal expansion of the lungs, an undue stress may be placed on lung tissues causing small capillaries to break. The higher blood flow through the lungs may also contribute to the capillary rupture." The bleeding usually subsides and the horse shows no signs of illness. EIPH cannot be detected by listening to the horse's lungs. Rarely though, there is a horse which will have massive pulmonary hemorrhage and die.

Trainers feel that EIPH does affect the performance of a great number of horses, and they are looking for ways to prevent bleeding.

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EIPH in Race Horses

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are looking for ways to prevent bleeding. In view of the stringent drug regulations at race tracks, only one approved drug can be administered, Drs. Sweeney and Soma have studied a number of bronchodilators to determine whether bleeding could be prevented by reducing resistance to gas flow in the lung. In a small experiment, known bleeder horses were given four different drugs during separate trials. When atropine was administered one hour prior to training, the occurrence of bleeding decreased.

When cromolyn was administered, no change in the incidence of bleeding occurred. Ipratropium was given to two of the horses and stopped the EIPH on almost all occasions.

Atropine and ipratropium are bronchodilators. The former drug is injected while the latter is inhaled. Cromolyn is not a bronchodilator; it is believed that it prevents constriction of smooth muscles in the airways.

Later the two researchers studied a large number of horses with EIPH to determine the efficacy of furosemide and of hesperidin-citrus bioflavinoids, a compound some believe will enhance capillary strength. Furosemide was administered to 61 horses with a history of EIPH four hours prior to racing. Of these, 34 showed evidence of EIPH after the races. A control group of 24 horses was not given the drug; of these, 17 horses bled. The animals on the hesperidin-citrus bioflavinoids regime were given the substance in their feed for 90 days prior to racing. It was found that 35 out of the 45 horses in the study did not get the supplement. Out of these, 32 continued to bleed. All the animals were examined with the flexible fiberoptic endoscope shortly after racing. The criteria used to determine the efficacy of furosemide or hesperidin-citrus bioflavinoids was the absence of blood in the trachea after racing. No assessment of partial reduction of hemorrhage could be made. In their report Drs. Sweeney and Soma point out that in some horses remission occurs without treatment. They concluded that there was no statistically significant difference between the treated and the control groups when no hemorrhage was used as criteria. Studies by others have shown a reduction of the amount of hemorrhage in some horses after furosemide administration.

In another study Dr. Soma and his associates examined the effects of furosemide on the racing times of horses with EIPH. The horses were confirmed bleeders and were grouped according to three methods used to diagnose EIPH: group one, observation of pulmonary hemorrhage at the nostrils within one hour after a work-out or race; group two, observation of pulmonary hemorrhage only by endoscopic examination after a race or work-out; group three, observation of hemorrhage at the nostrils during a race or immediately after a race. There was a control group of horses, selected randomly from the animals running during the study period. These horses were not bleeders. For the statistical analysis the value of the horses was also taken into account. Horses were studied for five races prior to being admitted to the bleeders program, when they were not given furosemide. They then were given the drug prior to races 6 through 10 based on the rules of racing. The researchers did not find significant differences in the racing times in all groups. However, it was found that the higher valued horses in the group, which showed gross evidence of hemorrhage while racing and the horses diagnosed by endoscopic examination had a progressive reduction in racing times during races 1 to 6, followed by an improvement to prior performance during races 6 through 10 when furosemide was administered. The effect of furosemide appears to be more pronounced in the faster horses and in horses in which a reduction in racing times was evident. The researchers also found that EIPH may be incapacitating in some horses, manifested in reduced racing times. The study revealed that furosemide does not produce an improvement or return to previous performance levels in all horses. nor does EIPH affect all horses uniformly.
Problems in Goats and Sheep

Sheepskin coats. It is not surprising that more people are raising sheep and goats, not on the range, but on small farms near urban areas. Between 1978 and 1984 the membership in the American Dairy Goat Association increased by 110 percent.

These small farmers learn, often the hard way, that keeping and raising such animals for profit is not an easy task. Sheep and goats require care, and they have diseases and parasites which, left untreated, reduce production of milk and wool. But unlike the dairy or cattle farmer, sheep and goat owners frequently have problems finding proper veterinary care. "Sheep and goats are sort of in between the small and the large animal practice," explained Dr. Wendy Vaala, lecturer in large animal medicine at the University of Pennsylvania School of Veterinary Medicine. "Often neither the large nor the small animal practitioner will call at a sheep or goat farm. Also, it is a matter of economics for the farmer. He cannot afford expensive procedures." Therefore, owners seek veterinary assistance infrequently. Traditions and lore have been handed down and people try to take care of these animals themselves. "In recent years though, students at the School have shown quite an interest in sheep and goats," said Dr. Vaala, "and we do try to expose them to these species as much as possible."

Health problems often begin at birth. "Many lambs are lost due to hypothermia," she explained. "They get chilled, the glucose level is low, they refuse to nurse and die. If something isn't done quickly, they are lost." She said that each January to March, preparations are made in the neonatal unit at New Bolton Center to help owners save these young. "We freeze colostrum and ready the facility to be able to warm up these animals on short notice. Colostrum is vital as it protects the youngsters against infectious diseases during the first weeks of life." She explained that difficult births are common in sheep because of the large number of twins. "Often one of the pair is weak and susceptible to hypothermia." Multiple births are responsible for another disorder, pregnancy toxemia. "A lot of people don't want to bother, particularly with the tetanus vaccination," she said. "But to protect the newborns, it is vital that the dam has a high titer against these diseases. It provides the newborns with passive protection for the first weeks of life."

Tetanus protection is needed because at two weeks of age, kids are dehorned and castrated and lambs have their tails docked and are castrated. The tetanus organism is present in the environment and can easily infect the animals through the wounds caused by the procedures. If the dam did not receive a recent booster vaccination, lambs or kids need tetanus antitoxin at the time of dehorning, docking and castration. Kids and goats, like puppies and kittens, need vaccinations. Two sets of vaccinations are given at age four and six weeks and repeated annually.

Some people don't like to dehorn goats at this young age. "Dehorning an older animal is difficult," said Dr. Vaala. "Often one doesn't get all the horns. Also, goats can develop sinuitis when the procedures are done after horns have formed."

Goats and sheep are susceptible to nutritional diseases. Care must be taken that they are fed a proper diet. In this area the ground can be Selenium deficient. "If feed is produced locally or is homemade, it should be supplemented with vitamin E and selenium," Dr. Vaala said. "This is particularly important for pregnant animals." Selenium and vitamin E deficiency in pregnant ewes and does cause white muscle disease in the offspring, occurring at about two to four weeks of age.

The young animals will be still and will have difficulty nursing and sudden death can occur due to heart failure. To prevent the disorder, kids and lambs should be given selenium and vitamin E between the ages of two and four weeks. Goats and sheep need access to a salt lick: a sheep salt lick should be provided. A cow salt lick is not feasible as it can cause copper imbalance. The animals need water for drinking. Goats will drink only clean water and in the winter it should be warmed to entice them to drink.

Lambs, after weaning, can develop Enterotoxemia Type D (overeating disease), which is due to a toxin produced by a proliferation of bacteria in the intestines. It most often affects lambs in feedlots. Death is sudden. The disease can be prevented by changing feed gradually. Young animals of both species frequently have gastrointestinal disorders. Coccidiosis is common, particularly in overstocked areas. To minimize it, feed should be kept off the ground so it cannot become contaminated with manure. A number of gastrointestinal disorders are due to clostridial bacteria, thus vaccination is very important to prevent illness. Goats and sheep can become infected with Johne's disease, although it is more common in the goat population. All these diseases weaken the young animals and if left untreated, can affect the growth rate or cause death.

Parasites are a major cause of illness in young sheep and goats, particularly strongyles, a blood
Dr. Walter M. Woolf (V'60), founder of Air Animal Inc., a pet travel agency in Tampa, FL, discussed the intricacies of transporting animals by air.

Since 1969, when Dr. Woolf first began to arrange air transportation for animals, he has reserved "seats" for species ranging from armadillos to worms. The largest number of travelers are family pets belonging to owners who are relocating. Woolf's agency sees to it that pets are safely housed once the family begins the move, that they are placed on the proper plane, and that they reach their destination in the shortest possible time.

Dr. Woolf discussed the different types of aircraft and pointed out where family pets are housed aboard the planes. He explained that animals travel in the bulk bin, a heated, air-conditioned and pressurized space. The animal crates are placed in such a manner that there is plenty of air circulating around them. They are held in place with sandbags and cargo nets.

Nothing is stored atop a crate and this is the reason shipping a dog or a cat is so expensive. One pays for the airspace around the container. Today, USDA rules prescribe the proper size as well as the construction of animal crates. He did recommend that for international trips a crate one size larger than one used for domestic travel should be purchased as the animal will be in transit longer. He recommended that the animal be acclimated to the crate for a few days prior to the trip. He suggested that the dog or cat spend some time each day in the crate to become familiar with it. For bedding during the trip he recommended shredded paper. He felt that foam pillows are not suitable.

He also recommended that the animal receive neither food nor water for four to six hours prior to the trip. "It won't hurt the animal to travel with an empty stomach," he said. "And it will be more comfortable that way. When it reaches its destination it can eat again."

To travel by air, animals need health certificates and current vaccinations. As each state and country has different regulations, it is best to check about the requirements before taking the pet to the veterinarian for vaccinations and a health certificate. If the animal is to be shipped abroad, one should find out about the requirements from the airline or the consulate of the foreign country.

Dr. Woolf is opposed to tranquilizing cats or dogs prior to shipping. "A tranquilizer affects the respiration rate of the dog or cat and serious problems can arise," he said. "An aircraft is pressurized to about 8,000 feet, so what you are doing is taking a relaxed animal and putting it into relative oxygen insufficiency. If it starts to struggle and breathe hard, you will have a problem." He feels that many deaths of pets during air travel can be attributed to the use of tranquilizers.

He explained that airlines are very careful when handling animals and that they are treated as a priority shipment. "They are the last to board and the first to be unloaded."

He also suggested that when planning to ship a dog which requires a large crate. one should check with the airline whether such a crate can be loaded. "The dimension of cargo doors are different for each airline," he said. "You may be able to send your great Dane to California aboard a Delta 727, but you may not be able to return it aboard a TWA 727 because of the differing dimensions in the cargo doors."

According to Dr. Woolf, air travel for animals is safe and fast. "You can transport horses, cattle, chickens, tigers, dogs, cats, fish, or any other species," he said. "The airlines will accommodate these animals and get them to their destination quickly and safely."
Commonly Encountered Skin Problems in Dogs

Common skin problems were the topic of Dr. Robert Schwartzman. He prefaced the discussion by advising the audience that in many cases skin problems have a genetic basis. “Don’t breed those animals which have repeated episodes of skin trouble, you will just continue the problem.”

Hot spots (moist eczema) are common, particularly in longer coated breeds. “Usually the underlying cause is fleas or impacted anal glands,” he said. “The animal feels uncomfortable and begins to lick the affected area. This constant ‘worrying’ causes a lesion and in a very short time a weeping sore Will develop.” Treatment involves clipping and cleaning the area, preventing the dog from licking it, and eliminating the underlying cause. In this area, hot spots appear to be seasonal, mostly in the spring and summer.

Sarcoptic mange (scabies) was the next disorder discussed. It is caused by a small mite which lives on the surface of the skin. Dogs with scabies are extremely uncomfortable and scratch continuously, causing lesions. The disease has a very characteristic distribution pattern. Usually it begins around the ears and affects the neck, belly, and sometimes the legs. It is not a difficult disorder to cure, although diagnosis is sometimes difficult. Scabies is contagious to humans, and Dr. Schwartzman said in 30 percent of the cases the owner is also affected.

Cheyletiella is another mite which affects dogs. Animals with this large organism have a lot of flaking, scaly skin and appear to be covered with dandruff. This mite primarily affects young puppies and is contagious to other animals. If a dog has been diagnosed with Cheyletiella it is important to treat the environment to eliminate the mite, which can live in nature for quite a while, reinfesting the dog.

Another disease caused by mites, demodectic mange, is quite serious. The mites causing this disease are present on the skin of dogs, cats, man, and other species and normally do not cause any trouble. However, in some dogs they suddenly begin to multiply, causing hair follicles to rupture and allowing bacteria to enter. This begins a cycle of skin infections. “There is a genetic predisposition and animals which have had demodicet mange should never be bred.”

He said that the disease takes two forms, either benign, where small localized patches of hair loss occur which often disappear spontaneously, or as generalized disease. The latter is the more serious form as self-cure does not occur and secondary infection is common. Diagnosis is made by scraping and looking for the mite under the microscope. The disease affects mostly younger dogs. Treatment has improved over the last ten years, though it is lengthy. Dogs need baths to kill the mites and antibiotics to clear up infections. Dr. Schwartzman said that products now available are about 70 percent effective.

Seborrhea is another difficult disease to treat in dogs. “It is an internal disease,” he said.

National Brands, Generics, and Specialty Dog Foods

Today’s pet owner is confronted by a bewildering array of dog foods when shopping in the supermarket. Products range from canned “dinners” to dry or semi-moist foods for puppies, performance dogs and older dogs. Everything is attractively packaged and relentlessly advertised as “the best.” The price-conscious shopper can foresee fancy wrappings and buy store brands or generic dog food. Those who attend dog shows are further confused by an additional selection of special foods, ranging from growth diets to “natural” foods.

Which then is the food for one’s dog? “That depends,” said Dr. David S. Kronfeld during his discussion. “If Bowser spends his days on the couch, his requirements will be different from those of a dog which hunts, is being shown or which races.” He then explained that dog food manufacturers are governed by guidelines issued by the National Research Council. “NRC guidelines used to be the standards manufacturers had to adhere to,” he said. “Recently they were changed from ‘adequate’ to minimum requirements of available nutrients on a caloric basis. The protein requirement, for example, dropped from 22 percent to 10 percent. Whether an animal will thrive on such a diet is another question.”

He explained that nutritional scientists and dog breeders look at dog food in different ways. “Scientists have been concerned with minimum nutritional requirements, while breeders want a diet that will enable a dog to reach its maximum potential as a specimen of the breed and as a performer.”

The cost of the food also plays a role. If money were no object, dogs could be fed organ and muscle meat as a protein source instead of the cereal based feeds. “Economies dictated the use of grain in dog food,” he said. “Cereal proteins are inexpensive and the dog, while basically a flesh eater, has adapted more or less to a grain diet, provided it is carefully supplemented with high quality protein, fat, vitamins and minerals.”

Even so, the cereal ingredients are not without drawbacks. Some of the plant ingredients utilized in dog foods interfere with absorption of minerals. It is known, for example, that soy products contain goitrogen, which depress thyroid action, they also contain other substances which bind up calcium. To counteract this effect, manufacturers add abundant calcium, which may diminish absorption of copper and zinc or block iodine uptake in the thyroid gland. These interactions are involved in the “generic dog food disease.” It has been found that dogs fed generic foods exclusively can grow poorly, develop anemia or skin disease.

Cereal foods have to be cooked to make them digestible for the dog. This partially destroys nutrients. Also, preservatives added to dog food can influence health. Dr. Kronfeld pointed out that certain semi-moist foods contain high amounts of acids and that recently such acids have also been added to dry foods. Another substance, propylene glycol, also a preservative, can damage red blood cells.
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The picture is further complicated by the fact that the formula for dog foods changes, depend-
ing on the availability of the ingredients, in an effort to keep the cost low. “You may be buying the same brand, but the ingredients are different in each part of the country and the dog must adjust.”

Discussing the minimum protein content of 15 percent established by the new NRC guidelines, Dr. Kronfeld pointed out that many studies have shown that dogs need 25 to 30 percent protein in their diet to grow properly. An even greater amount is required to cope with stress. What can the consumer do to ensure that his dog eats the proper diet? According to Dr. Kronfeld, he first should look at the animal to ascertain whether it is in prime condition. Is the coat glossy and dense, is the animal alert? Is the food dark and dense? Large amounts of stool, foamy, pale or in the color of the food, indicate poor digestion. The consumer should also look at the list of ingredients to find out the amount of protein. When comparing foods and quantities, keep in mind that the expanded foods contain a large amount of air and are bulkier than kibbled foods. He also mentioned that breeds with a predisposition to bloat should not be fed expanded food dry, that is, it should be soaked to minimize the amount of air ingested.

The nutritional value of most expanded dog foods can be enhanced by the addition of meat or eggs and milk. “Eggs and milk provide the right amino acids to improve protein quality, as well as trace minerals and vitamins. If you want to add this, introduce it slowly to give the dog’s system time to adjust.” Another alternative is to feed a fixed formula diet. These are more expensive but denser, and dogs generally eat less.

He was asked about vitamin supplementation and responded that the national brands of dog food contain adequate amounts, making supplementation superfluous. He warned against supplementation with minerals, especially calcium, explaining that this would do more harm than good.

In closing Dr. Kronfeld mentioned that the consumer dictates what is offered for sale by the feed companies. “A few years ago, a very high quality food based on our sled dog studies was test-marketed. It did not sell and was withdrawn. People perceive the current products as adequate.”

Dr. David S. Kronfeld is Elizabeth and William Whitney Clark Professor of Nutrition at the School of Veterinary Medicine.

Update on Blood Diseases

Dr. W. Jean Dodds provided an update on blood diseases. She discussed three groups of disorders, acquired and inherited bleeding disorders, and immune-mediated blood diseases.

Two disease states that produce bleeding disorders in all mammals are poisoning by rodenticides and liver disease. Dr. Dodds explained that rodenticides currently are posing a new problem in veterinary medicine. “Rodents have evolved a genetic resistance to compounds. Now a new generation of more potent poisons is being produced and marketed. Non-target mammals, such as cats, dogs and man, have not developed that resistance, and they are in great danger if they ingest these new substances.” These rodenticides are 20 to 100 times more toxic per unit ingested than the previously used compounds. Effects are longer lasting. The half life is up to six to eight weeks compared to two to three hours with the older poisons.

This means that treatment to save an affected animal must be continued for a long period of time. The previous treatment of one or two vitamin K injections is insufficient; animals or humans that have eaten the new type of rodenticide need repeated vitamin K treatment for up to six to eight weeks. Dr. Dodds recommended that if rodenticide poisoning is suspected the animal be treated as if it had ingested one of the newer compounds. She mentioned that a pamphlet outlining the effects of the new generation of rodenticides is being distributed to veterinarians nationwide to acquaint them with the changes in the nature and effect of these rodenticides already widely used by exterminators.

Rodenticides affect production by the liver of vitamin K-dependent clotting factors. However, there are other diseases which can interfere with the clotting factor production of that organ. If the liver is diseased or inflamed, clotting factor production can be inhibited, causing bleeding disorders. Also, if the animal has hepatitis, the blood vessels in the liver can thrombose (actively clot), thereby utilizing these factors which then will be in short supply in other parts of the body.

Clotting factors are also affected by drugs. “The most abused drug, aspirin, is a potent inhibitor of platelet function,” she said. “The standard human adult dose of two aspirins every few hours can inhibit platelet function for four to five days. If you give aspirin to a dog with bleeding tendencies you can cause a more serious problem.”

Other drugs which are potent inhibitors of platelet function are phenylbutazon (Butazolidin): promazine tranquilizers: estrogen, either as a drug or as naturally produced excess estrogen: nitrofurazones (Furadanit, furacins): sulfonamides (Tribrissen, Diatrim) and certain penicillin drugs. None of these drugs should be administered without veterinary supervision as severe problems can result for animals with bleeding tendencies.

Dr. Dodds then discussed inherited bleeding disorders. Animals, like man, can have hemophilia and von Willebrand’s disease. Hemophilia A, a clotting factor VIII deficiency, is found in most breeds of dogs and it is an X-chromosomal-linked recessive trait. Manifestations of hemophilia occur primarily in males.

Females carry the trait and transmit it, on average, to half of their sons, while half of their daughters will carriers. The disease varies in severity from mild to severe. Generally, the larger the species or animal, the more severe the manifestation. Hemophilia A has a very high prevalence in certain breeds, particularly in rare breeds or in those where much inbreeding or line breeding to a few individuals has taken place. This result, called the “founder effect”, occurs when breeders overutilize one particular sire that happens also to carry the undesirable gene in question. The gene pool thus becomes relatively fixed and permits mutation and expression of recessive genes with greater frequency. Prevalence of the undesirable gene can thus spread rapidly. Dr. Dodds explained that a recessive gene is difficult to eliminate. “Even if you eradicate it, it is still there. After ten generations, 25 percent of your stock will still carry it. Dominant genes can be eliminated quickly. Don’t breed animals which show the trait and it will be eliminated in one generation. Incompletely dominant traits can be virtually eliminated in two or three generations if the stock is tested and carriers or affected animals are not used as breeding stock.”

Concentration on a particular sire has had serious effects in the German shepherd breed, today one-third of the cases of hemophilia A observed world-wide occur in that breed. She stated that if one was contemplating acquiring a German shepherd from overseas for that breed, German blood testing is available, and those animals should be breed prior to testing. The females would be assessed for the carrier state of hemophilia and the males for presence of the disease.

Hemophilia B, a clotting factor IX deficiency has also been identified in dogs and cats, though it is not as common as Hemophilia A. Tests to identify carriers for both diseases are available free of charge from Dr. Dodds’s laboratory.

Hemophilia affects animals in various ways. There can be intermittent bleeding into the joints, resulting in immobility, prolonged bleeding when teething, and the most dangerous of all, bleeding into the body cavities or the central nervous system. If one has a dog with hemophilia one should never use it at stud as every daughter will be an obligate carrier.

Hemophilia B, the most common inherited bleeding disorder in the dog. In Scottish terriers, Chesapeake Bay retrievers, and German shorthaired pointers, the disease is inherited as an autosomal recessive. In this case, only those homozygous for the gene (having two carrier parents) show clinical signs. Both sexes can have the disease and both sexes can be carriers. In all other breeds it is inherited as an autosomal incompletely dominant trait, whereby heterozygosity is lethal and heterozygotes can either express the gene or disease to a varying degree or be asymptomatic carriers. To date 49 breeds have been recognized to have VWD and the condition has recently been seen in cats.

Expression of VWD varies in severity. “It is a disease with high morbidity and relatively low mortality,” she said. “The animals can be fine for months and then suddenly become triggered by stress, illness or trauma.” VWD is most frequently seen in Doberman pinchers where 50 to 60 percent of the breed have the gene. It is also prevalent in standard poodles, Manchester terriers, Pembroke Welsh corgis, miniature schnauzers, Scottish terriers, golden retrievers, beagle basset hunts, Shetland sheepdogs and Rottweilers.
EIPH in Race Horses

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Currently furusemide is the only permitted race day medication for EIPH in 19 of the 22 states that have Thoroughbred racing. Pennsylvania, New Jersey, Delaware, and Maryland are among the states that have not approved furusemide for race horses. The drug is administered four hours prior to racing, and the horse is supervised in a detention barn until its start.

This is a cumbersome and expensive procedure, and Dr. Soma is looking for alternatives to prevent EIPH. Currently, he is working with a number of bronchodilators to determine in the experimental horse their effects on lung resistance and other respiratory parameters. "It is difficult to get substances deep into the Airways when a nebulizer is used," he said. "We use an old method to make the horse breathe deeply. A tube is affixed to the breathing mask, causing the animal to inhale its own carbon dioxide. After about one minute it will breathe deeply and we administer the bronchodilator over a three-minute period. The researchers are determining effects, dose ranges and the most suitable compound. The next step is to determine whether it will lower the incidence of EIPH in affected animals.

Dr. Soma is also investigating the use of a transplant. The drug is administered four hours prior to racing, and the horse is supervised in a detention barn until its start. This is a cumbersome and expensive procedure, and Dr. Soma is looking for alternatives to prevent EIPH. Currently, he is working with a number of bronchodilators to determine in the experimental horse their effects on lung resistance and other respiratory parameters. "It is difficult to get substances deep into the Airways when a nebulizer is used," he said. "We use an old method to make the horse breathe deeply. A tube is affixed to the breathing mask, causing the animal to inhale its own carbon dioxide. After about one minute it will breathe deeply and we administer the bronchodilator over a three-minute period. The researchers are determining effects, dose ranges and the most suitable compound. The next step is to determine whether it will lower the incidence of EIPH in affected animals.

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Tucker, a Penn Dog

All his life, Tucker was a Penn dog. When I first started to teach in 1975, he ran away from the house and showed up in my class. And from then on, I just took him with me. He got to know how long 50 minutes was and would stand up and shake to signal me that it was time to stop. And if for some reason I left him home, I'd more often than not find him on the steps of College Hall—or get a call from the Dean's Office to come pick him up.

He had early contacts with the Vet School, too—abdominal surgery after he impaled himself jumping a fence and landing after a top. And if for some reason he needed to come up and greet him when we were walking together.

By the time you met him, he had stopped coming to class—the walk to campus was too much....(the lectures too repetitive?). And he knew Jessica had pushed him out of the central hospital. or perhaps both.

Some of his friends asked how they could remember him, so I thought that given his Penn connections and his special connection with you in the end, sending contributions through you was the most appropriate gesture. And I shall join them in hopes that some other deserving mutts may be treated so well.—Drew Faust

Dear Friend of the Veterinary School,

You have been our faithful ally, as either a Friend of New Bolton Center, the Small Animal Hospital, or perhaps both.

Your gifts have helped save and protect thousands of large and small animal patients from life threatening disease or injury. As owners, we have all reaped the benefits of your compassion. You have responded enthusiastically and enthusiastically to our requests for support. We know that those of you who have given recently will understand our need for additional support and will accept our thanks for your previous giving.

But if you haven't given recently, why not now?

At this time of the year the phenomena of new animal life at New Bolton and the Small Animal Hospital is a fascinating and happy counterpart to the work of healing.

But accompanying this spate of life beginnings is an increase in injuries. Warm weather always means more activity. All of us feel a little friskier.

And both our hospitals experience an upsurge in cases. Your dogs and cats begin spending more time out of doors and are vulnerable to a multitude of major and minor hazards to their health: paw injury, automobiles, poisoning, botulism. Fleas. Even a fight. Routine visits for testing for such serious afflictions as heartworm and Rocky Mountain Fever account for a significant increase in the Small Animal Hospital's caseload.

Spring also brings renewed anxieties to farmers who may face a devastating year if disease runs unchecked. The latest outbreak of avian flu this past fall continues to haunt the Pennsylvania and regional agricultural economies.

New Bolton Center has been working hard on this major threat. Our researchers are under enormous pressures to accelerate efforts to halt the problem.

Spring is, of course, the time for horse owners to redress the pleasures of the track, field, or ring. But here, too, renewed activity brings painful reminders of fragilities in animals of all ages and sizes.

It seems like only yesterday we remember when beloved and celebrated horses were put down for injuries as heartbreaking simple in humans as bone fractures.

But today, orthopedic rehabilitation surgical techniques developed at New Bolton have largely eliminated the need for such drastic measures. Yet always new perils arise. The spring of 1986, for instance, marks the beginning of another warm weather cycle we must face with Potomac Horse Fever looming ahead and no proven antedotes to this mysterious killer in sight.

Spring is indeed, a mixed blessing for New Bolton Center and the Small Animal Hospital.

Perhaps you have brought your animal to us at this time last year or maybe the year before. In the two years since then our case load has increased by over 3,000.

No wonder our clinical, teaching, and research resources are pushed to the breaking point.

We need your help.

For our part we pledged that your gifts would be used directly to treat and project the animals you have entrusted to our care.

But sadly, in accord with this pledge, we will soon have to suspend mailing bellwether to you if you have not contributed to either Friends program in 1985-86.

We would love to continue sending you every issue of bellwether, but due to its popularity the mailing list has grown huge. Printing and postage costs have risen so steeply as a consequence that we cannot afford to send you bellwether, unless we have your continuing support.

Please take a few moments right now and write a check to Friends of New Bolton Center or Friends of the Small Animal Hospital. You will find a return envelope secured in the centerfold of bellwether.

You may be an equestrian, cat fancier, dairy farmer, dog breeder, birdwatcher, first time puppy owner, or elder with a trusted animal companion, but as a Friend of the Veterinary School we think you'll agree that there are no places quite like New Bolton and the Small Animal Hospital.

Your steadfast support will ensure the continued effectiveness of these unique enterprises dedicated to your animal's health. Thank you very much.

Sincerely,

Richard A. McFeely, V.M.D.
Associate Dean For New Bolton Center and Hospital Director
Barry J. Supine
Director
Small Animal Hospital

Scholarships

The Pennsylvania Society for the Prevention of Cruelty to Animals recently made a contribution of $10,000 to the student loan fund for the 1985-86 academic year.

A donation to the scholarship fund was received from the Chester Valley Kennel Club.

Wayne Johnson and Evelyn Crish, both third year students, are the recipients of a scholarship from the Plainfield Kennel Club.

Martin McGuire, a fourth-year student, is the recipient of a scholarship from the Mid Susquehanna Valley Kennel Club.

Beth Ann Ferry, a fourth-year student, received the Dr. Samuel F. Scheidt Memorial Scholarship from the Pennsylvania Veterinary Foundation. The Dr. Samuel B. Guss Memorial Scholarship, made available by the same organization, was awarded to Steven A. Stake, a fourth-year student.

Steven Wilson, a second-year student, received a scholarship from the Burlington County Kennel Club.

Carolyn M. Glass, a second-year student, was awarded a scholarship offered by the Auxiliary to the Massachusetts Veterinary Medical Association.

A Salisbury Scholarship in the amount of $1,000 each was awarded to five senior students: Jocelyn L. Beznos, Margaret N. Bliss, Doris A. Cappiello, Giancara Chieffo, Bonita E. Conard.

Dean Robert R. Marshak (center) greets the guest at a luncheon held in honor of the establishment of the Marilyn M. Simpson Professorship in Equine Medicine. To his right is William K. Sheldon Hackney, and to his left University President Sheldon Hackney.
Thank You

During the past 18 months many clubs have provided generous financial support to the School and to VHUP. These funds have enabled us to purchase much needed equipment, provide financial aid to our students, study specific diseases, and help many of our small animal patients.

We thank the following clubs:

- Airedale Terrier Club of Greater Philadelphia, PA.
- Allentown Dog Training Club, PA.
- American Irish Setter Foundation.
- American Shetland Sheepdog Association.
- Bayshore Companion Dog Club, NJ.
- Belgian Sheepdog Club of America.
- Bucks County Kennel Club, PA.
- Bryn Mawr Kennel Club, PA.
- Bucks County Kennel Club, PA.
- Central Illinois Shetland Sheepdog Club, IL.
- Centennial Shetland Sheepdog Club of Greater Denver, CO.
- Central Illinois Shetland Sheepdog Club, IL.
- Central Pennsylvania Kennel Club, PA.
- Chesapeake Kennel Club, MD.
- Chester Valley Kennel Club, PA.
- Chicago Shetland Sheepdog Club, IL.
- Clarksville Kennel Club, TN.
- Collie Club of America.
- Collie Club of Northern New Jersey.
- Dandie Dinmont Terrier Club of America, PA.
- Delaware County Kennel Club, PA.
- Delaware Valley Yorkshire Terrier Club, PA.
- Devon Dog Show Association, PA.
- District Area Sighthounds Association, DC.
- Doberman Pinscher Club of Connecticut and New York.
- Dog Owners Educational League, NJ.
- Elm City Kennel Club, CT.
- Garden State Siberian Husky Club, N.J.
- Giant Schnauzer Club of America.
- Great Barrington Club, CT.
- Greater Lancaster Feline Fanciers, PA.
- Great Millieville Shetland Sheepdog Club, WI.
- Greater Philadelphia Dog Fanciers Association, PA.
- Greater Venice Florida Dog Club, FL.
- Greyhound Club of America.
- Harrisburg Kennel Club, PA.
- Hyattsville Dog Training Club, MD.
- Interlocking Shetland Sheepdog Club, IL.
- Irish Wolfhound Club of Delaware Valley, PA.
- Irish Wolfhound Club of Greater New York.
- Jack Russell Terrier Club of America.
- Kanadasaiga Kennel Club, NY.
- Kennel Club of Beverly Hills, CA.
- Kennel Club of Buffalo, NY.
- Kennel Club of Philadelphia, PA.
- Kennel Club of Texarkana, TX.
- Lancaster Kennel Club, PA.
- Langley Kennel Club, VA.
- Laurel Highlands Kennel Association, PA.
- Lehigh Valley Kennel Club, PA.
- Liberty Trail Cat Fanciers, NJ.
- Lochland Shetland Sheepdog Club, MN.
- Long Island Kennel Club, NY.
- Longshore Spaniel Kennel Club, CT.
- Lower Bucks County Dog Training Club, PA.
- Luzerne Dog Training Club, PA.
- Maltese Club of Greater Miami, FL.
- Manatee Kennel Club, FL.
- Maryland Cocker Spaniel Club.
- Meadowbrook Cocker Spaniel Club, CT.
- Mid-Hudson Kennel Club, NY.
- Mid-Susquehanna Valley Kennel Club, PA.
- Mississinno Kennel Club, DE.
- National Capital Kennel Club, DC.
- New Jersey Boxer Club.
- New-For-En-Del Newfoundland Club.
- Newfoundland Club of America.
- Norwich and Norfolk Terrier Club.
- Nova Scotia Collie and Shetland Sheepdog Club.
- Old English Sheepdog Club of America.

Penn Ridge Kennel Club, PA.
- Pescosau Dog Fanciers, FL.
- Penn-Treaty Kennel Club, PA.
- Plainfield Kennel Club, NJ.
- Potomac Valley Standard Schnauzer Club, MD.
- Rhodesian Ridgeback Club of the USA.
- Rockland County Kennel Club, NY.
- Salisbury Maryland Kennel Club, MD.
- Sand and Sea Kennel Club, NJ.
- Sara Bay Kennel Club, Inc., FL.
- Schooley's Mountain Kennel Club, NJ.
- Shetland Sheepdog Club of Des Moines, IA.
- Shetland Sheepdog Club of Georgia.
- Shetland Sheepdog Club of Houston, TX.
- Shetland Sheepdog Club of NMI, FL.
- Shetland Sheepdog Club of Mid-Miami, FL.
- Shetland Sheepdog Club of PA/NJ/DE.
- Shetland Sheepdog Club of St. Louis, MO.
- Shetland Sheepdog Club of Southern California.
- Shi Tsu Fanciers of Greater Miami, FL.
- Siberian Husky Club of Delaware Valley, PA.
- Shoreline Shetland Sheepdog Club, TX.
- Somerset County Dog Obedience Club, NJ.
- Southern Hills Kennel Club, NJ.
- Southern Florida Miniature Schnauzer Club, FL.
- Southern New Jersey Terrier Club.
- Suburban Dog Training Club, PA.
- Tampa Bay Area Shetland Sheepdog Club, FL.
- Tidewater Kennel Club of Virginia, VA.
- Union County Kennel Club, NJ.
- Upper Marlboro Kennel Club, MD.
- Virginia Beagle Kennel Club, VA.
- Wallkill Kennel Club, NY.
- Watchung Mountain Poodle Club, NJ.
- Waterland Retriever Club, PA.
- Western Michigan Shetland Sheepdog Club, MI.
- Wilmington Kennel Club, DE.

Editor's note: The above list was compiled from our records covering the period of July 1984 through December 1985. As it takes time for a gift to be entered into our system, it is possible that clubs which gave in December may not appear on the list. We apologize. These organizations will appear on our next acknowledgements.

Study of Caudal Cervical Spondylomyelopathy Using the CT Scan

A number of dog breeds are affected by Caudal Spondylomyelopathy, commonly called "Wobbler Syndrome." The disorder is most frequently seen in Doberman pinschers and great Danes. Two surgeons here at the University of Pennsylvania School of Veterinary Medicine are conducting a pilot study to determine the value of Computed Tomography (CT) scans to increase our understanding of this disorder. Dr. Nicholas J. H. Sharp, a visiting surgeon from the University of Liverpool, England, and Dr. Gail K. Smith, Assistant Professor of Orthopedic Surgery here at the School, have received a small internal grant to help conduct the investigation.

"These funds will enable us to study five Doberman pinschers both before and after they undergo surgery for the condition," said Dr. Sharp. The disease commonly affects middle-aged Dobermans born between four and eight years of age, and males appear slightly more susceptible. Dr. Sharp explained that in affected animals the spinal cord is compressed in the neck as a consequence of unstable vertebrae. "Most of these dogs at first show only slight signs," he said. "Their gait may be slightly different, but as the disease progresses, they will become increasingly more uncoordinated. Most dogs are not in pain, although they may become suddenly paralyzed. This is frequently seen when a disc gives way, protruding into the neural canal and damaging the spinal cord."

"Treatment is the stabilization of the affected bones in the neck," said Dr. Sharp. "There are many techniques but none are considered ideal." In this study the two surgeons will evaluate the animal by doing a myelogram, this being an x-ray taken where the spinal cord has been outlined with an opaque dye. In addition, a CT scan will be performed which permits a view of the affected vertebrae in cross-section, showing the compression of the spinal cord more clearly than the radiograph. After these two tests, one of the standard surgical procedures will be performed. "Generally we decompress the disk and then fuse the vertebrae to stabilize the area," Dr. Sharp explained. "The animal will be examined later in the recovery period again employing a myelogram and a CT scan."

"By looking at the condition prior to and after surgical treatment, we hope to ascertain whether the procedure accomplished the goal of reducing the pressure on the cord and stabilizing the affected area of the neck," Dr. Sharp said. "The CT scan allows us a really close and detailed look in the neck before in this condition and very rarely at all in the dog's spine."

Both surgeons would like to see Doberman pinschers with Caudal Cervical Spondylomyelopathy for this study. There will be no charge for the CT Scan, and it is hoped to be able to obtain more funding to extend the study beyond the present limit of five dogs. Information about the project can be obtained by contacting Dr. Smith or Dr. Sharp at the School of Veterinary Medicine, University of Pennsylvania, 3850 Spruce Street, Philadelphia, PA 19104-6008.

Dedication

The cottage adjacent to the Allam House at New Bolton Center was dedicated as Hill Cottage on Dec. 6, 1985, in memory of John J. Hill, III.

Mr. Hill, a dedicated horseman, was master of Natinal Hunt Farm, a member of the Radnor Hunt, and vice-president of The Devon Horse Show. He was a member of The Philadelphia Society for Promoting Agriculture and the Quaker City Farmers, and a great friend of the School, particularly New Bolton Center.

Mrs. John J. Hill, III, Mrs. D. Roy MacDonald and Mr. John J. Hill, IV, at the dedication of Hill Cottage at New Bolton Center.

Spring 1986
Heartworms

Heartworm infection occurs in the dog throughout the United States and parts of Canada, particularly in warm, mosquito-infected areas. Infective heartworm larvae develop in mosquitoes and are deposited in the skin of the dog following the bite of an infected mosquito. After several months of development, immature worms enter the bloodstream. Adult worms, which may reach a length of five to twelve inches, are found in the heart and lungs. Infected dogs may tire easily, have a chronic cough and lose weight. Diagnosis is made by detecting the microscopic larvae (microfilariae) in the circulating blood and by blood tests to detect antibodies or worm protein.

There is a nonpathogenic nematode, Dipetalonema reconditum, which also produces circulating microfilariae. These must be differentiated from the microfilariae of the heartworm, Dirofilaria immitis. Microfilariae are not always found in the blood of heartworm-infected dogs—there are seasonal and diurnal variations—so a negative test should be repeated if heartworm disease is suspected. Most dogs with heavy heartworm infections have changes in the heart and lungs which may be detected radiographically.

Dogs infected with heartworm may be treated with drugs to destroy the adult worms. Infections may be prevented by daily treatment with a drug that prevents larvae introduced by the mosquito from developing into adult worms. Diethylcarbamazine (DEC) is available in several forms: tablets, liquids and powders. Treatment should be started at the beginning of the mosquito season and continue for several weeks after. In warmer climates, it should be given year round. The drug must be given daily as it has no residual activity. A drug under study by the FDA, Ivermectin, appears to be effective as a prophylactic agent when given at monthly intervals. However, there have been severe reactions to this drug in some breeds, including death. It cannot be recommended without this warning. At the present time, it is not approved for use in dogs but is FDA-approved for horses.

It is important that preventive treatment with DEC should not be given to dogs which have circulating microfilariae as this may produce severe anaphylactic (i.e., allergic) shock. Have a blood sample checked before beginning treatment, even if the dog was on DEC the previous year.

Your Cat's Teeth

The cat has 30 permanent teeth and 26 deciduous ("baby") teeth. Because the jaw bones of the cat are rather short, the number of premolars and molars is reduced when compared with the dog. (The dog has a total of 42 permanent teeth.) The cat has six incisors (front) teeth in the upper and lower jaw, used for biting and gnawing. Four large canine teeth ("fangs") for seizing and tearing food; six premolars in the upper jaw and two in the lower and two molars in the upper and lower jaws. The molars are used for shearing soft tissue and bones.

The deciduous teeth erupt at about three weeks of age and are replaced by the permanent teeth at about six months of age.

Tooth care should begin at an early age. Chewing on hard toys helps keep the deciduous teeth clean. The cat's teeth should be checked at about six months. If a baby tooth does not fall out, your veterinarian can pull the tooth to allow permanent teeth to grow in normally. When a cat is fed only soft foods, it will not chew enough to clean its teeth. Feeding dry food most of the time will help prevent gum disease. Periodontal disease is a major cause of bad breath and loss of teeth in cats. If there is a yellow build-up, this is an indication that dental cleaning is necessary. This is best done under general anesthesia and in some animals it should be repeated yearly.

When the teeth have been cleaned (calculus and plaque removed), your veterinarian may recommend "brushing" the teeth once or twice a week—ideally daily! Wrap a finger with a soft washcloth and brush from gum line to tip of tooth. If you do this gently and follow the procedure with praise and a treat, the cat will become accustomed to oral care. Do not use human toothpaste. Start with plain water or water with a bit of salt added. Your veterinarian may recommend using a medicated brushing solution if gum disease is present.

Don't let gum disease get out of control. Check your cat's mouth frequently. If the gums are ignored, hard food may get in, the gums swell and bleed; the breath becomes almost unbearable, the teeth loosen, and eating and self-grooming become painful. This can be avoided by keeping the mouth clean. Gum disease in cats can cause severe problems, more so than in dogs. Two major sources of the pain associated with gum disease are "neck lesions" (erosion of part of the tooth at the gum line, which exposes sensitive dentin) and spreading soft-tissue ulcers that can cause pain when the mouth is opened.

Cost is always a factor when considering professional treatment. If the teeth are kept clean by brushing and the cat has something hard to chew, periodontal disease may be avoided.

Because some cats refuse to eat or drink due to severe gum disease, and because severe gum disease is much more difficult to treat in cats than in dogs, gum disease in cats is the subject of a current research project at VHUP. Headed by Dr. Colin E. Harvey, Professor of Surgery, the project includes progressive clinical and radiological examinations, detailed bacteriological and virological examinations (performed at the University of Pennsylvania Dental School), and self-grooming become painful. This can be avoided by keeping the mouth clean. Gum disease in cats can cause severe problems, more so than in dogs. Two major sources of the pain associated with gum disease are "neck lesions" (erosion of part of the tooth at the gum line, which exposes sensitive dentin) and spreading soft-tissue ulcers that can cause pain when the mouth is opened.

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and the University of Liverpool in England, respectively) and treatment.

This project is supported by grants from the Winn Foundation for Cat Research, IBM Corporation, H. Schein, Inc., and a private donor. Appointments for examination of cats with oral or dental disease at VHUP may be made by calling 215-898-4680.

Miscellaneous Class

At AKC shows, there are eight breeds which may be shown in the Miscellaneous Class. These breeds are represented by an active parent club maintaining a breed registry, with serious and expanding breeding activity over a wide geographic area. Breeds in the Miscellaneous Class are not eligible for championship points. They must have an ILP (Indefinite Listing Privilege) number issued by AKC.

When the AKC’s Board of Directors is satisfied that the breed is continuing a healthy, dynamic growth, it may be admitted to the Stud Book and be able to compete in regular classes at dog shows. At the present time, there are 129 breeds eligible to compete for championship points.

V.M.D. or D.V.M.?

There are 27 Colleges of Veterinary Medicine in the United States accredited by the American Veterinary Medical Association, Wisconsin will graduate its first class in 1887. The University of Pennsylvania grants a V.M.D. (Veterinarian Medicine Doctor) degree, probably because of the close association of the Veterinary and Medical Departments. Graduates of all the other Schools receive the D.V.M. degree.

University of Pennsylvania graduates can be recognized by their degree. The V.M.D. has been awarded to 4,064 graduates, beginning with the first class in 1887. The requirements for V.M.D. and D.V.M. are essentially the same. It might be pointed out that if “Dr.” is used before a name, the academic degrees are not included after the surname. To be grammatically correct, the name should be John Doe, V.M.D. or Dr. John Doe, V.M.D.

The American Kennel Club, 1884-1984

This important book for all those interested in dog shows is edited by Charles A. T. O’Neill and the Staff of the American Kennel Club. ($17.95, Howell Book House, 230 Park Ave., New York, NY 10069).

The American Kennel Club was founded on September 17, 1884, when 12 dedicated sportsmen met in Philadelphia, Pennsylvania. All were disciples of clubs which had been holding dog shows or field trials. The new “Club of Clubs” would undertake to consider “all dog matters concerning bench shows and field trials.” In 1887, AKC took over the American Kennel Club Book—with number one being the English Setter, Adonis, whelped in 1875. The first issue of the American Kennel Gazette appeared in January 1889.

In 1900, the point schedule was based on the total number of dogs at the show—1 point at all-breed shows under 250 dogs up to 5 points at all-breed shows with 1,000 dogs or over. Later, requirements were based on competition within the breeds. Unfortunately, the book gives little information about championships recorded and the requirements.

The Chinese Crested, a hairless breed tracing back to at least the 16th Century, is the latest breed made eligible to compete in the Miscellaneous Class at dog shows, obedience trials, and tracking events. This breed is characterized by a hairless body with a crest of hair on top of the head and a plumed tail. Some Chinese Cresteds have a fluffy coat and are known as “Powderpuffs.” Both hairless and powderpuff varieties may appear in the same litter.

The seven other breeds presently eligible to compete in the Miscellaneous Class are: Australian Kelpies, Border Collies, Cavalier King Charles Spaniels, Finnish Spitz, Miniature Bull Terriers, Spinoni Italiani and the Greater Swiss Mountain Dog.

From 1878 to 1884, 1,416 dogs were registered: in 1894, 3,667; in 1924, 49,579; in 1954, 346,525; and in 1970, 1,056,225. Litter registrations began in 1932 with 29,200, increasing to 422,098 in 1984.

In 1984, there were 11 All-Breed Shows and no Specialty Shows. In 1984, there were 989 All-Breed Shows, 1,414 Independent Specialty Shows, 1,478 Obedience Trials, 191 Tracking Trials and 1,141 Field Trials.

The first dog in each breed entered in the AKC Stud Book is listed, along with the date. There were a few names changed. The American Staffordshire Terrier was registered as Staffordshire Terrier until 1972, the Borzoi was Wolfhound (Russian) until 1936, the Brittany was Spaniel (Brittany) until 1982, the Japanese Chin was Chinese Spaniel until 1977, the Lhasa Apso was Lhasa Terrier until 1944 and in 1908 the West Highland White Terrier was registered as Rosneath Terrier. The first Skye was registered in 1888 but after 1959 was no longer eligible for registration. The Mexican Hairless, first registered in 1887, could not be registered after 1936. Although many facts and valuable data, particularly statistical material, have been included, it seems incomplete in many places. Perhaps a second edition will be a deeper treatment of the history of AKC.

The Dog’s Sense of Smell

The dog has a phenomenal sense of smell, and may be trained to assist man in many ways. Their work in detecting narcotics is well-known. They can be trained to detect gas leaks and explosives. Less well-known is their ability to detect cows in estrus. A cow may show no signs of estrus, and the period during which she should be bred is very short (usually less than twenty-four hours). Dogs may prove to be useful in the dairy and beef industry.

There have been reports recently about dogs trained to sniff out termites. It is said that their acute sense of smell and hearing alerts the dogs to where the termites are.

All of this special work requires training for dog and handler. Anosmia is loss of the sense of smell. This can occur after some diseases, including Canine Distemper. Techniques are being developed to measure olfactory activity. Possibly this might be useful in grading hunting dogs.

Gwynne McDevitt has had Gordon setters since the early seventies. “My first dog was Ch. Tomacyn Yair Linn of Gowdie,” she said. “He is the foundation sire for my kennel. But I don’t breed much, perhaps a litter every two or three years.”

Foundation Grant

The Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation of San Antonio, TX, has contributed $300,000 toward the construction of the Robert J. Kleberg, Jr. Animal Genetics Laboratory.

The new facility, to be located in the Old Quadrangle will expand the space of the laboratory of Reproductive Physiology. The additional space is needed to enable Dr. Ralph L. Brinster, Richard King Mellon Professor of Reproductive Physiology, and his associates to explore fully the potential of their gene transfer work. Through the development and use of the technique for gene transfer in animals, Dr. Brinster and his associates have contributed enormously to the understanding of gene regulation, growth control, development and tumorigenesis. The Robert J. Kleberg, Jr. Animal Genetics Laboratory will enable the School to retain its pre-eminent position in transgenic research.
Bovine Leukemia Research

Bovine leukemia (lymphosarcoma, malignant lymphoma) is the most common neoplastic disease of cattle, affecting animals of both sexes and all breeds. It occurs most frequently in dairy cattle.

The most significant pathological feature of bovine leukemia is the malignant or neoplastic transformation of lymphoid cells. The neoplastic lymphoid cells multiply in an uncontrolled fashion, invading various tissues and organs either diffusely or forming tumor masses. The disease is always fatal. Affected animals die within weeks or, at the most, months after appearance of clinical signs.

Early in the 1960s research on bovine leukemia was initiated at New Bolton Center under the direction of Dr. Robert R. Marshak, and since 1969 this work is continued in the Comparative Leukemia Studies Unit under Dr. Jorge F. Ferrer. Under Dr. Ferrer the Unit has made some outstanding breakthroughs, not only in the area of bovine leukemia, but also in other known C-type retroviruses. For example, it was found that cattle continuously infected with the virus have antibodies against the major internal BLV protein. This finding established the fact that BLV is an exogenous virus, and further studies have confirmed this. It is now known that BLV is transmitted horizontally, almost always after birth. For several years the significance of these and other differences shown by the BLV system was not appreciated by other authorities in viral oncology. However, in 1980 HTLV-I, the first C-type human leukemia virus was discovered, and it was soon found that it shares all of the differential characteristics of BLV. It is now clear that BLV is the prototype of a special family of C-type retroviruses. The unique relationship with HTLV-I is one of the main reasons why BLV is now considered as one of the most important animal models to study viral leukemogenesis.

Once an animal becomes infected with BLV it remains infected for life, regardless of whether or not it develops leukemia. It is estimated that probably no more than 5 percent, and certainly less than 10 percent, of cattle infected with the virus ever develop leukemia. Thus, 90 percent or more of BLV infected cattle are asymptomatic virus carriers. BLV carriers can serve as a source of infection for other cattle, and they may have subtle abnormalities that are important. For example, they may have immunodeficiencies that, although not clinically apparent, favor the development of other infectious processes.

The fact that only a small proportion of BLV infected cattle develop leukemia indicates that, in addition to the virus, other factors are involved in the development of leukemia. Studies in the Comparative Leukemia Studies Unit have shown that one of these factors, probably the most important, is the host's genetic susceptibility.
The University of Pennsylvania Research Foundation has awarded grants to the following faculty members: Dr. Urs Giger, assistant professor of medicine, for his proposal "Cyanide Phosphofructokinase Deficiency": Dr. Debra Deem Morris, assistant professor of medicine, for her proposal "Leukocyte Transfusion Therapy for Bacterial Septicemia in Neonatal Foals: Gene Expression in Equine Neutrophils, before and after Leukocyte Transfusion": Dr. Stephen P. Schiffer, assistant professor of laboratory animal medicine, for his proposal "Characterization of Organic Aciduria in Substrains of Balb/c Mice": Dr. M. Raja Jyengar, professor of biochemistry, for his proposal "Biochemical Studies on N-Phosphoryl Creatinine, a Newly Characterized High Energy Compound."

Dr. Sydney M. Evans (V'76), assistant professor of nutrition, has been installed as president of the American Academy of Veterinary Nutrition.

The next issue of the "Journal of Veterinary Internal Medicine" will feature Dr. R. A. Giger, assistant professor of medicine, for his paper "Cyanide Phosphofructokinase Deficiency.

Dr. Mark W. Allam (V'32), former dean, and professor emeritus of surgery, was awarded the Thomas E. Holmes Community Service Award, the top community award given by Media, PA.

Dr. William S. Chalupa, professor of nutrition, contributed to a National Research Council Report on "Ruminant Nitrogen Usage."

Dr. Robert E. Davies, Benjamin Franklin and University Professor of Molecular Biology, taught a course "Are We Alone in the Universe" in the University's Gifted Program.

Dr. Roy D. Hoffman (V'31) was named "Veterinarian of the Year" at the Pennsylvania Veterinary Medical Association meeting in October. Recently Dr. Hoffman was named Bedford Elks' Citizen of the Year. Dr. Hoffman lives in Bedford, PA, and has practiced veterinary medicine for 55 years.

Dr. James S. Reid (V'62), Vienna, VA, received the American Animal Hospital Association's Regional Practitioner of the Year Award.

Dr. Elizabeth Atwood Lawrence (V'56) has written "Heartsbeats and Society: Studies of Human-Horse Interactions," published by the Indiana University Press.

Dr. William Medway, professor of clinical laboratory medicine, completed a three-year term as a member of the Marine Mammal Commission's Committee of Scientific Advisors on Marine Mammals.

Dr. Charles W. Raker (V'42) has been named The Lawrence Baker Shepard Professor Emeritus of Surgery.

Dr. Dudley E. Johnston, professor of surgery, taught a post-graduate refresher course on "Soft Tissue Surgery of Dogs and Cats" and "Soft Tissue Workshops at the University of Sydney, Australia, in February.

Biomedical Research Support Grants were awarded to Dr. Urs Giger for "Canine Phosphofructokinase Deficiency. An Animal Model for Cytosol in jog in work to need."

Dr. Joan Hendricks (V'79), assistant professor of medicine, for "Sleep-disordered Breathing in Pups and Adult Dogs with Upper Airway Obstruction."

Dr. Gert Niebauer, assistant professor of surgery, for "Immune Reactivity in Canine Cruciate Ligament Rupture."

Dr. Gerhard A. Schad, professor of parasitology, has been appointed to a three-year term as a member of the Graduate Group in Biology. Recently Dr. Schad made a presentation on parasite biology at the Park City meeting of the MacArthur Consortium on the Biology of Parasitic Diseases.

Dr. James B. Lok, assistant professor of parasitology, has been appointed a member of the NIH-NIAID Ad Hoc Study Section for Tropical Medicine and Parasitology.

Dr. Alan M. Beck, adjunct associate professor of animal ecology, was interviewed by Italian television for "Italia Sera," a national talk show, and he discussed the studies conducted here by the Center for the Interaction of Animals and Society. Dr. Beck also participated in the conference "Zoonoses in New England: A Conference for Veterinarians and Physicians." He was appointed to the human animal bond.

Dr. Steve S. Reid, assistant professor of parasitology, has been appointed to the NIH-NIAID Ad Hoc Study Section for Tropical Medicine and Parasitology.

Dr. William Chang, professor of medicine, has been appointed to a three-year term as a member of the Graduate Group in Biology.

Dr. M. Raja Jyengar, professor of biochemistry, for his proposal "Biochemical Studies on N-Phosphoryl Creatinine, a Newly Characterized High Energy Compound."

An important consideration in the development of a reliable test to detect the virus in animals is the fact that cells infected with BLV do not synthesize virus particles and viral antigens in vivo. This means that cattle infected with the virus do not exhibit a viremia and, therefore, the disease cannot be identified by tests based on the direct detection of BLV in the plasma.

All cattle infected with BLV have antiviral antibodies, and procedures aimed at the detection of these offer the best, and most practical, approach for diagnostic tests. The presence of the antibodies provides an accurate indication of active rather than past infection.

Until recently, the radioimmunoassay (RIA) procedure was the most specific and sensitive technique for the detection of antibodies to BLV. However, this test is impractical for routine purposes because it requires specialized personnel and equipment.

Because of its simplicity, the agar gel immunodiffusion test (ID) has been the most widely used serological test. This has been marketed under the name Lekassay B. After some use in the field this test lost its popularity because it is now recognized that it frequently gives false negative results, particularly with animals in the early stage of infection. Under certain conditions the ID test may give false positive results. Also, the ID procedure does not lend itself to automation, and is therefore not practical for large scale use.

The Comparative Leukemia Studies Unit has directed its efforts to the development of a reliable, inexpensive and practical test that can be automated or semiautomated and used for large scale seroepidemiological studies. With support from the Edgewater Corporation, Dr. Ferrer's team has developed a test based on the enzyme-linked immunosorbent assay (ELISA) procedure. The basic ELISA procedure itself was found not to be suitable, but with modifications it has been developed into a highly sensitive and specific test now designated as the ELISA-NBC test. The test is simple to perform, does not require special equipment, and it can be conducted by an individual with minimal training and skills. Further, it is inexpensive (less than ten cents/sample) and it uses reagents that are commercially available and stable. A patent for the ELISA-NBC procedure has been applied for in six United States and in a number of other countries with sizeable cattle and dairy industries.

Immediate applications of the ELISA-NBC test include seroepidemiological surveys to determine the prevalence and distribution of BLV, the testing of cattle in eradication and control programs, the selection of cattle for export, the testing of cattle at import stations, and the selection of breeding stock.

Epidemiological studies indicate that about 30 percent of dairy cattle in the U.S. are infected with BLV, and approximately 70 percent of dairy and beef herds in this country contain infected animals. Since BLV is readily transmissible to sheep and to some extent to horses, unless control measures are instituted the number of animals and herds infected with the virus will double arithmetically every three years.

Since most cattle become infected with the virus at about 12 months, there are two main approaches to eradication and control. One is the isolation or removal of infected animals from a herd. The other is immunization of uninfected animals. Vaccination would provide the most practical and economically realistic approach to the eradication of BLV infection.

Dr. Ferrer's group, with support from the Edgewater Foundation, is engaged in a major effort to develop a suitable vaccine and, in fact, developed a vaccine which is suitable to immunize certain cattle populations. However, this preparation, known as Vaccine I, cannot be used in cattle with a history of BLV infection by means of serological tests (e.g., cattle for export) since it would give false positive results because of the antibodies produced in response to the vaccine. Researchers at the Comparative Leukemia Studies Unit are now engaged in work to produce a vaccine which will not interfere with the serological diagnosis of BLV infection.

— John F. Martin, V.M.D., Dr.
sucking intestinal worm. The animals become anemic and develop diarrhea. If they are not treated promptly, they can die. To prevent heavy worm infestation, manure samples should be checked frequently and the whole herd should be wormed at regular intervals. Also, when turning sheep out to pasture, every effort should be made to use a meadow which has been dormant from October to March and thus has a reduced parasite burden. Weaned lambs should go to clean pastures and not those used by ewes. Dairy goats which are kept inside are not so prone to parasites.

However, they have other problems. Sheep and goats are quite susceptible to respiratory ailments. Slowly progressive pneumonia occurs more in sheep. Ovine progressive pneumonia (OPP) is the most common viral pneumonia.

Alumni Day—
Saturday, May 17, 1986
—Philadelphia Campus

From the time of the first graduating class in 1887, alumni have returned to the School to celebrate the day that marks the beginning of their careers as veterinarians.

Please join us for all or part of the Veterinary Alumni Day festivities on Saturday, May 17, 1986. The day and evening have been planned for entertainment and celebration.

Coffee with the Dean and Faculty
The Veterinary Medical Alumni Society Annual Meeting
A buffet luncheon (All you can eat)
Things to do and places to see:
  • Tour the small animal hospital
  • Visit the Philadelphia Zoo
  • Marvel at the wonderful exhibits at the University of Pennsylvania Museum
  • Bus tour through Society Hill, including visits to the Powel House, home of the last colonial mayor of the city and the Hill-Physic-Keith House, home of the "Father of American Surgery"

Dean Robert Marshak and the Veterinary Medical Alumni Society will co-host a reception for all veterinary alumni at the Franklin Plaza Hotel at 6:30 P.M. to be followed by dinner and a night of dancing.

Round trip bus transportation will be available from the Franklin Plaza Hotel to the School on Saturday, May 17th.

A special invitation is extended to our REUNION YEAR classes. Whether you graduated from Penn five years, twenty-five years or fifty years ago, each quinquennial reunion has a unique meaning. Bill Hardly, Jr., '66, is the 1986 Reunion Year Chairman and he has worked diligently, along with all our Reunion Year Class Agents, to ensure our best ALUMNI DAY ever!

1986 Reunion Year Class Agents
1936—Earl Cook
1941—Robert Lench
1946—Seibert Berlin
1951—Clarence Bryer
1956—William Butler, Jr.
1961—Paul Evans
1966—William Hardy, Jr.
1971—Gerald Pietsh
1976—Britan Kolbourne
1981—Geoffrey Wright

"There is no cure," said Dr. Vaala. "One can only treat it supportively." Goats and sheep also develop bacterial pneumonia; this can be treated with drugs. "They have to be kept in a clean, dry, well ventilated environment to prevent respiratory diseases," she said. "There is a problem treating dairy goats with drugs; we don't quite know the period of time for which milk from treated animals should be withheld from market.

Goats frequently develop arthritis. The joints swell and there is pain. The most common form, Caprine Arthritis-Emphalitis Syndrome (CAEV) is caused by a retrovirus. It is thought that it is passed through the colostrum. The virus is latent in many animals will not be affected until older. Some infected goats may show no signs while others become depressed and have weight loss. If CAEV is present in a herd, kids can show signs of neurological disease between the ages of one to four months. These animals frequently have an ascending spinal cord infection and the prognosis is poor. Arthritis in goats can also be bacterial in origin. These forms are treatable with antibiotics. Diet can play a role; if goats are fed too much alfalfa, they may develop arthrosis.

Goats and sheep suffer from caseous lymphaditis infections, a disease affecting about 8 percent of the herds. It is caused by Corynebacterium pseudotuberculosis (ovis). Animals with the disease are not permitted to leave the state, as the illness is highly contagious. The infection causes abscesses. In sheep these occur most commonly at shearing laceration sites. Goats appear to contract the infection through ingestion; they often develop internal abscesses. These may involve internal lymph nodes in the thoracic (chest) and abdominal cavities and may involve organs such as the liver, lung or spleen. Chronic weight loss is often the most common complaint associated with internal abscesses. External abscesses can be excised or lanced and drained. Affected animals should be isolated from the rest of the herd/flock until all drainage has stopped. Internal abscesses are very difficult to diagnose and treat. Antibiotic therapy and surgical removal have been tried but often treatment is not successful and the affected animal is culled. In ewes and goats these
toward smaller group workshops in the after­
noon, highly practitioner-oriented.

The lectures will emphasize principles of
radiographic interpretation of the chest and
abdomen. The workshop will be handled as a
laboratory with teams of two to three people
assigned to a viewbox with the Radiology
faculty circulating to assist in radiographic
interpretation of the presented cases. The lab-

oratory will concentrate on recognition of nor-
mal and abnormal radiographic findings of the
chest and abdomen with specific emphasis on
differential diagnosis.

Dr. Darryl Biery, Professor of Radiology
Dr. Sydney Evans, Instructor in Radiology
Dr. W. Harker Rhodes, Professor of Radiology
Dr. Mark Saunders, Resident in Radiology

Mrs. Frederick Rode (L) and Mary Ann Tuschak (R),
Member of the Wilmington Financial Group. Ms. Tuschak
has generously offered to co-sponsor publication of the

Mr. Charles S. Wolf, chairman of the School's
Board of Overseers, calls the
Board to order. The Board of
Overseers held their winter
meeting in conjun-
tion with the Penn
Annual Conference.

Each year, the
Alumni Society
sponsors a luncheon
for recent graduates
(those alumni in
practice less than five
years). The luncheon
promotes interaction
among alumni,
faculty and students.
New Overseers

The University Trustees approved the appointment of four new members to the School's Board of Overseers. Miss Henrietta K. Alexander, Coatesville, recently returned to Pennsylvania to become more actively involved in her family's cattle and Thoroughbred breeding interests. Her grandfather, the late Robert J. Kieberg, Jr., developed the Santa Gertrudis cattle breed.

Mrs. Ann Eldredge, Middleburg, VA. breeds and shows English cocker spaniels. Together with her husband, the late E. Irving Eldredge, she bred and raised an outstanding line of Irish setters and exotic cattle at their Tirvelda Farm in Virginia. Mrs. Eldredge has been a member of the Ladies Committee of the Small Animal Hospital since 1980.

C. Taylor Marshall, Oakmont, PA. is chairman and president of the Edgewater Corporation. He is Master of Foxhounds of the Sewickley Hunt Club and serves as a director of the American Foxhound Association and the Master of Foxhounds Association of America. Mrs. Anne F. Thorington is a breeder of Thoroughbred horses. Recently she has begun to show dogs, and her new Pembroke Welsh corgi finished its Champion title while still under one year of age.

New Field Service Building

The Field Service at New Bolton Center moved into its new quarters in February. The new building is of modular construction and contains five individual offices and a reception area. There is also a conference room. The basement is used as storage space for old medical records and other documents.

Pennsylvania's Oldest Bequest

"In the name of God Amen. I John Keble of the City of Philadelphia Gentleman being of sound mind memory and understanding praised be the Lord for the same and all other his mercies do hereby make my last Will and Testament."

So begins a document dated September 24, 1807, in the files of the University of Pennsylvania. In his Will, Keble directed that his estate be divided among charitable institutions after bequests to his friends, his church, and a hospital.

Search Committee

University of Pennsylvania Provost Thomas Ehrlich announced the make-up of the search committee to recommend a successor to Dean Robert Marshak, whose term will be completed as of June 1987. The committee is chaired by Dr. Mark E. Haskins (V'69), associate professor of pathology, pathobiology, at the School. Other School faculty members on the committee are: Dr. Lawrence T. Glickman (V'72), associate professor and Chief, Section of Epidemiology; Dr. Adrian R. Morrison, professor of anatomy; Dr. David M. Nunamaker (V'68), Jacques Jenny Professor of Orthopaedic Surgery, Chief, Large Animal Surgery, Ms. Lynn M. Walker, Class of '87, and Ms. Tania D. Woerner, Class of '89, are the two student members.

In addition to the representatives from the Veterinary School, the committee has four other members. They are: Dean Jan Lindhe, School of Dental Medicine; Dr. Stephen Roth, chair, Department of Biology, professor of biology; Dr. Roy D. Schmickel, professor and chair, Human Genetics, School of Medicine; Dr. Rosemary A. Stevens, professor of history and sociology of science.

Bellwether

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