

Bellwether

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Large Animal Dermatology

Treatment of skin diseases is a vital part of a small animal practice. For the large animal practitioner, however, treatment of skin diseases is just a small part of his work. "Skin trouble in horses and livestock is often diagnosed incidentally because the animal is brought in for another reason and not for its lumps, bumps, or bald spots," said Dr. Kevin Shanley, assistant professor of dermatology at the University of Pennsylvania School of Veterinary Medicine. "Not much research has been devoted to large animal dermatology, but that is changing. It is an emerging field. Here we are trying to focus on it more and have established a bimonthly clinic for dermatology problems at the George D. Widener Hospital for Large Animals at the New Bolton Center campus. We hope to see many more cases as practitioners learn about the new clinic. It will also provide our students with greater exposure to skin diseases of large animals."

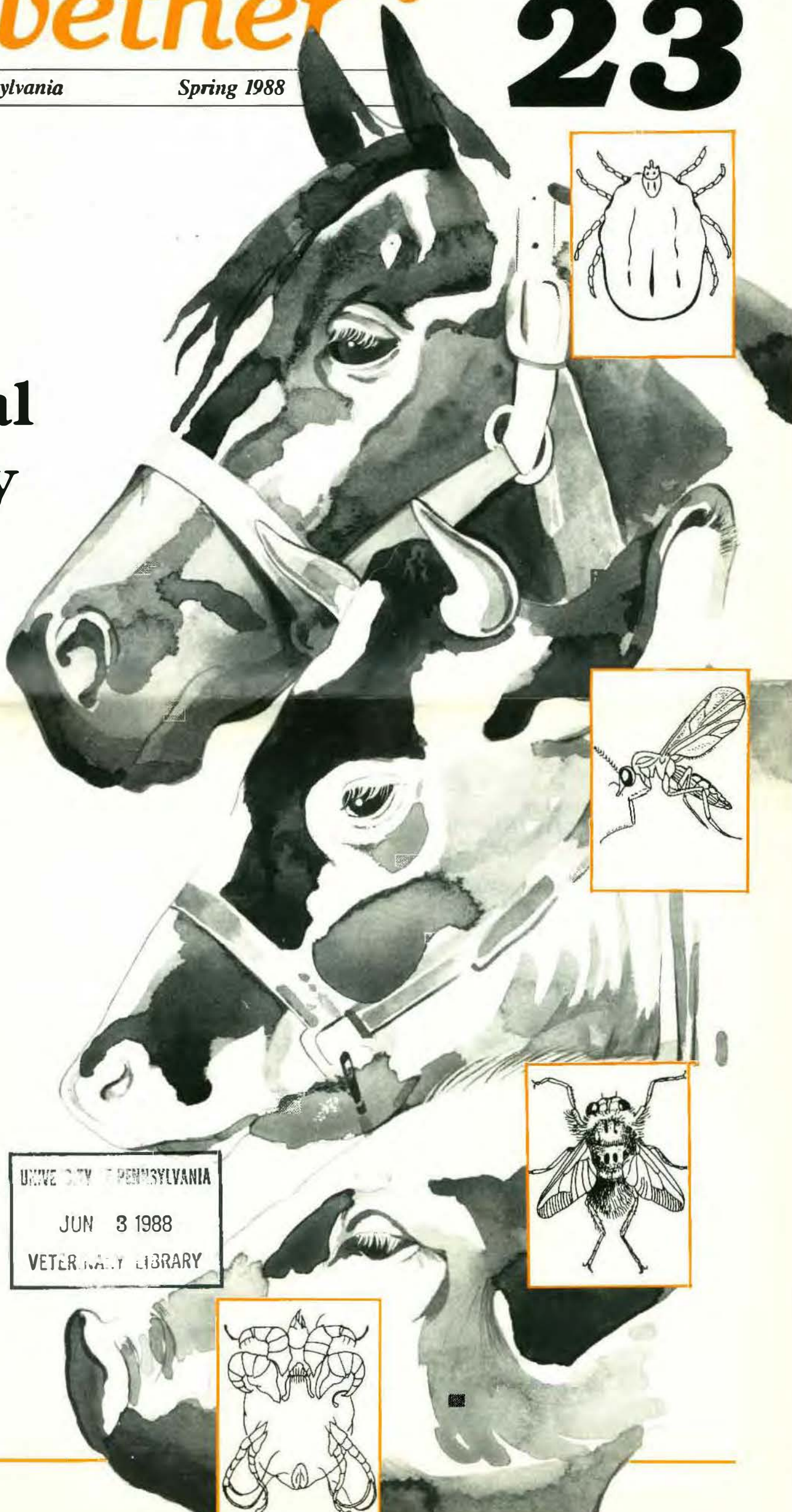
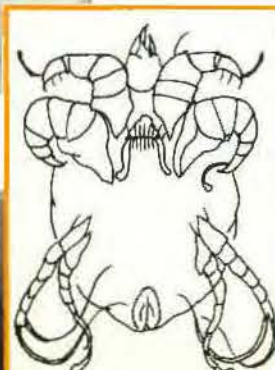
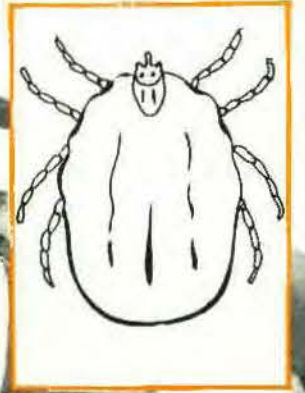
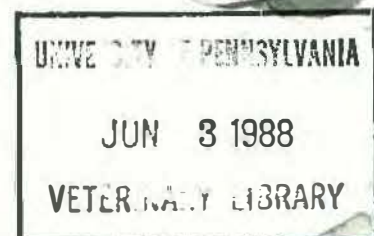
Skin diseases in horses and food animals are rarely life-threatening, yet they can interfere with the animal's performance, its general health, and the yield of milk, meat, or hides. Skin diseases also provide an opportunity for bacteria to enter the animal's system, causing unsightly infection and debilitation. As in the dog and cat, skin diseases in large animals can be caused by parasites, allergies and bacteria, as well as viruses. There are additional causes such as feed materials which result in extreme sensitivity to sunlight, and environmental factors such as prolonged wet weather which can facilitate skin infections.

"Because most owners of large animals do not worry too much about a few bald spots or pustules, the disease is often advanced when the veterinarian sees it," said Dr. Shanley, "making it more costly to treat. Also, if one is dealing with a contagious organism, it may have spread to other animals in the herd by the time it is diagnosed."

Diagnosis of skin diseases in horses or large animals is often complicated by owners' attempts to cure the problem with a myriad of ointments, tinctures, and other home remedies before seeing the veterinarian. This can change the clinical picture of the disease. By the time the veterinarian sees the animal, diagnosis may not be so easy and can only be made after evaluating the history and all the treatments tried.

Clean, dry conditions and regular grooming contribute much to the prevention of skin problems.

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From the Dean



As the crocuses and daffodils break the new Spring's crust, we as a school are showing our new colors.

The Markey Trust has provided us with a marvelous grant to support a new effort in molecular genetics at both the Veterinary and Medical Schools. The research supported by the grant will greatly enhance our understanding of the application of gene therapy to the benefit of animals and, hopefully, man.

At our New Bolton Center campus, the Connelly Intensive Care Unit/Graham French Neonatal Section is taking its final form and shortly we will be dedicating the Stubbs Laboratory, an important poultry research and diagnostic resource generously funded by the Commonwealth of Pennsylvania.

As the scaffolding on our historic quadrangle is dismantled, the traditional symbol of the school with its beautiful brick facade will shine anew.

We have a new fiscal plan, a new administrative organization, and new ideas for the School's direction. We have begun a strategic planning process to define our role in veterinary education. This effort, funded by the Pew Charitable Trusts, will help prepare us for the needs of veterinary medicine in the 21st century.

As my first year in the deanship comes to an end, I am thankful for the support of the faculty and staff, the continuing kindness of our friends, the confidence of our many agricultural constituencies, the enthusiasm of our students, and the commitment of the Commonwealth of Pennsylvania to our educational, research, and service mission.

—Edwin J. Andrews, V.M.D., Ph.D.

Exploring Gene Therapy

Under a \$3.8 million grant from the Lucille P. Markey Charitable Trusts, Penn will build up genetic research in the next five years in two health schools—Medicine, and Veterinary Medicine—with a view to treating genetic disease at the molecular level.

Dr. Mark I. Greene, professor of pathology in laboratory medicine and director of research immunology at the School of Medicine, and Dr. Donald F. Patterson, the Charlotte N. Sheppard Professor of Medicine at the School of Veterinary Medicine, are co-principals in the project.

The \$3.8 million grant is one of 11 given across the country. The Lucille P. Markey Charitable Trust commenced operation in November 1983 under the provisions of the will of the late Lucille P. Markey, who died in Miami in 1982. She directed that the Trust's assets be used exclusively for "supporting and encouraging basic medical research" and that all funds be spent by 1997. The recent round of awards, totalling \$75 million, is earmarked for biomedical science, where the foundation intends to "identify cutting edge

research and support those projects over a long period," the Trust's director for medical science, Robert J. Glaser, said.

At Penn, the grant will be used primarily to add young researchers and new equipment. Dr. Patterson, chief of the Veterinary School's Section of Medical Genetics which he started in 1970, heads an existing Gene Therapy Research Group which includes Dr. Roy Schmickel, professor and chairman of the department of human genetics at the School of Medicine, and colleagues from the School of Veterinary Medicine—Dr. Gustavo Aguirre, professor of ophthalmology and medical genetics; Dr. Ralph Brinster, the Richard King Mellon Professor of Reproductive Physiology; Dr. Mark E. Haskins, associate professor of pathology and medical genetics; Dr. Urs Giger, assistant professor of medicine in medical genetics; Dr. Vicki Meyers-Wallen, assistant professor of reproduction in medical genetics; and Dr. John H. Wolfe, assistant professor of pathology and medical genetics.

Research is aimed at correcting the gene functions

that have been lost in the cells of animals with genetic diseases. The investigators will isolate the normal gene and, through genetic engineering, construct a modified version of the gene that will assure its normal function in the defective cells. In initial studies, scientists will take cells from an animal patient and grow them in culture. Then, what scientists call "an engineered normal counterpart" to the defective gene will be transferred into the cells. The corrected cells will then be returned to the patient.

Since animals have many of the same genetic diseases as humans, the research is expected to lead the way to new approaches to therapy for a variety of human as well as animal genetic diseases. The first priority of the research will be a number of life-threatening or seriously debilitating genetic disorders for which no effective method or treatment now exists.

The group has been working for several years on treatment of diseases that involve enzyme deficiencies. One is mucopolysaccharidosis, a debilitating and sometimes fatal disease of both children and animals.

18th Annual Symposium

The 18th Annual Symposium *Your Veterinarian and Your Dog* was held on January 30, 1988, at the Veterinary Hospital of the University of Pennsylvania, Philadelphia. The event was supported by a contribution from the IAMS Company.

Dr. Darryl N. Biery, professor of radiology and

chairman, Department of Clinical Studies, Philadelphia, welcomed the capacity crowd which included representatives of the canine press and the American Kennel Club, as well as members of the School's Ladies Committee and the Board of Overseers.

Dr. Biery said that more than 22,000 patient visits are made annually to VHUP, that over 50 percent of the cases are referred, and that dogs comprise about 85

percent of the patients at the hospital. He mentioned that the facility is staffed by 80 veterinarians, faculty, interns, and residents who are assisted by the students of the senior class.

The symposium speakers came from the specialties of neurology, internal medicine, dermatology, and oncology. Following are summaries of their presentations.



Signals of Cancer

Dr. Stuart C. Helfand, assistant professor of medicine, discussed cancer in the dog. He pointed out that dogs develop diverse forms of cancer and that many of these tumors are quite similar to those of people. It is estimated that approximately two million dogs will be diagnosed with cancer this year. One in 25 dogs will develop a malignancy. On the oncology (cancer) service at VHUP there are about 2,000 patient visits per year.

For the most part, the causes of canine neoplasia are unknowns. Certain risk factors have been recognized for a number of tumors, however, and several types of tumors are known to occur more frequently in a particular breed. This latter observation suggests that some cancers are familial, that is, occurring more frequently in certain families than probability would suggest. This does not mean that the tumors are inherited as numerous environmental factors must be considered as well. At this time, the role of genetics is unclear in the etiology of cancer.

Some examples of risk factors include:

- ultraviolet light and some skin cancer,
- increased incidence of mammary tumors in dogs that are not spayed,
- the syndrome of multiple nailbed tumors in black-coated dogs,
- increased incidence of skin cancer in non-pigmented skin,
- increased incidence of anal sac tumors and lipomas in female dogs,
- increased incidence of perianal and bone tumors in male dogs,
- increased incidence of bone cancer in large and giant dogs,
- history of a chronic inflammatory process at the site of a cancer,

- increased incidence of all cancers in dogs 10 years of age and older, and
- decreased mammary cancer in unsplayed dogs that were kept lean during their growth years.

As in people, early detection of canine cancer is vital. By the time a tumor grows large enough to be recognized (about grape-sized), it already contains 1,000,000,000 cells! When the tumor is small, there exists the greatest chance for complete surgical removal. There is also a decreased chance for the tumor to have spread (metastasized). It is imperative that dog owners bring suspicious lesions to the attention of the veterinarian at the earliest possible opportunity. Watching a tumor grow for awhile before seeking veterinary attention is risky because during that time the tumor may invade deeply, making its complete surgical removal impossible. There is also an increased chance for metastasis as tumors enlarge.

Sooner or later, a malignancy will affect the tumor-bearing dog in such a way that the pet owner will observe an abnormality. The dog may show a non-specific alteration in its usual constitutional make-up (constitutional signs) such as loss of appetite, weight loss, and exercise intolerance.

Other signs may be recognized as dysfunction of a specific organ and include difficulty in eating, swallowing, urinating, or defecating, bleeding or discharge from any body orifice, bleeding into the skin, change in the character of the bark, persistent cough, an abnormal swelling that is persistent or progressive, a non-healing wound, foul oral odor, persistent vomiting or diarrhea, and black tarry stool.

The diagnosis of a malignancy is most often confirmed with a biopsy, the microscopic examination of a tissue sample by a veterinary pathologist. The tissue can be obtained in one of several ways, including a needle biopsy, an incisional biopsy, or an excisional biopsy. *In no case should a mass ever be removed without a biopsy being done.* Besides identifying the

tumor type, the pathologist can also supply information about the completeness of the excision by examining the specimen's edges. It is desirable to identify a border of normal tissue around the periphery of the tumor. Occasionally, a biopsy will not be diagnostic and a second (or third) biopsy may be necessary to confirm the diagnosis of cancer. This is because tumors frequently elicit inflammatory tissue reactions around them which may be biopsied instead of the actual tumor mass. With the naked eye, it is frequently not possible to differentiate this type of tissue from the tumor proper.

Canine tumors most frequently arise from the skin, mammary glands, lymph nodes, oral cavity, bones, and nasal cavity. Tumors are not confined to these locations, however, and can arise from any site in the body.

Skin tumors comprise the largest group of neoplasia in the dog. Most are benign, and it is not unusual for old dogs to have numerous skin lumps and bumps arising from skin glands and hair follicles. Malignancies of the skin include the mast cell tumor, squamous cell carcinoma, and melanoma. Brachycephalic dogs (boxers, bulldogs, Boston terriers, etc.) have the highest incidence of mast cell tumors.

Mammary tumors are also a heterogeneous group with nearly 50 percent being malignant. Surgery remains the treatment of choice, and spaying a bitch before her first heat almost always prevents the development of this form of cancer later in life. It is possible for a dog to have a benign tumor in one mammary gland and at the same time have a malignancy in another. All excised mammary tumors should be biopsied. The dachshund and the cocker spaniel have the highest incidence of mammary malignancy.

Malignant lymphoma is a systemic cancer frequently recognized by enlarged lymph nodes in the throat, over the shoulders, in the groin, and behind the knees. This illness can imitate many other diseases, but a biopsy will readily confirm the diagnosis. There is a higher incidence of lymphoma in the boxer, basset hound,

Scottish terrier, Airedale, St. Bernard, bullmastiff, bulldog, and golden retriever. Of all the forms of cancer treated by veterinarians with chemotherapy, lymphoma is the most responsive. Animals frequently survive for 1 to 1½ years when treated with anticancer drugs and immunomodulating agents.

Oral tumors are usually malignant. The most common types are the squamous cell carcinoma, fibrosarcoma, and melanoma. Some of the greatest treatment advances have been made against these tumors in the last decade with the advent of newer forms of surgical removal and facial reconstructive techniques. Many dogs have benefited from radiation of these tumors.

Osteosarcoma is the most common form of bone cancer. It usually develops in a bone in one of the legs but can arise within any bone of the body. Large and giant breeds of dogs such as the St. Bernard, great Dane, Irish setter, Doberman pinscher, German shepherd, and golden retriever develop this form of cancer most often.

Limb amputation has been the treatment of choice, but since this tumor has usually spread to the lungs by the time of diagnosis, dogs die of metastases. More recent treatments have involved chemotherapy and bone transplants to try to preserve the limb of the afflicted dog. Although still considered a fatal illness, many dogs are surviving to one year with these newer therapies. Previously, the average survival time has been 4½ months.

Nasal tumors are seen more often in long-nosed dogs such as the collie and Shetland sheepdog. These tumors are locally invasive and highly destructive to structures of the head. Facial deformity is possible if the tumor breaks through a facial bone. Dogs will usually present with a history of mucoid to bloody nasal discharge from one nostril, noisy respiration, and sneezing. Most dogs are not cured, but treatment consisting of surgery and radiation therapy has prolonged survival times for as long as two years.

The treatment of dogs with cancer continues to be a major challenge in veterinary medicine. The discipline of veterinary oncology is still a young one which is growing rapidly. Advances are being made with chemotherapy, radiation therapy and surgery, but some of the most innovative endeavors will lie in the area of immunotherapy. Veterinarians, with the help of the pet-owning population, will serve a vital role in investigating new cancer treatments for dogs that will hopefully have benefits for people as well.

The American Kennel Club has supported oncology research here at the School.

Seizures and More

Dr. Betsy Dayrell-Hart, lecturer in neurology, discussed seizures. "It is not difficult to provoke seizures in dogs," she said. "Dogs and people have seizures much more frequently than any other species. We don't know why." About 2 percent of the patients seen at VHUP are brought because of seizures.

"Seizures normally are not life-threatening," she said, "but they are frightening to the observer. We think that the dog is not in pain while having a seizure, and that it is completely unaware of the event. Afterwards, it often is dazed and disoriented." Dr. Dayrell-Hart said that many events may look like a seizure but in reality are not. Weakness due to muscle or nerve disease may appear to be a seizure. Metabolic disease, cardiovascular disease and internal bleeding, too, may cause seizure-like episodes.



Seizures have many causes and to determine their origin, the veterinarian must ask quite a few questions to obtain a detailed history. "We rely heavily on the owner's observations, what did the dog do, how long did the episode last, and what was the behavior afterwards."

A seizure is caused by abnormal activity in the cortex, the top part of the brain. During an occurrence, nerve cells in the cortex fire in an unorganized way and cause responses in the rest of the body. One may observe motor activity in the legs, autonomic activity such as dilated pupils or rapid heartbeat, salivation, urination, and defecation. The animal is unconscious and unaware of its surroundings or actions. Some seizures present a behavioral picture: the animal may run in circles, bite at the air, or lick the floor. Again, the dog is not aware of its actions.

"Seizures tend to occur in phases. Usually there is a 'warning phase'—the animal may be restless or seek reassurance," she said. "The actual seizure, or ictal phase, normally lasts only a short time, 30 seconds to a minute. The post ictal phase can vary in duration and symptoms. Some animals may be blind for a period ranging from hours to weeks, some may bark, others may want to eat or drink ravenously. In most cases, the post-ictal phase is short and the dog is back to normal in a relatively short time." The veterinarian has to determine whether the seizure is symptomatic, due to a disease, toxins or tumors, or whether it is idiopathic, where no cause can be found.

To make a diagnosis, a complete history is taken and a thorough physical exam is performed as well as various blood tests and urinalysis. The age of onset of seizure activity is important. Symptomatic seizures can occur at any age; idiopathic seizures due to epilepsy usually occur in animals six months to four years of age. Very young puppies and hunting dogs in the field can have seizures which are due to hypoglycemia. Brain disease, such as inflammation or viral infection, can cause seizures in animals of any age. In older dogs seizures are often caused by tumors.

If the tests show underlying disease, the animal can be treated and the seizures usually will stop. If no underlying disease is found, then the veterinarian must presume idiopathic epilepsy. "These dogs are healthy and perfectly normal between seizure episodes," she said. "It is suspected that epilepsy is inherited and that seizing dogs can produce offspring which may seizure also. We would like to have a test which could show us which animals will seizure. Some preliminary studies have been performed here by Drs. Steinberg and Farnbach to determine which dogs seizure easily, but quite a bit more work needs to be done before we can tell

which animals have a low seizure threshold and are suspect of developing epilepsy later."

Dogs with idiopathic epilepsy are treated with anticonvulsants. "There are plenty of these drugs on the market for people," she said, "but the number of drugs effective in dogs is limited because dogs eliminate drugs quickly from their systems. They do this four times as fast as people."

Phenobarbital is one drug which works quite well. It has a fairly long half-life (time it takes the body to eliminate half the dose) in the dog and it has been used for quite a number of years. However, the half-life of the drug varies from dog to dog, so each dose must be individually determined with the help of repeated blood tests. The half-life may change as the animal's system becomes accustomed to the medication, thus the dogs must be closely monitored. Phenobarbital is a barbiturate which depresses the function of the brain.

Other drugs, such as Benzodiazepenes, work on a brain area which suppresses function in other parts of the brain. To obtain the most beneficial effect for an animal, veterinarians may utilize more than one drug to prevent seizures, particularly if they occur in clusters. "Often seizures cannot be stopped completely," she said. "We hope to reduce their frequency and severity with these drugs. Once an animal is on them, they have to be given for life." In some cases current drugs do not work. Then the veterinarians here can use new drugs to try to help the animal. Acupuncture, too, has been used with some success to try to control seizures in a limited number of dogs.

Dr. Dayrell-Hart then discussed a number of other neurologic disorders. "Rabies is a disease we all have to be much concerned about," she said. "It is spreading and it is preventable in pets through vaccinations. Owners should have their dogs and cats inoculated. Remember, the only way to diagnose the disease is through a pathologic examination of brain tissue from a dead animal. If the animal has had regular vaccinations, then the question of rabies should not arise should abnormal behavior occur."

Dr. Dayrell-Hart then briefly spoke about spinal cord disease, disc collapse, and fibrocartilaginous emboli. These disorders are often diagnosed through a myelogram or a CT-scan. Many animals can be helped, though the recovery period may be slow. The CT-scan is also used in the diagnosis of brain tumors. Currently, about six brain surgeries and six radiation therapies are done at VHUP annually. "We have found that we can do a lot of good with these procedures and give the animals additional time to live a normal life," she said. "The data at this point are too small to project the odds for every animal presented."

During the question and answer period it was asked whether brain tumors or spinal cord disease are inherited. Dr. Dayrell-Hart replied that not enough data have been collected about the occurrence of brain tumors and that certain breeds appear to have a predisposition to developing spinal cord disease. She said that dogs on anticonvulsant medication should not be bred if the medication is given to prevent epileptic seizures; if the convulsions are due to other factors, the dog could be bred, though the effects of the drugs on the fetus are not known.

She mentioned that vaccinations are not related to seizures but that dogs with clinical distemper may develop seizures at a later date due to the damage done by the disease. She also explained that phenobarbital can affect the liver, and dogs on this drug need to have their liver function evaluated regularly. She explained that an EEG cannot be done on dogs as the animal would have to be anesthetized, which would distort the readings of the test. She also said that it is safe to



perform surgery on a dog which has had seizures as long as the veterinarian takes special precautions during the anesthesia.

She asked that owners be observant and make notes of what occurs while the animal is seizing; she also stated that if seizures last more than three minutes, the animal be brought to a veterinarian at once for treatment. During a seizure, the owner should be sure that the animal cannot be injured by falling furniture or by tumbling from a high place. "A convulsing dog does not swallow its tongue," she said. "Do not touch the mouth as the dog may bite you. It is completely unaware of its surroundings. It is best to leave it alone and then let it rest quietly once the seizure is over."

Epilepsy research in the department of neurology at the School has been supported by the American Kennel Club.

Allergic Skin Diseases in Dogs

The skin is the largest organ in the body, and more dogs are taken to the veterinarian for skin ailments than for any other medical problem. VHUP's dermatology clinic is one of the busiest places in the hospital. Dr. Kevin Shanley, assistant professor in dermatology, spoke about allergic skin diseases.

He stressed that an accurate and complete history of the onset and progression of an allergic skin disease in the patient is imperative in helping the veterinarian make the diagnosis and provide appropriate therapy. There are numerous questions applicable to most skin diseases that a veterinarian will ask. By knowing the answers to those questions, an owner will be better able to characterize a dog's skin disease and help the veterinarian treat the skin condition. Some of the questions asked are:

How old was the dog when the skin condition began?

What did the skin condition look like initially?

How has the skin condition progressed?

Is the skin disease intermittent or constant? Seasonal or non-seasonal?

Are other pets in the house affected?

Are people in the house affected?

What therapies (topical, oral, injectable) have been used?

What is the response to the therapies?

Is the skin condition a "rash that itches" or an "itch that rashes?"

In what environment does the dog spend time?

What is the dog's diet?

Does the dog have any other medical problems?

There are a number of specific allergic skin diseases. Flea allergy dermatitis (may also be referred to as flea bite dermatitis or flea allergy) is the most common allergic skin disease in dogs. It frequently presents as the sole cause of a dog's itchiness but can also be present with other allergic skin diseases and complicate the diagnosis and treatment. There is no breed predilection. The age of onset is variable, but is most common in dogs that are two to six years old. It rarely develops in dogs less than six months old. The pruritus (itch) is most severe from mid-summer through the fall (July through October). Since fleas are adaptable, they can live indoors year round and cause pruritus during all seasons of the year.

The pruritus and skin disease often worsen as the dog ages. Dogs frequently chew themselves in a "Christmas tree or Florida triangle" pattern, that is, starting at a

point in the middle of the back and spreading out towards the rear legs, rump, and tail base. Usually hair loss is present due to broken hairs, and numerous small "mosquito-bite" type sores are found. Fleas only spend 15-20 minutes a day on a dog. It is very difficult to find fleas on most dogs, particularly in long-haired or dark-coated breeds. For every flea found on a dog, there may be 10-100 fleas in the dog's environment (house and yard). Most (all?) dogs with itchiness due to flea bites are allergic to a component of the flea saliva. This allergic response varies tremendously among dogs. Some dogs can tolerate numerous fleas with minimal skin disease, whereas other dogs are exquisitely allergic and may develop severe skin disease from one or two flea bites every several days! The important points to remember are to treat long-term (months-years), to treat frequently (depending on products used), to treat all dogs in the household, and to *treat the environment*.

Atopic dermatitis is also called atopy, allergic inhalant dermatitis, and atopic disease. It is seen in all breeds. Terriers (especially cairns, wire-haired fox, west highland white, Scottish, and Boston), Dalmatians, retrievers (golden and Labrador), Lhasa Apso, bulldogs, miniature schnauzers, and pugs are more predisposed to develop the disease. Cocker spaniels, dachshunds, German short-haired pointers, and poodles have a decreased incidence of developing atopic dermatitis. Dogs are usually one to three years old when atopy starts. It is uncommon to develop in a dog younger than six months or older than seven years. Pruritus is the key feature and is usually seasonal initially but progresses to be year round in 75 percent of dogs.

The degree of itching typically worsens with age. The face, feet, and underside are most often affected. Asthma and hay fever signs are rare. Allergy skin testing is the best way to diagnose the specific allergens (pollens) that are causing the pruritus. Two new blood tests (RAST, ELISA) have become available commercially; however, their accuracy is unproven and they are still controversial tests. Approximately 50 percent of atopic dogs are also allergic to fleas. Therapy of atopic disease involves using a vaccine to hyposensitize the animal and thus reduce the itchiness caused by the allergies.

Food allergy as a cause of skin disease is much less common than flea allergy dermatitis and only approximately 1/10th as common as atopic dermatitis. There is no age, breed, or sex predilection associated with food allergy. Less than 10 percent of dogs with a food allergy will also have vomiting and/or diarrhea associated with the skin disease. The pruritus is non-seasonal and at times quite severe.

Food allergy usually is associated with one component of the diet and is not associated with a particular brand of dog food. Beef is the most common offending allergen. The distribution of pruritus and skin lesions is tremendously variable in food allergic dogs. It may mimic flea allergy or atopic dermatitis. Food allergy can also be generalized over the entire body or be localized to just the ears or around the eyes.

There are no blood or skin tests that can diagnose a food allergy. The best method is to feed a hypoallergenic diet for at least two to three weeks to see if the skin disease disappears. Simply changing brands of dog food is not sufficient. Lamb and rice may be used as the hypoallergenic diet for most dogs. After a diagnosis of food allergies has been made, the specific offending allergen must be identified (for example, beef, pork, chicken, wheat, soy, or preservatives).

Scabies is a disease caused by a microscopic mite (parasite) *Sarcoptes scabiei* which burrows through the superficial skin. It is similar to flea allergy in that there is an allergic reaction to the secretion and/or excretions



Christmas Tree Pattern

of the parasite. The scabies mite is contagious from dog to dog and can transiently affect people. It usually causes intense pruritus and usually affects the ear margins, elbows, hocks, and ventrum (underside).

There is no seasonality and any age, breed, or sex can be involved. The severe itching rapidly leads to hair loss and red, irritated skin. Diagnosis is by identifying mites on skin scrapings. However, the mites are usually very difficult to find and, therefore, any dogs suspected of having scabies should be treated. Various treatments are available and usually provide dramatic improvement within two to four weeks.

Allergic skin diseases are very common and tremendously variable in their presentation. They also predispose dogs to developing bacterial skin infections and seborrhea, which in turn will increase the itchiness and help create a vicious cycle. By being a keen observer, the owner can help the veterinarian diagnose and treat the dog's skin disease.

During the question and answer period Dr. Shanley stressed the importance of reading the labels on dips, powders, and shampoos and to follow the directions carefully. He also indicated that it is best to obtain anti-flea preparations from the veterinarian as he is familiar with the animal's state of health. He also cautioned against using any preparation containing insecticides on old, sick or very young animals.

Canine Esophageal Diseases

"The incidence of esophageal diseases in dogs is relatively low when compared to other gastrointestinal disorders," said Dr. Robert Washabau, lecturer in medicine. "We see about one such case per 2,500 admissions." However, esophageal diseases are very serious and an accurate early diagnosis and prompt medical and surgical treatment are imperative. Reflux esophagitis, for example, is a readily treatable disease but, if unrecognized or untreated, may progress to esophageal ulceration or stricture formation.

The esophagus, a hollow muscular tube, transports food from the mouth to the stomach and is not involved in digestion or secretion. A major portion of the esophagus is located in the thoracic cavity and is difficult to examine and impossible to palpate. The veterinarian, therefore, must rely on radiographic or endoscopic examination to make a diagnosis of an esophageal disorder.



One of the most important factors in arriving at a diagnosis is a detailed history provided by the owner. The veterinarian and pet owner must initially differentiate between a vomiting disorder and a regurgitation disorder. Regurgitation is seen with esophageal disorders and is the passive evacuation of ingested food without abdominal contractions. Vomiting typifies a gastric or intestinal disorder and is an active process with abdominal contractions; the vomitus appears partially or completely digested. Regurgitation is the classic sign of an esophageal disorder, but the animal may present with other signs. Oropharyngeal and esophageal disorders interrupt the swallowing process resulting in dysphagia (difficulty in swallowing). Multiple swallowing attempts may be observed as the animal attempts to pass a single bolus of food. Hyper-salivation is sometimes seen as a sign of severe esophagitis or foreign body ingestion. Painful swallowing (odynophagia) is also a sign of esophagitis and may be manifested by crying/yelping during a swallowing episode. A change in feeding behavior is also sometimes seen with esophageal disorders. Animals with a painful esophagitis may avoid food completely while animals with megaesophagus may have a ravenous appetite. The following table outlines some of the differences between oropharyngeal, esophageal, and gastric disorders. (See table I.)

Physical examination is an important part of the diagnostic work-up as some esophageal disorders, such as megaesophagus, are associated with a systemic disease. An evaluation of the oropharynx and the lower gastrointestinal tract is also included. Survey radiographs of the neck and chest are routinely obtained, and a barium contrast study will provide additional information on esophageal diameter, motility, and presence of diverticula or gastroesophageal reflux. A flexible fiberoptic endoscope is sometimes used in the diagnostic process. Endoscopy permits direct visualization of the esophagus and is also used to retrieve foreign bodies and perform biopsies.

One of the most common esophageal disorders seen by veterinarians is the ingested foreign body, frequently bones or cartilage, but sometimes fishhooks, and in one patient here at VHUP a small steak knife. (See Fig. 1) These animals usually have difficulty swallowing, salivate excessively, and regurgitate frequently. Foreign bodies are a medical emergency and the animal should have immediate care. Complications of untreated esophageal foreign body are esophageal perforation, mediastinitis/pleuritis, and esophageal stricture.

Esophagitis is another common esophageal disorder seen in the dog and cat. It can be the result of the ingestion of caustic substances, foreign bodies, or reflux of gastric juice into the esophagus. Most animals will respond to brief periods of fasting and administration of antacids.

Vascular ring anomalies, such as persistent right aortic arch, cause a proximal esophageal obstruction in young animals. (See Fig. 2) Surgery is the recommended treatment for this disorder, and most animals have a good prognosis if treated early. As with other esophageal disorders, the complications and prognosis are worse if diagnosis and treatment are delayed.

Megaesophagus, an enlarged esophagus, may occur as a congenital or an acquired defect. The congenital defect is seen in German shepherds, great Danes, Irish setters, miniature schnauzers, and wire-haired fox terriers. Many of these animals improve spontaneously with time, but others fail to thrive. The acquired form of the disease may occur in any breed and usually has



fig. 1

Foreign body (steak knife) in a dog.



fig. 2

Persistent right aortic arch.

an adult onset. The vast majority of these cases are of unknown etiology. Some of the important known causes are myasthenia gravis, hypothyroidism, polymyositis, and polyneuritis.

Treatment of megaesophagus is difficult and controversial. Current treatment recommendations include identifying and treating any underlying disease, elevated feedings to permit gravity-dependent drainage of the esophagus, motility modifiers to hasten the passage of food, antacids to treat secondary reflux esophagitis, and systemic antibiotics if secondary pulmonary infection is present. The disorder cannot be corrected surgically. Dr. Washabau indicated that many patients with the disorder do not improve, and many pet owners will elect euthanasia.

Esophageal strictures usually result from untreated esophagitis or esophageal neoplasia. The stricture acts as an obstruction to the passage of food, and the animals regurgitate frequently. Strictures are easily identified by barium esophagram. Cancer of the esophagus is rare, and the prognosis for such tumors is poor. Other strictures may be treated by dilation procedures (bougienage, balloon).

Hiatal hernia, a common entity in humans, has also been identified in the dog. Congenital and acquired forms have been described. They are both characterized by the same signs as esophagitis. Diagnosis of this disorder is very difficult and often requires several radiographic studies. Many animals will not show a response to conservative medical treatment and, therefore, require surgery.

During the question and answer period, Dr. Washabau stated that force-feeding may be dangerous, particularly for animals with esophageal motility problems. He also mentioned that liquid diets can be of benefit to animals with megaesophagus and that animals with other esophageal disorders benefit from frequent small meals.

Dr. Washabau is also a Ph.D. candidate in the department of comparative medical studies; he is supported in part by the American Kennel Club.

Table I.

	Pharynx and Upper Esophagus	Esophagus	Stomach
Time of food ejection	Immediate	Delayed, possibly hours	Delayed, possibly for hours
Character of food ejected	Undigested	Undigested	Can be partially digested, bile-stained, and with acid pH
Number of swallowing attempts	Multiple	Usually single	Single
Visible evidence of bolus passing in cervical esophagus	Not present	Present, maybe prolonged	Present
Ability to drink	Poor	Normal	Normal
Pain on swallowing	Possible	Frequent	Absent
Associated signs frequently seen	Dyspnea, cough	Dyspnea, cough	Retching
Aggravating and alleviating factors frequently seen	Food consistency	Exercise, food consistency	None

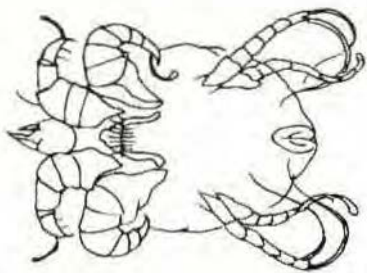


Large Animal Dermatology

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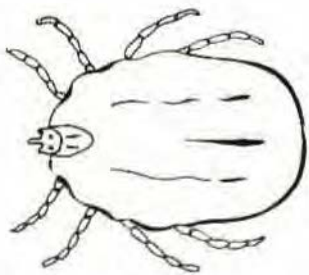
However, despite all good care, it is hard for horse and livestock owners to totally prevent their animals' exposure to insects, parasites, and bacteria. "Parasitic dermatoses are very common in large animals," said Dr. Shanley. "Flies, chiggers, and gnats are all around the stables and pastures, as are various species of mites. Each of these parasites causes specific problems in the different species of large animals."

Mange in a horse is a far less serious problem than a mange outbreak in a herd of swine. While the horse will show signs of the disease at the mane, ears, and the tail and will try to alleviate the itch by rubbing these areas, mange in pigs causes greater damage. The animals will rub themselves raw, doing considerable damage to their hides, and they will lose weight, cutting down on the farmer's meat yield. Mange in pigs is caused by the sarcoptic mite, which burrows into the skin. The disease is highly contagious and can spread quickly through a herd. Treatment consists of dipping or spraying of the animals and treating the environment.



The mite responsible for mange in the horse is the psoroptic mite. It also affects cattle, goats and sheep, though the disease in sheep has been eradicated here in the United States. These mites are quite specie-specific and cannot be spread from cattle to horses, for example. In cattle, the intense itching caused by the organism can lead to extensive self trauma and even death. Another mite, the chorioptes mite, affects horses, cattle, and sheep and causes lesions on the legs. In horses, it is often seen on the lower legs of draft animals, on the feathered part above the hoof.

Demodectic mange, so feared by dog owners, is uncommon in large animals. As each of the mites responds to different insecticides, a proper diagnosis is necessary before treatment can be started. The veterinarian takes skin scrapings and examines these for the mites.



Flies and ticks are also an important cause of skin lesions. *Culicoides*, a tiny gnat, also called "no-see-ums," will attack horses and cause an intense itch. Horses can develop an allergy to these pests, similar to a flea allergy in dogs, and they may have to be treated to prevent extensive damage to their skin from excessive rubbing on fences and walls.

The stable fly and other large flies cause painful bites which can become infected. Insect repellent and devices which attract and kill flies greatly cut down on such injuries. Grub is another disorder caused by flies. It



Culicoides hypersensitivity in a horse.

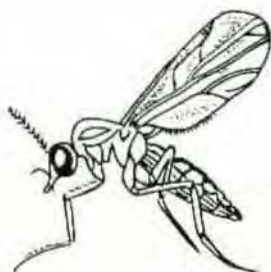
affects cattle and horses, though economic losses due to damage to meat and hides are greater in cattle. The female lays its eggs on the hairs of the lower leg. The eggs hatch and the larvae penetrate the skin and migrate through the body to tissues near the spinal cord. Here they mature and eventually emerge to pupate and become flies. They cause bumps with a breathing hole. If they are removed, care must be taken that the entire grub is removed, otherwise anaphylactic reaction may result.

Lice infestations are seen primarily in the winter months. They cause itching, and the animals can inflict self-trauma from rubbing. In calves, hairballs may result from excessive licking. In older cattle, milk production may fall. In pigs, lice infestation can result in lower weight gain and extensive hide damage. The disease can have a severe economic impact.

Ticks are ever present in pastures and woods and cause bite wounds which can become infected. Severe tick infestation can cause anemia. Ticks not only debilitate an animal, but they also are carriers of other diseases such as Lyme disease and a number of bacterial, viral, and protozoal infections.

"Lesions caused by insects often get infected and cause unsightly hairloss," said Dr. Shanley. "To determine the exact cause of such symptoms, the veterinarian takes a small skin plug and examines it for parasites and other organisms prior to treatment."

Weather plays an important role in the well-being of the skin. During a prolonged rainy season, horses can develop rain scald, a dermatophilosis which manifests itself with weepy and crusty sores. It affects the head, back, and lower limbs. Once the animals are moved to dry quarters, the disease usually disappears. Prolonged wet weather can also affect sheep and lead to dermatophilosis (lumpy wool disease) caused by bacteria. The crusting lowers the value of the fleece as it discolors it. Animals need to be treated to prevent the disease from spreading in the flock. Fleece rot is another disease affecting sheep. It, too, is caused by prolonged wetting of the skin. Fleece rot resembles dermatophilosis, but there is no scab development or skin ulceration. Also, the susceptibility of an animal to this disease depends on the nature of its fleece. It was found that animals with a fleece consisting of dense regular fibers are more resistant than animals which have irregular fiber size. Also, animals whose fleece



has a high wax content were not as susceptible.

Ringworm is another common skin disorder of large animals. "Any bald spot in a large animal should be checked for ringworm," said Dr. Shanley. "This fungus is widespread." It can be spread from animal to animal and also indirectly through grooming equipment, riding tack, and clothing. The fungal infection can be on the skin, but it can also affect the hair or the hooves. To diagnose which of the many ringworm species is responsible a culture has to be taken. Ringworm is very common in horses. It also occurs in swine, though here it is most often not treated as it does not seriously affect the animal.

Ringworm infection is common in confined cattle, and calves under the age of seven months are most susceptible. The lesions are generally hairless and not inflamed; they have a grey appearance. While they do not appear to bother the animal, these lesions can cause considerable damage to the hide, evident only after tanning, creating an economic loss.



Cow with ringworm infection.

Skin disorders caused by improper nutrition are another important disease category. Pigs are most susceptible to such diseases because of their rapid growth rate and their confined environment. Cattle fed improper rations also can develop skin disorders.

"The skin is a good barometer of the animal's general health," said Dr. Shanley. "Often, susceptibility to chronic infections indicates that more than a skin disorder is involved." Horse and livestock owners should check their animals' skin and seek a diagnosis when lesions are observed. "It is easier to treat it when the disease process is just beginning; it is more economical, too." The new dermatology clinic for large animals at New Bolton Center campus will provide a valuable service to the horse and livestock owners in the area.

Pseudorabies Studies

Pseudorabies is a severe economic problem in parts of Pennsylvania. The disease, caused by a herpesvirus, primarily affects swine, and it causes death in young animals, abortions, and increased numbers of stillbirths. Pseudorabies is transmissible from swine to other livestock, such as cattle and sheep. For these animals, the effects are devastating as they succumb to the virus after suffering from intense itching and encephalitis. Pseudorabies can also infect cats, dogs and wildlife, causing death. Animals with pseudorabies, except pigs, often exhibit behavior resembling that of rabid animals such as self mutilation or stupor, hence the name of the disease.

"In pigs the infection is usually subclinical, and only when litter deaths, stillbirths, and abortions occur does the farmer suspect something amiss," said Dr. Daniel Cohen, an epidemiologist at the University of Pennsylvania School of Veterinary Medicine. "Pseudorabies is a reportable disease, and afflicted swine herds are quarantined and often slaughtered to prevent the infection from spreading to other farms. It causes an immense economic hardship to the farmer."

Despite quarantine, depopulation and other protective measures, many farms in certain areas of the state become reinfected shortly after new stock is introduced. "We decided to investigate the reasons for such reinfections," Dr. Cohen said. "A study was designed to determine whether wildlife in the area and other animals on the farm might not harbor the virus, acting as a reservoir from which the virus could be reintroduced into the swine population. The findings so far have been quite interesting."

The researchers discovered that about 17 percent of the cats tested in the affected areas were serologically positive, indicating that they had contact with the virus and survived it. This contradicts previous findings. It had been thought that all animals, except pigs, could not



survive a pseudorabies infection. The researchers found that 12 percent of raccoons tested also showed positive antibodies. Squirrels, dogs, mice, and rats tested were all negative.

At this point it is not clear whether cats or raccoons shed the virus and thus infect pigs or other livestock. So far the study has raised many more questions than it has answered. "We are looking for carriers," said Dr. Cohen. "We don't know how the virus gets into the wildlife population. Do the animals come in contact with it through manure spread on fields? Do they get it through direct contact with infected swine or by ingesting infected rodents? We don't know."

This year a genetically engineered vaccine will be available. "Antibodies resulting from this vaccine are clearly distinguishable from those developing as a result of the disease," said Dr. Cohen. "We will now test wildlife near vaccinated swine herds and look for antibodies. If a crossover of the vaccine virus occurs we will be able to detect it." Another project is to isolate the virus from wildlife. "We have a lot of work ahead of us, but if we can identify a reservoir in affected areas in wildlife or cats, precautions can be taken to minimize contact between livestock and these animals."

The study is being supported by a grant from the Pennsylvania Department of Agriculture.

New Appointments

Dean Edwin J. Andrews has announced the appointment of **Bruce A. Rappoport** as assistant dean for administration, New Bolton Center. Mr. Rappoport, who joined the School last year as director of the George D. Widener Hospital for Large Animals, has overall responsibility for New Bolton Center, the farm there, and the Widener Hospital.

Dr. Charles D. Newton, professor of orthopedic surgery and chief, Section of Surgery, has been appointed assistant dean for student affairs, effective July 1, 1988. Dr. Newton will be responsible for recruitment, student aid, and student affairs. Additionally, he will maintain his current role as director of continuing education.

Ms. Ashra Markowitz has been appointed associate director of development. She is overseeing the Alumni and Friends programs and is responsible for implementing a broad-based fundraising program at the Philadelphia campus. In addition, Ms. Markowitz will continue to supervise the Continuing Education Program.

Ms. Catherine C. Larmore has been appointed associate director of development for New Bolton Center. She is responsible for developing and implementing a comprehensive program of fundraising activities for New Bolton Center.

Mrs. Helma N. Weeks has been appointed director of communications. Mrs. Weeks handles media relations at VHUP and New Bolton and will oversee the School's publications.



Henry Bower Dies

Henry Bower died at the age of 90 in January. A graduate of the University (W'18), Mr. Bower took a lifelong keen interest in Penn. In 1981, he endowed the Henry and Corinne R. Bower Chair in Medicine at the School of Veterinary Medicine. Mr. Bower also gave Penn Bower Field, a baseball diamond, and endowed the Henry Bower Professorship in Entrepreneurial Studies.

Mr. and Mrs. Bower always had dogs and owned wirehaired fox terriers, Scottish terriers, and great Danes. For a number of years Mrs. Bower bred Scotties. Their first contact with the Veterinary School was in the 1940s when Mrs. Bower brought a dog to be treated at the hospital.

After graduation in 1918, Mr. Bower joined the new air arm of the Marine Corps and became a lieutenant. In 1919, he began working for the Henry Bower Chemical Manufacturing Co. at 29th Street and Grays Ferry Avenue, a firm founded by his grandfather in 1855. He started in the sales department and worked his way up to become president in 1939, a position he held until 1967 when the company was sold.

Mr. Bower is survived by three nieces.

Second Century Fund Tops \$35,000,000

The Second Century Fund continues to grow! Through the generosity of our many friends and supporters, the total amount accumulated by March 1, 1988, reached \$35,073,000. Over the past four months, a number of important commitments were made that support educational and research activities, add to the School's endowment, and further a set of capital projects.

Endowment is the most critical area to provide for the School's future. Several recent contributions will support new scholarship funds and a book program for outstanding, but needy students. We gratefully acknowledge the generosity of Mr. Eberhardt LeSchin and Mr. Roy A. Coult for their support of student aid. Mr. and Mrs. Clinton Galbraith made an additional gift to the Dr. Charles W. Raker Professorship in Equine Surgery. Because of the vision and generosity of these and many other individuals, Penn continues its nationwide leadership among veterinary schools in the number of endowed professorships.

In addition to these designated gifts for endowment, the School's administration placed several unrestricted contributions into endowment funds. The estate of Marie A. Moore provided a bequest to establish the Marie A. Moore Chair in Humane Ethics and Animal Welfare. An additional contribution from her estate was directed to the C. Mahlon Kline Orthopedic and Rehabilitation Center to support the operation of the facility.

A recent donation from Mrs. Philip Hofmann was set aside as seed money to create an endowment for the Georgia and Philip Hofmann Research Center for Reproduction.

The School's list of capital projects continues to attract strong financial backing from donors. New gifts and pledges were received for the interior outfitting and equipment needs of the Connelly Intensive Care Unit and Graham French Neonatal Section. Mrs. Elizabeth R. Moran, Mrs. A. C. Randolph, the American Horse Breeders Association, the estates of Mr. Sydney S. Captain and Dr. Harry Frank, and an anonymous donor all contributed generously to the project.

American Cyanamid Company made a major donation to the construction of the Allam Dairy Facility. Mr. Keith Eckel and Mr. Richard W. Newpher, President and Administrative Secretary, respectively, of the Pennsylvania Farmers' Association, supported additional capital projects at New Bolton Center.

The Mabel Pew Myrin Trust awarded a two-part grant, totalling \$640,000, for repairs and operation of the Alarik Myrin Memorial Research Building at the New Bolton Center campus.

A variety of program support was received over the past four months. The most notable of these was a \$1,750,000 grant from the Lucille P. Markey Charitable Trust. This grant is part of a \$3.8 million award to be shared jointly by the Veterinary School's Dr. Donald F. Patterson, Charlotte Newton Sheppard Professor of Medicine, and Dr. Mark I. Greene, Professor of Medicine of the University's Medical School. This project is aimed at correcting the gene functions that have been lost in the cells of animals as a result of genetic diseases (see accompanying article elsewhere in this issue).

The Southeastern Poultry and Egg Association is supporting Dr. Robert J. Eckroade's research in the pathogenesis of *Salmonella enteritidis* infection in egg-laying chickens. Universal High Technology Corpora-

tion awarded a grant of \$75,000 to Dr. James Buchanan for research in cardiovascular grafts.

In addition to these grants, we wish to acknowledge the generous assistance of the following individuals: three anonymous donors; Ms. Helen W. Brann; Mrs. R. V. Clark; Mr. and Mrs. Henry R. C. Elser; Mrs. Muriel Freeman; Mr. Edgar H. Griffiths; Mr. M. Roy Jackson; Dr. Elinor B. Jenny; Mr. T. Lincoln Kerney; J. D. McCullough, V.M.D.; Mr. John W. Meriweather; Mr. and Mrs. Hardie Scott; Ms. Mary M. Silkworth; Ms. Abby R. Simpson; Mr. James A. Smith; Mrs. Mary L. Smith; and Mr. Oakleigh B. Thorne.

These individuals are joined by: the American Equine Foundation; the American Livestock Company; the Bucks County Kennel Club; the Devon Dog Show Association; DVM, Inc.; the Mrs. Aldina Scaife Gates Memorial Grant; the Bruce J. Heim Foundation; Hills Pet Products, Inc.; Mahoning-Shenango Kennel Club, Inc.; The Massey Trust; the New Jersey Veterinary Education Foundation; the Pellegrini Scholarship Fund; the Pennsylvania Horse Breeders Association; and the Pennsylvania Veterinary Foundation.

We extend our sincere appreciation to all of the individuals, corporations, foundations, and associations for their generous commitment to the Second Century Fund. Over the past five years, the School has strengthened its teaching and research programs, while adding new service facilities. These accomplishments are due in large measure to the campaign's success. And the campaign's success rests upon people concerned about and committed to animals, veterinary medicine, and their place in contemporary society. We thank you for your help.



Master of Ceremonies Roger Caras.



Dr. and Mrs. Donald F. Patterson present a quilt depicting the Marshak years. The quilt was crafted by Mrs. Patterson.



Board of Overseers Chairman Charles S. Wolf reminisces about the Marshak years.



Dr. Robert R. Marshak.

Marshak Roast

A dinner and "roast" in honor of former Dean Robert R. Marshak was held on the eve of the Penn Annual Conference. The friends, alumni, and faculty members numbered 250 at this fun-filled evening. Speeches were made, toasts were proposed, and gifts given.

Animal Crackers

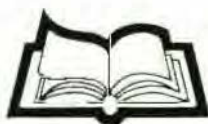
Vaccination Schedules

Vaccination schedules may vary in different situations. The program used in kennels may differ from that recommended for household pets. Follow the advice of your veterinarian.

One method would be to give three doses of combined vaccine (Canine Distemper, Infectious Canine Hepatitis, Parainfluenza, Canine Leptospirosis, and Parvovirus) at eight, eleven, and fourteen weeks, with an additional Parvovirus at twenty weeks. Rabies vaccine could also be given at fourteen weeks. There is no reason for not giving Parvovirus in combination with other vaccines. "Boosters" should be given yearly, except for Rabies which is given every two or three years. *This is only a suggested program.* In some cases, it might be advisable to start the series at an earlier age.

The most common cause of vaccination failure is the presence of maternal antibodies received in the colostrum for the first 24 to 72 hours of life. This can interfere with successful vaccination up to 12-14 weeks for Canine Distemper and 18 weeks for Parvovirus.

Puppies should be kept isolated until the vaccination series is complete. There may be a period of several days or weeks between exposure to an infectious disease and development of clinical signs. If vaccine is given during this incubation period, it may not prevent disease.



Book Review

Dogs Through History, by Maxwell Riddle (Denlinger's Publishers Ltd., Box 76, Fairfax, VA 22030), \$19.95.

Maxwell Riddle is an award winning writer on dogs. He is one of the 22 judges approved by the American Kennel Club for all breeds and has judged in many other countries. This book is not an exhaustive text and makes excellent reading. The author's foreword states that it is designed to show that highly intelligent people and their dogs wandered the world long before the beginning of recorded history.

The illustrations include canine paintings, sculpture, and drawings as well as photographs of archaeological findings. There is a brick (2100 B.C.) with the footprint of a dog that walked across it while it was drying (from the University of Pennsylvania Museum). Rock engravings from Scandinavia. Egyptian tombs, and a mosaic from Pompeii show dogs. A painting by Jan Van Eyck (ca. 1422) shows a small dog of Cairn Terrier type.

There are chapters on Stone Age Dogs, the Egyptians, Greeks, Africa, the Romans, the Celts, Middle Ages of Europe, the Arctic, Tibet, China, Japan, India, Afghanistan, Arabia, North and South America, and Australia.

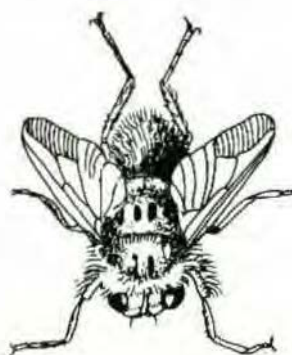
The author believes that the domestic dog was born in central Asia, and that dog and wolf developed from an unknown Pleistocene canid that lived some sixty thousand years ago. He states that modern wolf families do not differ from extinct species to a significant degree, but the dog shows astonishing divergencies—more than four hundred dog breeds are estimated to exist.

Dog fanciers will find much interesting material on the relationship of dogs and humans as well as descriptions of the types and uses of dogs in many civilizations and countries. This is a book to enjoy and talk about.

Warm Weather Notes

Warm weather brings an increased number of Parvovirus cases. Flies may carry the virus. Remove uneaten food promptly or it may become contaminated and a source of infection.

Consult your veterinarian about heartworm. This can be a problem wherever there are mosquitoes. Preventive medication may be given daily or monthly. Always have a blood test first to determine if infection is present.



Always read the labels carefully when using insecticides. Use these products at recommended intervals only and follow directions. Some products are not safe for cats.

"Hot Spots" may appear overnight as reddened, moist areas on the skin. If not recognized and treated promptly, a serious skin problem may result. Ask your veterinarian to recommend a preparation to have available at the first sign of trouble.

Heat stroke requires immediate treatment. Hosing down with cold water, ice packs, the prompt veterinary attention will help save lives. Don't keep animals in closed cars—they quickly become death traps in hot weather. Always be sure there is adequate ventilation.



Allergies

Allergies are quite common in dogs. They usually develop at 6 to 24 months of age and are likely to persist for life. Itchiness of skin, ears, and feet are usual signs—sneezing and runny noses usually do not occur in dogs. Certain breeds seem to be prone to develop allergies and the tendency may be inherited. Diagnosis requires a detailed history, and skin testing may be done for confirmation. Common inhalant allergens are pollen, mold spores, house dust, and dander. Some foods and drugs may cause reactions. In some cases, contact allergy occurs.

There are several types of drugs available for treatment. Antihistamines are helpful in some cases. Corticosteroids may provide quick relief but side effects limit their use. Hyposensitization involves giving small doses of the offending allergens. A treatment schedule must be worked out for each individual. If the dog goes untreated, self-trauma by scratching, rubbing, and chewing may lead to severe skin damage and infection.

How Old Is Your Dog?

Suggested guidelines for comparing the age of humans and dogs have been developed based on sexual maturity, tooth growth, etc. It has been said that "one dog year equals seven people years," but the chart shows that this is not true.

Age of dog	Human equivalent
3 mos.	5 yrs.
6 mos.	10 yrs.
12 mos.	15 yrs.
2 yrs.	24 yrs.
4 yrs.	32 yrs.
6 yrs.	40 yrs.
8 yrs.	48 yrs.
10 yrs.	56 yrs.
14 yrs.	72 yrs.
18 yrs.	91 yrs.
21 yrs.	106 yrs.

Large breeds have a shorter life span than smaller breeds. Cats age at about the same rate as dogs.

"Top Ten" AKC Breeds

The ten most popular breeds for 1987 are the same as for 1986—cocker spaniels, poodles, Labrador retrievers, golden retrievers, German shepherd dogs, chow chows, beagles, miniature schnauzers, dachshunds, and Shetland sheepdogs. A record 1,187,400 individual dogs were registered by AKC in 1987, a record high. The Finnish spitz became the 130th breed recognized by AKC, and 811 were registered in 1987.

There were 105,236 cocker spaniels registered in 1987, but at the other end of the list there are eleven breeds with less than 100 individuals registered—wirehaired pointing griffons, Irish water spaniels, curly-coated retrievers, Sealyham terriers, field spaniels, Ibiza hounds, Sussex spaniels, English foxhounds, otter hounds, American foxhounds, and harriers.

When choosing a breed, don't rely entirely on popularity. Look at adults as well as puppies. Investigate temperament and be prepared to take the time needed for proper training. Consider the amount of grooming required. Make a decision on the basis of which breed will fit into your lifestyle. Understand the breed you choose and be a responsible dog owner.

Pet Survey to Determine Threat of Rabies in Philadelphia

In order to determine the potential threat of rabies to pets and people in Philadelphia, the University of Pennsylvania's School of Veterinary Medicine has launched a study to assess the total pet population of the city. The study, funded by a \$35,000 grant from the Philadelphia Department of Public Health and the Geraldine R. Dodge Foundation, is believed to be the first comprehensive survey of a major city's pet population.

The number of dogs, cats, birds, lizards, snakes, turtles, and ferrets owned by Philadelphians should be known when the survey is completed in May. Dr. Lawrence Glickman, chief of the epidemiology section of Penn's School of Veterinary Medicine, Dr. Alan Beck, director of the School's Center for the Interaction of Animals and Society, and the Center's staff have designed a questionnaire which uses telephone sampling techniques to obtain population estimates. Extrapolating from the number of owned pets, it will be possible to estimate the pet population of the city (owned and unowned), according to Beck and Glickman.

The purpose of the study is to determine the danger that rabies would pose to the city, if it were to spread among the city's pet population. "The study is particularly important because rabies is rising in the United States and in this region. The Department of Public Health is funding the study in recognition of the increasing threat of rabies in Philadelphia and has



developed regulations that require all dogs and cats to be vaccinated," according to Harriet Williams of the Department of Public Health.

There were over 300 cases of rabies in Pennsylvania in 1987, and over 100 cases have been reported in Pennsylvania so far this year, according to the State Department of Agriculture's Bureau of Animal Industry. Fewer than four percent of cats and 20 percent of dogs in this country have been vaccinated against rabies. In many cases, pets received an initial vaccination but have not received the necessary booster shots to maintain their immunity to rabies.

Puppies and kittens should be vaccinated at three or four months of age, and again when they are a year old. Dogs require booster shots once a year or every three

years, depending on the type of vaccine used. Cats should have boosters every year. Because the degree of protection afforded by either vaccine declines over time, some pets may need more frequent vaccination. "Dogs that stay indoors and are not exposed to wildlife are adequately protected with vaccinations every three years if a triannual vaccine is used," said Glickman. "Animals that run free, and hunting dogs used in the field, however, should be vaccinated every year to provide maximum protection against the disease, regardless of the vaccine used." A pet is never too old to need rabies shots, he added.

Cats have surpassed dogs as the pet species most affected by rabies. In 1985, cats surpassed dogs as the most popular house pets in the United States—there were about 59 million house cats and 49 million dogs in the United States last year, according to a recent survey by the Pet Food Institute of Washington, D.C.—yet only 15 states require rabies vaccinations for cats, compared to 47 states that require them for dogs, said Glickman. The greatest risk to humans comes from cats because many owners allow them to wander, mistakenly believing that it is cruel to keep them indoors at all times, Glickman said. Last year, over 330 cats and dogs were stricken with rabies. "Of great concern is the fact that there were 1,311 rabid raccoons in the United States last year, mostly in Pennsylvania and Maryland," Beck said. "Raccoon rabies has been identified recently in nearby Chester County, and it is important to understand the city's pet population to develop a rabies-control program if necessary."

—Margaret Barry



Pennsylvania Farm Show

The largest farm show in the country is held the second week in January in Harrisburg. The huge Farm Show Building is filled with exhibits of machinery, livestock, fruits and vegetables, and everything else one would see at an agricultural fair, only more. Penn's Vet School has been part of this busy week for many years with a booth. This year the School's theme was "Research, Teaching, Service," and photos from these areas were displayed in the exhibit. In addition we prepared a special Farm Show Bellwether and gave out bags and magnets. Twenty-two faculty and staff members from New Bolton Center campus volunteered their time and staffed the booth for the six days.

Scavma Fund Raisers

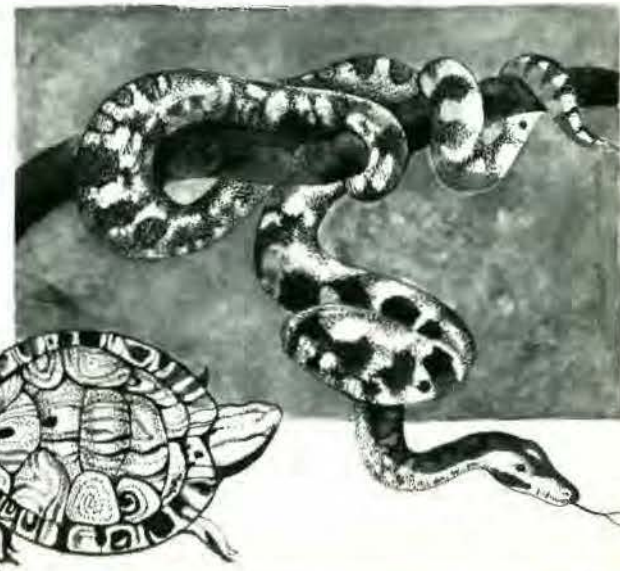
Fridays around noon, the student lounge in the Rosenthal Building is a hub of activity. Students, faculty, and staff wait in line to buy a hoagie fixed by future veterinarians. These culinary delights are one of SCAVMA's many fundraisers for student activities here at the School. Students sell T-shirts, not only on campus but also at the Penn Annual Conference and at the K.C. of Philadelphia Dog Show. The biggest fund raiser of them all is the raffle held during the Penn Annual Conference. This year \$2,500 were raised through the sale of tickets and generous donations by participants in the Conference. Prizes consisted of cash, pet food, gift certificates, books, hair cuts, dinner for two, and other interesting items.

And what is done with the money? It is used to pay the expenses of a large student delegation to attend the SAVMA Symposium, held annually at a veterinary school. This year 35 students went to the University of California at Davis to participate in the event. The students pay for their own accommodations, while SCAVMA funds raised throughout the year cover the air fare.

The students of the University of Pennsylvania School of Veterinary Medicine wish to thank the following individuals and companies for the gifts contributed to the Student Chapter of the American Veterinary Medical Association Raffle held at the 1988 Penn Annual Conference: The UpJohn Co.; Hills Pet Products, Inc.; Pitman Moore, Inc.; SCAVMA; A.J. Buck and Son, Inc.; ALPO Petfoods, Inc.; Urban Outfitters; Smokey Joe's; Tradewinds; Beecham Laboratories; Daniels Pharmaceuticals, Inc.; Eden Restaurant; Steve's Ice Cream; Marty's; Nautilus; Radio Shack; Salad Alley Restaurant; THF Publications, Inc.; Omnivet; Lea and Febiger; Friendly Flowers; Michael's Custom Cuts; Jos. Anthony Hairstyles.

Phi Zeta News

The Reptile House of the Philadelphia Zoo was the location of the Phi Zeta Induction Dinner on March 17. The 27 new members and their families and friends listened to an entertaining and informative talk by Dr. Peter Dodson about dinosaurs. Another part of the festivities was the announcement of the Phi Zeta competition winners. Jaime F. Modiano won the V.M.D.-Ph.D. category with his paper entitled *Requirement for extracellular calcium or magnesium in mitogen-induced activation of human peripheral blood lymphocytes*. In the V.M.D. category, two students tied for first place. Diane J. Deresiensky won with her paper entitled *Yohimbine reversal of ketamine-xylazine immobilization of raccoons (Procyon lotor)*. Thomas M. Niedermeyer was the other winner with his paper *Selectoandrogen insensitivity of hepatic drug metabolizing enzymes in senescent mice*.



Rosettes & Ribbons

The following members of the Class of 1988 have matched internships: **Ellen Behrend**, small animal medicine, Michigan State University; **Patricia Blakeslee**, large animal medicine, University of Pennsylvania; **George Boggan**, avian medicine, North Carolina State University; **Maribeth Bosshaly**, small animal medicine, The Animal Medical Center; **Chrysann Collatos**, large animal medicine, University of Georgia; **John Dascanio**, ambulatory clinic/large animal medicine, Cornell University; **Kirsten Haight**, small animal medicine, Rowley Memorial Animal Hospital; **Judy Lombardi**, small animal medicine and surgery, Oradell Animal Hospital, Inc.; **Deanna Purvis**, small animal medicine and surgery, University of Pennsylvania; **Richard Rockar**, small animal medicine and surgery, The Animal Medical Center.

Dr. Richard C. Post (S4) has been elected 54th Illustrious Potentate of Irem Temple, a masonic organization in Wilkes Barre, PA.

Dr. James W. Buchanan, professor of cardiology, received the Distinguished Alumnus Award from the College of Veterinary Medicine, University of Michigan.

Dr. James Eagelman (V'37) received the Distinguished Veterinarian Award of the Pennsylvania Veterinary Medical Association for 50 years of dedicated service to his profession. Dr. Eagelman retired from practice in 1983. He is an AVMA honor roll member.

Dr. Stuart A. Fox (V'53) received the PVMA Award of Merit for his efforts "to bolster the status of the veterinary profession through active participation in a wide variety of community and health professional organizations."

Dr. William V. Chalupa, professor of nutrition, has been invited to serve as a member of the Committee of Animal Nutrition of the National Research Council for the period of October 1987 through September 30, 1990.

Dr. Troy Ford, resident in surgery at New Bolton Center, was awarded first place in the resident's competition held by the American College of Veterinary Surgeons. Dr. Ford presented his research project at the organization's Annual Scientific Program, in Tucson, AZ, in February.

Dr. Grant Frazier, lecturer in reproduction, has his manuscript entitled *The histologic effects of DMSO on the endometrium of the mare* accepted into the national 1988 Phi Zeta competition by the Delta Chapter of Phi Zeta at Ohio State University, where Dr. Frazer did his Master's degree research work. Dr. Frazer also achieved Board Certification status from the American College of Theriogenologists.

Late in June, **Dr. Larry Friedman (V'67)** will compete with his 1936 Bentley convertible in the 6th Great American Race, Automobiles built prior to model year 1938 will start in Anaheim, CA. at Disneyland, and travel to Boston. The race should take about 12 days.

Dr. David S. Kronfeld, Elizabeth and William Whitney Clark Professor of Nutrition, was invited to speak at an International Conference on Growth Hormones in Agriculture, in December in Brussels. The conference was organized by the Rainbow Group in the European Parliament.

The School of Veterinary Medicine was one of four schools within the University leading in contributions to the United Way. Within the University, contributions and participation increased for the 87/88 campaign.

Dr. Sue McDonnell, lecturer in reproduction, received research funding from CEVA Laboratories to study seasonal androgen response to GnRH in stallions. She also presented two talks at the International Stockman's School of the Houston Livestock Show and Rodeo in February.

Dr. William Medway, professor of clinical laboratory medicine, spoke at the 28th meeting of the Marine Mammal Commission and the 22nd meeting of the Scientific Advisors on Marine Mammals in December in Florida. He related his experiences and those of other members of the necropsy group about the Mid-Atlantic die-off of *Tursiops truncatus*, the bottle-nosed dolphin, during the summer of 1987. Other members of the veterinary school faculty who helped with the investigation were **Dr. Thomas J. Van Winkle (V'75)**, assistant professor of pathology; **Dr. Mattie J. Hendrick (V'78)**, assistant professor of pathology; **Dr. Virginia Pierce (V'87)**, resident in pathology and zoological pathology; and **Dr. Gail Heyer (V'83)**, resident in pathology. Dr. Medway also attended the 7th Biennial Conference on the Biology of Marine Mammals in Miami from December 5 to 9.

Dr. James A. Orsini, assistant professor of surgery, has been asked to serve on the editorial board for the *Cornell Veterinarian* for a three-year period, beginning July 1988.

Dr. Sally S. Myton (V'69) received a first-degree Black Belt in Tae Kwan Do (Korean karate). She writes, "As a middle-aged veterinarian, I think it is never too late to attempt the impossible." Dr. Myton is a practitioner in Pittsburgh, PA.

Dr. Richard O. Cook (V'56) received the 1987 "The Good Doctor" Award from the Maryland Veterinary Medical Association in recognition of his compassionate actions towards his clients, patients, and



Left, **Dr. Richard O. Cooke**
Right, **Dr. Edward W. Jendrek**

community. Dr. Cook has practiced in Bel Air, MD, for 31 years. He has given his time and resources in aiding the rescue, repair, and rehabilitation of many species of wildlife. He maintains a wildlife refuge at his veterinary facility and farm, which includes a pond and special areas for birds of prey and compounds for injured deer and other animals brought to him for veterinary care.

Dr. Edwin C. Klein (V'77) has been named a diplomate of the American College of Veterinary Pathologists. Dr. Klein is an associate professor at the University of Pittsburgh and a senior staff veterinarian at the university's department of laboratory animal resources.

Dr. David K. Rice (V'45) recently retired from his post as county commissioner of Warren County, PA.

Dr. Martin J. Burton has been promoted to assistant professor of reproduction in clinical studies (New Bolton Center). **Dr. David T. Galligan (V'81)** has been appointed assistant professor of animal health economics in clinical studies (New Bolton Center).

Dr. Benson B. Martin, lecturer in surgery, presented a talk at the Farm Management Symposium held in Lexington, KY, in December.

Dr. Victoria Voith, adjunct assistant professor of medicine, presented a paper at an interdisciplinary conference held in Milan, Italy, in December.

Dr. Judy Rutkowski, resident in surgery, presented a paper at the American College of Veterinary Surgeons meeting in Tucson, AZ.

Dr. Eric P. Tulleners, assistant professor of surgery, presented the results of a study entitled *Transendoscopic YAG laser correction of epiglottic entrapment in the standing racehorse* at the annual meeting of the American College of Surgeons in February. He also presented the result of another project entitled *Teatotomy in the cow: A pilot study*.

Dr. Deborah Wilson, lecturer in anesthesia, successfully defended her Master's thesis in December. Her field was respiratory physiology.

Dr. William J. Donawick, Mark Whittier and Lila Griswold Allam Professor of Surgery, was awarded the National Gamma Award in recognition of distinguished service to the veterinary profession. It was presented to him in February in Columbus, OH.

Dr. K. Ann Jeglum (V'77) was selected as a charter diplomate in the subspecialty of Veterinary Medical Oncology under the American College of Veterinary Medical Oncology. Dr. Jeglum will present a paper at the American Association of Cancer Research Annual Meeting in New Orleans in May on *Monoclonal antibody therapy in canine lymphoma*.

Dr. E. Neil Moore, professor of physiology, co-chaired a two-day symposium on *Silent Myocardial Ischemia* in October in Philadelphia. In November, Dr. Moore presented a talk before the Los Angeles Cardiac Electrophysiology Society and a talk at Medical Grand Rounds at Cedars Sinai, UCLA Medical Center. He also participated in an invited symposium at the American Heart Association, where he presented a paper. In December, he spoke at the American College of Cardiac Arrhythmia Symposium, and in January he was a member of the Scientific Organizing Committee for the 8th International Congress on *The New Frontiers of Arrhythmia* held in Trento, Italy. He was chairman of the round table on *Progress in Experimental Electrophysiology* and presented an invited paper on *Anisotropic conduction*.

Dr. Lawrence T. Glickman (V'72), professor of epidemiology in clinical studies, has been appointed a member of the Committee on Animals as Monitors of Environmental Hazards, National Research Council.

Dr. Robert Orsher (V'79), assistant professor of surgery, is now a diplomate of the American College of Veterinary Surgeons. **Dr. Kristina Schwensen**, lecturer in radiology, is now a diplomate of the American College of Veterinary Radiology.

Scholarships

Mark Hodgson, Class of 1988, has been admitted to the Pennsylvania Department of Agriculture's Bureau of Animal Industry veterinary training program. This Pennsylvania Department of Agriculture-University of Pennsylvania cooperative program awards a full-tuition scholarship to a senior student who will pursue special training in epidemiology and accept, immediately following graduation, a one-year appointment with the Bureau of Animal Industry. The award is made from the University's Training and Applied Research in Veterinary Epidemiology and Animal Health Economics Grant. As part of the program, Mr. Hodgson will attend a summer program in epidemiology at Tufts University, and he will work as a trainee-veterinarian with the Bureau of Animal Industry, Pennsylvania Department of Agriculture, in Harrisburg.



First Pennsylvania Department of Agriculture's Bureau of Animal Industry trainee Mark Hodgson (V'88) with (l to r) Dr. Max van Ruskirk (V'56), director of the Bureau of Animal Industry; Commonwealth of Pennsylvania Secretary of Agriculture Boyd E. Wolff, Mark Hodgson, Dr. Colin E. Johnstone, associate professor of parasitology in epidemiology and health economics.

Michael Mihlfried, William Rives, and Frederick Rock, all of the Class of 1991, are the recipients of the Bob Coult Book Grant.



Westminster Kennel Foundation scholarship presentation (l to r) William Rockefeller, Janet Crawford (V'88), Mrs. Robert V. Lindsay, Margaret Ohlinger, William H. Chisholm.

The Westminster Kennel Foundation has established a fund for scholarships to be awarded to students in certain qualified veterinary schools. Janet Crawford, Class of 1988, was the recipient from the University of Pennsylvania School of Veterinary Medicine. The awards were presented for the first time at the 1988 Westminster K.C. show in February at Madison Square Garden. The scholarship students attended the Westminster K.C., and a brief awards ceremony took place during group judging on Tuesday night.



Chrysann Collatos, Class of 1988, is the recipient of the Dr. Samuel F. Scheidy Memorial Scholarship, presented by the Pennsylvania Veterinary Foundation. Steven Wilson, Class of 1988, is the recipient of a scholarship offered by the Burlington County Kennel Club. The scholarship offered by the Mid-Susquehanna Kennel Club was awarded to Patrice Klein, Class of 1988. Encarnacion Arias-Karolewski, Class of 1989, and Frederick Duddy, Class of 1989, are the recipients of the Plainfield Kennel Club scholarship.

George and Marion Dilley Jones Scholars in Reproduction

Dr. Sue M. McDonnell, Dr. Patricia Sertich, and Dr. Elaine D. Watson have been named George and Marion Dilley Jones Scholars in Reproduction. In 1983, David George Jones endowed the Marion Dilley and David George Jones Chair in Reproduction, and a candidate for the professorship will be recruited in the future. Until a candidate for the chair has been chosen, the administrators of the Jones Trust have allowed that funds from the Trust be used to support worthy junior faculty in reproductive studies. A portion of their salary and benefits will be paid from this fund.

Dr. McDonnell, a lecturer in reproduction, directs the equine behavior clinic at the Georgia and Philip Hofmann Research Center for Animal Reproduction. She has special research interests in the behavioral problems of horses and recently conducted a study on the effects of anabolic steroids on mare behavior.

Dr. Patricia Sertich (V'83), a lecturer in reproduction, is director of the equine embryo transfer service and of the Hofmann Center. Dr. Sertich's research interests include equine embryos, uterine involution, and fertility prognosis in the mare.

Dr. Elaine D. Watson joined the faculty last year as assistant professor of reproduction and director of the endocrine laboratory. Dr. Watson's research interests include uterine immune defense mechanisms, inflammation, and involvement of prostaglandins in the control of ovulation and maintenance of pregnancy in horses and cattle.

The appointments were retroactive from July 1, 1987, and continue for a term ending June 30, 1989.

Epilepsy Research Grant

The School received a grant of \$25,000 from the Estate of Pamela Cole to support a canine epilepsy research program in the department of neurology. Ms. Cole, a long-time breeder and exhibitor of German shepherds under her family's Dornwald prefix, died last year.

Seed Grants

Each year a number of new research projects are funded at the School through seed grants. These small grants are designed to permit researchers to begin new projects. Funding for the seed grants comes from a number of different sources and in the case of this listing, also from the Friends of New Bolton Center. The projects are:

Hemostatic Disorders in Horses with Acute Enterocolitis. Investigators: Drs. Bernard and Palmer.

Effect of an Intrauterine Dimethyl Sulfoxide (DMSO) Infusion on Subsequent In Vitro Bacterial Activity of Equine Uterine Neutrophils. Investigators: Drs. Frazer, Watson, and Strzemienski.

The Role of Oxygen-Derived Free Radicals in Small Intestinal Anoxia in the Horse (In Vitro). Investigators: Drs. Johnston, D. Freeman, Acland, and Soma.

Echocardiographic Evaluation of Cardiac Function Associated with Xylazine Administration in the Horse. Investigators: Drs. Reef and Spencer.

In Vitro Susceptibility Testing of Gentamicin Ophthalmic Solution When Combined with Routinely Used Ocular Medications. Investigators: Drs. Reimer, Benson, Irby, and Perkins.

Autologous Fibrin Glue and Its Use in Periosteal Grafting of the Equine Proximal Sesamoid Bones. Investigators: Drs. Richardson and Dreyfuss.

Prostaglandin Levels in the Involuting Mare. Investigators: Drs. Sertich and Watson.

Bronchoalveolar Lavage in the Horse: Further Description in Normal Horses and Horses with Pneumonia. Investigators: Drs. C. Sweeney and Ziemer.

Establishment of a Clinical Pharmacokinetic Service in the George D. Widener Hospital for Large Animals. Investigators: Drs. R. Sweeney, J. Orsini, and Divers.

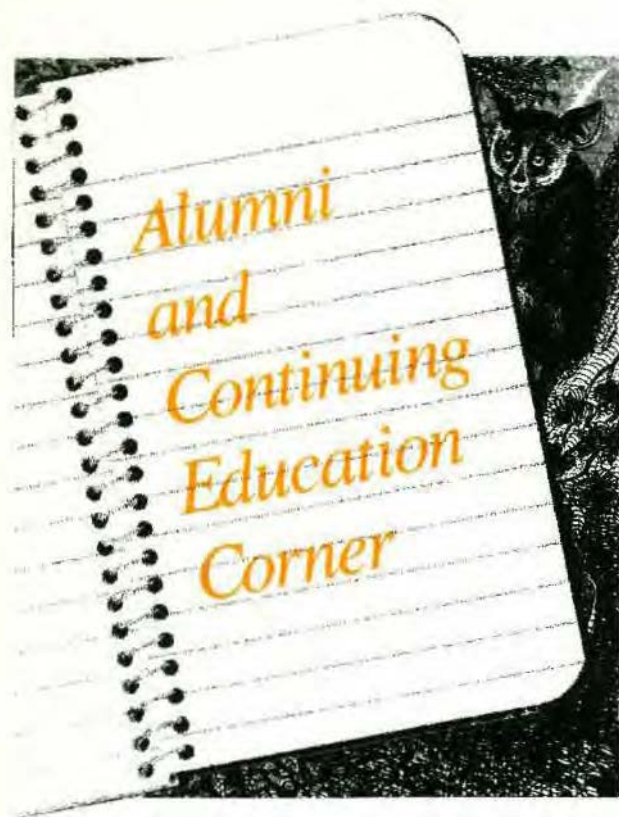
C-Reactive Protein in Horses and Neonatal Foals. Drs. Vaala and Johnston.

Chronic Obstructive Pulmonary Disease in the Horse—Role of Arachidonate Metabolites. Investigators: Drs. Watson, Pawloski, and C. Sweeney.

Histomorphometric and Histologic Analysis of Physiologic and Pathologic Remodeling of the Equine Third Carpal Bone in Response to Race Training. Investigators: Drs. Young, Richardson, and Nunemaker.

Influence of Ovarian Follicular Status on Time to Estrus in Dairy Cows Treated with Prostaglandin F2alpha during Diestrus. Investigator: Dr. Burton.

Investigation into Maintenance of Pregnancy in the Mare. Investigator: Dr. Watson.



Alumni and Continuing Education Corner

May means ALUMNI DAY. This year it will be on Saturday, May 21, at the Philadelphia campus. Events begin at 10 a.m. with registration and a chance to meet Dean Andrews over coffee. The Veterinary Medical Alumni Society holds its meeting at 11 a.m., and at noon a buffet luncheon will be served. In the afternoon, a number of activities are offered: a trip to the nation's oldest Zoo, a tour of the mansions of Fairmount Park. A small admission fee is required. Those interested in archeology or anthropology can take in the University Museum, just a few short blocks from VHUP. Also offered will be a tour of VHUP at 2:30 p.m.

A gala dinner with dancing will take place in the evening at The Four Seasons Hotel. These festivities begin at 6:30 p.m. with a reception co-hosted by Dean Andrews and the VMAS. Dinner is at 7:30 p.m., followed by dancing. Reservations for the luncheon, tours, and the dinner can be made by calling the Alumni Office at (215) 898-4234.



Penn Annual Conference

Dr. Charles Newton presents the Patron and Sponsor Certificate to:



ALPO Petfoods, Inc.



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Pennsylvania Department of Agriculture Grants

The Pennsylvania Department of Agriculture has announced continued support for four research projects here at the School. They are:

Construction of Live Attenuated Bovine Vaccines Using Genetically Engineered Infectious Bovine Rhinotracheitis Virus as a Vector for Genes for Other Bovine Pathogens.

Studies on the Two Most Important Infectious Diseases of Poultry in Pennsylvania.

Calving to First Service Interval and Open Period in Cows Short-Cycled by Prostaglandin Injections.

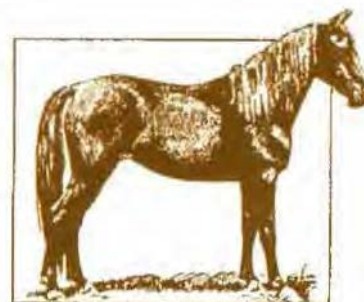
Significance of Rectal Pulpation in the Transmission of BLV in Pennsylvania Dairy Cows.

Animal Health Technician Continuing Education Conferences

The Animal Health Technology Department at Harcum Junior College, Bryn Mawr, will offer two continuing education conferences. The first conference on June 5 will cover the following topics:

Sample Collection and Preparation for the Reference Laboratory. Jeffrey Reed and Drew Schwartz, Veterinary Technical Laboratories, West Chester, PA.

Laminitis in the Horse. Dr. Kent Humber, resident in medicine, University of Pennsylvania School of Veterinary Medicine, New Bolton Center campus.



Vaginal Cytology, Semen Collection and Preparation. Dr. Ron Christensen, International Canine Genetics, Malvern, PA.

Marketing and Merchandising. Dr. Theodore Robinson, Richboro Veterinary Hospital, Richboro, PA.

The conference on July 5 will cover:

Urinalysis Refresher Course. Dr. Meryl Litman, assistant professor of medicine, University of Pennsylvania School of Veterinary Medicine, Philadelphia. This all-day course includes a lecture and a wet lab and is limited to 25 participants.

For registration and further information please call Heather Toland, Harcum Junior College, at (215) 526-6046.

New Bolton Center Resources

George D. Widener Hospital for Large Animals

Cardiology/Diagnostic Ultrasonography

Monday through Friday,

9 a.m. to 5 p.m.

Services include cardiac consultation, a variety of diagnostic services (electrocardiograms, echocardiograms, radiotelemetry, phonocardiograms), and complete work-ups for poor racing performance. Diagnostic sonograms can be performed to evaluate the tendons and ligaments, vessels, umbilicus, and various abdominal organs. Call (215) 444-5800, ext. 2359.

Clinical Laboratory Medicine

Monday through Friday, 8 a.m. to 11 p.m.; Saturday and Sunday, 8 a.m. to 12 noon.

Emergency service is provided at other hours. Call (215) 444-5800, ext. 2250.

Equine Outpatient Clinic

Monday through Friday, 9 a.m. to 5 p.m.

Specializes in muscular/skeletal problems. Accepts patients without prior referral. Call Dr. William Moyer, (215) 444-5800, ext. 2405 or 2406.

Farrier

By appointment only.

Complete farrier service. Call (215) 444-5800, ext. 2368.

Field Service

Provides routine health care and emergency service for farm animals and horses in the surrounding community. Call (215) 444-0900.

Intensive Care

Staffed around the clock, the Connelly Intensive Care Unit is designed to care for seriously ill or injured large animals.

Large Animal Pathology Laboratory

This laboratory offers biopsy and necropsy services. Biopsies should be mailed to the laboratory. Animals for necropsy must be accepted by the duty pathologist. Call (215) 444-5800, ext. 2211.

Medicine

Deals with internal medicine problems, such as respiratory and gastrointestinal diseases, all of large animals. Accepts patients without prior referral. Call (215) 444-5800, ext. 2111.

Neonatology

The Graham French Neonatal Section cares for premature or seriously ill neonates, especially foals. Staffed around the clock.

The Connelly Intensive Care Unit and Graham French Neonatal Section

Orthopedics

The C. Mahlon Kline Orthopedic and Rehabilitation Center specializes in arthroscopy, laser, and orthopedic surgery. Call (215) 444-5800.

Radiology

Monday through Friday, 9 a.m. to 5 p.m.

Only referral cases accepted.

Reproduction

The Georgia and Philip Hofmann Research Center for Animal Reproduction provides fertility examinations for stallions, mares, and other large animals. Equine embryo transfer service also offered. Call (215) 444-5570.

Surgery

Soft tissue and orthopedic surgery. For bovine surgery call (215) 444-5800, ext. 3595; for equine surgery call (215) 444-5800, ext. 3595; for equine surgery call (215) 444-5800, ext. 3201.

Auxiliary Services

The Large Animal Hospital has, on call, certain specialties at the Philadelphia campus, such as acupuncture, dermatology, neurology, and ophthalmology. Investigators in research units at New Bolton Center, such as the Comparative Leukemia Studies Unit, are also available for consultation. For information call (215) 444-5800.

Other Services

Center for Animal Health and Productivity

The Center provides diagnostic assistance for herd problems. Clinicians are available to assist and/or consult with veterinarians in the evaluation of difficult or unusual problems. For information call Dr. Robert Marshak, (215) 444-5800, ext. 2318.

Clinical Microbiology Laboratory

This laboratory provides a number of diagnostic services for the practitioner. Emphasis is on the isolation and identification of aerobes, fungi, salmonella, CEM (not for export purposes) organisms, mastitis specimens; certified EIA (Coggins) testing. Serology for Potomac Horse Fever is also available. Specimens should be sent directly to Microbiology, New Bolton Center. For handling procedures call (215) 444-5800, ext. 2156, 2157, or 2159.

Cooperative Poultry Diagnostic Laboratory

Monday through Friday, 8:30 a.m. to 4:30 p.m.

This is a University-state cooperative laboratory providing diagnostic and consultation services for poultry, game birds, and pet birds in the following areas: serology, bacteriology, virology, and pathology. Farm visits may be arranged. Call (215) 444-4282.

Cytogenetics Laboratory

This laboratory provides a complete chromosome and karyotype analysis on large animals with either reduced fertility, developmental disorders, embryonic or fetal mortality. Specialized banding techniques available. Prior to submitting a sample, call (215) 444-5800, ext. 2204 for an appointment and kit.

Endocrine Laboratory

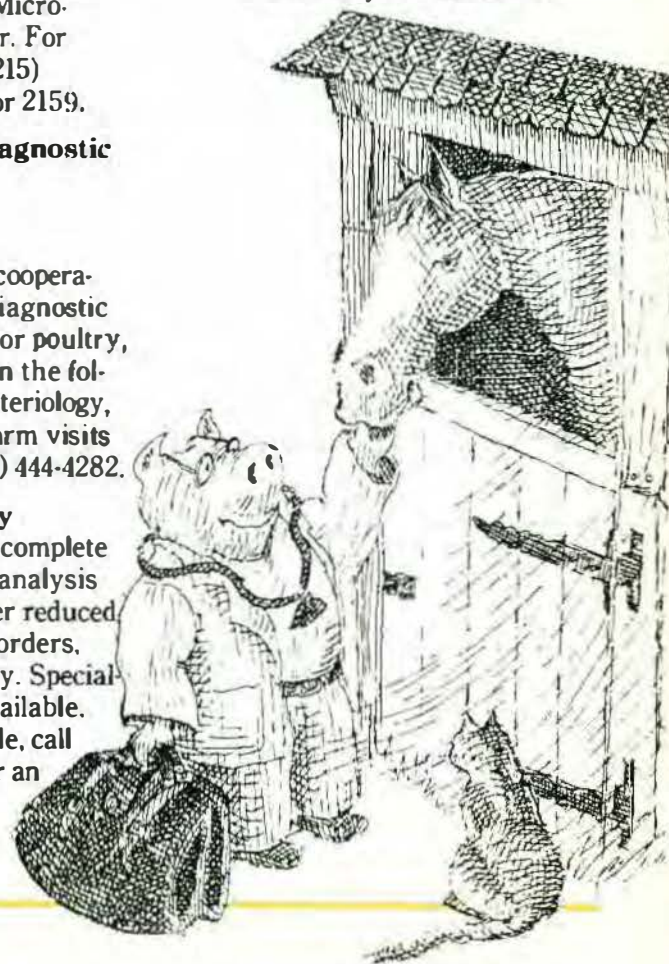
Assays on reproductive, thyroid, and adrenal hormones. Consultation on hormonal reproductive problems. Call Dr. Elaine Watson, (215) 444-5800, ext. 2202.

Nutrition

Nutritional advisory services are available for dairy herds and other livestock operations to optimize economic productivity and animal health management. These services are available through referring veterinary practitioners or by direct contact with the Section of Nutrition. Call (215) 444-5800, ext. 2316.

The New Bolton Center campus is located in Chester County, PA. For directions and further information please contact:

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