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## Animal Crackers

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**Heartworm** infestation in dogs was described in 1856 by Joseph Leidy before the Academy of Natural Sciences in Philadelphia. It was not until 1955 that the life cycle was completely documented. The next year it was shown that two different microfilariae may be found in the circulating blood—the one produced by the heartworm *Dirofilaria immitis* and the other by a harmless subcutaneous parasite *Dipetalonema reconditum*.

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Blood-sucking mosquitoes capable of transmitting heartworms are present in almost every part of the United States and Southern Canada, so the problem no longer is restricted to the southern coastal states. Heartworm disease has become a nationwide problem.

Adult worms can live nearly five years in the heart and pulmonary arteries. Dog owners and veterinarians are usually aware of the potential problem and the emphasis has been on early diagnosis. Often infection is diagnosed before clinical signs appear. Generally, coughing is the first sign noticed.

The adult worms produce microfilariae which are noninfective until they have been ingested by a mosquito. It may take up to a month in the mosquito before the microfilariae will infect a dog which is bitten. It can be another six months before microfilariae can be detected in the blood.

Finding microfilariae in the blood has been the usual method of detecting heartworm infection. There have been false negative results for various reasons. The adults may be of the same sex or adult worms may not be producing microfilariae for several reasons including an immune response.

For some time, an indirect fluorescent antibody (IFA) test has been used for measuring antibodies against microfilariae to detect cases where the microfilariae do not circulate in the blood because of an immune response directed against them. A new serologic test, and enzyme-linked immunosorbent assay (ELISA), using purified adult heartworm antigens, has been developed at the University of Pennsylvania School of Veterinary Medicine. This assay has been accurate in detecting infections with immature worms, as well as those cases where there are adults in the heart and pulmonary vessels but no circulating microfilariae. In addition, this test does not give false positive results when the dogs are infected with intestinal parasites.

There are other blood tests available but it's important to be sure that the test used has been thoroughly investigated and criteria for a positive report have been established.

Dog breeders are aware of the importance of avoiding treatment with various drugs when adult heartworms are present. These include several products highly effective against intestinal parasites, as well as the drug *diethylcarbamazine* used to prevent heartworm infection. It is known that severe reactions may occur in heartworm-infected dogs. The new ELISA test will be an excellent way to document infection if there is a question about the routine check for microfilariae.

A word of warning: if your dog is on a preventive program, daily dosage is a must, don't skip a day.

Except in the colder climate, year-round treatment may be recommended. Consult your veterinarian.

**What is an Emergency?** The Emergency Service at the Veterinary Hospital of the University of Pennsylvania is open twenty-four hours a day, every day of the year. There seems to be a tendency to use this service for convenience rather than because attention is urgently needed.

A true emergency arises when any small animal is injured or so ill that unless immediate therapy is instituted, irreversible bodily damage or death will result. Problems requiring prompt attention include

collapse, convulsions, uncontrolled bleeding, and accident injuries.

If your veterinarian refers you to VHUP because special services are required, be sure to have your veterinarian telephone and give essential information.

Often, help can be given over the telephone and arrangements made for the animal to be seen during regular hours.

The number to call for information is 215-243-4685.

**Parvovirus Update.** New vaccines containing a live, attenuated canine parvovirus are now available commercially. These are available either with canine parvovirus alone or in combination with distemper, hepatitis, parainfluenza, and leptospirosis. It is believed that the canine parvovirus will provide better and longer-lasting protection than the feline parvovirus used in vaccines first produced. The delay in getting these new vaccines on the market has been caused by the extensive safety testing required before the product can be federally licensed.

Maternal antibodies in the milk help protect puppies for a variable number of weeks after birth. This protection can last from a week or two after weaning until the puppies are sixteen weeks of age. Unfortunately, these antibodies neutralize vaccine virus, so vaccination before sixteen weeks may not be effective. Therefore, puppies vaccinated earlier than sixteen weeks of age, should be re-vaccinated at sixteen weeks and yearly thereafter.

An effective vaccination program for kennels has not yet been determined. In a kennel situation, it may be necessary to vaccinate puppies weekly beginning at six weeks of age and continuing up to sixteen weeks. The new canine-origin vaccine is recommended for all ages.

For show dogs, we still recommend "boosters" with the modified live canine vaccine every six months.

Vaccination against canine distemper, hepatitis, parainfluenza, and leptospirosis must not be forgotten for puppies, household pets, and show dogs. This should be done yearly for all dogs.

**Pet vs. Show Quality.** A number of people ask, "What is the difference between a pet and a show dog?" The question usually comes up after a visit to a breeder to see a litter of puppies.

Reputable breeders follow planned programs, using the best specimens available. They make every effort to eliminate hereditary and other undesirable faults. It's an educated guess as to whether or not a puppy will become a show dog. Usually the only difference between a puppy described as "pet quality" and one considered a "show prospect" is the opinion of the person who has graded the litter. Unless there are malformations or disqualifying faults, the difference may never be noticed except by one familiar with the breed.

Most people with show dogs resent a reference to "your pet." The males are dogs and the females are bitches. This is a question of semantics with some snobbery thrown in.

If you are considering a show career for your puppy, the American Kennel Club's breed standard is your guide. In addition to faults which disqualify any breed (blind, deaf, lame, castrated, spayed, or not

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having two normally-located testicles), individual breeds may have disqualifications such as the wrong color, an over- or under-shot bite, too large or too small (as an adult over one year of age), etc. There's always the chance that an extremely promising "show prospect" as a puppy may become just another dog after it matures.

If you are looking for a member of the family, personality should be the first requirement, followed closely by adaptability.

Send your pet care questions to Josephine Deubler, Animal Crackers, U of P School of Veterinary Medicine, 3800 Spruce Street, Philadelphia, PA 19104.

## Outreach

Five Philadelphia minority high school students spent the 1981 summer working in the laboratory of Dr. Bernard Shapiro, Associate Professor of Biochemistry in the School of Veterinary Medicine, under the auspices of STEP-UP—Student Training Employment Program—University of Pennsylvania. The students spent three hours daily working on a project designed to determine why male and female mice metabolize drugs differently. They were taught how to inject mice with hormones, how to prepare tissue samples by using an ultra centrifuge, and how to measure the metabolism of tagged drugs using a liquid scintillation counter. Students also studied basic English and math skills.

Dr. Shapiro reports that the students enjoyed the laboratory atmosphere and that "... while we worked them pretty hard, no one complained." Dr. Adelaide Delluva, Professor of Biochemistry, viewed the exercise as one which demonstrated that "if you give a person something productive to do, they really put their minds to it."

STEP-UP is sponsored at the University by Dr. Janis Somerville, Vice Provost for Student Life and Dr. Louise Shoemaker, Dean of the Graduate School of Social Work.