

Veterinary Science Research

current studies on disease and injury to domestic animals aid in the training of future veterinarians

George H. Hart

The Department of Veterinary Science conducts research in diseases of all species of farm animals and—through its School of Veterinary Medicine with 40 teaching specialists and a new building at Davis—is equipped to graduate 50 qualified young veterinarians each year.

Research projects are carried on in six divisions, dealing with clinical work, anatomy and pathology, microbiology and parasitology, pharmacology and toxicology, poultry diseases, and public health.

Clinics

The division of clinics includes work in X-ray examinations, infectious diseases, therapeutics, medicine and surgery in large and small animals. The division has a mobile clinic which may be called at any time of the day or night.

Live or dead animals may be brought from any part of California—or from out-of-state—for diagnosis in the clinic. Charges which help defray the cost of operation are made for treating animals in the clinic and for ambulatory service calls which are limited to a reasonable radius from Davis.

When animals get sick the local veterinarian should be called. If a diagnosis can not be made by the local veterinarian, he may call on the county livestock inspector or the field man of the State Division of Animal Industry who has the aid of the laboratory men in his organization. Should elaborate investigations be needed to ascertain the cause of loss, the case may be referred to the Department of Veterinary Science in Davis where the necessary investigations are done free of charge.

The clinical staff is studying new methods in surgery such as splinting fractures with metal splints for immediate fixation; cesarean section in the cow for over-size fetuses or abnormalities of the genital tract; and, rumenotomy for removal of foreign bodies such as bits of wire or nails.

The division of clinics also studies methods of treating the genital tract of valuable bulls to possibly free them from trichomoniasis infection, and methods of treating animals for removal of internal parasites, such as heartworm in hunting dogs.

Variations in methods of handling brucellosis in swine and in cattle are being investigated as is the place of the X ray in diagnosis and treatment of animal maladies.

A considerable amount of work is being done with individual abnormalities in light horses and with a variety of ailments in sheep.

Cases which come to the clinic furnish material for improved methods of treatment, and are valuable for student instruction. Many animals are salvaged and owners learn how to handle similar cases in the future.

Anatomy and Pathology

Studies in anatomy and pathology include clinical pathology and post mortem examinations. The staff in this division is working on comparative anatomy and pathology—both gross and microscopic. Museum specimens of all pathological processes in domestic animals are being collected for study.

In clinical pathology complete laboratory diagnostic procedures are systematically applied to diagnose occult—hidden—conditions. These examinations make it possible to differentiate between disease entities having similar symptoms. For instance, one source of much financial loss is the disease complex known as mastitis. Here a variety of organisms and—possibly—other factors cause similar clinical pictures but must be differentiated for successful treatment. New methods and procedures are constantly being developed and tested for their applicability under various conditions.

Microbiology, Parasitology

The division of microbiology and parasitology deals with diseases caused by bacteria, viruses, protozoa, and parasites, and with cellular antigens involved in immunology.

Under study is the virus of vesicular exanthema in swine, a disease limited to hogs and existing only in this section of the United States. Without special animal inoculation tests the virus of vesicular exanthema is indistinguishable from the virus of the very serious foot-and-mouth disease.

The virus of myxomatosis in rabbits

which is transmitted by the mosquito as vector also is being investigated.

Data obtained through the co-operation of the United States Bureau of Animal Industry covering 100 head of cattle used for testing a vaccine for brucellosis—which is somewhat different from vaccine Strain 19—are under analysis.

In cellular antigen work the various blood groups in cattle from which a variety of applications may be made are being studied.

In parasitology, phases of biology of the life cycle of internal parasites—so important in reducing their depredations—are under study.

Pharmacology, Toxicology

The division of pharmacology and toxicology is interested in the pharmacological action of new drugs—especially with relation to their healing value—which are constantly being produced for various abnormal conditions in animals. It also investigates the possible toxic effects on livestock of the great variety of agricultural chemicals—such as rodenticides, field crop sprays, defoliating agents and for seed treatment for the destruction of fungi and other plant pests.

The staff of this division keeps informed concerning antibiotics, hormones, and so forth. Currently they are working on cortisone, one of the adrenal principles obtained through synthesis, starting with bile.

Another area of their research is concerned with slight changes of molecular structure of compounds to develop more potent products for specific purposes—such as parasiticides which will have less toxic effect on the host than the substances already in use and thereby establishing a greater margin of safety.

In losses in livestock, when diagnosis is difficult, some indicative results are obtained through service work to the clinic in analyzing tissues and body fluids for heavy metals and organic poisons.

Poultry Diseases

Work in poultry pathology is assembled in one division of the department. At present, research centers around the study of virus diseases in poultry.

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The staff of this division is highly trained in certain phases of basic science relating to poultry problems. They aid in the teaching and the application of those phases in courses in medicine and infectious diseases.

It is hoped to develop from the student body and through graduate work more men who will spend their life work with poultry pathology.

Public Health

This field includes meat, milk and food inspection, and the study of diseases transmitted from animals to man.

Research is concentrated on the study of Q fever which has a high incidence among persons associated with animals in areas where outbreaks occur. The cow, the sheep and the goat are known reservoirs of the infection as the causative factor—a Rickettsia—has been found in affected animals. Working in co-operation with the Communicable Disease Center of the United States Public Health Service at Atlanta, Georgia, the division staff members are seeking to determine the temperature of pasteurization necessary to kill the Rickettsia with a proper margin of safety.

School of Veterinary Medicine

The School of Veterinary Medicine is within the Department of Veterinary Science and is one of three schools of veterinary medicine in the 11 western states.

The school at Davis was opened in the fall of 1948 with an entering class of 42 selected students screened from more than 200 applicants. This first class will be graduated in June 1952.

The first University of California School of Veterinary Medicine was organized on the San Francisco campus in 1895. After 18 students were graduated the school was closed in 1900 because of meager enrollment. The next year—in 1901—the College of Agriculture appointed an instructor in veterinary science and bacteriology. From that time until the recent development of the new school, the Division of Veterinary Science has been a research organization in which the teaching of agricultural students and graduate students played a minor role.

Students in the new School of Veterinary Medicine are selected after a minimum of two years of preveterinary work, which may be taken anywhere in institutions giving the required courses.

At the end of the first two years in the school at Davis, successful students are granted the undergraduate degree of Bachelor of Science and then enroll in

the Graduate School. After two years of work in the Graduate School graduating students receive the higher degree of Doctor of Veterinary Medicine.

Graduate students may take work in several fields, including comparative pathology and pharmacology for the degree of Master of Science or the degree of Doctor of Philosophy.

In addition, service courses in veterinary science are given to both degree and nondegree agricultural students in the animal science curricula.

The first responsibility of the School of Veterinary Medicine—housed since January 1, 1950, in a specially designed building equipped for 200 students and a teaching staff of 40—is to graduate 50 young men and women each year as qualified veterinarians. A second responsibility—of equal importance—is the continuation of research on animal diseases and their relation to public health. This accumulation of new knowledge reduces animal losses, increases the supply of animal products, and safeguards the enormous financial investments in the livestock industry.

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ROLLER

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of citrus spraying equipment are presented in the table. Many other trials were applied and observed using higher, the same, or lower dosages in addition to the typical results presented.

A 50% wettable powder of DDT used at the rate of three to 10 pounds of actual material in quantities ranging from 300 to 1000 gallons of finished spray per acre gave from 95% to 100% mortality of the larvae at seven days after treatment. DDT exhibits a high degree of irritation to the larvae causing them to become quickly dislodged from the trees and drop to the ground. The larvae subsequently become moribund and die.

A 50% wettable powder of DDD used at the rate of three to 10 pounds of actual material in quantities ranging from 300 to 1000 gallons of finished spray per acre afforded from 99% to 100% mortality of the larvae at seven days after treatment. DDD shows less irritation to the larvae than does DDT and DDD takes longer than DDT to effect initial mortality.

A 50% wettable powder of methoxychlor used at the rate of three to 10 pounds of actual material in lots of 500 and 1000 gallons finished spray per acre effected from 83% to 100% mortality of the larvae at seven days after treatment. Methoxychlor is somewhat less irritating

than DDD and is slower than DDD in effecting initial mortality.

A 25% wettable powder of parathion used at the rate of three-fourth to 2½ pounds of actual material in quantities ranging from 300 to 1000 gallons of finished spray per acre gave from 99% to 100% mortality of the larvae at seven days after treatment. Parathion used at the higher dosages kill the larvae very quickly and few dislodge themselves. At intermediate dosages parathion exhibits a somewhat high degree of irritation, however, at the dosages included in the table this insecticide shows only slight irritation to the larvae.

A 27% wettable powder of EPN-300 used at the rate of three-fourth to 2½ pounds of actual material in quantities ranging from 300 to 1000 gallons of finished spray per acre afforded 100% mortality of the larvae at seven days after treatment. EPN-300 effects a slower initial kill and is less irritating to the larvae than parathion.

The phenomenon of irritation followed by dislodgement varies with each of the above insecticides and also varies at different dosage levels with the same insecticide.

Ryania used at the rate of 15 to 60 pounds of the undiluted material in lots of 500 and 1000 gallons of finished spray per acre gave from 23% to 70% mortality of the larvae at seven days after treatment. Ryania exhibits an unusual effect on most of the larvae 12 to 48 hours after treatment in all instances where it was used. This effect consisted of a state of motor inactivity with partial or total insensibility to stimuli. After three days, however, they recovered and few died which were affected in this manner.

A 25% wettable powder and a 12½% emulsion of dieldrin used at the rate of three-fourth pound actual material in lots of 300 and 500 gallons of finished spray per acre afforded 84% to 88% mortality of the larvae at seven days after treatment. Twenty-five per cent wettable powder and a 25% emulsion of aldrin used at the rate of three-fourth to 1½ pounds actual material in 300 gallons of finished spray per acre gave 79% to 81% mortality of the larvae at seven days after treatment. Dieldrin and aldrin did not cause noticeable irritation to the larvae, and there was no apparent differences between the wettable powders and the emulsions.

Cryolite used at the rate of 12 pounds of the undiluted material in 500 gallons finished spray per acre afforded no mortality of the larvae at 14 days after treatment in a commercially sprayed grove.

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