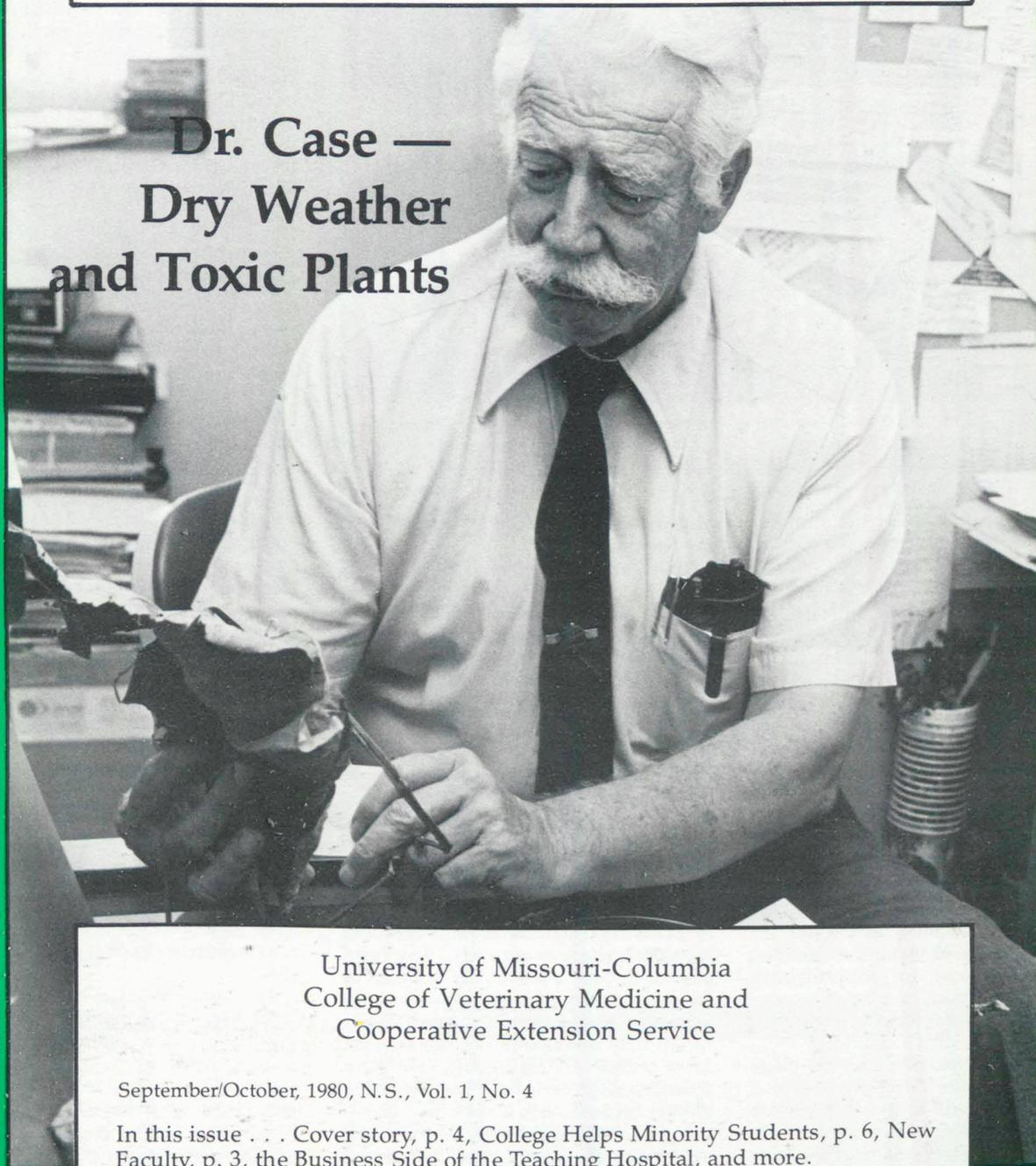


# VETERINARY MEDICAL REVIEW

## Dr. Case — Dry Weather and Toxic Plants



University of Missouri-Columbia  
College of Veterinary Medicine and  
Cooperative Extension Service

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*Client paying his bill at the Teaching Hospital.*

## The Business Side of the Teaching Hospital

### Teaching Hospital Must Charge for Services

"To pay the bills" was the straightforward answer Dr. Youngquist gave to the question of why does the College's Teaching Hospital charge clients for work performed on their animals. Dr. Youngquist, who is now interim associate Chairman for the Department of Veterinary Medicine and Surgery, simply expressed a fact of life that has faced the Teaching Hospital for decades as that unit has served to educate students and to provide veterinary care not readily available elsewhere.

"We're not in this to make a profit, but to break even," said Mr. Ron Haffey, Administrative Associate for the Teaching Hospital. Mr. Haffey is responsible for handling budget and day-to-day fiscal matters of that unit. Included in his duties is the task of using the Teaching Hospital's income for replenishing drugs and supplies, replacing equipment and instruments, and paying for contract services such as laundry.

No direct comparison may be made between what the Teaching Hospital charges its clients and what private practitioners charge because outright comparing by veterinarians of fees and charges violates fair trade practices. However, there is probably not much discrepancy. "I feel charges are comparable," stated Dr. Kenneth Niemeyer, interim Chairman for the Department of Veterinary Medicine and Surgery. Dr.

Youngquist and Mr. Haffey agreed with Dr. Niemeyer.

The Teaching Hospital charges clients set fees for ordinary services as hospitalization, vaccinations, and routine procedures like castrations. For other, less routine work such as orthopedic surgery, clients are charged according to effort and time committed, and supplies used.

Administrators perceive that the Teaching Hospital enjoys a good relationship with area practitioners. They refer some patients to the Teaching Hospital. None have lodged complaints about competition from the Teaching Hospital.

Whether a client is referred or comes in on his/her own initiative, the Teaching Hospital charges equally. Teaching allowances are occasionally made, but they are not the rule. Making a teaching allowance is a faculty prerogative. A clinician may not charge the full amount for a unique and intriguing case even though considerable time is spent on the animal because such a case may play a part in enlarging the art and science of veterinary medicine. Teaching allowances are also made for tests run for the benefit of the students' education.

Although they contribute to treating patients, the students are considered part of the team. The clinician is in command and the case is the responsibility of

that clinician. So, regardless of how much effort is put into any case by students, the charge is still the same as though it were entirely handled by the clinician.

The majority of clients at the Teaching Hospital anticipate paying for services. For most services, especially those involving income-producing animals, the client is given an estimate of the charges before services are provided.

If a client cannot pay the bill immediately in full, payment schedules may be arranged. When the client has trouble making time payments, the Teaching Hospital can be understanding. However, as Dr. Niemeyer pointed out, "If a client makes it apparent that he is not making an attempt to pay, after a certain length of time the bill is turned over to the University attorney for collection purposes."

A few clients have brought their animals to the Teaching Hospital expecting no charges or only nominal charges, and they were surprised to find their costs comparable to what a private practitioner might have charged. Dr. Niemeyer added that some of these people had been referred to the Teaching Hospital. He indicated that a referring veterinarian should tell the client that the Teaching Hospital will charge for services.

The Teaching Hospital charges reasonably for all services. However, some of the services available are very sophisticated and elaborate. The Teaching Hospital is staffed with expert clinicians, some of whom have achieved international renown in their areas of expertise. These veterinarians are capable of making diagnoses or performing procedures that are usually not available outside a university or a large facility such as the Animal Medical Center in New York. In addition, the Teaching Hospital has instrumentation and technicians that few private practices have. Special services can therefore be rather costly. "We can take in a patient," Dr. Niemeyer stated, "that has a pelvis fractured in several places, and treat it so that the animal has a reasonable chance of being able to walk again—but to do that is often expensive."

This last point raises the issue that has been discussed in veterinary circles during the past few years: "Has the profession advanced beyond the client's ability to pay?". That is, however, such a general question that it overlooks the individual client, the particular moment, or the special patient. Whether or not any diagnosis or mode of treatment is "worth it"—or if the patient is "worth it"—is the decision of the client. It is considered the veterinarian's responsibility to apprise the client of what to expect.

# New College Faculty

## Teaching Hospital Income—One Cog In the Big Wheel of the System

Although the University of Missouri receives support from state revenues, those dollars meet less than two-thirds of the total operating costs of the University. The rest must come from other means. Donations, student fees, and income from special services offered by several units within the University system go a long way in filling the gap. Veterinary services performed at the College's Teaching Hospital fall into that last category.

Until July 1 of this year, all income generated by the Teaching Hospital was turned over to the University of Missouri-Columbia's General Operating Account. These dollars, combined with income from other campus sources, was then allocated by central campus administrators to those campus areas where they felt the need was greatest. The College did receive funds each year from this account to maintain operations of the Teaching Hospital. Mr. Ben Riley, fiscal officer for the College, remarked that such an arrangement worked very well for the campus "but didn't work so well for the College." He went on to say this method created bookkeeping headaches as well as lethargic responses to fast-changing demands to replenish drugs and supplies in the Teaching Hospital.

To alleviate these and other shortcomings, the Teaching Hospital has been given as of July 1 a "Designated Account"—or, in other words, a revolving account. With such an account, all income generated by the Teaching Hospital may then be directly used by the College to purchase supplies, drugs, instrumentation, or other items. The College may respond much faster than before to ever-changing fiscal demands. In addition, a Designated Account will enable the College to "save up" over a several year period for purchases of occasional, high cost pieces of equipment. An added attraction of this account is that the College may use income dollars to hire additional technical help as needed.

## Liver Registry Established

Dr. Larry P. Thornburg, Department of Veterinary Pathology has established a Liver Registry at the College. The purpose of the Registry is to collect data on liver disease in all species of animals. The primary objectives are to characterize liver disease and develop rational therapeutic measures for treatment. The Registry is supported in part by the United States Kerry Blue Terrier Club. There is no charge to

### Drs. Everett Aronson and Jimmy Latimer



Dr. Aronson



Dr. Latimer

Two radiologists, Drs. Everett Aronson and Jimmy Latimer, are now working at the College. Assigned to the Department of Veterinary Medicine and Surgery, both radiologists are Assistant Professors.

Dr. Aronson received his DVM degree from the University of Illinois in 1975; he completed his residency program in radiology at Michigan State University this year.

Dr. Latimer received his DVM degree from Washington State University in 1975; he completed his residency program in radiology at Colorado State University in 1980.

### Dr. Conrad Boulton

Appointed Assistant Professor in the Department of Veterinary Medicine and Surgery, Dr. Conrad Boulton now works at the College's Equine Center, south of Columbia.



Dr. Boulton received his DVM degree in 1976 from Washington State University. He completed a residency program in equine medicine and surgery at UMC in 1979. Prior to his current appointment at UMC, Dr. Boulton had been in private practice in Chino, California.

### Dr. Gary Johnson

Dr. Gary Johnson has been appointed Assistant Professor in the Department of Veterinary Pathology.

Dr. Johnson received his PhD degree in biochemistry from Kansas State University in 1971 and his DVM degree from the University of Minnesota in 1977. From 1977 to 1980, he served as a U.S. Public Health Service Trainee for the New York State Department of Health.

Dr. Johnson's research interests include comparative biochemistry and medicine associated with animal diseases as models for human diseases, and comparative hemostasis.



### Ms. Nancy Olson

Ms. Nancy Olson has been appointed Instructor in the Department of Veterinary Pathology. She is in charge of the day-to-day operation of the Clinical Pathology Laboratory which serves the College's Teaching Hospital.

Ms. Olson holds an MS degree in Pathology from UMC and is currently working on her PhD. Prior to joining the faculty at UMC, Ms. Olson had been in charge of the Medical Laboratory Technology Program at Central Methodist College in Fayette, Missouri.



### New Residents

Veterinarians beginning their residency programs this fall at the College are: Lionel James Dawson (BVSc-Madras, India, 1978, MS-Iowa State, 1980); Sherrill A. Fleming (DVM-Guelph, 1977); Robert D. Heald (DVM-Auburn, 1977); and John J. Robertson (DVM-California, Davis, 1975).

Dr. Larry P. Thornburg  
W211 Veterinary Medicine  
College of Veterinary Medicine  
University of Missouri  
Columbia, MO 65211

A written diagnosis will be sent in the return mail 24 hours after the specimen is received. Feel free to call Dr. Thornburg, (314) 882-7038, for further information or to discuss your interesting liver cases.

# Animal Problems Related to Drouths

Arthur A. Case, DVM, MS  
Dept. Veterinary Medicine and Surgery

## Weather Extremes Create Animal Health Problems Not Otherwise Frequently Seen

Animals definitely depend on favorable climate and weather conditions for their well being. Variations such as abnormally dry or unusually wet weather will be reflected in both grain and forage crops upon which the animal producer depends for the nutritional needs of his livestock, whether the animals are dairy, beef, sheep and goats, or swine. Persons who have poultry, horses, or companion animals may be less dependent on normal growing seasons and good crops, but man as well as his animals must rely on the quality and amount of the basic foodstuffs and forages.

The author remembers very well the unusual amount of atypical health problems that he observed during the very severe and extended drouths that occurred during 1934-1936, which created the "Dust-Bowl" over much of the Great Plains. Some of those areas of the United States and Canada have never fully recovered! Other severe drouth periods were experienced in much the same area in 1953-1954, in 1976, and again in 1980. Missouri and adjoining states were particularly hard hit in both 1954 and 1980, with many previous records having been broken for extended hot weather and very dry conditions during July and August. Major crop failures of corn and soybeans in many areas plus severely damaged pasture and forage crops this year appear to be equal to or perhaps worse than previous disaster periods.

The unusual "second growth" problems with the crops combined with the more drouth-resistant weeds, some of which are potent poisonous plants, will cause some animal health problems that are not the ordinary problems usually seen during the late summer and autumn, and into winter.

Jimson weed is so prevalent in some corn and soybean fields that it may prove risky to feed either the silage or green chop to cattle or sheep, and such poisonous plants cannot be fed to either swine or horses unless that toxic forage is diluted enough to avoid poisoning by the toxic plant. Jimson weed, dogbane, and most milkweeds are toxic for most animals at a range of 0.01 to 0.15% of the

animal's live weight; a fresh plant will kill many animals if eaten. Some samples of silage or fresh chop have more weeds than corn this season, and owners had best be aware of the hazards of poisonous plants.

## Be Aware of Excessive Nitrate in Forages

A problem often associated with drouth-stricken forages is that of excessive levels of nitrate/nitrite. The highest level that we have heard of so far in 1980 is about 7 1/2% as potassium nitrate, which was in corn. Perhaps a third of this may disappear in the silo during fermentation, but a quantitative analysis will be necessary before it is fed to cattle; it will be very important to know exactly how much nitrate is still present so the ration can be managed to reduce danger of acute toxicity, and to balance the ration in the proper way. There are excellent recent references for utilizing the drouth-damaged forages that also note good precautions necessary for avoiding loss of animals. Dr. Homer Sewell, UMC Extension Cattle Feeding Specialist, does a good workup on drouth corn silage in the July 17, 1980, *Beef Newsletter*. Dairymen may prefer to consult the *Dairy Newsletter*, July, 1980, in which Dr. Rex Ricketts discusses the same subject for those who own dairy cattle. Other timely guides are available to Missouri livestock producers for not much more than a mailing fee.

## Extreme Heat Was a Disaster For All

More than field crops suffered from the heat and dry weather—loss of both plant and animal life was heavy in pastures, orchards, forests, streams, and ponds which were severely damaged. Hundreds of animals and birds as well as fish perished during the extreme heat of July. Human beings died by the hundreds, too. "Old Timers" who remember the drouths of the past and who have experienced the 1980 drouths thought that this year may have exceeded the previous drouths in the extreme, extended, and unremitting high temperatures which were above 100°F for most of July and into August.

In some areas—but not all—there was no rainfall, and the damage to growing crops and pastures was as bad as any previously experienced. In Boone county, Missouri, weather bureau record after

record was set as we witnessed complete failure of many corn fields, greatly reduced soybean growth, and only early cuttings of hay. Pastures were nearly completely "burned to a crisp", and little if any hay carried over from 1979. The situation will be critical this winter for many producers.

## Water Quality and Drouth Problems

The extended drouth caused many streams and ponds to disappear or become so stagnant that such water was lethal to both wild and domestic animals. Some stagnant ponds were so anaerobic that bluegreen algae would not grow in them.

Bluegreen algal blooms become a definite hazard to man and animals during the late summer and fall. At certain periods, the "bloom" of algae has both "quick kill" and slower acting toxic principles. The best way to defend against loss of animals from such toxic algal growths is to avoid exposing the animals to such stagnant water sources. This natural hazard also claims much wildlife and fish during drouths. Fish are doubly vulnerable because of stress and loss of oxygen due to higher water temperatures than fish can tolerate. The fish farmer took a beating during the summer of 1980!

## Getting Ready for Winter

Winters that follow unusually hot and dry summers prove nearly as difficult as the summer itself for the animal producer and his livestock because the supply of grains and forages are likely to be deficient in both quality and quantity.

Feed analysis is the key to all other calculations when preparing a ration as livestock depend on what is left over from pre-drouth seasons. Much of what is available will be inferior as sources of protein, vitamins, and minerals.

Animals also need a wholesome source of water with the chill taken off by a heater during sub-freezing weather. Too many livestock owners do not realize the value of an adequate supply of wholesome water; few if any animals can cope with frozen water supplies—such management that permits this can cause disaster of another kind.

Hay supplies, especially big bales, should be carefully sampled because

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they may vary in content, keeping quality, and such abnormal principles as prussic acid, nitrate, or molds (some of which may be toxin producers). Oxalic acid may form in sorghum hay that is moldy, posing still another hazard to animals.

Hay, as defined by the Hay and Grain Trade Commissions, is seldom fed to animals; what is fed may be more properly defined as aftermath (what is left after the grain has been threshed from grass or clovers). The sorghum and corn fodders with seed (grain) missing is actually stover rather than hay. Stover properly supplemented can be used as roughage for cattle and sheep.

Horses can do very well on a good quality grass hay (like timothy) plus a small amount of grain (preferably clean oats). Growing farm animals need rations that are balanced for growth plus maintenance.

The reason that the feed analysis is so important is that even good appearing hay can vary as much as 30% in digestibility. Bird-resistant grains may be considerably less digestible than grains with less tannin, which are not bird-resistant. Grass and grass-legume hays vary greatly according to the stage of maturity when cut. It is not unusual for tall fescue hay, when cut at the same time grass hay should be cut (when 2/3's out of the boot), to compare favorably with other grass hays, but if allowed to mature, it can be as unattractive as broom sedge and about as indigestible. Cutting grass hays at or before the bloom stage also eliminates ergot that forms in grass seedheads—a real plus.

There are many good references available for proper handling of hay and grain to avoid storage problems such as insects, molds, and other forms of spoilage. So, those situations will not be discussed further than to say, "Get a forage analysis before making any suggestions about ration management." Such an analysis is an absolute MUST for veterinarians as well as other persons advising producers about fall-winter-spring ration management problems.

### **It Is All We Have— How Can We Feed It?**

Quite a few veterinarians have mentioned that livestock owners have asked how to best utilize drouth-stricken corn, milo, or soybeans as either hay or silage (or perhaps as fresh chop). To make use



*Drouth-withered corn in Boone county. Such corn may concentrate nitrates, making it a risk for feeding livestock.*

of such crops is taking a calculated risk, but the owner may have little choice left. Then it becomes a matter of evaluating the risk of possible loss by decreased growth, lowered production, or perhaps actual death.

Definite guidelines may be followed. Drouth-stricken forage and grain will be reduced in quality and quantity. Corn and sorghums especially may have a very high nitrate content, which means nitrite potential. Prussic acid potential for sorghums should always be kept in mind. Nitrates and prussic acid can be tested for their presence in feed.

If they are present, then, "how much" becomes important so that the toxic principle can be "worked around" to avoid toxicity in the animals. If qualitative tests show either nitrates or hydrogen cyanide to be present, then one needs to make quantitative tests. One also needs the regular feed analysis in hand before giving advice on rations.

### **Special Problems of the Dairy Producers**

Doubtless, dairy producers have one problem that beef and pork producers do not have to contend with. The dairyman's milk not only has to be wholesome in all respects but its taste and odor must be acceptable to those who will consume it. Dry seasons may add to the problem because many weeds along with regular forage plants (such as clovers) develop

strong taste and odors in hot, dry weather that impart such aspects to the milk of cows which graze such plants. This problem is in addition to the usual complaint of lowered milk production during hot, dry weather.

Recognition of the cause is the key to correction. If the offending plant can be identified, then management of the herd to avoid that species until after milking is a logical way to correct the off taste or odor. Examples of plant species that affect palatability of milk are bitterweeds, many of the mustards, sweet clover (under drouth conditions), dandelion, poison hemlock, some of the ragweeds, and any of the strongly scented plants. A percentage of jimson weeds and milkweeds small enough so that cattle are not poisoned may be enough to give an unpleasant taste to the milk, and this problem may be bad in the drouth season.

If cows have access to hardwood pasture, white snakeroot can lead to problems. When this country was being settled, white snakeroot caused thousands of deaths in the autumn. White snake-root produces trembles in animals and vomiting or milk sickness in human beings. It is usually a problem of of "one family with a cow or milk goats" in this age. Though, each fall some horses, cattle, and sheep are affected where farm animals are allowed to run in the hardwood pastures along the great river valleys.

## Dr. Wagner Appointed to Review Board

Dr. Joseph E. Wagner has accepted an invitation to serve as a member of the Animal Resources Review Committee of the Animal Resources Branch, Division of Research Resources, the peer review system for grants and contracts for the National Institutes of Health (NIH). Dr. Wagner is Professor of Veterinary Pathology at the College. His four-year appointment to this national-level committee became effective August 1, 1980.



The mission of the Division of Research Resources, of which the Animal Resources Review Committee is part, is to identify and meet the research resource needs and opportunities of NIH by creating and developing the availability of those resources that are essential for efficient and effective conduct of human health research, especially as animal models are used in studying aspects of human disease. The committee to which Dr. Wagner belongs provides primary scientific and technical merit reviews of grant and contract proposals requesting federal funding.

Among his responsibilities at UMC, Dr. Wagner is Director of the Research Animal Diagnostic and Investigative Laboratory which is in its 12th consecutive year of funding by the NIH Division of Research Resources.

## New CE Coordinator for College

Ms. Terry Andre-Robertson is the new Coordinator of Continuing Education for the College. She began work on July 21, and replaces Ms. Carol McAllister.

Ms. Andre-Robertson received her B.S. degree in Physiology in 1972 from the University of California at Davis. She moved to Columbia from Coos Bay, Oregon, where she had worked in public relations for broadcast media.



In addition to working in broadcast media, Ms. Andre-Robertson has been employed as a medical technologist. In that capacity, she has designed a junior college course in hematology, and has set up an organization of laboratory personnel for educational purposes.

Her husband, Dr. John Robertson, has recently been appointed to a residency position in small animal surgery at the College.

# Parasites on Television

## Videotapes Add Flexibility to Dr. Corwin's Schedule

Parasitology lectures are being videotaped, thanks to a \$4,024 grant to the College from the Alumni Development Fund Board. For instructional improvement in parasitology, Dr. Robert Corwin is videotaping 64 of his lectures and several lectures by visiting parasitologists in addition to developing visual material for teaching parasitology to second-year veterinary students. The programs will be ready for the sophomore class in spring, 1981.

However, the videotaped lectures will not replace 'live' lectures by Dr. Corwin for that course. Instead, Dr. Corwin explained, these videotaped lectures will supplement conventional lectures. They will also allow Dr. Corwin a degree of freedom when facing conflicting responsibilities of teaching and attending outside programs in his specialty.

"This is part of the problem the Col-

lege faces in being 'one-deep' in certain disciplines," Dr. Corwin said, "there is no other parasitologist at the College who can teach the students should I want to go to an out of town meeting for my own professional development." With lectures on tape, Dr. Corwin can be away for several days but not short-change the students' education.

Dr. Corwin explained that an additional benefit of videotaping the parasitology lectures will be the opportunity to develop more visual material than is used now. Furthermore, by being able to see and hear himself, Dr. Corwin can refine his lectures.

Another bonus is that several lectures by nationally-recognized experts in parasitology and related fields are being recorded on tape. Instead of a one-time appearance, these guests will be heard and seen by students for years to come.

The Academic Support Center of the University is helping Dr. Corwin prepare the videotapes.

## Pseudorabies: A Threat Not to Be Ignored

### Swine Industry in Europe Hurt—Same for U.S. in 1984?

Research continues at the College on pseudorabies in Missouri swine. Dr. David Thawley, veterinary microbiologist, is currently monitoring several herds of pigs in this state for effectiveness of several different methods for control of pseudorabies.

But why continue research on a problem that, as Dr. Thawley said, affected a mere five percent of swine herds in Missouri in 1979?

"We don't want in this country the sort of problem that Europe is now experiencing," replied Dr. Thawley. "Today, we're in the sort of situation that Europe was in just a few years ago when pseudorabies was found in only a few herds there. If we are to avoid the situation now present in Europe where in many countries the majority of swine are pseudorabies seropositive and the disease causes financial losses of millions of dollars annually, it is critical that we act now to obtain the information necessary for the basis of sound control practices."

Under a \$63,990 grant awarded in 1978 from the U.S. Department of Agriculture (USDA), Dr. Thawley and his associates are analyzing the health of several herds of pigs on which different methods of pseudorabies control have been attempted.

Two of the methods involve use of vaccine; the third method is 'test and

removal'—following blood testing, seropositive animals being separated from seronegative ones, with periodic retesting; the fourth method is 'depopulation'—shipping the entire herd off to market if a few seropositive animals are found and then restocking; the final method is really no method at all—for comparative purposes no control measures have been taken on one herd.

Of all the methods, test for and removal of seropositive animals appears to be working best at this time. "In most instances, depopulation is an unnecessary extravagance," remarked Dr. Thawley, because very few swine producers have totally-house intensive production facilities which are conducive to rapid, wide-spread infection. "As long as there is some segregation of age groups, test and removal works," stated Dr. Thawley.

A significant finding, though, is that test and removal seems to be more effective in overall control of pseudorabies than vaccination. Observations made by veterinary researchers in the United States and Europe support this finding.

The number one stumbling block to vaccination as Dr. Thawley pointed out is that infected hogs are indistinguishable from vaccinated hogs with the standard blood test. So, with a statewide or nationwide vaccination program, how can anyone then measure the extent of

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# College Introduced Minority Students to Veterinary Medicine

For the second consecutive year, the College has brought to its campus minority students from around Missouri to acquaint them with the profession of veterinary medicine. This year, five minority high school students observed and involved themselves in various activities of the College, especially the Teaching Hospital, from July 6 to August 2.

Dr. Kenneth Niemeyer, Assistant Dean for Students and Alumni Affairs, directed this summer's minority student project. He explained the value of this effort: "The students were exposed to veterinary medicine from the inside and were given the opportunity to have experiences otherwise not available until entering a veterinary college. Specific goals of the project were to provide students with experiences which increased

the likelihood that they will view the health sciences as a viable career option and to make the students aware of the opportunities available on this campus for training in health careers, especially veterinary medicine."

The five students spent much of their time with assigned faculty watching those veterinarians work and teach. In addition, students participated in a learning skills diagnostic program provided by UMC's Education Resources Group.

The students were provided a stipend, a room and board in dormitories adjacent to the UMC Health Sciences Center.

Funds for this project were made available by the UMC Chancellor's Office and the Rockefeller Foundation—Howard University Minority Students Program.



Taking a sow's temperature (L to R) Dr. Ronnie Elmore, Assistant Professor (UMC), Mr. Robert Sheard, (Hayti, MO), Mr. Jerry Goodrich (Marston, MO), and Mr. C. Marvin Cobbs (St. Louis, MO).

## Pseudorabies, cont.

pseudorabies infection and detect naturally-infected hogs?

On top of that problem, other questions regarding vaccination have arisen. Does vaccination result in good protection in light of the observation made that serum antibodies to pseudorabies virus are low and occasionally non-existent in vaccinated pigs. Coupled with that question, could antibody immune responses be less important than cellular immune responses, which cannot be measured by a regular blood test? Does an immune response in young piglets passively acquired from their vaccinated dam affect vaccination of the piglets?

## Dr. Morehouse Appointed to Board of Directors

When the World Association of Veterinary Laboratory Diagnosticians was founded on June 26, 1980, in Lucerne, Switzerland, organizers selected Dr. Larry Morehouse to be one of five members of the new association's board of directors. Dr. Morehouse, who is in charge of the Veterinary Medicine Diagnostic Laboratory at the College was selected for the post in recognition of his international reputation as a veterinary laboratory diagnostician and administrator.

Dr. Morehouse had been President in 1978 and 1979 of the American Association of Veterinary Laboratory Diagnosticians, and in that role he contributed to developing the program for the 2nd In-



To study these last questions, USDA awarded an additional grant of \$29,925 in April, 1980, to Dr. Thawley.

These issues raised concerning vaccination are of great importance. Since early in 1977 sentiment among American swine producers and several animal health experts has swung away from eradication of pseudorabies by test and removal to control and containment of the disease by use of vaccines. Most major hog-producing states now permit use of pseudorabies vaccine.

However, Dr. Thawley, along with many other swine health experts, continues to worry that what has happened in Europe could very well engulf this

international Symposium for Veterinary Laboratory Diagnosticians. More than 400 diagnosticians from more than 20 nations attended that program last June in Switzerland.

So that more such international meetings will be held in the future is an important reason, according to Dr. Morehouse, that the World Association of Veterinary Laboratory Diagnosticians was formed. He stated: "A true international organization of diagnosticians will insure continuity in developing future international symposiums."

Dr. Morehouse added that the new World Organization will encourage dissemination of diagnostic laboratory information to all interested nations, and that it will promote training and international exchange of diagnostic laboratory personnel.

country. European swine producers began using vaccines years ago to contain what was then a nuisance of pseudorabies. That nuisance has swollen into a multi-million dollar problem under their vaccination programs. Now, some European swine health experts urge use of test and removal to bring pseudorabies under control in their countries.

Dr. Thawley's attitude toward pseudorabies in the United States, an attitude shared by many in USDA, is to "hit it on the head while it is still vulnerable. Think of the effort expended now as a sort of insurance policy. Otherwise, within five years this could be a disease we have to spend considerable sums on to control—and then it may be too late to economically eradicate."

## Dr. Kier Becomes Diplomate

Dr. Ann Kier passed the certifying examination to become a Diplomate of the American College of Laboratory Animal Medicine. She was one of 51 individuals taking the examination; 19 passed.

Dr. Kier is an Assistant Professor in the Department of Veterinary Pathology. She received her DVM degree in 1977 from Texas A&M University and her PhD degree from the University of Missouri-Columbia in 1980.



# Possible Adverse Reactions to Two Canine Anthelmintics

Frank J. Thomeczek, DVM, and  
Philip Roudebush, DVM,  
Dept. Veterinary Medicine and Surgery

Bunamidine<sup>a</sup> and Butamisole<sup>b</sup> are two commonly used canine anthelmintics. Bunamidine is effective against all common cestodes while butamisole is effective against hookworms and whipworms. Bunamidine and butamisole generally offer minimal side effects and contraindications, but their use is not without some danger.

On October 31, 1979, a 2½-year-old spayed female Golden-Black Labrador Retriever mix was presented to the University of Missouri Veterinary Teaching Hospital for routine vaccination. The physical examination revealed a 82 pound, alert, healthy-looking dog. Tapeworm segments were noted below the anus. The dog was vaccinated and bunamidine was dispensed for treatment of the tapeworm infection at home. The client was instructed to fast the dog 3 hours before and after the bunamidine treatment.

Approximately 3 weeks later, the client called the Veterinary Teaching Hospital. Her husband had administered the bunamidine the previous evening. That morning he had taken the dog with him for a morning run, as he had often done before. After a short distance of running the dog collapsed and died. A necropsy was not performed; however, the client was interested if the bunamidine treatment could have been responsible for the dog's death.

A review of the literature revealed that bunamidine has previously been as-

sociated with sudden death in dogs.<sup>1,2</sup> These deaths have a similar history of previously healthy dogs being treated with bunamidine and then later having a sudden death following either excitement (going home with the owner after hospitalization or boarding), or exercise. It is felt that bunamidine sensitizes the myocardium to endogenous catecholamine release, causing ventricular arrhythmias and fibrillation during exercise or excitement.

This unrecognized risk of bunamidine should be considered by the veterinarian before dispensing or administering this anthelmintic. A veterinarian should institute precautionary measures of avoiding undue excitement or exercise for a minimum of 48 hours following bunamidine administration. Treatment of overly excitable dogs or animals with known cardiac disease is probably contraindicated.

There are also indications that bunamidine enhances the toxic effects of butamisole.<sup>3</sup> The toxic effects of butamisole (6 times the recommended dose) in

healthy beagles were found to include weakness, paresis, ataxia, muscular tremors, sternal and lateral recumbency, respiratory difficulty, and a high incidence of death.<sup>3</sup> Beagle dogs given 6 times the recommended dose of bunamidine exhibited emesis only. When these dogs were simultaneously given the recommended dosage of bunamidine and butamisole, the toxic effects noted were those of butamisole toxicosis.<sup>3</sup> Thus, it is recommended that bunamidine not be administered to a dog until at least 24 hours after the administration of butamisole.

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## Mycotoxin—IBR Relationship to Be Studied

Although cattle may not show signs of toxicosis from eating feeds contaminated by the fungus, *Fusarium*, the cattle may become more susceptible to one of the diseases of the bovine respiratory diseases complex, infectious bovine rhinotracheitis (IBR). To study the suspected mechanism by which toxins such as T-2 and diacetoxyscirpenol produced by *Fusarium* may alter immune responses of cattle, Dr. Gerald Buening, veterinary microbiologist at the College, has been awarded a \$66,267 grant from the U.S. Department of Agriculture.

This grant was the only Special Grant awarded by USDA to the College this year. For receiving the Special Grant, Dr.

Buening's proposal underwent review by veterinary researchers and administrators nationwide.

Bovine respiratory diseases, of which IBR is one, cost the American cattle industry over \$250 million each year. Death loss results in 220 million pounds of carcass beef lost annually.

Other College researchers working with Dr. Buening on this three-year project will be Dr. Bruce Rosenquist, who has worked for years in bovine respiratory diseases, and Dr. Gary Osweiler, who is now doing related research on defining toxic levels of *Fusarium*. Dr. Douglas Mann, graduate student, will also assist.

## Veterinary Medical Review

College of Veterinary Medicine  
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