

# Veterinary Medical Review

College of Veterinary Medicine and Cooperative Extension Service



What Donations Can Do for the College

## University of Missouri-Columbia

The Student Lounge is a place for anyone at the College to relax, meet with friends, or even study, as Kathleen Gentry (VMII) is doing. The Lounge was furnished from funds donated by alumni and friends of the College. Through the years the support of donors has been vital to the College's welfare. For that story, see page 3.

The First Annual Research Day was held April 6, 1978, and was a unique day for the College. For the first time in the College's history original research by professional-level and graduate students was recognized. For more, see page 2.

May/June, 1978, No. 106

# Research Day



Dr. William Miner (C) presents a check for Beecham Laboratories contribution for Research Day to Dr. Vincent St. Omer (L) as Dean Kenneth Weide (R) looks on.

The College held the First Annual Beecham-Phi Zeta Research Day on April 6. The program was a success according to those who attended readings of students' final reports.

Beecham Laboratories and Phi Zeta Honorary Veterinary Fraternity cooperated with the College to sponsor the student research program. Any student enrolled in UMC's Veterinary College was eligible to complete an original research project and prepare a final paper for reading on Research Day. Sixteen students completed research projects.

Student researchers were divided into two groups, professional and graduate. They competed for cash prizes for the best research papers. Winners were chosen by a panel of four judges and were recognized at the annual Phi Zeta banquet the evening of April 6.

In the professional-level group, first place winner was Stephen Becker (VMIV), "Epidemiological Features of Canine Hydrocephalus"; second place was Dennis Hacker (VMIV), "A Comparison of Conjunctival Culturing Techniques in the Dog"; third place were Lettie Neuhauser (VMII) and Anthony Weiss (VMII), "Effect of Ketamine in Cats When Used in Conjunction with Lenperone (Elanone-V) and Methotrimeprazine (Leovoprone)".

In the graduate and resident category, first place was shared by David Francis (Research Assistant, Microbiology), "Characterization of the Immune Response

of Cattle to Several Anaplasma Vaccine Preparations", and Dr. Erick Egger (Resident, Medicine and Surgery), "A Surgical Approach for Prevention of Growth Deformities Caused by Premature Closure of the Distal Ulnar Physis". Third place was given to Ron Marshall (Research Assistant, Microbiology), "Characterization of Reo-like Virus Isolates".

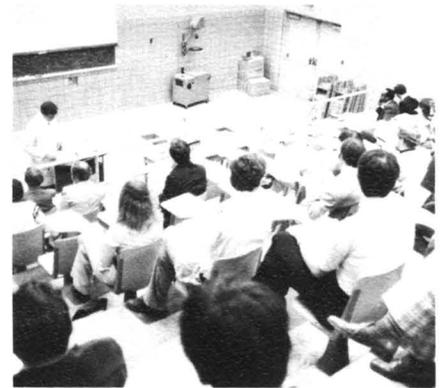
## Dean Becomes President-Elect

Dr. Kenneth D. Weide, Dean of the College, was elected President-Elect of the Intermountain Veterinary Medical Association. He was chosen during that organization's 50th Western States Veterinary Conference held in Las Vegas, Nevada, March 6 - 9, 1978.

Dr. Weide has been on the IVMA's Board of Directors since 1972 when he was on the faculty of the University of Arizona. He is also serving as Program Chairman. Dr. Weide has been Dean of the College since 1973.

The Las Vegas meeting attracted 3,010 people, including 1,480 veterinarians and 222 veterinary technicians. This was the largest meeting in the history of this conference program. The meeting offered a wide variety of workshops and seminars as a continuing education effort to update veterinarians and technicians of the latest techniques and knowledge in the profession.

The IVMA is the third largest organiza-



Audience in Teaching Hospital Auditorium listen to presentation made by the first student, Mr. Dennis Hacker, on the First Annual Research Day.

Drs. V. V. St. Omer and M. J. Bojrab, both on the College faculty, and Dr. William Miner, Beecham Laboratories, were instrumental in promoting Research Day.

The reason for Research Day, according to Dr. Bojrab, is that: "Research is the backbone of progress and advances in any science field. It is essential, therefore, that we stimulate and encourage increased investigative endeavors at the University of Missouri College of Veterinary Medicine."



Dr. Kenneth Weide, President-Elect of IVMA, stands with Dr. James Wommack (L), President, and Dr. Richard Tolley (R), immediate past President.

tion of its kind in this country. It was started in 1928 and within the past ten years has become nationally oriented.

In addition to Dr. Weide, other officers elected were: Dr. James Wommack (Maryland), President; Dr. Phillip Morgan (Oregon), 1st Vice President; Dr. Richard Hall (Idaho), 2nd Vice President. Dr. Weide will become President at the IVMA's next conference in 1979.

# Donations Provide Vital Aid for the College

## Gifts Support Several Needed Functions and Improvements

Throughout its 32-year history, the College of Veterinary Medicine has been helped by its alumni and friends.

The Office of Assistant Dean for Student and Alumni Affairs helps to guide that support for the College. That office is also a vital communications tie between the College and the University's Development Fund Office.

A donation from an alumnus or friend can be made for the direct benefit of the College. Dr. Kenneth Niemeyer, Assistant Dean for Student and Alumni Affairs, said that a number of the College's graduates have been confused about the difference between the fund-raising activities of this College and the University-wide Development Fund Office. These people have been concerned that their donations, intended to help the College, would be routed away from their goal. "I want to stress," stated Dr. Niemeyer, "that any gift specifically designated to go to the College of Veterinary Medicine will not go anywhere else."

Since 1974, Dr. Niemeyer's office has been assisted by the College of Veterinary Medicine Development Committee. The purpose of this committee is to initiate and coordinate fund-raising activities in behalf of the College. The committee is comprised of alumni from throughout Missouri, leaders of special interest groups, and representatives of the College's administration and faculty.

The University's Development Fund Office (an office distinct from this College's Development Committee) has given its full support to the College's fund-raising activities. Mr. John Sweeney, Director of the University's Development Fund, remarked that his office encourages any potential donor to specify a particular program anywhere within the University.

Donations are not mere icing on the College's financial-support cake. Although this institution is basically supported by state dollars, slightly more than \$3 million were provided for the College by state appropriations in the more than \$5 million total budget for fiscal year 1975-76. Federal funds and contracts help make up the difference. But the last gap in the College's financial support must be filled by private donations.

Private gifts have played a major role in developing the Equine Center, establishing residency positions, providing for spe-

cial equipment such as student microscopes and safety equipment, remodeling, and financing several other necessary functions.

Private funds furnished the College's Student Lounge and the Alumni-Friends Conference Room. The state provided the \$6.4 million necessary to build two new buildings. The College's Development Committee, as its first project, organized and promoted a fund-raising dinner that brought in over \$15,300 to furnish those rooms.

For its second project, the Development Committee has chosen refurbishing of the reception area and examining rooms of the Small Animal Teaching Hospital. More than \$16,000 are needed and to date more than \$10,790 have been raised.

To help raise money for the many different activities and improvements, the College's Development Committee and Dr. Niemeyer's office have developed several different donation programs.

The *Continuous Giving Program* was established to encourage alumni and friends to think of the College every year. Donations of any amount are accepted. Those who donate \$100 or more are given an engraved plaque with a tab at the bottom which denotes the year they gave. Each year a donor gives another \$100 or more, that person receives another tab. Different categories of donations are also noted on the tabs: Donor—\$100 to \$249, Sponsor—\$250 to \$499, Patron—\$500 to \$749, and Benefactor—\$750 or more.

The University's Development Fund Office has set aside a special chapter of the *Jefferson Club* for the College of Veterinary Medicine. Those people who pledge at least \$10,000 are entitled to become members of the Jefferson Club (or pledge \$20,000 as deferred gifts—wills, insurance, etc.). Since last December, two individuals have become members of this chapter of the Jefferson Club.

Classmates and friends who wish to honor a deceased alumnus can now contribute to the recently established *Veterinary Memorial Fund*. A memorial scroll for this special fund is currently in preparation. As with any donation, a special project can be chose by contributors.

In honor of the late Dr. Bill Clark, his family, friends and classmates gave over \$6,000 to furnish and equip a special



*Members of the Veterinary Medicine Diagnostic Laboratory staff meeting in the Dr. Bill Clark Memorial Conference Room.*

conference room in the Veterinary Medicine Diagnostic Laboratory. This room has been named the Dr. Bill Clark Memorial Conference Room.

Donations have provided the much-needed boost for many of the improvements at the College.

For more information, please contact:

Office of Assistant Dean for Student and Alumni Affairs  
College of Veterinary Medicine  
University of Missouri-Columbia  
Columbia, MO 65211



*The James H. Woods Foundation provided a grant to the College to fund a residency program in Veterinary Ophthalmology, beginning July, 1978. This program will train a veterinarian for two years under the guidance of the College's ophthalmologist, Dr. Harlen Jensen.*

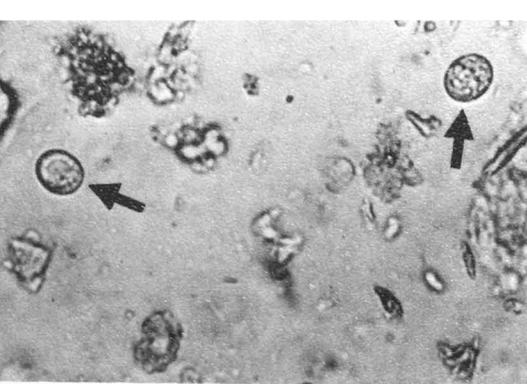


Figure 1. Fecal flotation in sucrose solution 1.15 sp. gr. demonstrating *Toxoplasma gondii* oocysts, 7-9 microns X 10-14 microns at 43X.

Toxoplasmosis is a protozoan disease caused by a tiny crescent-shaped parasite called *Toxoplasma gondii*. The organism was incriminated as the cause of encephalitis and chorioretinitis in man in 1939, and was first reported in the cat in 1942.<sup>7</sup> In 1970, it was shown that *Toxoplasma gondii* reproduced sexually in the intestines of cats and that cats shed oocysts in their feces (Figure 1).<sup>8</sup>

The life cycle of toxoplasmosis is important in understanding the pathology, transmission, and prevention of this disease.<sup>7</sup>

Cats can become infected by ingesting either tissues of infected animals or sporulated oocysts. In nature cats probably become infected mainly by preying on infected hosts such as rodents, rabbits, and birds. Cats shed oocysts within one week after ingestion of cysts and continue to shed oocysts for 1-2 weeks. The oocysts are infectious to most birds and mammals, including man. Toxoplasmosis can be transmitted to intermediate hosts in three ways: ingestion of sporulated oocysts, carnivorousness and transplacental transmission. Transplacental transmission is more common and most important in man, sheep and mice.

The cat, an important host of toxoplasmosis, is necessary for sexual reproduction of the parasite and is the only species that sheds *Toxoplasma* oocysts. Sixty-four percent of the cats in the United States have antibody titers to *T. gondii* but only 1% or less shed oocysts at any given time.<sup>2</sup> The possibility of contaminating the environment with oocysts with resultant transmission of toxoplasmosis to man makes the feline important in this disease.

Young cats with no immunity to toxoplasmosis shed oocysts at their first infection. After becoming infected and shedding oocysts, cats develop a partial cell-mediated immunity and become carriers of the organism. Reactivation of a latent infection and reshedding of oocysts can occur with immunosuppression caused by

steroid therapy, superinfection with other microorganisms especially *Isospora felis*,<sup>7</sup> or with other feline diseases, such as feline leukemia virus, or feline infectious peritonitis.

*Toxoplasma* infection is usually acquired via the gastrointestinal tract, and the organisms multiply in the intestines, lungs, and liver. The most frequent signs of toxoplasmosis are associated with infection of the nervous, visual, respiratory, and gastrointestinal systems. In cats, encephalitis, dyspnea, anemia, fever, bilirubinemia, uveitis, and chorioretinitis are clinical signs often associated with toxoplasmosis.<sup>9</sup> Seizures, blindness, hind limb paresis, and muscle atrophy with lower motor neuron signs have all been reported in affected dogs and cats. Some animals present with gastrointestinal or hepatic signs while others present solely for a myositis. Many *Toxoplasma* infections in cats are subclinical, however.

Cats may be presented to the veterinarian for ocular lesions only. Heavy ocular discharge and an anterior uveitis may be present, although, ocular toxoplasmosis may involve any portion of the eye (Figure 2). The anterior uvea is most commonly affected, but retinal and choroidal lesions are also common and may be the only intraocular sites (Figure 3). Cats with severe anterior uveitis due to toxoplasmosis usually present with blepharospasm, photophobia, and epiphora. Upon examination, there will be an aqueous flare, keratic precipitates, iritis, hypopyon and hypopyon (Figure 2). All of these findings are consistent with anterior uveitis. The differential diagnosis of anterior uveitis in the feline must include trauma, mycotic infection, lymphoma, feline infectious peritonitis and toxoplasmosis. If physical examination reveals no other lesions consistent with trauma, fungal infection, or neoplasia, and the plasma protein is less than 7.8 gm/dl, a toxoplasmosis titer should be obtained.

At the present time, there are only two ways of diagnosing toxoplasmosis in the live cat: 1) fecal examination and 2) serologic examination for antibodies to the organism. Two important considerations when examining cat feces for *Toxoplasma* oocysts are the proper identification of oocysts because of their public health significance and the safety of personnel doing fecal examinations. One of the better

## A Practical Review

In 1975, the Highest Number of Cases of Toxoplasmosis

techniques for demonstrating *Toxoplasma* oocysts is to use a sucrose flotation solution of 1.15 specific gravity. The sample is evaluated for oocysts which are 7-9 microns x 10-14 microns at 43X.<sup>3,4</sup> The *Toxoplasma* oocyst is the smallest feline oocyst and is approximately twice the diameter of the feline erythrocyte. It is often helpful to add a small amount of a feline blood saline suspension to the slide and compare oocyst size to the erythrocytes. A presumptive diagnosis of toxoplasmosis can be made if oocysts measuring 10-12 microns are found in cat feces. For a definitive diagnosis, however, feces should be sent to a laboratory for intraperitoneal mice inoculations. If a cat is found to be excreting oocysts, the cat should be euthanized, or confined to a cage until no oocysts are detected in the feces for three consecutive days (cats shed oocysts for 1-2 weeks), and the feces should be sanitarly disposed of daily.

When a serum antibody titer is desired, a 5 ml serum sample is needed. Preservatives should not be added to the sample. Cats usually do not develop detectable antibody titers to *T. gondii* while shedding the oocysts, unless they are reshedding due to immune suppression. Paired serologic examinations should be done 5 weeks apart, and a four-fold increase in the titer is highly suggestive of toxoplasmosis. In Missouri, serum for toxoplasmosis screening should be sent to the Division of Health, Broadway State Office Building, Jefferson City, Missouri.

A satisfactory treatment for toxoplasmosis is *not* available. Sulfadiazine\* and pyrimethamine\*\* are two recommended

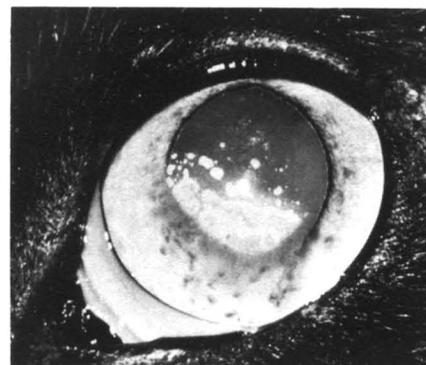


Figure 2. Anterior uveitis with aqueous flare, keratic precipitates, iritis, hypopyon, and hypopyon in a cat with toxoplasmosis.

# of Toxoplasmosis

## smosis in Humans Was Reported From Missouri

drugs for therapy. Sulfadiazine at 60-120 mg/Kg divided 4-6 times per day in combination with 0.5-1 mg/Kg/day pyrimethine for two weeks has been used. Pyrimethamine is often toxic and unpalatable to cats, however. Since pyrimethamine is an antimetabolite and folic acid inhibitor, it has been suggested that folic acid be supplemented.\*\*\* None of the available antitoxoplasmic drugs can be relied upon to prevent or stop the formation of *Toxoplasma* oocysts. While these drugs do reduce the numbers of oocysts shed in the feces, euthanasia is often recommended due to the public health importance.

### Public Health Significance

Human toxoplasmosis occurs most commonly in babies infected *in utero*. Prenatally acquired infections are usually serious in man, resulting in visual impairment, encephalitis, and mental retardation. Therefore, preventative measures are more important for women of childbearing age.<sup>7</sup> The major ways in which man acquires toxoplasmosis are through handling and consumption of raw or undercooked meat, and through contact with

feces from cats shedding oocysts of *Toxoplasma gondii*.

Ocular toxoplasmosis is probably the most important cause of posterior uveitis in man and many cases of toxoplasmic chorioretinitis are reported every year.<sup>5, 10</sup> In 1970 there were 130 cases of human toxoplasmosis reported from 21 states. In 1975 there were 388 cases reported from 16 states. The highest number (137) of these cases was reported from Missouri. In 1976 there were 607 cases reported from 20 states. The highest number (316) was reported from Alabama, while the second highest (127) was reported from Missouri.<sup>1</sup>

Congenital toxoplasmosis in man is rare, with an incidence of approximately one in every 1,000 pregnancies. It has been estimated that about 3,000 babies are born with toxoplasmosis in the United States each year. However, that number may be reduced by better client education and by early diagnosis of infected cats by the practicing veterinarian.

R. David Whitley, D.V.M.  
Intern

\*Suladyne,<sup>R</sup> Stuart Pharmaceuticals.

\*\*Daraprim<sup>R</sup>, Burroughs-Wellcome

\*\*\*Folinic Acid 1 mg/Kg/animal/day or Baker's yeast 100mg/Kg/animal/day

### To prevent toxoplasmosis:<sup>2, 6</sup>

- 1) Meat should be heated to 150°F (66°C) throughout before eating, and hands should be washed with soap and water after handling raw meat to remove any toxoplasma organisms contaminating the skin. Toxoplasmosis has never been isolated from beef in the United States.
- 2) Infections of indoor cats can be prevented by feeding them dry, canned, or boiled food and by preventing them from hunting.
- 3) If the diet cannot be controlled, an indoor cat's litter pan should be cleaned daily. Feces should be flushed down the toilet, and the litter pan disinfected with boiling water. The household should have two litter pans so that one can be in use while the other one dries. A person should wear disposable rubber or plastic gloves when cleaning up after cats, and pregnant women should not carry out this task.
- 4) Contaminated sand in children's sandboxes should be disposed of and sandboxes should be covered when not in use to prevent oocyst contamination.
- 5) Gloves should be worn while gardening and handling soil.
- 6) Pregnant women should avoid cats whose source of food is unknown and should not empty litter pans. Kittens should not be added to the household with a pregnant woman. It may be advisable to suggest that the concerned or pregnant client see a physician or county health office for a titer to toxoplasmosis.
- 7) Cockroaches, flies, snails, earthworms, rodents, and stray cats should be controlled since they can act as transport hosts.
- 8) Dogs and other non-feline pets do not directly transmit toxoplasmosis to man.

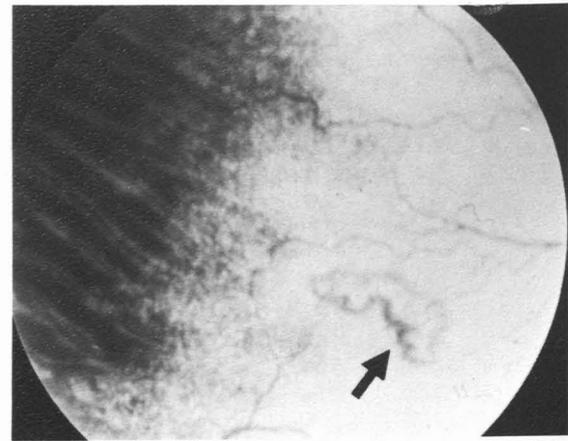


Figure 3. Area of chorioretinitis attributed to *Toxoplasma* infection in a feline.

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### Faculty Publish

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Garner, H. E., Hutcheson, D. P., Coffman, J. R., Hahn, A. W., and Salem, C.: "Lactic Acidosis: A Factor Associated with Equine Laminitis", *J. An. Sci.*, 45, 5:1037-1041.

Barton, C. L., Smith, C., Troy, G., Hightower, D., Hood, D.: "The Diagnosis and Clinicopathological Features of Canine Protein - Losing Enteropathy", *JAAHA*, 14, 1:85-91.

## Graduate Student Wins Research Award

David Benfield, Ph.D. candidate in Veterinary Microbiology, received first place award for his paper, "Activation of Latent Herpesviruses from Explant Cultures of Gonads and Ganglia of Turkeys." The paper was presented on March 17 in campus-wide competition that was jointly sponsored by the Missouri Branch of the American Society of Microbiology and the Area of Microbiology at UMC.



Mr. Benfield

Mr. Benfield was presented a scroll, a plaque, and a cash award of \$100.

Before coming to UMC in 1976 to study with Dr. Hans Adldinger, Mr. Benfield received his B.S. and M.S. degrees from Purdue University.

## Visiting Lecturers



Dr. Kahn



Dr. Lewis

The College's Visiting Lecturer's Series and the Student Chapter of the A.V.M.A. gave students and faculty the chance to hear two unique experts.

Dr. Donald Kahn spoke on "Feline Respiratory Diseases" February 9. Dr. Kahn is Head of Virological Research, Pitman-Moore, Inc.

On March 16, Dr. Hugh Lewis, staff pathologist for Smith-Kline-French Laboratories, gave an unforgettable presentation on "Autoimmune Diseases".

## Veterinary Museum in Jefferson City

Missouri's only museum of veterinary medicine is now open. It occupies the second floor of the old Gentry home, a 150 year-old renovated structure located at 1221 Jefferson Street in Jefferson City. This former residence is also the headquarters for the Missouri Veterinary Medical Association.

The museum was established by the Missouri Veterinary Medical Foundation,

# A Cow's Environment May

## Toxicologist Completes Penta Investigation

On March 11, 1977, the Michigan Department of Agriculture suspended registrations of commercial pentachlorophenol (penta or PCP) in that state after several dairy farms suffered herd health problems. One farm lost 70 out of 200 head. During initial investigations, small amounts of penta residue were found in blood samples taken from cattle. Penta treated wood was used extensively in the construction of some of the barns that had housed the affected herds.

Dr. Gary Van Gelder, toxicologist and Professor of Veterinary Anatomy-Physiology, participated in the Michigan investigation from the beginning (as reported in May/June, 1977, and September/October, 1977, issues of *V.M.R.*).

By means of field investigations and laboratory testing, Dr. Van Gelder has shown that penta treated wood was not the cause of cattle health problems.

In laboratory tests, dairy cows were exposed to more penta and penta impurities in 14 days than the Michigan dairy herds were exposed to in 90 days.

Results revealed no adverse effects on the cows and also demonstrated the rapid elimination of penta from the animals' bodies. Additional studies involving laboratory animals supported those results.

After analyzing the results of these tests in addition to other evidence, the Michigan Department of Agriculture hearing officer, Dr. Gilbert Wise, stated in his report: "No evidence was developed showing that wood preservative formulations containing penta have presented demonstrable risk to the food chain through exposure of food animals to CDD [a penta

impurity]. ...levels reported to date from food animals indicate no identifiable hazard to human health."

Dr. Wise went on to say: "Pentachlorophenol, a known toxic substance, has not been made an issue in this proceeding." Nonetheless, he recommended "that efforts be directed to implementation of labeling requirements and other regulations and consumer information actions that will reduce exposure to penta through insistence on proper use."

Dr. Wise recommended that the cancelled registrations be reinstated.

Dr. Van Gelder feels that there were multiple causes of health problems, including inadequate ventilation in total-confinement barns in cold climates coupled with high humidity and crowding. Also, consideration should be given to lack of exercise and adequate bedding for the cattle, and to bulk group feeding and subsequent spread of infectious diseases.

*Ed. note: As a result of his studies of the Michigan dairy herd health problems, Dr. Van Gelder has concluded that these problems are the result of more than a single environmental factor. In the following article and in articles that will appear in upcoming issues of V.M.R., Dr. Van Gelder will analyze some aspects of the farm environment that affect the health of food-producing animals.*

*The following article should logically be the last in such a series on herd health. However, considering that this is the season for building or renovating barns, this material may help some readers to more effectively advise their clients on problem prevention before construction begins.*

Inc. which has in addition taken the responsibility for finding historical veterinary artifacts to preserve and display.

A number of veterinarians and their families have responded to the Foundation's request for historical items by donating antique instruments, drugs, journals and old books. Even blacksmith equipment was given so that an old-fashioned blacksmith shop could be reconstructed in the smoke house which stands behind the

main house. The Women's Auxiliary to the Missouri VMA hired a graduate student of the University of Missouri to catalog and cross-file 1,100 artifacts in the museum as well as to design and build displays.

As part of the museum, a tape library is being prepared from interviews with old veterinarians and lay people from throughout the state. In addition, films on animal care will be shown at the museum.

# Be Hazardous to Her Health

## Late Night Aid for Antelope

### Environmental Factors Within the Barn

In recent years the pole barn has become a familiar part of the animal housing scene. In addition to open-faced barns, structures designed for year-around housing have been built for the total confinement of dairy cattle.

One of the major problems encountered in the total confinement facility in the fall and winter in the northern climate is high humidity. A producer may tend to consider these buildings as "hot houses" for cows. Some producers have been found to close up their barns completely when cold weather set in. Fogging within the barns was extensive at times.

The continuous exposure of animals to high humidity and cold temperature environments is a condition that must be avoided. The producer is faced with maintaining a delicate balance in these facilities. On one hand the inside temperature should be above freezing to avoid compounding problems with handling animal wastes. On the other hand lack of attention to ventilation contributes to disease problems because of high humidity and low air turnover.

An air exchange rate of 100 cubic feet per minute per 1000 pounds of biomass is a basic recommendation. The best way to achieve this is by using fans controlled by humidistats. However, many barns lack fans because of the added expense. Many barns are designed with side vent doors. If the barn is placed properly with respect to the prevailing wind directions, the proper use of the vent doors can keep drafts off the animals while still providing air exchange. Typical barn construction consists of a continuous 10-12 inch-wide ridge opening that runs the length of the barn and which is combined with either side vent doors or a 10-12 inch side wall opening at the eaves.

In cold weather fogging conditions, and excessive ice and frost are commonly found in the inadequately ventilated barn. When air flow is insufficient to remove excess moisture, the ridge opening may frost over which compounds the ventilation problem. Studies have shown that even in the ventilated-insulated barn where the inside temperature is 10-20°F warmer than in an uninsulated barn, the relative humidity is above eight percent 75 to 100% of the time, and frequently the humidity is 100%.

The resulting condition of cold tempera-

ture and high humidity can be expected to have an adverse effect on animal productivity. The effect is insidious as there is no specific disease, rather, one can expect an increase in respiratory disease as well as increased probability of the spread of infectious diseases resulting from the confinement, humidity, and stagnant air.

Problems are also seen when stanchioned cows are suddenly transferred to a free stall environment. A common history is a decrease in milk production coupled with the observation that the cattle are not using the free stalls but instead are laying in the alley ways. This is a problem that can be dealt with in one of several ways. One approach is to halter the reluctant cow and tie her in the free stall until she learns to lay there. Another approach is to make the free stall as attractive as possible. The liberal use of bedding material may help, particularly in situations where the type of bedding is suddenly changed or where rubber mats are substituted for bedding. Cows that do not adjust to the free stall environment may have to be replaced.

### Building and Operating a New Barn:

1) The large national farm building companies have invested engineering time in the design of these buildings. Problems can develop when owners fail to follow recommendations.

2) The provision of adequate ventilation is of primary concern in the total confinement facility. This is influenced by the physical location of the barn on the farm relative to hills, trees or other larger structures that might impede natural airflow. Another factor is the orientation of the facility relative to dominant wind direction.

3) Careful and continuous attention must be given to providing adequate bedding. In a total confinement barn the animal is captive and can no longer use natural instincts to seek out a satisfactory place to stand or lay down.

4) Since the animal is the economic unit, the comfort of the animal should take precedence over the convenience of the owner interested in a productive and profitable operation.

Gary A. Van Gelder, D.V.M.  
Professor and Chairman,  
Dept. Veterinary Anatomy-Physiology



*An Eland at the Swope Park Zoo in Kansas City that was suffering from a broken right tibia was successfully treated by clinicians from the College. Soon after arriving at the zoo the evening of February 21, Drs. S. G. Stoll, C. M. Trim, E. L. Egger, and C. H. Boulton began surgery on the 1,000 pound African antelope. They were assisted by Mr. N. Manning, animal technician at the College, and Dr. R. E. Hertzog (MO '56), the zoo's veterinarian. Surgery was done in the animal's stall on a portable table. Necessary equipment was brought from Columbia. Surgery was not completed until 3:00 a.m. the following morning.*

*Additional supportive therapy by Dr. Hertzog completed the efforts in mid-April.*

### Laminitis Research

Research at the College's Equine Center has shown that one dietary factor triggering laminitis in the horse is starch and other soluble carbohydrates. Investigators are looking further into the problem of laminitis and to help them the American Quarter Horse Association has awarded the Center a grant for \$19,866. This grant is for one year and is a renewal of a similar grant made last year. Dr. Harold Garner, Professor of Veterinary Medicine and Surgery, has been named principle investigator in this award. Other members of the staff at the Equine Center are participating in the study as are collaborating scientists at the School of Medicine and Dalton Research Center.

# Screening Program Begun to Detect Diseases of Laboratory Rodents

To screen the health status of laboratory rodents used by researchers, the National Cancer Institute has awarded a three-year contract for diagnostic evaluation services to the College. The diagnostic program began on March 1, 1978, and is under the direction of Dr. Joseph E. Wagner, Professor of Veterinary Pathology.



Dr. Wagner and his staff will periodically monitor samples of rodents raised in production and hybrid centers for the possible presence of naturally occurring diseases. The presence of many of these diseases in a group of laboratory rodents can unnecessarily complicate research efforts. Many rodent production and hybrid centers are private corporations that breed and raise rodents for laboratory purposes.

Success of this program will improve the quality and uniformity of laboratory animals by reducing disease outbreaks.

Dr. Wagner and his staff will utilize methods developed and standardized over the past nine years of screening rodent populations in the Research Animal Disease and Investigative Laboratory, which is also directed by Dr. Wagner.

Concerning this program, Dr. Wagner stated: "Improving the quality of animals available to research workers is a goal people have been working toward for many years. However, the health status of animals from commercial and contract sources has remained an unknown factor in many instances. . . because animals are always susceptible to the inadvertent introduction of infectious agents, a monitoring program must be an integral part of an animal research program."

## New Zip Code Number for College

The University of Missouri-Columbia now has its own Zip Code number, 65211. When corresponding with anyone at the College, please make sure you don't use the old number.

## Faculty Publish

Carrillo, J. M., Green, R. A.: "A Case Report of Canine Ehrlichiosis: Neutrophilic Strain" *JAAHA*, 14, 1:100-104.

Confer, A. W., DePaoli, A.: "Primary Neoplasms of the Nasal Cavity, Paranasal Sinuses and Nasopharynx in the Dog", *Vet. Pathol.* (1978), 15:18-30.

Garner, H. E., Hutcheson, D. P., Coffman, J. R., Hahn, A. W., Salem, C.: "Lactic Acidosis: A Factor Associated with Equine Laminitis", *J. Anim. Sci.* 45, 5:1037-1041.

Garner, H. E., Coffman, J. R., Hahn, A. W., Hutcheson, D. P., Tumbleson, M. E.: "Equine Laminitis of Alimentary Origin: An Experimental Model", *Am. J. Vet. Res.*, 36, 4:441-444.

Johnson, J. H., Moore, J. N., Coffman, J. R., Garner, H. E., Tritschler, L. G., Traver, D. S.: "Selection, Care and Maintenance of Endoscopic Equipment for Use in Horses", *JAVMA*, 172, 3:374-376.

Corwin, R. M., Miller, T. A.: "Anthelmintic Efficacy of Thenuim Closylate-Piperazine Phosphate Combination Tablets Against *Toxocara canis* in Pups and Young Dogs", *Am. J. Vet. Res.*, 39, 2:263-265.

Miller, W. L., Dale, H. E.: "Restoration of Hemorrhaged Plasma Volume By Gastrointestinal Fluid in the Dog", *Am. J. Physiol.*, 234, 1:H80-H87.

## Research Animal Laboratory Receives Additional Funding

The National Institute of Health (NIH) Research Resources Branch has awarded second-year funds totaling \$90,997 for the Research Animal Diagnostic and Investigative Laboratory (RADIL) which is located at the College. This laboratory is directed by Dr. Joseph E. Wagner, Principal Investigator and Professor of Veterinary Pathology.

RADIL was started in 1968 and has been continually funded by NIH. RADIL provides investigators of the four campuses of the University of Missouri and other regional institutions the service of definitive diagnoses of naturally occurring diseases of

laboratory animals used in human health-related research.

In addition, RADIL personnel study naturally occurring diseases of laboratory animals with regard to improving the efficiency and accuracy of identifying such disease. Because animal models are important in the study of human disease, the laboratory continually surveys animal disease cases and specimens for evidence of potential as animal models of similar human diseases.

In 1976, RADIL studied more than 1200 problem laboratory animal cases from research institutions throughout Missouri.

## Veterinary Medical Review

College of Veterinary Medicine  
and Cooperative Extension Service

Editor: Barry L. Siler, W-205 Veterinary Medicine Bldg.,  
College of Veterinary Medicine, University of Missouri, Columbia, MO 65211

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