

To the Rescue

The arrival of 33 llamas rescued from a Montana animal sanctuary that had shut its doors became a prime teaching opportunity. It was also a chance for the Camelid Clinical Service of the William R. Pritchard Veterinary Medical Teaching Hospital to shine.

Julie Dechant, DVM, MS, DACVS, is an assistant professor of clinical equine surgery and the faculty adviser to the Camelid Medicine Club. She learned of the animals' plight in January at the UC Davis Camelid Symposium. Llama rancher Joy Pedroni, a symposium attendee, was working with the Llama Association of North America to find new homes for 600 llamas from the Montana facility. She'd found homes in California for 30 male llamas and knew that they would need veterinary attention after being neglected for months as the sanctuary closed down.

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Student Melissa Garrick, right, assists faculty member Julie Dechant with one of the 33 rescued llamas.

The Species-Spanning Nature of Illness

Zoobiquity, one of the first conferences of its kind, brought together 200 physicians and veterinarians to promote understanding of the global, species-spanning nature of illness and forge ways that both fields can work together to further medicine, science and research.

The continuing education event on January 29 was organized by the David Geffen School of Medicine at UCLA, the UC Davis School of Veterinary Medicine, the Los Angeles Zoo and Botanical Gardens, and the One Health Center of the UC Global Health Institute. Veterinarians, physicians, veterinary students and medical students attended.

Unique Format

"It was a unique format," said Bennie Osburn, dean of the School of Veterinary Medicine, who gave welcome remarks.

"First a veterinarian described an animal case of a particular disease, then a physician presented a human case dealing with the same disorder, and they discussed them, comparing approaches and noting similarities. The presentations were followed by a discussion with the audience. The way in which the program was presented and the audience reaction really brought home how comparative medicine and translational research are such powerful tools."

More than a dozen veterinary faculty participated with physicians. Case studies illustrated similarities between species:

- Obsessive-compulsive disorder in a bull terrier and a video store employee
- Lead poisoning in a California condor and toddlers

- Brain tumor in a Rhodesian ridgeback dog and a retired school guidance counselor
- Lyme disease in a Thoroughbred horse and a mother of three
- Salmonella in a farm dog and a reptile collector

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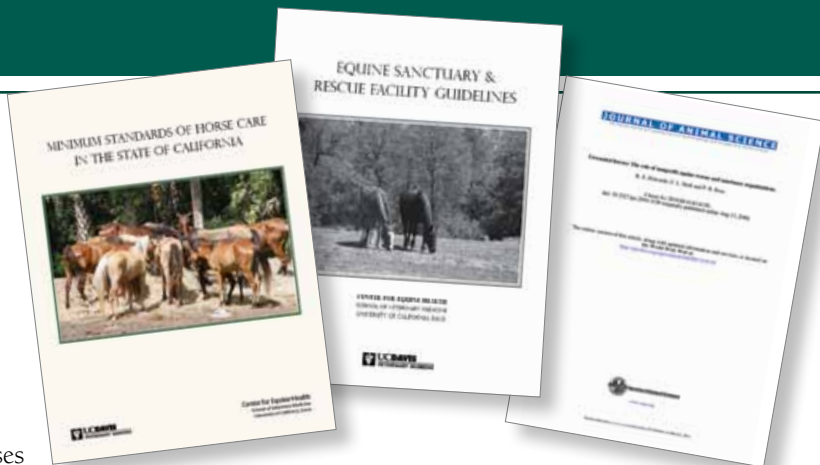
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New Resources for Coping with Unwanted Horses

Three new publications from the School of Veterinary Medicine address practical aspects of the unwanted horse problem, an animal welfare issue that has received increased attention since the nation's economy faltered, the supply of horses has outstripped demand, and the last US horse slaughter facilities closed in 2007.

Kathryn Holcomb, graduate student; Carolyn Stull, animal welfare specialist in Veterinary Medicine Extension and Holcomb's adviser; and Philip Kass, professor and chair of the Department of Population Health and Reproduction, have found that the maximum capacity of the 326 rescue and sanctuary organizations registered with the IRS totals about 13,400 horses a year, well below the widely published estimate of 100,000 horses that become unwanted in the United States each year. The report, "Unwanted Horses: The Role of Nonprofit Equine Rescue and Sanctuary Organizations," appeared in the August 2010 *Journal of Animal Science*. The researchers are the first to address the role that nonprofit equine rescue facilities serve in the care, rehabilitation, and re-homing of unwanted horses. The USDA Animal and Plant Health Inspection Service supported the study, available online at <http://bit.ly/EqRescueOrgs2010>.

The Center for Equine Health has developed *Equine Sanctuary & Rescue Facility Guidelines*, easy-to-use guidelines for the



well-being of horses at sanctuaries and rescue organizations throughout the country to meet the needs of those managing and operating these facilities. Gregory Ferraro, director of the Center for Equine Health; Carolyn Stull; and John Madigan, director of the International Animal Welfare Training Institute, offer suggestions on health, facilities, management, finances, husbandry, nutrition, transport and end-of-life care. The booklet is available online at www.vetmed.ucdavis.edu/ceh/sp_sanctuary.cfm.

Also published by the Center for Equine Health, *2010 Minimum Standards of Horse Care in the State of California* was written by Grant Miller, a California private equine veterinarian; Carolyn Stull; and Gregory Ferraro. Ferraro states, "The target audience is animal control officials charged with resolving cases of equine abuse, neglect or cruelty." The guide provides practical tips and reviews standards for water, feed, shelter, health care and transport. The appendix contains many applicable equine-related statutes for California. The booklet is available online, www.vetmed.ucdavis.edu/ceh/sp_standards.cfm.

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First stop

Dechant arranged to make the Large Animal Clinic the llamas' first stop before going to their new homes. It was the first time the hospital had taken in so many llamas at once. The first group of 21 llamas arrived February 1, and 12 more came in the next week.

Dechant wrangled llamas, identified and treated their medical concerns, and supervised the overall care of the animals. She oversaw all procedures, working with faculty and residents in anesthesia and equine surgery who instructed students. Veterinary students performed castrations, monitored anesthesia, trimmed overgrown toenails and fighting teeth, and vaccinated and wormed the llamas.

Members of the Camelid Medicine Club recruited dozens of volunteers to care for the animals during their stay and raised \$500 to defray the cost of services. The Student

Chapter of the American Veterinary Medical Association also contributed \$2,000.

By the third week of February, the llamas had gone to their permanent homes with stomachs full and health assured.

Camelid Services

The Camelid Clinical Service provides medical, surgical, reproductive and diagnostic services for alpacas and llamas. Board-certified veterinary specialists, resident veterinarians and staff deliver the highest quality veterinary care while training tomorrow's large animal practitioners and veterinary specialists. The service provides emergency care 365 days a year.

The UC Davis Camelid Symposium, sponsored by the California Alpaca Breeders Association, Calpaca, and hosted by the Camelid Medicine Club, takes place in January and is noted for providing seminar tracks suitable for veterinarians, veterinary students and camelid owners.

To donate funds to help cover treatment costs of rescued animals, please visit www.vetmed.ucdavis.edu/development.

Farm Salmon Did Not Cause Wild Salmon Decline

A December 2010 study contradicts earlier reports that salmon farms were responsible for the 2002 population crash of wild pink salmon in the Broughton Archipelago of western Canada. The crash caused concern about the potential environmental effects of open-net salmon farming, a \$10 billion industry producing 1.5 million tons of fish each year.

The study, published in *Proceedings of the National Academy of Sciences*, does not determine what caused the crash. It does acquit the prime suspect, small skin parasites called sea lice.

Lead author Gary Marty, DVM, PhD, DACVP, a research associate at the School of Veterinary Medicine, said, “For anybody concerned about the effect of farm salmon on wild salmon, this is good news. Sea lice from fish farms have no significant effect on wild salmon population productivity.”

The study is the first to analyze 20 years of fish production data and 10 years of sea-lice counts from every salmon farm in the archipelago and compare them against 60 years of population counts of adult pink salmon.

The analysis concludes that farm fish are indeed the main source of sea lice on the area’s juvenile wild pink salmon. However, it found no statistical correlation between lice levels



Farmed Atlantic salmon swim in a British Columbian net pen.

on the farms and the lifetime survival of wild pink salmon populations.

Study co-authors are Sonja Saksida, British Columbia Centre for Aquatic Health Sciences, and Terrance Quinn, University of Alaska Fairbanks. Marty is also the fish pathologist for the British Columbia Ministry of Agriculture and an affiliate faculty member of the University of Alaska School of Fisheries and Ocean Sciences.

He said that, though the trio used much of the same fish and lice data of previous studies, they reached a different conclusion for two reasons. First, the fish farmers gave Saksida additional records. Secondly, the old and new data were analyzed using Koch’s postulates and consideration of differential diagnoses – standard medical approaches not used in previous high-impact studies.

“The major lesson of this study is that we cannot settle for simple explanations for wild-animal population declines. There are very complex interactions among disease, environment and animal population health,” Marty said.

The publication and a Q & A with the author are available online at <http://faculty.vetmed.ucdavis.edu/faculty/gdmarty/default.html>.

“The major lesson of this study is that we cannot settle for simple explanations for wild-animal population declines...”

– Gary Marty



Natalie Zdimal, left, monitors anesthesia as fellow student Lauren Riley awaits instruction from mentor Julie Dechant (wearing hat), while student Alison Hoffman, right, prepares to neuter a rescued llama at the Large Animal Clinic.

Teaming up with Chinese Dairies

As the nation of China began paying close attention to the development of veterinary health standards and food safety protocols during the past decade, Dean Bennie Osburn and other school faculty have welcomed many Chinese visitors eager to observe and learn about modern dairy production, veterinary education, diagnostics and food safety systems. Osburn states, "As demand for safe and wholesome milk products skyrockets in China, dairies must adopt practical, standardized management tools to assure food safety."

With a reputation for expertise in dairy herd health and production medicine, it is no surprise that the School of Veterinary Medicine has become a pivotal member of an international alliance with the Chinese government, the China Veterinary Collaboration. Established in 2010, the group aims to:

- Advance the efficiency and quality of livestock production
- Promote standards in veterinary education
- Facilitate on-farm training programs with immediate impact
- Raise awareness of veterinary public health and food safety
- Enhance veterinary care for companion animals

Other Network Members:

- Iowa State University
- Kansas State University
- Pfizer Animal Health
- Royal Veterinary College, University of London
- University of Minnesota
- University of Nottingham, United Kingdom



James Cullor, top center, director of the Veterinary Medicine Teaching and Research Center, stands with employees he trained on a dairy near Shanghai in 2010.

James Cullor, director of the Veterinary Medicine Teaching and Research Center, led one of the group's first programs, a pilot project to help Chinese dairies produce consistently high-quality milk products. In August 2010, Cullor trained employees on two farms to apply the 10-step "Dynamic Dairy Management" program.

The team approach provides for monitoring processes, solving farm management problems and maintaining accurate records to enhance production and prevent disease. On a return visit in October, Cullor observed, "On-farm assessments indicated that milk quality was higher, and compliance with protocols improved." Pfizer Animal Health sponsored the pilot project.

The China Veterinary Collaboration has proposed other initiatives, including developing strategies to modernize veterinary education and scheduling a veterinary public health symposium in China in summer 2011. Faculty from the Veterinary Medicine Teaching and Research Center, Dairy Food Safety Laboratory, Western Institute for Food Safety and Security, and the California Animal Health and Food Safety Laboratory plan to contribute to the symposium and other initiatives as opportunities arise.

Veterinarians Call for Action on Deadly Bat Disease

Janet Foley (Center for Vectorborne Diseases) and Deana Clifford (Wildlife Health Center), along with other scientists around the country, have authored a study calling for a national fight against white-nose syndrome. The fungal disease has already killed more than 1 million bats in the eastern US and is spreading fast throughout North America.

Foley, a veterinary epidemiologist, said, "Bats are essential members of natural ecosystems: hunting insects, pollinating plants and scattering seeds. But because they are most active in darkness, few people are aware of how many bats live around us and how valuable they are."

The authors recommend an outbreak investigation network to establish a standard diagnosis and case definitions. Scientists also want to monitor bat populations and raise public awareness. They also call for further studies of agents known to kill the fungus but not yet proven safe for bats, as well as analyzing treatments for similar diseases.

The first infected bats were found in New York in 2006. White-nose syndrome is expected to cross the Rocky Mountains and enter California in the next several years.

Progress in Understanding Autism

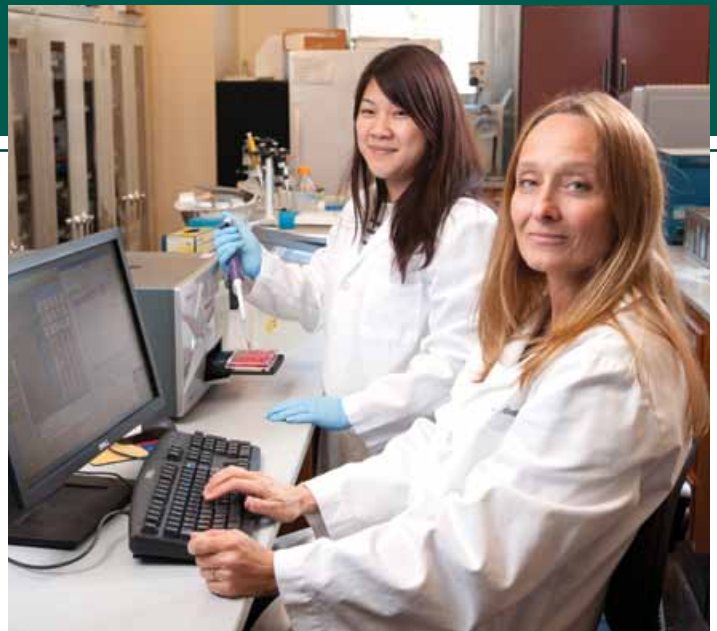
Children with autism are far more likely to have deficits in their ability to produce cellular energy than are typically developing children, reported School of Veterinary Medicine researchers November 30 in the *Journal of the American Medical Association*.

Cecilia Giulivi, professor in the Department of Molecular Biosciences, and fellow researchers found that cumulative damage and oxidative stress in mitochondria, the cell's energy producer, could influence both the onset and severity of autism, suggesting a strong link between autism and mitochondrial defects.

Deficiencies in the ability to fuel brain neurons might lead to some of the cognitive impairments associated with autism. Mitochondria are the primary source of energy production in cells.

Multiple Abnormalities

Giulivi and her colleagues recruited 10 previously identified autistic children aged two to five, and 10 age-matched typically developing children from similar backgrounds.



Professor Cecilia Giulivi, right, works in her lab with researcher Sarah Wong.

Mitochondria from children with autism consumed far less oxygen than mitochondria from the group of control children, a sign of lowered mitochondrial activity.

Reduced mitochondrial enzyme function proved widespread among the autistic children.

Levels of pyruvate, the raw material mitochondria transform into cellular energy, also were elevated in the blood plasma of autistic children, suggesting that their mitochondria are unable to process pyruvate fast enough to keep up with the demand for energy.

Hydrogen peroxide levels in autistic children were twice as high as in normal children. As a result, cells of children with autism were exposed to higher oxidative stress.

Mitochondria often respond to oxidative stress by making extra copies of their own DNA. The researchers found higher mtDNA copy numbers in the lymphocytes of half of the children with autism. These children carried equally high numbers of mtDNA sets in their granulocytes, another type of immune cell, demonstrating that these effects were not limited to a specific cell type.

Earlier Diagnosis?

“We took a snapshot of the mitochondrial dysfunction when the children were two to five years old. Whether this happened before they were born or after, this study can't tell us,” Giulivi said. “However, the research furthers the understanding of autism on several fronts and may, if replicated, be used to help physicians diagnose the problem earlier.”

Funding came from the UC Davis MIND Institute, the National Institute of Environmental Health Sciences, the U.S. Environmental Protection Agency and Autism Speaks.



Healthy bats emerge from their colony's cave at California's Lava Beds National Monument.

Twenty-three species of bats in California hibernate in caves and are therefore vulnerable to the syndrome. The fungus does not appear to be a threat to people or animals other than bats.

Full text of the study is available at <http://bit.ly/whitenosesyndrome>.

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Osburn noted that presentations by veterinary faculty Patricia Conrad and Jonna Mazet on their One Health projects particularly impressed clinicians because of the programs' multispecies approach and international scope.

The program later moved to the Los Angeles Zoo, where all observed grand rounds of animal cases. Experts in both animal and human medicine reviewed skin cancer in a rhinoceros horn and diabetes in New World and Old World monkeys. UCLA cardiologist and conference organizer Barbara Natterson Horowitz, who consults frequently with zoo veterinarians about their patients, described a heart condition in a lioness.

Conference proceedings will be submitted for publication in both human and veterinary journals.

The Future of Medicine

A. Eugene Washington, MD, UCLA vice chancellor for health sciences and dean of the Geffen School of Medicine, commented, "The Zoobiquity conference...brought together established field leaders, younger physicians and veterinarians-in-training who will develop the future of medicine with new hypotheses and approaches."

"Several of us may be developing new collaborations with our MD counterparts with whom we compared cases at the conference."

— SVM faculty member



Student Jenna Winer, DVM classmates and medical students observed a case of skin cancer in a rhinoceros during rounds at the Los Angeles Zoo, which co-hosted the event.



Veterinarian Patricia Conrad, left, physician Barbara Natterson Horowitz and veterinarian Cheryl Scott organized the conference and arranged rounds with colleagues at the Los Angeles Zoo.

Student Research Initiative

As one outcome of the conference, UC Davis and UCLA launched the Zoobiquity Research Initiative. Veterinarian Cheryl Scott, director of the Calvin Schwabe One Health Project, will coordinate veterinary students from UC Davis and medical students from UCLA. Several research projects pertaining to the health of humans and animals have been proposed, including a comparative examination of causes, outcomes and prevention of obesity in people and pets, particularly as weight gain relates to diabetes. Other studies will deal with geriatrics and environmental toxic exposures. Faculty mentors from each school will guide the students and evaluate their work.

"This symposium reminded me that there is so much that the human and veterinary medical professions have to offer each other. The world's [multi-faceted] health issues have already transcended the borders of one profession... and require an interdisciplinary approach."

— DVM student, zoo medicine track

New Endowed Chairs Support Excellence

A bequest from the estate of Ms. Maxine Adler of Florida has established two new endowed chairs in the School of Veterinary Medicine. These endowments will support faculty chair holders' scholarly activities in teaching, research and service. One will be known as the Maxine Adler Endowed Chair in Oncology and the other as the Maxine Adler Endowed Chair in Genetics.

The total value of Ms. Adler's legacy gift could reach \$8 million. In addition to funding the endowed chairs, Ms. Adler's gift will also establish endowments for graduate fellowships and for the UC Davis Koret Shelter Medicine Program.

Ms. Adler was a long-time client of the William R. Pritchard Veterinary Medical Teaching Hospital, where her cat, DuBee, was treated for cancer. Because of the excellent care DuBee received, both the length and quality of her life were significantly enhanced. Ms. Adler was interested in finding a cure for cancer in companion animals and in improving the lives of cats. While living, Ms. Adler established an endowed cancer research fund in memory of DuBee.

"Our school is grateful to Ms. Adler for this generous donation as it will make



Emergency/critical care specialist Karl Jandrey, right, instructs students about feline examinations.

a critical difference in sustaining our excellence," says Dean Bennie Osburn. "We will be able to recognize outstanding faculty scholars and support teaching and research leadership. Donations such as this gift expand our capacity and that of our university to achieve even greater heights of distinction, scholarship and service."

During these challenging financial times, these gifts – and the endowed funds they create – offset some of the loss in state support to the school's educational mission. For now, these chairs will support existing faculty positions. As the endowed funds grow, recruitment for additional faculty positions will be possible.

PREDICT Maps Real-Time Disease Alerts

Governments and health agencies may now track emerging infectious diseases worldwide thanks to an interactive, open-access map of the PREDICT program.

PREDICT is a global early warning system that is part of the United States Agency for International Development's (USAID) Emerging Pandemics Threats Program. The PREDICT team is increasing global capacity to monitor and prevent

emerging infectious diseases arising from humans and animals. Wildlife veterinarian Jonna Mazet of the School of Veterinary Medicine leads the project.

The map shows users in more than 20 countries a comprehensive, current view of infectious diseases and their effects on human and animal health. PREDICT's risk-based approach focuses on areas where zoonotic diseases are most likely to emerge and where host species are likely

to interact with domestic animals and high-density human populations.

The Wildlife Health Center, Wildlife Conservation Society, Harvard Medical School, Children's Hospital Boston, Eco-Health Alliance and other PREDICT team members unveiled the map in February.

To view the map, go to www.HealthMap.org/PREDICT.

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Veterinary Medicine News is published by the University of California, Davis, School of Veterinary Medicine: Bennie I. Osburn, dean; Lynn Narlesky, editor; Katie Blakewell, Celeste Borelli, Don Preisler, Reed Hutchison, Tony Kerwin, Justine Ma, Marine Harvest Canada, UC Davis Health System, UC Davis News Service, and UCLA Health Sciences, contributors. For subscription questions contact the Office of Development (530) 752-7024 or development@vetmed.ucdavis.edu. *The University of California does not discriminate in any of its policies, procedures or practices. The university is an affirmative action/equal opportunity employer.*

CE Calendar 2011

Veterinary Continuing Education, (530) 752-3905
Fax: (530) 752-6728, center4cpe@ucdavis.edu
www.vetmed.ucdavis.edu/ce

May 15, 2011

Veterinary Diagnostic Imaging Symposium, Davis

June 2-4, 2011

2nd Annual North American Veterinary Regenerative Medicine Conference, Lexington, Kentucky. Co-sponsored by Rood & Riddle Equine Hospital and Alamo Pintado Equine Medical Center. Contact: Rood & Riddle Equine Hospital, (859) 233-0371, shopper@roodandriddle.com

July 23-24, 2011

"Back to School" Veterinary Technician CE Seminar, Davis

July 30 - August 9, 2011

Luxury Safari, South Africa. Optional Gorilla Trekking in Rwanda July 26-30, 2011. Contact: Passport to Travel, (209) 571-5606, (800) 456-3378

October 2, 2011

3rd Annual Veterinary Practitioner Seminar, Davis. Presented by the faculty of the William R. Pritchard Veterinary Medical Teaching Hospital

November 2-9, 2011

George H. Muller Veterinary Dermatology Seminar, The Big Island, Hawaii. Contact: Sherry Cooper, (530) 752-1581 or slcooper@ucdavis.edu

November 29 - December 6, 2011

Veterinary Endocrinology & Internal Medicine Seminar, Maui, Hawaii. Contact: Sherry Cooper, (530) 752-1581 or slcooper@ucdavis.edu

New Test Assesses Risk of Pug Dog Encephalitis

A new test developed by the Veterinary Genetics Laboratory is available to screen pug dogs for susceptibility to necrotizing meningoencephalitis (NME), an inflammatory disease of the central nervous system that is usually progressive and fatal.

This DNA analysis is not a diagnostic test. The assessment helps determine the risk of developing NME in a particular pug and provides a tool that veterinarians and breeders may use to selectively mate animals that will produce puppies at decreased risk.

Approximately 1.2% of pugs die of the disease, also known as pug dog encephalitis. Symptoms include seizures, depression, ataxia, abnormal gait and blindness.

Recent research at the laboratory reveals that susceptibility to NME is associated with the dog leukocyte antigen region of dog chromosome #12. Dogs with two identical copies of the NME-associated markers (S/S) in this region are 12 times more likely to develop NME compared with pugs possessing one or no copies of these markers. Although 11 percent of pugs has both markers, only about one in eight in this group will develop NME.

Veterinary geneticists caution breeders not to eliminate the "S" genotype entirely as this approach would lead to a considerable loss of genetic diversity in the breed.

The laboratory website provides details on the disease and the role of genetic testing: www.vgl.ucdavis.edu/services/PDE.php.



Veterinary genetics testing helps owners make informed breeding decisions.