Ticks—Nuisance or Public Health Threat?
Tufts targets zoonotic diseases
25 years later, the mission continues: Preparing veterinarians for the front lines of public health

As health professionals, veterinarians have a responsibility to protect not only the health of animals, but also that of humans and the environment.

There are important links between animals, humans, and the environment, and the well-being of all three are dependent on sustainable ecosystems. Because of this comprehensive view, Tufts Veterinary School had the vision in its early years to establish an educational program that prepares graduates to protect our environment and maintain public health.

In our core curriculum, students learn about the ecological context of health, the control and prevention of zoonotic infectious diseases as critical to both animal and human health, the importance of protecting a healthy and secure food and water supply, and the challenges we face globally as international health professionals. Because of the flexible design of our curriculum, many veterinary students elect to become more knowledgeable and active in specific areas of public health.

Ten years ago, we had the foresight to establish a program with Tufts Medical School to enable students to obtain a dual degree in veterinary medicine and public health (D.V.M./M.P.H.) in just four years. To be sure, this rigorous program is not for the faint of heart! The first students in this program graduated in 1997 and continue to make their mark.

The seriousness of public health preparedness has been on everyone's mind since 9/11, anthrax attacks, and numerous global outbreaks of infectious diseases. I have attended many meetings locally and regionally about the urgent need to prepare for bioterrorism. Other veterinary schools are also following Tufts' lead by establishing combined D.V.M./M.P.H. programs. This is a good thing, because our profession must prepare many more veterinary graduates for public health jobs in the future.

It is also vital that we keep in mind the important impact that veterinarians in traditional private practice have on public health. Whether it's preventing common zoonoses such as toxoplasmosis and rabies—or providing early diagnosis and reporting of an emerging zoonotic infectious disease such as Mad Cow disease—private veterinary practitioners are on the front line of public health disease surveillance. This is why we have emphasized educating all of our veterinary students about their responsibilities to protect public health, while encouraging some to devote their careers to this by participating in Tufts' combined veterinary medicine and public health degree program.

Throughout this academic year, Tufts Veterinary Medicine will report on significant achievements the school has made during its first 25 years. This issue focuses on the work our faculty is doing to safeguard public health. I hope it will help you understand the many ways in which Tufts Veterinary School is leading the veterinary profession's efforts in protecting the health of animals, humans and the environment.

Philip C. Kosch, D.V.M., Ph.D.
Dean

State Funding Update

We are pleased to announce that Massachusetts Governor Mitt Romney has signed the state's 2004 budget, which includes a $3,004,000 appropriation for Tufts University School of Veterinary Medicine. We are grateful to the governor for acknowledging the necessity of state funding in order to operate the Commonwealth's and New England's only veterinary school.
Dr. Gary Patronek, director of Tufts’ Center for Animals and Public Policy and director of the graduate program in animals and public policy, received the Carl J. Norden Distinguished Teacher Award at commencement ceremonies this spring. He was cited for his excellence as a teacher, mentor and colleague.

Three years ago, Patronek was named the first Agnes Varis University Chair in Science and Society at Tufts University. Last year, he was elected to the National Academies of Practice and was honored by the American Humane Association for his dedicated and unselfish service to the welfare of animals.

“Policy decisions concerning animals in society have all too often been made on emotional or political bases, rather than being science-based,” said Dean Philip Kosch, who presented the award at commencement. “Dr. Patronek and his colleagues teach students how to evaluate the available data objectively and how to apply the scientific method to obtain needed data to better inform policymakers.”

The Pfizer Animal Health Award for Research Excellence was presented to Dr. Andrew Hoffman, associate professor of large animal medicine, who heads Tufts’ lung function testing service. Hoffman has successfully developed an independent, externally-sponsored research program that is internationally recognized. He secured more than $1 million in grants from the National Institutes of Health and other agencies to study comparative respiratory pathophysiology. Working with collaborators at Harvard Medical School, Hoffman developed a non-invasive thorascopic technique for lung reduction surgery in people with end-stage emphysema. He developed a novel, mechanical ventilator for the care of people with critical respiratory illnesses, as well as non-invasive lung function tests for horses and dogs.

Along with Dr. Melissa Mazan, V93, and other Tufts colleagues, he characterized equine airway hyper-reactivity as a model of human asthma to study the pathogenesis of asthma in horses and humans.

Christopher Weber, V05, was one of 12 Tufts students to receive the 2003 presidential awards for citizenship and public service from President Lawrence S. Bacow. Recipients were nominated by faculty, students, staff, alumni and community partners for their outstanding community service and leadership achievements.

Under Weber’s leadership, participation in Gap Junction increased four-fold. This student-run program encourages primary and secondary school children to enjoy learning about science.

As a member of the neonatal intensive care team at Tufts’ Hospital for Large Animals, Weber organized training sessions for 60 to 80 volunteers during foaling season. He also scheduled three shifts of volunteers every day from February to June, including difficult-to-cover overnight shifts.

Weber is a full-time student and emergency technician at the Hospital for Large Animals.

The late Dr. Annelisa Kilbourn, V96, was elected posthumously to the United Nations Environment Program’s Global 500 Roll of Honor for her outstanding contributions to the protection of the environment. She was one of eight individuals and organizations to receive the honor in 2003.

Kilbourn died in a plane crash in Gabon in November 2002, while researching the link between the Ebola virus and western lowland gorillas for the Wildlife Conservation Society’s field veterinary program. Her work in the field produced the first proof that gorillas are infected and quickly die of the virus, information which may serve to protect both gorillas and humans.

Classmates and friends of Kilbourn have established the Annelisa M. Kilbourn Conservation Medicine Fund at Tufts to support an annual wildlife and international veterinary medicine conference at Tufts and a keynote Annelisa M. Kilbourn Memorial Lecture.

Gifts in support of the fund should be directed to Tufts University School of Veterinary Medicine, Development Office, 200 Westboro Road, North Grafton, MA 01536.
Tufts research key to preventing tick-borne diseases

Checking their pets—and themselves—for ticks after a walk has become an all too familiar ritual for residents of central Massachusetts. That's because the spread of Lyme disease, the most frequently diagnosed tick-borne infection in the U.S., has added a public health risk to the simple pleasures of enjoying the great outdoors.

Dr. Stephen M. Rich, assistant professor in the infectious diseases division at Tufts School of Veterinary Medicine, has tracked the progression of the disease for more than a decade and is working on a vaccine to prevent it.

"When I was a graduate student studying Lyme disease in 1991, it was rare to find ticks carrying the disease inland or in urban areas," Rich said. "We used to see it primarily along the coast."

Now, ticks carrying Lyme disease can find human and animal hosts in city parks as well as in the woods of the Northeast. More than 17,000 cases of Lyme disease were reported in Northeastern states and Wisconsin in 2000, the most recent year for which statistics are available.

Lyme disease is zoonotic, which means it's transmitted to humans from animals. Zoonotic diseases can be dangerous, if not lethal to humans—recent examples include SARS and monkey-pox—and they represent three-fourths of the world's emerging diseases.

Writing in the June 2, 2003, issue of the Boston Globe, Madeline Drexler, author of "Secret Agents: The Menace of Emerging Infections," noted, "Whatever deadly pandemic next sweeps the world, whatever newly christened scourge dominates the headlines, it will almost surely have vaulted across the Darwinian order."
Zoonotic diseases such as anthrax, tularemia and plague are also implicated by the Centers for Disease Control and Prevention (CDC) as potential instruments of bioterrorism. (See page 6 for information on Tufts' involvement in bioterrorism preparedness.)

Though rarely seen in humans, these same diseases occur periodically in animals. Veterinarians and veterinary medical researchers, with their expertise in diagnosing and treating zoonotic diseases in animals, now find themselves in the spotlight when public health issues and bioterrorism are discussed.

"Tufts, with its strengths both in veterinary medicine and biological research, is poised for a major role studying and communicating about zoonotic diseases," Rich said.

The Lyme disease connection

Unlike other zoonotic diseases, Lyme disease symptoms are similar in both humans and animals. Those suffering from the disease have a fever and arthritis-like pain and stiffness in their joints. Unless treated with antibiotics, the infection can become serious and affect the brain and heart. Ticks pick up the bacteria that cause Lyme disease from white-footed mice and ultimately pass it on to other hosts as they feed on deer, dogs and humans.

"When people think about Lyme disease, they tend to think about vaccines and controlling it in the human population. To a basic scientist, what's happening in the wild is of greater relevance. If you want to get rid of the problem, you have to get rid of it at the root."

Rich's group is attacking tick-borne diseases with a two-pronged approach, going after Lyme disease in the wild with a bait-infused oral vaccine for white-footed mice. They're also beginning to work with Tufts' colleagues, Dr. Jean Mukherjee and Dr. Sam Telford III, to develop a vaccine against tick bites to prevent other diseases caused by ticks.

"The Lyme disease vaccine research involves Rich and colleagues from Yale University and the University of California at Irvine. It's an effort modeled after the Tufts rabies vaccine program on Cape Cod headed by Dr. Steve Rowell, V83, and Dr. Alison Robbins, V92. This effort—the longest-running program of its kind—has kept Cape Cod rabies-free for the past 10 years. (See related story, page 17.)

"We're making a case that this might be a strategy for public health departments to follow," Rich said. "Similar to spraying for mosquitoes, they could be vaccinating mice against ticks."

The Tufts researcher is optimistic about the potential for tick vaccines. "We have the potential to wipe out tick-borne diseases," he said.

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Rich vividly described ticks in action as he explained how a vaccine against tick-borne disease would work:

When ticks land on humans or animals, they take about a day to burrow their mouth into the skin of their host, creating a tiny pool. This pool becomes a mixture of blood and enzymes, as ticks literally spit in and out of it, slurping up the blood of their victim. It's here, in the pool, that ticks transmit the bacteria that cause Lyme disease.

"We're exploring ways of developing a vaccine that will create antibodies against the enzymes in the saliva of ticks," Rich said. "If these antibodies can stop the tick from feeding, then the disease won't be transmitted to the tick's host."

Dr. Rich at work in his laboratory.
Veterinarians ahead of the curve in bioterrorism preparedness

A recent series of bioterrorism preparedness programs for area veterinarians and other animal caretakers is another example of Tufts Veterinary School's role in protecting public health.

Developed by Tufts and sponsored by the Massachusetts Bureau of Animal Health, the programs are designed to educate people involved in animal health about signs of zoonotic diseases that have the potential for use as bioterrorism agents. These diseases, such as plague, anthrax and tularemia, occur periodically in animals—and when they occur in humans, they can be just as deadly.

Tufts faculty and other speakers are holding separate sessions for groups such as animal control officers, livestock owners, animal shelter workers and pet store owners. They will identify the signs of dangerous zoonotic diseases likely to be used in a bioterrorist attack, and what people should do if they detect them in animals.

"In the event of a bioterrorist act, it's likely that animal caretakers will be the first to notice signs," said Dr. George Saperstein, assistant dean for research and chair of the veterinary school's Department of Environmental and Population Health. "Our goal is to make them aware of unusual signs, so they will immediately contact a veterinarian."

Fast action is critical in controlling the spread of disease, Saperstein noted. This point was brought home during Tufts' participation in the test of an emergency response plan for controlling a simulated outbreak of foot-and-mouth disease last year. The Bureau of Animal Health and the Massachusetts Emergency Management Agency, working with the Massachusetts Bureau of Animal Health, examined a ewe for signs of disease.

Dr. George Saperstein.
Control and other organizations such as Tufts, developed the plan.

Besides being potentially lethal to livestock, the economic impact of such a bioterrorist act could be devastating.

"Any terrorist act on U.S. domestic meat production could have very damaging impacts on the U.S. and world economy," said Dr. Gilbert E. Metcalf, chair of Tufts University's Department of Economics.

The United States produces roughly one-quarter of the world's supply of beef. There are some three million workers employed directly in the agricultural sector. An additional half-million workers are employed in meat products manufacturing and processing, 3.5 million employed in food stores, and over eight million in restaurants and bars.

"There was an enormous learning curve to get people to understand the degree and seriousness of the risk of foreign animal diseases and zoonotic diseases like plague or anthrax," he said.

Sherman is the former head of Tufts' international veterinary medicine program and former director of Tufts' Center for Conservation Medicine.

"I knew from my international work that (a disease like foot-and-mouth) was endemic to Africa and Asia, but finding the highly contagious disease in England—with its close historical, cultural and trade relations with New England—was worrisome," he said.

"Someone could have been hiking in the English countryside, picked up foot-and-mouth on their shoes or nasal passages, get on a plane and be at a farm in New England the next day—then pet a cow or sheep. That's all it would take to get an epidemic started here."

The state's need for a plan to control the spread of diseases caused by acts of bioterrorism became evident after Sept. 11.

Saperstein, who took part in the simulated foot-and-mouth disease outbreak, noted that the exercise helped put Massachusetts at the forefront of disaster preparedness.

"Veterinarians are ahead of the curve when it comes to public health preparedness," he said.

"In the event of a bioterrorist act, it's likely that animal caretakers will be the first to notice signs."

"Clearly, any bioterrorist act that threatened the nation's beef supply would have large spill-over effects into many parts of the U.S. economy," Metcalf said.

Veterinarians and economists learned a hard lesson from the foot-and-mouth disease outbreak in Great Britain two years ago.

"At the time of the foot-and-mouth outbreak in the UK, there was very little awareness and concern about threats to agriculture in Massachusetts," said Dr. David M. Sherman, chief of the Massachusetts Department of Food and Agriculture Bureau of Animal Health.

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"Veterinarians are ahead of the curve when it comes to public health preparedness," he said.
Dr. Stephen M. Rich and his colleagues are studying malaria to determine how the mosquito-borne parasites maintain their ability to cause disease despite efforts to eradicate them over the course of the last century. This critical research impacts far beyond the Tufts campus, and spans across the globe to developing countries where millions die from malaria every year.

Though it is now extremely uncommon in the U.S., malaria is a serious, sometimes fatal disease that occurs in over 100 countries and affects more than 40 percent of the world's population. Approximately 500 million people are infected with malaria annually. Of the two million who die each year from the disease, 85 percent are children under the age of five.

Mosquitoes carry, or are vectors for, malaria by biting an infected person and ingesting malaria parasites. After growing inside the mosquito, the parasites can be transmitted to another person when the mosquito bites again.

There are more than 20 different malaria vaccines under development by researchers throughout the world—at a cost of hundreds of millions of dollars. With funding from the World Health Organization and the National Institutes of Health, Rich and his colleagues are studying the genes that encode proteins on the parasite that causes malaria in an effort to determine which vaccines are likely to be most effective.

While malaria was long thought to be an age-old parasite of humans, Rich and his colleagues demonstrated that the disease probably traces its origins to less than 10,000 years ago with the rise of human agricultural activity. This period is a mere "blink of the eye" in evolutionary time scales, but in that time frame malaria parasites have greatly diversified. The development of an effective vaccine requires finding target proteins that differ little among malaria strains.

"That parasites have become so diversified in such a short time span is a strong indication that malaria is not only a moving target, but that it is moving very quickly in ways that allow parasites to adapt to overcome our efforts to thwart them."

Cameroon, collecting blood samples from people hospitalized with malaria," he said. "We want to find out if the parasites differ from site to site—Sudan to Nigeria, for example—and if they differ from year to year in the same site."

Rich explained that in the early 1960s, health officials undertook a multinational effort to eradicate malaria.

"After a five-year effort, and millions of dollars spent, the parasites and mosquitoes became resistant to the agents used to combat them," he said. "We would like to make certain that future efforts to reduce malaria transmission are sustainable for the long-term public health benefit."

Lyme disease is one of several "vector-borne" diseases that Tufts researchers are targeting. Vectors are living organisms that transmit diseases. Ticks, for example, are vectors for several diseases, including Lyme disease. Mosquitoes are also vectors for a variety of diseases from malaria and encephalitis to the West Nile virus. Vectors like ticks are particularly vexing because they can transmit diseases to other organisms as well as act as parasites that feed on them.
Dr. Saul Tzipori, director of the infectious diseases division of the Department of Biomedical Sciences, was appointed to the rank of distinguished professor; Dean Philip Kosch announced the appointment at the 2003 commencement ceremony. It was only the fifth time the honor has been given in the 25-year history of Tufts Veterinary School.

Dean Kosch noted that Tzipori “has devoted his career to the investigation and control of enteric diseases in humans and animals sharing similar environments with humans. His work will result in improved diagnostic and therapeutic approaches to life-threatening diarrheal diseases in children and immuno-compromised adults in this country and the world.”

Tzipori joined the Tufts faculty in 1991 after a distinguished research career in Australia and Bangladesh, including being named a Fellow of the Royal College of Veterinary Surgeons by the Royal Veterinary College in London for meritorious contributions to learning. He earned his veterinary degree and Ph.D. in tropical viral diseases from the University of Queensland in Australia.

In less than three years after joining Tufts Veterinary School, and supported entirely by external funding, he built the division of infectious diseases. Today, Tzipori is one of the university’s best-funded researchers, with support from public and private sources including the National Institutes of Health (NIH), the U.S. Department of Agriculture, the Centers for Disease Control and Prevention, the Federal Food and Drug Administration and the Environmental Protection Agency.

Tzipori’s groundbreaking research is helping to develop an effective defense against a virulent strain of E. coli. Another of his major initiatives investigates Cryptosporidium parvum, a water-borne protozoa that causes diarrhea in humans and animals. It can be fatal to malnourished children and people whose immune systems are compromised. With funding from the NIH, Tzipori and colleagues are sequencing the nucleotides of the entire Cryptosporidium genome.

Tzipori also wrote the proposal that gained university approval for Tufts Veterinary School’s Ph.D. program and he currently chairs the school’s research committee. He represented Tufts in working with key researchers and deans from other veterinary schools to establish a student research training grant funded by NIH.

Tzipori’s “leadership and team-building skills have resulted in the most successful sponsored research program in the entire university. They have cemented our institutional reputation as a leader in biomedical research within the university and nationally,” Kosch said. “I have great respect for him as a member of our faculty and consider him to be the most distinguished biomedical scientist anywhere in academic veterinary medicine today.”

As distinguished professor, Tzipori’s inscribed photograph will hang in the Webster Family Library with those of the veterinary school’s other four distinguished professors: Dr. Sawket Anwer, Dr. Susan Cotter, Dr. Irwin Leav and Dr. James N. Ross, Jr.

“Tzipori has devoted his career to the investigation and control of enteric diseases in humans and animals sharing similar environments with humans.”
A 25 year legacy:
Protecting the health of animals, humans, and the environment

Tufts’ animal-facilitated therapy program helped first-graders at South Grafton Elementary School improve their reading skills by connecting them with a canine audience. Comforted by friendly dogs, the kids’ confidence and their reading ability grew. Here, Brandon Doyle shares a story with Hagrid, an English pointer owned by Debra Gibbs, veterinary technician at Tufts’ Henry and Lois Foster Hospital for Small Animals.

Rinderpest eradication helps prevent famine
Dr. Jeffrey C. Mariner, V90, helped develop a heat-stable vaccine for rinderpest, a devastating cattle disease that raged across much of Africa in the early 1980s, causing losses of at least $2 billion. Previous vaccines for the deadly disease required refrigeration, which hindered distribution in the hot and remote areas where it was needed. The vaccine has been so successful, the United Nation’s Food and Agriculture Organization estimates that rinderpest could be eradicated by the year 2010, only the second time in history a disease has been globally eliminated. Tufts’ success in helping resolve this classic conservation medicine case has prompted the university to initiate a similar campaign that would abolish the measles virus in developing countries.

Therapy program demonstrates animals’ role in human health
Tufts’ animal-facilitated therapy program promotes the human-animal bond in settings from nursing homes and mental health facilities to an elementary school reading program. With support from Tufts’ Center for Animals and Public Policy, the certified therapy dogs exemplify the vital role animals play in human health.

Rabies vaccine helps reduce threat to humans
For the past decade, Dr. Steve Rowel, V83, and Dr. Alison Robbins, V92, have led a raccoon rabies vaccination program, preventing the disease from reaching Cape Cod. Their efforts, supported by the Commonwealth of Massachusetts through the Department of Public Health, have also been successful in reducing rabies carried by raccoons within three towns that border the Cape.

Educating veterinarians and the public about bioterrorism
In addition to Tufts' involvement in developing bioterrorism preparedness programs, several veterinary school alumni are heading efforts to educate the public and veterinarians about bioterrorism, emergency management and public health. They include: Dr. Elizabeth Stone, V90, public health veterinarian for the Maine Bureau of Health; Dr. Louisa Castrodale, V97, epidemiologist for the state of Alaska; Dr. Fredric Cantor, V84, public health veterinarian for the Commonwealth of Massachusetts; and Dr. Hugh Mainzer, V90, senior preventative medicine officer and epidemiologist in the Division of Emergency and Environmental Health Services at the Centers for Disease Control and Prevention.

What better way to observe the 25th anniversary of Tufts University School of Veterinary Medicine than to note new and important contributions to public health that faculty, staff and alumni are making here and across the globe? There are abundant examples; following are a representative few.
Veterinarians as diplomats in the Middle East

Dr. George Saperstein headed a $2.3 million project funded by the U.S. Agency for International Development that improved diagnostic capabilities and training in disease surveillance in the Middle East. The five-year effort created a network of experts from neighboring countries that worked together despite their political differences.

Genomics research promotes shrimp and seafood industry

Innovative research in shrimp genetics by Dr. Acacia Alcivar-Warren is helping create disease-resistant strains and boost domestic production of the popular seafood.

Study exposes second-hand smoke as cause of cancer in cats

A first-of-its-kind study conducted by researchers at Tufts School of Veterinary Medicine and the University of Massachusetts links passive smoke to cancer in cats. Dr. Antony S. Moore and Dr. Elizabeth Bertone found that cats living in homes where people smoke cigarettes are susceptible to a deadly form of cancer known as feline lymphoma. Compared to cats in non-smoking households, the smokers’ cats were twice as likely to acquire the disease, according to this research.

Building a case to prosecute animal abusers

A first-of-its-kind study of forensic pathology by Dr. Annette Rauch, V86, MS00, shows veterinarians how to collect evidence and build cases against animal abusers. Working with the law enforcement staff of the Massachusetts Society for the Prevention of Cruelty to Animals and the Animal Rescue League of Boston, Rauch follows actual cases of animal abuse and documents evidence collected, posting information on a web site under development.

Loon research spotlights lead toxicity in birds

Research by Dr. Mark Pokras, V84, was key to successful legislation in New Hampshire, Maine and New York that banned or limited the sale or use of lead fishing sinkers. Pokras’ studies documented that lead poisoning is the most frequent cause of death in adult loons in freshwater lakes and ponds in New England.

Monitoring threats to aquatic birds, sentinels for human health concerns

In a unique collaboration, Tufts’ Wildlife Clinic staff members are working with the Lloyd Center for Environmental Studies in Dartmouth, Mass., to investigate threats to coastal and seabird populations in southeastern Massachusetts. It’s the first attempt at monitoring marine bird data on the Atlantic coast, and is critical in developing an early warning system for health dangers to human and domestic animal populations.

Animal hoarding as a mental health issue

Dr. Gary J. Patronek founded the Hoarding of Animals Research Consortium to study this poorly understood phenomenon. In a nationally recognized and pioneering study, Patronek and co-researchers found that animal hoarding may be a sentinel for a range of medical, social and economic problems. The study also noted that the common assumption that hoarding is a lifestyle choice may fail to address human health needs, thus placing dependent household members at risk.

Finding causes of food-and water-borne diseases

Dr. Saul Tzipori and colleagues have produced groundbreaking research on what may be the first effective defense against the toxin producing strain of E. coli bacteria, a leading cause of kidney failure in children. In addition, Tzipori has identified Cryptosporidium parvum, a water-borne protozoa, as the cause of a potentially fatal diarrhea in malnourished children and people whose immune systems are compromised.

Linking ticks, tularemia and bioterrorism

Dr. Sam Telford III’s studies of ticks that carry a rare, but potentially fatal form of tularemia have important applications in bioterrorism preparedness. Telford has been researching pneumonic tularemia that has infected 22 people on Martha’s Vineyard and Nantucket, killing one of them in the past three years.

Tularemia is a bacterial infection frequently found in rabbits and other small mammals, and can infect humans through tick bites. It is believed that the pneumonic form Telford is studying—which is rare but virulent—occurs when victims inhale particles contaminated with the bacteria. If not treated with antibiotics, tularemia can be fatal. The Centers for Disease Control and Prevention has classified tularemia as a bacteria that could be used by bioterrorists.

Celebrating 25 years
Ceremony launches school’s 25th anniversary celebration

On a sunny, spring afternoon as glorious as the occasion it celebrated, 81 graduates of Tufts University School of Veterinary Medicine’s class of 2003 received their diplomas while many members of the school’s first class of 1983 applauded their achievement.

As president of the trailblazing class, Dr. Jonathan H. Sonnenborn-Turetsky, V83, gave the keynote address and helped launch the school’s 25th anniversary.

In his comments, Sonnenborn-Turetsky urged graduates to maintain a sense of perspective. “Share your abilities, your expertise, and your compassion,” he said, but added, “don’t short change those closest to you.”

Deborah Digges, a Tufts English professor and wife of the late Dr. Franklin Loew, read a brief history of the school that Dr. Loew wrote before he passed away in April. Dr. Loew, who was dean of the school from 1982 until 1995, helped create an institution widely acknowledged for its pioneering role in veterinary medicine, education and research.

“The hundreds of talented, dedicated faculty and staff members who built the school came together at a time and place that will never be duplicated,” Dr. Loew wrote. (More excerpts from the history are on page 15; read Dr. Loew’s complete history of Tufts Veterinary School online at: www.tufts.edu/vet)

Dr. Antony Moore, professor of clinical sciences and head of Tufts’ Harrington Oncology Program, gave the faculty address, and noted that “the human animal bond is more than just a catch phrase, it is part of our lives as veterinarians.” He urged the new graduates, “When people ask who speaks for the animals? answer, I do.”
Tufts graduates lead in advanced clinical training

More Tufts University School of Veterinary Medicine graduates this year will begin advanced clinical training than graduates of any other veterinary school in the U.S. Members of the class of 2003 and alumni received 40 matches for internship and residency positions through the Veterinary Internship and Residency Matching Program (VIRMP) sponsored by The American Association of Veterinary Clinicians.

The 40 matches of Tufts graduates to hospitals, clinics and practices "were more than any of the nation's other 26 veterinary schools," pointed out Dean Philip C. Kosch.

"We can all be proud of how other institutions and practitioners seek our graduates for these coveted, advanced, clinical training slots," Kosch added. "It's a reflection of the excellence of our professional degree program."

The procedure used a central computer facility for matching prospective interns and residents with programs. Students gave the VIRMP a ranking list of internship and/or residency programs of their choice. In turn, the internship and residency programs supplied the VIRMP with their ranking of applicants being considered. Using both ranking lists, the VIRMP matched prospective interns and residents with the programs. This was the first year that the VIRMP, initiated in 1978, was conducted online.

Whether they sought advanced training or went directly into practice, the majority of Tufts veterinary alumni are private practitioners. In the 2003 Directory of the American Veterinary Medical Association (AVMA), which includes 1,145 of a total 1,400 Tufts graduates, 59 percent of the Tufts alumni listed are in small animal, private practices. The next largest group—11 percent—are in mixed small and large animal practices, while 4.5 percent are in equine practice. The remainder of Tufts graduates in the AVMA directory are engaged in a wide range of specialties, including caring for aquatic, zoo and exotic animals.

Most Tufts alumni practice in Massachusetts—38.4 percent of those listed in the AVMA directory—while others are in Connecticut (7.7 percent), California (7 percent), New York (5.9 percent), Maine (4.3 percent), New Hampshire (4.3 percent), Rhode Island (3.9 percent), and New Jersey (2.7 percent). Smaller percentages of Tufts graduates practice in other states and throughout the world.
On May 15, on the lawn next to the Franklin M. Loew Veterinary Medical Education Center, about 200 members of the Tufts community joined Dr. Frank Loew’s family to celebrate his life and the profound effect he had on our school and on so many of us.

Former Provost Sol Gittleman led the program, which illustrated the courageous and risky decision Frank made to assume leadership of this school in its infancy. We heard about the struggles of the early days when it was not clear that the school would survive; tales of corny jokes invariably followed by Frank’s own laughter; his foresight and eloquence regarding the changing role of animals in society; his insatiable curiosity; his brilliance; and his compassion.

Many of you knew Frank and appreciate the extent to which he influenced the development of our school. As I said on that lovely May morning, this school will always be, in so many important ways, Frank Loew’s veterinary school.

We mourn his passing and remain ever grateful for his leadership here at Tufts. Today we are thriving, and we move with confidence into the expanding role of veterinarians in our changing world.
Tufts University School of Veterinary Medicine—The Early Years

By Dr. Franklin M. Loew

On February 7, 1977, a headline in the Boston Globe announced, “Tufts veterinary school gets go signal.” This seemingly simple news report had been preceded by years of discussion, debate and argument about whether there was a need for another school of veterinary medicine and whether Tufts was the appropriate host institution. The discussions were often rancorous and when the dust settled, the fledgling school faced an uphill course to become established.

In the early 1970s, virtually all U.S. veterinary schools were part of state universities or received enough state funding such that only residents of the particular state were considered for admission. That meant that New England students were practically shut out, unless they moved to establish legal residence in a state with a veterinary school. When Harvard professor Jean Mayer became president of Tufts University in 1976, he told of the many students he knew who had no trouble gaining admission to medical or law school, but who found it impossible to gain entry to veterinary school. So, he vowed to establish a school open to New England applicants...

Because of its finances, Tufts has always had to charge a higher tuition than other veterinary schools. In order to justify that tuition, the school had to distinguish itself from the other schools so as not to simply be a commodity. We created a series of “signature programs,” programs that were either unique to Tufts or simply better than those elsewhere. And realizing that we couldn’t achieve true excellence in everything, we were very selective in what we invested in. One of the most successful and attractive areas was what might be called “animal welfare,” the scientific study of animals and animal issues dealing with their behavior, comfort, and uses. Biotechnology was just emerging as a potent approach to science 20 years ago, and that was another opportunity...

It became clear in those early years that having the first two years of the school in Boston and the final two in Grafton was not satisfactory. The preclinical students had little opportunity to see clinical veterinary medicine in action, and the clinical faculty had little opportunity to interact with their basic sciences colleagues. In 1985, when we moved the dean's office from Boston to Grafton, it became apparent that the Grafton campus was the school's center of gravity. That same year, Dr. and Mrs. Henry Foster underwrote the hospital for small animals and we began to have a complete school on one site. But it wasn’t until the creation of the David McGrath Veterinary Teaching Laboratory and the Agnes Varis Lecture Hall in 2000 that Dean Phil Kosch was able to have all four classes together on one campus...

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While I was dean, I was fond of calling us the “dandiest little veterinary school” in the country. Today, it has matured into one of the finest veterinary medical educational institutions in the world, thanks to the high quality of its students and faculty, the loyalty and dedication of its staff, and the support of a fine university. The hundreds of talented, dedicated faculty and staff members who built the school came together at a time and place that will never be duplicated. And though for me it’s been over 20 years since we began, it really does seem like yesterday—and we did it our way.
Although rabies has been eradicated in most domestic animals in the U.S., it continues to pose a serious public health threat in Nepal, which has the world's highest per capita rate of human death from the disease.

Faculty from Tufts Veterinary School are collaborating with their counterparts in Nepal to curb the spread of rabies and save the lives of children who are most often the victims of the potentially fatal disease. The effort features a spay/neuter clinic and a rabies vaccination program, and includes participation by members of Tufts' international, wildlife and clinical sciences departments.

In the Nepali village of Rampur, Tufts Veterinary School faculty members are helping Tribhuvan University School of Veterinary Medicine teach surgical sterilization of dogs.

"The rabies control project will bring relief to the community of Rampur, while helping Tribhuvan University train Nepal's veterinarians in surgical skills and zoonotic disease control," said Dr. Christine Jost, V96, F03, coordinator of the program and assistant professor in the international program of Tufts' Department of Environmental and Population Health.

Dogs—beloved by the villagers and allowed to roam freely—are the primary carriers of rabies in Nepal. More than 100 people, most of them young children, die from rabies every year and more than 25,000 seek treatment as a result of bites from potentially rabid dogs. The risk of rabies from dog bites is exacerbated by the country's lack of dog population control programs.

"Dogs are everywhere," said Dr. John Berg, chair of the Department of Clinical Sciences, who met with faculty at Nepal's only veterinary school this past spring on the campus of Tribhuvan in the village of Rampur.

Berg determined that, with sufficient instruction and training, Tribhuvan can establish a student-run spay and neuter clinic under the guidance of a surgery faculty member. Nepal's National Zoonoses and Food Hygiene Research Center in Katmandu is donating the vaccines for the rabies control project.

"Because the Nepali government is strapped for everything, rabies vaccination doesn't have a high priority," Jost said. However, key government and private institutions are supportive of Tufts' efforts to develop a pilot intervention program in Rampur and have agreed to provide some assistance.

In the initial phase, students from Nepal's veterinary school will work with community leaders and government officials on census and education campaigns. Dr. Ruth Lambert, V03, who conducted preliminary surveys on rabies in the area, completed groundwork for this effort during her final year at Tufts.

Tribhuvan students and faculty members will follow up with an education campaign about the dangers of rabies and benefits of sterilization. Dogs that are sterilized also will be vaccinated against rabies. In the final phase, the dogs will be returned to the community—identified by a notch in one of their ears.

From its modest beginnings on the campus of Nepal's veterinary school, the long-range goal of the rabies control project is to eliminate the disease as a threat to domestic animals and humans throughout the country in the next decade.

Dr. Gretchen Kaufman, J76, V86, assistant professor of wildlife medicine in the Department of Environmental and Population Health, is working with Jost on rabies control efforts in Nepal.

"We hope that our efforts will serve as a model for other developing countries that are facing similar problems," Kaufman said.

Tufts Veterinary School faculty will coordinate the project and provide surgical training and demonstration materials such as videos. Veterinarians for a Global Solution, the Tufts veterinary students' international organization, has already begun to solicit donations of textbooks and surgical equipment for their sister school in Rampur.
The future of a vaccine program that has successfully controlled the spread of rabies on Cape Cod for the past nine years is at risk, as the state legislature grapples with Massachusetts' $3 billion budget deficit.

Funding for the program, a collaboration among Tufts researchers, the Massachusetts Department of Public Health, the Wildlife Services of the U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC), was reduced to $160,000 for the 2003 fiscal year. As we go to press, funding for the program in the upcoming state budget is under deliberation.

Sean O'Brien, senior environmental specialist, Barnstable County Department of Health and the Environment said: "The oral rabies vaccine program has been an overwhelming success; it has prevented rabies from crossing the canal onto Cape Cod. The continuation of this program is critical to protecting public health."

Despite the uncertainty of the vaccine program's future, a dedicated group of volunteers, state and federal officials, and staff from Tufts Veterinary School continued the effort earlier this summer. Over five days, they distributed 58,500 packets of vaccine-infused fish meal in nine towns on the mainland side of Cape Cod covering 280 square miles.

When a raccoon bites into the fish meal bait, its teeth break the packet and the vaccine is released into its mouth.

"With the recent capture of a rabid skunk just northeast of the Cape Cod Canal, we're trying to determine if the rabies virus carried by raccoons has changed so that skunks are now susceptible; or if the virus changed slightly, so both raccoons and skunks can be readily infected," Rowell said.

A newly proposed collaboration among Tufts Veterinary School, the Massachusetts Department of Public Health, the Wildlife Services of the U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC) could explain how the virus is infecting skunks.

Under this proposal, Tufts' researchers will study virus samples from both skunks and raccoons to determine if the virus is the same or different than the raccoon rabies strain.

"The more we know, the better we can target our vaccine efforts," Rowell said.

Since 1994, Dr. Steve Rowell, V83, and Dr. Alison Robbins, V92, have led the raccoon vaccination program, supported by the Commonwealth of Massachusetts through the Department of Public Health. Their efforts have also been successful in reducing raccoons carried by raccoons within three towns that border the Cape.

As it enters its 10th year, however, the vaccine program faces another serious challenge. The raccoon rabies virus has been found in skunks and the vaccine that has so far kept Cape Cod raccoons-rabies-free may not be as effective in skunks as it is in raccoons.
The Great Hunger... The Great Famine... The Great Starvation...
These references to Ireland's devastating 19th-century potato famine sum up the consequences of agriculture gone awry.

The famine began when a North American fungus appeared in Ireland in the mid-1840s and destroyed the island's potato crop. After the fungus had decimated crops and turned fields into barren wasteland, the ensuing famine killed more than 1,000,000 people and forced another 1,500,000 to flee the island.

The devastation also dramatically highlighted the danger that farmers face when relying heavily on one variety of a staple in the country's diet. While scientists learned their lesson many years ago and established world and national seed banks, preserving animal germplasm as a safety net is a relatively new idea.

If a modern commercial breed of livestock were to be decimated—either through intentional or accidental means—that breed would be lost forever. The people relying on it for a food source—and the businesses relying on it for its economic value—would suffer terrible losses.

In the first privately-funded program of its kind, the SVF Foundation, led by Dorrance H. Hamilton, and Tufts University School of Veterinary Medicine are collaborating to help protect the world's food supply by preserving rare breeds of domestic livestock.

Because of Tufts' expertise in both herd health management and embryo banking, SVF has contracted with the veterinary school for three years (2002-2005) to create a 'library' of genetic material by cryopreserving (freezing) and storing the semen, embryos and cells of endangered breeds. These include breeds of domestic sheep, goats and cattle.

“Within the last 10 years, the United States Department of Agriculture has realized the need to bank germplasm of animals due to possible catastrophic loss and to maintain the genetic diversity of unique breeds that have fallen out of favor,” said Dr. George Saperstein, chair, Tufts Department of Environmental and Population Health and assistant dean for research. "In most countries, including the United States, it is common practice for the agricultural industry to breed and market livestock based on their commercial value. There's a danger to valuing production efficiencies over diversity, especially with looming threats of agriterrorism."

Today's modern breeds are highly efficient, however, many types of sheep, goats, cattle and horses are in decline or in danger of extinction. And while they may not currently be commercially appealing, some waning breeds carry invaluable and irreplaceable traits and genes related to the evolution of the breed. Such traits include unique food and fiber production characteristics, environmental adaptation traits like heat/drought tolerance, mothering ability, disease resistance and feed utilization. If these traits aren't preserved now, they will be lost forever.

In praising Hamilton's foresight, Saperstein noted: "Although many world leaders in agriculture have pointed out the need to prevent further breed extinctions through cryopreservation of germplasm, Mrs. Hamilton is the first person with the vision to move forward on such an important project."
Saperstein and Dr. Eric Overstrom, associate professor of biomedical sciences, are co-directing Tufts' efforts in the rare breeds preservation program. Assistant Professor Dr. David Matsas and Associate Professor Dr. Howard Levine, both veterinary theriogenologists (experts in animal reproduction) at Tufts' ambulatory clinic in Woodstock, Conn., and Victoria Huntress, senior research assistant, are also actively involved in the project, which is being conducted at SVF’s Newport, RI, facility and at Tufts' North Grafton, Mass., campus.

Located on a former farm built in 1914, the SVF site has 30 acres of farmland, exquisitely renovated animal facilities, a new procedures laboratory, infirmary, library and a large conference room.

Tufts Veterinary School is providing herd health management for this project and is using commonly used breeding and veterinary techniques to collect and preserve semen, embryos and other tissues from the rare breeds.

"It's such a logical fit for Tufts Veterinary School because of our expertise in herd health management, conservation biology, reproductive medicine, and applied reproductive biology procedures such as embryo transfer," Overstrom said. "In addition to helping protect our food supply and preserving valuable animal genetics, we also see this project as a possible model to improve disease resistance in certain breeds."

New scholarship fund honors parents, commemorates the family business

Nadia Ann Karnik of Belmont, Mass., recently established an endowed scholarship fund at Tufts University School of Veterinary Medicine in honor of her parents, Harry and Anahid Karnik.

The donation of $50,000 will generate income to provide an annual scholarship for a third- or fourth-year student, as well as create a legacy for Karnik's parents.

"Scholarships are the most important form of financial aid we provide," said Barbara Berman, assistant dean for student affairs. During the past academic year, 88 percent of Tufts' veterinary students received financial aid in the forms of grants, scholarships, and/or loans.

"When a donor establishes a scholarship, it’s an important validation of the career goals and the sacrifices our students make to achieve a degree in veterinary medicine," Berman said.

Karnik is vice president of Stormtite Aluminum Products Manufacturing Corporation in Watertown, Mass., which was founded by her father, Harry Karnik, and is celebrating its 50th anniversary this year.

Recalling a visit to Tufts' North Grafton campus and veterinary teaching hospitals, Karnik said, "I was so impressed with what I saw that I wanted to contribute to the excellent work accomplished by Tufts Veterinary School, which is New England's only veterinary school."

Karnik also has a special appreciation for Tufts University since she attended classes at Tufts' Medford campus when attending The Forsyth School for Dental Hygienists. She later followed another academic direction and graduated from Northeastern University.
Tufts University School of Veterinary Medicine welcomes animal lovers of all ages at the 19th annual Open House from 10 a.m. to 3 p.m. on Saturday, September 6, at the school’s campus in North Grafton.

The event features self-guided tours of Tufts’ Henry and Lois Foster Hospital for Small Animals and Hospital for Large Animals, as well as the Bernice Barbour Wildlife Medicine Building.

Other attractions include a miniature horse show, demonstrations of working dogs and assistance dogs, sheep shearing, large animal rare breeds, a teddy bear clinic and face painting for children.

The Open House is free to the public; refreshments will be available for purchase. There will be parking available at the MBTA station lot in North Grafton with shuttle buses from the lot to Tufts’ campus. Because of state rabies regulations and for your own safety, pets are not allowed at the event.

For more information visit the Open House link on the Tufts Veterinary School web site: www.tufts.edu/vet