Reprinted from the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, Vol. 216, No. 8, Pages 1231-1262.

AVMA Animal Welfare Forum:
Equine Welfare

December 8, 1999, Albuquerque, New Mexico

The following papers were submitted by speakers at the 1999 AVMA Animal Welfare Forum, held at the Albuquerque Convention Center in Albuquerque, New Mexico. This year's Forum was presented in partnership with the American Association of Equine Practitioners. These papers have not undergone peer review; opinions expressed are those of the authors and not necessarily those of the American Veterinary Medical Association or the American Association of Equine Practitioners.

During the Forum, the 1999 Animal Welfare Award was presented to Dr. Eric Davis of Knoxville, Tennessee.

Contributions from sponsors ensure the success of the Forum. Gold sponsors were Bayer Animal Health and Hill's Pet Nutrition Inc; our silver sponsor was the Massachusetts Society for the Prevention of Cruelty to Animals; and bronze sponsors included Church & Dwight Company Inc (Arm & Hammer Division), the Tennessee Walking Horse Breeders' and Exhibitors' Association, the University of California-Davis Center for Equine Health, and Western Horseman.

The AVMA Animal Welfare Forum is an annual event planned by the Animal Welfare Committee, under the direction of the Executive Board. For additional information about the Forum or the Animal Welfare Award, please contact the AVMA Division of Education and Research.

Table of Contents

Welcome

James E. Nave, DVM
AVMA President-Elect

Good morning and welcome to the American Veterinary Medical Association's Tenth Annual Animal Welfare Forum. It is my pleasure to welcome you on behalf of more than 64,000 members of the American Veterinary Medical Association. The Animal Welfare Forum is held each year as the highlight of the AVMA's Animal Welfare Week, which is a series of media events designed to promote the welfare of animals. Throughout the years, the Forum has served as a useful platform for highlighting and exploring important animal welfare concerns affecting many different species. This year, the AVMA is pleased to present "Equine Welfare" in partnership with the American Association of Equine Practitioners (AAEP).

The welfare of horses is a subject of particular interest to all of us in the veterinary profession. The horse is one of our oldest and most important animal companions. Even as the horse and buggy gave way to bicycles, motorbikes, and automobiles, horses have always occupied a special place in our lives. From Paul Revere to the Pony Express, horses are part of our history and our culture. From backyard saddle ponies to Thoroughbred champions, the health and welfare of our equine companions is one of the cornerstones of our profession.

During today's Forum we will discuss natural horsemanship, horses and social ethics, disaster planning, pregnant mare urine ranching, racing, rodeo, the Horse Protection Act, transport of horses to slaughter, endurance riding, and carriage horses. Many of these issues are contentious. Furthermore, addressing all these issues during a 1-day Forum is incredibly ambitious. Although we don't pretend to have all the answers, the AVMA's Animal Welfare Committee, working in cooperation with the AAEP's Animal Welfare Committee, has assembled an excellent panel of speakers to review these issues and provide all of us with scientifically based information that we can use to understand and improve the welfare of horses involved in these industries.

Our goal for this Forum, as it has been for all previous Forums, is to promote the well-being of animals. As practitioners of one of the oldest and most respected of the healing arts, we are committed to protecting animal health, advancing scientific and medical knowledge, and, particularly, to ensuring the welfare of animals.

The revolution in horsemanship

Robert M. Miller, DVM

During the last 2 decades of the 20th century, a remarkable revolution has developed in the training of horses. The onset of this change has generally been credited to a northern California horseman, Tom Dorrance, who is now in his nineties.[1] Several of Tom's protégé's went on the road to teach clinics, using technically correct behavior shaping techniques. The success of these clinics and the success of the methods taught at them encouraged other talented horsemen to join the movement and, by the mid-1990s, what has become popularly known as "natural horsemanship" (because it is natural to the horse, not the human) was being accepted and advocated all over the world.

Using the body language of the horse, a prey species, the human (a predatory species) is quickly able to communicate with the horse. If the techniques are properly used, the horse soon bonds with, and is subordinate to, the trainer.

From 320 E Carlisle Rd, Thousand Oaks, CA 91361.

Throughout human history, most horse training has involved the use of force and coercion. Whip, bits, and spurs, which can be legitimate signaling (bridging) devices, have been widely used to inflict pain and thereby compel horses to respond in order to avoid discomfort. These techniques have, of course, been effective, and they have therefore become traditional in nearly all horse cultures. They are less than optimally effective, however, because pain elicits fear in the horse and the horse, being a flighty creature, is motivated to flee when afraid.

Natural horsemanship causes the horse to do as the human wishes not because of fear, but because the techniques used inspire the horse to regard the human as a herd leader and want to follow and be subordinate to that leader. Done correctly, natural horsemanship produces a horse devoid of fear but filled with respect for the human who does the training.

There have always been horsemen who use such techniques. The Greek, Xenophon, was an advocate of

such methods 2,300 years ago. However, the overwhelming majority of horsemen were either unaware of the methods or incapable of using them.

Why, then, is this revolution developing now, at the dawn of the 21st century? Why didn't it develop, for example, in 1910 when the United States of America had 22.6 million horses and mules rather than the estimated 7 million that we now have?

There are several reasons for the belated success of this revolution in horsemanship, which is now well established and rapidly spreading in North America, western Europe, Australia, and New Zealand and has been introduced recently into Japan and Latin America. These include:

- The information explosion. Most horse owners and trainers in the industrialized world are educated today. This was not true early in the century when most horsemen were minimally educated and often illiterate. Most horse owners read books and periodicals about horsemanship avidly. Videotapes have become an important tool. The popular media have exploited and popularized natural horsemanship techniques (eg, "The Horse Whisperer"). The Internet and electronic mail have been information sources. Most important, clinicians now travel by airplane all over the world demonstrating and teaching their techniques.
- The acceptance of psychology. A discipline only 1 century old, psychology has finally become accepted by the masses as a reliable method of explaining and modifying behavior. Today, even laymen respect the information provided by learned behavioral scientists.
- The urbanization of society. Urbanization and changing values in the late 20th century are compatible with a learning method that urges persuasive rather than coercive training techniques. There is an increased awareness of humaneness in working with animals, and the animal rights movement has become a political force that compels those who work with animals to reexamine and often alter their methods.
- The entrance of women into the horse industry. Perhaps the most important influence is that for the first time in human history, women now numerically dominate the horse industry. Women, as a rule, readily accept persuasive rather than coercive methods of controlling equine behavior. It is women who supported this revolution initially, even though all of the early proponents were male (and, in fact, from a cowboy background, which means that they initially learned coercive horsemanship). By the mid-1980s, an increasing number of men joined the so-called revolution as they observed the superior results obtained with natural horsemanship methods.

Since my retirement from active equine veterinary practice in 1987, I have devoted most of my time to teaching and advocating natural horsemanship. I do this journalistically, on the international lecture circuit, and by producing educational videos.

Although this kind of horsemanship is spreading with unanticipated speed, there is still a large number of people, including those who actually are involved with horses, who are entirely unaware of the movement. With this in mind, I will present some videotapes that dramatically illustrate its effects.

- Tape 1—Pat Parelli, of Pagosa Springs, Colorado, one of the earlier proponents of natural horsemanship. He is shown riding several horses trained with his methods, sans saddle or bridle.
- Tape 2—Alfonso Aguilar, of Morelia, Mexico, a veterinarian and a Charro, one of Parelli's protégés, and now a teacher in his own right.
- Tape 3—A group of Parelli's students in Australia. These people, none of them professional horsemen, are shown with their own recreational horses, all of which had behavioral problems when they started learning these methods. They learned, as a group, partially from attending clinics, but largely from studying videotapes.
- Tape 4—A group of American students, most of them recreational horsemen, taken at the conclusion of their training at Parelli's school in Colorado.

Anyone involved with horses, professionally or recreationally, is urged to learn more about natural horsemanship. The following list of some of the foremost teachers is by no means complete. There are many more progressive horsemen, but it is my policy to recommend only those whom I have personally seen work with horses and students. All the individuals on this list have produced educational videos, and some have published books on their methods: Buck Brannamen of Sheridan, Wyoming; Ray Hunt of Mountain Home, Idaho; Pat Parelli of Pagosa Springs, Colorado; Dennis Reis of Penngrove, California; Monty Roberts of Solvang, California; Richard Shrake of Sunriver, Oregon; Harry Whitney of Ottawa, Kansas; Richard Winters of Termo, California; and Joe Wolter of Grass Valley, California.

Reference

1. Dorrance T. *True unity*. Tuscarora, Nev: Pioneer Publishing Co, 1987.

Forum continued on next page.

Equine welfare and emerging social ethics

Bernard E. Rollin, PhD

No one possessed of any historical sociocultural awareness can fail to notice that moral concern for the treatment of animals has emerged as a major social issue in Western democratic societies during the past 3 decades. Evidence for this claim is manifest throughout the world. In the United States, for example, 2 major pieces of legislation regulating and constraining the use and treatment of animals in research were passed by the US Congress in 1985, despite vigorous opposition from powerful biomedical research and medical lobbies. This opposition included well-financed, highly visible advertisements and media promotions indicating that human health and medical progress would be harmed by implementation of such legislation. There was even a less than subtle film titled "Will I be All Right, Doctor?", the query coming from a sick child, the response coming from a pediatrician who affirmed, in essence, "You will be if 'they' leave us alone to do as we wish with animals." With social concern for laboratory animals unmitigated by such threats, research animal protection laws moved easily through Congress and have been implemented at considerable cost to taxpayers. (The relevance of society's willingness to endure putative risks in the health area for the sake of laboratory animal welfare will become clear shortly.) In 1986, Britain superseded its pioneering act of 1876 with new laws aimed at strengthening public confidence in the welfare of experimental animals. Many other European countries have moved or are moving in a similar direction.

As early as 1965, British society took notice of what the public saw as an alarming tendency to industrialize animal agriculture by chartering the Brambell Commission, a group of scientists under the leadership of Sir Rogers Brambell, who affirmed that an agricultural system failing to meet the needs and natures of animals was morally unacceptable. Though the Brambell Commission recommendations enjoyed no regulatory status, they served as a moral lighthouse for European social thought. In 1988, the Swedish Parliament passed, virtually unopposed, what the *New York Times* called a "Bill of Rights" for farm animals, abolishing in Sweden, in a series of timed steps, the confinement systems currently dominating North American agriculture. Much of northern Europe has followed suit, and the European Union is moving in a similar direction.

The extent to which the US public is concerned about various animal treatment questions may be gleaned from looking at federal, state, and local legislative proposals during the past 20 years, all of which represent efforts to change our social consensus ethic regarding animal treatment. Twenty years ago one would have found no federal legislation addressing animal well-being; today, about 60 such proposals are put forward each year in Congress alone. These bills range from attempts to prevent duplication in animal research, to saving marine mammals from becoming victims of tuna fishermen, to preventing importation of ivory, to curtailing the parrot trade. State laws passed in large numbers have increasingly prevented the use of live or dead shelter animals for biomedical research and training and have focused on myriad other areas of animal welfare. Numerous states have abolished the steel-jawed leghold trap. When Colorado's politically appointed Wildlife Commission failed to act on a recommendation from the Division of Wildlife to abolish the spring bear hunt (because hunters were liable to shoot lactating mothers, leaving their orphaned cubs to die of starvation), the general public ended the hunt through a popular referendum. Seventy percent of Colorado's population voted for that constitutional amendment. In Ontario, the environmental minister stopped a similar hunt by executive fiat in response to social ethical concern. California abolished the hunting of mountain lions, and state fishery management agencies have taken a hard look at catch-and-release programs on humane grounds. According to a director of the American Quarter Horse Association, the number of state bills related to horse welfare filled a telephone-book-sized volume in 1998 alone. Public sentiment for equine welfare in California carried a bill through the state legislature making the slaughter of horses or shipping of horses for slaughter a felony in that state. Municipalities have passed ordinances ranging from the abolition of rodeos, circuses, and zoos to the protection of prairie dogs and, in the case of Cambridge, Massachusetts (a biomedical Mecca), the strictest laws in the world regulating research.

Many animal uses seen as frivolous by the public have been abolished without legislation. Toxicologic testing of cosmetics on animals has been truncated; companies such as the Body Shop have been wildly successful internationally by totally disavowing such testing, and free-range egg production is a growth industry across the world. Greyhound racing has declined, in part, for animal welfare reasons, with the Indiana veterinary community spearheading the effort to prevent greyhound racing from coming into the state. Zoos that are little more than prisons for animals (the state of the art during my youth) have all but disappeared, and the very existence of zoos is being increasingly challenged, despite the public's unabashed love of seeing animals. And Gaskell and his associates' work has revealed,[1] genetic engineering has been rejected in Europe not, as commonly believed, for reasons of risk but for reasons of ethics; in part for reasons of animal ethics. Similar reasons (ie, fear of harming cattle) have, in part, driven European rejection of bovine somatotropin (BST). Rodeos such as the Houston Livestock Show have, in essence, banned jerking of calves in roping, despite opposition from the Professional Rodeo Cowboys

From the Department of Philosophy, Colorado State University, Fort Collins, CO 80523.

Association, who themselves never show the actual roping of a calf on national television.

So sweeping and generalized are such animal welfare concerns, in fact, that I could easily spend my allotted time offering examples. And contrary to the opinion of many animal users, the demand for change is not simply or even primarily a matter of unfettered emotion. Though these social concerns are certainly issues of great emotion, the underlying theme is a new ethic for animals, rationally articulatable and defensible, and emerging inevitably from changes in animal use, changes in social demography and culture, and deducible from the platonic principle that ethics proceed inevitably from preexisting ethics.

This is not the forum for undertaking a detailed examination and justification of the new ethic; interested parties may seek out analyses in other works I have authored.[2-4] However, it behooves us to recognize the differences from the traditional component of the social ethic that addressed animal treatment. That ethic, articulated in the Bible and passed through Greek, Roman, and Medieval philosophy to post-Renaissance times until it became established as law in virtually all Western societies, is a prohibition against deliberate, willful, unnecessary, purposeless, sadistic, deviant cruelty or the infliction of egregious neglect upon animals. Underlying that ethic is an empathetic awareness of animal suffering, as the Rabbis argued, and an awareness, resoundingly articulated by St. Thomas Aquinas, that those who would wreak cruelty on animals if left unchecked by society will inexorably graduate to behaving that way toward humans. This common sense insight, recently buttressed by contemporary social science, has led our legal system to take animal cruelty as a sentinel for psychopathic behavior and address it far more seriously than has heretofore been done.

Underlying the new social ethic for animals is the realization that, if we draw a pie chart representing all suffering that animals undergo at human hands, only a tiny fraction of that chart represents the results of deliberate cruelty in the traditional sadistic sense. Every one of the 500 or so audiences I have addressed on the new ethic, be they animal activists or rodeo cowboys, say the same thing; at most, 1% of animal suffering is the result of that sort of deliberate cruelty. Most animal suffering is the result not of pathologic behavior, but of putatively decent motivations aimed at producing cheap and plentiful food, curing disease, advancing knowledge, protecting human safety, etc. Animal suffering is not an intended consequence but a by-product of such activities. A succinct ingression into the new ethic would point out that, for the first time in history, society is concerning itself with the more than 99% of animal suffering that is not the result of deviant deliberate cruelty!

Historically, the massive amount of animal suffering that does not fall under the old concept of cruelty is a creature of the second half of the twentieth century. The overwhelming use of animals in society has always been, and still is, agriculture: food, fiber, locomotion, and power. The essence of traditional agriculture was husbandry (from the Old Norse word for "bonded to the household"). Husbandry meant putting the animals into the ideal environment they were evolved for and augmenting their natural ability to survive with protection from famine, drought, predation, and disease. We put square pegs into square holes, round pegs into round holes, and created as little friction as possible doing so. If we harmed the animals, we harmed ourselves. So powerfully is this "ancient contract" ingrained in the human psyche, that when the Psalmist wishes to metaphorize God's relationship to Man, he uses a paradigm case of husbandry—the shepherd: "The Lord is my shepherd, I shall not want. He leadeth me to green pastures. He maketh me to lie down beside still waters. He restoreth my soul." We want no more from God than a shepherd provides for his animals. Thus, as long as husbandry was the guiding principle of agriculture, the only social ethic needed was prohibition of cruelty, to catch the few deviates who caused suffering for no reason.

Traditional animal use was, roughly, a symbiotic fair contract, epitomized in the maxim still prominent among western ranchers today: "We take care of the animals, and they take care of us." But this changed after World War II. With the loss of agricultural land and labor to urbanization, an industrialized view of agriculture emerged. The aim was to produce cheap and plentiful food, and industry values of efficiency and productivity replaced husbandry values. With the advent of "technological sanders," such as antibiotics and vaccines, we could now force square pegs into round holes and put animals into situations where, although their welfare was negatively affected, profit and productivity were not.

Infliction of suffering that was not deliberate cruelty was further strengthened by an increase in biomedical research and animal testing. Again, though researchers are invariably motivated by decent considerations such as curing disease and promoting health, and corporations by the desire to protect the public against toxicity of household products, the net result was an explosion of animal suffering that inexorably called forth new ethical concepts beyond deliberate cruelty. For example, it is clear that more suffering is created in laboratory animals by housing them for our convenience with no respect for their biological and psychologic needs and natures than by the invasive manipulations we perform on them.

The new ethic, in highly truncated summary, demands that although we may use animals, we must respect their basic needs and natures; what I, following Aristotle, call their telos—the "pigness" of the pig, the "horseness" of the horse. And, since husbandry has been superseded and respect no longer follows automatically from use, the ethic demands that we legislate such protection for animal needs, natures, and interests. In Europe, we have witnessed the abolition of severe confinement for sows, veal calves, laying hens, and other farm animals. All over the world new laws require control of pain in laboratory animals. Some laws require that experiments be terminated immediately if pain cannot be controlled. Other laws and regulations mandate laboratory accommodations for animals that fit their needs and natures, and zoos have moved in that direction without legislation.

How does all of this apply to the equine industry? The answer is, in a very direct and portentous way. I believe that not only are many aspects of the equine industry violative of the new ethic in failing to respect animals' needs and natures, but a substantial number of practices would and will count as overt cruelty if measured by the old ethic as recently broadened. As society has moved to the left in its view of moral obligations to animals, it has inevitably liberalized its view of cruelty. Consider one example. In 1987, during the USDA attempt to bolster dairy prices by buying a large number of dairy cows, the agency did not trust the farmers not to rebuy the cattle and return them to their herds. In an attempt to forestall such undercutting of the program, the USDA mandated face branding of all purchased milk cows with a USDA identification mark. Dairy farmers (who generally don't brand anywhere) and humane society members were appalled by this barbaric decree and brought the USDA to court in New York State on charges of cruelty. The judge ruled that the agency was in fact guilty of cruelty, for it had failed to examine or use alternative, less invasive methods of identification.

As society has evolved its new ethic for animals and become more urbanized, more sensitive, and less tolerant of animal suffering, the bar for what counts as cruelty has naturally been lowered. Twenty-four states since 1986 have elevated cruelty from a misdemeanor to a felony offense. In earlier eras, though society always defined cruelty as inflicting "unnecessary" suffering, it defined necessary as that which was inconvenient, too expensive, or not customary to alleviate. Today that definition has changed radically and, increasingly, when one says that "unnecessary suffering" is unacceptable, that is defined as suffering that is possible, if inconvenient, to alleviate. Necessary suffering, then, is suffering that is impossible to alleviate. In another era it might have been considered acceptable to train a horse using considerable negative reinforcement. Today, because our sensitivities and expertise in training have increased, we are aware that positive reinforcement can accomplish more than negative reinforcement. Someone who beats a horse severely in the process of training is likely to be seen as cruel by society in general, even if some of his peers endorse his training methods.

Societies are often disinclined to create new laws when old laws can be expanded to cover a perceived problem. For example, when concerns about horse tripping in Mexican rodeos surfaced, some states passed new laws banning such activities. In Colorado, where I was party to the discussions, the government believed that new legislation was unnecessary, because cruelty laws would cover an activity so far removed from what most citizens would consider acceptable animal use.

The new ethic for animals dictates that legislation be developed to protect animals in situations where the activities in question (eg, animal research and agriculture) are statutorily exempted by cruelty laws or where some pain and suffering must inevitably and necessarily accompany an animal use that society is not prepared to abandon. For example, consider the 1995 federal laboratory animal welfare laws. On the one hand, society realizes that researchers are not cruel and yet also sees that some pain, suffering, and death must inevitably and necessarily accompany the study of disease, toxicity, new surgical procedures, stress, and so on. Society was unwilling to forsake the benefits of biomedicine, despite the inevitability of some animal suffering, and thus would not forbid animal experimentation. However, society also did not believe that researchers were doing the best they could for animals used in research. This was evident when one realizes that analgesics were rarely used, social animals like chimps were housed in tiny individual cages, atrocities were documented, and so on. Society acted to "write large" (Plato's judicious term) their moral commitment to animals receiving the best possible treatment consonant with biomedical use by mandating pain control, eliminating multiple use, not administering paralytics without anesthetics, and providing enriched environments.

The same holds true for animal agriculture in Europe. People do wish to consume animal products, but, as the 1965 British Brambell Commission stated, they also wish to see animals live decent lives such as husbandry agriculture provided. Industrialized agriculture grew without people explicitly realizing what it entailed. As soon as they did (eg, in Britain and Sweden), laws were passed that underscored public commitment to decent lives for animals and abolished sow stalls, veal crates, and battery cages.

Research is seen by society as essential to human life and animal agriculture as essential to the food supply (few people are prepared to be vegetarians). Thus society deploys the new ethic to shape how these activities are done. Horse tripping, tame pigeon shoots, and dog fighting are not seen as essential or desirable by most citizens but are seen as causing animal suffering. Therefore, society moves to abolish them.

What of the equine industry? Horses are a favored animal, close to dogs in emotional appeal. The recent California law forbidding horse slaughter supports this point. At the same time, most people do not keep horses, make a living from them, go to racetracks, engage in endurance riding, show horses, or see or derive any benefit from hurting these animals. Social tolerance for suffering occasioned by equine use is going to be considerably less than for that growing out of research or agriculture. If society was willing to risk the threat of endangering their own human health by legislating proper treatment of laboratory animals, they will surely not cavil at shutting down morally objectionable aspects of an industry from which they receive no benefit. In fact, far too many practices in the equine area, if carefully scrutinized, would today very likely be rejected as cruel.

For example, the soring of horses is a practice so objectionable to society that it evoked federal legislation before the new ethic had even taken hold. Given that it is still done, albeit in more ingenious ways, I doubt that one could find a citizen (including many Tennessee Walking Horse owners) who would be unwilling to support a referendum abolishing it, now that it is evident that regulation has not worked.

As another example, consider the chain saw bit (or

mule bit) made of saw chain that one can legally buy from widely distributed catalogues. Most horse people are horrified when I show them one; yet there are sectors of the industry where they are used openly, with one trainer remarking to one of my veterinary students "So what? The worst that happens is we cut a few tongues off." Most ordinary citizens and most horse owners, I think, would share my view of this device: any horse that can't be ridden without it should be euthanatized; any rider who refuses to ride without it should be euthanatized.

Many training methods are equally socially and ethically unacceptable. Consider "tarping," a breaking method whereby a horse is thrown on the ground, covered with a tarp, and beaten with a whip or hose. Or blindfolding a horse, running him down an alley into a wall, and yelling "whoa." Or beating a horse with cable or hose filled with lead. Or tying a horse's head to his tail and turning him back in his pen, leaving him all day without water or the ability to straighten his head, usually done when the horse refuses to give his head to the rider. Severe bits and lip chains should be included in this list. The key point is that there are widely known alternative training methods that do not hurt horses. For example, there are all the well-publicized "natural horse" approaches based on an understanding of the horse and its nature. Given this knowledge, persisting in abusive approaches would surely count as cruelty.

The same point can be made about the show ring and the abusive shortcuts many people take, using firecrackers, whipping, electroshock, and anal irritants to excite animals for some show uses, and bleeding, hanging, taping nostrils, and even breaking ribs to make them look relaxed for other uses. "Tail-breaking" is another good example.

Even veterinary medicine is vulnerable to similar criticisms. Given the total absence of scientific evidence supporting any benefit to firing or freeze-firing, and given the pain they cause, do not such practices count as cruelty in today's moral milieu? The same can be said of practitioners who continue to use paralytic drugs for castration or for euthanasia. I spoke to one equine association outside of the United States that openly avows the use of succinylcholine for racetrack euthanasia. And what of drugs used to mask pain but allow horses to continue to run and thus to injure themselves?

The point is not to chronicle atrocities, though in my many speeches to horse people, I have found that they are generally totally unfamiliar with abuses outside of their own area and greatly shocked and upset by them. The public (ignorant as it is of the myriad aspects of the horse industry and of the fact that most horse owners are more horrified by these atrocities than nonhorse people) is likely to see the horse industry as a monolith and to direct its revulsion at all horse people rather than at those who deserve it.

Although I have stressed abuses that count as cruelty in today's moral context, we should recall that what we have called the new ethic—the demand that an animal's nature be respected in our uses of the animal—is also operative in the equine area, though not as clearly as in research or agriculture. Long-term tethering of horses for production of pregnant mare urine provides a clear example of something that can violate the horse's nature or telos. So too does the confinement of racehorses in a small stall for 23 hours a day. This must be a source of suffering to herd animals bred to run, whose nature is to graze. In addition, I believe that it predisposes an animal to injury when they do run. A third example is the racing of young horses before they are biologically prepared. Even if the public accepts racing, it will not accept racing at an age that promotes injury. A final example is all too common: keeping horses without exercise, without companions, without stimulation.

My presentation has been designed to provide the context in which we must think about equine welfare as we approach the new millennium. What counts as cruelty will be substantially expanded; what counts as violation of animal nature will continually be scrutinized and subjected to demands for reform. The public will not cavil at shutting down what it sees as abusive and hurtful to animals, be it cruelty or not. And, as occurred in research, a few well-chosen and well-publicized examples of "what those horse people do" can majorly impact the entire equine industry.

I strongly endorse removing our heads from the sand and facing up to our moral problems. Gary Carpenter of the American Association of Equine Practitioners (AEEP) has suggested an industry-wide national meeting to lay bare these issues and implement strategies for resolving them. The American public is fair-minded and will give you leeway if you are trying to do the right thing. The most effective defense is to admit one's shortcomings and lay out practical methods for overcoming them.

Let me conclude by quoting from a speech I did for the AEEP almost 10 years ago. "None of the equine suffering we have mentioned above is necessary—viable alternatives exist to the abusive practices we have mentioned. One can have racing without racing horses who are not biologically ready and without drug abuse; one can have horse training which works with the horse's nature, and not against it, brutally bending it to our will; (such training is in any event more beautiful and elegant). One can have horse shows that celebrate and exhibit the horse's telos, not our skills at abusive artifice. One can enjoy the horse for what it is, and what we can perfect, genetically and environmentally, not for our unfortunate skill in putting square pegs into round holes. In conclusion, I would argue that we should keep as our root metaphor what must surely have informed the ancient vision of the centaur, the symbiotic unity of man and animal, mutually interdependent, rising to heights neither could scale alone."

References

1. Gaskell G. Europe ambivalent on biotechnology. *Nature* 1997;387:845–847.
2. Rollin BE. *Animal rights and human morality*. 2nd ed. Buffalo: Prometheus Books, 1992.
3. Rollin BE. *Farm animal welfare*. Ames, Iowa: Iowa State University Press, 1995.
4. Rollin BE. *The Frankenstein syndrome: ethical and social issues in the genetic engineering of animals*. New York: Cambridge University Press, 1995.

The role of the equine practitioner in disasters

John E. Madigan, DVM, MS, DACVIM, and Jacqui Whittemore, BS

The health and well-being of horses can be adversely affected during natural disasters such as severe storms, floods, fires, hurricanes, tornadoes, or earthquakes. Equine practitioners are uniquely qualified to diagnose and treat injuries and stresses affecting horses during disasters and understand the logistics associated with rapid or planned evacuations of horses. Planning for disasters is often overlooked during the day-to-day operations of a busy equine practice; however, disaster planning is an important service that can benefit horse owners within a community. The purpose of this report is to briefly describe the important role equine practitioners have in disaster preparation, emergency response and rescue, and veterinary care of horses after a disaster has occurred.

Disaster Preparation

The most important role equine practitioners play is educating clients regarding disaster preparedness. Effective approaches to disaster preparedness save more lives than any type of disaster response.[1] Equine practitioners can educate local horse owners by giving seminars and presentations at pony clubs, 4-H, and other community equine forums. During these presentations, questions should be posed as to what each horse owner would do if they were without power for 3 days, had to evacuate all the horses on their premises, or if their structures were destroyed. Do they have resources available to evacuate all their horses quickly? Can they provide food and water for their horses for 3 days without power or outside help? Do they have adequate materials to securely identify evacuated and abandoned horses so that ownership cannot be challenged? Horse owners should also be educated about the ways horses respond to different types of disasters and the most common injuries sustained. Distribution of pamphlets describing the essentials of disaster planning should be as much a routine part of equine practice as is distribution of information on vaccinations or parasite control. Prepared pamphlets can be accessed and printed from the California Department of Food and Agriculture website (www.cdfa.ca.gov/programs/disasterprep/animals.html).

Practitioners may also play a critical role in developing local disaster response plans and setting up volunteer disaster response teams. Key components of a county disaster plan include identification of alternate animal housing, feed and water supplies, sources of tack and animal housekeeping materials, and means of mass transport during evacuations. Housing options for horses include fairgrounds, stables or racetracks, sale yards, rodeo arenas, local educational institutions, producers, ranchers, and private individuals. Food resources include feed stores, hay brokers, local boarding and breeding facilities, ranchers, and private individuals. Important supplies for use in disasters include halters, lead ropes, blankets, bedding, wheelbarrows, rakes, pitchforks, buckets, hoses, fly spray, chlorine bleach, disinfectant, and lime. Researching possible donors and stockpiling these materials in advance facilitates rapid distribution during times of need. Supplies practitioners may be best equipped to provide include common medications, intravenous fluids, leg wraps and bandages, vaccines, and ambulatory clinic facilities. Common resources for animal transport and evacuation include local horsemen's associations or riding clubs, private horse trailers, horse transportation companies, local cattlemen's associations, ranchers, and livestock transportation companies. Often, residents are only allowed to leave and return to the disaster site once or twice before they are barred from reentry. Therefore, a key to successful evacuation of animals is educating clients about the importance of maintaining adequate transportation to evacuate all animals within 1 or 2 trips. Because many resources may also be used during disasters for human care and response, it is important to work with your local **Office of Emergency Services (OES)** to incorporate a plan for animals into the county's disaster plan for humans. Animal control and local humane associations should also be involved. A free step-by-step manual on developing animal disaster plans and response teams is available at www.vetmed.ucdavis.edu/vetext/home.html. Other useful resources are the **Federal Emergency Management Agency (FEMA)** Animals in Emergencies course (www.fema.gov/fema/anemer.htm).

During large declared disasters, equine practitioners must be able to effectively interact with individuals controlling movement of people and animals in the area impacted. A plan must be in place so that equine practitioners' skills and resources are efficiently used. In addition, evacuation sites and sources of food and supplies must be identified to ensure adequate care of displaced horses. A County Animal Coordinator should be identified to serve in the OES, and this person should act as a point of contact for animal issues. Equine practitioners involved in disaster relief should be knowledgeable and part of the Disaster Service Worker plan for their area. This may require interfacing with Animal Control and the county OES coordinator. If a practitioner wishes to participate in field response, he or she will be required to take a course on the **Standardized Emergency Management System (SEMS)** and become certified as a Disaster Service Worker. By learning the components of the county disaster plan and the SEMS and becoming a registered Disaster Service Worker, equine practitioners can be extremely effective during disasters. Each state veteri-

From the Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California-Davis, CA 95616.
Dr. Madigan was the speaker.

nary organization should have an effective disaster plan for animals that includes horses. This plan should interface with existing state plans and have an assigned large animal coordinator in the state OES for animal issues. Equine practitioners should meet at least yearly to review the availability of resources and plans for the following year.

Rescue

Rescue of horses trapped or stranded during a disaster may require services that only veterinarians are qualified to offer, including physical examination and assessment, chemical restraint, emergency treatment of wounds or other conditions, or assessment of permanent irreparable injury for which humane destruction is required to prevent suffering.[2,3] To perform these duties, veterinarians must be able to enter disaster areas once they are stabilized but closed to all but emergency personnel. To gain entry, animal control or another supervising body must be contacted to coordinate immediate rescue and care of animals left behind in an evacuation. In addition, veterinarians should be aware of potential hazards following a flood, fire, or hurricane[4] and be trained in safety techniques and appropriate use of necessary equipment.[5] Specialized approaches may be required to rescue individual horses, including helicopter airlift, if no other means exist.[5] Providing horses with on-site food, water, and medical treatment until transportation or other resources become available can mitigate pain and suffering. When animal holding facilities are damaged and horses are loose, it is important that attempts be made to separate stallions or aggressive horses and group horses under safe circumstances until alternate housing can be located. Loose horses can be dangerous to approach, and only experienced individuals should be allowed to assist with animal capture, identification, and rescue.

References

1. Madigan JE. Equine disaster response for horse owners. *American Horse Council guidelines for minimal standards for the care of the horse in the United States*, 1999.
2. Madigan JE. Stress, shock, chemical restraint and problems of immobilization and restraint of the equine rescue patient. Proceedings of the first international conference on equine rescue. *J Equine Vet Sci* 1993;13:262–263.
3. Madigan JE. Rescue of the individual horse, in *Proceedings*. Am Assoc Equine Pract 1993;38:141–144.
4. Heath SE. Hazards. In: Heath SE, ed. *Animal management in disasters*. St Louis, Mo: Mosby Year Book Inc, 1999;21–98.
5. Madigan JE. Evaluation of a new sling support device for horses. Proceedings of the first international conference on equine rescue. *J Equine Vet Sci* 1993;13:260–261.
6. Madigan JE, Moore B. Helicopter rescue of horses. *J Equine Vet Sci* 1995;15:155–157.

The pregnant mares' urine industry—management and research

Douglas A. Freeman DVM, PhD

Pregnant mares' urine (PMU) ranching is a cooperative effort between equine agriculture and human medicine and is an important part of the equine industry. The ranches are located in North Dakota and the 3 prairie provinces of Canada (Manitoba, Saskatchewan, and Alberta). There are currently 431 ranches that contract to provide PMU, and approximately 35,000 mares are involved in its production. Additional horses kept on these ranches include stallions, young stock, and other mares. Pregnant mares' urine ranching is an important part of the agricultural economy and community in these regions.

Mares produce multiple estrogen conjugates during pregnancy and excrete these conjugates in the urine. Multiple estrogens are extracted from PMU to manufacture a hormone replacement[a] for postmenopausal women. Although this presentation focuses only on the management and welfare of pregnant mares, it is important to understand that manufacturing this hormone replacement is of major importance to women's health care.

From the Equine Studies Program, Department of Veterinary and Animal Sciences, University of Massachusetts, Amherst, MA 01003.

Dr. Freeman is a veterinary research consultant to Wyeth-Ayerst Global Pharmaceuticals and serves as cochairman of the Equine Management Group.

The Industry

On the basis of an industry demographic survey,[1] the typical PMU rancher has worked in PMU ranching for more than 10 years; works the ranch with a spouse, child, and 1 hired hand; is the second generation of his/her family to work the family ranch; cares for approximately 75 to 80 pregnant mares; breeds more Quarter Horses than any other registered breed; and also produces cereal grains, forages, and other livestock.

Pregnant mares' urine ranching follows a regular annual cycle. Mares are stabled while they produce estrogen conjugates during harsh winter weather. This means they are stabled beginning in October and return outdoors in March. Foaling takes place outdoors. During spring and summer, mares are maintained in bands on pasture. Most ranches use a natural pasture breeding management program. Stallions are

turned out with mare bands between June 1 and August 1. Foals are weaned in the fall when they are a minimum of 3 months old.

Urine is collected by use of a noninvasive lightweight collection unit suspended by elastic tubing from the ceiling behind the mare. During urine collection season (October to March) mares are housed in tie-stall barns. The collection cup is maintained near the perineum of the mare and will catch urine during normal urination. Collection of urine reduces wet bedding and, consequently, barn odor and ammonia. The suspension design allows stabled mares to move around and lie down freely within the stalls. Mares are periodically turned out to paddocks for free exercise. Turnout schedules vary among ranches.

Independent ranchers contract to supply PMU to Wyeth-Ayerst Global Pharmaceuticals. This contract includes an obligation by ranchers to apply guidelines in the *Recommended Code of Practice for the Care and Handling of Horses in PMU Operations* (The Code). These comprehensive guidelines were developed by a committee, which included independent veterinarians and government personnel. The Code is used by industry inspectors who evaluate each ranch monthly. The Code has been appended to the new Canadian-wide code for horses, which was coordinated by the Canadian Agri-Food Research Council (CARC), CARC Canada Committee on Animals, CARC Expert Committee on Farm Animal Welfare and Behavior, and the Canadian Federation of Humane Societies.

Continuous Improvement Program

The Continuous Improvement Program (CIP) encompasses various steps developed by veterinarians, quality assurance specialists, and other members of the PMU industry. These steps are designed to ensure the health and well-being of the horses involved, identify any problems within the industry, and develop ongoing strategies to improve mare and ranch management. It is, in essence, an industry-wide herd health program. The following are components of the CIP.

Monthly ranch inspections—The PMU industry employs field representative inspectors who conduct monthly comprehensive ranch reviews. An extensive review form was developed to facilitate complete and consistent inspections. Data from these forms is entered into a computerized database. To evaluate findings, information is reviewed, organized, and searched by a quality assurance specialist based on demographic data, month, or inspection results. Ranchers and field inspectors develop solutions to any problems identified, and the results are monitored by repeat assessments and data analyses. Field supervisors also review ranches and the ranch inspection process.

Veterinary review program—Ranchers are obligated to hire an independent practicing veterinarian to conduct 3 complete herd health reviews while mares are stabled (in November, January, and March). A herd health review form was developed by a committee of veterinarians to facilitate reviews and ensure they are complete and consistent. Herd health forms are also reviewed by the industry veterinarian in charge of PMU mare health. More than 90 veterinarians participate in conducting these herd health assessments.

Independent ranch review—Several national, provincial, and state offices have the authority to inspect ranches and investigate complaints. These include the Veterinary Services Branch of Manitoba Agriculture, the Saskatchewan SPCA, the Alberta SPCA, and the North Dakota Board of Animal Health. In addition, various equine experts have conducted ranch reviews. A recent extensive outside ranch review was conducted during the 1996 to 1997 collection season by international equine veterinarians representing the American Association of Equine Practitioners (AAEP), the Canadian Veterinary Medical Association (CVMA), and the International League for the Protection of Horses (ILPH). For this review, participating veterinarians selected ranches for inspection in all 3 provinces and North Dakota. The review encompassed 25 ranches and approximately 2,400 mares from which urine was currently being collected. Findings were published in a consensus report issued by the participating veterinarians.[2] The veterinarians concluded, "Based on our inspections, the allegations of inhumane treatment of horses involved in PMU ranching are unfounded."

Barn improvement program—A formal assessment of all barns collecting PMU for Wyeth-Ayerst Global Pharmaceuticals was conducted as a part of the CIP. Facilities that did not meet current technical or dimensional guidelines established in The Code were prioritized for renovation or replacement, even when horse care within those facilities was considered acceptable. Facility review and evaluation of horse management are a part of this ongoing program.

Linwood Equine Ranch—A working PMU ranch was purchased and developed as a research and educational facility. A veterinarian was hired to manage the facility, conduct research studies on mare management and welfare, and oversee all issues of PMU mare health across the industry. Veterinarians, clinicians, and researchers from outside the industry collaborate on studies conducted at Linwood Equine Ranch. In addition, the facility has been reviewed for accreditation by the Canadian Council on Animal Care.

Equine Management Group and Equine Advisory Board—The Equine Management Group comprises veterinarians, managers, and others from within and outside the industry. The group is charged with oversight and publication of research conducted at Linwood Equine Ranch, and members provide expertise consultanting on equine health and management. Members of the Equine Advisory Board are veterinarians and scientists who provide expertise in their area of concentration. Equine Management Group and Equine Advisory Board members have credentials in equine medicine, physiology, reproduction, nutrition, and behavior. Veterinarians in the Equine Management Group work in industry, academia, and private practice. All Advisory Board members currently practice in industry or academic settings. Participating academic institutions include Cornell University, Michigan State

University, The Ohio State University, The University of Pennsylvania New Bolton Center, Rutgers University, and the University of Massachusetts.

Current Research Initiatives in the PMU Industry

Many animal agriculture industries have conducted controlled research studies to evaluate established management practices in the face of changing perspectives on animal welfare. The PMU industry, in conjunction with members of the Equine Management Group and Equine Advisory Board, has conducted controlled studies at Linwood Equine Ranch, evaluating methods of watering stabled mares, turnout frequency, nutrition, and other barn management issues. Some data were presented at the 1998 AAEP Annual Convention.[3,4] Complete studies of watering methods were recently published in the *American Journal of Veterinary Research*.[5,6] To accurately assess mare welfare, indicators of physiologic and psychologic well-being were evaluated in these studies. Summaries of key projects follow.

Watering methods—Provision of water ad libitum to stabled mares results in substantial spillage and secondary barn hygiene and management problems. Various methods for providing water intermittently have been developed to prevent these problems. These methods were critically compared to continuous watering and a new timer-float system designed to provide residual volume after watering.[5,6] Mares were evaluated for health and hydration status clinically and biochemically. To address psychologic well-being, detailed quantitative measures and clinical assessments of behavior were conducted. In all cases, mares were healthy and normally hydrated when given intermittent access to water. Behavior of mares was normal and free of stereotypic behaviors. These studies indicated that intermittent access to water supports the physiologic and psychologic well-being of mares.

Turnout frequency—Mares are housed during the winter months in tie-stall barns and turned out at various intervals. No data is available from which to make recommendations regarding the appropriate frequency for turnout. Clinical impressions indicate that stabled pregnant mares will occasionally develop dependent edema or other forms of limb swelling. This limb swelling is not necessarily pathologic and is not always exercise-responsive. Studies were conducted at Linwood Equine Ranch to evaluate the physiologic and psychologic well-being of mares under various turnout frequencies. Although these studies are still in progress, initial findings indicate that results of physiologic health and behavioral assessments do not differ among mares on daily, weekly, or biweekly turnout schedules.[3,4] It is clear from clinical observation and research studies that the needs of individual mares vary, and multiple factors must be considered in establishing appropriate turnout schedules.

Issues Raised by Critics

Oversight of the industry and mare well-being—Currently, the PMU industry has an extensive review and oversight program. Inspections in the CIP provide a multilevel series of checks and balances during review of mare well-being: field inspector, field supervisor, private veterinary herd health reviews, industry veterinarian oversight, outside reviews by equine experts, and regulatory agency inspection. To ensure skill and objectivity, company inspectors are required to complete a training program with the industry veterinarian. Inspection territories are rotated every 3 years.

Veterinary care on PMU ranches compares favorably to the norm for US household-owned horses, based on the AVMA Center for Information Management 1997 report.[7] Whereas all PMU ranches must conduct a veterinary herd health review at least 3 times per year, more than 40% of US household-owned horses did not receive a veterinary examination. Comparatively, the PMU industry is a highly regulated and closely inspected equine industry.

Provision of water—Mares' access to water is managed to maintain good stable hygiene. Although The Code requires adequate water delivery to mares, groups critical of the PMU industry have alleged that the systems used do not provide adequate water for mares, and ranchers restrict water provided to mares so that they produce a lower volume of more concentrated urine. On the basis of normal health, hydration, and behavior of mares in controlled studies conducted at Linwood Equine Ranch, intermittent watering systems employed on PMU ranches provide adequate water to mares. To further ensure that adequate water is provided, the pharmaceutical manufacturer now contracts for grams of estrogen, independent of urine volume delivered, and pays all urine transportation costs.

Exercise and confinement—During the collection season, mares are periodically turned out into paddocks for free exercise. Specific turnout schedules vary between ranches and, in many cases, are based on the needs of individual mares. Although experience-based data is of limited objective use, tie-stall management has long been practiced around the world. A lack of objective data exists that defines adequate turnout requirements for pregnant mares, and critics have expressed concern regarding tie-stall management.

Studies at Linwood Equine Ranch, as well as university studies,[8] are being conducted to obtain objective data and develop related management recommendations regarding turnout frequencies. Available results support assessing mares as individuals. Groups critical of the industry allege that tie-stall winter housing causes musculoskeletal damage. Evaluation of muscle enzymes in the serum of mares maintained in barns from fall to early spring reveals no significant muscle damage. Regardless of the turnout schedule employed, monthly inspections and veterinary review processes are designed to identify mares that need additional turnout.

Foals—There is a misconception among groups critical of the PMU industry that foals from PMU ranches are unwanted by-products that are consumed by humans overseas. Foals can actually be an important component of the ranchers' production. Currently,

most foals are intended for show, rodeo, recreation, ranch, and replacement markets. An industry demographic survey indicated that a minority of PMU ranches sell their foals at public auction.[1] Pregnant mares' urine ranches sell 50% of their foals privately, 19% at breeder production sales, and 30% at public auction. In addition, results of a 2-year survey[9] indicated that foal mortality on PMU ranches was relatively low, and it was not different than mortality on non-PMU extensively managed facilities (6.4 versus 7.2%, respectively). On the basis of normal foaling rates among PMU mares, it is apparent that foals from the industry comprise only a small percentage of horses that go to the North American slaughter industry.

To address the well-being of foals transported to public auction, the industry has established regulations requiring a minimum weaning age of 3 months and annual trailer inspections. Management of weanlings going to public auction may be an area where additional input by veterinarians can be useful to ranchers. Selling foals at auction or to feedlots is likely to be the least-productive route for PMU ranchers. As horse breeders, the ranchers' association (North American Equine Ranching Information Council [NAERIC]) has developed several programs to further increase the quality of foals produced and their markets.[10] These programs include a Breeding Enhancement Program designed to cross PMU mares with Thoroughbred stallions for the purpose of producing quality North American horses for the sport horse industry. There are also financial incentive programs for buyers who purchase and compete with NAERIC horses as registered purebreds, ranch horses, and draft horse teams.

Urine collection system—Some members of the public mistakenly believe that PMU is routinely collected by catheterization. In reality, the suspended-collection system is noninvasive, allows freedom of movement in the stall, and is managed to avoid discomfort to mares. Based on observations at Linwood Equine Ranch, most mares turned outside in paddocks will urinate in the collection unit soon after returning to the barn. Furthermore, 5 universities in the United States use the PMU collection system in their equine nutrition research programs.

Impregnation—This is a term used by groups critical of PMU collection; however, it does not accurately reflect the use of natural pasture breeding management on PMU ranches.

Education—Ranchers' national and local associations conduct meetings and produce publications as continuing education for ranchers. Recently, a veterinary continuing education conference was held for practitioners working in the PMU industry.

Conclusions

The purpose of this presentation was to provide information regarding equine management in the PMU industry and describe programs designed to address concerns about the care and well-being of mares involved in the production of PMU. The industry has been a proactive leader in responding to criticisms and addressing questions regarding mare management and well-being. Ranch inspection and veterinary review programs in place should identify and correct problems that may arise. Research studies are ongoing. Data collected to date, particularly behavioral assessments yielding normal results, indicate that PMU mares can be managed appropriately for their health and well-being. This perspective is supported by the concluding statement from the AAEP, CVMA, and ILPH equine veterinarians' Consensus Report[2]: "The public should be assured that the care and welfare of the horses involved in the production of an estrogen replacement medication is good, and is closely monitored."

[a]Premarin, Wyeth-Ayerst Global Pharmaceuticals, St Davids, Pa.

References

1. North American Equine Ranching Information Council. *PMU ranching demographic study*, Louisville, Ky: North American Equine Ranching Information Council, 1996;4–17.
2. King AB, Messer NT IV, Roberts CA. *Equine veterinarians' consensus report on the care of horses on PMU ranches*. Lexington, Ky: American Association of Equine Practitioners, 1997.
3. Freeman DA, Cymbaluk NF, Kyle B, et al. *Health and welfare of stabled PMU mares under varied water and turnout schedules: 1. Physiology*, in *Proceedings*. Am Assoc of Equine Pract Annu Meet 1998;19–20.
4. McDonnell SM, Freeman DA, Cymbaluk NF, et al. *Health and welfare of stabled PMU mares under varied water and turnout schedules: 2. Behavior*, in *Proceedings*. Am Assoc Equine Pract Annu Meet 1998;21–22.
5. Freeman DA, Cymbaluk NF, Schott HC, et al. Clinical, biochemical, and hygiene assessment of stabled horses provided continuous or intermittent access to drinking water. *Am J Vet Res* 1999;60:1445–1450.
6. McDonnell SM, Freeman DA, Cymbaluk NF, et al. Behavior of stabled horses provided continuous or intermittent access to drinking water. *Am J Vet Res* 1999;60:1451–1456.
7. American Veterinary Medical Association, Center For Information Management. *U.S. pet ownership and demographics sourcebook*. Schaumburg, Ill: AVMA, 1997;119.
8. Sparks CR, Topliff DR, Collier ME, et al. The influence of restricted movement on the physical fitness and well-being of pregnant mares, in *Proceedings*. 16th Equine Nutr Physiol Symp 1999;251–252.
9. Burwash LD, Pritchard J, Coleman RJ. Foal mortality on extensively managed farms, in *Proceedings*. 16th Equine Nutr Physiol Symp 1999;247–248.
10. North American Equine Ranching Information Council Latest News, News Stories, and NAERIC Incentive Program web site information. Available at www.naeric.org. Accessed November 1999.

Racing

George D. Mundy, DVM

Horse racing, which takes advantage of the horse's natural ability to run for entertainment and pari-mutuel wagering, has been a mainstay sport for centuries. The horse's physical beauty, athletic form, and tremendous speed are admired by all. Racehorses, for the most part, are extremely well cared for. This care includes assigned grooms, around-the-clock monitoring, regular professional health care, individualized training programs, and excellent husbandry, all at considerable expense to these horses' owners. Physical activity is directed in a controlled environment to optimize fitness and performance. In addition, regulatory agencies oversee the racing industry, using standards that address the well-being of the horse. However, because racing events tend to be high profile (especially nationally televised races), and the industry has instituted an aggressive marketing program to attract new audiences, welfare issues are a constant concern. Welfare issues in the spotlight include performance-affecting substances, therapeutic medications, athletic injuries, and life for horses after a racing career.

Performance-Affecting Substances

Whenever pari-mutuel wagering is conducted and purse money is involved, there is a potential for nefarious acts to be committed that may affect the outcome of a race. For example, in Kentucky, sponges were recently found to have been inserted deep in the nasal passages of several horses that were poor performers. This was a deliberate attempt to prevent these horses from performing by compromising their breathing and had potentially life-threatening consequences. Another example is administration of performance-affecting substances to racehorses. These substances may be used to prevent a horse from running at full potential (eg, tranquilizers) or to enhance performance (eg, narcotics). The presence of a performance-affecting substance in a racehorse can only be construed as a deliberate attempt to alter the outcome of the race.

Postrace drug testing is performed in racing jurisdictions in which pari-mutuel wagering is conducted. Drug testing includes comprehensive screening of several participants in each race, including the winner. Detection of performance-affecting substances in blood samples obtained after the race results in substantial penalties for the responsible parties. Depending on the substance involved, fines, loss of winnings, and suspensions are levied by the racing board after a hearing process. The prevalence of adverse findings is extremely low, with one study citing a rate of 0.129%.[1] This represents a 10-fold lower use of performance-affecting substances in racehorses than in human Olympic competitors.[2] It has been my experience that, in most cases, adverse results of drug screening in racehorses are caused by inappropriate or unintentional administration of a legitimate medication. Human error (eg, giving medication to the wrong horse) is the usual explanation, as opposed to intent to affect the outcome of a race. New drug detection methods are constantly being developed, and state programs and regional collaborations address the detection of new performance-affecting substances as tests become available. These regulations and resources ensure that horse racing is one of the most tightly drug-regulated sports.

Medications are used routinely to protect and enhance the well-being of horses and include wormers, antibiotics, and medications that address performance-related problems. Administration of these products raises some issues. When does a medication intended to prevent or treat a condition affect the performance of the horse? Does medication administered to an asthmatic horse give that horse an unfair advantage? Do blood concentrations of nonsteroidal anti-inflammatory drugs permit a sore horse to perform and risk potential injury? Can administering bicarbonate to a horse prior to a race affect its speed? What are the long-term effects of administering such medications? The answer to these questions depends on the medication used, the dose administered, time of administration prior to competition, and the presence or absence of a medical condition for which the medication is indicated. Clearly, a zero-tolerance policy is the simplest to live by and enforce, but is that in the best interest of these horses?

One of the most common medical problems affecting racehorses is exercise-induced pulmonary hemorrhage (EIPH). Some studies indicate that virtually every horse suffers some degree of EIPH at some point.[3] Extreme episodes of EIPH can cause massive internal hemorrhage into the lungs with subsequent asphyxia and death. The industry standard for management of EIPH is race day use of furosemide. Furosemide is usually administered intravenously 4 hours prior to competition to horses affected by EIPH. This is an example of race day administration of a medication to address a performance-related problem that directly affects a horse's well-being. Results of at least 2 studies indicate that administration of furosemide affects racing performance of Thoroughbreds.[4,5]

Should medications be administered to racehorses to address ongoing problems so that they may compete? In the face of an ongoing medical problem, should other treatment options (eg, rest) take precedence over administration of medication on the day of the race? Equine practitioners must advise and administer medications within the guidelines of a particular racing jurisdiction and with consideration for the horse's welfare. In addition, the racing industry must adopt a sensible, national medication policy that addresses the integrity issue, does not provide com-

From Hill 'n' Dale Farm, 4252 Spurr Rd, Lexington, KY 40511.

petitors an unfair advantage (real or perceived), and, above all, maintains the health and welfare of racehorses. Practically, the only policy that meets these criteria is a prohibition on administration of medication on race days.

Racing Injuries

Horse racing has inherent risk for its participants, as does any athletic competition. Thoroughbreds, which are bred specifically to carry weight with sustained speed over extended distances, appear to be at particular risk for injury, whether racing or not. Osteochondral fractures are often found in the joints of weanling Thoroughbreds offered for sale in late fall. Obviously, these foals have never participated in a race. Recently, Farma Way, a 12-year-old stallion that earned more than $2,897,175 during a successful racing career, was found in his paddock with a catastrophic fracture to his hind leg.

Consider a 1,000-lb horse traveling at speeds of more than 25 mph suspending its entire weight (a force approaching 1 ton) on a single limb. It's no wonder the lower limbs of horses are susceptible to sprains, strains, and fractures. Thankfully, severe injuries are rare in Thoroughbred racing. When injuries do occur, interest in their cause and preventative strategies is heightened. This is particularly true when high-profile participants in major events are affected.

A Kentucky study[6] looked at the incidence of racing injuries over a 17-month period and included 35,484 race starts. Results of the study indicated a rate of 3.3 injuries/1,000 race starts. The fatal injury rate during the same period was 1.4 fatal injuries/1,000 starts. These rates are similar to those reported by several other North American sources.[7] Information on injuries sustained while training is difficult to gather because of the transient nature and varied location of training for racehorses. Limited studies[8] in North America suggest an attrition rate of 50%, with a fatal fractures incidence similar to those described for racing. It appears injuries sustained during training are at least as important as those occurring during racing.

Causes for racing injuries are multiple, and there is no simple cause-and-effect relationship. Many studies have been conducted to identify specific risk factors. There are epidemiologic challenges to designing such studies, because racing injuries are rare and random. Factors that have been identified include physical interaction and stumbling during racing, use of toe grabs (a type of horseshoe), and preexisting physical conditions (eg, microfractures in long bones).

Dr. Rollins previously mentioned the potential contribution of limited activity (racehorses often spend 23 h/d in stalls) to injury. This factor is still under investigation; however, some trainers have already instituted novel training regimens that reduce the time racehorses spend in their stalls. Farm training with ample turnout worked well for Breeders' Cup Mile 2-time winner Da Hoss.

The condition of a racetrack's surface is also believed to play a role in injuries. Studies to date have not identified a particular racing surface or condition that results in a higher incidence of injury; however, racetracks may experience periods when injury rates are higher than expected. Racetrack management pays close attention to track composition and maintaining a consistent, safe surface. Racing surfaces are routinely renovated at great expense to achieve this goal. When surfaces are deemed unsafe because of environmental conditions, races are cancelled. With the advent of simulcast wagering, short-term loss of live racing has little effect on the overall racing product.

The discovery of microfractures as a preexisting condition to most major long bone fractures has made application of nuclear scintigraphy in equine lameness diagnostics routine. Preexisting conditions are also the focus of some Kentucky investigators who are analyzing the results of prerace inspections performed by regulatory veterinarians. Findings to date support race day veterinary inspection as a useful tool for identifying horses at greater risk. These findings should result in an increased emphasis on prerace inspection, including implementation in jurisdictions where prerace veterinary inspections are not currently performed. For a number of years, major racing events have used veterinary surveillance to monitor racing soundness of participants well in advance of race day.

Acute injury management expertise, equipment, and procedures vary among racetracks. Experienced regulatory veterinarians usually provide initial treatment and stabilization on the track. Specialized equipment, ranging from lower limb braces to state-of-the-art equine ambulances with hydraulic lifts, is available to facilitate transport of injured horses to the most appropriate medical facility for further evaluation and treatment. Injury management is further refined at major racing events to include on-track trauma teams and detailed communication plans for immediate notification of trainers, practicing veterinarians, and owners so that injury management can be coordinated. To decrease speculation and dissemination of misinformation, in 1990 the American Association of Equine Practitioners (AAEP) implemented the On Call program to provide media-trained veterinarians for major racing events. The On Call program has become an integral component of televised racing, and AAEP members are available to respond to inquiries at virtually every nationally televised racing event. This year's Belmont Stakes provided an excellent illustration of refined injury management. When Triple Crown hopeful Charismatic sustained an injury shortly after crossing the finish line, immediate veterinary care was provided by the New York Racing Association veterinary team. Information on the horse's condition and a tentative diagnosis was relayed to the On Call veterinarian who was then interviewed on national television. Charismatic was taken to the stable area, further evaluated and treated by his attending veterinarians, and surgery was subsequently performed to stabilize the fracture. The outcome was excellent for everyone involved. I was once asked "If you can increase your scrutiny of horses and provide additional staff to your injury-management team on Kentucky Derby day, why can't you do it every day?" Ability to monitor is directly proportional to the availability of resources. Many daily events at major racetracks incorporate prerace

inspections and injury management plans. As the racing industry expands its product to new audiences, it must also set minimum standards for protecting and managing participants at all racetracks. Resources must be allocated to employ experienced regulatory veterinarians and provide them with the necessary equipment and manpower to adequately implement prerace inspections and injury-management procedures.

The wisdom of allowing 2-year-old horses to race is often debated, although 2-year-olds have traditionally participated in Thoroughbred racing around the world. The argument against racing 2-year-olds centers on the horse being physically immature. Many individuals believe this immaturity predisposes these horses to injury. Proponents point out that by birth date, horses are physically mature enough to be raced, only horses capable of racing at 2 are raced, and race-speed competition is necessary for optimum physical development. Studies have not identified a greater incidence of injuries in 2-year-old horses. In fact, most studies have identified older horses as being at greater risk. With races for 2-year-olds comprising less than 8% of races run in North America, today's 2-year-olds run less often and make their racing debuts later in the calendar year. Most 2-year-olds start no more than 4 times during their brief preparatory season.[9]

Recently, the declining number of starts per year by racehorses has raised questions concerning the direction in which the Thoroughbred breed is headed. The mean number of starts/horse/y has been tracked during the last 50 years, and a steady decline from almost 11 starts/horse in 1950 to slightly greater than 7 starts/horse in 1998 is evident. Some individuals have used these statistics as evidence that today's Thoroughbred is not as sound as Thoroughbreds of the past. There are actually many reasons for the decline in race starts, some anecdotal and some based on fact. From 1990 to 1998, total US purses increased 26.5%, whereas the total number of races run at tracks throughout the country decreased by 23.1%. The US registered foal crop declined 18.7% during this same period. These figures reveal that there are fewer opportunities to run for more purse money than ever before. A possible explanation for fewer starts may be that horses are being optimally managed and groomed for specific races, and trainers and owners are only taking advantage of race opportunities when their horse is at its physical peak. Today's horsemen are likely to give a horse more time between races knowing that a peak performance will reap substantial dividends.

Racehorse Retirement

Once a horse's racing career is finished, there are many options for its retirement. Most horses, especially fillies and mares, begin a second career as part of the breeding population. In 1999, the estimated Thoroughbred foal crop was 36,500 (from 54,340 mares bred to 4,022 stallions). Horses that do not become part of the breeding population may become riding horses, pleasure horses, or performance horses.

Finding a suitable home is most challenging for aged geldings and horses retiring with physical problems. The Mundy family, as of a year ago, includes 1 of these horses. Taco, a retired Thoroughbred gelding, had an undistinguished racing career but embarked on a successful second career as an outrider's pony at Keeneland racetrack in Lexington. I came to know Taco while working at Kentucky racetracks as the state's Commission veterinarian. Taco can be seen in some of Keeneland's fine promotional photographs—he's the one with the handsome outrider dressed in green leading the field to the starting gate. Unfortunately, Taco sustained a tendon injury while chasing a loose 2-year-old one morning during training. Since then, he has been a source of immense pleasure for our 2 children while helping them learn the essential lessons of responsibility caring for him. Ex-racehorses that are not fortunate enough to embark on second and third careers like Taco eventually find their way to livestock auctions and slaughter. Recently, the racing industry has made considerable progress in developing programs for retired horses. Many nonprofit organizations throughout the country also work for the humane treatment and retirement of racehorses. These organizations provide special care and rehabilitation, adoption services, and vocational training programs. Grassroots support has lead to partnerships that are gaining momentum. All segments of the racing community, including owners and breeders, actively participate in these programs.

Although there are many organizations that provide retirement options for racehorses, 2 specific organizations represent the scope of services available. The only reason I have chosen to highlight these 2 particular organizations is the proximity of their programs to my home in Lexington, Kentucky.

The ReRun Organization was started in northern Kentucky and gives ex-racehorses a second chance at a productive life by evaluating temperaments, talents, and physical capabilities and matching these horses to new owners. ReRun assists in the retraining and recuperation process with the help of volunteers and paid personnel skilled in horsemanship. In the future, ReRun hopes to work with at-risk youth and others who would like a hands-on introduction into the Thoroughbred world. The ultimate goal is twofold: to take care of the physical needs of the horses and to build confidence and self-esteem in these horses and the youth. As a nonprofit organization, ReRun depends largely on donations and fundraising efforts for its operating capital. To that end, the Kentucky Thoroughbred Farm Manager's Club (KTFMC), of which I am a member, contributed $26,000 last year to ReRun, making it the major benefactor of KTFMC's annual fundraising efforts.

Recently, the Thoroughbred Retirement Foundation (TRF) opened its newest farm for former racehorses at Blackburn Correctional Complex near Lexington, Kentucky. Recipient of the AAEP's 1998 Lavin Cup Equine Welfare Award, the TRF provides humane retirement for thoroughbred racehorses at privately owned satellite farms and at TRF-operated locations in Connecticut, Maryland, New Jersey, New York, Virginia, Vermont, and Wisconsin, as well as through adoptions. Blackburn and similar farms at Wallkill Correctional Facility in New York and the Hickey

School for juvenile offenders in Baltimore, Maryland, unite the efforts of the TRF and state correctional programs. Eight corporate donations totaling more than $100,000 provided sufficient funds to convert a Lexington cattle operation to a horse farm, using inmate labor. The farm can accommodate up to 75 horses, and as many as 50 minimum-security inmates will receive training in horse care and stable management through a state-accredited educational program.

Although my experience is mainly with Thoroughbreds, I would like to mention a milestone achieved by the **Standardbred Retirement Foundation** (SRF), which is dedicated to finding new homes for trotters and pacers unable to race. The SRF was founded in 1990 and is based in Freehold, New Jersey. The SRF recently celebrated the placement of its 1,000th horse, making it one of the most successful equine adoption organizations.

In closing, I feel it is appropriate to emphasize the mission statement of the AAEP, which is "To improve the health and welfare of the horse, to further the professional development of its members, and to provide resources and leadership for the benefit of the equine industry." The AAEP was established in response to a scandal of sorts that arose in the racing world, the one equestrian growth industry during the postwar era. Young veterinarians of the day were leery of racetrack practice, and the veterans of the backstretch were retiring, leaving that segment of the horse industry inadequately supplied with professional skills and leadership. State racing associations lacked consistent medication regulations, and no organization existed for the purpose of formulating and maintaining standards for equine veterinary care. In that ethical and regulatory vacuum, 3 veterinarians were accused of doping racehorses. Although the "dope" was later discovered to be an acceptable worming medication, the incident provoked a negative perception of equine veterinarians among the general public. To counteract this poor professional image, AAEP's founding veterinarians met in Louisville, Kentucky, to form an association dedicated to maintaining and promoting equine veterinary practices that have as their basis the health and welfare of the horse.

References

1. Mundy GD, Stanley SD, Tobin T. Analysis of prohibited substances in Kentucky with emphasis on strategies for practitioners to avoid problems, in *Proceedings*. 41st Annu Conf Am Assoc Equine Pract 1995;160–162.
2. Testing for therapeutic medications, environmental and dietary substances in racing horses. In: Tobin T, Mundy GD, Stanley SD, et al, eds. *Proceedings of a Workshop*. Lexington, Ky: The Maxwell H. Gluck Equine Research Center, 1995.
3. Sweeney CR. Exercise-induced pulmonary hemorrhage. *Vet Clin North Am Equine Pract* 1991;7:93–104.
4. Sweeney CR, Soma LR, Maxson AD, et al. Effects of furosemide on the racing times of Thoroughbreds. *Am J Vet Res* 1990;51:772–778.
5. Gross DK, Morley PS, Hinchcliff KW, et al. Effect of furosemide on performance of Thoroughbreds racing in the United States and Canada. *J Am Vet Med Assoc* 1999;215:670–675.
6. Peloso JG, Mundy GD, Cohen ND. Prevalence of, and factors associated with, musculoskeletal racing injuries of Thoroughbreds. *J Am Vet Med Assoc* 1994;204:620–626.
7. Mundy GD. Review of risk factors associated with racing injuries, in *Proceedings*. 43rd Annu Conv Am Assoc Equine Pract 1997;204–210.
8. Kobluk CN, Robinson RA, Clanton CJ, et al. Comparison of the exercise level and problem rate of 95 Thoroughbred horses: a cohort study, in *Proceedings*. 36th Annu Conv Am Assoc Equine Pract 1990;471–475.
9. The Jockey Club. *1999 fact book*. New York, NY: The Jockey Club, 1999.

Animals in rodeo—a closer look

Cynthia M. Schonholtz, BS

The Evolution of Livestock in the Sport of Rodeo

Rodeo, a Spanish word meaning roundup, has roots tracing back to early Spanish settlers in California. The first cowboy contests took place informally during cattle drives when cowhands competed for the title of best bronco rider or roper. These contests eventually evolved into Wild West Shows that toured the country from about 1886 until the late 1950s. Wild West Shows, where all performers were paid, were different from rodeos, where contestants pay entry fees, are judged or timed, and only the winners receive a prize. One of the earliest recorded rodeos was Deer Trail, Colorado, where the Hash Knife and Mill Iron outfits bet on their respective rough string riders.

On July 4, 1888, the Prescott Frontier Days Rodeo in Prescott, Arizona marked the birth of modern rodeo. Prescott was the first rodeo to have a committee, charge admission, award prizes, and invite cowboys prior to the rodeo. The events at this first rodeo illustrate the importance of horses in the development of professional rodeo; these early contests included bronco riding, steer roping and tying, and cow pony races. At Prescott, as at all early rodeos, the riders brought their own bucking broncos. There were no chutes in the early bronco riding events, so animals were blindfolded and saddled in the middle of a field or arena. Nineteen thirteen was the first year arrangements were

From the Professional Rodeo Cowboys Association, 101 Pro Rodeo Dr, Colorado Springs, CO 80929-9989.

made to bring in bucking horses, so that contestants did not have to furnish their own. Steer riding, the precursor to today's bull riding, debuted in 1889 and by 1913 was a standard event. Nineteen fourteen was the inaugural year for bareback bronco riding, and in 1917 the first calf-roping contest was held at Prescott. Team roping, which was actually called team tying and varies a bit from today's team roping, was introduced in 1919. Hereford range bulls were used in the early contests, and steers replaced the bulls in 1920. The Prescott Rodeo Committee started purchasing bucking horses in 1914 to ensure they had an adequate supply. The Committee decided it would be better to rent or contract for horses in 1931, so they sold their herd and paved the way for what we know today as stock contractors. C. B. Irwin is credited as the first bucking horse contractor in rodeo. He began acquiring spoiled, mean, and other unbroken horses around 1900 and began supplying bucking horses for the legendary Cheyenne Frontier Days and a few other rodeos in 1901. Side delivery bucking chutes were introduced in Cheyenne in 1928, helping immensely with the production of the rodeo. The Cheyenne Frontier Days Rodeo is also responsible for establishing some of the first rules in bronco riding.[1] Rodeo continued to grow with the creation of various rodeo associations, and ultimately the **Professional Rodeo Cowboys Association (PRCA)** was established.

The care, management, and origin of the animals that play such a large part in today's professional rodeo have evolved greatly over the years. What hasn't changed is the importance of the horse in every aspect of rodeo.

Self-regulation in the Sport of Rodeo

Competition and the treatment of animals in the sport of rodeo have been regulated almost from the start. Some of the first documented rules were established by the Prescott Rodeo and disqualified participants for infractions, including the abuse of animals. The Cheyenne Frontier Days also developed a set of rules in 1905, known as the "Cheyenne Rules." In 1914, Cheyenne passed a rule regulating the spurring of bucking horses, in cooperation with the Wyoming Humane Society.

In 1947, the Rodeo Cowboys Association (the precursor to the PRCA) began formally regulating the care and treatment of rodeo livestock. Currently, 60 rules govern all aspects of rodeo livestock's care, including time of transportation, facilities, weight limits, and suitability of animals. The PRCA has created a model of self-regulation for other rodeo associations to follow.

Since 1981, the Wrangler Pro Officials System has provided the PRCA with competent and accurate judging. Wrangler Pro Officials are charged with scoring rough stock rides and flagging timed events, ensuring that livestock scheduled for each performance are fit to compete, and seeing that all participants properly care for livestock at PRCA-sanctioned events. The PRCA employs 8 full-time Wrangler Pro Officials and more than 150 reserve officials. The importance of fair judging and enforcement of all of rodeo rules cannot be overstated. All Wrangler Pro Officials must go through rigorous training before they are allowed to judge PRCA-sanctioned rodeos. Officials must submit a written report following each rodeo that includes information about rodeo events, the signature of the on-site veterinarian, arena conditions, and any rule violations. Much of this information is entered into the PRCA's main computer system, and if a member violates any rule, he will be notified of the rule violation and penalty. If a monetary fine is part of the penalty, the member will receive a statement of charges due. The member must pay the fine within a certain time period or become ineligible and not be allowed to enter future PRCA rodeos until the fine is paid in full.

Not only has the PRCA developed the strictest rules and a very effective enforcement mechanism, but it has continuously worked with other rodeo associations to assist them in building programs of their own. In the spring of 1999, the PRCA hosted a meeting of rodeo associations to discuss animal welfare issues and rules. More than 2,500 rodeos and 35,000 rodeo association members were represented at this meeting. The attending organizations worked to create a Code of Practice for the rodeo industry. This code is being submitted to all rodeo associations in North America with the hope that these associations will endorse the code. Self-regulation begins with creating rules that permit safe, fair, and professional competition. The sport of rodeo must still address a few rodeos that do not follow rules such as those developed by the PRCA. Overall, most associations and independent rodeos understand the importance of their livestock and enforce rules to protect them.

Veterinary Involvement in the Sport of Rodeo

In 1906, the state veterinarian began attending the Cheyenne Frontier Days Rodeo to oversee the humane aspects of competition. Cowboys considered his rulings so fair that they did not mind his presence on the grounds. This was the beginning of a long and prosperous alliance between large animal veterinarians and the sport of rodeo. In 1995, the PRCA began requiring a veterinarian on site for all rodeo performances and sections of slack. Slack is a rodeo term that refers to competition outside of the paid performance due to the number of contestants in an event exceeding the number of spaces available in the performances attended by the public. Previous rules required that a veterinarian be on-site or on-call during all performances and sections of slack. Even before the rules were changed to require a veterinarian on-site, 85% of PRCA-sanctioned rodeos had already met this requirement. Since the institution of the new rule, the number of rodeos with a veterinarian on-site has increased to 95%. On-site veterinarians are a valuable resource for the PRCA. Not only do they provide veterinary care for all livestock, but they also permit the PRCA to conduct injury surveys. These surveys continue to provide data to support claims that injury to rodeo livestock is rare. For these surveys, injury is defined as: "A significant change, incurred while performing, that would affect the animals well being, general health and/or ability to perform." A study was conducted at 19 rodeos in 1998 and 1999, including small and large rodeos. Of 27,767

animal exposures, 15 injuries occurred. This represents an injury rate of 0.00054. A study conducted in 1994 and 1995 yielded similar results: 16 injuries were incurred during 33,991 animal exposures. These figures have been valuable in refuting critics' claims that livestock participating in rodeos are at great risk for injury.

Bucking the Myths

This catchy title has been used many times by critics of the sport of rodeo. Under this title, animal rights groups publish propaganda stating that the sport of rodeo exploits, abuses, and injures animals. The PRCA counters such misinformation with animal injury surveys and facts. The horse flank strap, a fleece-lined piece of equipment that enhances the bucking action of a horse that has the will to buck, is regularly a target of misinformation. Whereas critics claim that the flank strap is pulled tightly to make the horse buck, in reality, if a flank strap is pulled tightly, the horse will not buck at all and may even stop movement. A 5/8-inch-diameter cotton flank rope is generally used in bull riding. It may or may not be lined with fleece or neoprene. Stock contractors choose equipment on the basis of what equipment will maximize an individual animal's performance. Flank straps and flank ropes do not come in contact with, nor do they restrict, the genitals of bucking bulls or horses. The cattle prod, a generally accepted tool for use in moving cattle, is also a target for critics. The PRCA rules permit cattle prods to be used to move livestock; however, they may only be used on the hip and shoulder. The only exception is when a horse is blocking a chute; in that case, if the stock contractor, judge, and contestant all agree, a cattle prod may be used to move the animal out of the chute. With the value of bucking horses and bulls skyrocketing (Locomotive Breath, a bucking bull, was sold for $40,000 this year), stock contractors continue to ensure that these valuable animals are not misused in any way. As the sport of rodeo continues to grow, myths and misinformation will continue to play a part in the campaign to end the use of animals in entertainment. The sport of rodeo must enforce rules, educate the public, and continue to focus on animal welfare efforts.

The Bucking Horse

The type of horse used for bareback riding differs from the type used for saddle bronco riding. Horses used for bareback riding are smaller and have a wilder bucking style, whereas horses used for saddle bronco riding are generally larger and have a more classic style of bucking. The latter permits the rider to sit up in the saddle and establish a rhythm with his feet moving forward toward the horse's neck and back to the cantle of the saddle. Many saddle bronco horses are draft horse crosses. These large, sturdy animals have perfect classic bucking action as well as strength and durability that make them excellent athletes for long-term careers in the sport of rodeo.

An indicator of how well-suited horses are to the sport of rodeo is the longevity of their lives and careers. High Tide, a legendary bucking horse, bucked off a 19-year-old cowboy at the National Finals when he was 32 years old. Sippin Velvet, a descendent of Man O' War, bucked at the National Finals Rodeo 18 times and was retired to a standing ovation during the 1994 National Finals Rodeo at the age of 25. The Calgary Stampede Rodeo Company, one of the oldest breeding programs in rodeo, includes many older horses in their list of top bucking horses. A few of these older champion broncos that are currently bucking include 21-year-old Go Wild, 21-year-old Kloud Grey, and 24-year-old Guilty Cat.

Approximately 40% of rodeo bucking horses are in the sport, because they continued to buck their owners and riders off. They come from the racetrack, feed lots, ranches, and just about every other equine discipline. These horses are considered too dangerous for other equine activities, yet they are perfect for the events of bareback riding and saddle bronco riding. Stock contractors nationwide continuously get phone calls from anxious owners who have not been able to train their horses to not buck but want to ensure their horses receive a good home.

Classic Velvet epitomizes the bucking horse that comes to rodeo specifically for his ability to buck. This registered Quarter Horse and grandson of Three Bars was originally bred as a team roping horse in Santa Rosa, California, but after determining that he bucked too much for that task, he was sold to Calvin Milhous, a cousin of Richard Nixon. Milhous tried in vain to train the horse to drive and finally gave up. Cotton Rosser was called to try the horse as a bucking horse and knew almost immediately he would be a star. The great gelding bucked for 17 years in the PRCA and was named the Bareback Bucking Horse of the Year in 1981. At the age of 24, he was retired to the Pro Rodeo Hall of Fame in Colorado Springs. Healthy, with barely a scratch on him and completely sound, Classic Velvet spent 3 years at the Pro Rodeo Hall of Fame in Colorado Springs before finally retiring to Larry Mahan's picturesque ranch in Guffey, Colorado. He lives there today in a pasture with other retired rodeo stock.

Many of today's rodeo stock providers have developed sophisticated breeding programs to allow them to breed horses specifically for their ability to buck. Of 60 PRCA stock contractors, about 40 operate some type of livestock-breeding program. Some of the finest bucking horses in the world of professional rodeo today are products of these "born to buck" programs. When studying today's bucking horses, one cannot overlook the contribution of the late bucking horse stallion Custer. Nearly 15% of current rodeo bucking horses are believed to be genetically linked to Custer, which gives you an idea of this horse's impact on the breeding of the modern bucking horse. Ike Sankey of Sankey Rodeo Company, a former National Finals bareback and saddle bronco rider, ventured into the rodeo livestock breeding business in the mid-1980s with the intent to prove that horses can be born buckers. "Racehorse people for years have spent untold dollars trying to raise race horses," Sankey said. "I think for a long time people went the other way trying to bred the buck out of them, and I think they were pretty successful. We're just trying to go the other way and breed

it back into them." A big part of Sankey's effort can be linked to Custer. Sankey said Custer was a solid, middle-of-the-road horse that always bucked but was never sensational. Because he was not a spectacular bucking horse, no one knows why his colts buck so much better than others. With Custer as the foundation sire, Sankey claims that 85% of colts born into his breeding program grow up to become successful bucking horses. Nowhere was this more evident that at the 1996 National Finals Rodeo where Sankey had 17 horses selected, and 15 of them were products of Sankey's carefully planned breeding program. Nearly 30 of the bucking horses competing at the 1996 National Finals Rodeo were sons, daughters, grandsons, or granddaughters of Custer. At the 1997 National Finals Rodeo, the number of broncos Sankey hauled to Las Vegas from his Cody, Wyoming, ranch grew to 19. Among Custer's famous progeny are a daughter named 1991–1993 PRCA Saddle Bronco of the Year, Bobby Joe Skoal, owned by legendary stock contractor Harry Vold, and a granddaughter named 1994 Saddle Bronco of the Year, Skitso Skoal. Custer's bloodlines not only run through the Sankey string but also are strong throughout rodeo.

Rodeo and the Animal Welfare Community

The sport of rodeo and its relationship with the animal welfare and humane community has changed as the animal rights movement has melded with the humane movement. The PRCA relies heavily on veterinary organizations such as the American Association of Equine Practitioners, the American Association of Bovine Practitioners, and the American Veterinary Medical Association to provide guidance in animal welfare issues

In 1959, the American Humane Association (AHA) worked with the Board of Directors of the Rodeo Cowboys Association to appraise, augment, and codify regulations for the protection of rodeo animals. The AHA compiled a set of standards that were based on practical experience by major humane societies long active in the supervision of rodeos. Although the AHA did not officially approve rodeos, development of this uniform nationwide code for rodeo livestock signaled major progress in the protection of rodeo livestock. In 1982, the AHA joined The Humane Society of the United States in a joint statement that voiced clear disapproval of the sport despite the willingness of the rodeo industry to adopt rules to protect animals. Recently, the AHA has requested that the PRCA allow them to use PRCA rules as a part of their guidelines for use of animals in motion pictures that include rodeo action. This was approved by the PRCA, and it was believed that this move was a nod toward the extensive animal welfare rules the PRCA has enacted during the years.

Most local rodeo committees have developed working relationships with animal control officers or humane societies with jurisdiction in their area. This is important, because local animal welfare organizations are charged with enforcing laws and inspecting rodeo livestock to ensure animals are being provided proper care. The PRCA encourages local committees to cooperate fully with officials. During the past 2 years, the PRCA office has not received a complaint from a local humane or animal control officer with jurisdiction who has inspected rodeo livestock at PRCA rodeos. This information seems to contradict animal rightists' claims of injuries, death, and poor living conditions. The philosophical difference between animal welfare and animal rights helps explain this dichotomy. Animal control and humane officers are concerned with the health and welfare of rodeo livestock. Animal rights proponents disagree with use of animals for rodeos, other sports, and entertainment.

A major hurdle facing the rodeo industry is lack of training and expertise in the handling of livestock available to law enforcement and animal control agencies. As rodeo grounds across the country are being surrounded by development, the possibility of livestock ending up in an urban situation increases. During the past year, increased incidents of bulls escaping into cities or populated areas have led to the death of these bulls. The rodeo industry must take responsibility for these incidents and support law enforcement and humane agencies by providing training in livestock handling. Programs must be developed to provide training for rodeo committees, humane agencies, and law enforcement so that livestock can be appropriately handled in increasingly urban settings. Past incidents must be reviewed to develop clearer guidelines on animal facilities and to educate on-site veterinarians, local committees, and all others concerned so that similar tragedies can be avoided in the future.

The Future of Rodeo

The future of rodeo depends on the industry's willingness to accept changes in society and adapt to a more urban population. As migration from the family farm to the urban areas of this country continues, the sport of rodeo must adapt to a population that is removed from the farm and lacks experience with livestock. The rodeo industry must strive to educate urban dwellers on the history of livestock in this nation as well as the difference between livestock and companion animals. All rodeos, sanctioned and nonsanctioned, must join together and standardize rodeo regulations and practices and continue to make equine and animal welfare a top priority.

Reference

1. Jordan B. *Rodeo history and legends*. Montrose, Colo: Rodeo Stuff, 1994;2–35.

Forum is continued on next page.

The Horse Protection Act—a case study in industry self-regulation

W. Ron DeHaven, DVM

The Tennessee Walking Horse Breeders' and Exhibitors' Association (TWHBEA) promotes the Tennessee Walking Horse as "The ride of your life."[1] Tennessee Walking Horses are known for their easy, bounce-free ride, sturdy and powerful conformation, versatility, and mild temperament. Plantation owners in middle Tennessee wanted a horse durable enough to work the fields, impressive enough to go to town on weekends, and comfortable enough to ride around the plantation all day long. The Tennessee Walking Horse was bred to fulfill those demands, offering a smooth, easygoing ride suitable for men, women, and children of any age.

The TWHBEA has registered approximately 360,000 horses and estimates that the Tennessee Walking Horse is one of the fastest growing breeds in America. The industry for this breed is big business; it is estimated that the industry alone contributes $375 million annually to Tennessee's economy. Horses that reach championship status, particularly stallions, are extremely valuable as breeding stock. For example, the 1998 Reserve World Grand Champion was recently purchased for $1.25 million. Of these registered horses, only about 10% see the inside of a show ring.[2]

The Tennessee Walking Horse has three natural gaits: the flat walk, running walk, and canter. The term "big lick" is used to describe an exaggeration of these gaits in which the horse has a big reach in front and a substantial overstride behind. It is the big lick that crowds of people come to see and cheer and judges reward. Unfortunately, some methods used to train horses to display this animated gait are abusive; in the industry, such practices are termed "soring."

The reputation of the Tennessee Walking Horse has suffered in the public eye because of the stigma associated with soring, and the American Horse Show Association, which sanctions and governs all recognized English riding competitions in the United States, has refused to include the Tennessee Walking Horse in its all-breed shows.[2]

From a regulatory perspective, the situation begs the question, "Why does this practice of soring persist nearly 30 years after passage of the Horse Protection Act (HPA)?"

Implications of Soring

Without training, the Tennessee Walking Horse's emphasis on form and ease appears unexciting in the show ring when compared with the fast-moving, high-stepping Saddlebred. This motivated Tennessee Walking Horse trainers to experiment with methods to make the horse more appealing to the viewing public. It was discovered that if the front feet of the horse were deliberately made sore, the intense pain that the horse suffered when placing its forefeet on the ground would cause it to lift them up quickly and thrust them forward. The horse would then use its hind feet more in effort to take weight off the front feet, lessening the pain and thereby producing exactly the desired gait, or the big lick. The increase in speed and higher action up front proved to be extremely popular with horse show fans. More importantly, horse show judges began to reward this type of performance.

Tennessee Walking Horse trainers maintain that the big lick can be achieved through hard work, expert training, and patience. However, soring produces the desired gait much faster and easier than traditional training methods. Thus, many trainers resort to soring practices to save time and believe there is a competitive advantage to the use of soring to produce the bigger lick that captures the attention of judges.

Specifically, soring refers to the practice of inducing a painful injury on a horse's front feet for the purpose of producing an accentuated, or even exaggerated, gait. This injury can be accomplished through the application of chemical irritants such as mustard oil, croton oil, diesel fuel, gasoline, turpentine, cinnamon oil, kerosene, or corrosive hand cleaners. Carrying agents, such as dimethylsulfoxide (DMSO), are sometimes used to drive the irritant deep into underlying tissues. The horse's feet and ankles are then wrapped in plastic wrap and regular leg wraps to promote absorption of the irritant into the horse's limbs. Horses may stand in these wraps for prolonged periods, sometimes days. Chains, fastened around the front pasterns, are used during training to strike tender, chemically treated areas of the ankle, producing the accentuated gait.

Mechanical methods can be used to achieve similar results. Extensive use of chains, overweight chains, or other so called "action devices," can cause horses to become sore, with or without the use of chemical irritants. Unscrupulous trainers or owners may drive nails or screws through hoof walls into sensitive laminae and cover these holes with epoxy. Various methods of shoeing can be used to produce pressure points in the foot, again causing pain and producing an exaggerated gait.

The Horse Protection Act

"The State of Tennessee, in reaction to national pressure, enacted a law against soring in 1957. The law was ignored by the Tennessee Walking Horse industry just as it was by the government that passed it."[1] Public outcry continued regarding the inhumanity of soring horses and its destructive effect on the horse industry, and this lead to the creation of the Horse Protection Act

From the United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Care, 4700 River Rd, Unit 97, Riverdale, MD, 20737.

(HPA), which was enacted by Congress in 1970 and amended in 1976. Part of the hearing record on the HPA includes a statement by M. R. Clarkson, DVM, former Executive Vice President of the AVMA. Dr. Clarkson wrote, "The 'soring' of horses for show or exhibition purposes is a cruel practice. It is an unnecessary and objectionable substitute for selective breeding and competent training. The American Veterinary Medical Association unhesitatingly condemns the practice."[4]

The law was intended to "end the unnecessary, cruel, and inhumane practice of soring horses by making unlawful the exhibiting and showing of sored horses and imposing significant penalties for violations of the HPA. It was intended to prohibit the showing of sored horses and thereby destroy the incentive of owners and trainers to painfully mistreat their horses."[5]

In the HPA, "The term 'sore' when used to describe a horse means that

1. an irritating or blistering agent has been applied, internally or externally, by a person to any limb of a horse,
2. any burn, cut, or laceration has been inflicted by a person on any limb of the horse,
3. any tack, nail, screw, or chemical agent has been injected by a person into or used by a person on any limb of a horse, or
4. any other substance or device has been used by a person on any limb of a horse or a person has engaged in a practice involving a horse, and, as a result of such application, infliction, injection, use, or practice, such horse suffers, or can reasonably be expected to suffer, physical pain or distress, inflammation, or lameness when walking, trotting, or otherwise moving, except that such term does not include such an application, infliction, injection, use, or practice in connection with the therapeutic treatment of a horse by or under the supervision of a person licensed to practice veterinary medicine in the State in which such treatment was given."[6]

The HPA is administered by the US Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). Funding is limited by Congress to $500,000 per year, and current funding is approximately $350,000. This level of funding limits USDA's ability to enforce the Act nationally on its own. It is estimated that USDA Veterinary Medical Officers (VMO) are able to monitor and inspect horses at fewer than 10% of relevant horse shows each year. By partnering with industry organizations certified by the USDA, it is possible to expand oversight to nearly 100% of these shows.

The 1976 amendment to the HPA led to the establishment of the Designated Qualified Person (DQP) program, affording the industry greater self-regulatory authority while greatly expanding coverage beyond what the USDA could accomplish alone. These programs are operated by industry and are a primary mechanism for identifying sored horses.

Designated Qualified Persons are industry trained and sponsored inspectors. They are typically farriers, horse trainers, or other knowledgeable horse people. Horse show managers can choose to affiliate with a Horse Industry Organization (HIO) that has a DQP program certified by the USDA. The HIO then provides one or more DQP to inspect horses at the show. This affiliation limits the liability of show management for potential violations of the HPA and, more importantly, provides inspection of horses at a far greater number of shows than USDA representatives can attend.

The HIO maintaining certified DQP programs participate with USDA in yearly training seminars. Veterinarians working for the USDA provide regulatory instruction and guidance, incorporating classroom and hands-on instruction during training sessions. The DQP are licensed by the HIO when they demonstrate an ability to work with horses and detect sore horses through a standard inspection process.

Although USDA veterinarians observe and examine horses to ensure compliance with the HPA, their primary role is to evaluate DQP to ensure they can effectively identify HPA violations so that HIO can impose proper penalties. These VMO also attend as many unaffiliated horse shows as time and resources allow to help the USDA reach its goal of eliminating soring.

The Inspection Process to Detect Soring

Licensed DQP and USDA VMOs have the authority to examine any horse on the grounds of a show or sale. Designated Qualified Persons are required to examine all Tennessee Walking Horses and racking horses before these horses perform in any class at a show or are made available for purchase at a horse sale or auction. They also inspect all first place horses after they are shown. The VMO examine horses at their discretion, based on observation of the horse's movements during the DQP's exam, a suspected violation, or random selection to assist the VMO in his or her evaluation of the DQP's performance.

The inspection process begins with the inspector observing the horse as it approaches the inspection area. Inspectors check the locomotion and appearance of the horse. Physical examination by the inspector involves picking up the horse's front limbs and visually inspecting and palpating below the knee, focusing on the pastern area. A horse will indicate which areas, if any, are painful by responding when those areas are palpated. A horse can indicate pain by, among other things, withdrawing the foot; lowering, raising, or turning the head; stepping away from the inspector; tightening the abdominal muscles; shifting weight to the back legs; and rolling the eyes.

There is an ongoing controversy between portions the industry and the USDA on what constitutes a sore horse. Some industry representatives believe that evidence of pain on digital palpation alone is not sufficient to determine that a horse is sore. The USDA maintains that bilateral, consistent, and repeated pain responses to digital palpation of the pasterns, even in the absence of secondary indicia of pain, is evidence of soring and clearly distinguishes a sore horse from one that is jittery or "silly." Ample case law supports the position that the "finding of 'soreness' based solely on horse's reaction to (digital) palpation is sufficient to

invoke presumption that horse is 'sore' within the meaning of the HPA provision prohibiting showing or exhibition of 'sore' horse; (the) Department of Agriculture need not show inflammation or lameness in addition to pain reaction to conclude that horse is 'sore'."[7]

Inspectors also look for abnormal tissue in the pastern area (eg, granulomas or scar tissue) as evidence of previous soring. Horses with bilateral evidence of abnormal tissue are in violation of the scar rule. Specifically, scars appearing bilaterally on the front (anterior) and sides (medial and lateral) of the feet constitute a violation. Other changes or inflammation evident on the posterior aspect of the pastern, other than uniformly thickened epithelium, also constitute a violation of the scar rule. Horses with scars indicative of previous soring are legally considered to be sore and subject to the same prohibitions and penalties under the HPA as horses with signs of pain caused by application of chemical or mechanical irritants.

Challenges Facing USDA Enforcement of the HPA

Since passage of the HPA, the USDA has observed a substantial decrease in the amount and degree of soring. Nevertheless, the practice of soring continues and has become more sophisticated over the years. The USDA has documented 673 cases of soring during the past 11 years while attending less than 10% of events where Tennessee Walking Horses are shown. Those who have been put on suspension or have cases pending include 9 of the last 11 presidents of the Walking Horse Trainers Association and 9 of the last 16 winners of the "Trainer of the Year" award. There are various reasons why eliminating soring is difficult.

Motivation to win in the show ring is strong. Some people will do anything to win, including inventing new ways to sore horses and mask soreness such that affected horses pass inspection. As techniques to detect soring improve, new methods of soring horses that enable them to pass inspection are constantly being developed. For example, pressure shoeing methods that place the horse's weight on the sole between the frog and white line are difficult to spot. The sole is trimmed to the point where it is almost bleeding, and the hoof wall is trimmed at an angle so that it is slightly shorter than the sole at the toe. This allows pressure to be exerted on the sole when the shoe is nailed on.

Methods that enable sored horses to pass inspections by DQP and VMO include application of topical anesthetics to the skin of the pasterns. The intent is to desensitize the pastern sufficiently that the horse passes inspection but with a duration of action such that the effect wears off prior to entering the show ring. Horses can be trained not to react to palpation. Alternatively, painful diversions, such as alligator clips placed on the tongue or scrotum, can eliminate or reduce pain responses to digital palpation of the pastern by diverting a horse's attention elsewhere.

To eliminate or reduce already-existing scar tissue or granulomas, some trainers apply caustic chemicals such as salicylic acid. This process can be more painful than soring and can produce extreme inflammation. Trainers then use colored powders, tattoo ink, or dyes to mask redness associated with inflammation or to provide color to skin that has been depigmented or denuded of hair in the process.

Some groups and individuals within the industry have not fully supported the USDA's goals for the Horse Protection Program. Whereas the industry as a whole certainly wants to control the practice of soring, not all its members support the intent of the law to totally eliminate the practice.

Although the DQP program clearly expands the number of horse shows that can be monitored under the HPA, historically, DQP have not been as effective when operating without USDA presence at a show. Typically there are 2 to 3 times as many violations identified by DQP when USDA representatives are at a show, compared with when there is no USDA presence. Once word gets out that VMO are on the show grounds, it is common for many horses to be left in stalls and not shown or to see trailers leaving the show grounds. Conflict of interest with the DQP program has been a problem, often characterized as the fox guarding the hen house because of the close affiliation of some DQP with the industry. At best, it is a stressful situation for a DQP to inspect the horse of a friend or fellow trainer, especially if that person may be judging a future show in which the DQP or his family will participate.

This conflict of interest issue extends beyond individual DQP. A DQP program stays in business by having horse shows affiliate with them to provide on-site inspection. Because horse show managers seek to maximize the number of entries at their respective shows, they may be less likely to affiliate with a DQP program having a reputation for stringent enforcement of the HPA.

The goal of the HPA and USDA is to eliminate the unnecessary, cruel, and inhumane soring of horses. The responsibility of the HIO with certified DQP programs is to keep sore horses out of the show ring. This difference in goals becomes evident at shows when an HIO keeps a sore horse from showing but refuses to issue proper penalties to the trainer and owner of the horse. As long as it has kept that horse out of the show ring, the HIO can argue that it has done its job. To illustrate the point, a trainer, who was also a senior official with one of the HIO, was found to have a sore horse during an inspection at a recent show. His response was an apology for bringing a horse in that condition to be inspected, not for putting the horse in that condition.

Political influence permeates all aspects of our society, including the Tennessee Walking Horse industry. Clearly, the Tennessee Walking Horse has a substantial impact on the economy of several states. In addition, many shows donate a portion of their proceeds to charity. The industry has several influential participants who routinely contact members of Congress relative to USDA enforcement of the HPA. In June 1998, a member of the Humane Society of the United States supporting the Horse Protection Program acknowledged that, "The segment of the industry that uses soring is trying to pressure Congress to prevent

full implementation of the plan and restrict the use of funds for enforcement."[8]

Finally, the HPA only makes it illegal to move, show, exhibit, or sell a sore horse. The actual practice of soring, in itself, is not a violation of law, despite the stated intent of the law to eliminate soring. Authority for USDA to enforce the HPA is only granted on the show or sale grounds, not in the trainers' private barns where most soring is performed.

Although substantial progress has been made, the past 30 years have been frustrating for those who genuinely want to stop the practice of soring. Reliance on any industry to police itself is inherently problematic, and experience indicates such efforts to enforce the HPA are no exception. However, there is hope on the horizon. In 1998, the USDA proposed an operating plan to the industry that outlined the duties and responsibilities of the HIO for the 1999 show season. This plan attempted to clarify many issues and problems to ensure a consistent and minimal level of compliance and enforcement. The plan was signed by all certified HIO, a clear signal that industry can and will work together with the USDA to enforce the HPA.

In addition, a grass roots movement from inside the industry has become more vocal. New organizations, whose goal is to promote stringent enforcement of the HPA, provide a positive alternative to shows where soring is commonplace. Increased public awareness of the issue and strong support for the HPA by a growing segment within the industry have become evident through media coverage in recent years.

A benchmark to identify progress in self-regulation will be when the discussion with industry shifts from the degree of allowable scar tissue on a horse's pasterns to total elimination of all scars on a horse's pasterns. Ultimately, the welfare of the horse must become a higher priority than winning in the show ring.

References

1. Tennessee Walking Horse Breeders' and Exhibitors' Association. *An ideal horse for every rider*. Lewisburg, Tenn: Tennessee Walking Horse Breeders' and Exhibitor's Association.
2. Briggs K. Tennessee Walkers: try the glide ride. *Horse Illustrated* 1999; July:60.
3. Womack B. *The echo of hoofbeats, The history of the Tennessee Walking Horse*. Shelbyville, Tenn: The Walking Horse Publishing Co, 1973.
4. Committee on Commerce, United States Senate. "Hearing on the Horse Protection Act of 1969," at 125.
5. Senate Report, Legislative History PL 94-360, Horse Protection Act Amendments of 1976, at 1699.
6. Horse Protection Act as Amended (15 USC §§ 1821–1831), Section 2.
7. Bobo v. U.S. Department of Agriculture, CA6 1995, 52 F3d 1406.
8. Klausnitzer D, Hamburg J, Tsouderos T. Horse show battle goes to Congress. *The Tennessean* 1998; June 3.

Equine slaughter transport—update on research and regulations

Venaye P. Reece, DVM; Ted H. Friend, PhD; Carolyn H. Stull, DVM; Temple Grandin, PhD; Timothy Cordes, DVM

Growing concern about the welfare of horses in commercial transport to slaughter in the United States, as well as in many parts of Europe, Canada, and Mexico, has caused major educational, research, and legislative activities to be initiated. In the United States, horse industry groups, the slaughter horse industry and its supply of horses, and the USDA, state agencies, humane associations, researchers, the American Association of Equine Practitioners (AAEP) and the American Veterinary Medical Association (AVMA) are involved.[a] Resulting research and changes benefit horses transported to slaughter, and horses in general, by providing a scientific basis for, and clarification of, transport criteria.

Horsemeat has been considered a suitable red meat for human consumption for many years in certain cultures and geographic areas. After World War II, horsemeat was recommended for its lean meat and relatively high iron content to populations of war-torn Europe. In some countries, such as the United States, Canada, and Great Britain, the horse has been favored as a performance and companion animal, and these cultures have never embraced the use of horsemeat for human consumption.[a]

From Clemson University Livestock-Poultry Health, 500 Clemson Rd, Columbia, SC 29229 (Reece); Department of Animal Science, Texas A&M University, College Station, TX 77843-2471 (Friend); Veterinary Medicine Cooperative Extension, University of California, One Shields Ave, Davis, CA 95616 (Stull); Department of Animal Sciences, Colorado State University, Fort Collins, CO 80523 (Grandin); and USDA-APHIS-VS, National Animal Health Programs, Equine Programs, 4700 River Rd, Unit 43, Riverdale, MD 20737 (Cordes).

Dr. Reece was the speaker.

Funding was provided by the US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services.

The author thanks Dr. Joan Arnoldi, Amelita Donald, the American Association of Equine Practitioners, the American Horse Council, the American Horse Protection Association, the American Humane Association, the American Veterinary Medical Association, and representatives of the equine slaughter industry and various humane and livestock groups for assistance.

Continued market demand for horsemeat in Europe (especially France, Italy, and Belgium), Japan, and South America has caused foreign companies to seek a supply from the large horse populations of the North American continent. Before the late 1970s, horses were transported live on ships for slaughter in European abattoirs. A US federal law passed in 1976, and brought about by poor conditions and high mortality of horses shipped in this manner, prohibits the international transport of live horses by ship for slaughter. Foreign companies have since invested in federally inspected horse slaughter plants or abattoirs in the United States and Canada for the purpose of exporting horsemeat to other countries for human consumption. Serious changes in the US tax structure combined with other variables produced a floundering horse market in the mid 1980s. A surplus of horses, especially evident in the large registries, such as Thoroughbred, Arabian, and Quarter Horse, fed the slaughter market and created peak slaughter numbers and export volumes in the late 1980s. Fewer foals produced in the late 1980s, a subsequent leveling off of the horse population, and growing production in other countries (Australia and South America) may be factors in the decreasing number of horses slaughtered in the United States.[a] USDA figures during the past decade illustrate this reduction: in 1992, there were 243,585 horses slaughtered in US plants; in 1995, this figure was 109,200; in 1996, 103,678; in 1997, 87,200; and in 1998, 71,173.[1] In addition, approximately 20,000 to 60,000 horses are shipped into Canada from the United States each year for slaughter in 3 Canadian plants, and an unknown, relatively small number are shipped into Mexico to process. Numbers of horses slaughtered in Mexico have been difficult to obtain and validate.[a]

Concern for horses in transit to slaughter is not a new issue. In 1976, an amendment to the Animal Welfare Act, which was intended to include horses destined for slaughter, was considered but not passed. Another bill that same year, HR 3673, would have authorized the Secretary of the USDA to promulgate standards governing the transport of horses in interstate commerce. As early as the mid 1980s, concerned humane groups produced educational materials for the public in an effort to focus on the need for humane care of horses in transit to and at slaughter plants. A steady buildup of concern during the late 1980s and early 1990s focused on long transit miles and hours, water deprivation and dehydration, exhaustion and injuries, horses unfit to travel, trailer design (the use of the double-deck "pot-bellies" or "pots" [Fig 1]), and stolen horses.[a,b]

Tangential issues cropped up, such as an outcry against the culling of horses from racing and training facilities for slaughter and the possible disposal of foals produced by mares on pregnant mare urine ranches through slaughter. The possibility (past fact) of Bureau of Land Management mustangs being illicitly sold for slaughter, the occasional incidence of stolen horses going to slaughter, and horses used in Charro Rodeos being disposed of through slaughter, are just some ways this issue has touched the horse industry as a whole.[a-c]

Figure 1—Horses entering a double-deck or "potbelly" trailer. Steep ramps, narrow openings, and low ceilings with protrusions are believed to contribute to injuries (especially to the head, back, and limbs) incurred in double-deck or potbelly trailers.

It is important that we examine where the slaughter horse originates and how it moves toward its final destination at the slaughter plant. An unpublished national survey of State Veterinary Offices, carried out by the author in 1993, revealed that only a few states had any laws or regulations addressing equine slaughter transport, most states had no idea how many horses were going to slaughter, and most states did not have procedures in place to capture that data. Most horses destined for slaughter are collected by dealers or "killer buyers" and gathered from multiple sources, such as public auctions and large training or boarding facilities, so that a sufficient load can be obtained for transport to the slaughter plant. When the slaughter industry was at its peak during the late 1980s, there were at least 16 federally inspected plants spread throughout the United States, processing in excess of 300,000 horses/y. In addition, 50 to 100,000 more horses were shipped from the United States into Canada for slaughter at their 3 plants. As the number of horses available for slaughter buyers has decreased, it has become even more difficult to gather a full load, and many dealers stockpile horses at their farms or a feedlot area until numbers are sufficient for a full load.[a,b]

Major trailer designs used for slaughter transit are the gooseneck, the straight-deck, and the potbelly or double-deck trailer. Horses may travel distances exceeding 1,600 miles, with travel times in excess of 30 hours, on a trip from central California to a plant in Fort Worth, Texas. During the early 1990s, Canadian plants sent trucks on a pick-up circuit through the United States that involved travel as far south as South Carolina, Georgia, and Alabama before return to Canada with a load. Added to this extensive travel are

the distances that many horses travel through the horse auction circuit. A special report published after investigation of the transport of 3 horses infected with equine infectious anemia out of New Jersey indicated that it is not uncommon for auction horses to travel through 5 or 6 states in a matter of 6 or 7 days, changing hands several times.[a] In 1998, only 4 plants remained fully operational in the United States (2 plants in Texas, 1 in Nebraska, and 1 in Illinois). At this time, the plant in Illinois has not renewed its facility lease and is looking at options for operating in a nearby area. There are also 2 plant-affiliated feedlots for horses, 1 in Texas and 1 in Montana. Economic pressures for maximum load density and rapid transit, coupled with forced long distances to the few equine slaughter facilities in the United States (3 plants and 2 feedlots), and Canada (3 plants and 1 feedlot) make horses in transit to slaughter vulnerable to neglect and abuse. Slaughter horses lack the individual owner care and responsibility that generally protect our pleasure and performance horses.[a,b,c]

Improved humane transport for horses to slaughter has almost universal support, including the horse industry, horse owners, veterinarians, and welfare groups in many countries. The difficulty has been in arriving at a consensus as to how to achieve this goal in the most effective and balanced manner. Many countries, including Canada, New Zealand, Great Britain, and the European Union, have regulations, directives, or Codes of Practice addressing the needs of horses during transport and, specifically, during transport to slaughter.[a] A few states, such as California and New York, have passed laws that attempt to provide some regulation of slaughter horse transport. In 1993, a number of horse support groups, lead by the American Horse Council, the American Horse Protection Association, and the American Humane Association, and joined by the AAEP, the AVMA, and others, began working to develop a federal bill addressing this issue. The **Safe Commercial Transportation of Horses to Slaughter Act (SCTHSA)** was passed as part of the Farm Bill in the spring of 1996. This law gives authority to the Secretary of the USDA to develop and promulgate rules and regulations to enforce the stated law, contingent on available funding. The task to develop the regulations was delegated to USDA-APHIS-VS (**Veterinary Services**). As funds became available, VS supported research to define and clarify minimum standards for safe and humane care of horses in transit to slaughter.

While reviewing the available material, including various documents from Australia, New Zealand, Great Britain, and Canada, it became evident that many standard guidelines, including those for shipping density, travel time, and water consumption or dehydration parameters, did not have a science-based foundation. To assist in the development of guidelines for humane transport that are based on science, and not arbitrary or traditional figures, the USDA has funded a number of research projects.

Research Projects

In 1995, one of the authors (TF) conducted a study that characterized progressive patterns of dehydration, stress responses, and water consumption of horses transported 24 hours on a large semitrailer during hot weather.[2] Half the horses transported were offered water on board the trailer at regular intervals. Various field methods of determining dehydration were used. A similarly designed study was conducted in 1997,[3] but transport was begun earlier in the day so that horses were fully exposed to the hottest period of the day, and transport continued until the horses displayed signs of severe dehydration or fatigue (30 hours of transport). Horses in both studies readily drank water while in the trailer. During the longer duration 1997 study, weight loss in horses provided with water stabilized at 4.0%, whereas horses not provided access to water lost 12.8% of body weight after 30 hours of transport (36 hours of total water deprivation). There was a marked acceleration in weight loss for horses not provided water after 24 hours of transport in both studies. Serum sodium, chloride, and protein concentrations and most other biochemical values dramatically increased above reference values after 24 hours of transport. These studies clearly indicate that severe dehydration and fatigue can affect otherwise healthy horses when they are transported longer than 24 hours.

During 1997 and 1998, this same author conducted 2 additional studies to determine the efficacy of on-board watering troughs in reducing dehydration in slaughter horses[4] and evaluate the effects of load density on balance, orientation, and injuries.[5] Horses destined for slaughter were purchased by a commercial order-buyer from auctions in central Texas, and a commercial 52-foot long, single-deck, open-topped trailer was used to transport these horses. Rigid portable water troughs were mounted inside the compartments in various configurations after 8 hours of transport during hot weather.[4] These horses were highly motivated to drink. However, 1 or 2 horses in each compartment were frequently blocked from drinking by more aggressive horses, except when the horses were in larger groups of 12 and the troughs were placed on both sides of the compartments. Although this study[4] revealed that providing water on board trailers during transport to slaughter will reduce or delay onset of dehydration, interference with Department of Transportation regulations, the need to permanently modify trailers, increased risk of injury to horses because of projections, and slippery flooring from spilled water and urine may make on-board watering impractical at present.

Results of density comparisons[5] indicated that high density (1.28 m^2/horse) adversely affected the ability of horses to maintain balance and increased injury rates. The number of injuries and their severity were significantly greater ($P = 0.006$) in horses transported at high density (mean, 32 injuries) than in horses transported at low density (2.23 m^2/horse; mean, 6 injuries). Of greater concern, however, was that significantly more ($P = 0.046$) horses fell when transported at high density (mean, 5.7 falls) than when transported at low density (mean, 1.3 falls), and they remained down for much longer periods of time (high-density mean, 39.8 s/fall; low-density mean, 15 s/fall). At high

density, horses that fall tend to be covered over by standing horses resulting in downed horses being trampled.

In trials studying orientation, it was found that there is a slight preference for individual horses to orient themselves at approximately 45° toward or away from the direction of travel.[5,6] Lowering their hindquarters appears to be as important as raising or lowering their heads in coping with changes in speed.[6]

Another author (CS) studied 9 trailer loads (straight-deck and double-deck or potbelly trailers were used) of horses (n = 306) transported to slaughter facilities (over distances of 596 to 2,496 km and for travel times ranging from 5.75 to 30 hours) to characterize the type of horses provided for commercial markets, their physiologic responses to transport, and the number of injuries incurred under summer environmental conditions.[7] Neither food nor water were available during transit. Body temperature, WBC count, neutrophil:lymphocyte ratios, cortisol and lactate concentrations, weight, and numbers and types of injuries were documented and analyzed.

In this study, transport in straight-deck trailers with solid sides resulted in greater physiologic stress responses than transport in double-deck trailers. The investigator (CS) believes that poor ventilation in this particular straight-deck design, versus the improved ventilation of double-deck trailers, may have affected these results. Injuries (single or multiple abrasions and lacerations) were sustained during transport in 19.6% of the horses. Most injuries (58%) occurred on the head and face. A higher percentage of horses were injured in potbelly (29.2%) than straight-deck trailers (8.0%), and more horses were injured in trailers with high floor area (29%) than low floor area (12%). The percentage of horses injured was higher for long trips (33%), compared with short (8%) or medium (9%) trips.

A third author (TG) evaluated 1,008 horses arriving at 2 slaughter plants in Texas in July and August of 1998.[8] She tabulated injuries found during premortem and postmortem inspections, assigned grades of severity, and identified causes where possible. In addition, she visited the New Holland Horse Sale and observed 168 horses, ponies, mules, and donkeys that were sold. She paid special attention to the type of buyer and the management, handling, and conveyances used to bring horses to and from the sale.

Of the 1,008 slaughter horses, 930 (92.3%) arrived in good condition and 78 (7.7%) had severe welfare problems. Of these 78 horses, sixty (77%) had conditions caused by owner neglect or abuse, and 18 (1.8%) had severe injuries that occurred during transport and marketing. When the number of severe welfare problems caused by injuries that occurred during transport and marketing were subtracted from the number of total severe welfare problems, the proportion of conditions caused by neglect or abuse by owners was significantly greater than the proportion that developed during transport. Problems evident in horses prior to transport included fractures, emaciation, laminitis, bowed tendons, and weakness.

Fighting was a major cause of injuries during transport and marketing.[8] Twenty-five percent of carcasses were bruised. Fifty-one percent of carcass bruises were caused by bites or kicks. Results of the study indicated that horses traveling directly to slaughter plants had fewer external injuries and fewer carcass bruises than horses transported through several auctions. There was a slightly increased prevalence of injuries to the face and back of horses arriving in double-deck trailers compared with single-deck and gooseneck trailers, however injuries caused by fighting were more severe. The investigator (TG) believes that owner knowledge and careful management are more important than trailer design. Repeated loading and unloading and longer travel times significantly increased risk of injury from kicking or biting. One of the single most important findings of this study was that aggressive horses (whether stallions, mares, or geldings) should be segregated as early as possible during transport and remain segregated throughout holding and transport to a destination.

Discussion

Attention to the plight of horses being transported to slaughter has resulted in an increased welfare conscience throughout the horse industry. National and international lines of communication have been opened between animal welfare activists, industry personnel, veterinarians, regulatory agencies, researchers, and horse owners. The USDA has developed regulations to implement the SCTHSA, using performance-based rather than engineering-based criteria. Research has generated useful information that can be applied to a wide range of horse transport situations and has helped identify aspects of handling and transport needing further study. Some major conclusions became apparent during compilation of existing data:

- The US horse industry raises the horse primarily as a performance or pleasure animal, and slaughter is an option that may be viewed as an alternative to humane euthanasia in certain situations.
- Some horses arriving at slaughter plants in poor condition should never have started the trip. Public education encouraging responsible ownership must address the decision to euthanatize when necessary and appropriate.
- Studies can be designed and carried out to identify important criteria and support realistic, science-based standards for transporting horses.
- Many aspects of transport, such as distance, density, grouping, trailer type, and driver and handler education, can be managed to reduce stress and enhance the comfort and safety of horses being transported to slaughter.
- It is possible for a wide variety of horse interest groups to share concerns and arrive at consensus agreements on most issues concerning equine slaughter transport.

Regulations

USDA/APHIS-VS worked diligently to develop regulations that were acceptable and effective. Data and ideas were brought forward for consideration by a select panel comprising 1 representative each from the

USDA, the American Horse Council, the American Humane Association, the American Horse Protection Association, the Humane Society of the United States, the AAEP, and the AVMA; managers of the 3 equine slaughter plants; an auction representative; and researchers. This group was able to arrive at a consensus on most of the important issues to be covered in the implementation and enforcement of the SCTHSA. Regulations for implementation of the SCTHSA have been proposed in the Federal Registry, and a final rule is expected in 2000. Major areas addressed in these regulations include:

- Accountability and a paper trail from the point of origin (where a horse is first purchased for slaughter) to the destination (the slaughter plant). An owner/shipper statement giving pertinent information must accompany each horse.
- Inspection by a specially assigned USDA representative at the time the horse arrives at the slaughter plant or at a United States border and collection of transport records and postmortem data at the slaughter plant.
- Ability to investigate, charge, and prosecute violators. This will include USDA officials being able to amplify inspections at the slaughter plant with spot checks at auctions, assembly points, or road stops if these are identified as problematic during trace backs.
- Phase out of double-deck trailers in an industry-friendly manner to minimize the financial impact on haulers. A 5-year phase-out is proposed. Because the life span of large transport trailers is about 7 years, this will allow many conveyance owners to simply replace the double-deck trailer at the end of its life span or sell newer ones for hauling other livestock.
- Segregation of stallions and aggressive horses.
- Preventing transport of pregnant mares if they are likely to foal during the trip.
- Defining and characterizing horses that are unfit to travel and should not be shipped by commercial transport to slaughter. The need for strong education and enforcement of this portion of the regulations is understood.
- Allowing at least 6 hours of access to food, water, and rest prior to shipping. Horses will not be allowed to travel for longer than 28 hours without offloading and rest for at least 6 hours.
- Allocation of funds for education and training. All involved have a part to play in this process, from owner to veterinarian to shipper and plant staff.
- Prohibiting the use of an electric prod, except in life-threatening situations. Any special needs or special handling requirements must be mentioned on the owner/shipper statement.
- This is not a complete summary of the proposed regulations, and the listed items are not official requirements until the proposed regulations complete the approval process.[2]

Summary

The proposed regulations are intended to ensure the humane care of horses being transported to slaughter by working in conjunction with state laws or regulations and facilitating agreements between the United States and its contiguous countries, Canada and Mexico.[5]

The AAEP and the AVMA have been intimately involved in the development of the federal bill and the proposed regulations. International sharing of data and discussions are ongoing. Members of the AAEP and the AVMA have provided responsible guidance concerning the health requirements of horses as they are currently understood, and scientific investigators have moved into new areas of study to enhance that knowledge. This is an example of how appropriate and effective the veterinary community can be in helping to guide and resolve equine welfare issues. No one group has total control of an issue, and we have seen some tangential effects of the attention to slaughter horse transport. The outcome of more than 6 years of work supports the well-being and health of the horse. One major benefit (largely immeasurable) to the horse is heightened public and industry awareness, which has resulted in numerous improvements in stewardship and accountability. Emphasis on "retirement foundations," second careers for horses, and improved conditions at equine slaughter plants are just a few such results.

Concerns

If public outcry obstructs the sale of horses for slaughter to any great extent, this could have a negative impact on the welfare of horses. Why? First, it is difficult to dispose of large animal carcasses in many areas of the United States. Second, without the option of humane slaughter, many horses may be neglected and left to die slowly because their owners lack adequate knowledge or financial resources to deal with their needs. Third, more stringent restrictions on the sale and transport of horses for slaughter may drive more of this activity underground. One of the authors (TG) noticed that the New Holland Horse Sale did not allow disabled horses through its auction, yet a load of disabled horses from New Holland found its way to the slaughter plant. A "junk" dealer was gathering up horses that were not allowed through the sale. There is also concern that US plant investors, who reside mainly outside the United States, will move plants into nearby Mexico, which has much less stringent humane regulations.[4]

Market demand for horsemeat for human consumption is almost certain to continue and may grow in the foreseeable future. It is therefore proper and necessary that we continue to work with national and international groups to provide humane care for horses intended for slaughter and maintain as much consensus and practicality on these issues as possible.

I would like to conclude with a quote from the introductory chapter of Dr. Temple Grandin's *Livestock Handling and Transport:* "Observations...indicate that the single most important factor that determines how animals are handled is the attitude of the manager."[11]

As veterinarians, we should play an integral part in providing information and encouragement to horse owners and horse industry representatives. We all must share the responsibility of providing good stewardship during the commercial transport of horses to slaughter.

[a]Reece V. Equine transport: the auction/slaughter funnel, or out of sight, out of mind (abstr), in *Proceedings*. 20th Annu Conv Am Assoc Equine Pract 1994;71–72.

[b]Cordes T, USDA-APHIS-VS, Riverdale, Md: personal communication, 1999.

[c]Donald A, Fort Worth, Tex: personal communication, 1998.

References

1. USDA: Livestock-Slaughter Division. *Annual federally inspected slaughter report figures*, 1993;1996–1999.

2. Friend TH, Martin MT, Householder DD, et al. Stress responses of horses during a long period of transport in a commercial truck. *J Am Vet Med Assoc* 1998;212:838–844.

3. Friend TH, Parker ML, Matthews NS. Stress responses of horses during commercial truck transport for 30 hours in hot weather. *J Anim Sci* 1998;76(suppl 1):101.

4. Gibbs AE, Friend TH. Effect of animal density and trough placement on drinking behavior and dehydration in slaughter horses. *J Anim Sci* 1999;77(suppl 1):149.

5. Collins MN, Friend TH, Jousan FD, et al. Effects of density on displacement, falls, injuries, and orientation during horse transportation. *Appl Anim Behav Sci* 2000;in press.

6. Gibbs AE, Friend TH. Horse preference for orientation during transport and the effect of orientation on balancing ability. *Appl Anim Behav Sci* 1999;63:1–9.

7. Stull CL. Responses of horses to trailer design, duration, and floor area during commercial transportation to slaughter. *J Anim Sci* 1999;77:2925–2933.

8. Grandin T, McGee K, Lanier LL. Prevalence of severe welfare problems in horses that arrive at slaughter plants *J Am Vet Med Assoc* 1999;214:1531–1533.

9. International League for Protection of Horses, Royal Society for Prevention of Cruelty to Animals. *Dead on arrival; the transport of live horses in Europe*. Z441 9.99. Causeway, Horsham, West Sussex, United Kingdom: International League for Protection of Horses, Royal Society for Prevention of Cruelty to Animals.

10. USDA APHIS Code of Federal Regulations Part: 9CFR 70,88 FR Citation: 64 FR 27210.

11. Grandin T. Livestock Handling and transport. In: *Introduction: management and economic factors of handling and transport*. Wallingford, Oxon, United Kingdom: CAB International, 1993;1.

Who speaks for the horse—the sport of endurance riding and equine welfare

Dane L. Frazier, DVM

Endurance riding is an athletic event in which the same horse and rider cover a specified course of not less than 50 miles (usually 50 to 150 miles) within a maximum time limit (usually 12 h/50 miles).[1] There is no minimum time limit. It is not uncommon for shorter rides, usually 25 to 35 miles, to be held in conjunction with rides of longer distances within the "limited distance" category. Other competitive distance-riding sports include trail riding, jackpot racing, marathon racing, and international endurance competitions. The American Endurance Ride Conference (AERC) sanctions endurance competitions in the United States but does not have rules or regulations governing other competitive distance events. Those events are sanctioned by other organizations or are conducted without benefit of sanctioning by a recognized national organization.

Historical Perspective

Horses have been used to assist in traveling long distances throughout most of US history. In 1791, at the age of 59, George Washington completed a journey from Augusta to Columbia, Georgia (a distance of 74 miles via US Route 1). Washington traveled 49 miles on May 21 and 48 the following day; 21 miles of the latter day's trip were completed before Sunday breakfast. That day he wrote: "The whole rode from Augusta to Columbia is a pine barren of the worst sort, being hilly as well as poor. This circumstance added to the distance, length of stages, want of water, and heat of the day, foundered one of my horses very badly."[2] On another trip in 1795, a horse overcome with heat was led for a day, following which, "My sick horse died."[2]

George Washington had completed what is known today in endurance riding as a "2-day hundred," not in competition, but as part of the usual course of day-to-day life as it existed before mechanization. Unfortunately, it appears that the horses of Washington's era were affected by metabolic disorders associated with traveling long distances just as they are today.

When the US Horse Cavalry was disbanded during the late 1940s, much knowledge regarding distance riding was lost. In 1955, a rancher, Mr. Wendell Robie of Auburn, California, contending that the horse of that time was as good as the horses that had brought the pioneers West, started the Western States Trail Ride, better known around the world as The Tevis. Riders in this event were required to travel 100 miles in 1 day on 1 horse from Lake Tahoe, Nevada to Auburn, California, across the Sierra Nevada Mountains and along the American River. This event set the standard for endurance rides in the United States and has been emulated in many other parts of the world.

In 1972, a small group of people sitting around a

From Terra Veterinary Services Inc, 1931 S Jefferson, Lebanon, MO 65536.

kitchen table set out to standardize the manner in which endurance rides were conducted by forming the AERC, headquartered in Auburn, California. These people founded the organization around 6 principles.[3] Principles 1 and 5 are germane to this presentation:

"1. To promote the sport of endurance riding, to act as an education center and clearing house for information concerning endurance riding, and to encourage better care of endurance horses and the prevention of cruelty to animals.

5. To publish rules and guidelines for ride managers and for veterinarians to assist them in putting on rides and to encourage quality rides held under similar conditions."

The 2 overriding principles on which the AERC is based are, first and foremost, the safety of the horse, and second, an even playing field so that competition outcomes are based primarily on objective performance and only secondarily on subjective judgment.

Humane Concerns

Horses participating in endurance rides must maintain healthy homeostatic mechanisms while optimizing performance. These horses perform for hours over uneven terrain, and often in less than ideal environments (hot, humid weather; cold, chilling winds; rocky, mountainous country; and deep sand or mud). Mechanical problems that must be addressed include stresses applied to muscle, tendon, ligament, and bone that can cause lameness. Metabolic problems that must be overcome include fuel substrate depletion, dehydration, thermoregulatory control, electrolyte loss, and body pH changes that can result in metabolic disease. Such stressors can cause incapacitation or death secondary to lameness of many types or metabolic diseases such as heatstroke, colic, exertional rhabdomyolysis, synchronous diaphragmatic flutter, and exhausted horse syndrome. From his writings, it appears that our first President had personal experience with many of these conditions.

Overriding their horses is the greatest ethical dilemma facing endurance riders. When horses are made to perform beyond their ability to accommodate stresses, conditions associated with overuse develop. Overuse is not acceptable, because it violates our humane ethic, cruelty statutes, and the rules of the AERC.

Equine welfare issues are not predicated on the premise that horses are asked to perform difficult athletic tasks. Concern arises when horses have not been adequately prepared for endurance competition or, when failing to accommodate to the stresses encountered, are forced to continue to perform. Addressing this welfare concern requires that we examine measures in place that give a voice to the entity that is the silent participant—the horse.

Who Speaks for the Horse?

The rider—The preamble to the Rules and Regulations of the AERC states: "While the AERC assumes that most participants are responsible and caring, it is recognized that a highly competitive and demanding sport requires regulation. The AERC's concern in establishing rules and regulations is to assure that competition occurs within standardized parameters considered fair and reasonably safe for horse and rider. The AERC services the requirements of the competitor by promulgating and establishing rules and regulations, recording and publishing results of events, and providing awards; but the competitor is totally responsible for self and mount before, during, and after an endurance ride."[3]

During the course of a ride, horses are evaluated by veterinarians for a period of several minutes, whereas riders are able to evaluate their horses for hours. It is a long and well-known fact that the ultimate safety net for horses competing in endurance rides is a knowledgeable and caring rider.

Competitors younger than 16 years old are classified as junior riders. Junior riders must be sponsored by an adult rider, who is at least 21 years old. Junior riders must travel with their sponsors at all times.[4] Young people should not be required to make decisions in competition that potentially threaten the well-being of their horses.

Even the best intentioned people may have their judgment clouded by ignorance, prizes, or ego, and "allow things to happen to the horse in the heat of competition that would not be committed in cold blood."[5] Ignorance can only be addressed through education, which is a basic tenant of the AERC. Stewards must be present during any competition having a prize in excess of $1,000 to ensure that AERC rules are followed. Ego can become intertwined with a horse's performance in a person's self-perception. Endurance riding requires a person capable of mature judgment. The horses involved must be protected from those that cannot or will not accede to acceptable standards.

The veterinarian—"Rule 2. The horses must be under the control of veterinarian(s) experienced with horses or endurance rides."[3]

From the beginning of the sport, veterinarians have been required to evaluate the health of horses prior to the start of the ride, during the ride at predetermined veterinary examination points, and after the ride to ensure that participating horses meet standards of mechanical and metabolic fitness. Any time a horse fails to accommodate the stresses of the ride, the horse is either not allowed to start, not allowed to continue, or not allowed to complete a ride even though it may have traversed the distance required in the time allotted.

Horses are evaluated statically by assessing their heart rate recovery index, hydration factors (mucous membrane color, capillary refill time, jugular refill time, and skin tenting), intestinal sounds, muscle tone, tack lesions, wounds, interference lesions, and anal reflex. Horses are evaluated in motion for consistent lameness, mental attitude, and impulsion. With experience and a sufficiently organized examination procedure, a veterinary evaluation may be completed within 2 minutes.

Horses entered in any sanctioned endurance ride must undergo preride and postride examinations.

Horses entered in limited-distance rides must undergo at least 1 veterinary examination during the competition. Horses entered in 50-mile rides undergo 2 to 3 veterinary examinations during the ride. Horses entered in 100-mile rides usually are subject to 5 to 7 on-course veterinary evaluations. Decisions of veterinarians about the health of the horses and the ability of the horses to continue to compete are final and cannot be overruled by ride management.

Age of Horses

All breeds of horses and mules may be entered in endurance rides. However, because of the stresses of competition, horses must be at least 60 months old to compete in events covering 50 miles or more. Horses must be at least 48 months old to compete in the limited distance category.[6] This is not a sport for 2- and 3-year-old youngsters. Endurance riding requires an adult horse.

Fit to Continue

To start a ride, continue a ride, and complete a ride, horses must meet minimal standards demonstrating that they can accommodate stresses that will be placed on them during the ride. These standards are listed in the AERC rules and include 3 requirements that are based on the concept of "fit to continue."[8]

First, horses' heart rates must recover to within a specified range after a period of rest, usually within 30 minutes of arrival at a veterinary examination point during the ride and within 1 hour of completing the ride. The specified range is generally between 60 bpm and 68 bpm, depending on the environment and terrain.

Second, horses must be metabolically stable. This means they must have adequate physical reserves to continue competing if required. Certainly, horses afflicted with performance-related metabolic diseases are disqualified.

Third, horses must not have gait aberrations that are consistently observable and cause pain or threaten the horse's immediate athletic performance. This evaluation is done with the horse on a lead, at a trot, and traveling back and forth in a straight line, without prior flexion or deep palpation of the limbs.

Any horse that has received medical treatment from a veterinarian or layman during the course of a ride prior to the final examination is disqualified. Any horse that a veterinarian advises should be treated prior to the final examination and for which treatment is not sought by its rider or owner is also disqualified.

Drugs

"The integrity of endurance competition requires that the equine is not influenced by any drug, medication, or veterinary treatment."[8]

The AERC requires that horses compete on the basis of their natural ability. The effects of medication or treatment administered during a ride on competitive outcome cannot be completely ascertained. Safety and fairness require that such practices be prohibited. In addition, use of alternative and complementary treatments during competition, such as acupuncture, chiropractic, lasers, bioscans, and magnets, is prohibited.

Drugs are nonnutrient compounds that have demonstrated physiologic effects. Nutrients fall into 1 of 6 classes: water, carbohydrate, fat, protein, vitamins, and minerals. Horses are natural athletes. The AERC believes that modern chemistry and intensive science currently cannot safely extend the horse's athletic ability and endurance beyond what can be achieved by feeding an appropriate diet (forage, grain, and water) and use of wet saddle blankets. Furthermore, the AERC, when instituting its drug policy, considered that drugs could be prohibited or regulated. If regulated, decisions would be required regarding which drugs would be permissible and at what serum concentrations. If prohibited, disagreements would be likely to ensue over what constitutes a drug. The AERC has elected to prohibit drugs during competition rather than attempt to regulate them.

Conclusions

Endurance riding is one of the most enjoyable of equine performance sports; however, the stresses and demands placed on horse and rider are great and differ from those of other equine sports. The welfare of endurance horses depends on the knowledge and skill of their riders and is protected through evaluation of horses by veterinarians before, during, and after these events. Equine welfare is further protected by standards set by the AERC. These standards include requiring horses to be fully mature before they are allowed to compete, requiring that horses be "fit to continue" at all veterinary examination points, and requiring that horses not be under the influence of drugs or other performance-enhancing modalities during competition. The efforts of the AERC to protect the well-being of horses competing in endurance rides surpass those of any other group sanctioning equine performance events.

In the preface of the "Ethical and Professional Guidelines of the **American Association of Equine Practitioners (AAEP)**,"[9] former AAEP President, Dr. James Coffman, is quoted as stating: "We must take care to maintain a high level of awareness of why we exist as an organization, lest we lose our bearings in the midst of the rapid pace at which things are changing and increasing in complexity. I submit we, as equine practitioners, exist as an organization because of the horse and the medical and surgical needs peculiar to the species. I would argue further that this consideration serves as a virtually infallible standard against which to consider all AAEP policies. If thought through to its ultimate conclusion, whenever a question is answered based upon the welfare of the horse, the human principles involved are also best served in the long run. We are here for the horse; to the extent that we are responsive to that concept, we will prosper both as individuals and as an organization."[10]

Dr. Coffman was addressing the members of the AAEP. Isn't he speaking to all of us who admire and are concerned for the horse that participates in performance sports?

[9]Mackay-Smith M. White Post, Virginia: Personal communication, 1999.

References

1. *American endurance ride conference rules and regulations.* Appendix B–Bylaws, Article V, Section 1. Auburn, Calif: American Endurance Ride Conference, 1999.
2. Smithcors JF. *The veterinarian in America 1625–1975.* Santa Barbara: American Veterinary Publications, Inc, 1975;29–30.
3. *American endurance ride conference rules and regulations.* Appendix B–Bylaws, Article V, Sections 1 and 5. Auburn Calif: The American Endurance Ride Conference, 1999.
4. *American endurance ride conference rules and regulations.* Preamble. Auburn, Calif: The American Endurance Ride Conference, 1999.
5. *American endurance ride conference rules and regulations.* Rule 10. Auburn, Calif: The American Endurance Ride Conference, 1999.
6. *American endurance ride conference rules and regulations.* Rule 2. Auburn, Calif: The American Endurance Ride Conference, 1999.
7. *American endurance ride conference rules and regulations.* Rule 3. Auburn, Calif: The American Endurance Ride Conference, 1999.
8. *American endurance ride conference rules and regulations.* Rule 6. Auburn, Calif: The American Endurance Ride Conference, 1999.
9. *American endurance ride conference rules and regulations.* Rule 13. Auburn, Calif: The American Endurance Ride Conference, 1999.
10. American Association of Equine Practitioners. *Ethical and professional guidelines.* Lexington, Kentucky: American Association of Equine Practitioners.

Urban carriage horses 1999—status and concerns

J. G. Merriam, DVM, MS

In today's high-speed urban life, the incongruous sight of a horse-drawn carriage amidst downtown traffic is viewed in different ways by different eyes. To vacationers, it hearkens back to a bucolic era when the pace was slower and signals the presence of a historic district or revitalized downtown. To harried truck or bus drivers, it is an obstacle to be passed quickly; a hindrance to a regular schedule. To passing horsemen, it may pique interest but also wonderment as in "why on earth is it here?" Same horse and carriage but various interpretations. How do we, as veterinarians, see it? Is this history? Is this abuse? Is this simply an inappropriate use of the horse or a legitimate one that can set the tone for an entire city or area and be a paradigm for how society treats the animals in its care?

Today, thanks to this Forum, we have an opportunity to step back from our busy lives and think about the ramifications of the horse's use and place within our no-longer rural population. It is particularly appropriate that we focus on the uses of horses in the United States where they are almost exclusively a recreational vehicle as opposed to their uses in the other two thirds of the world where they still serve as beasts of burden.

Gathering information about carriage horses has been difficult because of disparities in their use, the mobility of the industry, and lack of a central oversight body. Many talented, dedicated people have worked tirelessly to obtain the information presented here.

The images most of the public sees are dramatic juxtapositions. When accidents occur or carriage horses are severely neglected, they often make headlines on the evening news, the cover of magazines, or special-interest publications. Alternatively, these horses may be used as a prop on catalogs, brochures, or advertisements to convince unsuspecting individuals that there is still warmth in urban environments.

So, who are these horses, what are the issues, and why should we care?

From the Massachusetts Equine Clinic, 75 Locust St, Uxbridge, MA 01569.

Appreciation is extended to Dr. Holly Cheever for providing key information and contacts, Barbara Clarke for up-to-date statistical information, Dr. Theo Capaldi for photos, Carter Luke for providing information concerning carriage horses in Massachusetts, and Joe Silva for historic photos. Dr. Susan White shared her expertise on heat-related problems among southern carriage horses.

Numbers and Organizations

Best estimates indicate there are 1,000 to 2,000 carriage horses in the United States, kept in groups of 1 to 30, and spread over hundreds of locations. Housing varies with locale. Horses in New York City are stabled in tiny, poorly ventilated stalls right downtown, whereas those in other locales are shipped in daily from farms to which they return. Carriage Operators of North America has more than 500 members.

Organizations with interest in, or interaction with, carriage horses include **People for the Ethical Treatment of Animals (PETA)**, the **American Humane Association (AHA)**, the **Carriage Horse Action League (CHAC)**, the **New England Antivivisection Society (NEAVS)**, the **Animal Rescue League (ARL)**, the **Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA)**, and local support and challenge groups. Many, such as the AHA, ARL, and MSPCA, provide direct services to carriage horses and direct action on behalf of municipalities, whereas others raise funds and initiate legal challenges to the carriage horse industry. Universities and other organizations are involved in the daily care of carriage horses and address long-term concerns, but private practitioners provide most medical services.

Welfare Concerns

Hours of work, availability of shelter and water, and protection from environmental extremes have been the foci of most concern. The effects of a "nose-

to-tailpipe" existence and long-term exposure to air pollution are being studied, as are increasing morbidity and mortality (human and horse) associated with horse/motor vehicle accidents. Upward trends in the latter point to a need for limiting access to certain streets and areas, as well as a need to enforce strict curfews, carriage lighting, and construction standards.

Equine 911

The availability of emergency services for carriage horses is random and affected by traffic, hour of the day or night, distance, and availability. Few cities have an equine ambulance, and fewer still have the resources to staff it. Emergency medical technicians and law enforcement personnel are usually not able to help because of lack of training and unfamiliarity with horses. Training programs and resources are readily available but are assigned a low priority for funding in most locales.

Regulatory Problems

Carriage horses and operators are usually regulated by taxi licensing bureaus, not animal control. Enforcement of regulations, therefore, can range from strict to nonexistent. In New York City, the Mayor, at the request of influential counselors, recently overrode hard-fought regulations and restrictions; this allowed carriages to operate in high traffic areas during peak times. Ideally, regulations should address environmental concerns, work hours, mandatory health inspection, shelter, carriage safety, loads, and local issues and geography. Regulations should be enforced by legitimate humane or animal control professionals. Emergency care provisions should be clear, appropriate to the venue, and enforced. If they are not, carriage horses should not be used in the area.

The Task Ahead

To improve the welfare of carriage horses, veterinarians and the public can:

- Work locally and nationally for strict regulation;
- insist that regulations be enforced by qualified personnel;
- Form appropriate alliances (eg, veterinarians with human organizations);
- Support legitimate research on environmental and other factors, and channel the results of the information obtained appropriately; and
  put the welfare of horses first.
- Above all, get involved—it makes a difference! Carriage horses that work in uncomplaining silence depend on our efforts.