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COMMENTARY

You can always depend on Mother Nature to provide humbling experiences. From tornadoes to earthquakes, hurricanes and blizzards, the forces of nature provide challenges for animal owners. Flooding has been the specialty of 1997, with severe problems in Northern California, Kentucky/Ohio/Indiana, North and South Dakota/Minnesota and the bordering Canadian area. Horse owners and managers were faced with saving their own lives, often needing to leave their homes and animals within minutes of being warned. Veterinarians could not reach emergency calls due to impassable roads; electricity and telephones were off line. Cellular telephones and ham radios were often the only communications available.

The aftermath provided an eye-opening experience for all involved. Now concerns were with building safety, lost and injured animals, contaminated water and feed (sewage, chemicals, fuel oil, dead animals, infectious agents), displaced wildlife including poisonous snakes, and the threat of infectious and vector-borne diseases. Experts in multiple disciplines were consulted for questions regarding: "cleaning" sewage-contaminated soil (agronomy); disinfecting equine facilities (preventive medicine); dealing with ponds and standing water in pastures which were contaminated with sewage and possibly agri-chemicals (civil engineering); and managing wildlife now found in barns (wildlife biologists). The logistics and cost of the labor-intensive clean up effort were staggering.

People in disaster-affected areas now are acutely aware of the importance of safe drinking water, and pastures free of sewage, garbage and debris. Veterinarians and horse owners in previously unaffected areas would be wise to learn from these challenges of Mother Nature to be prepared for the unexpected. Getting a wider, more farsighted perspective in anticipating and surviving a disaster means being informed and taking action.

The *AVMA Emergency Preparedness and Response Guide* is an excellent resource covering multiple disasters, and the care and handling of animal species ranging from horses to marine mammals. This publication is available for $55 (call for information on foreign mailing) from the American Veterinary Medical Association, 1931 North Meacham Road, Suite 100, Schaumburg, IL 60173-4360; telephone 1-847-925-8070.

INTERNATIONAL

First Quarter 1997

The International Collating Center, Newmarket confirmed the following disease outbreaks. Cases of African Horse Sickness were reported in South Africa between October 1996 and March 1997. Contagious Equine Metritis was confirmed in Japan (1 case) and United Kingdom (3 cases). There was little evidence of widespread influenza activity with cases diagnosed in France and Sweden.

Various clinical manifestations of equine herpesvirus infection were reported from several countries. Coital exanthema caused by EHV-3 was diagnosed in a stallion in Ireland. Hong Kong reported an outbreak of respiratory disease involving approximately 200 Thoroughbred racehorses during February and March attributable to equine herpesviruses (EHV-1 and 4). Cases of EHV-1 abortion were reported from Denmark, Germany,

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Ireland, Japan, Switzerland, United States and United Kingdom. Multiple cases on premises were reported in Kentucky USA and the United Kingdom. The paralytic form of EHV-1 was diagnosed on two premises in the United Kingdom.

Multiple cases of *Salmonella abortus equi* were confirmed on two premises in Japan. Strangles was reported from 10 countries continuing the trend for it to be the most frequently reported disease.

Equine Influenza

In March 1997 the Expert Surveillance Panel for Equine Influenza assembled a report on the worldwide prevalence of equine influenza activity and characteristics of the causative viruses for the calendar year 1996.

The panel concluded that while equine influenza was detected in circulation in several countries, the overall level of activity was low with the exception of Sweden. Virus isolates appeared similar to those previously characterized. Thus the panel left unchanged its 1995 recommendation for the strain composition of equine influenza vaccines, i.e. viruses antigenically similar to Prague/56 (equine-1), Newmarket/2/93 (equine-2 "Eurasian") and Kentucky/94 (equine-2 "American").

The panel consists of six laboratories in Europe, Asia and the USA, including influenza reference laboratories of the Office International des Epizooties and World Health Organization, chaired by Dr. Jennifer Mumford.

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VIRUS ALERT

On June 6 the Arizona Department of Agriculture confirmed that a 2-year old Quarter horse had been diagnosed with Vesicular Stomatitis. Consequently the Kentucky Department of Agriculture prohibited entry of livestock, wild or exotic animals which originated from Arizona. All equidae coming to Kentucky from any state with a common border with Arizona must be tested negative for Vesicular Stomatitis by either the SN or CF test within 30 days prior to entry.

EEE — Not Just an Equine Problem

Eastern equine encephalitis (EEE) virus, a mosquito-borne alphavirus, can cause morbidity and mortality in a variety of vertebrate species. The virus was first isolated in 1933 during a major equine epizootic that occurred along the Eastern seaboard of the United States. This virus has subsequently been isolated from other vertebrate species including humans, dogs, pheasants, quail, ostriches, and emus.

EEE virus is typically active each summer and fall in the eastern, southern, and midwestern United States as far west as Texas and as far north as the Upper Peninsula of Michigan. The virus also occurs in Central and South America. EEE virus is maintained in nature in enzootic cycles involving passerine birds, primarily perching songbirds, and mosquitoes.

Epidemics and epizootics occur when mosquito vectors transmit the virus from infected birds to humans, horses, or other susceptible hosts. Infections of these species with EEE virus are often subclinical. When horses or emus develop clinical infections, an estimated 80-90% of such cases are fatal. Horses are generally considered dead-end hosts, incapable of producing sufficient quantities of virus in their bloodstreams to pass the infection

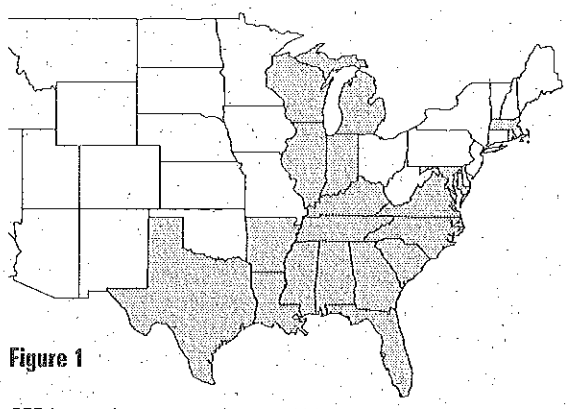

Figure 1

EEE in non-human vertebrates, 1995-96
Data submitted to the CDC by state epidemiologists, state veterinary diagnostic laboratories and state public health veterinarians

to feeding mosquitoes. Equine and other vertebrate species function as sentinels, demonstrating the presence of virus activity and warning that humans may be at risk for infection.

EEE virus may cause severe clinical illness in humans. Fatalities occur in approximately 30-70% of clinical cases, and the majority of survivors suffer residual neurologic deficits. During the 32-year period 1964-1995, a total of 151 human EEE cases were reported to the Centers for Disease Control and Prevention, for a national average of nearly 5 cases per year (range, 0-14). The distribution of non-human vertebrate cases reported during 1995-1996 is shown in **Figure 1**. Reported cases occurred in horses (215), ratites (emus, ostriches, and cassowaries) (51), dogs (2), and other avian species (5).

Although human EEE cases are now notifiable, reporting of EEE cases involving other species is voluntary. Thus, the number of non-human vertebrate cases reported is likely to under-represent the true incidence of disease. Surveillance data are most useful in understanding the geographic and temporal distribution of the virus.

Because of the severity of clinical EEE infections in humans and some non-human vertebrates and the perennial nature of EEE virus activity, measures to prevent infection should be taken in areas where the virus in enzootic. Routine vaccination of horses is recommended. Although many emu producers routinely vaccinate their birds with equine EEE vaccine, the efficacy of these products in this species has not been demonstrated. There is no evidence that either horses or emus can pass EEE virus directly to humans, but it is wise to wear protective clothing and gloves when working with animals that might be infected.

In addition, people should protect themselves from biting insects by applying repellents, wearing protective clothing, and limiting outdoor activities during the evening hours when vector mosquitoes are biting.

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Wildlife

Several wildlife species in Kentucky have exhibited a continued population increase in recent years. This trend is primarily evident in populations of fur-bearing mammals, or "furbearers," most notably raccoons and coyotes. Other Kentucky furbearer species include red and gray fox, striped skunk, opossum, muskrat, beaver, mink, weasel, and bobcat.

The Kentucky Department of Fish and Wildlife Resources has collected highway mortality data for selected wildlife since the early 1980s. This information, augmented by trapper harvest surveys and fur purchase reports, provides biologists with insight on wildlife population dynamics.

Beginning in 1986, the raccoon highway mortality index reached a record high for nine consecutive years **(Figure 2)**. Despite a slight reduction in 1995, the index still reflected a 386% increase over 1985 figures. The coyote index also reveals a dramatic increase, reaching a record high in 1994 **(Figure 3)**. Coyote index figures for 1995 reflect an increase of 888% since 1985. The adaptable coyote is a relative newcomer to Kentucky, having expanded its range eastward from the plains and mountains of western North America for the last several decades. A rapid population increase is very common for species that colonize a new area as they spread out to occupy available habitat.

Harvest pressure plays an important role in the dynamics of a wildlife population. Harvest pressure has substantially decreased for most furbearers since the late 1970s. For instance, the number of active trappers in Kentucky has plummeted from 6,654 in 1980 to 390 in 1995, a seventeen-fold decrease **(Figure 4)**. This decline is inherently tied to a significant depression in the fur market during that same period. The average raccoon pelt price exceeded $12.00 in the early 1980s, but averaged only $2.00 in 1991. The fur market has rebounded slightly from 1991-1995, but not enough to spur a dramatic increase in trapping.

Decreased furbearer harvest pressure has resulted in elevated population levels for many species. Regulated hunting and trapping are effective wildlife management tools that can prevent over-

Figure 2

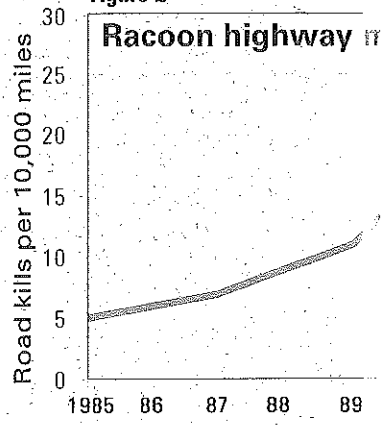
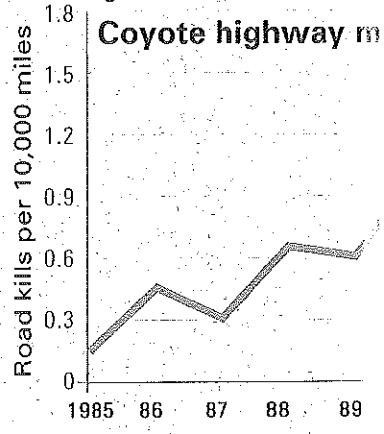


Figure 3



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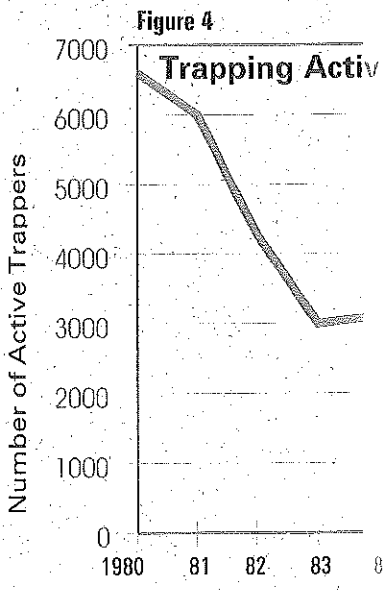

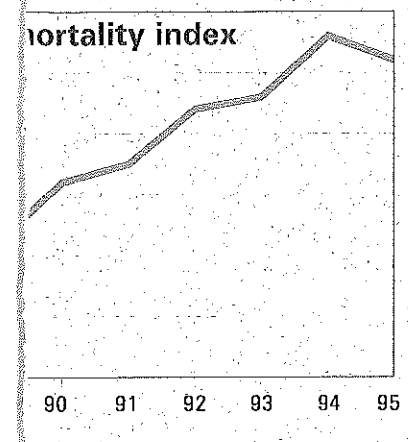

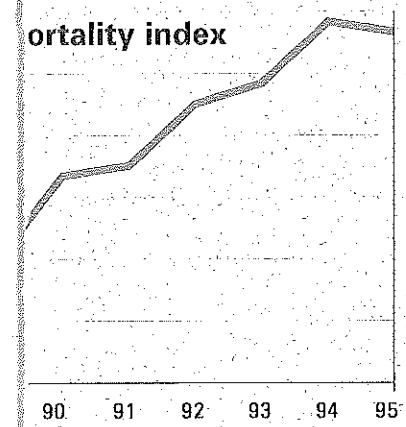

population in many wildlife species. Overpopulation can cause a variety of problems for animals and humans, including habitat degradation, property damage, and disease.

Furbearers are significant disease vectors that can affect wildlife, domestic animals, and humans. An increase in wildlife density will generally increase the likelihood of disease transmission. Rabies, tularemia, leptospirosis, mange, and distemper are prime examples of diseases carried by furbearers. Recent findings indicate that opossums are involved in the spread of equine protozoal myeloencephalitis (EPM). Although highway mortality surveys do not include opossums, it is likely that opossum populations have grown since the early 1980s based on dramatic declines in trapper harvest totals. Approximately 70,000 opossums were harvested in 1982 compared to 2,000 in 1994.

These wildlife population trends are certainly no cause for panic, but they do warrant an increased awareness of potential wildlife/human conflicts and associated strategies for nuisance wildlife control. Wildlife has a variety of ecological, economic, and recreational values, but those values can be positive or negative depending on the situation. The difficulty in managing wildlife populations is in balancing a myriad of values and striving for the prudent utilization of harvestable surpluses while incorporating the desires and tolerances of people.

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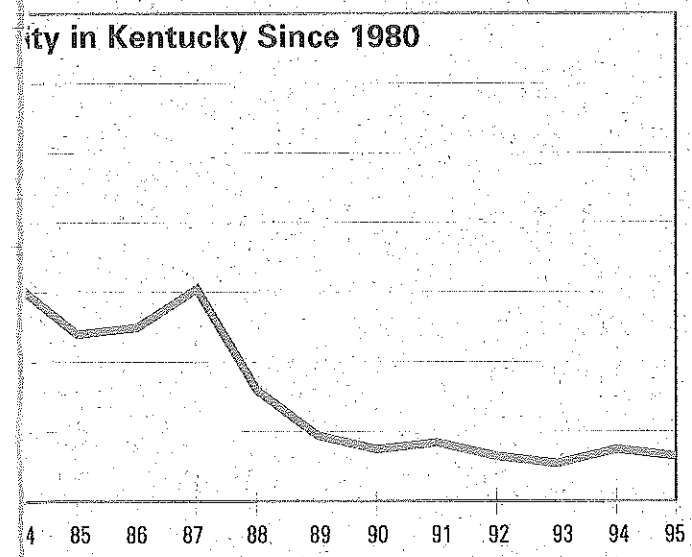

Bacterial Lung Disease

Lung conditions are commonly encountered in horses examined at the Livestock Disease Diagnostic Center and bacterial infection is the most common cause of equine lung disease. Of 4,255 horses (excluding fetuses) necropsied from January 1993 through December 1996, 448 (10.5%) had lung disease and bacteria were incriminated as the cause of disease in 337.

The two broad diagnostic categories, which encompassed most of the horses with lung disease, were pneumonia and pleuritis/pleuropneumonia. The first category consisted of the various forms of pneumonia including bronchopneumonia, suppurative pneumonia, bacterial pneumonia, aspiration pneumonia, and interstitial pneumonia.

Of 255 horses diagnosed with broncho-, suppurative, and bacterial pneumonia, bacteria were cultured from the lungs of 170. Two or more bacterial organisms were cultured in 25% of the horses from which bacteria were isolated. The most commonly isolated bacterium was *Streptococcus zooepidemicus* (55), followed by *Rhodococcus equi* (48), *Escherichia coli* (33), *Klebsiella pneumoniae* (16), and *Pasteurella caballi* (8).

In foals less than 1 month of age, the most commonly isolated organisms were *Escherichia coli* (25), *Streptococcus zooepidemicus* (18), followed by *Klebsiella pneumoniae* (10). *Rhodococcus equi* was not isolated from the lung of any foals in this age group. In foals 1 to 12 months of age, the most commonly isolated organisms were *Rhodococcus equi* (44), *Streptococcus zooepidemicus* (24), and *Escherichia coli* (5). The most commonly isolated bacteria from pneumonia cases in horses over 1 year of age were *Streptococcus zooepidemicus* (13), *Pasteurella caballi* (4), and *Actinobacillus equuli* (4).

Twenty-two horses were diagnosed with aspiration pneumonia from which *Escherichia coli*, *Streptococcus zooepidemicus* and *Rhodococcus equi* were the most frequently isolated bacteria. Fifty-six cases of interstitial pneumonia were diagnosed, the majority of which were in horses 1 to 12 months of age. Bacteria were isolated from the lung in only one third of the cases; most commonly isolated were *Escherichia coli* and *Rhodococcus equi* followed by *Streptococcus zooepidemicus* and *Actinobacillus equuli*.

The second category, pleuritis/pleuropneumonia, was diagnosed in 42 horses. *Streptococcus zooepidemicus* was the most commonly isolated bac-

terium, followed by *Klebsiella pneumoniae, Staphylococcus aureus,* and *Escherichia coli.* Two thirds of the horses with pleuritis/pleuropneumonia were over 1 year of age, and in this group *Streptococcus zooepidemicus* was the most frequent isolate.

The data confirm bacteria are an important cause of respiratory disease in horses and incriminate *Streptococcus zooepidemicus, Rhodococcus equi,* and *Escherichia coli* as the most important pathogens of the equine lung in this study.

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Equine Leptospirosis

During the past two foaling seasons, 18 cases of leptospira-induced abortion have been diagnosed at the Livestock Disease Diagnostic Center. Six cases occurred during the 1996 season and 12 during the 1997 season. **Figure 5** gives the number by month and year of confirmed cases of leptospira-induced abortions for the past nine foaling seasons.

The six mares (all Thoroughbreds) diagnosed during the 1996 season were located on six different farms. *Leptospira* serovar *grippotyphosa* caused two of the abortions (one in January and one in March), and *L.* serovar *pomona* type *kennewicki* the other four abortions. On a seventh farm, leptospirosis was also diagnosed in two Thoroughbred mares that delivered premature foals that survived. These mares were in the same barn, gave birth at about the same time, and were infected with serovar *pomona* type *kennewicki.*

All 12 cases diagnosed during the 1997 foaling season were due to infection by serovar *pomona* type *kennewicki.* The mares were from 12 different farms; however, one of the farms did have a mare that aborted due to leptospirosis during the 1996 season. Ten of the mares were Thoroughbreds, one Standardbred, and one Rocky Mountain Spotted.

The central Kentucky area received extremely heavy rainfall during late February 1997 that resulted in the flooding of many of the farms in this area. There was a concern that the incidence of leptospirosis might be significantly higher because of the flooding, but only two cases have been diagnosed since the flooding.

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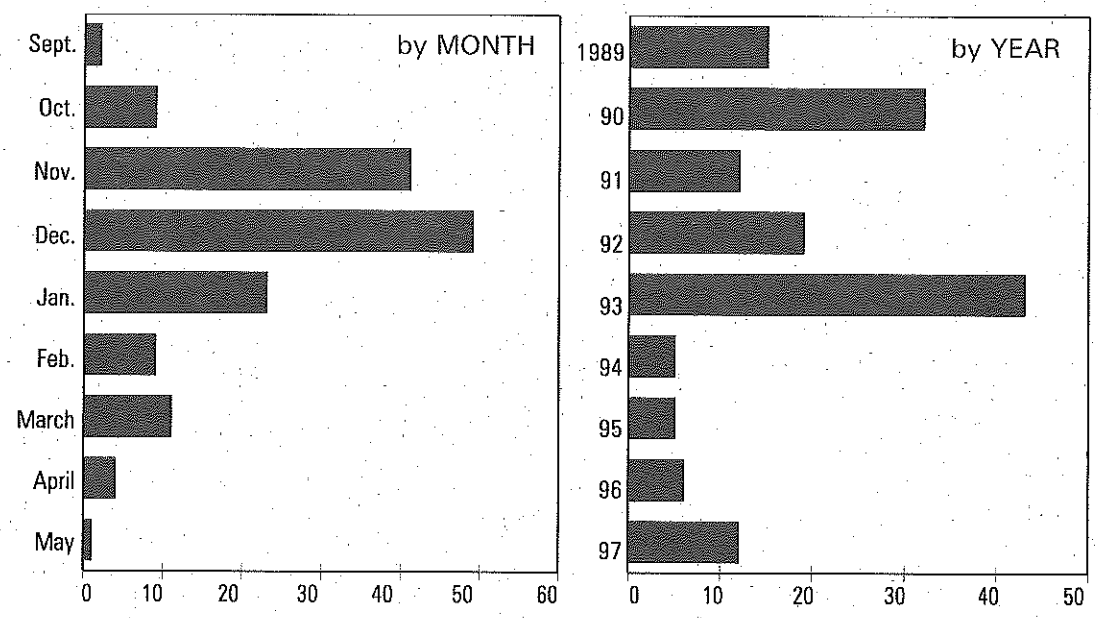
Figure 5.
Confirmed cases of leptospira-induced abortion, 1989-1997

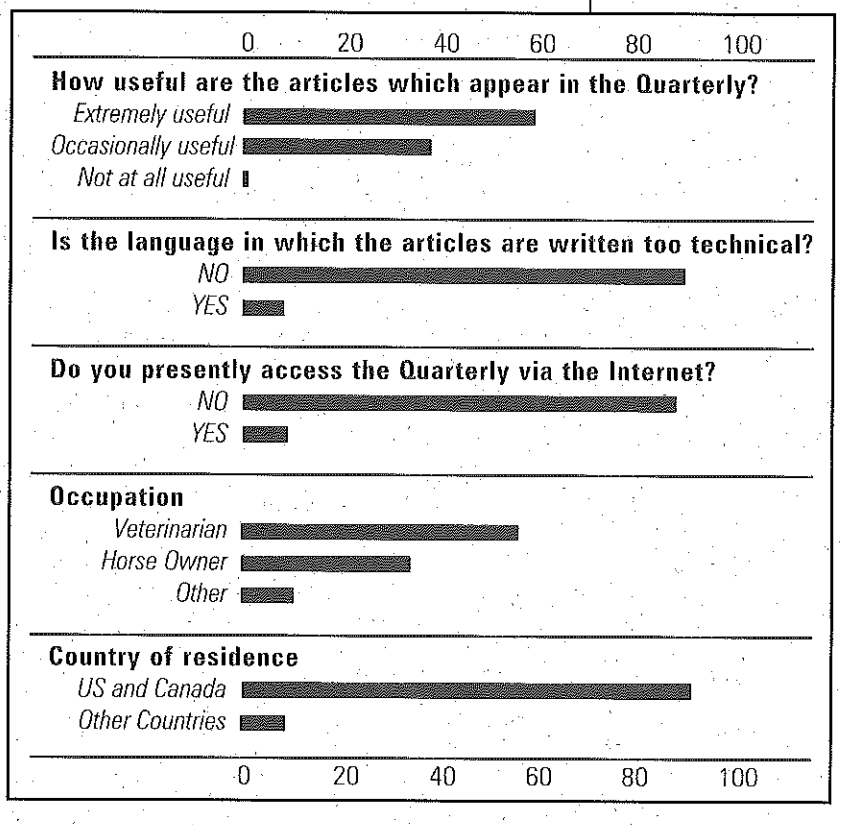


Survey Results

The survey responses from the January 1997 issue were most informative and helpful in the future planning of this publication. Mailings and electronic replies arrived from 22 countries.

Suggestions for future topics included musculoskeletal injuries, nutrition, sports medicine, reproduction and therapeutics. Don't wait until the next survey to let us hear your comments and suggestions. You can reach us by post or e-mail.

Many thanks go to those who took the time to complete the 506 survey cards.



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