JANUARY
2000
Volume 8
Number 2

Equine Disease Quarterly

FUNDED BY UNDERWRITERS AT LLOYD'S, LONDON, BROKERS AND THEIR KENTUCKY AGENTS

IN THIS ISSUE

University of Kentucky

College of Agriculture

Department of Veterinary Science

LLOYD'S

Commentary

The recognition of West Nile virus infection among humans, horses, birds and mosquitoes in the northeast United States during August and September of 1999 once again reaffirms the tremendous challenges posed by arboviral (vector-borne) diseases to human and animal populations worldwide.

West Nile virus was first identified in Uganda during 1937 and subsequently has been recognized as a cause of human disease throughout Africa, the Middle East, western Asia and the Mediterranean countries of Europe. Recent outbreaks have occurred among humans in Romania and Morocco (1996), and in Russia (1999); and among horses in Morocco (1996) and Italy (1998).

West Nile is a flavivirus belonging taxonomically to the Japanese encephalitis subgroup that includes the serologically related St. Louis virus found in the United States. Hence the initial confusion of diagnosis in New York caused by serological cross reactions.

Historically West Nile virus infection among humans was considered an asymptomatic or mild febrile disease. The virus is transmitted by mosquitoes that themselves acquire infection from feeding on viremic birds. Migratory birds are considered the primary means whereby infection is spread within and between countries.

Clinical disease among horses occurs infrequently following infection. Symptoms reported from outbreaks in Egypt, France, Morocco and Italy include paralysis, recumbency and mortality. Based on published scientific reports, there is no evidence that the virus can be transmitted directly from infected horses to humans or other horses. It is also considered that the low level of viremia in the horse among those that develop viremia is inadequate to infect mosquitoes.

Unusual features of the recent outbreak include the high mortality observed among birds which may reflect the introduction of infection into a naive population or a more virulent strain of the virus. How the virus was introduced into the United States is an important question that may or may not be answered. Migrating birds or the importation of exotic avian species by legal or illegal means are possible sources.

The rapidity with which the disease was diagnosed, bearing in mind its exotic nature, is remarkable and those involved should be commended, despite the initial misdiagnosis. The success can be attributed to collaboration between medical, public health, veterinary and wildlife agencies and individuals at the local, state and federal levels who linked mortality occurring among birds to sickness in humans.

This was facilitated in no small way by the extensive discussion which developed on the Internet using Promed (www.promedmail.org), an e-mail reporting network to monitor global emerging diseases. The network was put to excellent use during the major epidemic of disease caused by the previously unrecognized Nipah virus which infected humans and swine in Malaysia and Singapore commencing in 1997.

The system is not without its distractions; cases in crows were mistakenly reported to be in cows, and statements are sometimes made which lack scientific validity and because of widespread and rapid dissemination become accepted as fact.

With the onset of colder weather and the first frosts of the fall in the northeast, it is anticipated that the primary mode of transmission via the mosquito will cease. It is, however, imperative that investigations continue to try to ensure the disease does not re-emerge in the United States during 2000. ■

CONTACT
Dr. David G. Powell, (606) 257-2756
dgpowe2@pop.uky.edu
Maxwell H. Gluck Equine Research Center

Equine Disease Quarterly

Editors
Roberta Owyer
David Powell
Neil Williams

Staff
Diane Furry
Linda Millercox
Libby Noble

Correspondence should be addressed to the editors,
Department of Veterinary Science
Gluck Equine Research Center
University of Kentucky
Lexington, KY 40546-0099
Telephone (606) 257-4757
Fax (606) 257-8542.

Internet address:
gopher.ca.uky.edu
or
http://www.uky.edu/Agriculture/VetScience/gluck1.htm

International

Third Quarter 1999

The International Collating Center, Newmarket and other sources provided the following information.

Cases of Contagious Equine Metritis (CEM) were reported from Norway and the Netherlands. Eastern Equine Encephalitis (EEE) causing mortality among horses was reported extensively from the United States in the states of Alabama, Florida, Louisiana, Michigan, Mississippi, Texas and most recently in October from Georgia. Coital exanthema (EHV-3) was confirmed in the United Kingdom among two non-Thoroughbred mares after covering.

Respiratory disease attributable to equid herpesvirus was reported in France among Thoroughbred and non-Thoroughbred horses, in the United Kingdom on two premises housing non-Thoroughbreds and in Kentucky, USA among Thoroughbred weanlings.

Following the report of Equine Infectious Anemia (EIA) in a Thoroughbred mare exported from Australia to New Zealand in June, 5,600 Coggins tests were subsequently undertaken on horses in New South Wales, primarily on farms housing shuttle stallions. All results were negative. Influenza was widely reported in France among several breeds of horses.

Clinical and sub-clinical cases of equine piroplasmosis were reported from Switzerland and strangles was confirmed in Queensland, Australia, the Netherlands, Switzerland and the United Kingdom. In South Africa cases of purpura haemorrhagica resulting in mortality, as a sequel to strangles were observed. ■

How Much Weight?

A question which frequently arises is the amount of weight a horse should or can carry. It is obvious that such added weight is a significant factor both in the ability of a horse to perform and the duration of such performance. This has, of course, long been recognized in the use of added weight to handicap Thoroughbred racehorses.

While an easy question to pose, it is a difficult question to answer. The ability of a horse to carry a given weight is a function of how long that additional weight is to be carried and at what speed.

Of singular importance is what measure or measures are to be used to determine optimum weight-carrying ability once an optimum has been defined. The optimum would have to include consideration of size, conformation, condition, age, the speed at which the work is to be done, and the duration of the work.

When the horse was a significant factor in travel and warfare, this question was of wide interest and importance. In the modern era the question arises most often, in my experience, with endurance trail-ride horses and horses used for police work. The matter is rarely mentioned in modern books and, if mentioned, the statement is usually that a horse can carry 20% of its own body weight.

Veterinary-Major Frederick Smith (later Major-General Sir Frederick Smith) addressed this question in *The Journal of Comparative Pathology and Therapeutics* in 1898 (Vol. XI, No. 4) and again in the several editions of his *A Manual of Veterinary Physiology* (5th Ed. Eger. Chicago, 1921).

In the 1898 paper Smith used 136 horses weighing between 840 and 1,333 pounds. The weight-carrying ability of the horses was estimated, and the horses weighed after the estimates had been made. The estimation was done by two different "experts" in two different groups of light and heavy cavalry horses three years apart.

The expert opinion assigned weight-carrying ability to the horses with the assumption that they would be doing hard work as hunters but no mention was made as to duration of work, presumably that of a usual fox-hunting expedition.

The relationship of the weight-carrying estimates to the body weight of the horses is shown in **Figure 1** with the linear regression line. Smith gives some individual values and some mean values, making a clean statistical study impossible, but the trend is apparent. This shows that the expert evaluation of the weight-carrying ability of a horse correlated reasonably well with the body weight of the animal.

Smith believed that the experts' evaluation was not simply a one-to-one relationship of weight and weight-carrying ability but he provides no details or support for that view. It would certainly appear that they were using a subjective estimate of body weight in making their estimates of weight-carrying ability.

Smith concluded in 1898 that, "The rule to ascertain the carrying power of a horse is to divide his body weight by 5.757, and, if intended for only moderate work, add to this 28 lbs."

In 1921 Smith appeared to be less secure about these estimates and recommendations, giving 15-20% of body weight as the general rule. His opinion may well have been modified by awareness of the sometimes weight-carrying

ability of ponies and donkeys.

Smith's work was pioneering and, though seriously flawed and subjective in modern scientific terms, may serve as a guide and stimulus for new work with modern scientific tools. ■

CONTACT
Dr. J.R. Rooney
jarooney@goeaston.net

National

An Unwelcome Visitor

On August 23, 1999 a physician at a hospital in the borough of Queens, New York City contacted the local health department to report two patients with symptoms of encephalitis. Further investigations revealed eight similar cases clustered in northern Queens. Serum samples obtained from the patients and tested at the Centers for Disease Control (CDC), Fort Collins, Colorado gave positive results for St. Louis encephalitis virus on September 3.

St. Louis is an arboviral (vector-borne) encephalitis and so aerial and ground application of mosquito adulticides and larvicides was immediately commenced in the boroughs of Queens and South Bronx. Emergency telephone hotlines plus extensive media and press coverage were set up in New York to provide information and advice on precautions to be taken.

Between September 7 and 9 a veterinarian at the Bronx Zoo noted the deaths of several exotic birds. At the same time there were reports of significant mortalities among crows in the city.

Tissue samples were sent to the USDA Veterinary Services Laboratory, Ames, Iowa on September 10. By September 14 scientists at the laboratory had isolated a virus that did not conform to the common avian and other agents present in the United States and the isolates were sent to CDC, Fort Collins for identification and characterization.

On September 23 test results indicated the avian virus isolates were closely related to West Nile virus, never previously reported in the Americas. At the same time, tissue samples from the brains of three human patients that had recently died of encephalitis in New York were examined by scientists at the University of California, Irvine and gave similar results.

By the end of September, 25 cases of human encephalitis had been reported in New York City and 12 in neighboring counties of Westchester and Nassau, including four deaths among elderly patients.

During September and October an extensive mosquito and bird surveillance program was undertaken by state and federal authorities in New York and neighboring states. West Nile virus was isolated from *Culex pipiens* and *Aedes vexans* mosquito species collected from several counties in New York and a county in New Jersey.

Tissues from dead birds also tested positive from five boroughs and six counties in New York, one county in Connecticut, 12 in New Jersey and in Baltimore Harbor, Maryland. Most of the identifications were obtained from American crows but also from a range of native scavenging and predatory birds.

Confirmation that the virus was indeed West Nile was provided by CDC and the US Army Medical Research Institute for Infectious Diseases, Fort Detrick, Maryland based on sophisticated molecular analyses of isolates of human, avian and mosquito origin.

Between August 26 and October 4 approximately 20 horses in the Riverhead area of Long Island, some 60 to 70 miles east of New York City, developed signs of incoordination, depression and recumbency with half dying or being euthanized.

An intensive investigation by members of the USDA Early Response Team identified cases occurring on 13 premises all within a five-mile radius involving 10 different breeds of horses aged between three and 30, the majority 20 years or older. Initially the horses had been diagnosed as suffering from Equine Protozoal Myeloencephalitis (EPM). Two cases were also confirmed at Belmont Park Race Track in Nassau County.

On October 19 health officials in New York reported that the Ames laboratory in conjunction with CDC had identified West Nile virus as the cause of illness and mortality based on virus isolation and serology from submitted equine samples.

By November 2 there were 60 confirmed human cases, including seven fatalities, all in the state of New York with the last case reported on September 22. The peak of human cases occurred during late August and equine cases in mid-September. As of November 2, 12 affected horses had been identified as serologically positive and 103 birds in New York State were confirmed West Nile virus positive. See **Figure 2** for breakdown of reported cases.

Ongoing studies include extensive surveillance of bird and mosquito populations along the Atlantic seaboard as far south as Florida to monitor the possible spread of the virus primarily by migrating birds.

USDA is developing a serological test to detect the virus infection in animal and avian species. Also they are

Figure 1

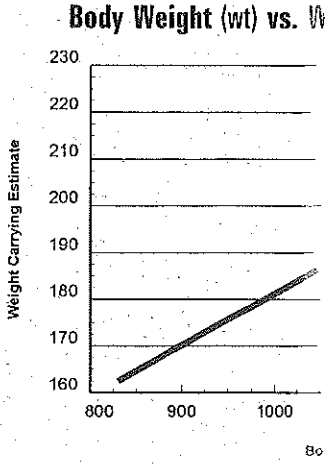
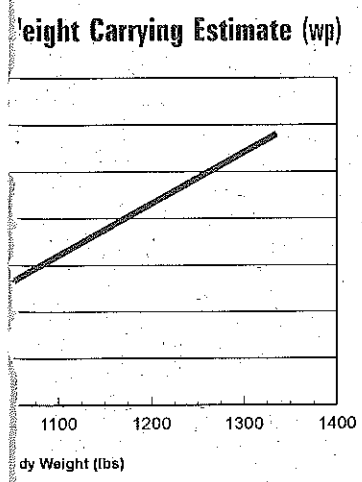


Figure 2 — Distribution

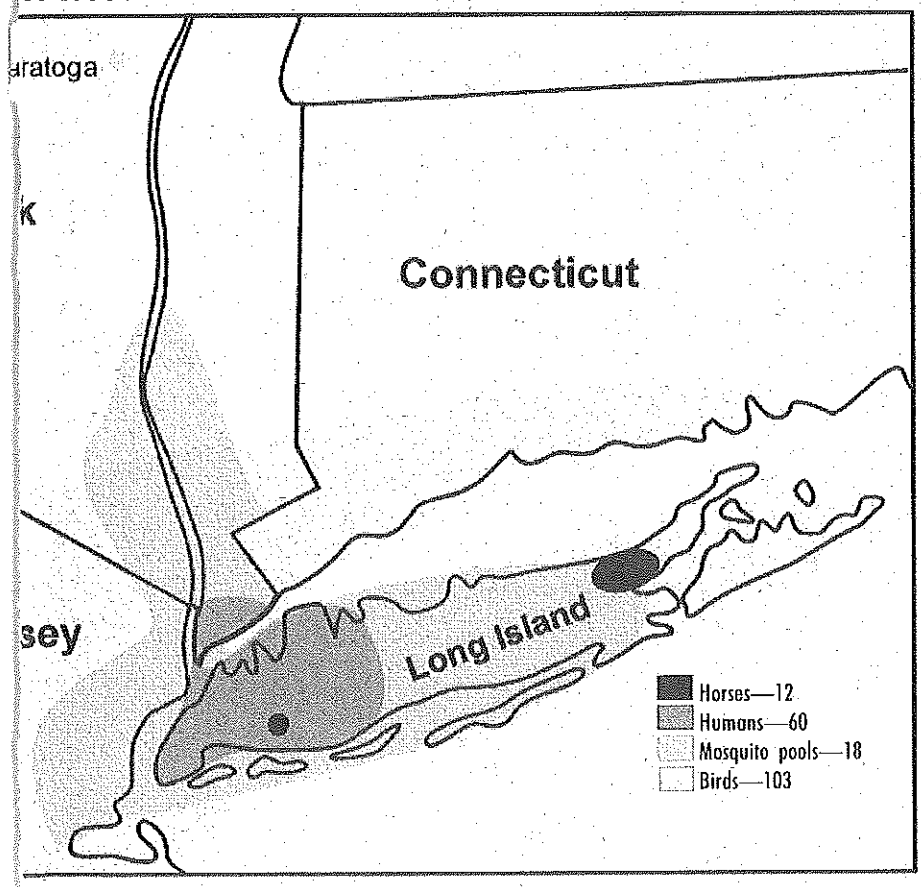


undertaking animal transmission studies in horses, chickens and turkeys to better understand pathogenicity of the virus and whether they play a role in the spread of this infection.

Within the United States no restrictions have been placed on the movement of horses. Several countries including Argentina, Brazil, Hong Kong, India, Mexico and Saudi Arabia, the European Union, and the United Arab Emirates have placed temporary restrictions on the movement of horses from the United States.

Details vary between importing countries but up-to-date information regarding requirements can be obtained from the USDA, APHIS, National Center for Import and Export, Riverdale, MD. ■

CONTACT
Dr. David G. Powell, (606) 257-2756
dgpowe2@pop.uky.edu
OR
Dr. Peter J. Timoney, (606) 257-4757
ptimoney@ca.uky.edu
Maxwell H. Gluck Equine Research Center



Information supplied by the State of New York Department of Health as of 11/1/99.

Kentucky

Disease Conditions in Geriatric Horses

This report discusses diseases diagnosed in horses 15 years of age and older presented to the University of Kentucky Livestock Disease Diagnostic Center for necropsy examination.

A total of 817 horses 15 years of age or older were necropsied between January 1994 and July 1999. Fifty-four percent were 15-19 years of age, 33% were 20-24 years, 9% were 25-29, and 4% were 30 years and older. The oldest equine was a 45-year-old pony and the oldest horse was a 42-year-old mixed breed. In the 30 years and older group, one third (9 of 27) were ponies, while in the 15-19 year age group, only 3% were ponies, suggesting greater longevity for pony breeds.

Many different conditions were diagnosed; however, the majority of diagnoses pertained to the gastrointestinal, musculoskeletal, and reproductive systems, as well as various types of neoplasia (**Figure 3**). Other, less common, diagnoses included diseases affecting the nervous system, liver, heart, and lungs—each group representing approximately 3-8% of the cases.

Conditions involving the gastrointestinal tract were mainly displacements or twists with strangulation of some portion of the tract, including many cases of rupture of the stomach or bowel. With the common occurrence in older horses of abdominal lipomas (fat tumors) with cord-like stalks, a number of the cases of strangulation were the result of lipomas wrapping around the intestine.

The overwhelming majority of conditions involving the reproductive system were cases of rupture of the uterine artery and fatal hemorrhage, with a few cases of uterine perforation or laceration also diagnosed. Uterine artery rupture occurs most commonly in older mares around the time of parturition. It was most common in the first two age groups which were still reproductively active, becoming less common in the two older groups which were beyond the normal reproductive limits of the mare.

Diagnoses involving the musculoskeletal system represented a variety of conditions with fractures, laminitis, arthritis, and other trauma (in that order) making up the majority of the cases. The percentage of disorders affecting the musculoskeletal system was fairly constant in each of the age groups.

An increased incidence of neoplasia is associated with

advanced age in animals and neoplasia was commonly diagnosed in older horses. In the two oldest groups, neoplasia was the most common individual diagnosis. Common types of neoplasia in decreasing order included pituitary adenoma, melanoma, squamous cell carcinoma, and lymphoma.

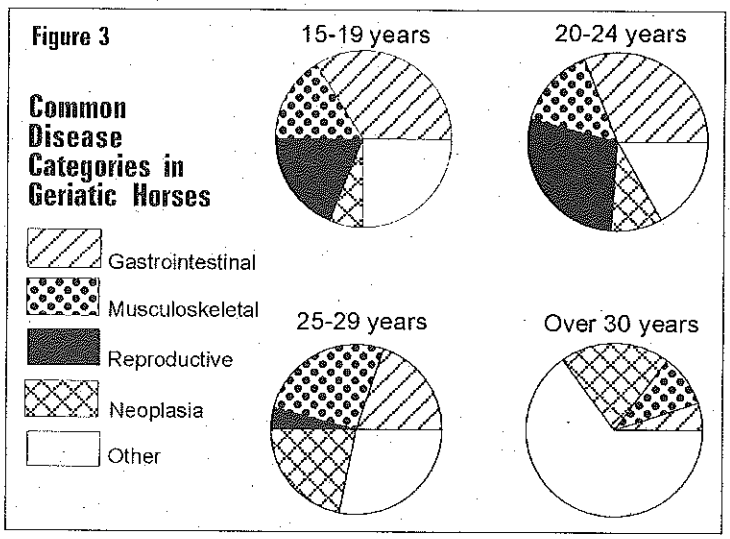
In general, infectious diseases are an important cause of morbidity and mortality in horses. However, infectious diseases were a much less common cause of illness in geriatric horses compared to conditions that were anatomical, traumatic, or neoplastic in nature. Only approximately 10-15% of all diagnoses had an infectious etiology. These were most commonly pneumonia and enteritis cases.

Based on the findings of this report, some basic recommendations can be made to owners of geriatric horses. With the large number of gastrointestinal disorders, it is recommended that horses be fed diets with ample high quality roughage, and that abundant water and appropriate exercise are provided.

Regular deworming and dental care are also essential in older horses to help ensure optimal gastrointestinal function. The environment should be policed for hazardous areas and stocking rates should be appropriate for the pasture.

Older foaling mares, especially following difficult deliveries, should be closely monitored and veterinary assistance sought immediately if undue pain or signs of shock are observed. ■

CONTACT
Dr. Neil Williams, (606) 253-0571
nmwillia@ca.uky.edu
Livestock Disease Diagnostic Center
Lexington, Kentucky



Last Year's Drought on This Year's Pasture?

Throughout Kentucky, the summer of 1999 will be remembered for hot days and a lack of rain. While the drought and its effects were readily noted this past summer and fall, horse owners need to consider what the drought may have done to their pastures for the upcoming grazing season.

With some fall moisture that hopefully will rejuvenate some of the pasture grasses, horse owners by early January should have a clear picture of what their pastures look like and what forage will be available for the upcoming grazing season.

What many horse owners will see is that their pastures are not as bad as anticipated. However, there will be areas in the pasture where the forage stand has been thinned by the dry conditions and other areas where the grass has died due to the dry conditions or overgrazing and needs to be reseeded.

For those areas where the grass is thinner, rejuvenation of the stand can be done by fertilizing the pasture. An application of nitrogen in late March is recommended for pastures that were not fertilized in the fall. Owners and managers should contact their county Extension agent for a recommendation regarding the application rate for their area and also consider a soil test to get an idea as to the fertility requirements of their pastures.

Where large areas of grass have died due to drought or overgrazing, it will be necessary to reseed and establish new forage stands. The re-establishment of grasses or legumes will require seeding the grass seed directly into those areas of the pasture where the grass has died. This should be done in late March to early April and requires the use of a sod seeding grass seeder.

Because of the extensive drought across the state last summer, no-till seeders are in demand and it may be difficult to book one if left to the last minute.

Pastures under reconstruction will not be available for grazing for some time. If pastures are re-seeded, expect a 60-90 day waiting period before the pasture will be ready for light grazing. If the application of fertilizer is all the pastures need, it should be possible to graze the pasture in about one month. In either case, these suggested times will be affected by the spring growing conditions, particularly rainfall.

While waiting for the pasture to grow, it will be necessary to provide an alternative area for grazing horses. Otherwise, all the preparation will have been wasted.

It is important to get advice from the county Exten-

sion agent regarding the most suitable grasses to use in the pasture, and what rate of fertilizer should be applied. Local conditions can have a great effect on how successful pasture renovation will be.

The drought of 1999 was severe with extreme conditions not seen in more than 100 years. However, with good management and some rain, pastures should be available for horses in 2000. ■

CONTACT
R. J. Coleman, Ph.D., (606) 257-9451
rcoleman@ca.uky.edu
Department of Animal Sciences
University of Kentucky

Equine Disease Quarterly Newsletter

Department of Veterinary Science
Gluck Equine Research Center
University of Kentucky
Lexington, Kentucky 40546-0099

Address Service Requested

U.S. POSTAGE
P A I D
BULK RATE
Lexington, Kentucky
Permit No. 51