

Equine Disease


April 1996
Volume 4
Number 3

Quarterly

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

 C O M M E N T A R Y  I N T E R N A T I O N A L

The *Quarterly* was first published in October 1992 with a circulation of several hundred, primarily within Kentucky. It has grown to more than ten thousand for the current issue and now encompasses a national and international readership including members of the American Association of Equine Practitioners. Each issue is translated into Japanese and widely circulated to horse owners and breeders in Japan. The rapid growth would not have been achieved without the steadfast financial support of Lloyd's of London Underwriters and Brokers and their Kentucky Agents.

The extensive interest in the *Quarterly* confirms the unquenchable thirst for knowledge exhibited by those with an interest in the horse. As the electronic superhighway surges inexorably onward it is perhaps surprising that the written word is still so avidly sought after. However, a visit to any bookstore will reveal the tremendous diversity of books and magazines relating to the horse and equestrian activities.

Communication of information has its benefits but also its distractions. Knowledge imparted should prove of benefit to the health and welfare of the horse, particularly if the information is accurate, unbiased and up-to-date. The weekly updates provided by the USDA during the recent epidemic of vesicular stomatitis represented an innovative approach to national disease reporting. The data on EHV-1 abortion in this number provide information over a 36-year period within a well-defined population.

The lack of information compounded by misinformation surrounding the recent outbreak of Venezuelan Equine Encephalitis in South America is an example of a distraction which with time can hopefully be overcome.

The primary goal of the *Quarterly* is to provide objective information in a language that can be easily comprehended. As the technology of communication progresses, objectivity remains paramount in the reporting of disease information.

Fourth Quarter 1995

The International Collating Centre, Newmarket confirmed the following disease outbreaks.

Equine-2 influenza was reported from Denmark, France, Sweden and the United Kingdom. Italy reported 12 seropositive cases of Equine Infectious Anemia (EIA) following widespread testing of all horses in the country. Strangles was reported on seven premises in New Zealand and three in Switzerland. Abortions attributable to EHV-1 were reported among unvaccinated mares on two non-thoroughbred farms in South Africa. Belgium reported a stallion (breed not identified) with Contagious Equine Metritis (CEM) and Italy reported three cases of equine tuberculosis. Piroplasmiasis was reported to be endemic in the south of France, South Africa, and United Arab Emirates, and 12 horses were reported as seropositive in Switzerland.

In the United States the USDA declared the epidemic of vesicular stomatitis to be over with the last confirmed case reported in Colorado on November 30, 1995. During the outbreak, a total of 367 premises were confirmed positive, distributed by state as follows: Arizona 1, Colorado 165, New Mexico 186, Texas 1, Utah 6, Wyoming 8. Quarantine was lifted on the last positive premise in Colorado on December 31, 1995.

IN THIS ISSUE

INTERNATIONAL 1

NATIONAL 2

KENTUCKY 9

University of Kentucky
College of Agriculture
Department of
Veterinary Science

Outbreak of Glanders

Although glanders was eradicated from the United States in 1939, the disease is still recognized in the Middle East, Eastern Europe, North Africa, Asia and Australia. The following report concerns an outbreak of glanders or farcy among racehorses in Iran.

Glanders is a contagious bacterial disease caused by *Pseudomonas mallei* affecting the skin, respiratory and lymphatic system of horses and other solipeds including camels, and very rarely humans. Transmission usually occurs by ingestion of contaminated material, inhalation and wound infection.

Two horses were diagnosed with glanders in February 1994 and in May four horses from the affected stable which had been moved to three stables in Tehran also developed signs. The signs included pyrexia, a copious purulent discharge from the nostrils; increased respiratory rate; coughing; and ulceration of the nasal mucous membrane. The submandibular lymph nodes were enlarged and nodules were located on the trunk, neck and limbs, some of which ruptured releasing a honey-colored discharge. Edema was present in the lower hind limbs. *Pseudomonas mallei* was cultured from the discharge and the four horses were positive to the mallein test.

Necropsy examination revealed ulceration of the nasal and thoracic surfaces, a purulent discharge and enlarged pharyngeal and laryngeal lymph nodes. Small abscesses were present in muscle and liver tissue. Consequent to the diagnosis all stabled horses in Iran were mallein tested and 10 horses from six stables tested positive and were subsequently destroyed. The affected horses had been imported into the western area of Iran which had been in a state of war causing great disruption and extensive movement of animals including horses.

Report submitted by Dr. T.T. Bazargani
Faculty of Veterinary Science,
University of Tehran.

Rabies—1994

The Centers for Disease Control (CDC) in Atlanta recently reported there were 42 cases of equine rabies in 1994 as compared to 48 the previous year. The distribution of cases by state is illustrated in Figure 1. This and other information concerning the incidence of rabies in the United States was published in the *Journal of the American Veterinary Medical Association*, December 15, 1995.

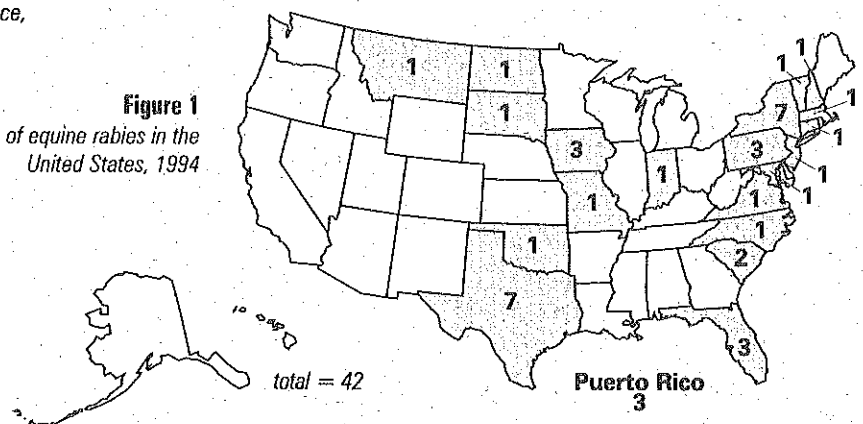
CDC reported 8,224 cases of rabies among animals and eight fatal cases among humans during 1994. Ninety-three percent of animal cases were wild animals, the other seven percent domestic animals. The total number of reported cases declined 13% from the previous year primarily due to the drop in the number of cases among raccoons. However, raccoons still constituted the majority of cases among animals in the United States. The epidemic of rabies among raccoons is present in all 16 states of the Eastern Seaboard and Alabama. Besides raccoons, rabies is most frequently reported among skunks, bats and foxes.

Cats were the most frequent domestic species reported with rabies. The number of cases in domestic animals continues to decline reflecting the success of vaccination programs for dogs and cats and the increased awareness of the risk posed to horses and other domestic animals.

Genetic analysis of virus from the human cases during 1994 determined that two were the result of infection from rabid dogs and six from bats. Since 1980 24 people have died from rabies in the United States. Fourteen were as a result of infection acquired within the United States, 11 of which were acquired from bats.

CONTACT:
Dr. David G. Powell, (606) 257-2756
Maxwell H. Gluck Equine Research Center

Figure 1
Cases of equine rabies in the
United States, 1994



Equine Disease Quarterly

Editors:
Roberta Dwyer
Lenn Harrison
David Powell

Staff
Deborah Witham
Dennis Düross
Diane Haughey

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.ca.uky.edu/
agcollege/vetscience/gluck1.htm](http://www.ca.uky.edu/agcollege/vetscience/gluck1.htm)

The University of Kentucky is an
Equal Opportunity Organization.



Printed on recycled paper



EHV-1 Abortion

Over a period of 36 years the incidence of abortion attributable to equine herpesvirus-1 (EHV-1) has dropped significantly within the Kentucky Thoroughbred mare population, as illustrated in Figure 2. Records for the first 28 years were kept by Dr. J.T. Bryans based on aborted fetuses submitted to the Department of Veterinary Science. Farm managers were encouraged to send all aborted fetuses and dead foals for examination, and they fully cooperated. In recent years fetuses were submitted to the Livestock Disease Diagnostic Center where similar records have been kept.

The number of pregnant mares in the area was calculated from the number of live foals born annually as notified to the Jockey Club. This figure was assumed to represent 70 percent of mares considered to be in foal. Based on this calculation the pregnant mare population rose from 4,370 in the late 1950's to a high of 12,710 in the mid 1980's, falling to 9,920 by 1993.

In contrast the prevalence of EHV-1 abortion has fallen significantly despite the increase in population size. The highest was 17.3 abortions per 1000 pregnant mares in 1963 with a progressive decline over the next 30 years culminating in just over 1 EHV-1 abortion per 1000 in 1993.

Two factors, improved management and the introduction of a vaccination program, have contributed to this excellent example of the positive effects of

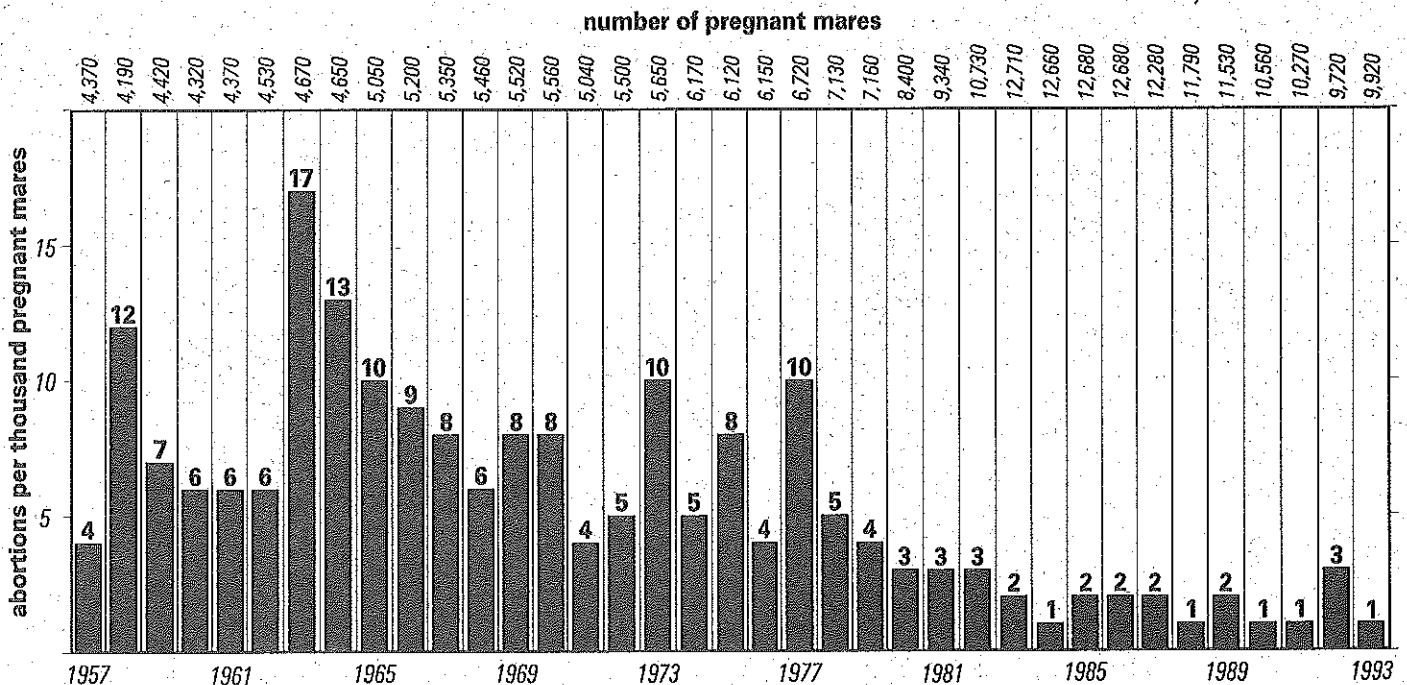
preventive medicine. The most useful management tool was to segregate pregnant mares from other horses on the farm and divide them into small groups during the fall according to their expected foaling date. Investigation frequently reveals that a maiden mare from the racetrack or a pregnant mare has been recently introduced into a group in which an EHV-1 abortion has occurred.

During the 1950's a killed vaccine was replaced by a program of "planned infection" using modified live EHV-1 virus administered intranasally. The number of abortion "storms" was reduced through the 1960's and 1970's but the live vaccine was itself capable of causing the odd abortion. In 1980 an inactivated or killed vaccine was introduced; administered to mares at 7, 9 and 11 months of pregnancy; and has been used extensively. During this period a number of farms have continued to use a modified live EHV-1 vaccine.

The pattern of EHV-1 abortion has changed dramatically over the years. Only rarely does more than one abortion occur on a farm in a year; when this has happened the evidence suggests that the subsequent abortions were as a result of other pregnant mares sniffing or licking the initial aborted fetus, usually in the paddock. The aborted fetus and placenta are a potent source of EHV-1 virus, sufficient to overwhelm the immunity of the mare even if it is vaccinated.

CONTACT:
 Dr. David G. Powell, (606) 257-2756
 Maxwell H. Gluck Equine Research Center

Figure 2
 EHV-1 abortion among
 Thoroughbred mares in
 Kentucky



Evolution of Equine Rotavirus Vaccine

1986-1988

Epidemiological study to determine etiology of foal diarrhea.

1989-1991

Vaccine development in collaboration with biologic's manufacturer.

1992

Safety study of vaccine among University of Kentucky mares.

1993

Develop legal contract to undertake field safety and efficacy study.

1994-1995

Undertake field safety and efficacy study.

1996

Vaccine given a conditional license.

Rotavirus Vaccine

As of January 1996, the first commercially available equine rotavirus vaccine was given a conditional license for use in the state of Kentucky. The killed vaccine produced by Fort Dodge Laboratories followed several years of field studies undertaken by researchers at the Gluck Equine Research Center. Start of vaccine development began in 1986 as illustrated at left.

The etiology of foal diarrhea outbreaks was poorly understood in 1985. Bacterial pathogens and unknown viral agents were assumed to be the causative agents, and rotavirus was considered by many researchers and clinicians to be a secondary invader with questionable pathogenicity. The Department of Veterinary Science received funding from Lloyd's of London Brokers, Underwriters and their Kentucky Agents to direct an intensive three-year study determining the etiology of foal diarrhea outbreaks in central Kentucky.

With the cooperation of farm veterinarians, managers and staff, thousands of blood and fecal samples were obtained from foals and mares to determine what bacteria, viruses and parasites were found in feces of normal and diarrheic foals. The conclusions reached were that rotavirus was a primary pathogen and was responsible for greater than 90% of outbreaks investigated. Bacteria such as *Salmonella* and *Campylobacter* and parasites including *Eimeria* were not major causes of foal diarrhea outbreaks. This was one of the largest studies of healthy and diarrheic foals undertaken to look at bacterial, viral and parasitic pathogens.

In June 1989 The Grayson Foundation sponsored an International Equine Rotavirus Workshop at the University of Kentucky to discuss all aspects of the disease, including a rational approach to vaccine development. Participants discussed effectiveness of rotavirus vaccines used in other species and unique challenges in enhancing immunity in foals. One of the conclusions reached was that in order to protect young foals from disease, the maternal antibody via colostrum should be boosted.

After discussions with several biologics manufacturers, Fort Dodge Laboratories agreed to develop an equine rotavirus vaccine. Following production of a vaccine, a three-year field study was undertaken to test the safety and efficacy of the vaccine administered to pregnant mares.

The study was designed to determine the safety of the killed equine rotavirus (H-2 strain) vaccine given intramuscularly to pregnant mares at 8, 9 and 10 months of gestation; the immunogenicity of eliciting maternal antibody against rotavirus; the passive transfer of rotavirus antibody to foals; and the efficacy of passive immunity to prevent and/or minimize disease.

Year 1 involved safety testing the vaccine among mares on the University farm. The results demonstrated vaccine safety and production of significant rotavirus antibody by mares which was passed to their foals. Years 2 and 3 involved nine central Kentucky Thoroughbred farms which had histories of rotavirus disease in foals. Three hundred pregnant mares were randomly assigned to vaccination or control groups on each farm. Multiple blood samples were taken to determine the levels of serum antibody in mares and foals from birth to 120 days of age. Foals were closely monitored and clinical scores were assigned for animals with diarrhea to document severity and length of illness.

The results of the field trial showed the vaccine was highly immunogenic in pregnant mares and resulted in significant maternal antibody transfer to foals. The incidence of rotavirus diarrhea, severity of disease and duration of diarrhea were less in foals from vaccinated mares as compared to foals from non-vaccinated mares.

Further studies are being conducted by Fort Dodge Laboratories to obtain full licensure of the product, allowing it to be used throughout the United States.

CONTACT:

Dr. Roberta M. Dwyer, (606) 257-4285
Maxwell H. Gluck Equine Research Center

Alimentary Tract Diseases of Foals

Diagnoses of alimentary tract diseases were made in 133 foals necropsied between January 1, 1993 and December 31, 1994 at the Livestock Disease Diagnostic Center. Foals included in this tabulation were less than 1-year old and the diagnoses accounted for 2.8% of the total equine necropsy cases. Total number of equine necropsies performed during the reporting time frame was 4757; Thoroughbreds accounted for 73% of the equine necropsies. Eighty-seven cases were Thoroughbreds with the remainder being an approximately equal distribution of American Saddlebreds, Standardbreds, Tennessee Walking Horses, Quarter Horses and others.

The most common conditions sorted into two diseases and three lesions diagnoses. The diseases were colibacillosis and salmonellosis, and lesions diagnoses were gastritis, enteritis and colitis. The dis-

eases included 14 cases of colibacillosis and 11 cases of salmonellosis while the common lesion diagnoses included 30 cases of gastritis, 22 cases of enteritis and 35 cases of colitis. Also there were eight case of enterocolitis, four esophagitis and one stomatitis. Colibacillosis could be grouped with enterocolitis and salmonellosis with colitis to give a more complete view of the primary sections of the alimentary affected during the illness.

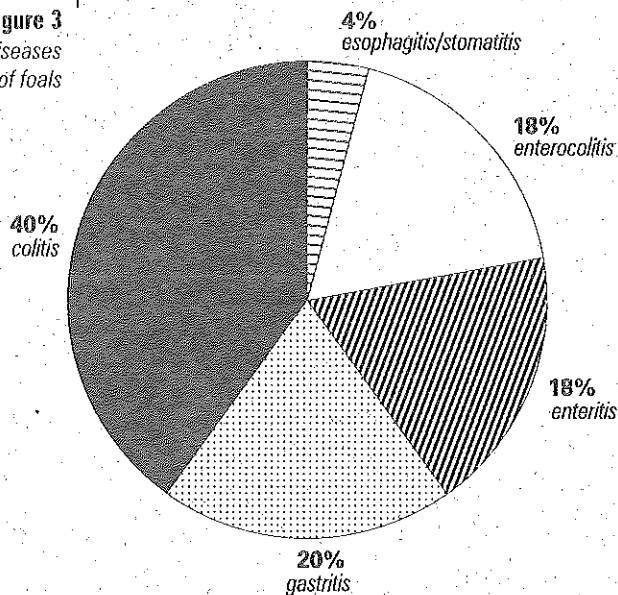
Except for the cases of colibacillosis and salmonellosis, the cause(s) of the alimentary tract disorders were not established. Most, or maybe all, cases had received aggressive antibiotic and supportive treatment for one or several days. Undoubtedly therapy modified the clinical course of most cases and limited laboratory efforts to identify the specific causes. Several cases had lesions of other systems indicating that alimentary lesions were likely to be both primary and secondary conditions occurring during progression of the illnesses. No viral agents were implicated probably because therapy extended the time of survival. *Rhodococcus equi* was isolated from pulmonary and/or lymph node lesions of three cases of gastritis and two of colitis. This was the only infectious agent identified in relation to gastrointestinal disorders other than *E. coli* and *Salmonella* sp.

A diagnosis of enterotoxemia was proposed for six cases that had consumed carbohydrate rich diets. *Clostridial* sp. were implicated in these cases because an abundance of gram positive rods were demonstrated on smears of mucosal surface materials. Other infectious agents were not demonstrated in samples of intestinal materials of these cases.

Two cases of uncommon conditions diagnosed included emphysematous gastropathy and proliferative enteropathy.

CONTACT:
Dr. Lenn Harrison, (606) 253-0571
Livestock Disease Diagnostic Center

Figure 3
Alimentary tract diseases
of foals



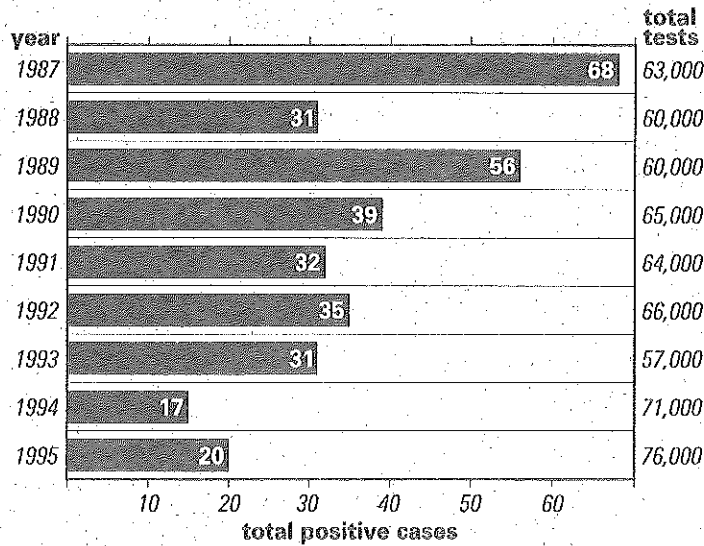
EIA Surveillance

During 1995 a total of 75,997 samples were tested for EIA in Kentucky. Private tests amounting to 59,500 samples were submitted to comply with state regulations; 9 of these were positive. Market tests undertaken on horses going through markets and stockyards amounted to 16,497, of which 11 were positive. Of the 20 horses which tested positive all were singleton cases with the exception of four located on a farm in Graves County, western Kentucky.

The number of positive EIA animals identified on an annual basis since 1987 is depicted in Figure 4, revealing a gradual reduction in the prevalence of positive animals over the nine-year period.

CONTACT:
Rusty Ford, (502) 564-3956
Division of Animal Health, Kentucky State Department of Agriculture, Frankfort, Kentucky

Figure 4
EIA surveillance testing



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

