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IN THIS ISSUE

University of Kentucky

College of Agriculture

Department of Veterinary Science

LLOYD'S

Commentary

The fourth in a series of WHO/OIE Consultations on Control of Equine Influenza was held in Miami during August. Attending were representatives from research laboratories, veterinary diagnostic laboratories, equine vaccine manufacturers, United States Animal Health Association, the American Association of Equine Practitioners, and government agencies from around the world including the United States Department of Agriculture.

The equine-2 subtype of influenza has remained enzootic in many parts of the world including the United Kingdom, Scandinavia, North and South America; whereas Australia and New Zealand remain equine influenza-free. Japan and Hong Kong have avoided repetition of past outbreaks through strict quarantine and vaccination regimens.

In the USA, states with large racehorse populations including California, Florida, Kentucky, Ohio, and New York have reported equine-2 influenza, whereas states such as Texas with equally large populations of work/pleasure horses have not. This probably represents greater sensitivity to disease and consequent heightened surveillance in the horse populations, and not an absence of influenza from the non-reporting states.

Horses from the USA and United Kingdom have introduced equine influenza into importing countries as a result of quarantine breakdowns with increased frequency over the last 15 years. Surveillance activities within the USA and worldwide have increased during the 1990s but need to be increased still further so that future recommendations for updating virus strains in the vaccines will have better scientific support.

The participants let stand without modification the recommendations from the 1995 meeting that vaccines should contain equine-2 influenza strains similar to Newmarket/2/93 (Eurasian lineage) and KY/94 (American lineage) strains and that the Miami/63 strain should be discontinued.

Most manufacturers have products now at market or in development which meet these recommendations at least in part. Vaccine manufacturers strongly endorsed the suggestion for greater scientific evidence if recommendations for virus updates are to be made.

A review of evidence from the USA and elsewhere indicated that the equine-1 subtype of influenza has been absent from general circulation since 1978 and occasional serological signs of it since then have most likely been false-positive cross-reactions.

Using the WHO's rationale for human influenza vaccines as a guideline, participants concluded there is no longer sufficient justification for retaining the equine-1 subtype as a component of the vaccines. However, manufacturers should keep their seed stocks.

The effectiveness of equine influenza vaccines has long been contentious. Comparative studies revealed continuing problems in attaining long-lasting immunity based on serum antibodies. Maternal antibody interference with vaccination in foals was reported by several groups including the Universities of Kentucky and California (Davis), although the subject remains controversial.

Criteria for evaluating the effectiveness of vaccines, including the potential of animal model systems, and the requirements for vaccine licensure were considered. Protection from experimental challenge is likely to replace serological response as proof of efficacy in the eyes of regulatory authorities, and this will require standardization of challenge model systems.

The USA and the European Union presently have different requirements for licensure of vaccines, but discussions held out promise that harmonization of these requirements was a possibility and that a fast-track system for licensure of vaccines with updated virus strains could be devised.

The inclusion of several diagnostic and regulatory agency representatives has to be accounted an important step forward in promoting better multilateral communication about the problems posed by equine influenza, and their solutions. ■

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International

Second Quarter 1999

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

The outbreak of African horse sickness (AHS) attributable to serotype 7 in the Western Cape Province of South Africa was officially declared over on June 28. The last case occurred on May 19 with a total of 34 cases reported, including 28 deaths, 3 horses euthanized and 3 surviving.

Contagious Equine Metritis (CEM) was identified in Switzerland among two warm-blood stallions imported from France and Germany plus a mare inseminated by one of the stallions. Cases of Eastern Equine Encephalitis (EEE) were reported among horses in the state of Louisiana, USA during the months of May and June and more recently in Alabama, Florida, Michigan, Mississippi and Texas.

Abortion caused by equine herpes virus (EHV-1) was reported from Canada, Germany, Japan, the United Kingdom and the United States. The number of cases in central Kentucky among Thoroughbreds during the 1999 foaling season was 22, the majority of which were single cases on individual farms in vaccinated mares.

A total of 118 Coggins positive tests all among non-Thoroughbreds were detected in approximately 11,000 horses tested for Equine Infectious Anemia (EIA) in Canada during the first quarter of 1999. A mare exported from New South Wales, Australia tested positive for EIA on arrival in New Zealand in early June and was destroyed.

Five other horses in the importation and two in-contacts with the index case were placed in isolation pending the results of sets of tests taken at 30- and 60-day intervals. Testing has been completed with negative results and all restrictions have been removed.

A case of equine viral arteritis (EVA) was confirmed in a gelding at a boarding stable in the southwest of England during June. All in-contact horses have been tested with negative results. Six Standardbred stallions tested serologically positive for EVA in New Zealand. They had been in contact with a known shedding stallion and will be tested for the presence of virus in their semen.

Equine-2 influenza virus was isolated from a young horse in Kentucky with cases also confirmed in the United Kingdom and France.

Serological tests undertaken on horses in Singapore revealed no evidence of prior infection with the newly identified Nipah virus which has been associated with fatalities in Malaysia among people having close contact with swine.

Rabies was diagnosed in two horses in Germany and strangles was extensively reported from Australia, Ireland, South Africa, Sweden, Switzerland, United Kingdom, and the United States. ■

Contagious Equine Metritis in Japan

Since the first outbreak of Contagious Equine Metritis (CEM) in 1980 the number of horses positive for *Taylorella equigenitalis* has greatly decreased and only a few carrier mares have been reported in Hokkaido, a major breeding area of Thoroughbred horses in Japan.

CEM has recently been reported in Sweden, Holland, Switzerland and Japan and several countries including the United States have identified positive warm-blood stallions following their importation from Germany. The organism still persists and circulates even though it has been almost eradicated from Thoroughbred horses around the world.

The global movement of horses has increased and shuttle stallions travel between the northern and southern hemispheres annually. Among breeds other than the Thoroughbred, the transport of semen for artificial insemination has become more frequent. In Japan an eradication program was started last year supported financially by the Japan Racing Association.

The program emphasized to owners of mares and stallions the gravity of the disease and that veterinarians recognize the significance of swabbing, treatment and selection of mares on the basis of the Common Code of Practice for CEM.

All swabs taken from horses prior to breeding according to their the risk category were submitted to the Animal Hygiene Centers for diagnosis and for PCR surveillance testing to the Epizootic Research Station of the Japan Racing Association where the test had been developed by Dr. T. Anzai.

A comparative study was undertaken between bacterial isolation and a single step PCR test on various samples obtained from 1,253 horses. The study revealed that 2 of 486 samples from the cervix, 4 of 286 from the clitoral fossa, and 5 of 326 samples from the clitoral sinus were positive by the PCR test. Only two from the clitoral sinus were positive by bacterial isolation. Samples from stallions

were all negative by both tests.

Results from the first year of the program identified 11 of 1,082 mares chosen by risk category from among approximately 15,000 as positive for CEM by PCR test. The positive horses were treated or not bred and there has been no case of CEM at least by May 1999. ■

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National

Blister Beetle Poisoning

Blister beetle (*Epicauta* spp.) poisoning occurs in horses that consume alfalfa hay contaminated with these insects. Over 200 species of blister beetles can be found in the United States. Blister beetle larvae feed on grasshopper eggs while the adults feed on pollen or nectar of flowering plants, such as alfalfa. The adults swarm and mate in summer and fall when alfalfa is in bloom. Hay is especially vulnerable to contamination when mowing is done during this swarming period.

Adult blister beetles have narrow bodies that are 0.5 to 1.25 inches long. The various species can range in color patterns from striped or spotted to solid colors such as black or gray (see **Figure 1**). The toxin present in the beetles is cantharidin, which causes irritation of the mucosa and hypocalcemia.

Cantharidin content can range from 0.1%-12.7% of dry weight, depending on the species and sex of beetle. The minimum lethal dose of cantharidin for horses may be less than 1 mg/kg of body weight. Therefore, as little as 4-6 grams of dried beetles could be fatal to a horse.

Symptoms are most often related to abdominal pain caused by the irritating effects of cantharidin: colic, depression, and decreased appetite. Irritation of the urinary tract can result in frequent urination or straining to urinate. Other possible signs are fever, diarrhea, dehydration, increased respiratory rate, and increased heart rate.

Signs associated with hypocalcemia include muscle fasciculations, synchronous diaphragmatic flutter, stiff gait, and abnormal behavior such as aggressiveness, head pressing, swaying, or disorientation. Sudden death with no signs of struggle has also been reported.

Abnormal laboratory findings can include low levels of calcium, magnesium, and protein in the blood as well as impaired kidney function and blood in the urine (hematuria). Necropsy findings, when present, are reddening or ulcers of the gastrointestinal tract (most often in the esophagus and stomach) and of the urinary tract (bladder, ureters, renal pelvis). Some horses will have patchy necrotic areas in the heart. Diagnosis can be confirmed by testing the urine and gastrointestinal contents for cantharidin.

No antidote is available for blister beetle poisoning. Suspect alfalfa hay, cubes, or pellets should be removed from the animal's diet. Activated charcoal and mineral oil will decrease the amount of toxin that is absorbed into the body.

Symptomatic care includes analgesics, fluids, electrolyte replacement, and possibly antibiotics. Prognosis depends on the amount of blister beetles eaten as well as the speed and aggressiveness of therapy.

While there is no way to completely eliminate blister beetle poisoning, many management options are available to reduce the risk.

- **Learn to identify blister beetles.** Because the beetles swarm, it is common to find a massive number of beetles in a small area of the hay while the rest of the hay is not contaminated. Pull individual blocks of each bale apart and inspect before feeding.
- **The beetles swarm and mate in late summer.** Therefore, first cutting hay is safer to feed than hay cut later in the year.
- **Cut alfalfa before it reaches the full bloom** stage. Also reduce the number of flowering weeds in the hay field. Remember that blister beetles are attracted to flowers.
- **Modify your method of harvesting hay.** Crimping traps the beetles in the hay, whereas mowing without crimping allows the beetles to escape from the cut hay before baling. Use a method that allows the hay swath to be straddled by the tractor so that the beetles aren't crushed and then baled into the hay.
- **Consider using insecticides** to control the blister beetle population as well as the grasshoppers that the larvae feed on.
- If you do not harvest your own hay, **get to know your hay suppliers** and their management practices. ■

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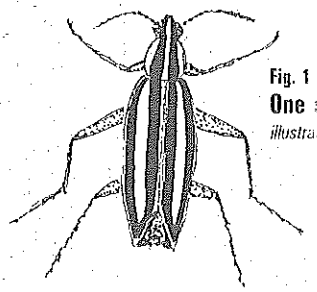


Fig. 1
One sp
illustrat

Fig. 2
Kentucky Horse Barn

BREAKDOWN BY COU
Anderson—1
Bourbon—2
Boyle—1
Fayette—11
Hardin—1
Henderson—1
Jefferson—3
Mercer—1
Russell—1
Shelb
Scot
Woo
• Uni

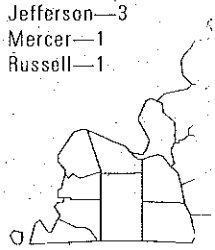


Fig. 3
Breed Incidence

Breed
American Saddlebr
Thoroughbred
Breed not reported
Tennessee Walking
Standardbred
Arabians
Miniature Horse
Pony
Hackney Pony

* some fires involve

NOTICE: The ASPCA-NAPCC is a 24-hour veterinary toxicology consultation service available to animal owners and veterinarians. There is a $45 charge per case to assist with the expense of maintaining the center. Call 1-800-548-2423 to charge the fee to a credit card or call 1-900-680-0000 to have the fee billed directly to a phone bill. However, over 30 companies pay for calls about their products so there is no charge to the caller.

ecies of blister beetle
: Heather Bair, MS

Kentucky

Horse Barn Fires

Rule of thumb: A fire involving combustible materials (wood, straw, hay, shavings, etc.) doubles in size every minute. Therefore, in 10 minutes, the fire will increase in size by 4,086 times. This emphasizes the need for fire prevention, and prompt action when one is faced with flames.

In order to determine the significance of horse barn fires in Kentucky, attempts were made to uncover the incidence and causes of such fires. When a horse barn (or any other structure) burns, the fire commander on the scene makes a determination of whether a cause is readily apparent, such as lightning strikes in the area, or if further investigation is needed.

If an in-depth study of the incident is required, the investigative unit of the fire department is called to the scene. (This chain of command differs in various jurisdictions.) The actual cause of the fire may be determined in a matter of hours, or with complex suspected arson cases, several weeks. The state Fire Marshal investigators may also become involved.

If the property is insured, the insurance company's investigator contacts the fire department and inspects the scene within 48 hours of the fire. After the fire investigation is completed, the fire department files a report with the National Fire Incident Reporting System (NFIRS) which is the statistical record maintained by the Federal Emergency Management Agency (FEMA).

Obtaining the statistical data for horse barn fires in Kentucky was initially thought to be a straightforward task, by obtaining computer data already in the NFIRS system. However, livestock structure fires are subclassified by cattle, poultry, swine, or "other livestock" facilities and insurance companies do not have a centralized reporting agency for retrieving such data.

Data was obtained through the generous efforts of members of the Lexington Fire Department, multiple librarians, Kentucky newspapers, and lay equine publications. Searches were made for news reports of horse barn fires in Kentucky from 1980-August 1999.

The result is not a complete set of data, but represents a start in compiling a data base for the future. FEMA will be encouraged to establish a data code which will specify horse barns for future data analysis.

Twenty-eight horse barn fire news reports were examined and their geographical locations are shown in **Figure 2.** Fires caused the deaths of 267 horses at the following locations: 23 privately owned farms, 1 racetrack, 1 racehorse training facility, 1 public riding stable, and 1 veterinary clinic barn; 1 had no building ownership mentioned. The number of horse deaths per fire ranged from 1 to 38. In 5 fires, no horses were killed due to successful evacuation, or being in pasture at the time of the fire. The breeds involved are listed in **Figure 3.** One fire caused the death of one person. Fires occurred in the evening/night (6:00 p.m. to 6:00 a.m.) on 14 occasions, and 7 during daytime hours. Six reports did not state the time.

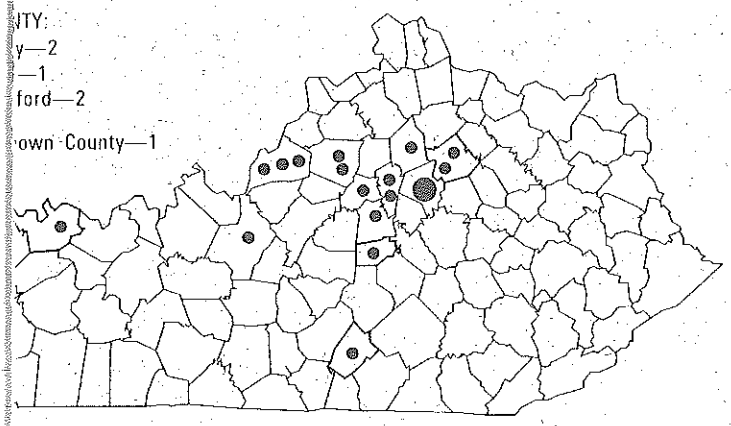
The economic losses can be devastating, with one fire killing 14 horses at an estimated value of $1.5 million, plus the cost of the structure. In 14 reports which mentioned the estimated value of the horses and/or property lost, the loss was estimated at $5.6 million.

The causes were electrical fires (4), suspected or confirmed arsons (3), lightning strikes (2), light fixture malfunction (1), electrical heater malfunction (1), overheated electrical cord attached to a fan (1), heat lamp igniting hay (1), malfunctioning lawn tractor stored in the barn (1), cigarette dropped by farm worker (1), and sparks from a welder (1). In 12 fires, the cause was not disclosed.

Without having the NFIRS reports for these specific fires, causation and other details could not be defined, even though it may have been determined later by the ongoing fire personnel investigation.

Experts in fire investigations estimate that 80%-85%

Fires— 1980 - 1999
ITY:
y—2
—1
ford—2
own County—1



	Number died	Number of fires *
ed	83	5
	77	10
	51	5
Horse	24	1
	14	1
	13	3
	2	1
	2	1
	1	1

d more than one breed

of horse barn fires are accidental, caused by human error (e.g., smoking cigarettes, welding next to combustible materials) or by electrical malfunctions. Arson, or situations which are highly suspected of arson but cannot be proven, represent approximately 15% of barn fires. People who commit arson usually are primarily motivated by profit or anger, with a very low percentage of them being true pyromaniacs (people with a compulsion to start fires).

By developing a reliable, ongoing data base tracking the incidence, it is possible to provide more accurate information to the equine and insurance industries, and to firefighters. Anyone who has experienced a horse barn fire knows its devastation, and knows that **prevention** is key. ■

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Fire Prevention

- No smoking around barns **ever**. Post signs and enforce them at all times.
- Housekeeping: Keep barn aisleways clear of clutter; brush down cobwebs; store flammable materials outside of the barn; have a separate facility for hay and straw if possible.
- All light bulbs should have a metal mesh cage around them. Most horse owners believe that this is to keep the horse from breaking the bulb, but it also prevents straw or hay from landing on a hot bulb and setting the material on fire, which falls to the ground and ignites other combustible materials. This is especially important when traveling to horse shows as well as at home.
- Use fans, extension cords, electric heaters and heating lamps wisely, and do not leave heaters unattended, or close to combustible materials. If electrical appliances, especially fans used 24 hours a day, show any malfunction, dispose of or repair them immediately.
- Have a water hose attached to a faucet, since water is the best extinguisher of fires in hay, straw, and shavings. Electrical or flammable liquid fires require a chemical fire extinguisher (ABC designated). However, remember how fast a fire can spread, and never risk human lives over a building.
- Have lightning rods installed by a licensed contractor.
- Lightning can hit electric fencing miles away from the barn, and the charge can follow the wire to the transformer, which is usually in the barn, and thus start a barn fire. Have a qualified electrician ground the electric fence transformer to prevent this from occurring.
- Plan and practice a horse evacuation plan ahead of time.

Equine Leptospirosis

During the past two foaling seasons, 12 cases of leptospira-induced abortion or neonatal death have been diagnosed at the Livestock Disease Diagnostic Center. Three cases occurred during the 1998 season and nine during the 1999 season. **Figure 4** on the back page gives the number by month and year of confirmed cases of leptospira-induced abortions or neonatal deaths for the past 11 foaling seasons.

Two of the three mares (all Thoroughbreds) diagnosed during the 1998 season were located on the same farm. One of these mares gave birth to a 30-day-premature foal on December 8, 1997 that died two days later, and the other aborted a fetus that was at approximately 7.5 months of gestation. The third mare aborted a three-week-premature fetus on April 20, 1998.

The nine mares (seven Thoroughbreds, one Standardbred, and one Belgium) diagnosed during the 1999 season were located on nine different, geographically scattered farms. Three of the cases were diagnosed in January, two in February, two in March, and two in April 1999. Of the three foals born alive, one lived one hour, one for 24 hours, and one for three days. The gestational age of the other six foals varied from eight months up to full term. Serological results obtained on the 12 cases for the past two years indicated that *Leptospira* serovar *grippotyphosa* was involved in one case and serovar *pomona* type *kennewicki* in the remaining 11 cases. ■

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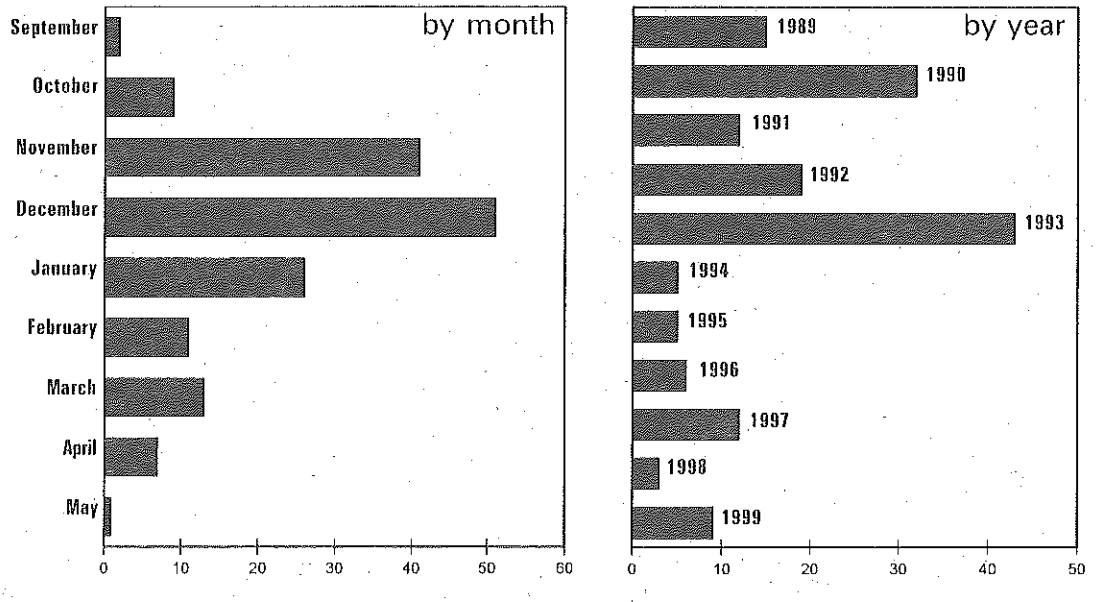
Fig. 4
Confirmed cases of leptospira-induced abortion, 1989-1999



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