Infectious Reproductive Disease DRAFT Feb. 08, 2017

Equine:

Equine Viral Arteritis (EVA)

EVA virus causes a generalized vasculitis that clinically presents as a lower respiratory disease, primarily an interstitial pneumonia. Other signs of vasculitis include lower limb edema and ventral dependent subcutaneous edema, enteritis and diarrhea. Pregnant mares will likely abort, experience stillbirth or give birth to a weak infected foal that may survive. Most EVA infections are asymptomatic. In very young, older animals and immunocompromised animals the full clinical syndrome can develop.

Equine arteritis virus utilizes respiratory and the venereal routes of transmission. Stallions and male foals that become infected will likely become persistently infected (PI) in the testicles and accessory genital glands. Virus is then shed in the semen of PI stallions. Mares and geldings will rid themselves of the infection as immunity develops. PI males may or may not eventually rid themselves of the infection. Repeated vaccination with a modified live vaccine may help a stallion get rid of the infection, but it is difficult to prove that a diagnosed PI stallion has actually eliminated the infection; as viral shedding may be intermittent and relapse of shedding may occur.

Mares that are bred by a PI stallion that is shedding virus in his semen will probably not become pregnant, unless she has a strong immunity to EVA, and the stallion's semen quality is not effected by the viral infection.

Equine viral arteritis can be diagnosed by virus isolation, PCR and serology. In recently infected animals, equine arteritis virus may be recovered from nasal secretions, blood and semen as well as from a number of tissues and fluids at necropsy. Carrier stallions can be identified by isolating the virus from semen.

Equine Herpes Virus (EHV)

EHV-1,

EHV-1 causes a respiratory disease that is named Equine Rhinopneumonitis. It is transmitted via respiratory aerosols. EHV-1 can also cause other disease syndromes. The most serious of these are:

1. Neurological disease resulting in difficult ambulation, paresis, and paralysis.
2. Fetal disease resulting in disease or death of the conceptus and abortion.
3. Neonatal morbidity and mortality if the disease is contracted by a pregnant mare. Most abortions occur during the last 4 months of pregnancy but can occur at any time.

EHV-4,

EHV-4 also causes equine respiratory disease. This disease is also referred to as Rhinopneumonitis. EHV-4 can occasionally cause abortion if an immunologically naïve mare contracts EHV-4 during pregnancy.

EHV-3,

EHV-3 causes genital herpes lesions on prepucial and vulvar mucocutaneous epidermis. The disease is called "equine coital exanthema". The herpes lesions can affect the desire of affected animals to breed but do not typically cause infertility or abortion. EHV-3 is not typically transmitted via aerosol, but is instead transmitted venereally.

Identification of the various strains of Equine Herpes Virus can be done by single or paired serologic testing. Perhaps a better approach is to perform virus isolation (VI) on nasal

swabs, tracheal wash, genital swabs, whole blood, fresh lung or liver tissue sample and semen. VI can be combined with FA or PCR to confirm the virus species and strain.

Foreign animal diseases; transmitted venereally & causing infertility

Contagious Equine Metritis (CEM)

CEM is a foreign animal disease, endemic in Europe and perhaps elsewhere. All foreign animals must be cultured and quarantined for 30 days of observation for evidence of infection by the bacteria: Taylorella equigenitalis, prior to entry into the U.S.

CEM is transmitted venereally. When it is transmitted at breeding to a non-immune mare, it can result in metritis and embryonic loss or early abortion in the first trimester. CEM rarely induces a visible abortion. Mares will develop immunity and may (or may not) clear the infection. Mares that remain infected act as carriers. Local and systemic therapy with effective antimicrobials will clear the bacterial infection. Mares that are treated or spontaneously rid themselves of infection may conceive and carry a pregnancy to term.

The most common visible symptom is a purulent vaginal discharge on the vulva and tail hair. Stallions show no signs of disease but act as permanently infected carriers of the organism.

Dourine

Trypanosoma equiperdum is a protozoan parasite that is the cause of dourine. Dourine is transmitted venereally, but it could potentially be transmitted by TseTse flies, Tabanid flies and other biting flies such as is the case with the closely related T. evansi parasite. While not confirmed; artificial insemination (AI) could potentially transmit the infection.

The World Organization for Animal Health (OIE) has reports that suggest that this disease is endemic in parts of Africa and Asia, but the exact distribution is poorly defined. South America may also have areas where dourine still exists, but there have been no recent reports from there. At one time (<1915) dourine was even reported in the United States.

Early signs of the disease that occur in stallions and mares are vulvar or prepucial edema, genital discharges and infertility. The disease will then progress with systemic signs such as weakness, anemia, emaciation, nervousness, neurologic signs and edematous dermal plaques called “Silver Dollar Plaques”. The dermal plaques can occur anywhere on the skin, but are prominent over the ribs and legs. The plaques are said to be pathognomonic. This disease can be fatal in some affected animals.

The complement fixation test is used for international movement and dourine control programs. However, the CF test is not specific enough to confirm dourine. The CF test will cross-react with “Old World” trypanosomes, such as T. brucei and T. evansi, which are closely related to T. equiperdum. The CF test is sensitive in identifying Trypanosome infections caused by species in the dourine group; so this is usually adequate for most routine testing.

For additional diagnostic testing, microscopic examination of body fluids for the trypanosome parasite may be done. Samples obtained for identification of the T. equiperdum parasite include blood, serum, semen, and edema fluid aspirated from the prepuce, vulva or dermal plaques. Other potential samples for diagnosis is fluid obtained by aspiration or lavage of the uterus in acutely infected females with genital discharges. Trypanosome parasites are visualized with microscopy, and have typical Trypanosoma appearance.

In the U.S. treatment is not permitted. Anti-trypanasoma drugs are effective in treating sick, affected horses; but they may not eliminate the carrier state. Treatment may be used in endemic foreign countries where it is permitted.

In the United States; if dourine is suspected, state and federal health authorities must be notified. Dourine is a reportable foreign animal disease, and treatment does not guarantee

elimination of the carrier state. In the U.S. any test positive case would need to be euthanized.

Mare Reproductive Loss Syndrome - a unique cause of abortion

MRLS is caused by consumption of Eastern Tent Caterpillars (Malacosoma americanum). This caterpillar is the larva of a brown moth. The setae (hairs) of the Eastern Tent Caterpillar are very sharp and barbed. When a horse consumes the caterpillar the setae will penetrate the mucosa of the digestive tract and enter the portal circulation. From there fragments of the barbs and associated bacteria can cause vasculitis, in many tissues of the body, including the maternal placenta. Vasculitis in the placenta will lead to abortion.

Bovine:

Brucella abortus

Brucella abortus (Bangs Disease) is a disease of cattle that is also infectious for many other species including Humans (Undulant Fever). At the time of abortion, when the infectious fetus and associated membranes are available to herd members to nuzzle, sniff, lick, transmission will readily occurs. Humans can become infected at this time also by examining and removing the infectious material if adequate precaution is not taken. If the bacteria enters a body orifice, contacts a mucus membrane or even an epidermal abrasion or cut the infection can be transmitted.

Diagnosis of Brucella abortus is usually accomplished with serologic testing. Culture may be done but are performed rarely as it involves handling infectious materials.

Campylobacter fetus

Campylobacter fetus was formally known as Vibrio fetus, and many practitioners, clients and vaccine manufacturers still use the term “Vibrio” in the name of the vaccine and in casual conversation. It is just easier to say.

Campylobacter fetus is a venereal disease transmitted exclusively by the venereal route. Bulls are considered to be the carriers of the disease and will transmit it upon breeding a non-immune cow. Once infected a bull will become persistently infected and carry the C. fetus organism for life unless treated.

The primary sign of the disease is decreased fertility that results from early embryonic loss or early 1st trimester abortion in non-immune females. A cow or heifer will develop immunity after contracting the infection. Immunity will allow the female to get pregnant and carry the fetus to term. Often upon pregnancy checking the herd; many late bred cows are found. This indicates that conception was poor during the early breeding season. Only occasionally are early abortions seen.

Diagnosis requires culture of the C. fetus organism. Cultures are usually obtained from bulls. The bacteria will colonize the prepucial skin of the bull and reside in the sweat gland ducts (referred to as prepucial crypts). The bull will not develop an immunity to the superficial prepucial infection; so they remain persistent carriers of the infection. A culture is obtained by using a sterile infusion pipette with an attached syringe to abrade and aspirate the smegma and abraded epithelium from the prepucial cavity. All bulls in the herd should be cultured. The aspirate is transferred to a small quantity of lactated ringers solution in a small red top tube. The tube is inverted and mixed and a syringe with a needle is used to inoculate the microaerophilic “Clark’s” transport medium.

Prevention requires the use of Vibrio fetus Vaccine. Treatment of carrier bulls is allowed in Colorado and macrolide antibiotics are usually very effective.

Trichomonas fetus

Trichomonas fetus is a protozoan parasite that causes an exclusively venereal disease that causes early embryonic loss and infertility in any non-immune cow that has been bred by an affected carrier bull. As with Campylobacter fetus the T. fetus organism will colonize the prepucial crypts (prepucial epithelium sweat glands) in the prepucial cavity of carrier bulls. The carrier bulls will not develop an immune response to the epidermal infection and therefore will remain persistently infected with the T. fetus organism. Cows will develop immunity and any cow that is pregnant is considered to be free of T. fetus, even if she is a member of an affected herd.

The individual and herd symptoms of T. fetus are very similar to C. fetus infection.

Trichomonas fetus infection is a reportable disease in most states of the U.S. There is no treatment for Trich. fetus that is available for use in food animals. Any infected bull must be slaughtered or euthanized. Females will clear themselves of the infection immunologically. The Colorado State Veterinarians office will quarantine all cows from an infected herd unless theyare pregnant and separated from all suspect animals. Pregnancy indicates that the animal does not have an active infection.

Diagnosis requires culture of the T. fetus organism. Cultures are usually obtained from bulls. A culture is obtained by using a new, single use infusion pipette with an attached syringe to abrade and aspirate the smegma, abraded epithelium and prepucial crypt (sweafrom the prepucial cavity. All bulls in the herd should be cultured. The aspirate is transferred to an “InPouch TF” transport media and shipped to the lab at room temperature. A Trichomonas fetus culture can be done using the same prepucial aspirate used for a Campylobacter fetus culture. The lactated ringers solution with the suspended smegma is used to inoculate both the Clark’s media and the InPouch TF transport media.

Infectious Bovine Rhinotracheitis (IBR)

Infectious Bovine Rhinotracheitis - Causes abortion. Check back for more!

Bovine Virus Diarrhea (BVD)

Bovine Virus Diarrhea, causes abortion, stillbirth, birth defect, neonatal infection and live birth of persistently infected (PI) calves. PI calves are responsible for maintaining the infection in the herd from one year to the next. Check back for more!

Leptospirosis

Leptospirosis, causes abortion. Check back for more!