

CLIENT EDUCATION HANDOUT

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Bovine Viral Diarrhea Virus

Overview

Bovine viral diarrhea virus (BVDV) is a ubiquitous pathogen of ruminants with high seroprevalence worldwide. Infections with BVDV are endemic in many countries and are often associated with severe economic losses for the cattle industry. Prevalence of cattle persistently infected with BVDV is low with estimates generally less than 0.05% of the cattle population. Cattle can become acutely infected with BVDV at any age. This is also referred to as primary infection or transient infection. Fetal infection prior to day 125 of gestation can result in the development of immunotolerance to the BVDV and the development of a persistent infection (PI) with the virus. Camelids and cervids can also develop PI. Cattle persistently infected with BVDV shed large amounts of virus during their lifetime. They are the major source of virus spread within and between farms.

Species and Animal Groups Affected

BVDV is capable of infecting most ruminant species (cattle, sheep, goats, camelids, cervids). It can cause PI in alpacas, white-tailed deer, camels, llamas and other wild ruminants

Signs

Acute infections are mostly subclinical in nature. Severe acute infections may be characterized by fever, leukopenia, thrombocytopenia and hemorrhagic disease. Other manifestations of acute BVDV infection may include enteric disease, respiratory disease and immunosuppression. The severity of disease depends upon host and viral factors. Reproductive outcomes following fetal infection can include transient infertility, early embryonic death, abortion, congenital defects, congenital infections and persistent infection. A mild, biphasic elevation in body temperature and leukopenia may be evident. Lactating cattle may have an associated decrease in milk production. Mucosal disease occurs in cattle persistently infected with BVDV and is characterized by fever, anorexia, depression, profuse salivation, nasal discharge, severe diarrhea, hemorrhages and erosions in gastrointestinal tract, and a very high case fatality rate.

Causes

BVDV is an RNA virus and a member of the genus *Pestivirus* in the family Flaviviridae. The BVDV is antigenically related to classical swine fever virus (CSFV) of pigs and border diseases virus (BDV) of sheep. BVDV is further divided into genotypes (1 and 2) and sub-genotypes (a, b, c...). The most common sub-genotypes in the USA include BVDV 1a, BVDV 1b, BVDV 2a, and BVDV 2b.

Risk Factors

The major risk factor for BVDV being introduced into a farm is the acquisition of new cattle, specifically cattle persistently infected with BVDV. Other risk factors include sharing of pastures with other cattle (direct or fence line) and lack of a BVDV vaccination program. The virus is shed in most secretions and excretions of infected animals including tears, milk, saliva, urine, feces, nasal secretions, and semen. Virus can survive for several days in a cool, protected environment and hence fomites (nose tongs, halters, etc.) can play a role in virus transmission. Flies can also transmit the virus. The virus can be present in milk and colostrum

Treatment

Cattle acutely infected with BVDV typically recover over time. In severe cases, supportive therapy is indicated. There is no treatment for cattle persistently infected with BVDV.

Management Considerations

Biosecurity is a central pillar in the prevention of BVDV in a cattle operation. This includes quarantine and testing of animals prior to entering the herd. Purchased pregnant animals are a huge threat to introduce BVDV through the birth of a PI calf. There is no simple test of the pregnant animal that can be used to detect a PI calf in utero. Vaccination is an important tool in controlling BVDV. To be the most successful at preventing PI animals, animals need to be vaccinated prior to breeding. Because of the antigenic diversity of the virus, control programs should not rely on vaccination alone, but should include the implementation of appropriate biosecurity programs as well as monitoring and testing for BVDV PI. The role of wild ruminants as a reservoir host or as a dead-end host in BVDV epidemiology is not clear. Controlling contact between cattle and wildlife is advisable if possible.

Expected Course and Prognosis

Most acutely infected cattle recover within 10 to 14 days. Some of the more severe BVDV type 2 strains result in morbidity rates of 100% and mortality rates of up to 50%. Most PI animals die within the first year of life. The mortality rate is almost 100% in animals with mucosal disease.

Notes

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