



Cattle Producer's Handbook

Animal Health Section

675

Infectious Bovine Rhinotracheitis

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Infectious bovine rhinotracheitis (IBR) is a common and widespread herpesvirus of cattle. Respiratory disease and abortion are the most economically significant forms of IBR infection. IBR virus also causes conjunctivitis and mild genital infections. IBR can infect wild ruminants and goats, although disease in these species is uncommon.

IBR virus is characteristic of herpesviruses in its ability to develop persistent infections called latency or latent infections. IBR persistence does not result in continual viral shedding in contrast to persistently bovine viral diarrhea virus (BVDV) infected animals. This virus incorporates its genetic information into nerve cells innervating the infected organs and tissues. The virus becomes inactive in the nerve cells.

With appropriate stress, the virus may be reactivated and cause disease with potential shedding to pen mates. This reactivation also boosts the immune response that then controls the reactivated disease. While reactivation of latent IBR virus may contribute to maintaining an active immunity to the virus, latency is the mechanism whereby the virus can be maintained in the cattle population.

Transmission and Disease Production

IBR is a viral respiratory disease that is transmitted primarily by respiratory secretions to susceptible animals. Characteristic of herpesviruses, IBR transmission requires close contact to effect successful movement from an infected animal to a susceptible recipient. The virus is unstable outside of the infected animal. After invasion and infection of cells of the respiratory tract, the virus is disseminated via the blood stream to many organs within the infected animal, which results in multiple disease conditions in cattle.

Clinical disease caused by IBRV depends on the tissues or organs infected, the dose of infecting virus, and the resistance of the animal. Respiratory infections

are the most common IBRV infection, although clinical disease is usually only clinically evident in feedyard situations. IBRV respiratory disease in mature cattle is routinely asymptomatic. Conjunctivitis and infectious vulvovaginitis may be observed without evidence of a respiratory infection.

Conjunctivitis presents with tearing and squinting. Upon close examination, the whites of the eye(s) may appear reddened and small blood vessels may be seen extending over the surface of the eye. If corneal opacity (cloudiness) is present, it extends from the periphery to the center as opposed to infectious pinkeye in which the cloudiness proceeds from the center to the periphery.

In addition, IBR conjunctivitis causes the underside of the eyelids to have small "pimples" or follicles not seen in pinkeye and more often involves both eyes. IBR virus can often be recovered from cases of infectious pinkeye as well as from "pinkeye" due to injury because the insult/healing processes may reactivate latent IBR; therefore, diagnosis of IBR conjunctivitis or pinkeye is difficult to verify.

Infectious vulvovaginitis (IPV) is a sporadic condition of cattle after a respiratory episode. The virus can infect the vaginal cells via the bloodstream or by direct transmission by licking and transfer of nasal secretions to the vulva/vagina.

IPV may result in the transmission of the virus to bulls during breeding, which results in infectious balanoposthitis (IBP) with subsequent transmission to another female. Both forms appear as small white vesicles or pimples on the surface of the vaginal vault, the vulvar lips, and the surface of the penis and prepuce.

IPV and IBP do not exhibit abnormal discharges. Interestingly, evidence of the virus spreading via the blood stream when transmitted by breeding is lacking as well as association of the IPV and IBP forms being associated with abortions.

Respiratory disease presents with ocular and nasal discharges that are thin and watery, unless there is a secondary bacterial infection. A dry cough is often evident in groups of animals when they are at rest. The intensity of the cough may become more pronounced with exercise. Affected animals will have fevers of 103.5° to 104.5°F; fevers of > 104.5°F more often are associated with secondary bacterial infections (i.e., pasteurellosis or mycoplasmosis).

IBRV, through its damaging effects on the structure and function of the respiratory tract, predisposes the animal to secondary infections contributing to the bovine respiratory disease (BRD) complex. While respiratory infections are a significant contributor to morbidity in feedlots, abortion is the IBR disease of concern in the cow-calf sector. Post IBR abortion cows will routinely breed back, and they are likely immune to IBR induced abortion for several years.

Abortion due to IBRV can occur at any time during pregnancy, although it occurs most commonly in the fifth to eighth month of gestation. Unfortunately, the abortion can occur any time from 8 to 100 days post infection; therefore, an accurate history of previous respiratory or ocular infection is generally difficult to confirm.

IBR virus does not develop a persistent infection of the fetus but causes fetal death with expulsion or abortion resulting in 3 to 8+ days. Due to the lag between fetal death and expulsion, the fetus is decomposed and physical signs of viral infections are not evident. Fetal tissues in an IBR aborted fetus are uniformly dark and hemorrhagic.

Diagnosis

The clinical disease picture produced with IBR is similar to those produced by many other infectious agents. While clinical symptoms may indicate IBR disease, confirmation requires laboratory assistance. Conjunctivitis and IPV/IBP may be confirmed by submission of small, fresh biopsies for fluorescent antibody testing.

Respiratory infections may be confirmed with the submission of tracheal swabs for viral isolation or fluorescent antibody assays. Post mortem and abortion samples are routinely assayed by fluorescent antibody, immunohistochemical, or molecular technologies. Cattle producers should submit the lung and trachea for analysis of the presence of respiratory diseases and fetal liver, lung, and kidney, as well as placenta (if available) from aborted fetuses. The specimens should be refrigerated and formalin fixed post mortem.

Serologic diagnoses may be possible in acute respiratory infections. Producers should submit serum (or blood) samples, which are called acute and convalescent samples, taken at the onset of disease and 7 to 14 days later. Serologic diagnosis is a retrospective diagnosis because convalescent antibodies develop as the disease wanes. Serodiagnosis of abortions is unlikely since the infection may have occurred several months previously and acute/convalescent sampling is not possible. Serologic testing for IBR is best utilized to define the immune status of the animal or herd.

Prevention

Prevention of IBR requires biosecurity measures and an immunization program (see 602). There are almost 200 vaccines that contain IBRV! Therefore, the programs must be developed for each operation (see 600). Most operators elect to vaccinate calves at branding time when there may still be colostral antibodies present that can interfere with MLV vaccination: In this case, the calves should be re-vaccinated at weaning to assure complete immunization.

Replacement heifers should be vaccinated again 1 month before breeding. All mature cows should be vaccinated on a yearly basis to maintain adequate immunity to IBR. MLV vaccines are now available that may be administered to previously immunized pregnant cows—FOLLOW THE LABEL!

