AGRIALLIS
Science for Agriculture and Allied Sector: A Monthly e Newsletter
Volume 2 – Issue 8
Online ISSN: 2582-368X
www.agriallis.com

BOVINE RESPIRATORY DISEASE (BRD) IN CATTLE

Article Id: AL202087

Vinay Kumar Mehra

Animal Biotechnology Centre, National Dairy Research Institute, Karnal, Haryana

Email: vinay28mehra@yahoo.com

Cattle are susceptible to various types of infectious agents during their life cycle. Viral and bacterial infections are the most common among these cattle, although it does not always cause clinical symptoms or disease. Most of them affect the respiratory tract, results in bovine respiratory disease complex (BRDC) with varying morbidity and mortality rate and lowered the economic return to the farmers. BRDC caused by the bacteria and viruses including bacterium; *Mannheimia haemolytica* and *P multocida and* viruses; bovine respiratory syncytial, bovine herpesvirus-1, parainfluenza-3 virus, bovine viral diarrhea virus, bovine adenovirus (BAV) and, more recently, bovine coronaviruses (BCV). In addition to this, environmental factors such as transport, adverse weather, co-mingling and stressful events may also enhance the BRD infection. Bovine Respiratory Disease (BRD) is also known as "shipping fever. BRD is most prevalent within the first weeks of arrival to the feedlot, but it can occur later in the feeding period and is also seen in calves on pasture.

The general symptoms of the BRDC

- Fever
- Rapid shallow breathing.
- Coughing
- Nasal and eye discharge.
- Salivation.
- Lack of appetite

Volume 2 – Issue 8
Online ISSN: 2582-368X
www.agriallis.com

BHV1 (bovine herpesvirus-1)

BHV1 infection leads to a variety of clinical syndromes resulting from infection of the genital, respiratory, or digestive tract: abortion, encephalitis, mastitis, and tracheitis. Endemic infection is more common in most regions of the world. BHV1 infection caused mucosal lesions of the pharyngeal tonsil, which leads to loss of microvilli and goblet cells, resulting in necrosis of the epithelium and adjacent lymphoid tissue and leukocyte exudation. BHV1 infection may affect antigen-specific as well as nonspecific defence mechanisms. It has been reported that mitogenic response of peripheral blood mononuclear cells stimulated by concanavalin A is suppressed during BHV1 infection and a significant decrease in the percentage of T cells and non-T, non-B cells but a significant increase in B cells and monocyte. Both inactivated and live attenuated vaccines are available for the prevention of this disease. The inactivated vaccines are given at 3-week interval, starting from the age of 3-4 months. Live attenuated vaccines are given either once or twice depending on the type of vaccine. Duration of immunity usually lasts from six months to one year

PI-3 (parainfluenza-3) virus

Parainfluenza-3 virus is associated with both acute and chronic pneumonia in cattle. Infection with PI3 is often concurrent with bovine herpesvirus-1. The clinical signs of the infection include fever, cough, and nasal and ocular discharges. The PI3 infection of alveolar macrophages results in decreasing the ability to kill the bacteria. The infected alveolar macrophages inhibit the lymphocyte response to concanavalin A and IL-2 .PI3 infection leads to an increase in the secretion of histamine by mast cells and enhanced ionophore induced release. This reaction is associated with type 1 hypersensitivity responses, which could ultimately have adverse effects on respiratory clearance and which might facilitate pulmonary colonization by bacteria. Both modified live vaccine and killed vaccines are available for the prevention of PI-3 infection.

BVDV (bovine viral diarrhea virus)

BVD infects in a number of ways, either by a congenital infection of the fetus or after birth. This virus to cross the placenta during early pregnancy and may cause abortion and if the calf is born than infected calves will shed BVDV continuously in the farm environment.

Volume 2 – Issue 8
Online ISSN: 2582-368X
www.agriallis.com

The Symptom in calves is the cerebellar hypoplasia and but in adults, clinical signs are highly variable, which include fever, lethargy, loss of appetite, ocular discharge, nasal dischargem oral lesions, diarrhea and decreasing milk production and in severe cases**,** the calf may die. The vaccines for BVD are available, which include the modified live virus (MLV) vaccines and killed virus (KV) vaccines. The MLV vaccines require only one dose during the initial immunization step; however**,** they are more difficult to handle. KV vaccines are usually more expensive and more than one dose is required during immunization. However, KV vaccines are less susceptible to deactivation by temperature extremes, and they are less susceptible to deactivation by chemicals.

BCV (bovine corona viruses)

Bovine coronaviruses are enveloped viruses. BCV infections in cattle are worldwide. it is pneumoenteric virus that infects the upper and lower respiratory tract, and intestine leads to three distinct clinical syndromes in cattle: (1) calf diarrhea, (2) winter dysentery with hemorrhagic diarrhea in adults, and (3) respiratory infections. No consistent antigenic or genetic markers have been identified to discriminate this virus from different clinical syndromes. The infections can be diagnosed by detection of the virus, viral antigen, or viral RNA in tissues, secretions, or excretions of infected animals. No vaccines have been developed to prevent BCV-associated pneumonia in cattle.

Conclusion

Viral and bacterial infections are the most common, which mostly affect the respiratory tract. The most common respiratory disease is bovine respiratory syncytial, bovine herpesvirus-1, parainfluenza-3 virus, bovine viral diarrhea virus, bovine adenovirus (BAV) and, more recently, bovine coronaviruses (BCV). This bovine respiratory disease complex (BRDC) is most prevalent within the first weeks of arrival to the feedlot, so the recognition and treatment of Bovine Respiratory Disease Complex are very important to prevent the economic loss to the farmers. The BRDC treatment response can be difficult to predict. Most of the focus is on BRD that occurs during the first 30 to 60 days following feedlot arrival and 90% to 95%. Several researches are going on BRD to understand the respiratory microbiome and also looking into antimicrobial resistance, improving, and vaccines as well as getting a better understanding of the disease complex.

Volume 2 – Issue 8
Online ISSN: 2582-368X
www.agriallis.com

References

Lemaire, M., Meyer, G., Baranowski, E., Schynts, F., Wellemans, G., Kerkhofs, P., Thiry, E (2000) Production of bovine herpesvirus type 1-seronegative latent carriers by administration of a live-attenuated vaccine in passively immunized calves. *J Clin Microbiol*, 38(11):4233-4238; 43 ref.

Fulton R. W. (2009). Viral Diseases of the Bovine Respiratory Tract. *Food Animal Practice*, 171–191.

Hartel H, Nikunen S, Neuvonen E, et al. (2004) Viral and bacterial pathogens in bovine respiratory disease in Finland. *Acta Vet Scand*. 45(3-4):193-200.

Saif L. J. (2010). Bovine respiratory coronavirus. The Veterinary clinics of North America. *Food animal practice*, 26(2), 349–364.

Khodakaram-Tafti, A., & Farjanikish, G. H. (2017). Persistent bovine viral diarrhea virus (BVDV) infection in cattle herds. *Iranian journal of veterinary research*, 18(3), 154–163.