



CAMBRIDGE
TECHNOLOGIES



BOVINE RESPIRATORY DISEASE NEW SOLUTIONS TO ONGOING PROBLEMS

Bovine Respiratory Disease (BRD) is one of the most common, yet most complex, health issues facing today's cattlemen and veterinarians. Affecting an estimated 97 percent of United States feedlots and 21.2 percent of cattle², the disease carries an average treatment cost of \$23.60 per case⁴.

Often referred to as Shipping Fever or Pneumonia, BRD involves a number of factors such as the age, environment, and immunity of the animal as well as several different pathogens. Stressed cattle during weaning, transport, and co-mingling in the feedlot, tend to be at the highest risk for BRD³. Both bacterial and viral agents can come into play, making it difficult to gain protection via traditional commercial vaccines.

CLINICAL SIGNS³

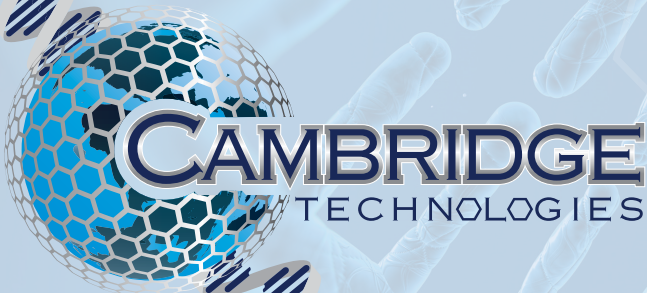
- Fever greater than 104°F
- Discharge from eyes, nose, mouth
- Coughing
- Difficulty breathing
- Decreased appetite
- Depression/loss of interest in surroundings
- Lethargy
- Low head/droopy ears

COMMON PATHOGENIC CAUSES¹

- Mannheimia haemolytica
- Bibersteinia trehalosi
- Histophilus somni
- Pasteurella multocida
- Mycoplasma spp.
- Trueperella (formerly Arcanobacterium) pyogenes
- Bovine Herpes Virus (BHV-1)
- Bovine Respiratory Syncytial Virus (BRSV)
- Bovine Parainfluenza Virus (PI-3)
- Bovine Coronavirus (BCV)
- Influenza D Virus (IDV)⁵

THE CAMBRIDGE SOLUTION

Autogenous vaccines from Cambridge Technologies employ the latest in diagnostic and production technology to create a product targeting the disease-causing agents in the affected herd(s). Our industry-leading molecular diagnostics, including metagenomics and next-generation sequencing, identify the specific threats and antigens that need to be included in the product. Then, the experienced production team can formulate and manufacture a vaccine customized to the needs of each individual customer, including antigen concentration, multiple adjuvant choices, dose sizes, and the option of SoliDose® implants.



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WHY AUTOGENOUS?

SPECIFIC: Autogenous vaccines from Cambridge Technologies are the most targeted, science-driven solution available. The vaccines will be built around the disease strains that are identified as potential threats to the herd in question.

SPEED AND FLEXIBILITY: The nature of autogenous products means a speedy turnaround, so that emerging threats can be dealt with in a timely fashion. Should a new strain or agent emerge, future manufacturing runs of the autogenous product can be altered to include the new threat.

ANTIBIOTIC STEWARDSHIP: In the past, the majority of BRD cases were treated with antibiotics⁴. However, the recent implementation of FDA guidance 209 and 213 along with the expansion of the Veterinary Feed Directive has created a need for an alternative to managing animal health. Autogenous vaccines offer veterinarians and their clients a flexible management tool to counter emerging and evolving diseases.

SERVICE AND SOLUTIONS: The customer and technical service at Cambridge Technologies extends beyond the vaccine bottle. Our experienced team partners with veterinarians and cattlemen through every step of the process, from initial diagnostics through product testing and shipment, and continued monitoring moving forward.

SOURCES:

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2. Hause BM, Huntimer L, Falkenberg S, Henningson J, Lechtenberg K, Halbur T. An inactivated influenza D virus vaccine partially protects cattle from respiratory disease caused by homologous challenge. Veterinary Microbiology. 2017; 199:47-53.
3. Johnson K, Pendell D. Economic Impact of Reducing Bovine Respiratory Disease in United States Beef Cattle Feedlots. <https://ageconsearch.umn.edu/record/206872/files/BRD%20poster%20AAEA%20final%20to%20upload%20with%20cover%20page.pdf>. Presented July, 2015. Accessed July 22, 2017.
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5. USDA- APHIS. Types and Costs of Respiratory Disease Treatments in U.S. Feedlots. https://www.aphis.usda.gov/animal_health/nahms/feedlot/downloads/feedlot2011/Feed11_is_ResDis.pdf. Published April, 2013. Accessed July 22, 2017.



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