

Cattle Handling to Minimize the Incidence of Bovine Respiratory Disease

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Bovine Respiratory Disease Complex Series



FAST FACTS

- BRD prevention can be accomplished by minimizing both exposure to pathogens and stressors associated with managing cattle.

Stressors of weaning, transportation, processing and handling can significantly impact an animal's exposure and susceptibility to respiratory diseases through the various stages of beef cattle production (Hodgson et al and Mitchell et al). Decreasing stress during these management times with low-stress cattle handling can help reduce the interaction of these management stresses with psychological stressors, fear and flight. Cattle handled roughly in poorly designed facilities have significantly higher heart rates than quietly handled cattle in well-designed facilities (Grandin 1997a and Grandin 2001). Research by Temple Grandin (1997) also demonstrated that cattle with elevated heart rates, as a result of psychological stressors from squeeze chute restraint, also had increased cortisol levels (Grandin 1997a), suggesting BRD prevention can be accomplished by minimizing both exposure to pathogens and stressors associated with managing cattle.

Behavioral indicators of stress are expressed by flight, vocalization, kicking, and struggling, while physiological indicators of stress are expressed by elevated levels of cortisol, beta endorphins, and heart rates (Grandin 1997a). Bovine Respiratory Disease (BRD) is a complex disease with various pathogens, stressors, and the interactions of the two. There is evidence corticosteroid may indirectly inhibit pro-inflammatory responses necessary for the animal's immune system to develop a defense against BRD (Hodgson et al). Research has also demonstrated that vaccinations administered during immunosuppression due to elevated stress can reduce vaccine efficacy and immune development against viral and bacterial pathogen's responsible for BRD (Richeson et al). To help minimize the incidences of BRD producers and cattle caretakers should take care to manage pathogen exposure, environmental stressors and psychological stress through vaccination, bio-security, genetics, nutrition, and low-stress cattle handling.

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FAST FACTS

- Cattle are very sensitive to high frequency noises and can become very agitated by loud and unfamiliar noises.
- Low-stress cattle handling techniques should be used when handling and managing cattle at all times, despite the quality of the facility.



Low-stress cattle handling involves implementation of equipment design and cattle caregiver's handling techniques to reduce and eliminate the amount of stress cattle experience during managed care, processing and transportation. To adequately develop facilities and develop low-stress cattle handling techniques, caregivers must first understand basic cattle behavior (Grandin 1997b). All individuals responsible for cattle care and handling should be trained in natural cattle behavior, handling movement techniques and be able to recognize signs of distress or behavior that could result in injury or additional stress to the animals (Federation of Animal Science Societies 2010).

Cattle Natural Behavior

Cattle are herd and prey animals that can become very stressed when they are isolated from the herd (Grandin 1997a & 1998). They have a wide angle of vision and can become frightened by lighting, shadows, or moving distractions (Grandin 1997a, 1997b, 1998 and 2001). Cattle are very sensitive to high frequency noises and can become very agitated by loud and unfamiliar noises (Grandin 1997a, 1997b, 1998 and 2001). When routinely worked in a calm manner, cattle will typically have a smaller flight zone than animals that have had aversive treatment (Grandin 1997a, 1998 and 2001). They can learn to associate specific sights and sounds with both positive and negative experiences (Grandin 1998).

Facility Design

Low-stress cattle handling techniques should be used when handling and managing cattle at all times, despite the quality of the facility. However, there are handling facilities that work better than others. Handling facilities should utilize cattle's natural behavior to minimize stress (Grandin 1997b). For example, cattle will hesitate at flooring changes or lighting differences during movement in corrals and other cattle handling facilities (Grandin 1997a and 1997b). Animals can also become excited when their footing is unstable and they start slipping (Federation of Animal Science Societies 2010). Facilities should be designed to have no-slip floors or adequate bedding applied to crowding pens to provide proper footing for the animals. Lighting changes or shadows should be minimized in animal handling and loading facilities. Shadows will cause cattle to balk (Grandin 1997a and 1997b). The animals will typically move from dim lighting to more brightly lighted areas, however, caution should be taken to ensure light does not glare into the animals' eyes (Grandin 1997a and 1997b). The facilities should also be checked regularly to make sure that there are no objects, such as tarps, coats, sorting flags, etc., that can cause flapping movement that may also cause cattle to balk. Facilities should be regularly maintained and cleaned to help minimize stresses related to injuries or exposure to environmental (mud) and pathogen stressors.



FAST FACTS

- To decrease stress while handling and managing cattle, care should be taken to avoid loud or new noises.
- To get cattle to move calmly in a desired direction, caregivers should work on the edge of the flight zone .



Genetics

An animal's genetics can influence an animal's temperament and its ability to respond to handling stressors (Grandin 1998). There is a direct relation to stress stimuli and disease susceptibility (Salak-Johnson et al 2007). Therefore, an effort to reduce psychological and environmental stressors, in addition to decreasing pathogen exposure will aid in BRD prevention. Research by Temple Grandin shows that cattle with poor temperament, or that are easily excitable, have a more difficult time adapting to repeated non-painful handling procedures than cattle with calm temperaments (Grandin 1997a). Management decisions about culling and bull selection should consider an animal's temperament to help decrease potential injuries and stressors for both cattle and caregivers.

Noises

Strange, loud, or new sounds are strong stressors, as prey animals often associate them with danger (Grandin 1997a). Noise can cause both behavioral and physiological reactions to stress and make them even more difficult to handle (Grandin 1997a, Lanier et al 2000, and Pajor et al 2003). Animals will adapt to a reasonable amount of continuous noise or human voices (Grandin 1997a). Caregivers should not elevate their voices to yelling or shouting as it can be as stressful to cattle as an electric prod (Pajor et al 2003). To decrease stress while handling and managing cattle, care should be taken to avoid loud or new noises.

Flight Zone and Movement

The flight zone of an animal is an animal's comfort area. When someone or another animal enters an animal's flight zone the animal will move away from the pressure. The flight zone of an animal varies depending upon temperament and previous experiences (Grandin 1997a). Understanding an animal's flight zone and point of balance can help reduce stress when handling cattle (Grandin 1997a and 1998). To get cattle to move calmly in a desired direction, caregivers should work on the edge of the flight zone and in reference to the animal's point of balance, the point of the shoulder or the globe of the eye. Handlers should always walk where cattle can see them. Cattle cannot see directly behind them because of their field of vision; handlers should avoid being directly behind cattle because animals will turn and look preventing forward motion. To get an animal to move forward, the caregiver should move behind the point of balance. To get the animal to back up or turn around, the caregiver should approach in front of the point of balance. To cease movement by the cattle, the caregiver should retreat from the animal's flight zone (Grandin 1997a, 1998 and Federation of Animal Science Societies 2010).



FAST FACTS

- Electric prod's should not be a person's primary moving aid, rather only used when absolutely necessary to move a stubborn animal.
- Cattle learn quickly and act accordingly to past handling experiences.

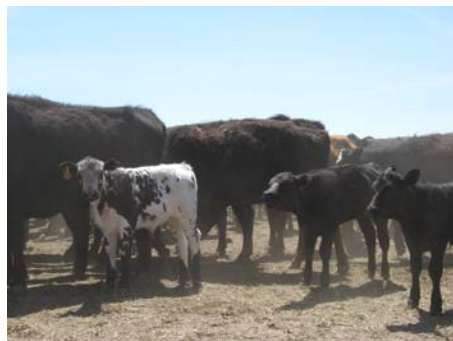
Moving Animal Aids:

People can move animals with minimal to no equipment if the cattle have been handled calmly in the past and if the facilities are designed to use their natural behaviors (Federation of Animal Science Societies 2010). Nonelectrical moving aids, such as paddles, flags, and sorting sticks with visual stimuli (plastic bag or plastic ribbons) can be used as an aid in conjunction with natural cattle behavior to move cattle. Care should be made to use aids calmly with small deliberate movement, so not to agitate or stress animals with the aid. Do not wildly wave the moving aid (Federation of Animal Science Societies 2010). Research by Grandin demonstrated that most cattle at meat packing plants could be moved through the plant's facilities without the use of electric prods (Federation of Animal Science Societies 2010). Electric prods should not be a person's primary moving aid, rather only used when absolutely necessary to move an unreasonably reluctant animal (Federation of Animal Science Societies 2010). If situations arise where animals are balking, evaluate why an animal refuses to move, for example by removing an item in their path, rather than using an electric prod as a primary moving aid.

Memory:

Cattle learn quickly and act accordingly to past handling experiences. Cattle that have frequent positive handling interactions are less stressed by handling and restraint than animals that have had little people interaction (Grandin 1997a and 1998). It is important to implement low-stress cattle handling techniques early in the calf's life, as it will impact how they will respond to psychological stressors later in life (Grandin 1997a). Cattle that are mishandled or have a negative experience will associate handling or the management process with fear and resist handling or facility in the future. Raising calmer cattle requires cattle caregivers to walk quietly among animals and teaching them to follow a lead caregiver or horseperson (Grandin 1997a).

Implementing low-stress cattle handling techniques and proper facility design, along with other BRD prevention management tools, can help aid in the animal's immune defense against bacterial and viral BRD pathogens and minimize the incidences of BRD in the herd.



References:

- Duff, G. C. and M. L. Galyean. 2007. Recent Advances in Management of Highly Stressed, Newly Received Feedlot Cattle. *J. Anim. Sci.* 85:823-840.
- Federation of Animal Science Societies. 2010. Guide for Care and Use of Agriculture Animals in Research and Teaching, 3rd Ed. Federation of Animal Science Societies, Champaign, Illinois.
- Grandin, T. 1997a. Assessment of Stress During Handling and Transport. *J. Anim. Sci.* 75:249-257.
- Grandin, T. 1997b. The Design and Construction of Facilities for Handling Cattle. *Livestock Prod. Sci.* 49:103-119.
- Grandin, T. 1998. Reducing Stress to Improve Productivity and Welfare. *The Professional Animal Scientist.* 14:1-10.
- Grandin, T. 2001. Livestock Handling Quality Assurance. *J. Anim. Sci.* 79:E239-E248.
- Hodgson, P. D., P. Aich, A. Manuja, K. Hokamp, F. M. Roche, F. S. L. Brinkman, A. Potter, L. A. Babiuk, and P. J. Griebel. 2005. Effect of Stress on Viral-Bacterial Synergy in Bovine Respiratory Disease: Novel Mechanisms To Regulate Inflammation. *Comp. Funct. Enom.* 6:244-250.
- Lanier, J. L., T. Grandin, R. D. Green, D. Avery, and K. McGee. 2000. The Relationship Between Reaction To Sudden Intermittent Movement and Sounds and Temperatures. *J. Anim. Sci.* 78:1467-1474.
- Mitchell, G. B., M. E. Clark, M. Siwicky, and J. L. Caswell. 2008. Stress Alters The Cellular and Proteomic Compartments of Bovine Bronchoalveolar Lavage Fluid. *Vet. Immun. And Immunopathology.* 125:111-125 .
- Pajor, E. A. , J. Rushen, and A. m. B. DePassille. 2003. Dairy Cattle Choice of handling Treatment in a Y Maze. *App. Anim. Behav. Sci.* 80:93-107.
- Richeson, J. T., E. B. Kegley, M. S. Gadberry, P. A. Beck, J. G. Powell and C. A. Jones. 2009. Effect of On-Arrival Versus Delayed Clostridial or Modified Live Respiratory Vaccination on Health, Performance, Bovine Viral Diarrhea Virus Type I Titers and Stress and Immune Measures of Newly Received Beef Calves. *J. Anim. Sci.* 87:2409-2418.
- Salak-Johnson, J. L., and J. J. McGlone. 2007. Making Sense of Apparently Conflicting Data: Stress and Immunity in Swine and Cattle. *J. Anim. Sci.* 85:E81-E88.

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