Controlling Bovine Respiratory Disease in feedlot cattle

Bovine Respiratory Disease (BRD) is the most common cause of illness and death in Australian feedlot cattle, causing between 50% and 90% of all sickness and deaths. It is most common in the first four weeks after entry to the feedlot. In addition to the costs associated with treatment, wasted feed and cattle deaths, BRD also results in performance losses due to decreased weight gain and feed conversion efficiency. Management strategies to prevent and control BRD can improve feedlot productivity, profitability and animal welfare.

Key benefits

- Prevention and control of BRD can improve feedlot productivity, profitability and animal welfare.
- Smoother transition on entry into the feedlot will result in quicker adaptation to the pen environment and increase feed efficiency and weight gains.
- Controlling BRD can lead to reduced feedlot mortalities and illness, and faster recovery times for infected cattle.

What causes BRD?

BRD results from a combination of stress and infectious agents. Exposure to the viruses and bacteria involved in BRD rarely causes serious illness in unstressed cattle on pasture. However, exposure to the same viruses and bacteria in the high-stress environment of a feedlot can overwhelm the animal's natural defence mechanisms, leading to the development of respiratory disease. In some cases up to 50% of the cattle in a pen may be affected, and death rates up to 5% have been reported.

Table 1. Predisposing factors that may contribute to Bovine Respiratory Disease in feedlot cattle

Stress Factors	Infectious Agents
• Weaning • Saleyards • Transport • Injury • Dehydration • Co-mingling • Pen competition • Pen "add-ons" and movements • Handling • Weather extremes • Dust • Feed and water changes	**Viruses** • IBR - Infectious Bovine Rhinotracheitis (Bovine Herpes Virus 1) • BVD - Bovine Viral Diarrhoea (Pestivirus) • BRSV - Bovine Respiratory Syncytial Virus • PI3 - Parainfluenza type 3 Virus **Bacteria** • Mannheimia haemolytica (previously called Pasteurella haemolytica) • Pasteurella multocida • Haemophilus somnus

Stress factors involved in BRD

Feedlot cattle are exposed to a range of stress factors that may depress their immune system making them more susceptible to viral and bacterial infections. Feeder cattle experience high levels of stress during handling and transport prior to entry to the feedlot, on arrival and during the first few weeks in the lot. The stress factors that may lower the immunity of feedlot cattle and their ability to resist infections are listed in Table 1.

Prior to entry, cattle may have been through a saleyard and mixed with other cattle from different properties. This 'co-mingling' of cattle from different sources generates competition and psychological stress in the animals. Co-mingling may also expose animals to respiratory viruses at a time when their immune system is lowered due to stress. During transport to the feedlot, cattle may be exposed to exhaust fumes that irritate their respiratory tract and they may become dehydrated. Injuries may also occur during transport, or at the saleyards.

On entry to the feedlot there is further stress due to handling during processing. There is usually further co-mingling and competition for water and feed. The water supply at the feedlot may have a different taste and the animals may not be familiar with drinking out of troughs. Feed is usually in a different form to any experienced previously and is provided in feed bunks, which require both learning and competition to access the feed. The functioning of the rumen becomes seriously impaired after 48 hours off-feed and some cattle may take longer than this to commence eating once they enter the feedlot. Disruption of rumen function due to dehydration and limited feed intake can further depress the immune system.

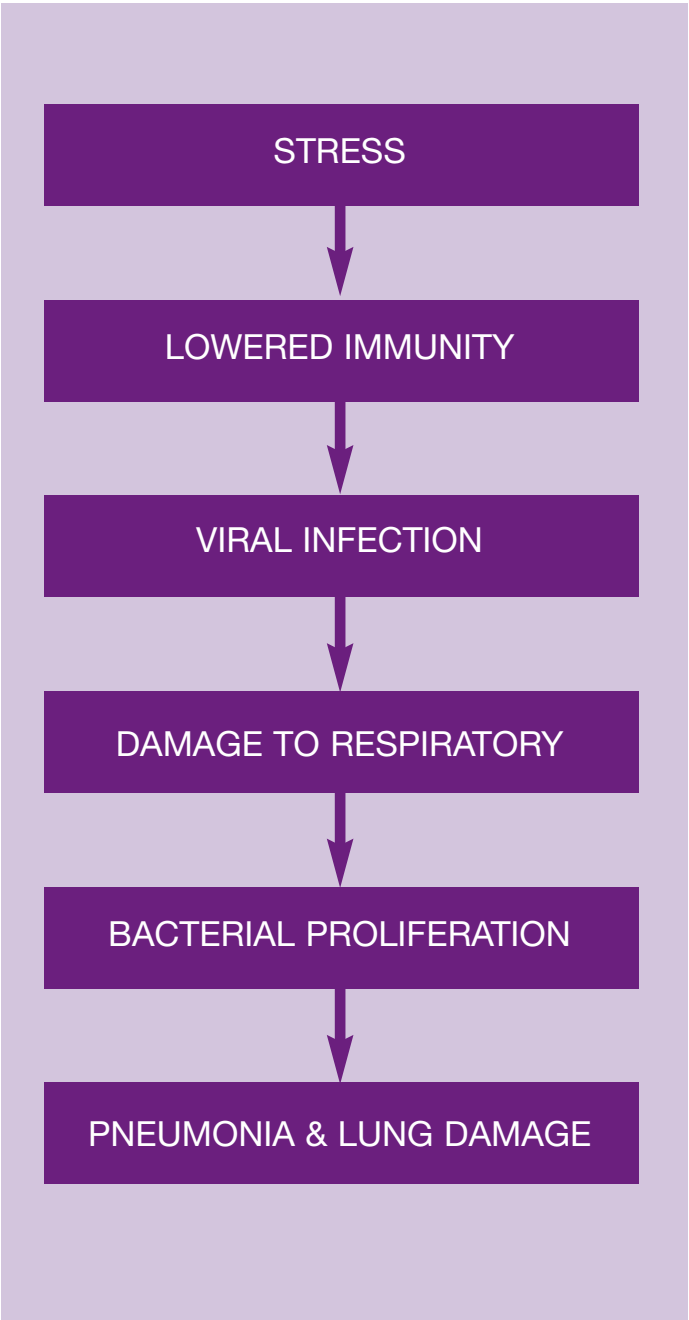
Feedlot cattle develop stable behaviour patterns related to eating and drinking once they become established as a group within a pen. New additions to the pen, or 'add-ons' as they are also known, may disrupt this established group. This can occur when cattle intake numbers are low and it takes time to fill a pen. Add-ons or movement of cattle between pens stresses all the animals in the pen, but particularly the new arrivals that have to compete for food with the more established cattle.

Infectious agents involved in BRD

Respiratory viruses are widespread in both paddock and feedlot cattle. In unstressed animals exposure to these viruses rarely produces obvious signs of illness. However when the immune system is weakened by stress, viral infections may become established, which leads to further breakdown of the normal defence mechanisms of the upper respiratory tract and lungs. Bacteria that normally live in the nose and throat without causing any disease are then able to invade lung tissues, causing pneumonia and lung damage.

It is the combination of stress and exposure to viruses and bacteria that leads to the development of BRD. Occasionally only one infectious agent is involved in BRD, however more commonly, obvious disease results from a bacterial infection, secondary to a viral infection. The viruses and bacteria that can be involved in BRD are listed in Table 1.

The Bovine Respiratory Disease cycle



Clinical signs of BRD

Most cases of BRD occur within the first four weeks after entry to the feedlot. The early signs may be fairly subtle, however it is important that affected cattle are recognised early, as the 'time of pull' from the pen is the most critical factor in the success of treatment. Early treatment is vital to minimise deaths, treatment costs and production losses.

Clinical signs to look for include:

- Depression and loss of interest in surroundings
- Lethargy and unwillingness to move
- Extended head
- Droopy ears
- Discharge from eyes, nose and mouth
- Coughing
- Rapid, shallow breathing

Prevalence of BRD

A recent survey of 72 Australian feedlots revealed that BRD was rated the major health concern by medium and large feedlots. BRD was also considered an important health concern in small feedlots, but the prevalence of the disease was lower than in larger feedlots. Overall, 64% of all illnesses and deaths were attributed to BRD.

Treatment

Early identification of affected cattle is vital. Pen riders should evaluate the attitude of the whole pen and then observe animals that appear different. The 'depth of pull' is the extent to which animals are removed from the pen for treatment. This should be established based on BRD activity in the feedlot at the time, the history of the individual pen, including days on feed and previous illness or deaths in that pen. The death rate from BRD in the first two days after being pulled is the same as mortality in the pen. The success or failure of hospital treatment can also be used as an important guide to determine the depth of pull in a pen. Once this has been determined all animals showing the same degree of symptoms should be removed for treatment.

It is recommended that pen riding be carried out early in the day during the hot months, as hot weather may make the whole pen look as though it has BRD. Agitation, due to pen riding or cattle pulling, leads to the release of adrenaline, which may temporarily mask the signs of BRD, so disturbance should be kept to a minimum during inspection of the pen.

Hospital management

Pulled cattle should be housed in a less competitive environment in a hospital pen with easy access to palatable food, such as high quality lucerne hay, and fresh clean water. Hospital and recovery pens should have no more than 50% of the cattle density of the home pens, to avoid crowding and competition for food and water.

Cattle in the hospital should be identified with specific hospital tags. This allows identification of treatment regimes, dates of treatment and withholding periods after treatment. Records should be kept for each animal detailing the admission date, weight, treatment dates, drugs administered, dose rates, date moved into the recovery pen and the outcome of treatment. Good records will allow analysis of the success of hospital treatment.

Treatment should be aggressive and early. Appropriate antimicrobials are usually administered and should be selected based on effectiveness, duration of action, and the withholding period required prior to slaughter. Treatment may also include anti-inflammatory drugs, anti-histamines, vitamins and probiotics. Veterinary recommendations on dose rate, injection volume, choice of injection site, treatment frequency and drug withholding periods should be strictly followed to minimise the risk of tissue damage and drug residues.

Once treatment is completed the animal should be moved into a recovery pen. These pens should be monitored daily and should not be overcrowded as this can affect recovery. The ration in the recovery pen should be the same as that fed in the home pen to allow the animal to re-adapt to the feedlot diet.

Control and prevention

Management programs to reduce the incidence of BRD are recommended to reduce the impact of the disease on the feedlot operation.

Management programs should aim to:

1. Decrease stress; and
2. Improve adaptation of cattle to the feedlot environment.

Selection and management of cattle prior to entry into the feedlot is just as important as management once they are in the pens.

Selection of feeder cattle

Many feedlots purchase feeder cattle direct from breeders. This eliminates the saleyard process, reducing stress on the cattle prior to arrival at the feedlot.

The practice of 'yard weaning' has been shown to lower the incidence of BRD in feedlots. Weaning is known to be a critical learning time for young cattle. Housing in suitable yards with good quality hay or silage for 7-10 days after weaning, conditions the calf to accept confinement and improves socialisation skills. Weaners learn to accept new food and water sources, resulting in faster adaptation to pen conditions and a quicker commencement of weight gain once they enter the feedlot. Yard weaned cattle have lower pulls due to illness, and higher weight gains in the feedlot compared to paddock weaned cattle.

More information on yard weaning is provided in Tips & Tools Yard *weaning methods for preparing feeder cattle*. For a copy of this publication call MLA on 1800 675 717 or email publications@mla.com.au.

Backgrounding

Backgrounding is the assembling of cattle prior to entry into the feedlot. This allows mixing of cattle that will occupy a pen, prior to entry to the feedlot. This not only helps to socialise the group but also exposes the animals to a range of respiratory viruses before their immune system is challenged by the stresses of the feedlot. Cattle may also be trained to feed from bunks during backgrounding, if desired.

Vaccination

Vaccines are becoming commercially available against respiratory viruses and bacteria that contribute to BRD. Rhinogard is an intranasal vaccine against Infectious Bovine Rhinotracheitis, and is the first to be registered for sale in Australia. Two additional vaccines have also been registered, PESTIGARD® for the control of pestivirus and BOVILIS® MH for the control of *Mannheimia haemolytica*. The ideal time to administer vaccines is during backgrounding, prior to entry into the feedlot. This allows the immune system of the animal to respond to the vaccine prior to exposure to the potential stressors of the feedlot, which can suppress the immune response.

Steps to reduce BRD

1. Purchase feeder cattle direct from breeders
2. Select producers who yard wean calves
3. Background cattle in groups prior to entry to the feedlot
4. Vaccinate against respiratory pathogens during backgrounding
5. Avoid sudden food and water changes or restrictions
6. Minimise pen add-ons and movements
7. Regulary monitor cattle for early signs of BRD
8. Pull suspect cattle early and move to hospital pen for treatment

The bottom line

Bovine Respiratory Disease is the major cause of illness and mortality in Australian feedlots. Production losses due to BRD can be reduced by the implementation of management practices to decrease stress and improve adaptation to the feedlot environment.

For more information

Contact the MLA Producer Hotline 1800 675 717

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