

Management Approaches to Reduce Transportation Stress Risk For BRD

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Bovine Respiratory Disease Complex Series



FAST FACTS

- Transporting cattle, especially young cattle, can dramatically increase plasma cortisol levels, indicating that the animals have experienced significant stress.

The widespread and economically devastating cattle disease known as Bovine Respiratory Disease Complex (BRD), was for many years referred to commonly as “Shipping Fever,” because the disease was most often seen shortly after cattle had been shipped from one location to another. This was especially true of calves that had been shipped from ranches or markets to feedlots. Producers, veterinarians, researchers and others have long known that there was a strong correlation between transporting cattle and their susceptibility to respiratory disease. Transporting cattle, especially young cattle, can dramatically increase plasma cortisol levels, indicating that the animals have experienced significant stress (Crookshank, et al., 1979; Fillion et al., 1984). This stress can also have significant effects on animals’ immune systems, affecting not only circulating hormones, but also the functioning of neutrophils and leukocytes, and the expression of certain genes (Buckham-Sporer, et al., 2009).

Even though it is recognized that transportation stress is associated with BRD, there is not a simple cause and effect relationship between shipping and BRD. Some studies have found that cattle shipped longer distances are more likely to contract BRD (Cernicchiaro, et al., 2012; Sanderson, et al, 2008), but other studies have found that there is no relationship between distance shipped and incidence of BRD (Cole, et al., 1988). Some researchers have suggested that it is the stresses of sorting, loading and early transport that are the most stressful aspect of overall transportation, and therefore possibly the major factor affecting cases of BRD (Taylor et al., 2010a).

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If this is the case, then this supports the observation by Grandin (1997a) that cattle shipped from the Southeast to Texas in a non-stop 32-hour trip have fewer health problems than cattle shipped the same distance where they are unloaded and reloaded at “rest stops” along the way. Grandin suggests that these so-called rest stops may indeed be more akin to “stress stops.”

It is also not well understood whether it is the transportation itself, or other factors related to transportation that are the primary predisposing factors for BRD infections (Taylor et al., 2010a). Factors such as cold, heat, ventilation, dust, extreme temperature swings, dehydration, hypoxia, cold coupled with wetness, crowding, sanitation of the truck, driving habits and others vary tremendously in the transport of cattle. Research has not yet been able to sort out which of these factors are major factors in the stress that can contribute to cases of BRD, although there is evidence that many of these factors play a part in the complex etiology involved in BRD. On top of this, the handling of the cattle just prior to shipping undoubtedly plays a major role in how cattle respond to the stress of transport.

Many studies have shown that commingling of cattle from different sources is a major factor affecting incidences of BRD (Alexander, et al. 1989; Ribble et al., 1995; Step et al., 2008). Commingling of cattle from different sources not only increases the stress upon the animals as they struggle to establish dominance and social order, but it also likely increases the exposure to more and different pathogenic organisms in the group that is commingled. When cattle are commingled and then quickly shipped, such as groups put together from auction yards, this can lead to severe stress and major outbreaks of BRD. In a study by Step et al. (2008) it was found that cattle put together from auction sales yards (MARKET) had a BRD morbidity rate of 42 percent. When MARKET cattle were commingled with calves all from one ranch (COMM) the BRD morbidity rate was 22 percent. When cattle were kept together as a group all from one ranch (RANCH) the morbidity rate was 11 percent. In this same study the authors also compared calves all from one ranch that were weaned 45 days before shipping (RANCH45), ranch calves weaned and vaccinated 45 days before shipping (RANCHVAC45), and the RANCH calves from the same ranch that were weaned and shipped immediately. The study found BRD morbidity rates of 35 percent, 6 percent and 9 percent, respectively, for the RANCH, RANCH45 and RANCHVAC45 treatments. The study concluded that not only did commingling significantly increase BRD morbidity rates, but that the combined effect of weaning and shipping in a short time period also significantly increased incidence of BRD.



FAST FACTS

- The handling of the cattle just prior to shipping undoubtedly plays a major role in how cattle respond to the stress of transport.
- When cattle are commingled and then quickly shipped, such as groups put together from auction yards, this can lead to severe stress and major outbreaks of BRD.



FAST FACTS

- There is evidence that the stress of loading and unloading may be as stressful, or even more stressful, than the actual transportation once inside the truck.
- When possible it is best to ship cattle that are familiar with one another; cattle that come from the same source.

Mitigating Transportation Stress as a Contributing Factor for BRD

There is no doubt that the various stresses associated with transporting cattle can contribute significantly to the combination of factors causing BRD. However, research to date has not been able to definitively identify the major aspects of transportation that cause the most stress. That said, most experts agree that whatever can be done to reduce or eliminate various stressors before, during and immediately after transportation should help to reduce cases of BRD.

Loading & Unloading

As suggested in previous sections, there is evidence that the stress of loading and unloading may be as stressful, or even more stressful, than the actual transportation once inside the truck. Grandin (1997b) and others have convincingly made the case that proper design of handling facilities, coupled with well-trained handlers who are familiar with low-stress cattle handling techniques, can dramatically reduce the stress cattle experience when being loaded or unloaded, as well as at other times during the overall ordeal of being sorted, penned, processed and transported from one location to another.

Commingling

Evidence is clear that commingling alone of cattle from different sources can increase the incidence of BRD. Commingling coupled with transportation adds another level of stress that likely increases further the chances of BRD. When possible it is best to ship cattle that are familiar with one another; cattle that come from the same source.

Pre-conditioning

The study by Step et al. (2008) clearly demonstrates the benefit of weaning calves 45 days before shipping to the feedlot. BRD morbidity was dramatically reduced simply by allowing the calves to recover from the stress of weaning before shipment. Preparing cattle to better handle the stress of transportation by properly pre-conditioning them before the trip can dramatically reduce cases of BRD upon arrival.

Weather

In reviewing the research on how weather impacts, BRD Taylor et al. (2010a) suggest that the link between weather and BRD is still not well understood. They cite several studies which indicate that BRD incidences are highest in the fall. However the authors caution readers not to assume that this is a causal link, as fall is the busiest time for marketing cattle. They suggest that various management factors such as fatigue, being hurried, inadequate time to identify and treat sick animals, etc., as well as potentially more crowding, commingling, etc. might explain why BRD occurrences seem to increase in the fall.



FAST FACTS

- Extreme heat and extreme cold can both be highly stressful, as can periods with wide swings between daytime and nighttime temperatures.
- Research has shown that treating cattle with long-acting antibiotics either just before transport, or upon arrival at the feedlot, can significantly reduce occurrences of BRD .

Ribble et al. (1995) found some evidence that BRD cases increase during periods of extreme shifts in temperature, but Taylor et al. (2010a) also noted that other studies failed to support this finding. While the findings on weather and BRD are still somewhat inconclusive, it is still suggested by many in the cattle industry, that if possible, it is best to avoid transportation of cattle during extreme weather. Extreme heat and extreme cold can both be highly stressful, as can periods with wide swings between daytime and nighttime temperatures.

Air Quality and Sanitation

BRD has often been linked to poor air quality and poor air ventilation (Lago et al., 2006). Therefore, anything that can be done to improve air quality and ventilation during transport might help mitigate against BRD. Trailer designs that improve air flow could potentially reduce risk of BRD. Overcrowding of trucks can contribute to degradation of air quality and should be avoided. The cleaner the trailer the cattle are being hauled in, the less likely that the trailer itself might be a source of BRD pathogens. Therefore, if possible, it is best that trailers be cleaned between loads, especially if they are to haul calves that might be considered at high risk for BRD.

Metaphylaxis

Research has shown that treating cattle with long-acting antibiotics either just before transport, or upon arrival at the feedlot, can significantly reduce occurrences of BRD (Lofgreen, 1983; Schunicht et al. 2002; Cusack 2004). However, cost and labeling restrictions on these antibiotics preclude their mass usage to prevent BRD (Taylor et al., 2010b). If calves with high risk of BRD can be identified prior to shipment, or immediately upon arrival (e.g., lightweight, non-preconditioned, commingled calves coming from a sales yard) there is evidence that BRD incidences can be reduced by using recommended long-acting antibiotics (Taylor et al., 2010b).

Castration & Dehorning

Research has consistently found that castrating and dehorning of cattle is best done early (i.e., before two months of age if possible). Given that these surgical procedures are in themselves highly stressful it is important that they not be done immediately before or immediately after a stressful transportation trip. If calves are not castrated or dehorned while young, then it is best to do these procedures early on in a preconditioning period so calves can recover prior to transport. If these procedures must be done after arrival at the feedlot, cattle should be allowed time to reduce circulating cortisol levels (at least 48 hours), rehydrate, and hopefully get started eating again before these procedures are done.



FAST FACTS

- Acclimating calves to feed bunks and water troughs during preconditioning prior to shipment can help calves to get started eating after arrival, and therefore somewhat mitigate risk of BRD after shipment.

Size and Age of Calves

Most research has consistently found that lighter, younger calves are more susceptible to BRD after shipping than larger, older calves (Taylor et al., 2010a). Management systems that therefore increase weaning weights may also somewhat reduce risk of BRD. Management systems such as fall-calving operations that market their calves at a year of age should have significantly fewer incidences of BRD once these heavier, older calves arrive at the feedlot.

Nutrition

Research on how rations and nutrition affect BRD in calves after arriving at feedlots has yielded no clear data on whether the type of ration fed affects susceptibility to BRD. Research has shown, however, that feed intake is important as a preventative measure in dealing with BRD (Taylor et al., 2010b). Acclimating calves to feed bunks and water troughs during preconditioning prior to shipment can help calves to get started eating after arrival, and therefore somewhat mitigate risk of BRD after shipment (Taylor et al., 2010b). Regardless of preconditioning, whatever can be done to get calves started on feed and water soon after shipment should provide some prevention of BRD. Use of older “trainer” animals to teach new arrivals how to use feedbunks and waterers has been shown by some research to reduce BRD incidence; however the research on this is limited and somewhat inconclusive (Taylor et al., 2010b).

Historically, Bovine Respiratory Disease Complex results in 75 percent of cattle morbidity and 50 percent of cattle mortality in feedlot cattle (Smith 1998). The vast majority of these cases occur within a few weeks after arriving at the feedlot – that is, after being transported. Although our current knowledge about which specific aspects of cattle transport contribute most to BRD is somewhat limited, we do know that there are some things that can be done in preparing to transport cattle, transporting cattle, and caring for cattle immediately after transport that can help reduce incidences of BRD. Prevention of BRD is not only very economically important, but it also decreases workload stress in treating the disease, and is an important component of beef quality assurance, as well as animal welfare. To aid in the prevention of BRD, careful consideration and management of transportation stressors should be addressed prior to handling and shipping cattle, especially cattle at high risk of BRD.

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Authored by: C. Beus, S. Smith, D. Nelson

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