Optimizing Pre-weaning Calf Care and Treatment to Reduce the Impact of BRD

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Bovine Respiratory Disease Complex Series

FAST FACTS

- The major profits in the cow/calf business come from weaning weights and the number of calves at weaning.

Research with feedlot calves shows that those that stay healthy have a higher net profit than calves treated for disease (Smith 1998) and the fewer visits to the hospital pen, the better the average daily gain (ADG) (Roeber 2001). Couldn't the outcomes of lower death loss, higher ADG, and lower cost of gain with healthy calves be the same in the cow/calf herd? The major profits in the cow/calf business come from weaning weights and the total number of calves at weaning. Average daily gain and low mortality contribute to these profit areas. Although we can try to keep the herd healthy by preventing disease, sometimes we still have to treat and how effective our treatment is depends on a number of factors. What are the factors that influence treatment outcomes that will minimize the impacts of Bovine Respiratory Disease Complex (BRD) in the cow/calf herd?

Early detection is touted as an important key to treatment success. *When* to concentrate efforts to watch calves for signs of BRD is not exactly known. Snowder (2005) reported that the highest incidence of BRD in beef calves was between 70 to 170 days of age, although calves can develop BRD at any time after birth. In a French study of over 6,000 Charolais calves, respiratory disease incidence was highest in 14 to 20 day old calves (Assie 2004).

What to look for exactly is debatable because most clinical signs lack specificity, meaning that some clinical signs might be found with other disease conditions. For feedlot steers the use of the DART program (depression, appetite loss, respiratory changes and temperature elevation) had a Sensitivity and Specificity of only 62 and 63 percent, respectively (Toaff-Rosenstein 2012). A recent challenge trial (Toaff-Rosenstein 2012) showed what cattle were *actually* experiencing early on in the course of BRD:

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FAST FACTS

- Peak fever was not seen until five days after challenge

Increase in clinical score within two days of bacterial challenge

Anorexia – Dry Matter Intake as a percent of body weight dropped from 2.2 to 1.3 percent within two days after challenge

Peak fever was not seen until five days after challenge

Sluggishness (lethargy) – no change in total daily lying time was observed after challenge

Affected animals showed increased pain sensitivity after five days

Affected animals decreased grooming within two days of challenge with BRD pathogens.

Some of these behaviors may be of value when trying to find sick animals. The predictive ability of these behaviors to say a calf has BRD or not, however, has not yet been established.

Combinations of some more obvious signs of illness could be used to identify sick calves. Use of a simple scoring system was proposed to identify sick cattle that includes: score of 0 – a normal animal, 1 – noticeable depression without apparent signs of weakness, 2 – marked depression with moderate signs of weakness without significantly altered gait, 3 – severe depression with signs of weakness such as significantly altered gait, and 4 – moribund and unable to rise (Perino and Apley 1998). Poulsen and McGuirk (2009) devised a scoring system for respiratory disease for pre-weaned dairy calves with decision points upon which to decide to treat or not, based on nasal and ocular discharge, temperature, and cough. According to the authors, respiratory disease should be treated when calves receive a score 5 points or more using the Calf Respiratory Scoring System .

Use of respiratory disease scoring systems, however, had not been validated with subsequent lung lesions or treatment success until very recently. Leruste and others (2012) evaluated veal calves for clinical signs of respiratory disease and subsequent lung lesions at slaughter. At two weeks before slaughter, 60 percent of calves with lung lesions had abnormal breathing, 55 percent had a nasal discharge and 61 percent were observed to be coughing. The prevalence of lung lesions in this study was much higher, however, than the prevalence of any of the clinical signs, indicating that many animals were sick but never identified. Treatment success based on finding specific clinical signs and correlation with lung lesions has not been evaluated at this point.

Adding lung auscultation with a stethoscope and rectal temperature may increase the predictive nature of the clinical signs and treatment outcomes. In feedlot cattle, a lung auscultation score was assigned at the first pull into the hospital pen and, at the same time, the rectal temperature was taken (DeDonder 2008). Lungs were listened to in the area of the lung fields just behind and above the elbow. Lung sounds were scored independently on the left and right side of each calf.

FAST FACTS

- Lung scores could predicted 90 percent of the variation in lung lesion scores.

The scoring system was:

Lung Score	Auscultation Findings
1 – 2	Normal lung sounds
3 – 4	Mild lung sounds
5 – 6	Moderate lung sounds
7 – 9	Severe lung sounds
10	Acute interstitial pneumonia

Lung scores were correlated with lung lesions (lung scores could predicted 90 percent of the variation in lung lesion scores) and lung scores were associated with death rates in the calves. The higher the lung score, the greater the likelihood of death. Also, the higher the lung score, the higher the retreatment (re-pull) rate. The risk of retreatment also increased with a higher rectal temperature at first pull.

Recently, ultrasound was used to evaluate cattle lungs for bovine respiratory disease. In a group of feedlot cattle monitored over time, Abutarbush and others (2012) found that compared to non-ill animals, cattle with fever (diagnosed with severe BRD) after arrival to the feedlot were about 12 times more likely to have lung lesions on ultrasound. The predictive ability of this diagnostic technology, however, is not good enough for weight gain or other health outcomes at this point.

The general cow/calf producer should gather a minimum amount of information when evaluating calves for possible respiratory disease. These would include:

Respiratory rate (normal resp. rate = 30-60 breaths per minute)
Increased respiratory sounds (raspy loud breathing)
Difficulty breathing
Cough
Nasal discharge
Temperature (normal temp = 101.5-103.0 F for calves)
Demeanor of calf (droopy ears, off feed, not suckling, lethargic)
Signs of dehydration (sunken eyes, prolonged skin tent*, dry nose, tacky lips and gums)

*skin tent involves pinching the skin on the side of the neck of the calf (normal hydrated calves' skin will spring back to normal in less than two seconds).

The cattle producer and veterinarian need to use the diagnostic criteria available to them and develop case definitions for BRD on the ranch. Once defined, treatment protocols can be developed and eventually evaluated for effectiveness if the ranch keeps good records of all treatments used.

FAST FACTS

- Retreatment of calves after entering the feedlot has an effect on feeding and carcass performance.

Effective treatment

Calves that have to be treated for BRD, even if treated successfully, may not gain as well as calves that never need treatment (Bateman 1990). There are a number of antibiotics available and labeled for treatment of respiratory disease in cattle. Some antibiotics require daily treatment and some have longer retreatment intervals. The producer and their veterinarian need to decide which antibiotic is right for their operation, based on facilities and effectiveness of the drug. One consideration when using most antibiotics in pre-weaned calves is that there may be no established meat withdrawal time for this age class of cattle so producers should keep treatment records on all treated calves and have their veterinarian help set a meat withhold for these animals, particularly if they happen to be sold or marketed within a short period after treatment.

Getting the animal treated right the first time is a key to better performance of that calf later on. Retreatment of calves after entering the feedlot had an effect on feeding and carcass performance. Calves that were treated two or more times after arrival to the feedlot had lower ADG, poorer marbling score and lost money, on average (Engleken 2009).

Anti-inflammatory drugs have been evaluated as ancillary treatments in conjunction with antibiotics. Although the use of these drugs remains controversial because of the lack of sufficient, well-designed randomized clinical trials (Francoz 2012), some veterinarians may recommend them to help reduce fever and improve first treatment success rates. Recent research with pre-weaned calves demonstrated a significant reduction in clinical signs of rectal temperature, respiratory rate and clinical index score when calves were treated with an antibiotic and diclofenac or flunixin meglumine, both non-steroidal anti-inflammatory drugs (Guzel 2010).

Making sure the cattle are treated with the right drug, using the right dose (based on body weight) for the right duration of time and through the right route of administration (IV, IM or SQ) will help maximize treatment effectiveness.

FAST FACTS

- Training employees on the ranch is multi-faceted and crucial to the overall success of calf health.

Environment

The hospital pen or treatment area should be conducive to recovery. The area should be dry, sheltered, have good ventilation, and low stocking density, both at the bunk and in the pen. Sick cattle need fresh, highly palatable feed. People designated to treat the calves should be able to work them in a low-stress environment.

Train people to identify and treat

People on the ranch tasked with observations and treatment need to be trained on the identification and scoring protocol employed, the treatments to be used (treatment protocols), record-keeping, and the observations needed to evaluate treatment success. Standardized operating procedures (SOPs) could be developed so that each calf receives the same attention. Ideas for developing SOPs have been described by Moore (2008).

Conclusions

Treatment success for calf cases of BRD depend on a number of factors. Early detection, proper identification, following a treatment protocol and label directions, and keeping treatment records are essential. The right hospital environment and the right people working and treating cattle will help with the recovery of those sick calves.

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