

Use of Treatment Records and Lung Lesion Scoring to Estimate the Effect of Respiratory Disease on Growth during Early and Late Finishing Periods in South African Feedlot Cattle

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Introduction

Bovine respiratory disease (BRD) is the most important disease of feedlot cattle worldwide, which, even in its subclinical form, negatively affects calf growth and therefore feedlot profitability. In order to accurately estimate the impact of BRD in the feedlot, it is necessary to account for both clinical and subclinical disease. Although most clinical cases occur during the first 3-6 weeks after arrival at the feedlot, the various persistent lung lesions may affect growth for a longer period of time. However, the effects of lesion type and extent and the time period during which they affect growth are uncertain. This study was done to estimate the effect of clinical and subclinical BRD, lung lesion type and lung lesion extent on growth during the early and late finishing period in South African feedlot calves.

Materials and Methods

Growth, morbidity and slaughter data from 2,036 calves in two South African commercial feedlots were used. Calves were weighed at processing (day 5 after arrival), on day 35 and at slaughter after a mean of 137 days on feed. All calves were monitored twice daily and were treated for BRD if rectal temperature was above 104°F (40°C) or if other specific signs of BRD were present. After slaughter, the occurrence and extent of parenchymal bronchopneumonic lesions and pleural adhesions were recorded. A combined case definition (treated for BRD and/or lung lesions present at slaughter) was used to estimate the overall incidence of BRD and to classify cases into clinical (treated for BRD) vs. subclinical (never treated but with lung lesions at slaughter). Multiple regression analysis was used to estimate the effect of clinical, subclinical and overall BRD, as well as different lesion types and extent, on growth rate during early (processing to day 35), late (day 35 to slaughter) and overall finishing periods.

Results

Subclinical BRD occurred in 29.7% of calves, and

clinical BRD in 22.6% of calves. Lung lesions were present in 43% of calves at slaughter; 8.6% had parenchymal lesions and 38.8% had pleural adhesions. Using the combined case definition, the incidence of BRD was 52.5%. During the early finishing period, clinical BRD reduced ADG by 0.48 lb (216 g; $P < 0.001$), subclinical BRD reduced ADG by 0.20 lb (91 g; $P < 0.001$) and the combined effect of BRD was a 0.32 lb (143 g) reduction in ADG ($P < 0.001$). After day 35, animals that had been treated for BRD tended to grow faster than those with subclinical BRD ($P = 0.11$). The extent of bronchopneumonic lesions at slaughter was not associated with reduced growth during the early finishing period ($P = 0.27$), but extensive lesions reduced ADG by 0.19 lb (88 g) during the late period ($P = 0.02$). In contrast, the extent of pleural adhesions was not associated with reduced growth rate during the late finishing period ($P = 0.37$) but was strongly associated with reduced ADG before day 35; there was a 0.22 lb (101 g) reduction ($P < 0.001$) and a 0.05 lb (220 g) reduction ($P = 0.01$) for adhesions involving <50% and >50% of the pleural surfaces, respectively. The overall effect of BRD was a 0.49 lb (24 g) reduction in ADG ($P = 0.02$) and a 5.1 day increase in days-on-feed ($P < 0.001$). The hidden cost of reduced growth rate due to BRD amounted to \$3.41 per calf with clinical or subclinical BRD, or \$1.79 per animal entering the feedlot.

Significance

Despite the fact that these were well managed feedlots, less than half of the BRD cases were detected clinically and treated. Both clinical and subclinical BRD reduced overall growth rate to a similar extent, but the effect was seen mainly during the early finishing period. We also showed that the extent of pleural adhesions at slaughter was an indicator of reduced growth during the early finishing period, whereas the extent of parenchymal lung lesions was associated with reduced growth rate only during the late finishing period. The use of both lung lesion scoring at slaughter and treatment records enabled a more realistic calculation of the overall extent and effect of respiratory disease in the

feedlot than using either measure alone. To our knowledge, this was the first study to use a combined case definition to estimate the overall effect of BRD on growth

in feedlot calves and the first report of the impact of BRD in South African feedlots.

Feedyard Managers and Veterinarian Response to a Delphi Feedyard Biosecurity Survey

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Introduction

Biosecurity is an important aspect of disease prevention in any agricultural production system. The beef feedyard is particularly vulnerable to disease introduction because of the large number of different cattle arriving from multiple sources. Additionally, the large concentration of animals makes a feedyard a likely target for bioterrorism from domestic or international terrorist groups. The economic losses that accompany the treatment or elimination of an infectious or toxic agent to a feedyard would be substantial. The purpose of this survey was to determine the importance of different aspects of biosecurity in feedyards utilizing a Delphi survey.

Materials and Methods

A Delphi survey series was submitted to feedyard veterinarians and the feedyard managers of midwestern feedyards to assess knowledge and opinion regarding biosecurity risks and practices. All feedyard managers included in the survey were chosen by recommendations from academic and consulting feedyard veterinarians. Managers from 17 feedyards were selected for participation. Based on recommendations by academic veterinarians associated with the beef industry, 13 veterinarians in consulting practice, academia and industry were selected for the survey. Feedyard managers and veterinarians were given the same survey with the addition of two questions in the veterinary survey. Veterinarians were additionally asked about security measures and risks from domestic and international

terrorist groups. They were also provided one fill-in-the-blank question for other suggestions.

The Delphi survey was repeated three times with each feedyard manager and veterinarian. Following each survey, results were compiled for the each group separately (feedyard managers and veterinarians). Median answers were determined for each question and the surveys were submitted again with the same questions including the median from the first survey. This process was repeated a second time using the median scores from the second survey answers in the third survey. Final median results were summarized for each question and each group for comparison.

Results

Results show that consulting veterinarians and feedyard managers have very similar views on the likelihood of disease caused by terrorism, natural introduction or accidental introduction, and on the importance of on-site security. They did, however, disagree on the importance of preventative products, environmental control and disease transmission control. The most significant difference between veterinarians and feedyard managers was found in the area of environmental control. In general, the veterinarians believed that environmental control was less important than the feedyard managers did.

Significance

A Delphi survey seeks to find the consensus opinion among anonymous contributors while allowing them to see what answers the others gave. It is a useful tool