EXTENSION
BEEF CATTLE RESEARCH UPDATE
Britt Hicks, Ph.D., PAS
Area Extension Livestock Specialist

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Evaluation of the Economic Effects of Bovine Respiratory Disease on Performance, Carcass Traits, and Economic Outcomes in Feedlot Cattle

Shipping fever, or bovine respiratory disease complex (BRD), is the most common morbidity and mortality event among feedlot cattle in the United States.[1] BRD accounts for approximately 75% of morbidity[2] and 50% to 70% of mortality in feedlots.[3] Research from 2006 showed that the economic loss associated with lower gains and treatment cost for BRD infection in a 1,000 head feedlot was $13.90 per animal, not including labor and associated handling costs.[4] Research has demonstrated that animal performance, carcass traits, and carcass value at slaughter decrease as both the number of BRD treatments and lung lesion severity at slaughter increase.[5, 6, 7, 8] A recent Australian study evaluated the impacts of BRD on performance, carcass traits, and economic outcomes defined using four BRD diagnosis methods: number of BRD treatments an animal received, pleural lesions at slaughter, lung lesions at slaughter, and clinical BRD status defined using both treatment records and lung and pleural lesions.[9]

In this study, 898 crossbred steers with an initial body weight of 953 lb were followed from feedlot entry to slaughter. Following feedlot entry animals were monitored for visual signs of BRD by trained feedlot pen riders once daily at approximately 6 am. Any animals exhibiting visual signs of BRD, including nasal or ocular discharge, cough, lethargy, depression, labored breathing, and depleted rumen fill were pulled from their pens and taken to the feedlot hospital for clinical measurements and treatment if required. Animals were followed through to slaughter at 112 to 122 days on feed. Veterinary treatment records were collected and lungs scored at slaughter for lesions indicative of BRD.

These researchers reported an 18% morbidity rate and a 2.1% BRD mortality rate, with an average net loss of ~$1,175 (US dollars) per BRD mortality. Steers treated 3 or more time for BRD had 87 lb lighter carcasses at slaughter and returned an average of ~$275 less compared to animals never treated for BRD ($P < 0.001$). In research published in 2009, Iowa State University investigated the effects of the BRD complex on economically important production traits with the use of health records in combination with lung lesion scores obtained at slaughter.[8] This study utilized 5,976 cattle which entered 10 different Midwestern feedlots between 2003 and 2006. These Iowa researchers reported that decreases in performance and carcass merit observed in this study were associated with a decline of $23.23, $30.15, and $54.01 in carcass value when comparing cattle never treated with cattle treated once, twice, or 3 or more times, respectively.

In the Australian study, steers with severe lung lesions at slaughter gained 0.66 lb/day less, had 32 lb lighter carcasses at slaughter, and returned ~$65 less than animals with no lung lesions ($P < 0.001$). Animals with subclinical and clinical BRD had 35 lb and 53 lb lighter carcasses, respectively, and returned ~$48 and ~ $153 less at slaughter, respectively, compared to healthy animals that were never treated with no lesions ($P < 0.001$). They also reported that the severity of BRD based on the number of treatments an animal received and the severity of lung and pleural lesions reduced animal performance, carcass weight and quality, and economic returns. Subclinical BRD reduced animal performance and economic returns compared to healthy animals. However, subclinical animals still had greater performance than animals with clinical BRD.

These authors concluded that the results of this study indicate that BRD morbidity and mortality have substantial impacts on animal performance and carcass traits, and that considerable economic losses occur as a result. Steers suffering from more severe BRD (2 or more treatments), clinical BRD, and those with severe lung lesions and pleurisy had lower performance and economic returns when compared with animals that suffered less severe or no BRD. Steers that received one

treatment for BRD showed similar slaughter value and net return to animals that were never treated for BRD. Thee concluded that these results “highlight the importance of effective and timely first treatments for BRD and indicate that efforts to increase the effectiveness could have positive impacts on economic return”.

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[1] USDA-APHIS (2013). Pages 18 in Feedlot 2011 Part IV: Health and Health Management on U.S. Feedlots with a Capacity of 1,000 or More Head. USDA-APHIS-Veterinary Services, Fort Collins, CO.

[2] Edwards, A. J. 1996. Respiratory diseases of feedlot cattle in the central USA. Bovine Practioner 30:5-7.

[3] Loneragan, G. H., D. A. Dargatz, P. S. Morley and M. A. Smith. 2001. Trends in mortality ratios among cattle in US feedlots. J. Am. Vet. Med. Assoc. 219: 1122-1127.

[4] Snowder, G. D., L. D. Van Vleck, L. V. Cundiff, and G. L. Bennett. 2006. Bovine respiratory disease in feedlot cattle: Environmental, genetic, and economic factors. J. Anim. Sci. 84:1999-2008.

[5] Waggoner, J. W., C. P. Mathis, C. A. Loest, J. E. Sawyer, F. T. McCollum, III, and J. P. Banta. 2007. Case study: Impact of morbidity in finishing beef steers on feedlot average daily gain, carcass characteristics, and carcass value. Prof. Anim. Sci. 23:174-178.

[6] Montgomery, S. P., J. J. Sindt, M. A. Greenquist, W. F. Miller, J. N. Pike, E. R. Loe, M. J. Sulpizio, and J. S. Drouillard. 2009. Plasma metabolites of receiving heifers and the relationship between apparent bovine respiratory disease, body weight gain, and carcass characteristics. J. Anim. Sci. 87: 328-333.

[7] Reinhardt, C. D., M. L. Hands, T. T. Marston, J. W. Waggoner, and L. R. Corah. 2012. Relationships between feedlot health, average daily gain, and carcass traits of angus steers. Prof. Anim. Sci. 28:11-19.

[8] Schneider, M. J., R. G. Tait Jr., W. D. Busby, and J. M. Reecy. 2009. An evaluation of bovine respiratory disease complex in feedlot cattle: Impact on performance and carcass traits using treatment records and lung lesion scores. J. Anim. Sci. 87: 1821-1827.

[9] Blakebrough-Hall, C., J. P. McMeniman and L. A. González. 2020. An evaluation of the economic effects of bovine respiratory disease on animal performance, carcass traits, and economic outcomes in feedlot cattle defined using four BRD diagnosis methods. J. Anim. Sci. 98. Available at: https://doi.org/10.1093/jas/skaa005.