BEEF CATTLE RESEARCH UPDATE

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Effect of Bovine Respiratory Disease and Overall Pathogenic Disease Incidence on Carcass Traits

Recent research at the U.S. Meat Animal Research Center in clay Center, NE evaluated the effects of incidence of bovine respiratory disease (BRD) and overall incidence of pathogenic diseases (IPD) on carcass traits of two independent populations of cattle.[1] The first population included 642 crossbred steers of *Bos taurus* descent (sired by seven different British and Continental breeds). The second population included 621 crossbred steers sired by tropically adapted *Bos taurus* and *Bos indicus* breeds. The percentage of animals treated for IPD was 31 and 29% in populations 1 and 2, respectively. The most common source of illness in both populations was BRD with treatment rates of 20 and 24%, respectively, in the two populations. In both populations, cattle treated for BRD or IPD produced carcasses with significantly less fat thickness and lower yield grades when compared to non-treated cattle. In the first population, the percentage of cattle grading Choice tended to be reduced in BRD treated cattle. Meat tenderness as measured by Warner-Bratzler shear force was significantly reduced in cattle treated for BRD in population 2, but not in population 1. The results of this research agree with numerous other studies that have shown that morbidity in feedlots suppresses performance and carcass quality and value.[2,3,4,5,6,7] Based on the results of this study, the researchers concluded that the relationship between disease and carcass traits should be given consideration by future studies that aim to develop selection strategies based on specific traits.

Heritability of Bovine Respiratory Disease

Since BRD is the most common and costly beef cattle disease in the United States, Iowa State University researchers studied the heritability of BRD incidence in beef calves before weaning and during the finishing phase.[8] The preweaned data analyzed in this study were obtained from 1,519 calves with known purebred sires born from spring 1997 to fall 2006 at the Iowa State University Teaching Farm located in Ames, IA. The feedlot data analyzed in this study were obtained from 3,277 head of cattle with known Angus sires enrolled in the Tri-County Steer Carcass Futurity (located in Southwest Iowa) between 2003 and 2006.

This paper noted that the incidence rate of BRD in preweaned calves was 11.39%. The average age at weaning in the preweaned calves was 176 days and the average age of first BRD treatment was 118 days. Among treated cattle, 82.1% were treated once, 13.9% were treated twice, and 4.0% were treated 3 times or more. It was reported that the incidence of BRD ($P = 0.35$) or the number of BRD treatments ($P = 0.77$) had no significant effect on weaning weights. These researchers suggested that these results indicate that BRD infection may not have been severe enough to reduce performance or that treatment for BRD-stricken cattle was effective in combating disease. The heritability estimates of these preweaned calves for BRD resistance and number of treatments were only 0.11 and 0.08, respectively.

The average delivery and final weights in the feedlot cattle were 631 and 1180 lb, respectively. The incidence of BRD in these feedlot cattle was 9.43%. Among treated cattle, 47.9% were treated once, 36.6% were treated twice, and 15.5% were treated 3 times or more. Cattle treated for BRD had significantly lower feedlot gains and yielded lighter carcasses (20 lb less) with less backfat and marbling. It was reported that these values generally decreased as the number of BRD treatments increased. The heritability estimates for BRD resistance and number of treatments were only 0.07 and 0.02, respectively. This heritability estimate for BRD resistance is similar to that reported in research at the U.S. Meat Animal Research Center (estimates of 0.04 to 0.08).[9,10] This Iowa study indicated that selection for BRD resistance may have little to favorable effects on hot carcass weight,

ribeye area, and backfat thickness due to low genetics correlations between BRD incidence and these traits. Favorable genetic correlation estimates for feedlot daily gain, final weight, and marbling with either health measure were also reported. These researchers concluded that because of the high economic cost associated with BRD incidence, even these low estimates for heritability of BRD resistance should be considered for incorporation into beef cattle breeding programs.

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