

The impact of commingling preconditioned calves on mortality, morbidity and performance in a feedlot

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Introduction

Bovine respiratory disease (BRD) is the most important disease in the North American beef industry, causing substantial economic losses due to morbidity and mortality, including treatments, reduced performance, and increased antimicrobial use. Preconditioning (PC) to mitigate BRD was proposed as early as 1967 and constitutes management practices that reduce stressors and optimize resilience through vaccination against bacterial and viral pathogens, optimized timing of dehorning, castration, best weaning strategy, and training calves to eat from a bunk and drink from a water source at least 45 d before transport to the feedlot. Despite proven profits for preconditioning of beef calves, PC hasn't been established in the current beef industry. Besides the lack of premiums paid, there is also the question if commingling of PC and auction-derived (AD) calves in the feedlot can hamper PC calves' expected growth and health advantages. Therefore, our objective was to evaluate the impact of optimally preconditioned calves on mortality, morbidity and average daily gain (ADG) during the first 40 days in the feedlot when PC calves were commingled with different proportions of AD calves (25, 50, 75%).

Materials and methods

The first 250 bull calves born to adult dams were enrolled, and subject to the preconditioning protocol at WA Ranches of the University of Calgary, including processing at D60, fence-line weaning and bunk feeding (PC, n = 250). In fall, beef calves of the same average size and frame from a local auction market were sourced (AD, n = 250). Upon arrival at the feedlot, all calves underwent an identical arrival protocol and were assigned into 1 of 5 pens: 100% PC (100 PC), 100% AD (0 PC), 50% PC/50% AD (50 PC), 75% PC/25% AD (75 PC), and 25% PC/75% AD (25 PC). Morbidities, mortalities and weights were recorded until day 40. Hair samples from each calf were collected for cortisol detection as a measure of chronic stress.

Results

In the first 40 days, 5 AD calves died, with 3 deaths in 100AD pen and 2 AD deaths in the 25PC pen. A total of 190 animals were diagnosed with BRD (66 PC and 124 AD respectively). At pen level, morbidity was highest in 25 PC and 0 PC (63 and 50%, respectively) and least in 50 PC (23%). Irrespective of ratio of commingling, PC calves had lower morbidity than AD calves over 40 days at the feedlot. Furthermore, pen placement did not significantly affect morbidity of PC calves. Therefore, we inferred that commingling did not affect BRD morbidity.

The mean ADG in 0 PC pen (3.16 lb/day) was significantly higher than rest of the groups ($P < 0.05$). Finally, no difference in cortisol concentration was found between best performing PC calves (n = 26, mean = 19.26 pg/mg) and least performing AD calves (n = 25, mean = 19.36 pg/mg) ($P < 0.05$).

Results

In our study, commingling had no effect on PC calf performance, as PC calf morbidities were significantly lower compared to AD irrespective of pen placement. However, growth in AD calves was higher, explained by the low variability in feedlot arrival weights of AD versus PC calves. This was due to PC sourcing for the study at birth.

Significance

Despite the lower ADG, PC calves outperformed AD calves regardless of commingling rate with AD calves reflected in a significantly lower morbidity rate, resulting in significantly lower treatment rates. Therefore, there is a place for preconditioning in our current beef industry when striving for reduction in antimicrobial use.

