

# Delaying Implant in High-Risk Calves Has No Benefit for Health or Feedlot Performance

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## Introduction

Bovine respiratory disease is the most common and costly disease in the beef industry. Calves affected by bovine respiratory disease have a 53-lb decrease in finished weights and decreased quality grades compared with healthy cattle.

Many stressors influence post-arrival health and nutrient intake, including weaning, marketing, transportation, co-mingling, genetics, previous nutrition, and health history. These stressors can negatively affect the immune system at a time when the animal is more likely to be exposed to infectious agents within the bovine respiratory disease complex. Feed intake by stressed calves is low, and low nutrient intake likely increases the negative effects of stress on the immune system.

Delaying the initial steroid implant may reduce post-transit stress and improve carcass quality of feedlot cattle. This study was designed to examine the effects of administering initial steroid implants at feedlot arrival or 45 days after feedlot arrival on health, performance, and carcass characteristics of feeder calves at relatively high risk for bovine respiratory disease.

## Experimental Procedures

Calves ( $n = 1,601$ ;  $604 \pm 10.3$  lb) were shipped to a commercial feedyard in central Kansas and were allowed to rest overnight prior to processing. At processing, calves were randomized either to receive an initial implant (Revalor XS; 40 mg estradiol  $17\beta$  + 200 mg trenbolone acetate) on day 1 or to receive the same initial implant on day 45 post-processing. Cattle were randomly assigned to treatment in groups of 5 animals as they were moved through the processing barn. Groups were assigned subsequently to pens within treatment groups (approximately 80 animals/pen; 10 pens/treatment).

Cattle were weighed individually on day 0 and day 45, and their final body weight was estimated by dividing the hot carcass weight by the average dressing percentage of the pen. Weight of feed offered was recorded daily. Feed bunks were managed such that all feed offered was consumed within 24 hours.

Cattle were observed daily by trained feedyard personnel for disease or injury. Cattle deemed sick or injured were removed from the home pen for further diagnosis. Reason for death or removal, date, and body weight were recorded.

Cattle were shipped by replicate to a commercial slaughter facility. Trained abattoir personnel recorded hot carcass weights. Quality grade and yield grade of all carcasses were assigned by USDA personnel. Trained university personnel recorded lung lesions, liver abscess lesions, and thoracic peel-out lesions at the time of slaughter.

## Results and Discussion

Cattle performance and carcass characteristics were not affected by delaying the initial implant by 45 days (Tables 1 and 2). Cattle in the delayed-implant group had similar carcass weights ( $P = 0.20$ ) compared with the arrival-implant group. Yield grades were not affected ( $P = 0.16$ ) by treatment; however, delayed implanting tended to increase ( $P = 0.09$ ) carcass value per pound. There was no difference in death loss or death loss due to respiratory disease for cattle that received their implant on arrival compared with delayed-implant cattle. Treatment did not affect ( $P = 0.13$ ) the percentage of cattle pulled for disease; conversely, delaying implantation decreased ( $P = 0.02$ ) the percentage of cattle railed due to chronic bovine respiratory disease illness (Table 3). Treatment did not affect ( $P = 0.11$ ) case fatality rates.

Delaying implant administration did not affect peel-out rates, lung lesion rates, or liver abscess rates (Table 4). Over 50% of all cattle had lung lesions at slaughter, which indicated that they experienced a severe bovine respiratory disease challenge during the study. Pleural adhesion rates in this study averaged 20.7%.

## Implications

High-risk calves can be implanted upon feedlot arrival without increasing risk of disease or harming performance.

**Table 1. Feedlot performance and cost of gain for steers at high relative risk for bovine respiratory disease that were implanted either immediately upon feedlot arrival (Arrival) or 45 days post-arrival (Delayed)**

Item	Arrival	Delayed	SEM	<i>P</i> -value
Number of pens	10	10		
Number of cattle	801	800		
Initial body weight, lb	604	603	10.5	0.97
Final body weight, lb	1,303	1,296	12.2	0.56
Average daily gain, lb	3.17	3.09	0.59	0.56
Dry matter intake, lb/day	19.45	19.24	0.24	0.40
Feed:gain	6.21	6.30	0.309	0.77
Days on feed	187	187	3.6	0.96
Cost of gain, deads in, \$/cwt	76.24	77.50	4.01	0.76
Cost of gain, deads out, \$/cwt	69.87	70.42	1.92	0.78

**Table 2. Carcass traits and carcass value for steers at high relative risk for bovine respiratory disease that were implanted either immediately upon feedlot arrival (Arrival) or 45 days post-arrival (Delayed)**

Item	Arrival	Delayed	SEM	<i>P</i> -value
Number of pens	10	10		
Number of cattle	801	800		
Hot carcass weight, lb	853	842	8.0	0.20
Quality grade				
Choice, %	42.8	44.1	3.00	0.67
Premium Choice, %	3.6	4.4	1.03	0.44
Select, %	52.7	52.2	3.24	0.87
No Roll, %	4.1	3.8	1.11	0.73
Yield grade	2.24	2.10	0.098	0.16
Yield grade 1, %	19	24.7	4.42	0.21
Yield grade 2, %	44.1	45.3	5.04	0.82
Yield grade 3, %	31.5	25.8	4.59	0.23
Yield grade 4, %	4.9	4.3	1.36	0.65
Price, \$/cwt	\$92.21	\$93.62	0.79	0.09
Total sales, \$/head	\$1,109.10	\$1,111.31	29.4	0.94

**Table 3. Health data for steers at high relative risk for bovine respiratory disease that were implanted either immediately upon feedlot arrival (Arrival) or 45 days post-arrival (Delayed)**

Item	Arrival	Delayed	SEM	<i>P</i> -value
Number of pens	10	10		
Number of cattle	801	800		
Morbidity, %	28.5	24.7	2.35	0.13
Days on feed at first treatment	30	27	5.6	0.58
Retreatment, %	9.4	8.2	1.18	0.31
Medicine cost, \$/head	22.33	21.74	1.24	0.64
Railed, %	3.3	1.8	0.63	0.02
Mortality, %	7.9	9.0	2.07	0.61
Respiratory mortality, %	3.3	4.5	1.49	0.43
Case fatality rate, %	12.4	19.4	4.11	0.11

**Table 4. Liver and lung abnormalities for steers at high relative risk for bovine respiratory disease that were implanted either immediately upon feedlot arrival (Arrival) or 45 days post-arrival (Delayed)**

Item	Arrival	Delayed	SEM	<i>P</i> -value
Number of pens	10	10		
Number of cattle	801	800		
Pleural adhesions, %	20.1	21.3	2.45	0.63
Lung lesions, %	55.5	58.1	2.94	0.41
None	42.3	41.3	3.22	0.77
Minor	26.7	27.6	3.63	0.80
Severe	28.9	30.5	3.20	0.63
Abscessed livers, %	17.1	19.7	3.54	0.46
A-, %	13.8	15.3	3.62	0.69
Ao, %	2.1	3.2	1.20	0.40
A+, %	1.1	1.3	0.53	0.78