

Effects of SRP[®] *E. coli* Vaccine Technology on Feeder Cattle Performance, Health, and Carcass Characteristics

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Introduction

The use of SRP[®] *E. coli* vaccine technology effectively decreases the prevalence of *E. coli* O157:H7 in feeder cattle, thus making it a valuable tool for increasing food safety in the beef industry. However, questions continue to be raised about the vaccine effects on economic drivers in cattle feeding. The aim of the study was to assess the effect of vaccinating cattle three times with SRP[®] *E. coli* vaccine technology versus a placebo (control) on performance, health, and carcass characteristics of cattle fed in commercial feedlots.

Materials and Methods

Sixty pens of feeder cattle (4,869 head, BW 728 ± 12.7 lb; 330 ± 5.7 kg) housed at four commercial feedlots in Kansas and Nebraska were administered one of two treatments: 1) injected subcutaneously with 2 ml of SRP *E. coli* O157:H7 vaccine on day 0, revaccinated with a second dose between 21-29 days-on-feed (DOF), and given a third dose given between 42-57 DOF (VAC) or 2) injected subcutaneously with a placebo containing physiological saline emulsified with a commercial adjuvant on days 0, and then revaccinated with a second dose between 21-29 DOF, and given a third dose between 42-57 DOF (CON). Cattle were individually weighed on day 0 and pen weighed on the day of harvest. Daily feed delivery was captured by load cells on feed trucks and recorded on computer programs at the feedyard. Animal health was observed by trained feedlot personnel, and

data were recorded into the animal health computer at the feedyard. Pen closeout data were provided by each respective feedlot. Carcass characteristic data were collected and recorded by trained personnel at the commercial abattoir. LS Means were calculated using the MIXED procedures of SAS (SAS version 9; SAS Institute Inc, Cary, NC).

Results

No negative effects on performance or health were observed when feeder cattle were vaccinated with three doses of SRP[®] *E. coli* vaccine compared to CON. Average daily gain was not different between treatments (3.09 vs 3.11 lb; 1.4 vs 1.41 kg for CON and VAC, respectively; $P=0.73$). Likewise, CON and VAC did not differ in percent prime and choice (46.1 vs 45.3%; $P=0.61$) or percent yield grade 1 and 2 (68.6 vs 69.1%; $P=0.76$). Mortality rate was identical for both treatments (3.2%, $P=0.98$).

Significance

Based on these observations, SRP[®] *E. coli* technology may be used to reduce the prevalence of *E. coli* O157:H7 without negative repercussions on welfare or profitability of cattle feeding. However, it must be noted that CON was subjected to the same number of pen removals for revaccination as VAC, thus the need for examination of the effects of no vaccination and no pen removals versus multiple pen removals for vaccination is warranted.