

TITLE: \$100 Dollars more for your Feed Lot Steers

Historically ENDOVAC-Bovi® has been the gold standard for protecting neonatal and light weight calves from Gram negative diarrheas and pneumonias. Recent studies have shown that pre-conditioning of feed lot steers with ENDOVAC-Bovi® (IMMVAC, INC., 6080 Bass Lane, Columbia, MO 65201; Ph. 573-443-5363) a) not only reduces the incidence of illness and treatment costs, but b) more importantly **increases average weight gain by 143 to 186 pounds over the finishing cycle, thus increasing the bottom line by \$143 to \$186 per head at today's prices.**

For two consecutive years steers receiving two doses of ENDOVAC-Bovi® before entering the finishing lots were compared to similar groups of non-vaccinated animals as controls. The steers were good quality Black Angus or Black Angus crosses (black baldies) sired by registered Black Angus bulls, weighing 550 to 650 pounds when processed for spring pasture in April-May of each year.

All of the animals received a 2 milliliter dose of modified live virus vaccine (IBR-BVD-PI3-BRSV: TITANIUM®, AgriLabs, St. Joseph, MO 64505), 5 milliliters of killed Clostridial vaccine (Ultrabac® 7, Pfizer Animal Health, Exton, PA 19341), 75-100 milliliters of pour on insecticide (SYNERGIZED DELICE, Schering Plough Animal Health, Union, N.J. 07083), and fly tags. Approximately half of the steers also received a 2 milliliter dose of ENDOVAC-Bovi® while the remainder did not receive ENDOVAC-Bovi® to serve as controls.

After spring processing, all of the animals were co-mingled and placed on mixed grass pasture of K-31 fescue, red clover, and lespedeza with ad lib access to mineral salt and water for 180 to 200 days. The steers were not handled again until the end of the year when they were rounded up for shipment to the finishing pens at the Knight Feedlot, Inc., 1768 Avenue J., Lyons, Kansas 67554, Mark Knight, Manager (Phone 620/257-5106). All of the animals that had received a 2 milliliter dose of ENDOVAC-Bovi® in the spring were administered a second 2 milliliter dose 24-48 hours before they were loaded onto trucks for the 8-10 hours transport to the Knight Feedlot in central Kansas.

Table 1: 2006-2007 FEEDLOT STEERS

ENDOVAC-Bovi® Vaccinated Steers	Non-Vaccinated Steers (Controls)
N = 147	N = 153
Weight in = 789 Lbs	Weight in = 741 Lbs
Days on Feed = 113	Days on Feed = 113
Weight out = 1293 Lbs	Weight out = 1107 Lbs
Avg. Daily Gain = 5.19	Avg. Daily Gain = 3.77
Dry Conversion = 5.19	Dry conversion = 5.98
Standard Deviation = 261 Lbs	Standard Deviation = 227 Lbs

Statistical Test: 2 sample test

Hypothesis (H₀): ENDOVAC-Bovi® Vaccinates = Non-Vaccinates

Alternate Hypothesis (H_a): ENDOVAC-Bovi® Vaccinates ≠ Non-Vaccinates

Result: t = 6.594, P<0.0001 with 298 degrees of freedom. Therefore Reject H₀, Accept H_a.

Conclusions:

- 1) The Average Weight out of the ENDOVAC-Bovi® Vaccinates is different or more than the Average Weight out for the Non-Vaccinates (Controls), and the probability of a Type 1 error < 10⁻¹⁰.
- 2) Vac. Avg. Wt. out – Control Avg. Wt. out = (1293 Lbs -1107 Lbs) = 186 Lbs
- 3) Vac. Avg. Daily Gain – Contrl. Avg. Daily Gain = (5.19 - 3.77) X 113 = 160.5 Lbs
- 4) Bottom Line: 186 Lbs/steer X US\$1/Lb = **Additional margin of US\$186/steer**

The 2006-2007 set of steers in the pasture phase cycle were grazed on average to poor quality pasture because of the moderate to severe drought conditions in central Missouri in the summer-fall of 2006. However, temperatures and other climatic conditions were almost ideal, mild and dry in the feedlot phase from mid-January, 2007 until May 04, 2007 when they were marketed. The 2006-07 set of animals were in the feedlot for 113 days, and the ENDOVAC-Bovi® vaccinates gained an average of 5.19 pounds per day in contrast to the non-vaccinates which averaged 3.77 pounds per day. The vaccinates each averaged 48 pounds more than the non-vaccinates on entering the finish lot, and averaged 1293 pounds at finish compared to 1107 pounds for the non-vaccinates, or 186 pounds more than the non-vaccinates at completion of the finish cycle. The feed to gain ratio also was best for the vaccinates (5.19 pounds of feed per pound of gain), and was significantly different ($P \leq 0.01$) than the non-vaccinates 5.98 pounds of feed per pound of gain. Carcass data was not available for the 2006-2007 steers.

Table 2: 2007-2008 FEEDLOT STEERS

ENDOVAC-Bovi® Vaccinated Steers

Non-Vaccinated Steers (Controls)

N = 90

Weight in = 724 Lbs

Days on Feed = 164

Weight out = 1364 Lbs

Avg. Daily Gain = 4.76

Dry Conversion = 5.36

Standard Deviation = 261 Lbs

N = 126

Weight in = 700 Lbs

Days on Feed = 164

Weight out = 1221 Lbs

Avg. Daily Gain = 3.84

Dry conversion = 5.98

Standard Deviation = 227 Lbs

Statistical Test: 2 sample test

Hypothesis (H₀): ENDOVAC-Bovi® Vaccinates = Non-Vaccinates

Alternate Hypothesis (H_a): ENDOVAC-Bovi® Vaccinates ≠ Non-Vaccinates

Result: t = 2.29, P<0.00003 with 214 degrees of freedom. Therefore Reject H₀, Accept H_a

Conclusions:

2) The Average Weight out of the ENDOVAC-Bovi® Vaccinates is different or more than the Average Weight out for the Non-Vaccinates (Controls), and the probability of a Type 1 error = 0.007.

2) Vac. Avg. Wt. Out – Control Avg. Wt. Out = (1364 Lbs – 1221 Lbs) = 143 Lbs 3) Vac.

Avg. Daily Gain Contrl. Avg. Daily Gain (4.76 – 3.84) X 164 = 150.9 Lbs 4) Bottom Line:

143 Lbs/steer X US\$1/Lb = **Additional margin of US\$143/steer**

In contrast, the steers in the 2007-2008 cycle stood in snow with below normal temperatures from mid December, 2007 when they were shipped to the Knight Feedlot until the first week of March, 2008. They remained in the finish yard for 164 days until they were marketed May 27, 2008. The average daily gain was higher for the ENDOVAC-Bovi® vaccinates (90) which gained 4.76 pounds per day in contrast to the non-vaccinates (126) which averaged 3.84 pounds per day. Each of the vaccinates averaged 24 pounds more than the non-vaccinates on entering the finish lot, and averaged 1364 and 1221 pounds respectively at the end of the feeding period; or 143 pounds more than the non-vaccinates at completion of the finish cycle. The feed to gain also was

significantly (P value ≤ 0.07) better for the vaccinates with 5.36 pounds of feed per pound of gain versus 5.98 for the non-vaccinates. The average weight of the vaccinates (1409 lbs) was 85 pounds more than for the non-vaccinates (1324 lbs) at slaughter. The carcass weights were significantly different (vaccinates = 915 pounds vs. 861 pounds for the non-vaccinates, P=0.001), and both dressed out about the same percentage (64.9-65.1%). Although the Ribeye was higher in the vaccinates (14.5% for vaccinates vs. 13.9% for non-vaccinates, P=0.005) there were no significant differences in grading or other carcass data.

In Summary: These studies suggest that feeder steers pre-conditioned with 2 doses of ENDOVAC-Bovi® before transfer to the finishing lots gained 143-186 pounds more, and had significantly better feed conversion than non-vaccinated controls finished under the same conditions. The greater average weights of the vaccinates vs. controls (although not significant) entering the finish lots off of pasture also suggests that feeder calves may fair better even under pasture conditions when vaccinated with only one dose of ENDOVAC-Bovi®. Doctor Harold Garner, one of the inventors of the ENDOVAC-Bovi® vaccine technology has suggested for years that feeder calves passing through his back grounding operation, vaccinated with ENDOVAC-Bovi® generally are healthier and appear to do better in the pre-conditioning process. Numerous other veterinarians knowledgeable of the beef cattle industry and the feeder-calf feedlot process have made similar observations, although no definitive data has been available to confirm their hypothesis.

However, since it is known that calves on hot rations release elevated levels of endotoxins in the gut and circulation and that one of the major roles of ENDOVAC-Bovi® is stimulation of antibodies that neutralize bacterial endotoxins, then it is logical to assume neutralization of endotoxin is involved in the improved weight gains and feed conversions in finishing calves. In today's beef economy, optimizing herd health and weight gains are essential to the bottom line. By raising the bar of cross protection, ENDOVAC-Bovi® is helping cattle feeders increase their profit margin.

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