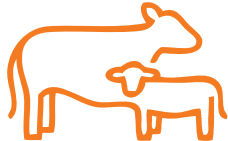


# TECHNICAL BULLETIN

April 2016



## SYNOVEX® ONE-FEEDLOT Implants in Feedlot Steers: 4-Site Clinical Trial Results

**Zoetis**

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### Summary

- A multi-location clinical study was conducted in feedlot steers to evaluate the effect of SYNOVEX® ONE-FEEDLOT (SYNOVEX ONE) on growth performance over a 200-day period and carcass traits.
- Feedlot beef steers in ID, TX, KS, and CO were sham-implanted (n=342) or implanted with SYNOVEX ONE (n=342). Growth performance was measured for approximately 200 days and carcasses were evaluated in commercial slaughter plants.
- SYNOVEX ONE improved performance over the approximately 200-day period. ADG was increased 15% and final live body weight was increased 94 lb. Feed efficiency was increased 9.2% in spite of a 4.7% increase in dry matter intake (DMI).
- SYNOVEX ONE increased carcass value. Hot carcass weight was increased 57.8 lb and ribeye area was increased 0.91 in<sup>2</sup>.
- Compared with negative controls, marbling score was decreased 5.5% and prime and choice carcasses were decreased 12.7 percentage units for SYNOVEX ONE-implanted steers.

**F**ew beef cattle management practices are more cost effective or provide a higher return on investment (ROI) than growth promoting implants. Because cattle feedlots operate on narrow profit margins, costs of production are critically important and the ROI for implants is greater than for any other technology. Animals with implants grow faster, use less nitrogen, produce less CO<sub>2</sub> and CH<sub>4</sub> per pound of protein, and have heavier carcasses than animals without implants. Of the variety of implants used routinely in the commercial feedlot industry, most have a duration ranging from 60 to 120 days and typical programs include reimplantation. Although reimplantation is sometimes combined with other

prophylactic treatments and vaccinations, it is associated with additional costs of handling and loss of performance. Thus, use of a single implant that maintains production benefits over an entire finishing period is of significant value to the producer compared to reimplant strategies.

Zoetis has developed a single implant with a coating that prolongs release of 200 mg of trenbolone acetate (TBA) and 28 mg of estradiol benzoate (EB) to improve performance over a 200-day finishing period. This bulletin summarizes the growth and carcass responses of feedlot steers to the SYNOVEX® ONE-FEEDLOT (SYNOVEX ONE) implant administered approximately 200 days before slaughter.

## Experiment Design

A randomized block design consisting of 9 blocks of cattle and 2 treatment groups was used at each site. The treatment groups were:

- sham-implanted control (implant gun needle inserted subcutaneously at ear injection site and withdrawn, but no growth implant administered);
- SYNOVEX ONE implant containing 200 mg TBA and 28 mg EB.

After the completion of the study, the animals were harvested at a commercial beef processing facility and carcass data were obtained.

Animals were housed in outdoor pens that were naturally lighted and ventilated, 8 to 10 head/pen. No other growth promoters or feed additives (ionophores, in-feed antibiotics, etc.) were fed during the study.

## Results

### Growth performance

Starting on day 35, animals with the SYNOVEX ONE implant weighed significantly more than the sham-implanted animals such that by day 198 they had gained 94 lb more live weight than the sham-implanted animals (Figure 1). In addition, the shape of the growth rate shows the body weights continued to diverge to the end of the study, indicating that the implants were continuously active for the full duration of the study.

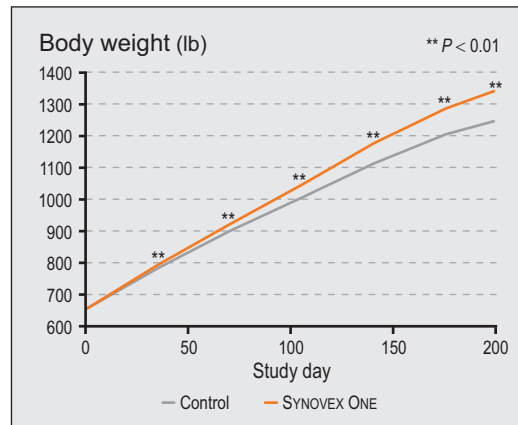


Figure 1 – Body weights of control and SYNOVEX ONE steers.

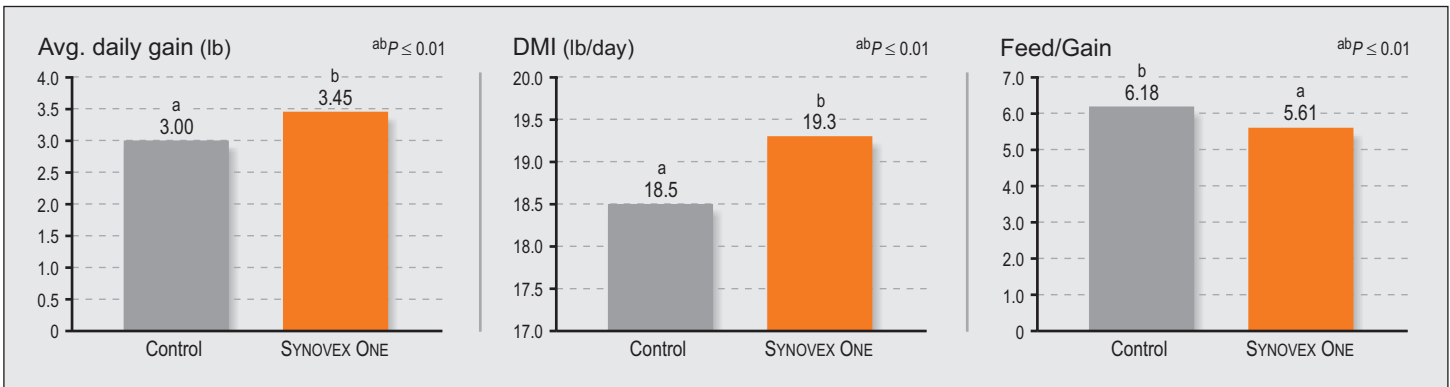


Figure 2 – Performance results.

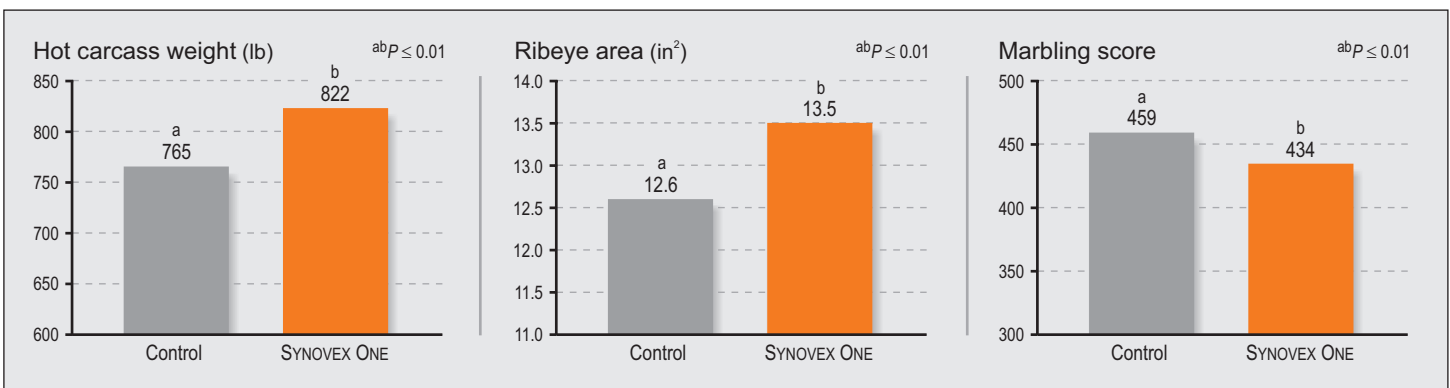


Figure 3 – Carcass parameters.

Compared with sham-implanted controls, animals implanted with SYNOVEX ONE had 15% faster ADG ( $P = 0.0023$ ), 4.7% higher DMI intakes ( $P = 0.0003$ ), and 9.2% better feed efficiency ( $P = 0.0047$ ) (Figure 2).

### Carcass composition

Hot carcass weights and ribeye areas were increased 57.8 lb ( $P = 0.0045$ ) and 0.91 in<sup>2</sup> ( $P < 0.0001$ ), respectively, and marbling score was negatively ( $P = 0.0003$ ) affected by SYNOVEX ONE (Figure 3). There were no treatment effects on KPH percent fat, backfat thickness, yield grade, or dressing percentage.

There was fewer percentage of choice and leaner carcasses for SYNOVEX ONE animals compared with sham-implanted controls ( $P = 0.0007$ , Fisher's Exact test, Figures 4 and 5).

Distribution of normal and abnormal liver scores did not differ between treatment groups ( $P = 0.2282$ ). Across treatment

groups, 42.2% of animals that completed the study had a liver score with abscesses of varying severity. The incidence rate would have been reduced had diets included ionophores and/or antibiotics.

### Conclusions

Use of the 200-day SYNOVEX ONE implant effectively improved 200-day growth performance and carcass attributes.

- **Growth performance.** Average daily gain and feed efficiency were increased 15% and 9.2%, respectively, in spite of a 4.7% increase in dry matter intake.
- **Carcass attributes.** Final live body weight and hot carcass weight were increased 94 and 57.8 lb, respectively, and ribeye area was increased 0.91 in<sup>2</sup>.
- Marbling score was decreased 5.5% and choice and better reduced by 12.7 percentage units.

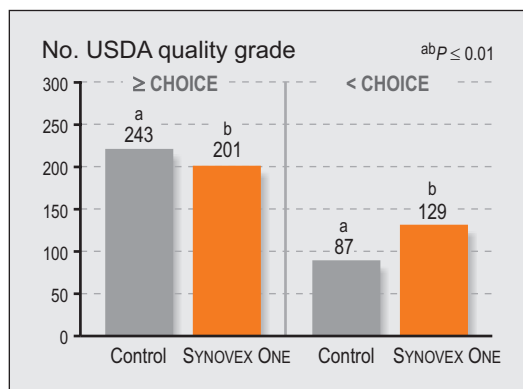


Figure 4 – Number of USDA quality grade.

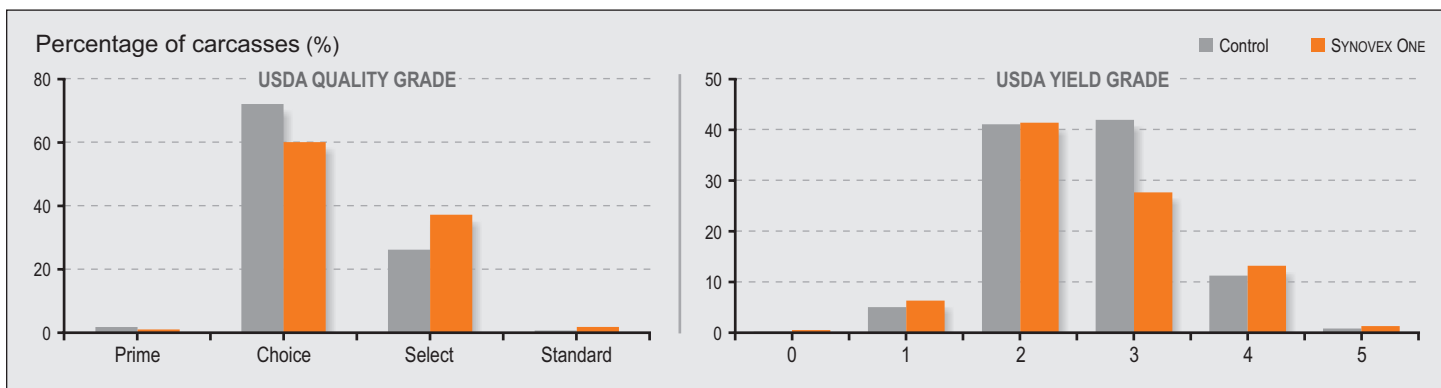


Figure 5 – Percentage of USDA quality grade and yield grade carcasses.

**Table 1 – Summary of performance and carcass characteristics.**

Parameter	SYNOVEX ONE	Control	SEM	P value
No. pens	36	36		
Average daily gain (lb/day)	3.45	3.00	0.064	0.0023
Dry matter intake (lb/day)	19.34	18.48	0.412	0.0003
Gain efficiency (ADG/DMI)	0.179	0.163	0.004	0.0026
Feed efficiency (DMI/ADG)	5.61	6.18	---	0.0047
Hot carcass weight (lb)	822.3	764.5	21.3	0.0045
Kidney, pelvic, heart fat (%)	1.90	1.93	0.022	0.1944
Ribeye area (in <sup>2</sup> )	13.48	12.57	0.153	< 0.0001
Backfat thickness (in)	0.55	0.54	0.021	0.3098
Marbling score	433.5	458.8	4.8	0.0003
Yield grade	3.08	3.11	0.111	0.6466
Dressing percent	61.32	61.27	0.284	0.7158
<b>USDA Quality Grade (%)</b>				
Carcasses with grades (n)	330	330	NA	0.0007 <sup>1</sup>
Prime	0.6	1.5		
Choice	60.3	72.1		
Select	37.6	26.1		
Standard	1.5	0.3		
<b>Calculated Yield Grade (%)</b>				
Carcasses with grades (n)	329	329	NA	NA
0	0.3	0.0		
1	6.4	5.2		
2	41.3	41.0		
3	37.7	41.9		
4	13.1	11.2		
5	1.2	0.6		
<b>Liver scores (n)</b>				
Normal liver	178	188	NA	0.2282
Abscessed liver	143	124		

<sup>1</sup> Quality grade data were evaluated by comparing the proportions grading Prime and Choice vs. lower than Choice for each treatment by the 2-sided Fisher's exact test.

Do not use SYNOVEX products in veal calves. Refer to label for complete directions for use, precautions, and warnings.

## References

1. Data on file, Report No. GASD 16-20.00, Zoetis Inc.



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