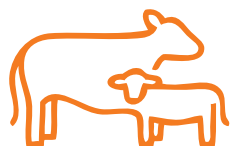


TECHNICAL BULLETIN

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SYNOVEX CHOICE[®] Implants in Feedlot Heifers: 4-site Clinical Trial Results

Zoetis

Florham Park, NJ 07932

Summary

- A multi-location clinical study was conducted in feedlot heifers to evaluate the effects of SYNOVEX CHOICE[®] on growth performance over a 112-day period and carcass traits.¹
- A total of 1824 feedlot beef heifers in ID, CO, TX, and KS were sham-implanted or implanted with SYNOVEX CHOICE, with trenbolone acetate (TBA) only, or estradiol benzoate (EB) only (n = 456/group). Growth performance was measured for a approximately 112 days and carcasses were evaluated in commercial slaughter plants.
- SYNOVEX CHOICE improved performance over the approximately 112-day period. Average daily gain (ADG) and feed efficiency (FE) were improved by SYNOVEX CHOICE compared with sham-implanted cattle or animals implanted with EB or TBA alone. ADG and FE were increased for all implanted cattle compared with the sham-implanted controls.
- SYNOVEX CHOICE increased carcass value. Hot carcass weight was increased 26.6 lb and ribeye area was increased 0.6 in² compared with all other treatment groups, and dressing percent was increased 0.5 percentage point compared with controls.
- These data justify additional label claims for use of SYNOVEX CHOICE for improved rate of weight gain and feed efficiency in heifers fed in confinement for slaughter.

Few 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 CO₂ and CH₄ per pound of protein, and have heavier carcasses than animals without implants. Numerous types of implants are

available, including SYNOVEX CHOICE[®] [100 mg trenbolone acetate (TBA) and 14 mg of estradiol benzoate (EB)], which is one half-dose of SYNOVEX PLUS[®]. This lower dose may be more beneficial under certain circumstances.

Until now, SYNOVEX CHOICE has been available only for steers. This bulletin summarizes the growth and carcass responses of feedlot heifers to SYNOVEX CHOICE administered approximately 100 days before slaughter.¹

Experiment Design

A randomized block design with 12 blocks of cattle and 4 treatment groups was used at each site for a study total of 48 replicates. The 4 treatment groups were:

- Sham-implanted control (implant gun needle inserted subcutaneously at ear injection site and withdrawn, but no growth implant administered);
- EB alone, containing 14 mg EB;
- TBA alone, containing 100 mg TBA;
- SYNOVEX CHOICE, containing 100 mg TBA and 14 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.

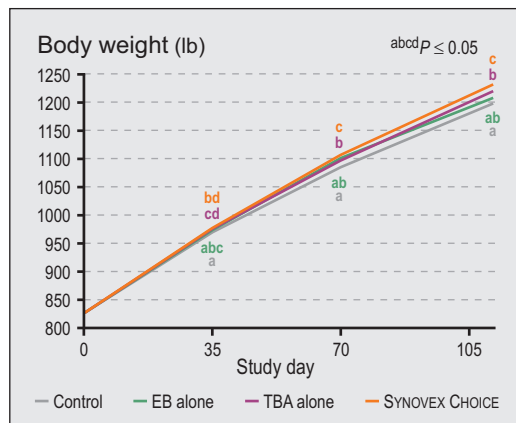


Figure 1 – Body weight.

Results

Growth performance

From day 35 to 112, cattle implanted with SYNOVEX CHOICE weighed more than the sham-implanted controls (Figure 1). From days 70 to 112, cattle with the TBA alone implant weighed more than the sham implanted controls, but less than the SYNOVEX CHOICE implanted cattle. In addition, the shape of the growth curves from day 35 forward showed the body weight of the SYNOVEX CHOICE group continued to diverge from that of the sham controls to the end of the study as well as for the TBA alone group, indicating the implants were continuously active for the duration of the study. Final weights were increased 10, 21, and 34 lb for EB alone, TBA alone, and SYNOVEX CHOICE groups compared with sham controls, respectively.

Rate of weight gain of all animals that received implants was faster than the sham-implanted control animals ($P \leq 0.05$, Figure 2). In addition, average daily gain (ADG) for cattle implanted with SYNOVEX CHOICE was greater than for cattle with TBA or EB alone implants ($P \leq 0.05$). ADG for SYNOVEX CHOICE animals was 8.7% greater than for sham-implanted controls.

Feed efficiency (feed/gain) of cattle implanted with SYNOVEX CHOICE was improved 6.3% compared with sham-implanted control animals. In addition, feed efficiency for SYNOVEX CHOICE implanted cattle was better than for either EB or TBA alone implants, and the TBA implant was better than for the EB alone implant.

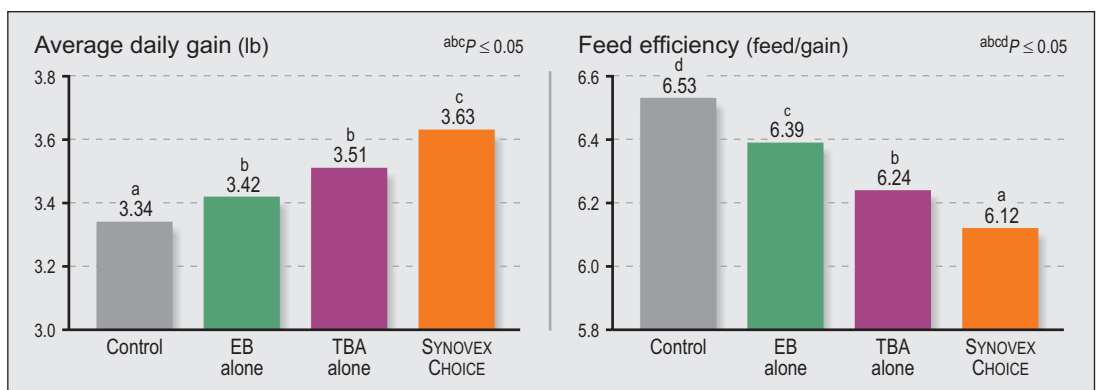


Figure 2 – Average daily gain and feed efficiency.

Carcass composition

Hot carcass weights of all implanted cattle were heavier ($P \leq 0.05$) than for sham-implanted controls (Figure 3). In addition, hot carcass weights for SYNOVEX CHOICE implanted cattle were 26.6 lb heavier compared with sham-implanted controls, 17.5 lb more than those of EB alone, and 11.2 lb more than those of TBA alone implanted cattle ($P \leq 0.05$). Although dressing percent treatment differences were small, dressing percent for SYNOVEX CHOICE cattle was 0.5 percentage units greater ($P \leq 0.05$) than for sham-implanted control cattle but not other implanted cattle (Figure 3).

Ribeye areas of all implanted cattle were larger ($P \leq 0.05$) than for sham-implanted controls (Figure 4). In addition, ribeye areas for SYNOVEX CHOICE cattle were larger than for EB alone or TBA alone cattle ($P \leq 0.05$). Ribeye area was increased 0.6 in² in SYNOVEX CHOICE compared with

sham-implanted control animals. Marbling score for SYNOVEX CHOICE implanted cattle was less than for all of the other 3 treatment groups ($P \leq 0.05$), which were not different from each other (Figure 4).

There were no treatment effects on KPH percent fat, backfat thickness, or yield grade (Tables 1 and 2). Although marbling scores differed, the distribution of carcasses into categories of percent choice and better and percent less than choice did not differ among treatment groups (Figures 5 and 6).

Distributions of liver scores into categories of either normal or condemned due to abscesses differed among treatment groups based on Fisher's exact test (Figure 7). Pair-wise comparisons of the distributions indicated that EB alone vs sham-implanted ($P = 0.0020$) groups, and EB alone vs TBA alone ($P = 0.0283$) groups, were different, but sham-implanted vs SYNOVEX CHOICE groups did not differ.

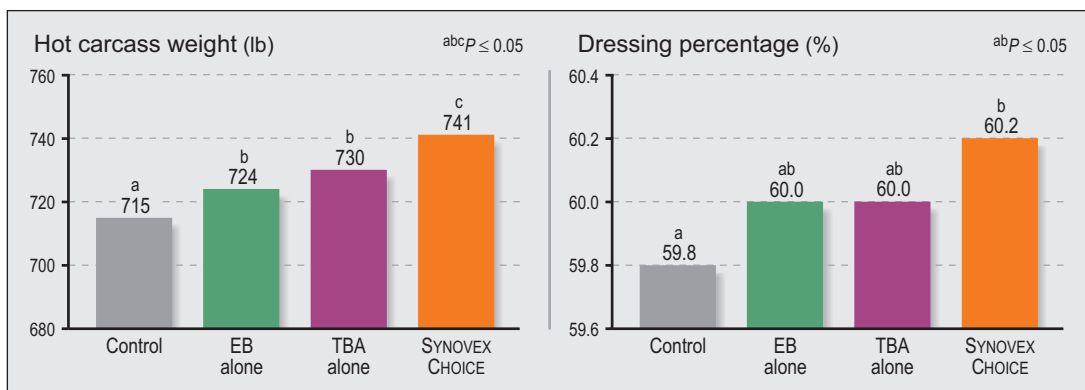


Figure 3 – Hot carcass weight and dressing percentage.

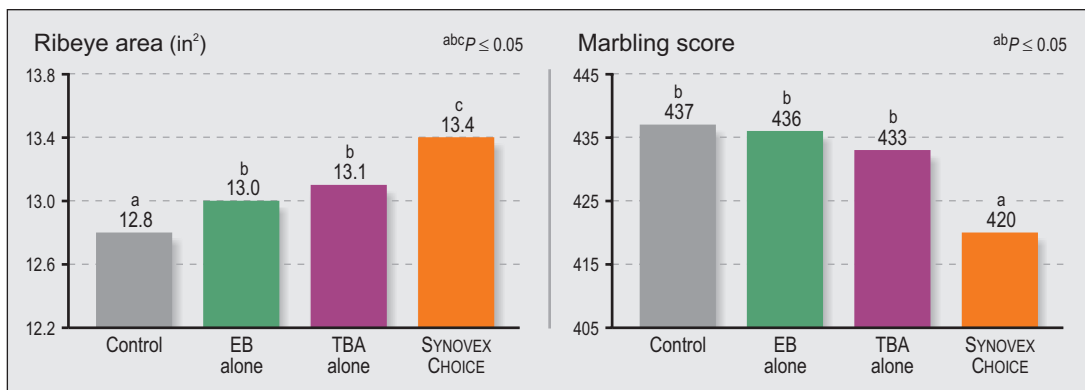


Figure 4 – Ribeye area and marbling score.

Table 1 – Performance and carcass data.

	Control	EB Alone	TBA Alone	SYNOVEX CHOICE
No. pens	48	48	48	48
Average daily gain (lb/day)	3.34 ^a	3.42 ^b	3.51 ^b	3.63 ^c
Dry matter intake (lb/day)	21.76	21.79	21.83	22.17
Gain efficiency (ADG/DMI)	0.154 ^d	0.157 ^c	0.161 ^b	0.164 ^a
Feed efficiency (DMI/ADG)	6.53 ^d	6.39 ^c	6.24 ^b	6.12 ^a
Hot carcass weight (lb)	714.6 ^a	723.7 ^b	730.0 ^b	741.2 ^c
Kidney, pelvic, heart fat (%)	2.27	2.29	2.24	2.19
Ribeye area (in ²)	12.75 ^a	13.01 ^b	13.05 ^b	13.35 ^c
Backfat thickness (in)	0.49	0.50	0.51	0.50

^{abcd} $P \leq 0.05$

Table 2 – Carcass and yield/grade characteristics.

	Control	EB Alone	TBA Alone	SYNOVEX CHOICE
No. pens	48	48	48	48
Marbling score	436.5 ^b	436.2 ^b	432.8 ^b	420.1 ^a
Yield grade	2.81	2.80	2.81	2.73
Dressing percent	59.75 ^a	59.97 ^{ab}	59.98 ^{ab}	60.22 ^b
USDA Quality Grade (%)				
Carcasses graded (n)	453	451	451	451
Prime	1.1	1.6	0.7	0.2
Choice	64.9	67.2	63.4	61.2
Select	31.8	28.6	33.9	35.3
Standard	2.0	2.0	1.8	3.3
Commercial	0.0	0.4	0.2	0.0
Utility	0.2	0.2	0.0	0.0
Calculated Yield Grade (%)				
Carcasses graded (n)	453	450	450	450
0	0.9	0.7	1.3	1.6
1	11.7	14.4	12.4	18.0
2	48.8	41.1	41.1	42.2
3	30.9	37.6	38.4	29.6
4	7.1	5.3	6.4	8.4
5	0.7	0.9	0.2	0.0
6	0.0	0.0	0.0	0.2
Liver scores (n)				
Normal liver	278	246	283	292
Abscessed liver	131	156	121	122

^{ab} $P \leq 0.05$

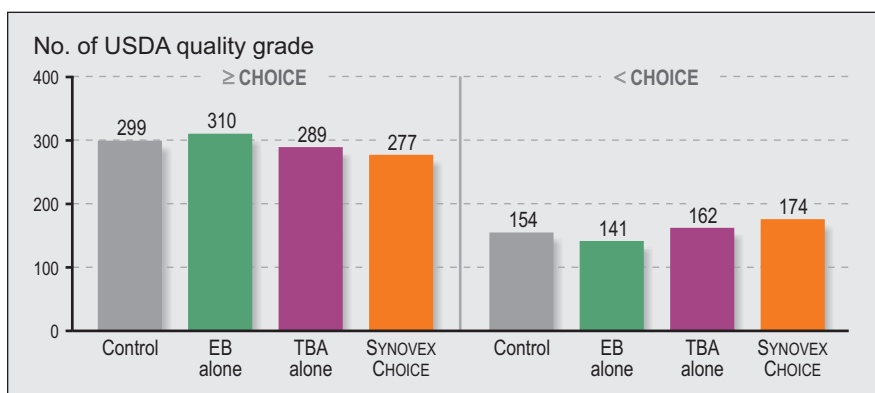


Figure 5 – Number of USDA quality grade carcasses.

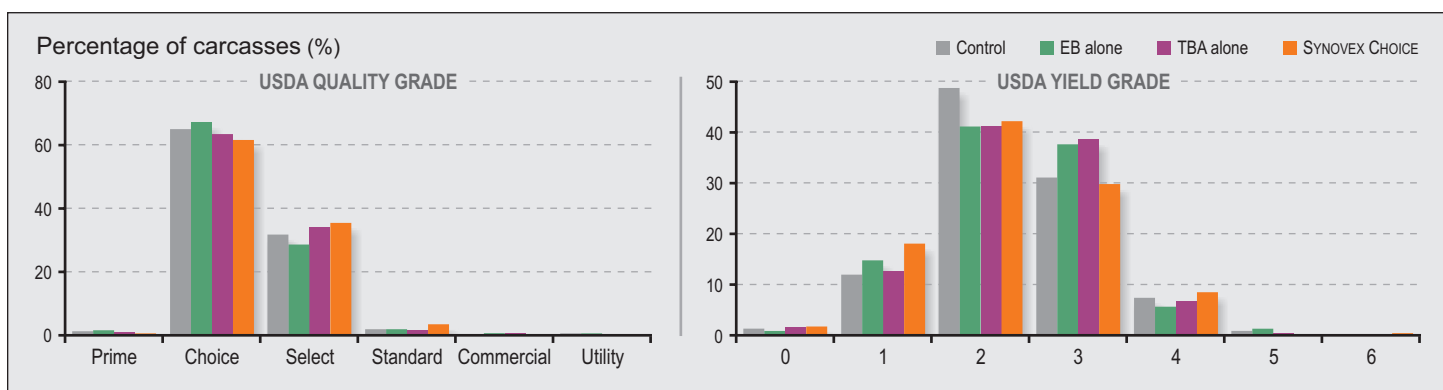


Figure 6 – Percentage of USDA grade and yield grade carcasses.

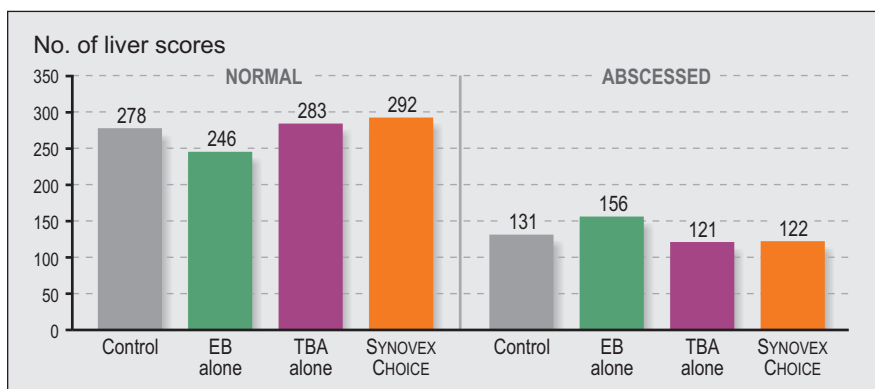


Figure 7 – Number of normal and abscessed liver scores.

Conclusions

Use of the SYNOVEX CHOICE implant effectively improved 112-day growth performance and carcass attributes.

- **Improved growth performance.** Average daily gain and feed efficiency were increased 8.7% and 6.3%, respectively, compared with sham-implanted controls, and the increases were more than those for EB alone or TBA alone.
- **Carcass attributes.** Final body weight and hot carcass weight were increased 34 and 26.6 lb, respectively, compared with sham-implanted controls, and ribeye area was increased 0.6 in².
- Although marbling score was decreased slightly (3.8%) compared with sham-implanted controls, there were no differences in percent of choice and better carcasses.

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

References

1. Data on file, Study Report No. GASD 16-83.00, Zoetis Inc.



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