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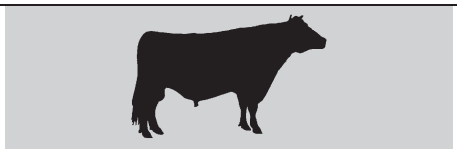

# Comparison of the effects of long-acting Synovex One with Revalor-XS and Synovex Plus on growth performance and carcass quality in steers[1]

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## ABSTRACT

*Two studies were conducted with beef steers to compare the effects of long-acting implants Synovex One (SYN-ONE) and Revalor-XS with each other and with the shorter-acting implant Synovex Plus (SYN-PLUS) on growth performance and carcass quality. Steers (n = 240, initial BW = 384 ± 4.0 kg) in Nebraska were administered SYN-ONE, SYN-PLUS, or Revalor-XS 161 d before slaughter. Steers (n = 300, initial BW = 262 ± 3.6 kg) in Texas were administered the same implants 200 d before slaughter. Each experiment was conducted according to a randomized complete block design with 10 blocks of 3 treatments and pen as the experimental unit. Blocking was based on pretreatment BW, and treatments within a block were assigned to contiguous pens. On d 0, steers were weighed and received assigned implants. Steers were fed finishing diets and were weighed twice more during each experiment and on 2 consecutive days before slaughter in commercial facilities for carcass evaluation. Statistical-analysis models included the fixed effect of treatment and random effects of block and block by treatment interaction and residual; BW and ADG were analyzed as repeated measures. Overall growth performance did not differ ($P > 0.05$) among implant groups in either location. However, there were differences ($P < 0.05$) in BW, ADG, and G:F between treatments during some intermediate intervals, i.e., SYN-PLUS was greater than SYN-ONE during the first interval and SYN-ONE was greater than SYN-PLUS during some of the later intervals. Carcass characteristics did not differ ($P > 0.05$) among implant groups. It was concluded that the 3 implants were equally efficacious.*

**Key words:** anabolic, cattle, growth, growth performance, long-acting implant

## INTRODUCTION

More than 96% of cattle entering feedlots are treated with an anabolic implant at least once during the finishing period, and more than 30% of steers and heifers entering feedlots weighing 318 kg or more received 2 or more implants (NAHMS, 2000). With a wide variety of products available commercially, programs that match implant sequences (active ingredients and doses) to desired management and marketing outcomes are common in feedlot cattle (Samber et al., 1996; Mader, 1998; Duckett and Andrae, 2001). Because of their effects on growth performance, implants typically increase HCW and LM area and are associated with decreased marbling, QG, and tenderness; however, effects vary with implant strategy,

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genetics, and sex (Herschler et al., 1995; Duckett and Andrae, 2001; Montgomery et al., 2001).

More recently, long-acting implants with 200 d of activity have been made available to replace multiimplant regimens. One of these is the Revalor-XS implant (Merck Animal Health, Summit, NJ; FDA, 2007; Parr et al., 2011a,b). The uncoated pellets are believed to begin releasing immediately after implantation, whereas the coated pellets presumably start releasing approximately 80 d later (FDA, 2007). A second long-acting implant is Synovex One (Pfizer Animal Health, New York, NY), which is the Synovex Plus implant (Pfizer Animal Health) where all pellets are coated with a polymer that extends duration of activity to approximately 200 d (Cleale et al., 2012).

Two experiments were conducted with differing durations and genetics with the objective of comparing growth performance and carcass characteristics for animals implanted with the 2 long-acting implants, Revalor-XS and Synovex One, and with the shorter-acting implant, Synovex Plus, in 2 small-pen studies of different durations, 161 or 200 d, and 2 locations, Nebraska and Texas, respectively. The hypothesis was that responses to the long-acting implants would be similar to each other and greater than those to the shorter-acting implant, especially in the 200-d experiment, and that the results would not differ with type of genetics.

## MATERIALS AND METHODS

### *Nebraska Experiment*

For all experiments, approval was obtained before initiation of these experiments by the site IACUC committee (Nebraska location) or the Pfizer IACUC committee (Texas location) for all animal procedures. The experiment was conducted with approximately 90% black-hided English and Continental steers (initial BW = 384 ± 4.0 kg) to compare 161-d feedlot growth performance responses to Revalor-XS [**REV-XS**, an implant composed of 4 uncoated and 6 coated pellets with a total of 200 mg of trenbolone acetate (**TBA**) and 40 mg of estradiol-17β], Synovex Plus (**SYN-PLUS**, an implant composed of 8 uncoated pellets with a total of 200 mg of TBA and 28 mg of estradiol benzoate), and Synovex One (**SYN-ONE**, the SYN-PLUS implant composed of coated pellets). The experiment was conducted as a randomized complete block experimental design with pen as the experimental unit. Animals were blocked into 10 groups of 24 animals each based on sequential order of BW measured 1 d before treatment. Each group was then assigned to a set of 3 contiguous pens such that there were 8 animals per pen and treatment was randomly allocated to a pen within each group. Thus, 30 pens of cattle were used, and there were 10 pens of 8 animals per pen for each of 3 treatments. Treatments were implantation with REV-XS, SYN-PLUS, or SYN-ONE.

Cattle were received at the Nebraska site at least 14 d before treatment administration. They were processed according to procedures typical of the beef-feeding industry and were vaccinated with 2 mL of Bovi-Shield Gold FP 5 s.c. (Pfizer Animal Health), administered 7 mL of Dectomax s.c. (Pfizer Animal Health), and topically poured with 22 mL of Durasect II (Pfizer Animal Health) along the midline of the back. During processing, ears were palpated, and any previously administered implants were excised.

Experimental treatments were administered on d 0 with either a REV-XS implant gun (Merck Animal Health) or a Synovex SX-10 implant gun (Pfizer Animal Health). Implants were placed subcutaneously in the middle one-third of the posterior aspect of the pinna of the ear. Dry ears were implanted without cleaning. Ears that were wet or contaminated with manure or mud were scrubbed with a solution of chlorhexidine (Nolvasan, Pfizer Animal Health) before implanting. Stylets of implant guns were disinfected in chlorhexidine solution after each animal was treated.

Experimental pens were outdoors, naturally lighted and ventilated, had 11.6 $m^2$ of shade, and were concrete surfaced. Pens provided 7.0 $m^2$ of space and 0.5 m of bunk space per animal. Adjustment of cattle to final feedlot diets began during the acclimation period. After administration of treatments, cattle were fed a high-concentrate diet (Table 1) once daily in fence-line feed bunks with the goal to provide ad libitum access to feed. Water was available ad libitum from automatic waterers. No other growth promoters or feed additives (i.e., ionophores or in-feed antibiotics) were administered.

Full BW of individual animals was measured on d −1, 0, 49, 98, 160, and 161. Accuracy of animal scales was verified using reference weights each time cattle were weighed. On d 49, animals were also vaccinated with 2 mL of Bovi-Shield Gold IBR-BVD i.m. (Pfizer Animal Health) and topically treated with 26 mL of Durasect II (Pfizer Animal Health).

Daily feed deliveries to each pen were recorded, and quantities of orts were recorded on d 49, 98, and 161 following the last BW measurement before slaughter. Samples of feed offered were collected every 2 wk, and DM was measured to calculate DMI. Two-week samples were composited every 8 wk for proximate analysis of DM, CP, NPN, NDF, Ca, P, and K. Cattle were observed daily, and health events and therapeutic treatments were recorded by personnel masked to the treatments the animals received.

### *Texas Experiment*

The experiment was conducted with 80% black-hided and 20% Charolais and Hereford with some Brahman steers (initial BW = 262 ± 3.6 kg) to compare 200-d feedlot performance of cattle implanted with REV-XS, SYN-PLUS, or SYN-ONE. The experiment was conducted as a randomized complete block experimental design with pen as the experimental unit. Animals were blocked into 10 groups of 30 animals each based on sequential order of BW measured 2 d before treatment.