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CALIFORNIA STATE UNIVERSITY AGRICULTURAL RESEARCH INITIATIVE

RESEARCH REPORT

Growth promotants shown not to reduce meat grade qualityon Holstein steers

Jonathon L. Beckett, Animal Science Department
California Polytechnic State University, San Luis Obispo

Colleges of Agriculture at

California State University, Fresno

California Polytechnic State University, San Luis Obispo

California State Polytechnic University, Pomona

California State University, Chico

Executive Summary

Currently, approximately 95 percent of all the fed cattle in the United States are provided supplemental growth stimulation through the use of growth-promoting implants. The vast majority of the research identifying the optimal combinations and times of implant presentation was conducted on traditional beef cattle (Bos taurus). However, a large number of steers from the dairy industry are fed in feedlots. The United States currently has more than nine million dairy cows in production (USDA, 1997). Specifically, California has approximately 1.3 million dairy cows. A major byproduct of the dairy industry is the large number of male calves (approximately 4.5 million head annually), of which the majority will be fed in feedlots and harvested as retail beef products. Holstein steers have genetic differences compared with typical beef steers.

The objective of this research was to test the efficacy of a long-lasting, sustained-release estrogen implant, singularly, and in combination with other growth promotants. Specifically, these following responses were measured: 1) effect on growth and efficiency characteristics, 2) influence on quality grade, yield grade, dressing percent and ribeye area, and 3) effect of season on implant regimen.

Holstein steers exhibit significant differences from traditional beef cattle breeds in their response to growth promotants.

California Polytechnic State University, San Luis Obispo

The working hypotheses of the proposed research were as follows: 1) A long-acting estrogen implant can be used in a growth promoting strategy (which limits the number of times the cattle must be handled) maintains the rapid growth and high efficiency of other implants regimens, yet minimizes the detrimental effects of implants on carcass quality; and 2) Different strategies are appropriate depending on the season of placement into the feedyard.

Two hundred thirty-six Holstein steers (141 kg) randomly assigned to one of four treatment groups (A, B, C, D; n = 59) were used to investigate the effects of a long-acting estrogen implant with and without a trenbolone acetate/estradiol terminal implant on growth, performance and carcass characteristics. Implants contained zeranol (Z), progesterone (P4), estradiol benzoate (EB) or trenbolone acetate (TBA) and estradiol (E2). Animals were treated as described (tables) and weight gain, average daily gain (ADG), and feed efficiency were calculated on 30-d intervals. Steers were harvested after 276d on feed and carcass measurements were collected. All implanted groups had heavier ($P<0.05$) average final live weights and carcass weights, and improved ADG ($P<0.05$) compared with non-implanted controls. Cattle receiving the TBA/E2 terminal implant produced heavier carcasses than implanted cattle not receiving the terminal implant ($P<0.05$). Average REA were significantly greater ($P<0.05$) for all groups receiving the terminal implant than either E2 only or non-implanted groups. The percentage of carcasses with USDA quality grade of Choice or better was significantly lower ($P<0.05$) for treatment A (66.7 percent) than treatment B (83.9 percent) and non-implanted controls (85.2 percent), but treatment C (72.9 percent) was not different from any other treatment group. In a second phase of the study, cattle were 960 steers were fed in a commercial feedyard in Southern California. The cattle were placed in Spring or Fall, and implanted with similar protocols as described above. Relative differences in carcass data were similar to those in Phase I. Encore does not significantly reduce quality grade compared with control cattle, particularly when calves are exposed to heat stress during the early growth phases. Based on these data, a long-acting estrogen implant is effective in increasing growth and efficiency compared with non-implanted controls. A TBA/E2 terminal implant 180 d after the initial estrogen implant significantly improved growth and efficiency, yet did not significantly suppress quality grades compared with non-implanted controls.

Project Director

Jonathon L. Beckett, Professor
Animal Science Department
Californa Polytechnic State University,
San Luis Obispo
Phone: (805) 756-7011
Email: jbeckett@calpoly.edu

Cooperator(s)

Peter Anderson
VetLife LLC
Phone: (888) 462-3493
Email: andersonpete@vetlife.com

Jiggs Johnson
El Toro Land & Cattle Co.
Phone: (760) 352-6312

ARI Administration

California Agricultural Technology Institute
California State University, Fresno
2910 E. Barstow Ave. M/S OF115
Fresno, CA 93740-8009
Phone: (559) 278-2361
Fax: (559) 278-4849
ARI Website: ari.calstate.edu

ARI Executive Director

Joe Bezerra, Director of Operations
California Agricultural Technology Institute
California State University, Fresno

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For More Information

This research report contains summarized results of Jonathon L. Beckett's study entitled "Effects of Long-acting Estrogen-base Growth Promotant on Growth and Performance and Carcass Characteristics in Holstein Steers," ARI Project No. 02-3-004. (Research Focus Area: *Production and Cultural Practices*). To view and/or obtain a copy of the complete final report, or to obtain additional information about this or other research projects, visit the ARI website at *ari.calstate.edu*. For information on projects specific to Cal Poly San Luis Obispo, visit the Cal Poly ARI website at *ari.calpoly.edu*.