

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 845

1990

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Recommended Citation

Apple, J.K.; Simms, D.D.; Kuhl, Gerry L.; Dikeman, Michael E.; and Kastner, Curtis L. (1990) "Effects of Finaplix® Synovex-S®, and Ralgro® implants, singularly or in combinations, on performance, carcass traits, and longissimus palatability of Holstein steers," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2248>

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Effects of Finaplix® Synovex-S®, and Ralgro® implants, singularly or in combinations, on performance, carcass traits, and longissimus palatability of Holstein steers

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**EFFECTS OF FINAPLIX®, SYNOVEX-S®, AND RALGRO®
IMPLANTS, SINGULARLY OR IN COMBINATIONS,
ON PERFORMANCE, CARCASS TRAITS, AND
LONGISSIMUS PALATABILITY OF
HOLSTEIN STEERS¹**

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C. L. Kastner, and G. L. Kuhl**

Summary

Over the entire feeding period (249 d), Finaplix® (F) plus Synovex-S® (S)-implanted steers had higher ($P<.05$) daily gains than F+Ralgro® (R), F, and control (C) steers. All treatments produced higher ($P<.05$) daily gains than C, with the exception of F. The only feed efficiency differences were during the fourth implant period, when F steers were more ($P<.05$) efficient than F+R or C steers. The F+S and F+R steers had higher ($P<.05$) masculinity scores than S and C steers. Carcasses of F+S steers were heavier ($P<.05$) than those of F and C steers. The F+S steers had larger ($P<.05$) ribeyes than R, F, and C steers. Also, F+S steers tended ($P=.07$) to have lower yield grades than S, R, or C steers. Even though marbling scores and quality grades were similar ($P>.05$) among treatments, only 50% of F+S carcasses graded low Choice or higher compared to a range of 75 to 100% for the other treatments. The only meat palatability differences were tenderness scores; steaks from S and F+R steers were less tender ($P<.07$) than those from R and C steers.

(Key Words: Holsteins, Implants, Performance, Carcass Traits, Meat Palatability.)

Introduction

Consumer demand for beef with little "waste" fat and adequate "taste" fat has increased cattle industry interest in feeding Holsteins. A high percentage of Holstein carcasses grade Choice with desirable fat thickness but have a low muscle-to-bone ratio and small ribeyes in comparison to beef breeds.

Finaplix (F), an implant containing the androgenic anabolic-steroid, trenbolone acetate, has been shown to increase muscle-to-bone ratio and ribeye area and to decrease fat thickness and marbling in beef breeds. This is particularly true when it is combined with an estrogenic implant such as Ralgro (R) or Synovex-S (S). Therefore, our objectives were to determine the effects of serial implanting Holstein steers with F, R, or S, as well as combinations of F+R and F+S, on (1) animal performance and masculinity; (2) carcass traits; and (3) ribeye steak palatability.

Experimental Procedures

Seventy-two Holstein steers (3 to 5 mo of age) with an average weight of 400 lb were weighed and allotted to pens of four steers each. Pens were assigned randomly to one of six treatments: (1) non-implanted controls (C); (2) implanted with R; (3) implanted with S; (4)

¹Partial funding provided by Pitman-Moore, Terre Haute, Indiana.

implanted with F; (5) implanted with R and F in opposite ears; and (6) implanted with S and F in opposite ears. Steers were reimplanted on days 56, 112, and 168 of the feeding trial.

Steers were fed increasing proportions (six steps) of concentrate for 77 d; the final diet consisted of 76% rolled milo, 18% sorghum silage, and 6% supplement. Steers were fed to appetite twice daily for a total of 249 d. Two steers died, and one steer was removed for reasons not related to the treatments.

Steers were scored for masculinity (1=steer and 5=very masculine) 24 hr before slaughter. Cattle were slaughtered at the Excel Corp. packing plant in Dodge City, Kansas. USDA quality and yield grade data were obtained at 24 h postmortem. Ribs were removed and shipped to the K.S.U. Meats Laboratory and aged until 6 d postmortem. One-inch-thick ribeye (RE) steaks were removed for sensory panel evaluations and Warner-Bratzler shear force determinations.

Results and Discussion

Average daily gain and feed efficiency data are presented in Table 13.1. During the second implant period (from 56 d to 112 d), F+S steers gained faster ($P<.05$) than F, R, and C steers, but not S and F+R steers. The S and F+R steers also gained faster ($P<.05$) than C steers. No significant differences were observed in ADG among treatment groups during the third and fourth implant periods. Over the entire feeding period (249 d), the F+S group had a higher ($P<.05$) ADG than F+R, F, and C groups; the C group gained slower ($P<.05$) than all groups with the exception of the F group.

Table 13.1. Effects of Implant Treatments on Average Daily Gains and Feed Efficiency of Holstein Steers at Specified Implant Periods

| Item | C ^a | F | R | S | F+S | F+R |
|-------------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| <u>Average daily gain, lb</u> | | | | | | |
| 0 to 56 d | 3.06 ^c | 3.48 ^b | 3.37 ^b | 3.37 ^b | 3.65 ^b | 3.54 ^b |
| 56 to 112 d | 3.45 ^d | 3.61 ^{cd} | 3.70 ^{cd} | 3.89 ^{bc} | 4.09 ^b | 3.85 ^{bc} |
| 112 to 168 d | 2.55 | 2.51 | 2.75 | 2.62 | 2.86 | 2.75 |
| 168 to 249 d | 1.98 | 2.09 | 2.27 | 2.24 | 2.18 | 1.98 |
| 0 to 249 d | 2.68 ^d | 2.84 ^{cd} | 2.95 ^{bc} | 2.95 ^{bc} | 3.08 ^b | 2.93 ^c |
| <u>Feed/gain, DM basis</u> | | | | | | |
| 0 to 56 d | 5.4 | 5.1 | 5.0 | 4.7 | 4.7 | 4.9 |
| 56 to 112 d | 5.7 | 5.6 | 5.6 | 5.3 | 5.5 | 5.8 |
| 112 to 168 d | 7.6 | 7.7 | 7.6 | 7.9 | 7.7 | 7.9 |
| 168 to 249 d | 9.3 ^{bc} | 8.2 ^d | 8.4 ^{cd} | 9.2 ^{bcd} | 8.9 ^{bcd} | 9.9 ^b |
| 0 to 249 d | 6.9 | 6.5 | 6.5 | 6.6 | 6.5 | 6.9 |

^aC=Control; F=Finaplix; R=Ralgro; S=Synovex-S.

^{bcd}Mean values in the same row with different superscript letters differ ($P<.05$).

There were no significant differences in feed-to-gain ratios among treatment groups during the first three implant periods. However, during the last implant period, F steers gained more ($P<.05$) efficiently than F+R or C steers. Also, R steers were more efficient ($P<.05$) than F+R steers. Control, S, F+S, and F+R treatment groups had similar feed conversions.

Masculinity scores, carcass traits, and sensory panel characteristics are presented in Table 13.2. Steers implanted with F+S and F+R were more ($P<.05$) masculine than S and C steers; F and R steers were intermediate in masculinity. Carcasses of R, S, and F+S steers were heavier ($P<.05$) than those of F and C steers. Carcasses of F+R steers were heavier ($P<.05$) than those of C steers but were not different from those of F steers. F+S steers had larger ($P<.05$) ribeyes than R, F, and C steers; ribeyes of F+R, F+S, and S steers were similar. Marbling scores and quality grades were not affected by implant treatment. However, only 50% of the F+S carcasses graded low Choice or higher, compared with 75 to 100% Choice for the other treatments.

Implanting had no effects on flavor, juiciness, detectable connective tissue or off-flavors. However, sensory panel scores for tenderness tended ($P=.07$) to be lower for steaks from S and F+R steers than steaks from R and C steers.

Table 13.2. Effects of Implant Treatments on Masculinity, Quality Traits, Yield Grade Traits, and Palatability Characteristics of Holstein Steers

| Item | C ^a | F | R | S | F+S | F+R |
|--------------------------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|
| Masculinity score ^b | 1.5 ^f | 1.9 ^{ef} | 1.7 ^{ef} | 1.5 ^f | 2.1 ^e | 2.0 ^e |
| Quality grade ^c | 226 | 227 | 219 | 207 | 200 | 213 |
| Choice, % | 100 | 75 | 82 | 90 | 50 | 83 |
| Dressing percent | 59.6 | 59.1 | 60.0 | 60.2 | 60.0 | 59.7 |
| Carcass wt, lb. | 638 ^g | 654 ^{fg} | 681 ^e | 691 ^e | 700 ^e | 675 ^{ef} |
| Fat thickness, in. | .27 | .22 | .29 | .28 | .23 | .27 |
| Ribeye area, in ² | 10.3 ^g | 11.1 ^{fg} | 10.9 ^{fg} | 11.2 ^{ef} | 12.0 ^e | 11.4 ^{fg} |
| Kidney knob, % | 2.96 | 3.38 | 3.01 | 2.94 | 2.54 | 2.75 |
| USDA yield grade | 3.0 ⁱ | 2.8 ^{hi} | 3.0 ⁱ | 2.9 ⁱ | 2.5 ^h | 2.7 ^{hi} |
| Shear force, lb | 8.8 | 9.0 | 8.8 | 8.7 | 9.5 | 9.6 |
| Flavor intensity ^d | 6.1 | 6.1 | 6.2 | 6.0 | 5.9 | 5.9 |
| Juiciness ^d | 5.9 | 6.1 | 6.1 | 5.6 | 5.7 | 5.7 |
| Tenderness ^d | 6.5 ^h | 6.3 ^{hi} | 6.6 ^h | 6.1 ⁱ | 6.3 ^{hi} | 6.1 ⁱ |

^aC=Control; F=Finaplix; R=Ralgro; S=Synovex-S.

^b1=steer; 2=slightly masculine . . . 5=very masculine.

^c0-99=USDA Standard; 100-199=USDA Select; 200-299=USDA Choice.

^d1=extremely bland, extremely dry and extremely tough . . . 5=slightly intense, slightly juicy and slightly tender . . . 8=extremely intense, extremely juicy and extremely tender.

^{efg}Mean values in the same row with different superscript letters differ ($P<.05$).

^{hi}Mean values in the same row with different superscript letters differ ($P=.07$).