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Implant Programs for Feedlot Heifers using Synovex® Plus™, Revalor®-H, or Finaplix®-H with MGA

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Implanting feedlot heifers with Synovex Plus increases ADG and hot carcass weight but decreases grade compared to heifers implanted with Revalor-H or Finaplix-H and fed MGA.

Summary

A commercial feedlot experiment was conducted using 1,558 heifers to evaluate the effects of implant programs on finishing heifers. Implanting with Synovex Plus increased ADG and hot carcass weight compared to heifers implanted with Revalor-H or Finaplix-H and fed MGA. Heifers implanted with either Synovex Plus or Revalor-H had increased DMI compared to heifers implanted with Finaplix-H. Marbling score was influenced by each of the implant treatments, being highest for Finaplix-H followed by Revalor-H and Synovex Plus.

Introduction

In finishing heifer implant programs, the final implant (administered approximately 100 days prior to harvest) generally contains trenbolone acetate (TBA) or a combination of estradiol (E_2) and TBA. Along with these implants melengestrol acetate (MGA) can be fed to enhance the activity of TBA. Implants commercially available that contain TBA or the combination of E_2 and TBA are Finaplix-H (200 mg of TBA), Revalor-H (14 mg of E_2 and 140 mg of TBA), and Synovex Plus (28 mg of estradiol benzoate (20 mg of E_2) and 200 mg of TBA). Within these implants, dosage, combination of hormones, and carrier of active ingredients differ and may alter growth promoting activity. Objectives of this trial were to compare performance, carcass characteristics, and feeding economics in heifers implanted with Finaplix-H, Revalor-H, or Synovex Plus and fed MGA.

Procedure

The experiment was conducted between the dates of Jan. 11, 2000 and Aug. 3, 2000 using 1,558 heifers (761 lb) in a randomized block design. Heifers were kept separate by truckload following unloading and were weighed. Heifers from the separate truckloads were randomly assigned to one of three implant programs, one by one, using a gate sort into one of three arrival pens and then assigned to one of 18 home pens (six replications/treatment). Treatments were heifers terminally implanted with 1) Finaplix-H, 2) Revalor-H, or 3) Synovex Plus with all treatments receiving MGA supplementation. The finishing diet was formulated to provide 0.4 mg of MGA/head/d. Within a block, all heifers arrived at the feedyard at the same time. After sorting, pens were reweighed, processed, and moved to their home pen. During processing, heifers were vaccinated for viral diseases (BoviShield® 4, Pfizer Inc,), treated for internal and external parasites (Dectomax®, Pfizer Inc,), implanted with Ralgro®, and given a lot tag for identification.

Heifers were reimplanted with their respective treatment of Finaplix-H, Revalor-H, or Synovex Plus following

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45 (range 35 to 58 days) days on feed. Heifers were exposed to their final implant for an average of 95 days across replications (range 84 to 108). Heifers were not fed MGA in the adaptation diets (first 18 to 20 days on feed). The final diet contained 48.0% steam-flaked corn, 27.0% dry-rolled corn, 9.0% supplement, 7.5% alfalfa hay, 5.5% corn steep liquor, and 3.0% fat, and was formulated to contain 13.7% CP, 7.0% crude fat, 0.77% Ca, and 0.37% P. Heifers were fed an average of 139 days (range 127 to 166).

Initial weights were determined by prorating each arrival treatment pen weight back to the total of the group of heifers within block and adjusted to pay weight. For example, shrink (positive or negative depending upon the source of cattle) would be applied to the cumulative off-truck weight of all heifers within a block to determine pay weight for the entire group. The weight of individual pens, after heifers were sorted into arrival treatment pens, was divided by the cumulative weight of all three arrival treatment pens. The total pay weight for the entire group was multiplied by this percentage to calculate the initial starting (pay weight) weight for each home treatment pen. Final live weights were determined on a treatment pen just prior to shipment, and shrunk 4%. Final live weights were obtained under identical weighing conditions for each treatment pen within a block. Carcass weights also were used and adjusted to a common dressing percentage of 63% to calculate daily gain and feed conversion on a carcass-adjusted basis.

All pens within a block were harvested under identical conditions. Hot carcass weights were recorded on the day of harvest. Carcass fat thickness, marbling score, KPH fat, longissimus muscle area, and USDA quality grade were recorded following a 24- to 48-hour chill.

The economic influence of the implant treatments was determined using the ration cost at the feedyard during the period the experiment was conducted. The ration cost used in the analysis includes markup. Nonfeed costs (medicine, processing, etc.) were calculated for each pen of heifers in the experiment and averaged. This average nonfeed cost was applied to each pen of heifers for calculation of cost of gain and net return. Final heifer value was calculated by using a live price, dressed price, or a carcass-merit price based on individual heifer carcass value. Carcass value was calculated based on USDA quality grade, calculated yield grade, carcass weight and nonconformance (i.e. dark cutters). A carcass base price of $111/cwt was used for low Choice, yield grade 3 carcasses weighing 550 to 950 lb. Discounts were calculated as: $10, Select; $20, Standard; $30, dark cutters; $25,

Table 1. Effect of implant strategy on performance and carcass characteristics in finishing heifers.

	Implant Strategy[a]			
Item	PLUS MGA	REV MGA	FIN MGA	SEM[b]
Number of pens	6	6	6	
Number of heifers	523	519	516	
Days on feed	139	139	139	
Initial weight	760	761	760	3.0
Final weight[c]	1250[d]	1235[e]	1232[e]	4.2
Dry matter intake	20.3[d]	20.1[d]	19.5[e]	0.2
Daily gain, lb	3.52[f]	3.39[g]	3.38[g]	0.05
Feed/gain	5.76	5.94	5.77	0.09
Carcass weight, lb	787[d]	778[e]	776[e]	2.7
12th rib fat, in.	0.53	0.54	0.54	0.01
Longissimus muscle area, sq. in.	14.5[f]	14.2[f]	14.0[g]	0.1
Calculated yield grade	2.6	2.7	2.7	0.1
Marbling score[i]	5.26[f]	5.38[g]	5.48[h]	0.04
Quality grade distribution, %				
Prime	1.9	1.4	2.8	0.5
Upper 2/3 Choice	16.1[d]	21.7[e]	24.0[e]	3.2
Low Choice	37.1	42.4	40.5	3.1
Select	41.8[f]	29.8[g]	25.9[g]	2.9
Standard	3.1	1.4	1.4	0.7
Dark cutters, %	1.2	2.0	0.0	0.8

[a]PLUS = Synovex Plus, REV = Revalor-H, and FIN = Finaplix-H.
[b]SEM = Standard error of the mean.
[c]Final weight calculated as hot carcass weight divided by .63 (common dressing percentage).
[d,e]Means within a row with different superscripts differ (P < .10).
[f,g,h]Means within a row with different superscripts differ (P < .05).
[i]Marbling score: 4.0 = Slight; 4.5 = Slight 50; 5.0 = Small; 5.5 Small 50; etc.

Table 2. Effects of implant program on feeding economics of finishing heifers.

	Implant Strategy[a]			
Item	PLUS MGA	REV MGA	FIN MGA	SEM[b]
Ration cost[c], $/ton	131.50	131.50	131.50	
Cost of feed, $/head	185.36[d]	183.59[d]	178.27[e]	1.6
Total feeding cost, $/head	194.24[d]	192.95[d]	187.32[e]	1.6
Cost of gain, $/cwt	39.74	41.09	39.85	0.65
Carcass price[f], $/cwt	107.56[d]	108.62[de]	109.51[e]	0.5
Profit(loss)[g], $/head				
Live basis	62.77	54.15	61.73	5.0
Dressed basis	86.91	76.42	81.11	4.7
Carcass merit basis	59.90	58.19	70.37	5.3

[a]PLUS MGA = Synovex Plus fed MGA, REV MGA = Revalor-H fed MGA, and FIN MGA = Finaplix-H fed MGA.
[b]SEM = Standard error of the mean.
[c]Includes feed mark-up.
[d,e]Means within a row with different superscripts differ (P < .05).
[f]Calculated using a $111/cwt carcass base price: discounts = $10, Select; $20, Standard; $15, yield grade 4 and 5; $30, dark cutter; premiums = $8, Prime; $3, upper 2/3 Choice; $3, yield grades 1 and 2.
[g]Initial animal cost = $78/cwt; animal returns based on $70/cwt live price, $111/cwt carcass price, or calculated carcass value, respectively, interest not included.

light (<550 lb) and heavy (>950 lb) carcasses; and $15, yield grades 4 and 5. Premiums were calculated as: $8, Prime; $3, upper 2/3 Choice; and $3, yield grades 1 and 2.

Performance, carcass, and economic data were analyzed as a randomized block design using SAS. Least squares means were separated using the Least Significance Difference method when a significant (P < 0.10) F-test was detected. Variables were considered significant when probability values less than 0.10 were obtained.

Results

Data are presented with deads and chronics removed from the analysis. Feed intake and total head days were adjusted on a pen basis when deaths occurred or chronic cattle were sold before their home pen was. Feed intake and head days were adjusted one day prior to the removal of the animal from the pen as either a dead or chronic.

Effects of implant programs on performance of finishing heifers implanted with Finaplix-H, Revalor-H, or Synovex Plus supplemented with MGA are shown in Table 1. Dry matter intake was higher (P < 0.05) for heifers implanted with Synovex Plus or Revalor-H compared with those implanted with Finaplix-H. On a carcass-adjusted basis, heifers implanted with Synovex Plus as the final implant gained 4.2% (P< 0.10) faster than heifers implanted with Revalor-H or Finaplix-H as the final implant. This resulted in 17 lb heavier (P < 0.05) carcass-adjusted final weight for Synovex Plus heifers compared to Revalor-H and Finaplix-H heifers. Carcass-adjusted daily gain of heifers implanted with Revalor-H or Finaplix-H was similar. Live performance daily gain, final weight, and feed conversion were similar among implant treatments.

Carcass characteristics are presented in Table 1. Hot carcass weight was 10 lb or 11 lb heavier (P < 0.05) for heifers implanted with Synovex Plus compared with heifers implanted with Revalor-H or Finaplix-H, respectively. Hot carcass weight was similar for heifers implanted with Revalor-H or Finaplix-H. Dressing percentage tended (P = 0.13) to be significant among treatments. Longissimus muscle area was larger (P < 0.05) for heifers implanted with Synovex Plus compared with Finaplix-H, with Revalor-H being intermediate. Twelfth rib fat thickness and KPH fat were similar among treatments. Calculated yield grade was similar among treatments. Marbling score was lower (P < 0.10) for heifers implanted with Synovex Plus compared to those implanted with either Revalor-H or Finaplix-H. Revalor-H implanted heifers had a lower marbling score than Finaplix-H heifers. The percentage of carcasses grading USDA upper 2/3 Choice was lower (P < 0.05) and percentage of carcasses grading USDA Select was higher (P < 0.10) for heifers implanted with Synovex Plus compared to those heifers implanted with Revalor-H or Finaplix-H. Carcasses grading USDA Standard and the incidence of dark cutting carcasses were similar among treatments.

A summary of the economic analysis is provided in Table 2. Cost of gain was similar among treatments. Cost of feed and total feeding cost were (P < 0.05) less for those heifers implanted with Finaplix-H compared to heifers implanted with Synovex Plus or Revalor-H which is due to the decreased intake of Finaplix-H implanted heifers. Carcass price, calculated on individual carcasses using a grid for premiums and discounts as discussed previously in this report, for heifers implanted with Finaplix-H were higher (P < 0.05) compared to those heifers implanted with Synovex Plus, while Revalor-H implanted heifers were intermediate. Net return on a dressed basis price tended to be improved (P = 0.15) by $10.49 per head for those heifers implanted with Synovex Plus compared to Revalor-H. Net return on a carcass-merit basis tended to be improved (P = 0.20) by $10.47 or $12.18 per head for those heifers implanted with Finaplix-H compared to Synovex Plus or Revalor-H, respectively.

These data suggest implanting with Synovex Plus increases ADG and hot carcass weight compared to implanting with Revalor-H or Finaplix-H when MGA is fed. When MGA is fed, marbling score decreases with Synovex Plus compared to Revalor-H or Finaplix-H implants. Finally, implanting with Revalor-H decreases marbling compared to Finaplix-H. Part of the data from this experiment has been pooled with data from two other experiments reported in the following report (*2002 Nebraska Beef Report* pp. 34-35).

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