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Effect of Zilpaterol-HCl (Zilmax) on implanted and non-implanted feedlot steer performance and carcass characteristics

Abstract

Zilpaterol-HCl (Zilmax) is a β 2-adrenergic receptor agonist approved as a growth promotant in feedlot cattle for use during the last 20 to 40 days prior to harvest. It is orally active and improves performance and total body lean tissue. The recommended dosage is 7.6 grams per ton of feed on a 100% dry matter basis. Steroidal implants are used in feedlot animals to improve average daily gain, feed efficiency, and total lean tissue deposition. Little is known about how Zilmax and steroidal implants influence growth performance when used in combination. Our objective was to evaluate performance of steers administered Zilmax in combination with the steroidal implant, Revalor1-S.

Keywords

Cattlemen's Day, 2008; Kansas Agricultural Experiment Station contribution; no. 08-212-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 995; Beef; Cattle; Zilmax; Steroidal implants; Revalor-S.

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EFFECT OF ZILPATEROL-HCL (ZILMAX¹) ON IMPLANTED AND NON-IMPLANTED FEEDLOT STEER PERFORMANCE AND CARCASS CHARACTERISTICS

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Introduction

Zilpaterol-HCl (Zilmax) is a β_2 -adrenergic receptor agonist approved as a growth promoter in feedlot cattle for use during the last 20 to 40 days prior to harvest. It is orally active and improves performance and total body lean tissue. The recommended dosage is 7.6 grams per ton of feed on a 100% dry matter basis.

Steroidal implants are used in feedlot animals to improve average daily gain, feed efficiency, and total lean tissue deposition. Little is known about how Zilmax and steroidal implants influence growth performance when used in combination. Our objective was to evaluate performance of steers administered Zilmax in combination with the steroidal implant, Revalor¹-S.

Experimental Procedures

Crossbred steers ($n = 2279$) with an initial body weight of 940 lbs were assigned to 24 pens. The trial was conducted as a 2x2 factorial, with Zilmax feeding and implant as main effects. One of four treatments was applied to each pen: 1) Revalor-S without Zilmax 2) Revalor-S with Zilmax 3) no implant, no Zilmax 4) no implant with Zilmax. Ultrasound was

used to estimate initial body fat. Steers were stratified by body fat and assigned to pens. Steers were implanted with Revalor-S 91 days before harvest. Zilmax was included in the diet starting at 33 days before harvest and then withdrawn from the ration three days before slaughter, as required by the U.S. Food and Drug Administration. The finishing diet consisted of 27.6% flaked corn, 20% high moisture corn, 25% sweet bran, 19.6% corn silage, 2.9% tallow, and 4.9% finisher supplement on a dry matter basis. A 4% shrink was applied to the initial and final live weights. Carcass characteristics were measured at slaughter.

Results and Discussion

Revalor-S increased hot carcass weights, dressing percentage, and ribeye area, but decreased marbling scores (Table 1). These results are consistent with previous studies on steroidal implants.

Feeding Zilmax increased hot carcass weight, dressing percentage, and ribeye area. Conversely, Zilmax decreased 12th-rib fat thickness and marbling score, indicating that Zilmax increased the amount of lean tissue deposited when fed 30 days before harvest.

¹Zilmax and Revalor are registered trademarks of Intevet Inc., Millsboro, DE.

Revalor-S and Zilmax had an additive effect on performance. Hot carcass weights of steers receiving the combination were 69.4 lbs heavier than the control group (Table 1). The largest numerical dressing percentage was observed in the group administered the combination of Revalor-S and Zilmax (Table 1). Ribeye area of steers receiving the combination was 2.6 in² larger than that of control steers (Table 1). Marbling scores and 12th-rib fat thickness of steers receiving the combina-

tion of Zilmax and Revalor-S were numerically less than other treatments.

Implications

Results suggest that Zilmax improved animal performance and increased lean tissue deposition by finishing steers. When combined with Revalor-S, Zilmax resulted in additional improvements in performance and lean tissue growth.

Table 1. Effects of Revalor-S and Zilmax (fed for the final 30 days on feed plus a 3-day withdrawal) on Performance During the Final 91 Days on Feed by Finishing Beef Steers

Item	Treatment					SE ²	P-values ¹		
	Revalor-S: Zilmax:	None None	Rev-S None	None Zilmax	Rev-S Zilmax		Rev-S	Zilmax	Rev-S × Zilmax
Initial BW, lbs ³		939.3	940.2	939.1	939.6	14.05	0.72	0.84	0.91
Final BW, lbs ³		1,291.7	1,320.6	1,316.5	1,347.0	20.88	<0.01	<0.01	0.88
ADG, lbs/d		3.89	4.20	4.16	4.49	0.191	<0.01	<0.01	0.85
DMI, lbs/d		22.72	23.23	22.51	23.01	0.594	0.02	0.27	0.99
Feed:gain		5.87	5.56	5.44	5.14	0.141	<0.01	<0.01	0.88
HCW, lbs		818.1	842.6	865.6	887.5	13.17	<0.01	<0.01	0.60
Dressing %		62.94	63.31	65.42	65.57	0.139	0.05	<0.01	0.38
12th rib fat, in		0.60	0.59	0.55	0.53	0.013	0.31	<0.01	0.78
Marbling score ⁴		369.5	353.4	339.9	323.5	6.53	<0.01	<0.01	0.96
Ribeye area, in ²		13.96	14.69	15.76	16.58	0.198	<0.01	<0.01	0.66

¹Probability of a quarter F-test of the main effects of Revalor-S implant (Rev-S), Zilmax, and the Rev-S × Zilmax interaction.

²Pooled SE of simple-effect means, n = six pens/treatment with 90 to 100 steers/pen initially and 89 to 100 steers/pen at slaughter. Due to the slightly unbalanced numbers among treatments and heteroscedasticity in some cases, the largest SE values were reported.

³A 4% shrink was applied to initial and final live weights. Deads-in calculations considered that dead or removed animals contributed to the initial BW but not to the final BW.

⁴300 = Slight; 400 = Small; 500 = Modest.