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THE EFFECT OF ZILPATEROL ON FEEDLOT PERFORMANCE, CARCASS QUALITY, USDA CARCASS GRADES AND MEAT QUALITY

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ABSTRACT Phase 1: Feedlot adapted steers were placed in two treatments groups at 300kg and received (1) no implant (2) O-TBA-implant (24mg oestradiol + 120mg trenbalone acetate) and fed a ration (10.7 MJ ME/kg DM) for 56 days. Phase 2: The two treatments were the divided into four treatments: (1a) control; (1b) 0.2mg Zilpaterol through the feed; (2a) O-TBA; (2b) O-TBA + 0.2 mg Zilpaterol. Feeding continued for another 56 days. A sample was slaughtered initially and at the end of each treatment period. At end of Phase 1, LW's (kg) were (1) 393, (2) 420. During Phase 2, ADG's (kg/d) were (1a) 1.18, (1b) 1.35 (2a) 1.46 (2b) 1.82; FCR's (LW) (kg/kg) (1a) 9.69, (1b) 6.70 (2a) 7.92 (2b) 6.39; FCR's (CCW) (1a) 14.32 (1b) 9.08 (2a) 12.66 (2b) 9.07. At the end of Phase 2, LW's were (1a) 477, (1b) 489, (2a) 523. (2b) 551; dress % (1a) 59.2, (1b) 60.4, (2a) 59, (2b) 60.8; rib cut fat % (1a) 35.5, (1b) 27.6 (2a) 30.4 (2b) 28.0; shear forces (N) of not matured *M. Longissimus dorsi thoracis* were (1a) 85, (1b) 104, (2a) 90 (2b) 108; USDA quality grades (1a) Select 83, (1b) Select 40 (2a) Select 40 (2b) Select 33; cooking loss (%) (1a) 25.5, (1b) 27, (2a) 25.4, (2b) 27.6.

**INTRODUCTION** Feedlot efficiencies and carcass characteristics of steers have been shown to be improved by treatment with the anabolic agent oestradiol in combination with trenbalone acetate. Zilpaterol is a *B*-adrenergic agonist, which are agents characterised by the repartitioning effects. The aim of this study was to investigate the effects of Zilpaterol alone and in combination with an oestradiol-trenbalor acetate implant on the feedlot performances, carcass and meat quality of steers.

**MATERIALS AND METHODS** The experiment consisted of an adaptation period and an initial feeding period to 300 kg LW, followed by Phase 1, two treatments: Control, and implanted with 24 mg oestradiol + 120 mg trenbalone acetate (O-TBA) and fed a ration (10.7) ME/kg DM) for 56 days. In Phase 2, the two treatments were divided into four treatments: Control; 0.2 mg Zilpaterol through the feed 0 TBA; O-TBA + 0.2 mg Zilpaterol. Feeding continued for another 56 days. A sample of 8 steers was slaughtered from each treatment after Phase 1 and 16 from each treatment at the end of Phase 2.

The 80 crossbred weaner steers were of a medium maturity type (Sussex and Hereford x Sussex). On arrival at the experimental farm, the animals were allowed to rest and provided with *Eragrostis tef* hay and fresh drinking water. They were processed according to normal procedures within the first week, weighed, ear tagged and dehorned. Prophylactic treatments administered were against pasteurellow (*Pasteurella multocida; P. haemolytica*); black quarter (*Clostridium chauvoei*); anthrax (*Bacillus anthracis*); botulism (*Clostridium botulinum*); infectious bovine rhino tracheitis (IBR); bovine virus diarrhoea (BVD); parainfluenza-3 (PI<sub>3</sub>); bovine respiratory syncytial virus (BRSV) gastro-intestinal roundworms, parafilaria, liver fluke and external parasites, and were injected with vitamin A and dosed with a minete animals were fed *Eragrostis tef* hay *ad libitum* for the first 8 days and then gradually changed-over from hay to a complete feedlot diet (10-MJ ME/kg DM), over the next 21 days. After adaptation the steers were randomly allocated to the four treatments of Phase 2, and from each of the four groups half were randomly allocated to the two treatment groups of Phase 1. Zilpaterol was administered through the feed in micro amounts with ground maize meal used as a carrier. The steers were fasted overnight and weighed every Tuesday morning. The average weight for the target population was considered to be practical for the administration of Zilpaterol in a commercial feedlot.

The ADG for each animal was calculated as the difference between the initial live weight and the final live weight divided by the amount of experimental days. The FCE was calculated as daily live weight gain per unit DM intake. Warm Carcass Weight (WCW) was recorded immediately after slaughter and Cold Carcass Weight (CCW) after 24 hours in the chiller (4°C). Dressing out percentage (Dress%) is the CCW as a percentage of the fasted live weight. SCF thickness (mm) was measured with a vernier calliper posteriorly of the 13 th rib, 50 mm from the medial plane. Carcasses were not electrically stimulated. Rib-cut samples (8, 9 & 10 th ribs) were taken from each half of the chilled carcasses 24 hours post mortem, weighed, bagged and stored frozen for later analyses. Carcass composition was estimated from the composition of the right rib-cut sample while cooking losses (%) and shear force (N, on an Instron apparatus) were measured on the that *M*. Longissimus dorsi thoracis of the left rib-cut sample. The meat was not matured.

The data were statistically analysed by the Statistical Analysis Systems (SAS, 1985), using PROC MEANS, PROG GLM and  $PROC^{RE0}$  where applicable. Results are given as means.

**RESULTS** The results of Phases 1 and 2 are shown in Table 1.

**CONCLUSIONS** Zilpaterol in combination with O-TBA and on its own improved ADG's and FCR's highly significantly, and reduced the carcass fat content while improving the lean content. An improvement in rib eye erea occurred over the control, however in combination with O-TBA the rib eye erea was improved highly significantly. It would appear that Zilpaterol caused a greater shear force value in the *Longissimus dorsi thoracis*, however this is inconclusive since the shear force values of the younger and lighter animals of the control group in Phase, which also had the same fat content as the Zilpaterol treated steers of Phase 2, did not differ from those of the Zilpaterol treated steers.

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Table 1 Means of feedlot performance, carcass and meat quality data of steers treated in Phase 1 with no growth promoting or repartitioning agent, and with O-TBA, and in Phase 2 with no growth promoting or repartitioning agent, with Zilpaterol, with O-TBA and with O-TBA plus Zilpaterol

Ireatments	Phase 1			Phase 2				
	Control	O-TBA	p > F	Control	C + Zilpat	О-ТВА	O-TBA+Zilpat	p > F
arameters			and the second	9 212 05 MB 10	10 Y 4 COD - H L 10	in de erater u.	ored assessment for	Dowollo1
W (initial)	300.00	300.00	a area da ba	393.00	393.00	417.00	424.00	o Riversita
W (final)	393.00	420.00		466.00	478.00	507.00	538.00	sheet sheets
LDG	a1.65	<sup>b</sup> 2.07	0.0001	a1.18	<sup>b</sup> 1.35	<sup>b</sup> 1.46	°1.82	0.000
CR (LW)	ª6.86	<sup>b</sup> 5.67	0.0001	<sup>a</sup> 9.69	<sup>b</sup> 6.70	°7.92	<sup>b</sup> 6.39	0.000
VCW (CCW)	<sup>a</sup> 9.43	<sup>b</sup> 7.96	0.0001	°14.32	°9.08	a12.66	°9.07	0.000
Cur	*230.00	<sup>b</sup> 247.00	0.0006	<sup>a</sup> 279.00	<sup>bc</sup> 291.00	°301.00	<sup>d</sup> 330.00	0.0001
Tess or	<sup>a</sup> 227.00	<sup>b</sup> 244.00	0.0002	<sup>a</sup> 276.00	<sup>bc</sup> 288.00	°299.00	<sup>d</sup> 326.00	0.0001
CF (	57.70	58.20	0.3030	59.20	60.4	59.0	60.8	0.0033
ib cut c	7.70	7.20	0.7279	11.10	9.2	9.1	9.44	0.3286
ib cut fat %	27.80	27.10	0.6826	a35.60	<sup>b</sup> 27.6	°30.4	<sup>b</sup> 28.00	0.0001
lear for	56.30	56.90	0.6258	<sup>a</sup> 50.10	<sup>b</sup> 58.3	°54.7	<sup>b</sup> 57.70	0.0001
<sup>00</sup> king l	107.16	100.00	0.5985	84.81	104.09	89.93	107.7	0.0005
SDA.	27.56	28.23	0.1889	25.50	27.04	25.37	27.60	0.0123
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arbling soon	eer der kanzalt	met menr phier	and builded a	11.74	12.74	12.55	*14.45	0.0001
uality grad	most exhibit i the	forces Ib history	conducted by	3.78	3.35	3.43	3.39	an statem
J grade	mileers & being	some with descen	and a los of same	Select 83	Select 40	Select 40	Select 33	

Superscripts indicate differences at the 5% level between treatments within phases

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