THE EFFECTS OF RACTOPAMINE-HCL (OPTAFLEXX[1]) ON PERFORMANCE, CARCASS CHARACTERISTICS, AND MEAT QUALITY OF FINISHING FEEDLOT HEIFERS

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Introduction

Beta-adrenergic agonists are commonly used in livestock production to accelerate growth by enhancing lean tissue gain. These compounds repartition nutrients away from fat deposition and toward protein accretion. Generally, increased growth is associated with ractopamine feeding, which improves feed conversion and increases body weight gain. However, little data exists on the effects of ractopamine-HCl on live performance or carcass characteristics of beef heifers. Data released from Elanco Animal Health indicate that differences between gender may exist in response to ractopamine, and therefore appropriate strategies for the administration of this compound must be defined for heifers independent of those for steers. The objective of this study was to determine the effects of Optaflexx, when fed for different dosages over different durations, on finishing heifer performance.

Procedures

Non-implanted crossbred heifers (n= 281, 1,049 lb initial body weight) were fed diets based on steam-flaked corn and individually weighed on day 0. The animals were blocked by body weight into 10 weight blocks. Within each weight block, heifers were randomly allocated to 50 partially-covered, concrete-surfaced pens (five to six animals/pen, 10 pens/treatment). Pens were then randomly assigned to five dietary treatments: no ractopamine (Control); 200 mg of ractopamine per heifer daily for 28 days prior to slaughter (200×28); 200 mg of ractopamine per heifer daily for 42 days prior to slaughter (200×42); 300 mg of ractopamine per heifer daily for 28 days prior to slaughter (300×28); and 100 mg for 14 days, 200 mg for 14 days, and 300 mg of ractopamine per heifer daily for the 14 days prior to slaughter (Step-up).

Pens of cattle were weighed using a platform scale on day 0 and immediately before being transported to a commercial abattoir for slaughter. All cattle were allowed *ad libitum* access to a common finishing diet. The entire daily ration was delivered at approximately 1:00 p.m. Dry matter intake, rate of gain, and feed efficiency were determined for each pen of cattle. Initial carcass weights were used for performance calculations and were estimated by multiplying initial live weight by an assumed dressing percentage of 62%. The dose and duration of Optaflexx feeding is summarized in Table 2. All values represented in tables were calculated based on the entire 42-day period.

[1]Optaflexx is a registered trademark of Elanco Animal Health, Indianapolis, IN.

Table 1. Experimental Diet and Nutrient Composition

Item, % dry basis	Diet
Steam-flaked corn	82.9
Ground alfalfa hay	7.0
Corn steep liquor	5.0
Vitamin/mineral supplement[a]	2.9
Feed-additive premix[b]	2.2
Nutrient	
Dry matter	79.3
Crude protein	14.0
NEm, mcal/lb	1.00
NEg, mcal/lb	0.70
Calcium	0.70
Phosphorus	0.36

[a]Formulated to provide 0.13 ppm Co, 10 ppm Cu, 0.63 ppm I, 60 ppm Mn, 0.25 ppm Se, 60 ppm Zn, 91 ppm Fe, 0.67% K, 2,640 IU/kg vitamin A, 110 IU/kg vitamin D, and 32.2 IU/kg vitamin E.

[b]Formulated to provide 300 mg monensin, 90 mg tylosin, 0.5 mg melengestrol acetate and 0, 100, 200, or 300 mg ractopamine-HCl per head daily in a ground corn carrier.

Results and Discussion

Dry matter intake was lower for heifers fed the high dose of Optaflexx. In addition, carcass average daily gain and gain efficiency were improved in all animals fed Optaflexx when compared to the control treatment ($P<0.05$). Carcass gain efficiency was similar for those heifers fed Optaflexx at 200 and 300 mg/heifer daily.

Table 2. Amount and Duration of Optaflexx Feeding

	Days of Experiment		
Treatment[1]	0 to 14	15 to 28	29 to 42
CON	0	0	0
200×28	0	200	200
300×28	0	300	300
200×42	200	200	200
Step-Up	100	200	300

[1]Numbers displayed as mg per head daily of ractopamine-HCl.

No differences among treatments existed for hot carcass weight; dressing percent; yield grade; marbling score; loin eye area; kidney, pelvic, and heart fat; incidence of liver abscess; or quality grade ($P>0.19$).

Duration of feeding Optaflexx appeared to have a greater impact than the dosage level. There was no advantage in feeding an escalating dose of Optaflexx when compared to continuous feeding of 200 mg/day.

Implications

In general, feeding Optaflexx to finishing feedlot heifers increased performance, and had relatively little impact on carcass characteristics.

Table 3. Performance of Heifers Fed 100, 200, or 300 mg/day Optaflexx for 28 or 42 Days

Item	CON	200×28	300×28	200×42	STEP-UP	Contrast[1]
Number of heifers	57	56	57	55	56	-
Days on feed	42	42	42	42	42	-
Days on Optaflexx	0	28	28	42	42	-
Initial carcass weight[1], lb	616	614	612	616	614	-
Hot carcass weight, lb	671	679	676	688	684	+
Dry matter intake, lb/day	18.0[a]	18.0[a]	16.9[b]	18.0[a]	17.4[ab]	**
Carcass gain, lb/day	1.28	1.47	1.50	1.67	1.63	*
Feed:carcass gain	14.1	12.0	11.1	10.5	10.4	+

[1]Contrasts: Control vs. Optaflexx = *; 200 mg vs. 300 mg = **; (P≤ 0.05), Contrasts: Control vs. Optaflexx = +; (P≤ 0.10).
[abc]Superscripts with uncommon letters differ (P≤ 0.05).

Table 4. Carcass Characteristics of Heifers Fed Optaflexx at 100, 200, or 300 mg/heifer Daily for 28 or 42 Days

Item	CON	200×28	300×28	200×42	STEP-UP	Contrast[2]
Dressing, %	63.8	63.9	64.5	65.2	64.7	-
Yield grade	2.09	2.12	2.12	2.31	2.36	-
Marbling[1]	438	431	411	427	409	-
Backfat, inches	0.34	0.39	0.40	0.43	0.41	+
Loin eye area, inches[2]	13.0	12.90	12.90	13.01	12.81	-
Kidney, pelvic, and heart fat, %	2.69	2.56	2.57	2.66	2.61	-
Liver abscess, %	1.68	2.00	6.68	3.34	7.00	-
USDA Choice, %	60.7	70.7	55.3	61.8	59.3	-
USDA Select, %	39.3	27.7	44.7	38.2	40.7	-
USDA Standard, %	0	1.7	0	0	0	-

[1]Marbling scores were obtained by a commercial abattoir; slight = 300 to 399, small = 400 to 499, modest = 500 to 599.
[2]Contrasts: Control vs. Optaflexx = +; (P≤ 0.10).