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Effect of Optaflexx Dosage and Duration of Feeding Prior to Slaughter on Feed Conversion and Carcass Characteristics

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Summary

Finishing steer calves were fed 0, 100, or 200 mg/head/day of Optaflexx for the final 28, 35, or 42 days of the finishing period. Steers were started on Optaflexx treatment at one-week intervals and marketed as a single group. Feeding Optaflexx to feedlot steers increased ADG, improved F:G, and increased carcass weight. Feeding 200 mg/head/day of Optaflexx improved feed conversion by 8.1% without impacting carcass characteristics. Feeding Optaflexx at 200 mg/head/d for 28 to 42 days appears beneficial when compared with feeding diets without Optaflexx.

Introduction

Optaflexx is a feed additive approved for use in feedlot cattle during the final 28 to 42 days of the feeding period. Optaflexx can be fed at a rate of 70 to 430 mg/head/day and 9.1 to 27.3 g/ton (100% DM basis) in the final mixed diet to improve rate of weight gain and feed efficiency. While some information is available on effects of Optaflexx dosage and feeding duration from research prior to F.D.A. approval of Optaflexx, post-approval data are limited. Because of the wide range of approved inclusion rates, research to predict response at various doses and durations is warranted. The objective of this experiment was to evaluate F:G and carcass characteristics when steers were fed 0, 100, or 200 mg/head/day of Optaflexx for the final 28, 35, or 42 days prior to slaughter.

Procedure

Crossbred (English x Continental) steer calves were received at the Agricultural Research and Development Center near Mead, Neb. in the fall of 2003. Calves were received on a common program and adapted to gain over a 21-day period by replacing alfalfa with high-moisture corn. Prior to initiation of Optaflexx treatment all cattle were fed 58.5% high-moisture corn, 30% wet corn gluten feed (SweetBran, Cargill, Blair, Neb.), 7.5% alfalfa hay, and 4% dry supplement (DM basis).

In late January, steers were re-implanted and weighed individually on two consecutive days. At this time, steers were assigned to one of nine treatments, arranged as a 3 x 3 factorial with factors including Optaflexx feeding duration (final 28, 35, or 42 day of the finishing period) and Optaflexx dosage (0, 100, or 200 mg/head/day). Steers were separated into two blocks based on two-day re-implant weights. The heavy block consisted of 360 steers assigned randomly to 45 pens (10 steers/pen) while the light block consisted of 495 steers assigned randomly to 36 pens (10 steers/pen). Pens within a block were assigned randomly to one of nine treatments in the 3 x 3 factorial. An additional 69 steers were assigned randomly into six pens creating three baseline marketing groups. The baseline marketing cattle were fed the same diet as the heavy and the light block, and two pens (23 head) were slaughtered at initiation of each Optaflexx duration treatment (light block, 28, 35, 42 days) to determine carcass characteristics for later estimation of carcass changes during the Optaflexx feeding period. Carcass ADG and efficiency of weight transfer were calculated by regressing dressing percentage on days after initial weight using the baseline marketing cattle (day 0, 7, and 14; n=69) and all control cattle in the light block (day 42; n=164). This allowed for observations of dressing percentage at 0, 7, 14, and 42 days after initial weights were measured. From this regression, a theoretical dressing percentage was determined by multiplying the duration of feeding after initiation of treatment with the slope generated from the regression and then subtracting this value from final dressing percentage. The slope represents gain in dressing percentage for each day after initiation of treatment. An initial carcass weight was then calculated by multiplying the theoretical initial dressing percentage with live weight at the time of treatment initiation.

Steers were implanted with Synovex-S initially and re-implanted with Revalor-S 100 and 104 days prior to marketing for the heavy and light block, respectively. The baseline marketing cattle received the same implant treatments, and therefore were implanted 62, 69, and 76 days prior to slaughter for the 42, 35, and 28 day treatments, respectively.

During the Optaflexx feeding period, a new Optaflexx dry supplement consisting of fine-ground corn was added to all diets to provide 0, 100, or 200 mg/head/day of Optaflexx. These diets included 55.4% high-moisture corn, 30.0% wet corn gluten feed, 7.5% alfalfa hay, 4% supplement, and 3.1% of the Optaflexx supplement (DM basis). Cattle were fed twice daily throughout the entire experiment at approximately 0800 and 1300 hours. Steers received 60% of their daily DM during the A.M. feeding and 40% during the P.M. feeding. To determine actual Optaflexx concentration in the delivered feed, samples were collected daily at the beginning, middle, and end of each A.M. load and assayed. Feed assays showed Optaflexx was provided at target levels throughout the Optaflexx feeding period.
Seven steers were removed from the experiment due to health reasons during the Optaflexx feeding period. In addition, one animal died from interstitial atypical pneumonia diagnosed during necropsy. All causes of removal from experiment appear unrelated to Optaflexx treatments. Individual steer weights were taken on day 1 of Optaflexx treatment. Therefore, steers assigned to 42 days Optaflexx treatment were weighed 42 days prior to marketing, with the 35 days treatment steers weighed one week later, etc. Steers assigned to the heavy block were marketed one week prior to steers on the light block with cattle being fed for an average of 178 days.

At the end of the experiment, all cattle within block were weighed live for determination of live performance during the Optaflexx feeding phase. All cattle were marketed at a commercial abattoir (Tyson Foods, Inc., Dakota City, Neb.) where carcass data were collected. Hot carcass weights and liver abscess scores were collected on the day of slaughter, while fat depth, kidney, pelvic, and heart fat (KPH), longissimus muscle area (LM area), marbling score, and overall maturity (lean and skeletal maturity) measurements were collected after a 36-hour chill. Yield grades were based on measured carcass characteristics.

All data were analyzed as a randomized complete block design with block (i.e. two weight blocks) as a random effect. Treatments were analyzed as a 3 x 3 factorial design where the interaction between dose of Optaflexx and duration of feeding was tested as a main effect. Treatments were analyzed for orthogonal linear and quadratic responses.

Results

Final live weight and carcass characteristics of the baseline marketing groups are presented in Table 1. In order to determine carcass weight gain and changes in carcass characteristics over the duration of Optaflexx feeding, it is assumed that the baseline marketing steers accurately represent the remaining steers in the experiment.

Steer performance data are for the last 28, 35, or 42 days of the finishing period. All performance data presented are based on live weight (4% shrink). Live weight at the initiation of Optaflexx treatment averaged 1,164 lb. Based on DMI, average Optaflexx intakes were 109 mg/day and 215 mg/day for the 100 and 200 mg treatments, respectively.

Simple effects outlining feedlot performance for the Optaflexx feeding period are presented in Table 2. There were no dose x duration interactions (P > 0.58) for feedlot performance, and there were only two carcass characteristics (LM area and calculated

(Continued on next page)
suggested that the weight gain observed when feeding Optaflexx is primarily in muscle tissue.

In this study, carcass weight increased 6 and 8 lb for steers fed 100 and 200 mg of Optaflexx/head/day, respectively, compared to steers fed no Optaflexx. When comparing the final live weights of the treatment groups, the difference is 3 and 8 lb for the 100 and 200 mg/head/day treatments, respectively, compared to the steers fed no Optaflexx. This suggests the increase in ADG due to Optaflexx feeding was carcass gain, which is further supported by a slight numerical increase in dressing percentage and an increase in longissimus area with increasing Optaflexx dosage. By using the baseline marketing groups to estimate carcass gain during the Optaflexx feeding period, efficiency of weight transfer (carcass weight gain/live weight gain) was calculated at 74.6% across all treatments. This represents the proportion of weight gain during the final 28 to 42 days prior to slaughter that was carcass gain, showing that a large proportion of the gain during this time was carcass gain. Carcass ADG, estimated using the baseline marketing groups as a reference, increased linearly (P < 0.01) with Optaflexx dosage.

In summary, feeding Optaflexx up to 200 mg/head/day for the last 28 to 42 days prior to marketing increases live weight gain, carcass weight, and improves feed conversion in feedlot steers. Larger longissimus area without an impact on fat depth suggests most, and possibly all, of the weight gain associated with Optaflexx feeding is due to lean carcass gain.

Table 3. Main effects of Optaflexx dosage (mg/head/day) on live performance and carcass characteristics.

<table>
<thead>
<tr>
<th>Dosage</th>
<th>0</th>
<th>100</th>
<th>200</th>
<th>SEM linear</th>
<th>quadratic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial BW, lb</td>
<td>1164</td>
<td>1165</td>
<td>1164</td>
<td>37</td>
<td>0.79</td>
</tr>
<tr>
<td>Final BW, lb</td>
<td>1311</td>
<td>1314</td>
<td>1319</td>
<td>50</td>
<td>0.07</td>
</tr>
<tr>
<td>DMI, lb/day</td>
<td>24.1</td>
<td>24.0</td>
<td>23.6</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td>ADG, lb</td>
<td>4.06</td>
<td>4.15</td>
<td>4.32</td>
<td>0.35</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>F:G</td>
<td>6.01</td>
<td>5.84</td>
<td>5.52</td>
<td>0.29</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Carcass weight, lb</td>
<td>848</td>
<td>854</td>
<td>856</td>
<td>30</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Carcass ADG, lb</td>
<td>3.00</td>
<td>3.08</td>
<td>3.18</td>
<td>0.04</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Dressing %</td>
<td>64.7</td>
<td>65.0</td>
<td>65.0</td>
<td>0.2</td>
<td>0.14</td>
</tr>
<tr>
<td>Marbling</td>
<td>549</td>
<td>549</td>
<td>536</td>
<td>6</td>
<td>0.10</td>
</tr>
<tr>
<td>Longissimus area, in²</td>
<td>13.21</td>
<td>13.40</td>
<td>13.69</td>
<td>0.11</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>12th rib fat depth, in</td>
<td>0.56</td>
<td>0.55</td>
<td>0.55</td>
<td>0.02</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Note: P-values for linear and quadratic main effect of Optaflexx dose.

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