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Finishing Yearling Heifers Using Self-Fed Dried Distillers Grains on Pasture

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Summary

A 2-yr study compared a traditional system of grazing yearlings followed by a grain-based drylot finishing program to a system using a self-fed dried distillers grain supplement during a spring/summer/fall pasture grazing season. The self-fed (SF) heifers had greater ADG and ending BW on pasture but the traditionally managed heifers had greater final BW and HCW. At harvest, SF heifers had greater 12th rib back fat. When data were adjusted to a common empty body fat, carcass weight and marbling score were greater for traditionally managed heifers.

Introduction

Traditionally, producers select replacement heifers at weaning time. Selecting replacement heifers at weaning is based on weaning weight. Once heifers are selected as replacements, producers have management options for cull heifers. Non-selected heifers could be sold or retained into a yearling system where they graze pasture and are finished in a feedlot. With the availability of ethanol byproducts, an alternative heifer enterprise may be considered for the non-selected heifers. This experiment was conducted to determine the possibility of adding another enterprise to an existing cow/calf enterprise and establish another profit center to generate revenue. Distiller grains was selected as the feed used in the self-feeder because distiller grains are usually less expensive in the spring/summer compared to the fall/winter and distiller grains does not have a negative impact on forage digestibility. The objectives of the experiment were: 1) to compare heifer performance and carcass characteristics in two systems post-weaning, and 2) to assess the pasture use and conditions when heifers were either finished on vegetative pasture with a high energy supplement or allowed to graze summer pastures without supplementation followed by a feedlot finishing phase.

Procedure

The experiment was conducted at the University of Nebraska Barta Brothers Ranch located near Rose, NE. In a two year study, 96 crossbred yearling heifers were used: Control (CON) and Self-fed (SF) to compare a traditional yearling system of spring/summer grazing followed by a feedlot finishing period to a system where yearling heifer grazed spring/summer/fall pasture and were offered a high concentrate self-fed ration. In the spring each year, heifer calves were weighed, vaccinated for respiratory disease, implanted with Synovex-H (Pfizer Animal Health), and dewormed with Ivermectin (Merial Animal Health). Once weighed, heifers were assigned randomly to treatments. All heifers had limited access to grass hay for three days before two day consecutive BW measurements were recorded and used to stratify heifers and randomly assigned them to treatments after the second weight was recorded (CON = 688 lb; SF = 677 lb). Control heifers (n = 24/yr) were provided a summer pasture with no supplement followed by a feedlot finishing period. Self-fed heifers (n = 24/yr) had ad libitum access to a dried distillers grains plus solubles (DDGS)-based concentrate that was offered in a self-feeder during the grazing season.

Both CON and SF heifers were placed on native upland Sandhills pastures of similar topography and forage composition. Control heifers had a stocking rate of 0.61 AUM/ac while SF heifers were stocked at 0.87 AUM/ac based on the assumption that the distiller grain supplement would replace one third of the grazed forage consumed. Each treatment grazed from mid-May to the end of their treatments respective grazing period. Forage stubble height was measured at the end of each grazing period.

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All cattle were transported to a commercial abattoir (Tyson Fresh Meats, Dakota City, Nebraska) when 12th rib backfat was estimated to be 0.50 inches. Hot carcass weights, marbling scores, 12th rib fat depth, LM area, and KPH were recorded. Final live weight was estimated by dividing individual carcass weight by a 62% dressing percentage.

Control (Grazing Followed by Feedlot Phase)

Control heifers grazed from mid-May to mid-September annually and received a free choice mineral supplement (0.24 lb/HD/). In September, heifers were weighed and transported to the Haskell Agricultural Laboratory (HAL) feedlot located near Concord, NE. Upon arrival heifers were vaccinated for respiratory disease, treated for internal and external parasites with Ivermectin (Merial Animal Health), and re-implanted with Synovex-H (Pfizer Animal Health). Prior to collecting two day consecutive weights, cattle were limit fed grass hay for three days to minimize variation in gastrointestinal tract fill. Cattle were transitioned over a period of 21 days to a final finishing diet composed of 75.25% dry rolled corn, 18.0% corn silage, 3.5% liquid supplement, 3.25% SBM, on a DM basis.

Self-Fed (Ad libitum DDGS Based Feed during Grazing)

The SF heifers grazed from mid-May to mid-October and had ad libitum access to a dry distiller grains plus solubles (DDGS) based supplement (Table 1). Self-feeders were located near pasture water sources. This was done to reduce trampling of areas and minimize the effect of creating a blowout. The stocking rate was increased by one-third in anticipation that the DDGS would substitute for some of the grazed forage. Heifers were harvested on October 26 and October 16 for yr 1 and 2, respectively. Because 12th rib backfat...
was significantly different from the control heifers at harvest (0.57 inches for SF and
0.42 inches for CON), performance and carcass data were adjusted using an equa-
tion to adjust data to a common empty body fat (EBF) of 28%.

Data were analyzed as a completely ran-
domized design with the experimental unit being the pasture. Treatment was analyzed as
a fixed effect and year was analyzed as a random variable.

Results

Performance

Heifer performance and days on grass
or in the feedlot are presented in Table 2.
The SF heifers had greater ADG while on
pasture as a result of the treatment. Gain
for SF heifers was 3.39 lb/d while CON
heifer ADG was 1.73 lb/d during the pas-
ture phase and 3.51 lb during the feedlot
phase (2.52 lb/d; combined grazing and
feedlot phases for CON heifers, Table 3).
Self-fed heifers consumed on average 10.12
lb/hd/d/yr of the DDGS concentrate. There
was no difference in forage appraisal be-
tween the two treatments. Self-fed heifers
were harvested approximately 93 d before
their CON contemporaries.

Carcass Data

Control heifers had greater F:G on grass
(11.58 lb) and in the feedlot (7.25 lb) than
SF heifers (6.55 lb and 6.55 lb respective-
ly). The CON heifers produced heavier
carcasses than SF heifers (788 lb vs 711 lb).
A greater hot carcass weight for CON heif-
ers resulted in final calculated live weight
being greater than SF heifers (1271 lb, 1146
lb respectively; Table 3). After carcass data
were adjusted to a 28% empty body fat,
there were differences ($P \leq 0.01$) in USDA
marbling scores, calculated yield grade,
and LM area (Table 4). Control heifers had
higher marbling score and had a lower
calculated yield grade then SF heifers (2.85
vs 3.11 respectively). Heifers on the control
treatment had larger LM area compared to
SF heifers.

This experiment was conducted to
determine the possibility of adding another
enterprise to an existing cow/calf enterprise
and establish another profit center to gen-
erate revenue. Distiller grains was selected

Table 1. Composition of concentrate mixture offered to Self-fed heifers

<table>
<thead>
<tr>
<th>Ingredienta</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDGS</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Whole Shelled Corn</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Soy Hull Pellet</td>
<td>—</td>
<td>20</td>
</tr>
<tr>
<td>Commercial Pelletb</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*% of supplement DM basis. Supplement intake: 10.12 lb/hd/d/yr (DM basis).
*bContained minerals and ionophore (Bovatec).

Table 2. Performance and forage attribute of Control and Self-fed heifers

<table>
<thead>
<tr>
<th>Item</th>
<th>Actual</th>
<th>SEM</th>
<th>P-value</th>
<th>Adjusteda</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial BW, lb</td>
<td>688</td>
<td>19.81</td>
<td>0.33</td>
<td>688</td>
<td>19.81</td>
<td>0.33</td>
</tr>
<tr>
<td>Off Grass BW, lb</td>
<td>909</td>
<td>21.21</td>
<td>0.01</td>
<td>909</td>
<td>13.02</td>
<td>0.01</td>
</tr>
<tr>
<td>ADG</td>
<td>1.73</td>
<td>0.10</td>
<td>0.01</td>
<td>1.73</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>Days on Grass</td>
<td>128.5</td>
<td>6.75</td>
<td>0.01</td>
<td>128.5</td>
<td>8.14</td>
<td>0.17</td>
</tr>
<tr>
<td>Forage Appraisal, in</td>
<td>6.46</td>
<td>0.66</td>
<td>0.33</td>
<td>6.46</td>
<td>0.66</td>
<td>0.33</td>
</tr>
<tr>
<td>Days in Feedlotb</td>
<td>97.5</td>
<td>—</td>
<td>—</td>
<td>103</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

aData adjusted to 28% empty body fat (Guiroy et al., 2001; Journal of Animal Science).
bFeedlot diet composition (DM-basis): 75% DRC, 18% corn silage, 3.5% liquid supplement, 3.25% SBM.

Table 3. Performance and carcass weight of Control and Self-fed heifers

<table>
<thead>
<tr>
<th>Item</th>
<th>Actual</th>
<th>SEM</th>
<th>P-value</th>
<th>Adjusteda</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCW, lb</td>
<td>789</td>
<td>24.05</td>
<td>0.01</td>
<td>788</td>
<td>18.57</td>
<td>0.01</td>
</tr>
<tr>
<td>Final BW, lb</td>
<td>1256</td>
<td>38.91</td>
<td>0.03</td>
<td>1271</td>
<td>29.95</td>
<td>0.01</td>
</tr>
<tr>
<td>System ADG, lbb</td>
<td>2.53</td>
<td>0.21</td>
<td>0.01</td>
<td>2.52</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Feedlot ADG, lbb</td>
<td>3.58</td>
<td>0.34</td>
<td>0.01</td>
<td>3.51</td>
<td>0.20</td>
<td>0.46</td>
</tr>
<tr>
<td>F-G Grass</td>
<td>11.58</td>
<td>0.27</td>
<td>0.01</td>
<td>11.58</td>
<td>0.27</td>
<td>0.01</td>
</tr>
<tr>
<td>F-G Feedlotb</td>
<td>6.95</td>
<td>0.76</td>
<td>0.92</td>
<td>7.25</td>
<td>0.48</td>
<td>0.06</td>
</tr>
</tbody>
</table>

aData adjusted to 28% empty body fat (Guiroy et al., 2001; Journal of Animal Science).
bUsing days in system: (Control: May-December; Self-fed: May-October).
cUsing days in system: (Control: September-December; Self-fed: May-October).
dGrass intake was determined using the 2000 NRC Nutrient Requirements for Beef Cattle.
eFeedlot DMI: 23.90 lb/d.
as the feed used in the self-feeder because distiller grains are usually less expensive in the spring/summer compared to the fall/winter and distiller grains does not have a negative impact on forage digestibility.

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<table>
<thead>
<tr>
<th>Item</th>
<th>Actual</th>
<th>Adjusted&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SEM</th>
<th>P-value</th>
<th>Actual</th>
<th>Adjusted&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% EBF&lt;sup&gt;b&lt;/sup&gt;</td>
<td>27</td>
<td>29</td>
<td>0.34</td>
<td>0.01</td>
<td>28</td>
<td>28</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Marbling Score&lt;sup&gt;c&lt;/sup&gt;</td>
<td>457</td>
<td>431</td>
<td>9.02</td>
<td>0.06</td>
<td>464</td>
<td>387</td>
<td>9.16</td>
<td>0.01</td>
</tr>
<tr>
<td>YG</td>
<td>2.80</td>
<td>3.36</td>
<td>0.15</td>
<td>0.01</td>
<td>2.85</td>
<td>3.11</td>
<td>0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>12th Rib Backfat, in</td>
<td>0.42</td>
<td>0.57</td>
<td>0.41</td>
<td>0.01</td>
<td>0.43</td>
<td>0.50</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>LM Area, in</td>
<td>13.03</td>
<td>12.21</td>
<td>0.24</td>
<td>0.01</td>
<td>13.14</td>
<td>11.60</td>
<td>0.33</td>
<td>0.01</td>
</tr>
</tbody>
</table>

<sup>a</sup>Data adjusted to a 28% empty body fat (Guiroy et al. 2001; Journal of Animal Science).
<sup>b</sup>Original EBF % (Control 27.26; Self-fed 29.01).
<sup>c</sup>Marbling Score 500 = Modest (Choice), 400 = Small (Choice), 300 = Slight (Select).