Assessing the Cost of Beef Quality Revisited

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Introduction and Objectives

• Forristall et al. (2002) found that marbling was the most important performance and carcass trait determining feedlot profit.

• Prices for corn and cattle have changed
  – 1996-99 were $64.13 and $2.49
  – 2005-08 were $88.87 and $3.04

• Objective: What is the relative importance of performance and carcass traits under the now higher prices?
Data

- **Tri-County Steer Carcass Futurity**
  - Fourth quarter placements
  - 180-540 days of age
  - 10,384 steers and 3,255 heifers
  - Less variable than industry standard, CV for
    - carcass weight: 11% v. 13%
    - yield grade: 20% v. 31%
Data

• Biological correlations and economic antagonisms
  – HCW: strong positive correlation with REA and ADG
  – ADG: negative correlation to FG
  – MS: positive with FC and FG
• Marbling is less correlated than some variables, but has a positive relationship with ADG, but negative with REA, PW and HT.
Methods

- Standardized prices for feed, feeder cattle and fed cattle.
- Baseline Choice-Select spread = $8
- Typical grid in the industry for determining individual animal value
- Calculate Net Return (NR) per head based on actual performance and carcass data and standardized prices.
Methods

1. Regress variables on NR to determine which factors have the greatest impact.
   - \( NR_i = f(FG_i, HCW_i, FC_i, REA_i, KPH_i, MAR_i, PW_i, HC_i) \)
   - Separate equations for steers and heifers

2. Repeat at different prices to evaluate sensitivity of results
Methods

• The *regression beta* is the dollar impact on NR of changing a variable by one unit.
• The *standardized beta* is the relative importance of the variable
  – Adjusts for variation
  – Compares apples to apples
## Results

Tri-County Steer Carcass Futurity Steers Placed on Feed in Fourth Quarter. Dependent Variable is Net Return per Head

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Beta</th>
<th>Std Error</th>
<th>Standardize Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-649.04</td>
<td>10.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Hot Carcass Wt</td>
<td>0.35</td>
<td>0.01</td>
<td>0.25</td>
</tr>
<tr>
<td>Fat Cover</td>
<td>-53.67</td>
<td>3.77</td>
<td>-0.08</td>
</tr>
<tr>
<td>Ribeye Area</td>
<td>12.10</td>
<td>0.46</td>
<td>0.15</td>
</tr>
<tr>
<td>Marbling Score</td>
<td>0.52</td>
<td>0.01</td>
<td>0.42</td>
</tr>
<tr>
<td>Feed To Gain</td>
<td>-26.05</td>
<td>0.82</td>
<td>-0.23</td>
</tr>
<tr>
<td>Daily Gain</td>
<td>35.82</td>
<td>1.41</td>
<td>0.20</td>
</tr>
<tr>
<td>Placement Weight</td>
<td>-0.34</td>
<td>0.01</td>
<td>-0.34</td>
</tr>
<tr>
<td>Health treatments</td>
<td>-1.29</td>
<td>0.03</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

R² & obs are: 0.78, 10,384
Economic value of a one unit change in the independent variable on the net returns for steers and heifers placed in the fourth quarter

<table>
<thead>
<tr>
<th>Variable</th>
<th>One Unit</th>
<th>Steers</th>
<th>Heifers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>-649.04</td>
<td>-496.39</td>
</tr>
<tr>
<td>Hot Carcass Wt</td>
<td>10 pound</td>
<td>3.50</td>
<td>4.60</td>
</tr>
<tr>
<td>Fat Cover</td>
<td>1/10 inch</td>
<td>-5.37</td>
<td>-10.65</td>
</tr>
<tr>
<td>Ribeye Area</td>
<td>1 sq. inch</td>
<td>12.10</td>
<td>12.12</td>
</tr>
<tr>
<td>Marbling Score</td>
<td>10 degrees</td>
<td>5.17</td>
<td>4.17</td>
</tr>
<tr>
<td>Feed To Gain</td>
<td>1/10 pound</td>
<td>-2.61</td>
<td>-2.87</td>
</tr>
<tr>
<td>Daily Gain</td>
<td>1/10 pound</td>
<td>3.58</td>
<td>2.15</td>
</tr>
<tr>
<td>Placement Weight</td>
<td>10 pound</td>
<td>-3.40</td>
<td>-2.90</td>
</tr>
<tr>
<td>Health treatments</td>
<td>1 dollar</td>
<td>-1.29</td>
<td>-1.24</td>
</tr>
</tbody>
</table>
Sensitivity Analysis

• Feed Cost +/- 20%
  – Little impact on MS
  – HCW, FG and PW increasingly important
  – At lower feed cost PW as important as MS

• Base carcass price +/- $10/cwt
  – Little impact on MS
  – HCW only variable to increase in importance

• MS still most important within these ranges
Sensitivity Analysis

• Compared Choice - Select spread at $4, $8, $12 and $16
  – MS increasingly important with wider spreads
  – Other variable decrease in relative importance

• At approximately $6 Choice-Select spread PW is of equal relative importance to MS and is more important at lower spreads
Summary

• Economic antagonisms exist:
  – i.e., higher marbling cattle put on more external fat and require more feed per pound of gain
• Marbling is still the most important performance and carcass trait even with higher corn and cattle prices
• Placement weight become as important as marbling at a Choice-Select spread of approximately $6
Thank you!

A copy of the paper may be found at www.iowabeefcenter.org