**Analysis of US Cow–Calf Producer Survey Data to Assess Knowledge, Awareness and Attitudes Related to Genetic Improvement of Feed Efficiency**

Dr. Bob Weaber


Kansas State University, University of Minnesota, Lincoln, Nebraska, USDA ARS, US Meat Animal Research Center, Colorado State University, Pennsylvania State University, New Zealand, Washington State University, University of Missouri, Texas A&M University, Iowa State University, University of Nebraska, and Ohio State University.

Feed costs = 66% in calf feeding systems
Feed costs = 77% in yearling finishing systems

Anderson et al. 2005

10% improvement in gain = +1.8% profit
10% improvement in efficiency = +4.3% profit

Fox et al. 2001

Efficiency increases have 7–8 times the economic impact of comparable increases in gain

Okine et al. 2004

---

**Value of Improved Efficiency in Feedlot Sector**

Table 1. Estimated cost savings to the US beef cattle industry from selection for a 2 lb reduction in residual feed intake.

<table>
<thead>
<tr>
<th>In</th>
<th>Out</th>
<th>Lb.</th>
<th>ADG</th>
<th>Days</th>
<th>Feed</th>
<th>Reduced Feed (lb)</th>
<th>Feed Cost Savings</th>
<th>% of Feed</th>
<th>Total Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>1200</td>
<td>650</td>
<td>3.5</td>
<td>166</td>
<td>166</td>
<td>166</td>
<td>2</td>
<td>892</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Yearling Feeds

775 | 1300 | 525 | 4.0 | 131 | 2.0 | 262 | 0.67 | 11.6% | $689,519,820 |

Total Savings: $ 1,192,140,476

---

**Stakeholder Survey**

- Objectives
  - Develop understanding of stakeholder attitudes/behaviors related to:
    - Importance of feed efficiency
    - Feed efficiency metrics
    - Methods of genetic improvement
    - Base line for determination of project impact
    - Guide extension program development deployment

---

**National Program for the Genetic Improvement of Feed Efficiency in Beef Cattle**

University of Missouri

Iowa State University

Texas A&M University

University of Illinois

University of Nebraska

Texas A&M University

University of Minnesota

University of Missouri

Washington State University

University of Nebraska

USDA–ARS

GeneSeek

University of Missouri

BIF 2016 Selection Decisions Breakout

Session
Bob Weaber, Kansas State University

June 15, 2016

Stakeholder Survey

- Regions
- Strata—Herd Size
  7  5,001 +  Beef Cows
  6  2,501 - 5,000  Beef Cows
  5  1,001 - 2,500  Beef Cows
  4  501 - 1,000  Beef Cows
  3  251 - 500   Beef Cows
  2  101 - 250   Beef Cows
  1  100 and below  Beef Cows

Weighted frequencies and standard errors estimated using PROC SURVEYFREQ in SAS
Means and standard errors estimated using PROC SURVEYMEANS in SAS
Stratified sample design
Frequencies weighted to account for unequal probability of inclusion in the sample

Regions
- Strata—Herd Size
  7  5,001 +  Beef Cows
  6  2,501 - 5,000  Beef Cows
  5  1,001 - 2,500  Beef Cows
  4  501 - 1,000  Beef Cows
  3  251 - 500   Beef Cows
  2  101 - 250   Beef Cows
  1  100 and below  Beef Cows

Stakeholder Survey Results

- Analysis focused on commercial cow-calf producers (n=269)
  - 93% Owners
  - 5.1% Managers
  - 1.8% Other
- Mean age 57.4 ± 1.9 y
- Mean experience 33.2 ± 1.6 y
- Farm/ranch cattle inventories of respondents
  83.1 ± 6.7 hd
- 3.7% use of Artificial Insemination
- Mean bull price US$ 1,887 ± 102

Stakeholder Survey Results

- Respondent level of education
  - 38.3% 4 y college graduates
  - 23.3% some college
  - 27.3% high school graduates
  - 5.0% less than high school grad
  - 6.3% no response
- Farm/ranch work as % of time
  - 47.3% indicated greater than half-time
- Farm/ranch income as % of family income
  - 29.9 ± 2.2%

Stakeholder Survey Results

- Sources of breeding/genetics information
  - 38.9% unpaid consultant
  - 29.7% veterinarians
  - 29.5% extension professionals
  - 27.7% seedstock producers
  - 18.9% internet search
  - 18.1% farm supply/feed store
  - 14.7% breed association personnel
  - 11.7% AI stud personnel
  - 9.3% popular press
  - 2.1% paid consultants
  - Important to educate traditional trainers; but also direct communication to commercial and seedstock

Stakeholder Survey Results

- Decision making process in their business
  - 73.8% profitability greatest concern
  - 24.2% early adopters of new technologies
  - 77.0% let ideas prove themselves before adoption
  - 87.0% current management/selection sustainable
  - 55.4% access new knowledge from media/program
  - 40.1% rely on extension educators to teach new techniques
  - 39.8% rely on seedstock/breed associations for new info on breeding/selection practices

Analysis focused on commercial cow-calf producers (n=269)
- Mean age 57.4 ± 1.9 y
- Mean experience 33.2 ± 1.6 y
- Farm/ranch cattle inventories of respondents
  83.1 ± 6.7 hd
- 3.7% use of Artificial Insemination
- Mean bull price US$ 1,887 ± 102

Respondent level of education
- 38.3% 4 y college graduates
- 23.3% some college
- 27.3% high school graduates
- 5.0% less than high school grad
- 6.3% no response

Farm/ranch work as % of time
- 47.3% indicated greater than half-time

Farm/ranch income as % of family income
- 29.9 ± 2.2%
**Stakeholder Survey Results**

- **Feed Efficiency Concepts**
  - 32.5% correctly identified definition of F:G
  - 36.2% correctly identified definition of feed efficiency
  - 16.4% had heard of RFI
  - 14.3% familiar of RADG
  - 54.8% identified rate of gain as method used by industry historically to improve FE
  - 40.6% improved diet formulation
  - 28.4% feed additives

- **Largest obstacle to genetic improvement of FE in beef industry**
  - 11.9% lack of available facilities/equip
  - 9.7% lack of uniform guidelines
  - 8.3% no obstacles
  - 8.0% lack of demand for tested bulls
  - 7.1% too expensive to collect ind. FI records
  - ~10% were aware of this project

- **Genetic Improvement Concepts**
  - Gauge knowledge of and understanding of basic genetics/selection concepts and attitudes
  - Asked to identify current and anticipated selection behaviors

- **Producers lack basic understanding of new genomic based selection tools and anticipated benefits**
  - 62% didn’t know what class of traits would benefit from marker assisted selection
  - 13.1% correct (difficult/expensive; sig. costs/returns)
  - >2/3 didn’t know value of including genomics in NCE
  - 20.8% correctly ID’d increase in acc.
  - 70% didn’t know how much genetic variation accounted for by current DNA markers

---

**Frequency of use (SD) for various types of genetic prediction information used by beef producers during past five years and their anticipated future use.**

<table>
<thead>
<tr>
<th>Data type</th>
<th>Use past 5 years</th>
<th>Anticipated future use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual measurements</td>
<td>18.4 (3.0)</td>
<td>6.7 (1.8)</td>
</tr>
<tr>
<td>Expected Progeny Differences</td>
<td>21.8 (4.0)</td>
<td>13.8 (3.3)</td>
</tr>
<tr>
<td>Genetically Enhanced EPD</td>
<td>29.9 (4.0)</td>
<td>12.4 (3.4)</td>
</tr>
<tr>
<td>Comments by seller</td>
<td>6.6 (2.2)</td>
<td>12.5 (3.8)</td>
</tr>
<tr>
<td>DNA marker results</td>
<td>16.4 (3.3)</td>
<td>14.5 (3.7)</td>
</tr>
<tr>
<td>Comments by seller</td>
<td>7.3 (1.8)</td>
<td>11.4 (3.0)</td>
</tr>
<tr>
<td>Overall results</td>
<td>2.8 (1.3)</td>
<td>15.4 (3.1)</td>
</tr>
<tr>
<td>None of above</td>
<td>31.0 (4.9)</td>
<td>42.5 (5.1)</td>
</tr>
</tbody>
</table>

*Respondents could select more than one type of information used; column totals will not sum to 100%.

**Stakeholder Survey Results**

- 41.2% not knowledgeable of methods to select for improved efficiency
- 28.8% slightly knowledgeable
- 20.2% somewhat knowledgeable
- 7.0% very knowledgeable
- 1.5% extremely knowledgeable

**Genetic Improvement Concepts**

- Producers lack basic understanding of new genomic based selection tools and anticipated benefits
  - 62% didn’t know what class of traits would benefit from marker assisted selection
  - 13.1% correct (difficult/expensive; sig. costs/returns)
  - >2/3 didn’t know value of including genomics in NCE
  - 20.8% correctly ID’d increase in acc.
  - 70% didn’t know how much genetic variation accounted for by current DNA markers

**Largest obstacle to genetic improvement of FE in beef industry**

- 11.9% lack of available facilities/equip
- 9.7% lack of uniform guidelines
- 8.3% no obstacles
- 8.0% lack of demand for tested bulls
- 7.1% too expensive to collect ind. FI records
- ~10% were aware of this project

**Producers lack basic understanding of new genomic based selection tools and anticipated benefits**

- 62% didn’t know what class of traits would benefit from marker assisted selection
- 13.1% correct (difficult/expensive; sig. costs/returns)
- >2/3 didn’t know value of including genomics in NCE
- 20.8% correctly ID’d increase in acc.
- 70% didn’t know how much genetic variation accounted for by current DNA markers

---

**Stakeholder Survey Results**

- 32.5% correctly identified definition of F:G
- 36.2% correctly identified definition of feed efficiency
- 16.4% had heard of RFI
- 14.3% familiar of RADG
- 54.8% identified rate of gain as method used by industry historically to improve FE
- 40.6% improved diet formulation
- 28.4% feed additives

- 41.2% not knowledgeable of methods to select for improved efficiency
- 28.8% slightly knowledgeable
- 20.2% somewhat knowledgeable
- 7.0% very knowledgeable
- 1.5% extremely knowledgeable

**Stakeholder Survey Results**

- 41.2% not knowledgeable of methods to select for improved efficiency
- 28.8% slightly knowledgeable
- 20.2% somewhat knowledgeable
- 7.0% very knowledgeable
- 1.5% extremely knowledgeable

**Stakeholder Survey Results**

- 32.5% correctly identified definition of F:G
- 36.2% correctly identified definition of feed efficiency
- 16.4% had heard of RFI
- 14.3% familiar of RADG
- 54.8% identified rate of gain as method used by industry historically to improve FE
- 40.6% improved diet formulation
- 28.4% feed additives
Stakeholder Survey Results

- Genetic Improvement Concepts
  - 41.7% ADG as selection criteria to improve FE
  - 27% cow mature weight and body condition score
  - <4% ME EPD
  - <4% Residual Average Daily Gain (rADG)
  - <4% selection index that use FI predictions

- Willingness to pay for bulls with reliable FE genetic predictions
  - 23% would not pay more
  - 10.5% increase price US$ 101-200
  - 11.8% increase price US$ 201-300
  - 13.6% pay > US$ 500

Stakeholder Survey Conclusions

- Cow-calf producers not well versed in either feed efficiency or genetic/selection concepts.
- More work to be done to educate trainers and producers on both topics.
- No direct price signal in value chain, although significant cost saving/value improvement through improvement.
- Value of demonstration project; surveyed participants to quantify knowledge gain/attitudes

Acknowledgements

- US Consortium for Genetic Improvement of Feed Efficiency in Beef Cattle
  - www.beefefficiency.org

www.beefefficiency.org

Thank you!

Questions?