Cow Feed Efficiency Unknowns, Including Utilization of Range Forages

Douglas Olsen
Olsen Ranches, Inc.

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Cow Feed Efficiency
Unknowns, Including
Utilization of Range Forages

Douglas Olsen
Olsen Ranches, Inc.

Range Beef Cow Symposium
November 17, 18, and 19, 2015
Loveland, CO

Olsen Ranches, Inc.
Banner County, NE

Olsen Ranches, Inc.
Why Test for Efficiency?

- Bob Weaber (2011) estimated that a 10% improvement across the entire feedlot industry would reduce feed cost $1.2 billion in 2011.
- A 1% improvement in feed efficiency has the same economic impact as a 3% increase in rate of gain.
- Feed cost are large portion of beef production
  - Feedlot
  - Backgrounding
  - Cow/Calf

Cow Efficiency

- Importance of Cow Feed Efficiency
  - ≈70% of feed resource for the cow herd
  - ≈70% of feed resource for maintenance
  - ≈50% of all feed is used to maintain the cow herd
Doubts of Feed Efficiency Testing

- Environmental Effects
  - Confined space versus rangeland
  - Pen mate competition
- Growth curve
- Age and hormone effects
- Grazing versus bunk feeding
- Diet
  - Forage versus concentrate
  - Fill regulated or energy feedback
- Gain versus maintenance
- Gain versus milk

Efficiency

- Input divided by output (or vice versa)
  - Example is Feed / Gain

Cow Efficiency

- A cow must convert the forage resource she is given to a high value calf.

What is an efficient cow?

Cow Efficiency (output)

- Must grow enough early to get pregnant early for her first calf
- Low rates of dystocia
- Rebreed annually for multiple years
- Produce pounds of a marketable calf
  - Minimal sickness
  - Efficient growing calf
  - High quality beef product at harvest
Cow Efficiency
(input)

- Forage resource
  - Grass
  - Winter grazing
  - Harvested feed

Cow Efficiency

- Thus Cow efficiency is a whole life cycle

\[
A + B + C + D + E + F + G + H \\
X + Y + Z
\]

INDEX

Genetics

- AHA National Reference Sire Program
  - Over 200 sires tested
  - Over 10,400 progeny with data
- Olsen Steers tested in GrowSafe facility
  - 71 sires
  - 1777 steer progeny

Genetics

- Actual Data from June 14, 2012 to August 25, 2012 test (72 day)
- AI sired steers out of 4 year old or older cows
- 13 sires
- 209 steers

Genetics

- ADG 5.02 lb/day
- In value of $1.45 /lb
- Out value of $1.35 /lb
- Feed Cost $283.02 /DM ton

2015 Range Beef Cow Symposium, Loveland, Colo.

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<th>Sire</th>
<th>In Weight</th>
<th>In Value @ $1.45/lb</th>
<th>ADG</th>
<th>Out Weight</th>
<th>Out Value @ $1.35/lb</th>
<th>Feed Cost @$283.02/DM ton</th>
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- Similar Beginning Weight
- Large difference in feed cost - $36.14
- Feed cost far exceeded extra gain

Genetics

- Moderate to High heritability for change
  - Phenotype
  - Marker Assisted
- Marker Base estimates of heritability
  - Four populations of beef cattle
  - 847 Hereford cattle in 10 contemporary groups
  - Population specific

Marker-base estimates of heritability ($h^2$) for ADG, DMI, MMWT and RFI

<table>
<thead>
<tr>
<th>Breed</th>
<th>DMI (lb)</th>
<th>MMWT (lb/100)</th>
<th>ADG (lb/d)</th>
<th>RFI (lb/d)</th>
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Saatchi et al.: QTLs associated with dry matter intake, metabolic mid-test weight, growth and feed efficiency have little overlap across 4 beef cattle studies. BMC Genomics 2014 15:1004
2015 Range Beef Cow Symposium, Loveland, Colo.
Management Efficiency

• Match genetics to your goals and resources
• More Growth equals ?
  – Breed trends versus Feedlot or Commercial cow/calf performance
• More Milk equals ?
  – Weaning rate
  – Breed trends
• More Muscle equals ?

Opportunity

• Genomic research
  – Health as it relates to efficiency
  – Genomic abnormalities and embryonic death
  – Weaning rate
• Continued testing of phenotypes
• Better data sets to compare cow lifetime productivity

So What?

• Room for improvement in production efficiency and specifically feed efficiency
• Careful evaluation of growth, muscle, and milk in the cow herd
• Improve digestion, metabolism, or health
• Selection for feed efficiency does not appear to have negative effects on cow fertility and weaning rates

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Summary

- Visual appraisal can not determine feed efficiency
- More feed intake data is needed
- Better evaluation of correlations to other traits with bigger data sets
- Index to combine traits

www.beefefficiency.org

National Program for Genetic Improvement of Feed Efficiency in Beef Cattle