Efficiency in the Range Beef Cow

Trey Patterson

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Efficiency in the Range Beef Cow

Dr. Trey Patterson, CEO, Padlock Ranch Company
Range Beef Cow Symposium: November, 2015

Biological Versus Economic Efficiency

- Profitable cattle are usually productive
- Productive cattle are not always profitable

Taylor, 1994

Biological Type and Biological Efficiency

Profitable cattle are usually productive
Productive cattle are not always profitable

Taylor, 1994

Economic Efficiency of Beef Production

<table>
<thead>
<tr>
<th>Class</th>
<th>Avg lb/d</th>
<th>$ Out/$100 In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>13.8</td>
<td>90.3</td>
</tr>
<tr>
<td>Med</td>
<td>17.6</td>
<td>89.2</td>
</tr>
<tr>
<td>High</td>
<td>20.2</td>
<td>88.1</td>
</tr>
</tbody>
</table>

*All cows same size

Van Oijen et al., 1993

Summary of 1984 Beef Cow Efficiency Forum

- Liberal Feed and/or Low Stress
  - Heavier-milking, larger cattle are more efficient

- Restricted Feed or Higher Stress
  - Moderate-milking, moderate size are more efficient

Adapted from Ritchie, 1995

Cow Efficiency

- Stocking Rate and Grazing Management
  - Run more moderate than large cows?
- Longevity in a production setting important
- Cows produce second calf at 3 years? (Zietsman, 2014)
Key Metrics
- Pregnancy Rate
  - Two-year pregnancy rate
  - Cows bred early vs late
- Cost/weaned calf
- Carrying Capacity
- Customer Feedback

The Frustration?
- Complex Systems
  - Genetics
  - Management
  - Environment
  - Costs
  - Marketing

Net Present Value of Cows

Capital Budgeting: NPV

Effect of Longevity on NPV
(5-yr avg prices; weigh-up cow marketing)

Cost of Bred Heifers

2015 Range Beef Cow Symposium,
Loveland, Colo.
NPV vs Lifetime Profit

<table>
<thead>
<tr>
<th>Cost to Put Heifer in Herd</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>$821/hd</td>
</tr>
<tr>
<td>$1,500</td>
<td>$321/hd</td>
</tr>
<tr>
<td>$2,000</td>
<td>-$179/hd</td>
</tr>
</tbody>
</table>

Can we build a better cow?

![Cow on pasture]

Range Development

- Heifers developed on range or in a dry lot; All to grass May 18
  - Similar winter gains
- Gain from turnout to breeding (May 18 to June 14)
  - Range: 2.07 lb/day
  - Dry lot: 0.32 lb/day
  
(P < 0.05)

![Gain graph]

Salverson et al., 2005

ADG from AI to Pregnancy Detection for Heifers on Range or Dry Lot Prior to Breeding

![Gain graph]

P < 0.01

Perry et al., 2013

Pregnancy to AI for Heifers on Range or Dry Lot Prior to Breeding

![Conception graph]

Range: 59.49%
Drylot: 43.16%

P = 0.04

Perry et al., 2013

Range Development at Padlock

- 2011
  - 500 hd range developed
    - 3 lbs of cake
    - No hay
    - 771 lbs at breeding in July
    - 60.9% first service conception
  - 1000 hd in feedlot
    - 39 NEg grower
    - 879 lbs at breeding in July
    - 61.6% first service conception
Range Development at Padlock

- 2012
  - 1000 hd range developed
  - 2 lbs of cake
  - No Hay
  - 865 lbs at breeding in July
  - 64.5% first service conception
- 1600 hd feedlot developed
  - 913 lbs at breeding in July
  - 60.7% first service conception

Fort Keogh Research

- Cows managed with marginal or adequate supplementation during the winter (8yrs)
- Progeny heavier at 5 yrs of age from dams on marginal vs adequate nutrition
  - BCS was better on marginal progeny

Roberts et al., 2011

Effect of Protein Supplementation on Subsequent Heifer Performance

<table>
<thead>
<tr>
<th>Item</th>
<th>No Winter Protein</th>
<th>Winter Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj. 205-d wt, lb</td>
<td>481^a</td>
<td>498^b</td>
</tr>
<tr>
<td>Age at Puberty</td>
<td>334</td>
<td>339</td>
</tr>
<tr>
<td>Pregnant %</td>
<td>80^a</td>
<td>93^b</td>
</tr>
</tbody>
</table>

P < 0.05

Martin et al., 2007

Cow Efficiency

- Reproduction is a driver in cow efficiency
- Improved reproduction in young cows improves longevity
- Young cow pregnancy may be influenced by management of the cow and the heifer calf

Looking Ahead

- Learned Grazing Behavior
- Systems of Cow Management
- Fetal Programming
Look Deeper

- Cause and Effect are distant in time and space
- The areas of highest leverage may not be the most obvious!

Senge, 1990

Thank You!