Economic Tools

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Ag & Applied Economics
University of Wyoming
Cows need to be profitable!

• We can’t afford to overpay
• We need to extract as much value as we can when they’re culled
Where we’re going

• Think of a heifer as a production facility
  – Make an investment decision
• In order to determine if a heifer enterprise is profitable, we need to compare revenues and costs
• Timing of these streams of $ matter
So, What is a Heifer *Worth*?

• Price is what she’s ‘worth’ at sale.
• What is she worth to you?
  – All the future earnings, less costs, in current terms
  – Time Value of Money is Important!
Timing Matters!

- Money today is worth more than money in the future
  - For lots of reasons
Imagine you meet your financial advisor at the sale barn...

- You give him $1,000
- And he gives you a check for $100 each of the next 10 years, starting next year
- Would you give him any more business?
Cow Value Tool

• We need to account for the stream of both revenues (calf sales) and costs
• The Net Present Value of these streams compared to what she costs us determines if she will be profitable...
Cow Value

• Depends on:
• Annual Costs (feed efficiency, cow size, milk production)
• Value of Calves (weaning weight, timing, price - EPDs)
• Number of calves (longevity)
• Interest rate
Online Tool

- Available at: [http://uwyoextension.org/ranchtools](http://uwyoextension.org/ranchtools)
- Just Google: Wyoming Ranch Tools
Welcome to Wyoming Ranch Tools

Designed and Maintained by Bridger Feuz
University of Wyoming – Livestock Marketing Specialist/Area Educator

The goal of this site is to provide usable tools to help ranchers (both large and small) be able to make better decisions, leading to sustainable operations. Each tool is accompanied with a fact sheet and instructions on utilizing the tool. If you don’t see the tool you need here contact me at bmfeuz@uwyo.edu and let me know what you would like to have added.

General Budgeting

- **Partial Budget** – Use the partial budget tool to help make decisions such as: Should I sell calves or yearlings? Should I retain ownership on my heifers? What should I do with my cull cows? Should I buy hay or put up my own?

- **NPV Tool** – Use the Net Present Value (NPV) tool to make decisions when a significant capital investment is needed. The NPV tool also contains an EconoRange version which helps in making decisions on range and pasture improvement projects.

Livestock Tools
Livestock Tools

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- **Cow Valuation** – This tool is designed to estimate the current value of a cow based on a projected number of calves. It can be used for all breeding age cows from heifers to short term cows. The tool was adapted from a spreadsheet developed by John Ritten, Steve Paisley and Brian Lee.

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## Wyoming Master Stockman

### Cow Valuation Tool

by Dr. John Ritten, S. Paisley, B. Lee, B. Feuz - University of Wyoming Extension

<table>
<thead>
<tr>
<th>Individual Herd Information</th>
<th>Estimated Cow Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Annual costs per cow:</td>
<td>1</td>
</tr>
<tr>
<td>Sale weight of calves:</td>
<td>2</td>
</tr>
<tr>
<td>Calf price (per cwt):</td>
<td>3</td>
</tr>
<tr>
<td>Cull cow weight:</td>
<td>4</td>
</tr>
<tr>
<td>Cull cow price (per cwt):</td>
<td>5</td>
</tr>
<tr>
<td>Discount Rate:</td>
<td>6</td>
</tr>
<tr>
<td>Weaning percentage:</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
We can estimate worth...

• We need to compare to cost in order to decide if buying them is profitable...
What do heifers cost?

• We can buy them
  – But, why did someone else sell them?
  – Genetics are always a concern

• We can create them
  – Need to get them from heifer calves to bred
  – Not all that are kept and exposed will be bred
  – We need to buy the calves from ourselves!
A Few Considerations

- How many calves will we get?
- What will costs do?
- Livestock Prices?
- When should we cull?
So, what should we do with culls?

- Cull Cows are an important revenue stream
- Roughly 13% of Revenues come from Cull Cow Sales
- How can we Impact Value?
  - Seasonality
  - Weight and Quality
Seasonality
Seasonality

• Regardless of where you are, this phenomena exists
• Fairly consistent results across both markets and quality grades
## Quality

<table>
<thead>
<tr>
<th>USDA Grade</th>
<th>Market Class</th>
<th>% Lean</th>
<th>BCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutter</td>
<td>Lean</td>
<td>85-90%</td>
<td>3-4</td>
</tr>
<tr>
<td>Boning Utility</td>
<td>Boners</td>
<td>80-85%</td>
<td>5</td>
</tr>
<tr>
<td>Breaking Utility</td>
<td>Breakers</td>
<td>75-80%</td>
<td>6-7</td>
</tr>
<tr>
<td>Commercial</td>
<td>Premium White</td>
<td>70-75%</td>
<td>7-8</td>
</tr>
</tbody>
</table>
How do we impact quality grades?

• Keep in mind grading is subjective, but based on percent lean meat
• However heavily related to BCS (again subjective)
• Typically, adding weight increases fat %, and therefore increases BCS
• Rule of Thumb*: 70 lbs of gain = 1 BCS
Wyoming Prices over the last 10 years

<table>
<thead>
<tr>
<th>Month</th>
<th>Breakers</th>
<th>Cutters</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$50</td>
<td>$54</td>
</tr>
<tr>
<td>February</td>
<td>$52</td>
<td>$56</td>
</tr>
<tr>
<td>March</td>
<td>$54</td>
<td>$58</td>
</tr>
<tr>
<td>April</td>
<td>$56</td>
<td>$58</td>
</tr>
<tr>
<td>May</td>
<td>$58</td>
<td>$60</td>
</tr>
<tr>
<td>June</td>
<td>$60</td>
<td>$58</td>
</tr>
<tr>
<td>July</td>
<td>$62</td>
<td>$60</td>
</tr>
<tr>
<td>August</td>
<td>$64</td>
<td>$58</td>
</tr>
<tr>
<td>September</td>
<td>$66</td>
<td>$58</td>
</tr>
<tr>
<td>October</td>
<td>$68</td>
<td>$58</td>
</tr>
<tr>
<td>November</td>
<td>$68</td>
<td>$58</td>
</tr>
<tr>
<td>December</td>
<td>$70</td>
<td>$60</td>
</tr>
</tbody>
</table>
Example of Seasonal Impacts

• Let's say we were going to cull in October
• What if we wait until February or March?
• To keep it cheap, just putting them on Winter Pasture
• Look at constant weight, and slight increases or decreases
Change in value of Breakers given 10 Year Average Prices (BSC 6-ish)
Change in Value of Cutters given
10 Year Average Prices (BCS 4-ish)

- Constant Weight
- Losing 60
- Gaining 60

October November December January February March

$100.00
$80.00
$60.00
$40.00
$20.00
$0.00
$-20.00
$-40.00
$-60.00
What if we impact Quality

- Assumptions:
  - 1,100 pounds
  - Would have sold in November (worst month)
  - Feed 90 (120) days
- Daily Ration:
  - 13 lbs grass hay, 15 lbs alfalfa, 3.25 lbs corn
- Gain 1.5 lbs/day
“You said to scatter the hay!”
Changes in Cow Value

Differences in Revenue at the sale barn due to seasonal price increases, increased weight, and quality premium

10 year Average Increase by Keeping and Feeding Through:

<table>
<thead>
<tr>
<th></th>
<th>February</th>
<th>March</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$203.50</td>
<td>$258.24</td>
</tr>
</tbody>
</table>

But, these gains aren’t free...
Yep, there’s a tool for that...

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What do we need to know?

- Normal:
  - Sale date
  - Expected Price
  - Body Condition
  - Weight

- If kept:
  - Days kept
  - Anticipated ADG
  - Feed costs
    - Include Yardage
  - Deathloss
  - Interest Rate
Cull Cow Marketing Tool

This calculator allows you to analyze the market timing of cull cows, as well as the potential to feed cull cows to create additional value.

Price and Revenue Projections

<table>
<thead>
<tr>
<th>Present Date</th>
<th>11/1/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present BCS of Cull Cows</td>
<td>5.0</td>
</tr>
<tr>
<td>Estimated Cow Weight</td>
<td>1100</td>
</tr>
<tr>
<td>What is the present market price for</td>
<td>Boner 80-85% Lean</td>
</tr>
<tr>
<td>Estimated Value of Cull Cows if Sold today</td>
<td>$814.00/head</td>
</tr>
<tr>
<td>Number of Day to be fed</td>
<td>90</td>
</tr>
<tr>
<td>Expected Average Daily Gain</td>
<td>1.5 Note: can be negative</td>
</tr>
<tr>
<td>Expected Final Cow Weight</td>
<td>1235</td>
</tr>
<tr>
<td>Expected Sale Date</td>
<td>1/30/19</td>
</tr>
<tr>
<td>Expected BCS of Cull Cows</td>
<td>6.8</td>
</tr>
<tr>
<td>Expected Market Price for a</td>
<td>Breaker 75-80% Lean</td>
</tr>
<tr>
<td>Estimated Value of Cull Cows if Sold at the end of the feeding period</td>
<td>$1,003.49/head</td>
</tr>
<tr>
<td>Gross Feeding Margin</td>
<td>$189.49/head</td>
</tr>
<tr>
<td>Cost Item</td>
<td>Amount</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Feed Costs</td>
<td>170</td>
</tr>
<tr>
<td>Vet Costs</td>
<td>0</td>
</tr>
<tr>
<td>Supplies</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td></td>
</tr>
<tr>
<td>Yardage</td>
<td>31.5</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>0.05</td>
</tr>
<tr>
<td>Death Loss Percent</td>
<td>0.005</td>
</tr>
<tr>
<td><strong>Total Feeding Period Costs</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Net Return to Cull Cow Feeding Enterprise**

$-27.35
### Summary

A Cull Cow with a BCS of **5** and weighing **1100 lbs.** would be in the **Boner 80-85% Lean Market Class.**

Your estimated price was **$74.00 / cwt. on 11/1/18.**

The cow would be worth **$814.00.**

If you fed the cow for **90 days at an average daily gain of 1.5 lbs.** the cow would weigh **1235 lbs.** and have an expected BCS of **6.8.**

The estimated market price on **1/30/19** would be **$81.25** for a cull cow in the **Breaker 75-80% Lean market Class.**

The Cull cow would then be worth **$1,003.49.**

Your estimated feeding cost were **$216.85.**

The projected Net Return to feeding is **-$27.35.**

Your total cost per pound of gain is **$1.61.**

Your break-even selling price is **$83.47.**
A Cull Cow with a BCS of 3 and weighing 950 lbs. would be in the Cutter/Lean 85-90% Lean Market Class.

Your estimated price was $74.00 / cwt. on 11/1/18

The cow would be worth $703.00

If you fed the cow for 90 days at an average daily gain of 1.5 lbs. the cow would weigh 1085 lbs. and have an expected BCS of 5.1

The estimated market price on 1/30/19 would be $87.70 for a cull cow in the Boner 80-85% Lean market Class.

The Cull cow would then be worth $951.56

Your estimated feeding cost were $214.92
The projected Net Return to feeding $33.64

Your total cost per pound of gain is $1.59
Your break-even selling price is $84.60
Any other options

• What if we beat the market?
• Assume we get out early, preg check and sell in August
• Take advantage of seasonality and increased (slightly) weights
Difference in **Values** from August to November

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Year Average Value of Cutter weighing 1150 in August vs 1100 November</td>
<td>$105.31</td>
</tr>
<tr>
<td>10 Year Average Value of Breaker weighing 1300 in August vs 1250 November</td>
<td>$114.47</td>
</tr>
</tbody>
</table>
So, how can we compare Sire A and Sire B?

• Benton didn’t have time. Luckily, we have a tool for that...
• We can compare 2 bulls
• All we need is:
• Cost difference
• Years in service
• Calves sired per year
• Tool calculates required increase in value per off-spring
Genetic Investment Tool

Wyoming Master Stockman
Bull / Ram Investment Tool

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard bull / ram cost</td>
<td>3,000.00</td>
</tr>
<tr>
<td>Cost for a better bull / ram</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Increased cost</td>
<td>2,000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Details</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in Service</td>
<td>5</td>
</tr>
<tr>
<td>Calves / Lambs per year</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interest/Discount Rate</th>
<th>3%</th>
<th>5%</th>
<th>7%</th>
<th>9%</th>
<th>12%</th>
<th>18%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break-even Analysis</td>
<td>$436.71</td>
<td>$461.95</td>
<td>$487.78</td>
<td>$514.18</td>
<td>$554.82</td>
<td>$639.56</td>
</tr>
<tr>
<td>Additional Annual Revenue Required</td>
<td>$436.71</td>
<td>$461.95</td>
<td>$487.78</td>
<td>$514.18</td>
<td>$554.82</td>
<td>$639.56</td>
</tr>
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<td>3%</td>
<td>5%</td>
<td>7%</td>
<td>9%</td>
<td>12%</td>
<td>18%</td>
</tr>
<tr>
<td>------------------------------------------</td>
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**Additional Revenue Needed Per Calf / Lamb**
Thank You!

John Ritten

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307-766-3373