

11-2015

Challenges with Heifer Selection - HOW MANY Should I Breed, and What are they worth?

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Lemenager, Ron and Lake, Scott, "Challenges with Heifer Selection - HOW MANY Should I Breed, and What are they worth?" (2015). *Range Beef Cow Symposium*. 329.

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FAPRI (Aug, 2015) Estimates

| Price Projections | 14/15 | 15/16 | 16/17 | 17/18 | 18/19 | 19/20 |
|-----------------------------------|--------|--------|--------|--------|--------|--------|
| All hay price, \$/t | 172.00 | 155.90 | 155.39 | 16416 | 170.35 | 173.84 |
| Corn, \$/bu | 3.70 | 3.68 | 3.71 | 3.96 | 4.09 | 4.14 |
| Beef cows, M hd | 29.7 | 30.7 | 31.4 | 31.6 | 31.7 | 31.5 |
| Steers, all grades 5-area, \$/cwt | 156.89 | 149.10 | 136.60 | 129.80 | 124.77 | 122.12 |
| Steers, 600-650 lb OKC, \$/cwt | 242.01 | 224.95 | 198.26 | 181.60 | 168.93 | 162.75 |

Annual Cow Cost

- **Annual feed cost (Rasby, 2015)**
 - Mature cows \$508.88
 - 1st calf heifers \$558.25
 - Replacement heifers \$358.25
- **Other cash costs** \$85.00
- **Ownership costs** \$133.00
- **Total**
 - Mature cows \$727.00
 - 1st calf heifers \$776.00
 - Replacement heifers \$567.00

- ### Challenges – What Are They Worth?
- **Accurately estimating future prices**
 - Pasture, feed, supplement
 - Power and fuel
 - Equipment/facility repair/replacement
 - Interest
 - Bulls
 - Feeder calves
 - Cull/surplus cows
 - **How much risk is the ranch willing to take?**

What are They Worth?

My answer:

“All cattle are worth market price, anything above or below that is based on perceived value.”

Is Perceived Value = Real Value?

Value of cattle on cash flow statement
vs.
What someone is willing to pay

Likely not the same


Net Present Value



Net present value (NPV), also called net present worth (NPW), is an approach to evaluating investments that assesses the difference between all the revenue the investment can be expected to achieve over its whole life and all the costs involved, taking into consideration inflation, and discounting both future costs and revenue at an appropriate rate. It can be challenging to calculate NPV because it is not always clear what discount rates should be used.

Source: Business Terms Glossary

Dangers

In any assumptions we make





NPV - ISU



- Schulz and Gunn (2015)
- Assumptions
 - Annual cow costs (\$400, \$500, \$600, \$700)
 - Future weanling calf prices (FAPRI, 2015)
 - Calf weaning weights (500 vs. 600 lb; 40# discount 1st calf)
 - Cull cows (1200# -1st calf; 1250# -mature cows; \$80/cwt)
 - Discount rate (5%; interest or living expenses)
 - 1 to 5 calves

<http://www.extension.iastate.edu/agdm/livestock/html/b1-74.html>



Assumptions

- We could buy, or are willing to sell
 - 600# Weanling heifer for \$1200
 - 600# x \$200/cwt ≈ \$1200
- Or*
- Bred yearling heifer for \$2000
 - (1063# x \$150/cwt) ≈ \$1600
 - \$1600 + \$400 cost ≈ \$2000
- What's the maximum bid price to break even?



Inputs Used (Bred Yrlg. Example)

| Purchase and Financing | |
|---|---------|
| Purchase price of replacement female, \$/head | \$2,000 |
| Year of purchase | 2015 |
| First year for calf sales | 2016 |
| | |
| Expected calving opportunities, years | 5 |
| Marketable calves (1 - death loss), % | 90% |
| Discount factor (risk rate), % | 5.0% |



Inputs Used

| Production and Prices | | | | | | |
|---------------------------|------|----------|----------|----------|----------|----------|
| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Calf | 0 | 0 | 1 | 1 | 1 | 1 |
| Marketable calves, % | 0% | 90% | 90% | 90% | 90% | 90% |
| Steer calf weight, lbs | | 560 | 600 | 600 | 600 | 600 |
| Steer calf price, \$/cwt | | \$225.00 | \$198.00 | \$182.00 | \$169.00 | \$163.00 |
| Heifer calf weight, lbs | | 560 | 600 | 600 | 600 | 600 |
| Heifer calf price, \$/cwt | | \$225.00 | \$198.00 | \$182.00 | \$169.00 | \$163.00 |
| Cull cow weight, lbs | | 0 | 0 | 0 | 0 | 1250 |
| Cull cow price, \$/cwt | | \$80.00 | \$80.00 | \$80.00 | \$80.00 | \$80.00 |

Outputs

| | | | | | | | |
|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Income above annual costs, \$/year | | \$0 | \$434 | \$369 | \$283 | \$213 | \$180 |
| Nominal Cash Flows | Initial Year 0 | 2015 Year 1 | 2016 Year 2 | 2017 Year 3 | 2018 Year 4 | 2019 Year 5 | 2020 Year 6 |
| Net cash flow | | \$0 | \$434 | \$369 | \$283 | \$213 | \$180 |
| Cull cow salvage value | | \$0 | \$0 | \$0 | \$0 | \$0 | \$1,000 |
| Annual pre-tax cash flows | | (\$2,000) | \$0 | \$434 | \$369 | \$283 | \$213 |
| Cumulative value of annual pre-tax cash flows | | (\$2,000) | #N/A | #N/A | #N/A | #N/A | #N/A |
| Discounted Cash Flows | Initial Year 0 | 2015 Year 1 | 2016 Year 2 | 2017 Year 3 | 2018 Year 4 | 2019 Year 5 | 2020 Year 6 |
| Present value of annual pre-tax cash flows | | (\$2,000) | \$0 | \$394 | \$319 | \$233 | \$167 |






Outputs

Profitability Indicators

Nominal (undiscounted):



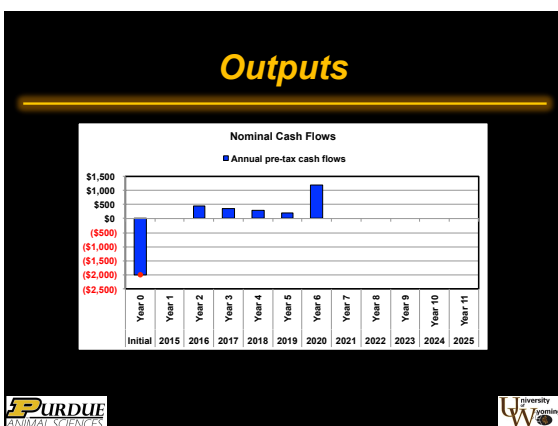
| | |
|---|----------|
| Average annual pre-tax cash flows | \$495.76 |
| Internal rate of return (IRR) | 4.9% |
| Payback period, years | 6 |
| Payback year | 2020 |

Outputs

Preferred (discounted):



| | |
|--|----------------|
| Net present value (NPV) | -\$7 |
| Max bid price for replacement female to yield risk rate | \$1,993 |

Maximum Bid Price

| Weanling Heifer; 500 lb Wwt | | | | |
|-----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Calf, no. ^a | \$400 Annual Cost ^b | \$500 Annual Cost ^b | \$600 Annual Cost ^b | \$700 Annual Cost ^b |
| 1 | 829 | 743 | 656 | 570 |
| 2 | 1167 | 999 | 830 | 661 |
| 3 | 1410 | 1163 | 916 | 669 |
| 4 | 1622 | 1300 | 979 | 657 |



| Bred Yearling; 500 lb Wwt | | | | |
|---------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Calf, no. ^a | \$400 Annual Cost ^b | \$500 Annual Cost ^b | \$600 Annual Cost ^b | \$700 Annual Cost ^b |
| 1 | 1353 | 1262 | 1171 | 1081 |
| 2 | 1770 | 1593 | 1416 | 1239 |
| 3 | 2074 | 1814 | 1555 | 1296 |
| 4 | 2317 | 1979 | 1642 | 1304 |
| 5 | 2528 | 2116 | 1704 | 1291 |

Maximum Bid Price

| Weanling Heifer; 600 lb Wwt | | | | |
|-----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Calf, no. ^a | \$400 Annual Cost ^b | \$500 Annual Cost ^b | \$600 Annual Cost ^b | \$700 Annual Cost ^b |
| 1 | 983 | 897 | 810 | 724 |
| 2 | 1456 | 1287 | 1119 | 950 |
| 3 | 1818 | 1571 | 1324 | 1077 |
| 4 | 2139 | 1818 | 1496 | 1174 |

| Bred Yearling; 600 lb Wwt | | | | |
|---------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Calf, no. ^a | \$400 Annual Cost ^b | \$500 Annual Cost ^b | \$600 Annual Cost ^b | \$700 Annual Cost ^b |
| 1 | 1537 | 1446 | 1355 | 1264 |
| 2 | 2108 | 1931 | 1754 | 1576 |
| 3 | 2546 | 2287 | 2027 | 1768 |
| 4 | 2908 | 2571 | 2233 | 1895 |
| 5 | 3229 | 2817 | 2405 | 1993 |





Something to Think About

If weanling heifers are valued at \$1200
AND
We buy/sell 100 heifers

What's their value, if only 85% get bred?

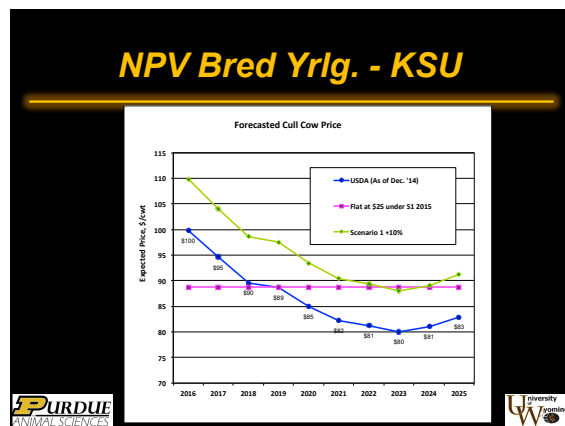
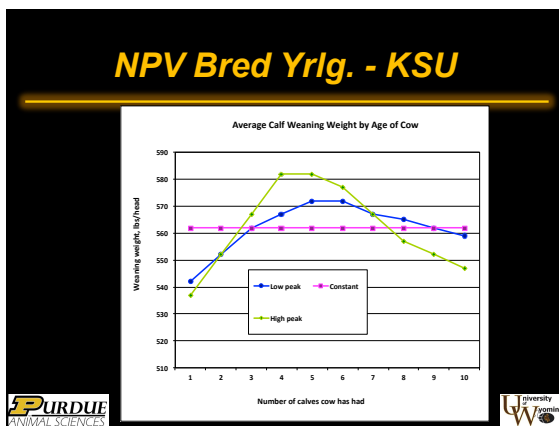
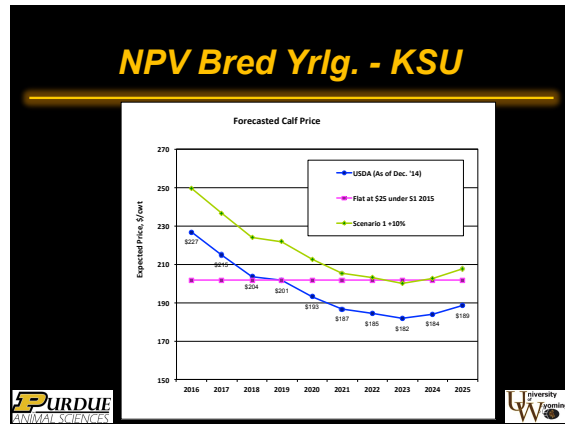
$\$1200 \times .85 = \$1020?$

We Wanted a 2nd Opinion

- **Tonsor and Dhuyvetter, 2014.**
KSU-Beef Replacements.xls
Spreadsheet Program to Evaluate the Economic Value of Purchasing Beef Replacement Heifers.

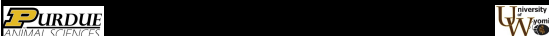
www.agmanager.info/livestock/.../beef/KSU-BeefReplacements

Print Information


NPV Bred Yrlg. - KSU

| Input Assumptions | | | |
|---------------------------------------|-------|--------------------------------|-------|
| Number of replacements purchased | 100 | Percent marketable calves | 97.0% |
| Year of purchase | 2015 | Annual cow death loss | 0.5% |
| First year for calf sales | 2016 | Annual cull rate | 15.0% |
| Cull cow weight, lbs/head | 1,250 | Annual inflation rate on costs | 1.0% |
| Annual cow costs, \$/year | \$400 | Annual increase in wwt. | 0.0% |
| Price scenario to use (USDA-Dec. '14) | 1 | Discount rate (interest rate) | 5.0% |
| Weaning weight scenario to use (1) | 1 | | |



NPV Wnlg. Heifer - KSU

| Calf No. | Annual Cow Cost | | | |
|----------|-----------------|-------|-------|-------|
| | \$400 | \$500 | \$600 | \$700 |
| 1 | 1833 | 1737 | 1645 | 1552 |
| 2 | 2183 | 2015 | 1847 | 1680 |
| 3 | 2354 | 2125 | 1896 | 1667 |
| 4 | 2430 | 2152 | 1873 | 1595 |
| 5 | 2386 | 2067 | 1748 | 1429 |
| 6 | 2266 | 1915 | 1563 | 1211 |
| 7 | 2099 | 1720 | 1342 | 963 |
| 8 | 1891 | 1491 | 1091 | 691 |
| 9 | 1663 | 1246 | 828 | 410 |
| 10 | 1422 | 990 | 557 | 125 |



NPV Bred Yrlg. - KSU

| Results | | | | |
|----------|-----------------|-------|-------|-------|
| Calf No. | Annual Cow Cost | | | |
| | \$400 | \$500 | \$600 | \$700 |
| 1 | 1925 | 1829 | 1733 | 1637 |
| 2 | 2299 | 2125 | 1950 | 1776 |
| 3 | 2481 | 2243 | 2005 | 1776 |
| 4 | 2564 | 2274 | 1984 | 1695 |
| 5 | 2518 | 2187 | 1855 | 1523 |
| 6 | 2394 | 2029 | 1663 | 1297 |
| 7 | 2219 | 1826 | 1433 | 1039 |
| 8 | 2002 | 1586 | 1170 | 754 |
| 9 | 1764 | 1330 | 895 | 461 |
| 10 | 1511 | 1061 | 612 | 163 |

- ### Our Recommendations
- **These results *might not fit anyone in this room***
 - *Based only on selling feeder calves at weaning*
 - *No value-added calf/yearling/cow prices considered*
 - **Run your ranch “net present value” numbers**
 - *Weaning weights*
 - *Annual cow cost*
 - *Calf/yearling/cow price expectations out 5 - 10 years*
 - *Discount needed for loan interest and family expenses*

What Are They Worth?

- **Assumptions: ≈ 600# wwt.**

| Weaning Heifer (4 Calves) | FAPRI & USDA | |
|---------------------------|----------------|------|
| Annual Cow Cost | Range in Value | Mean |
| 400 | 2200 – 2400 | 2300 |
| 500 | 1800 – 2150 | 2000 |

- ### How Many Do I Keep?
- **Question: “What do you think they’re worth?”**
 - *Can I make more money selling heifers, or keeping?*
 - **How much risk is the ranch willing to take?**
 - *Where is ranch debt?*
 - *What are ranch interest payments?*
 - *What’s annual cow cost been running?*
 - *Where are ranch weaning weights?*
 - *Can I add value beyond feeder calf prices?*

- ### Based on These Simulations
- **Keep only the “best” heifers**
 - *Keep herd genetics moving forward*
 - *Keep herd size constant vs. expansion*
 - **Consider selling heifer packages:**
 - *Wnlg. heifers when there are premiums*
 - *Bred yrlg. when there are premiums*
 - *Pay down debt, lower interest payments*

- ### Other Useful Resources
- **Tranel and Sharp – CSU spreadsheets**
 - *What Are Your “Cow Carrying Costs”. Cow-Calf Enterprise Budget.*
www.coopext.colostate.edu/ABM/cowcarryingcosts2011.xls
 - *Buying verses Raising Replacement Heifers – Weaning to Pregnancy Testing.*
www.coopext.colostate.edu/ABM/heiferreplacementdecisiontool.xlsx
 - *What Can You Afford to Pay for a Cow. A decision Aid for Cattle Producers v2.0.*
www.coopext.colostate.edu/ABM/afford_a_cow.xls

Contacts

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