



University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service

Presented By: Kenny Burdine
Extension Livestock Economist
UK Agricultural Economics

Breeding Stock Depreciation: What Can I Pay for a Bred Heifer?

COW-CALF PROFITABILITY CONFERENCES



University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service



A huge thanks to the Agricultural Development Board for funding this program through the Kentucky Beef Network!

BACKGROUND AND MOTIVATION

- Take long term view on long-term investments
- Producers often think of equipment, but applies to breeding stock
- Cow-calf profitability (calf prices) tends to be capitalized back into heifer values
- Consider 2014 / 2015 - \$2,400 - \$2,800 bred heifers
 - Only would have worked if calf market stayed there forever
 - Extreme example: someone who bought a cowherd then

COW-CALF COST TARGETS

- Our budgets usually come in at \$350 to \$450 per cow, per year
 - 2.5 tons of hay, 2 acres of pasture, mineral, vet / med, commission, etc.
- Fixed costs are highly variable across operations
 - Buildings, machinery, fencing, etc
- This \$350 to \$450 is often compared to revenues per cow to assess profit levels

Select Costs per Cow per Year

Pasture Rent	2.0	acre	\$0.00	\$0
Pasture Maintenance	2.0	acre	\$25.00	\$50
Hay	2.5	ton	\$75.00	\$188
Labor	5.0	hours	\$0.00	\$0
Mineral			\$24.00	\$24
Vet			\$20.00	\$20
Breeding			\$40.00	\$40
Marketing			\$35.00	\$35
Machinery			\$20.00	\$20
Trucking			\$10.00	\$10
Other			\$13.00	\$13
<i>Total Per Cow</i>				\$400



Most Commonly Made Mistake in Cow-calf Profitability Analysis?

Not Accounting for Depreciation on Breeding Stock



Annual Breeding Stock Depreciation:

$$\frac{\text{Bred Heifer Value} - \text{Cull Value}}{\text{Number of Productive Years}}$$



Annual Depreciation Example:

$$\frac{\$1,500 - \$500}{8}$$

8

Annual Depreciation Example:

$$\frac{\$1,500 - \$500}{8}$$

= \$125 per year

HEIFER PRICES AND ANNUAL COSTS

- Many ways to consider cost of breeding stock
- Simple approach – depreciate over productive life
- Example: purchase heifer for \$1,500, cull value of \$500, 8 year productive life
- $(\$1,500 - \$500) / 8 \text{ years} = \125 depreciation per year
- Interest – actual cost or opportunity costs
- \$1,000 average value @ 3% = \$30 per year

WHAT IF I DEVELOP MY HEIFERS?

- Doesn't really change analysis or results
- First cost is what you don't sell the weaned heifer for
- 12 months of costs (pasture, feed, vet / med, mineral, breeding, etc.) to compare to purchased bred heifers
 - Still not apples-to-apples
- If heifers can be developed cheaper than purchased...
 - Annual depreciation is lower, or
 - Money is being made on "heifer development enterprise"

BRED HEIFER PROFIT ESTIMATOR HALICH, BURDINE, AND KINDRED (2015)

- Enter basic cost and production info:
- Heifer purchase price, cow costs, life, weaning rate, expect calf price
- Depreciates heifer over productive life
- Added to variable costs
- Reports expected return above variable costs and breeding stock depreciation
- <https://agecon.ca.uky.edu/files/bredheifer.xlsx>

Bred Heifer Profitability Estimation

Heifer/Cow Information:

Heifer Purchase Price	\$1,300
Expected number of breeding years	8.0
Weaning Rate	85%
Total Calves Weaned & Sold	6.8
Expected Death Loss for Cow over 8 Years	5.0%
Cull Value	\$600
Cull Value (adjusted for death loss)	\$570
Interest on Heifer Purchase	3.0%

Estimate cow maintenance costs below or use table to the right? (select one) **Enter Below**

Cow Maintenance Cost per Year	\$400
-------------------------------	-------

Weaned Calves: averaged over 8 years

Steer Calf Weight (lbs)	575
Heifer Calf Weight (lbs)	525
Weighted Avg. Calf Weight (lbs)	550
Steer Calf Price (\$/lb)	\$1.60
Heifer Calf Price (\$/lb)	\$1.40
Weighted Avg. Calf Price (\$/lb)	\$1.50
Net Calf Value per Year	\$828
Net Calf Value Adj for Weaning Rate	\$703
Depreciation/Cow/Year	\$91
Interest/Cow/Year	\$28
Cow Maintenance Cost/Cow/Year	\$400
Total Specified Costs/Cow/Year	\$519
Gross Return/Cow/Year	\$184

Select Costs per Cow per Year

Pasture Rent	2.0	acre	\$0.00	\$0
Pasture Maintenance	2.0	acre	\$25.00	\$50
Hay	2.5	ton	\$75.00	\$188
Labor	5.0	hours	\$0.00	\$0
Mineral			\$24.00	\$24
Vet			\$20.00	\$20
Breeding			\$40.00	\$40
Marketing			\$35.00	\$35
Machinery			\$20.00	\$20
Trucking			\$10.00	\$10
Other			\$13.00	\$13
Total Per Cow				\$400

SUMMARY / RESULTS TABLE FROM BRED HEIFER PROFIT ESTIMATOR

\$1300 Bred Heifer: Gross Profit per Cow per Year					
	Avg. Steer/Heifer Price, 550 lbs				
Cow Maintenance Cost	\$1.10	\$1.30	\$1.50	\$1.70	\$1.90
\$300	\$95	\$188	\$282	\$375	\$469
\$350	\$45	\$138	\$232	\$325	\$419
\$400	-\$5	\$88	\$182	\$275	\$369
\$450	-\$55	\$38	\$132	\$225	\$319
\$500	-\$105	-\$12	\$82	\$175	\$269

Note: Gross profit is a return to management/risk and would also be a return to labor and/or land if they are not specified as costs above.

<https://agecon.ca.uky.edu/files/bredheifer.xlsx>

COSTS NOT INCLUDED

- Labor – hired or family
- Depreciation / interest on owned capital
 - Land, facilities, fencing, etc.
- Return to management and risk taking
- Any return must compensate us for these
- Similar to initial gross return on opening night
 - Before land*, labor*, depreciation, and interest

ASSUMPTIONS OF THE ANALYSIS (STATIC)

- Weaning rate – 85%
- Weaning weight – 550 lbs
 - Steer-heifer average
- Cull cow value - \$600
 - Discounted 5% for potential death loss
- Productive life – 8 years
 - 8 potential calves

ASSUMPTIONS OF THE ANALYSIS (DYNAMIC)

- Long-run steer-heifer average price
 - \$1.30, 1.50, \$1.70
- Bred heifer cost
 - \$1,100, \$1,200, \$1,300, \$1,400, \$1,500
- Annual cash cow maintenance cost
 - \$300, \$350, \$400, \$450, \$500

Gross Profit per Cow per Year

550 lb Steer / Heifer Calf Price: \$1.50 per lb

	Bred Heifer Cost / Value				
Cow Maintenance Cost	\$1,100	\$1,200	\$1,300	\$1,400	\$1,500
\$300	\$310	\$296	\$282	\$268	\$254
\$350	\$260	\$246	\$232	\$218	\$204
\$400	\$210	\$196	\$182	\$168	\$154
\$450	\$160	\$146	\$132	\$118	\$104
\$500	\$110	\$96	\$82	\$68	\$54

Note: Gross profit is a return to management/risk and would also be a return to labor and/or land if they are not specified as costs above.

Gross Profit per Cow per Year

550 lb Steer / Heifer Calf Price: \$1.30 per lb

	Bred Heifer Cost / Value				
Cow Maintenance Cost	\$1,100	\$1,200	\$1,300	\$1,400	\$1,500
\$300	\$216	\$202	\$188	\$174	\$160
\$350	\$166	\$152	\$138	\$124	\$110
\$400	\$116	\$102	\$88	\$74	\$60
\$450	\$66	\$52	\$38	\$24	\$10
\$500	\$16	\$2	(\$12)	(\$26)	(\$40)

Note: Gross profit is a return to management/risk and would also be a return to labor and/or land if they are not specified as costs above.

Gross Profit per Cow per Year

550 lb Steer / Heifer Calf Price: \$1.70 per lb

	Bred Heifer Cost / Value				
Cow Maintenance Cost	\$1,100	\$1,200	\$1,300	\$1,400	\$1,500
\$300	\$403	\$389	\$375	\$361	\$347
\$350	\$353	\$339	\$325	\$311	\$297
\$400	\$303	\$289	\$275	\$261	\$247
\$450	\$253	\$239	\$225	\$211	\$197
\$500	\$203	\$189	\$175	\$161	\$147

Note: Gross profit is a return to management/risk and would also be a return to labor and/or land if they are not specified as costs above.

KEY SENSITIVITIES

- Cost reduction – direct impact - \$25 for \$25
- \$0.10 change in calf prices - \$40 - \$50 per cow per year
- 5% increase in weaning rate - \$35 - \$40 per cow per year
- 50 lbs in weaning weight - \$30 - \$50 per cow per year – remember this is gross!
- \$100 increase in heifer cost / price - \$14 per cow per year

OVERALL THOUGHTS

- Hard to over-emphasize cost control
- Breeding stock depreciation greatly impacts cost structure
- Profit is determined over the course of cow's productive years
 - Best estimated by thinking long term on prices and costs
- Use bred heifer profit tool!

CONTACT INFORMATION

Kenny Burdine
UK Ag Economics
(859) 257-7273
kburdine@uky.edu
[@KYCattleEcon](#)

