

"Improving the beef industry through performance evaluation"

Beef Improvement FEDERATION

2015 ANNUAL CONVENTION
JUNE 9 - 11, BILOXI, MISS.

How do current market incentives affect genetic selection decisions?

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Things to Remember About Economists

- We have a firm grasp on the obvious...
- We are better at predicting history than the future...

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Genetic selection decisions should be based on **long-term** profitability, but we live in a **short-term** world where prices (profitability) varies widely from year to year.

Source: CME Group
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How important would the following factors be for improving cost of production on your operation?

Factor	% Important/Very Important
Feeding my own hay and silage	91.6%
Pasture and feed management	91.4%
Productivity of pasture acres	91.4%
Health management	85.6%
Genetic selection	76.9%
Grazing/harvesting corn stalks for feed	74.9%
Access to animal health consultants	70.9%
Financial record-keeping programs	68.8%
Access to animal nutrition consultants	64.1%
Local supply of corn and corn co-products	63.0%
Equipment to feed co-products	58.0%
Availability of labor	57.1%
Data management and tracking	48.4%
Access to financial consultants	45.9%
Artificial insemination	30.8%
Benchmarking services	28.8%
Estrous synchronization	28.6%

Do you agree or disagree that changing the following practices would expand your marketing opportunities?

Practice	% Agree/Strongly Agree
Vaccination program	72.1%
Genetic selection program	69.7%
Follow specific animal care/handling guidelines	54.0%
Crossbreeding program	47.3%
Document and share herd performance information	45.9%
Document and share specific size/genetic information	42.2%
Document and share breed background information	42.2%
Calving season	32.2%
Use a marketing schedule	24.8%
Participation in a production supply chain	20.5%
Contract production for a specific market	19.2%
Partner on cattle in a feedlot	16.2%

IBC Iowa Beef Center
2014 Cow-Calf Producer Survey

How important are the following traits for the feeder cattle that you buy?

Trait	% Important/Very Important
Condition	93.8%
Frame	91.0%
Castrated	90.1%
Weight	83.8%
Vaccination history	82.8%
Dehorned	79.7%
Sex of animal	77.5%
Uniformity of head in a lot	76.5%
Reputation of seller	76.2%
Weaned at least 30 days	69.0%
Animal care/handling practices	65.1%
Weaned at least 45 days	64.5%
Number of head in a lot	59.5%
Third-party health verified	53.5%
Breed background information	35.8%
Specific size/genetic information	29.3%
Age and source verified	25.3%
Implanted	25.1%
Naturally raised	11.7%
Non-hormone treated	11.1%
Organically raised	3.0%

IBC Iowa Beef Center
2014 Feedlot Operator Survey

Overarching Beef Industry Economic Outlook

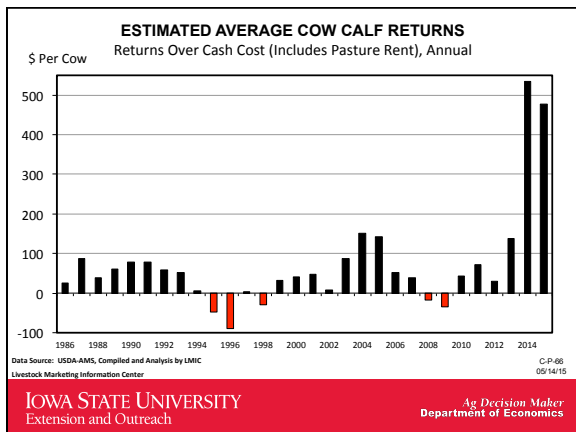
- Tight cattle & beef supplies +
- Attractive beef-to-feed price ratios +
- Strong retail meat demand +
- Initiated (slow???...fast???) herd expansion =

Record:

- Prices throughout industry
- Cash at-stake (so ROI may not be record)
- Opportunity/Threat... in the eye of the beholder...

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What is the current market incentivizing?

“The market signal is pretty clear; more calf production is needed and will be rewarded.”
COW/CALF NEWSLETTER, November 3, 2014, Derrell Peel, Oklahoma State University

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What is the current market incentivizing?

↑

Pounds of calf weaned per exposed female

↑

Conception rate

↑

Calving percentage

↓

Pre-weaning calf death loss

↑

Weaning weight

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Cow-Calf Economics 101: “Economist-Speak”

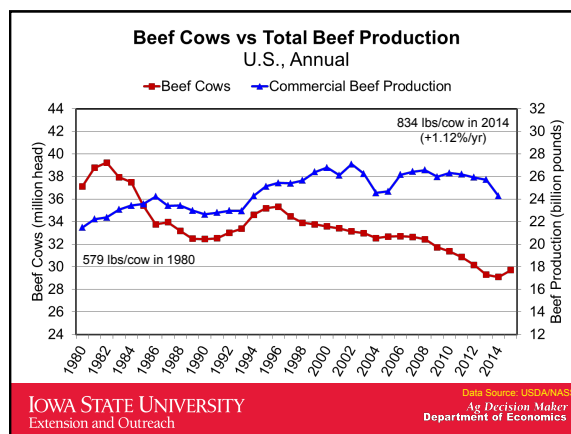
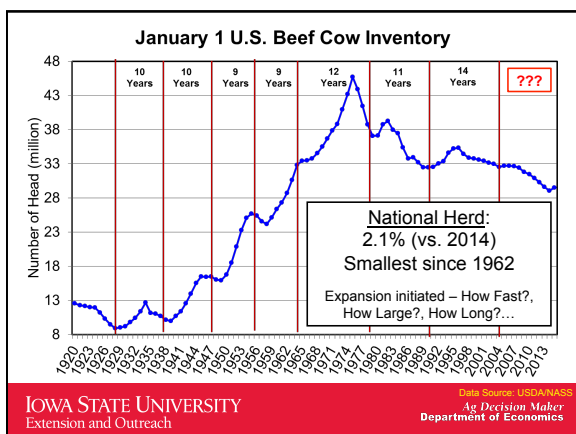
- Expected Profit
 - 2014 & 2015 LMIC Estimates >3X 04', 05', & 13'
 - ERS Total Costs/Cow: 2002 - \$974; 2008 - \$1,121; 2013 - \$1,349
- Textbook example of a commodity industry
 - Long-run economic (not accounting) profits are zero

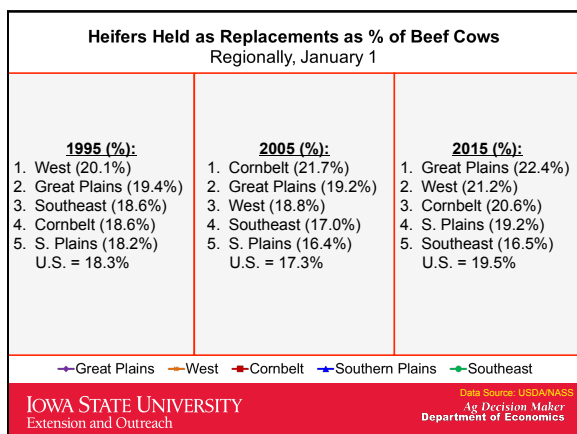
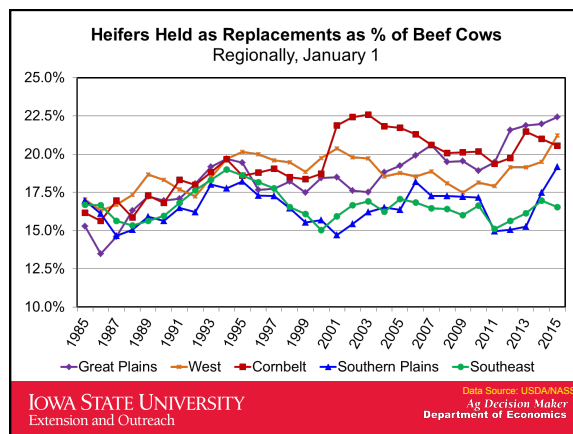
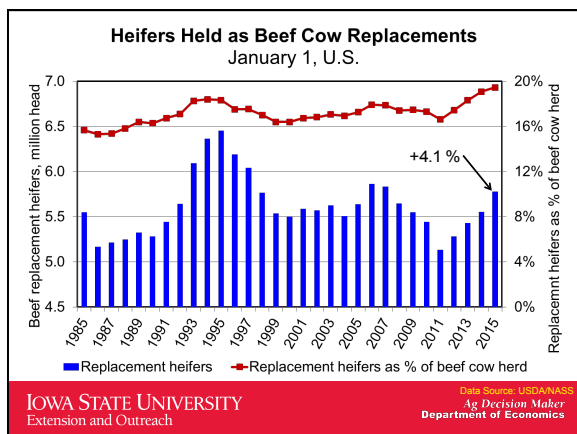
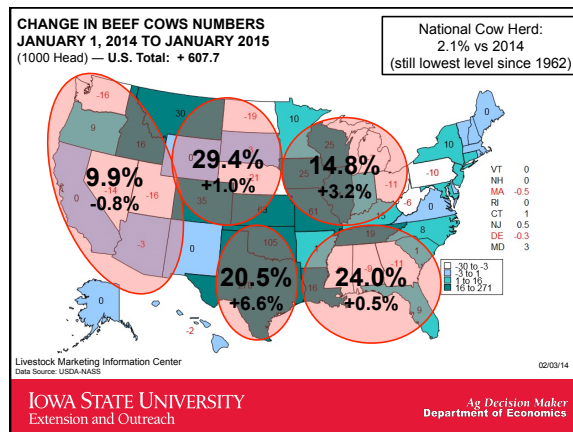
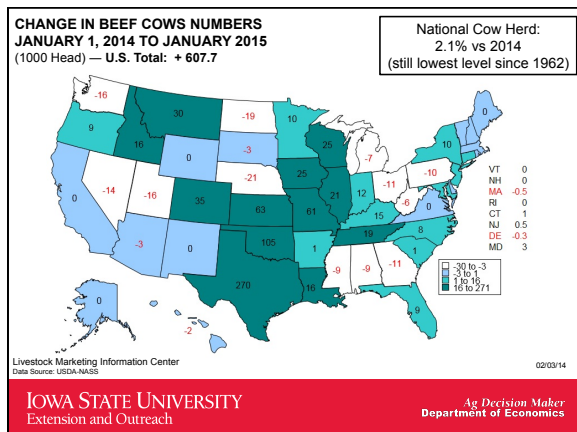
>>> Profit levels lead producers to 'bid away' margins

- Reducing culling rates; buying (and/or) retaining replacements
- Increase breeding inventories; return to 'typical' profitability levels

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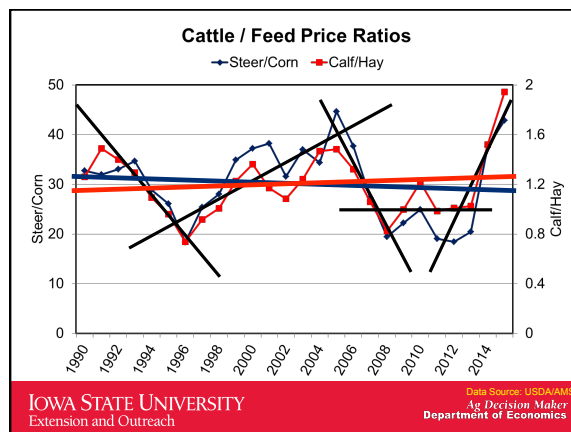
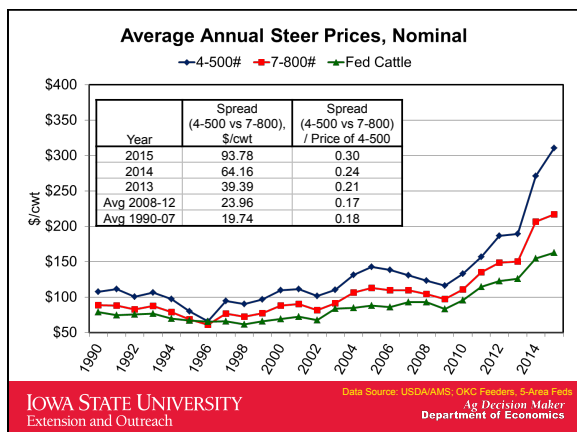


Changing Output/Input Price Ratios Change the Optimal Trait Emphasis

- Good approximations to relative economic values often can be obtained from long-time price averages and cost-of-production figures (Hazel 1943)
- Long-term price ratios are relatively stable; more predictable than individual prices
- Short-term ratios will be out of balance
 - Could lead to "right" cattle at the wrong time
 - Let management address short-term prices

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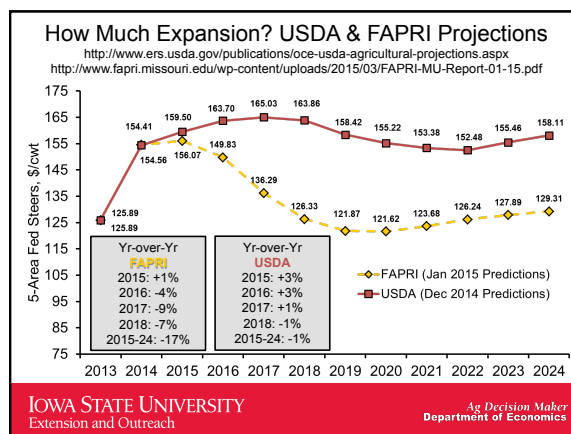
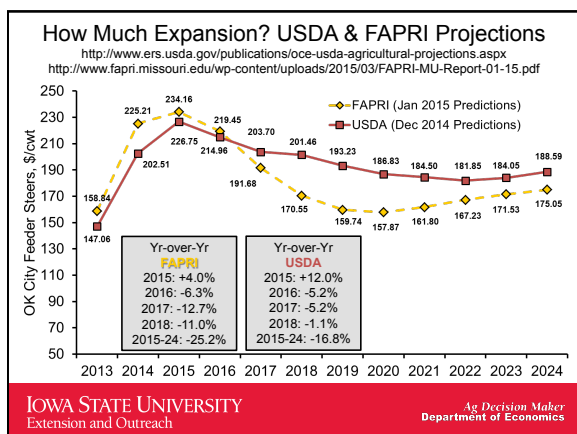
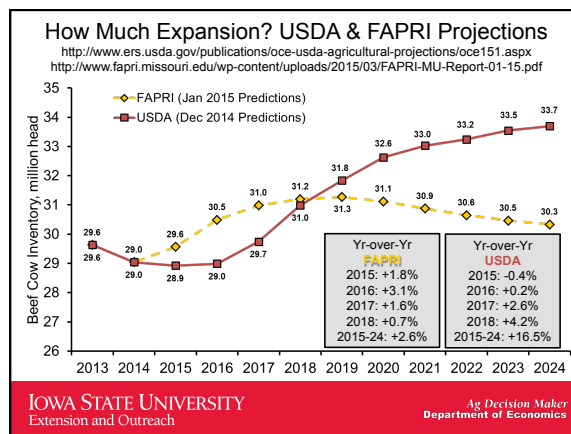


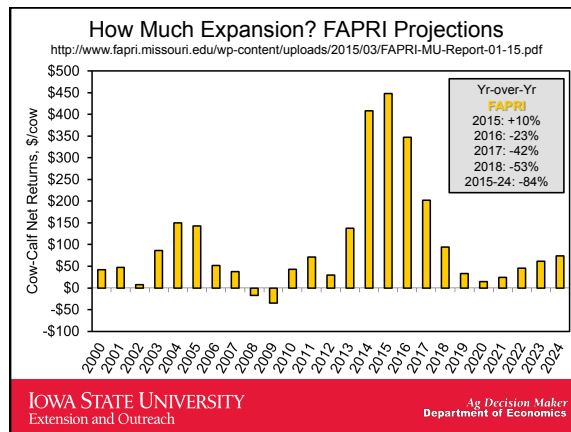
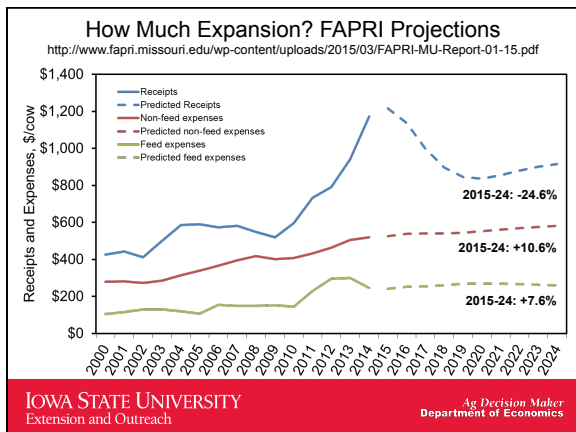
Economic Returns Earned by Future Generations of Progeny should Influence Current Genetic Selection

...But there is no perfect crystal ball

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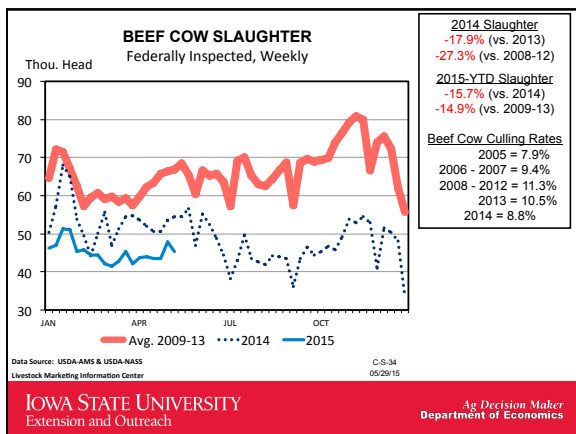
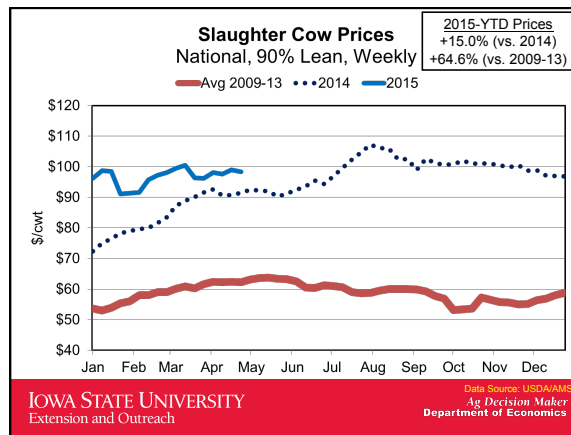


Implications of Genetic Selection Decisions

“Probably no single aspect of modern beef herd management is as complicated, or has as potentially great an economic impact, as the cow culling and replacement decision.”
Western Journal of Agricultural Economics, 1980, Bryan Melton

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Cow-Calf — Expansion Discussion

ISUE&O Ag Decision Maker Resources

- Raising versus Buying Heifers For Beef Cow Replacement
 - Fact sheet and video tutorial available online:
 - Tutorial - <http://www.iowabeefcenter.org/heiferdevelopment.html>
 - Factsheet - www.extension.iastate.edu/agdm/livestock/html/b1-73.html
- Net Present Value of Beef Replacement Females
 - Fact sheet and video tutorial available online:
 - Tutorial - <http://www.iowabeefcenter.org/heiferdevelopment.html>
 - Factsheet - www.extension.iastate.edu/agdm/livestock/html/b1-74.html

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Resources and goals are different for each cow-calf operation

Identify production & marketing system

1. When will animals be marketed (at what age)?
2. How will animals be marketed?
3. What are your available resources?
4. What is the current performance and genetic level of your herd?

Use "own" historical (projected) data

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Buy vs Raise Replacement Females

2014 Herd Plans

- Final Sample (N) of 1,003
- July 18-Aug 4, 2014 online collection

10a. How will you accomplish your cowherd expansion?	All respondents	South Atlantic	East South Central	West South Central	East North Central	West North Central	Mountain	Pacific
Hold back heifers	56%	53%	52%	57%	52%	55%	55%	52%
Buy replacements	37%	40%	42%	44%	46%	35%	24%	21%
Sell fewer cull cows	13%	10%	13%	9%	8%	17%	14%	12%
Lease cattle or run cattle on shares	1%	1%	4%	1%	-	2%	2%	-
Respondent Count	701	72	83	163	39	193	98	34

Base = Respondents expanding their cowherd
Percent may reflect multiple answers

Important to note this summary is not weighted by an operation's current herd size.

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Buy vs Raise Replacement Females

- Raise, Yes if:
 - It truly cost you less to raise than buy
 - Genetic base is acceptable already
 - Calving ease, milk production, etc. // also consider meat impact
 - Your environment is stressful for "imported" heifers
 - Climate, feed resources, parasites, etc. vary
 - You are concerned about open market availability

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Buy vs Raise Replacement Females

- Buy, Yes if:
 - It truly cost you less to buy than raise
 - You value alternative uses of \$ and/or time
 - You value the reduced bull needs
 - Genetic control is valued and worse than desired
 - You want to grow herd faster

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Buy Instead of Raise Replacement Females

DRIVERS OF PROS/BENEFITS

- Added Returns
 - Sell a heifer you otherwise would have retained
 - Possible revenue increase from improved genetics
- Reduced Costs
 - Save variable, fixed, etc. costs of NOT raising heifer

DRIVERS OF CONS

- Reduced Returns — Not applicable
- Added Costs
 - Purchase a heifer you otherwise would have raised

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Buy Instead of Raise Replacement Females

DEFAULT SITUATION

- Total Added Returns: \$2,350.37/head
- Total Added Costs: \$2,700.00/head
 - **Net change in returns of -\$349.63/head**
 - Any multi-year gain (i.e., genetics) would increase this value
 - Under this scenario, what genetic or intrinsic merit do you need to make buying instead of raising heifers even?
 - 20 lbs of weaning weight / calf / year**
 - = \$349.63 / 7 years / \$2.60 per pound calf price**

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Raise Instead of Buy Replacement Females

DRIVERS OF PROS/BENEFITS

- Added Returns — Not applicable
- Reduced Costs
 - Cost of would-be purchased replacement heifer

DRIVERS OF CONS

- Reduced Returns
 - Retain a heifer you otherwise would have sold
 - Possible revenue decrease from less genetic improvement
- Added Costs
 - Incur variable, fixed, etc. costs of raising heifer

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Raise Instead of Buy Replacement Females

DEFAULT SITUATION

- Total Added Returns: \$2,700.00/head
- Total Added Costs: \$2,350.37/head

– **Net change in returns of +\$349.63/head**

- Any multi-year "lost opportunity" (i.e., less genetic improvement) would decrease this value
- Under this scenario, what genetic or intrinsic merit would you need to "give up" to make raising instead of buying heifers even?

20 lbs of weaning weight / calf / year
= \$349.63 / 7 years / \$2.60 per pound calf price

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BEEF 2014 Cow Herd Plans

<http://beefmagazine.com/cattle-industry-structure/beef-readers-say-they-re-dedicated-herd-expansion-2014>. N=695, Oct 23-Nov 1, 2013 online collection

Different Survey

On average, what do you expect to pay per bred heifer?	
\$1,000 - \$1,500/head	40.00%
\$1,501 - \$2,000/head	45.70%
\$2,001 - \$2,500/head	11.40%
More than \$2,500/head	2.90%
Respondent Count	105
Weighted Average	\$1,636

Important to note this summary is not weighted by an operation's current herd size

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Added Investment Cost per Cow

Monthly Average IA 650 lb Heifer Price
2013 - March 2015

Expanding is very expensive

Price, \$/cwt

Data Source: USDA/AMS
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U.S. Beef Cow Inventory Year/Year Change 1980 - 2015

Percentage Change in Beef Cow Inventory

Data Source: USDA/NASS
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Approximate Industry Investment in Added Heifers

Year	Added Head (1,000)	Nominal Price (\$/cwt)	Producer Price Index (2014=100)	Per Animal Cost (2014 Dollars)	Investment in Replacement Heifers (2014 Dollars)
1981	1,666	\$64	53	\$783	\$1,304,478,000
1994	1,238	\$82	54	\$993	\$1,229,334,000
2015	608	\$221	100	\$1,438	\$874,214,016

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Capital Requirements Industry: High Stakes

- Signals to expand were apparent
- Likely not done yet
- Long-term decisions
- Expanding is very expensive now
- Way more capital to play at all levels
- When capital needs increase:
 - Managing working capital critical
 - Emphasis on animal fertility, health, genetic improvement
 - Risk management becomes high priority

>>> Likely altered risk-reward relationship

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Should I Retain/Buy Replacement Females?

- Yes **if**:
 - Market encourages that
 - Compare NPV of replacements females available to buy/retain

Objective of a cattleman is to maximize the present value of the stream of residual earnings from cows in the herd; prices and interest rates are important (Melton, 1980; Melton and Colette, 1993)

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Net Present Value of Beef Replacement Females

$$NPV = -I_t + E_t/(1+r) + E_{t+1}/(1+r)^2 + E_{t+2}/(1+r)^3 + \dots + E_{t+n}/(1+r)^{n+1}$$

Investment **I** made in year **t** and discounts future earnings **E** by a discount rate **r** in each following year

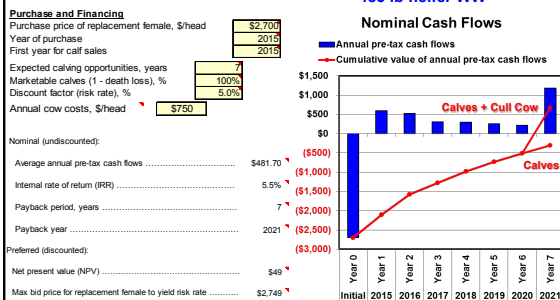
- If NPV > 0, the investment is acceptable because the rate of return on future earnings is at least as great as the investors' required rate to accept risk (i.e., discount rate)
- If NPV < 0, the rate of return is less than the discount rate and the investment is unacceptable
- If NPV = 0, the rate of return on the investment equals the discount rate

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Net Present Value of Beef Replacement Females

Base Scenario for Calf/Cull Prices; 525 lb steer WW
485 lb heifer WW

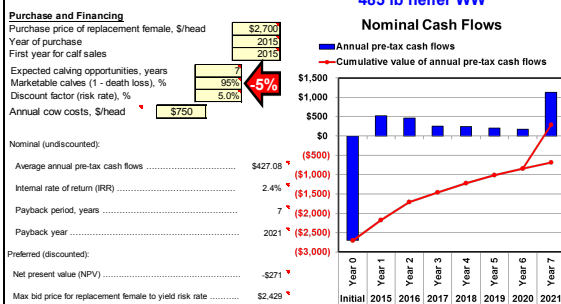


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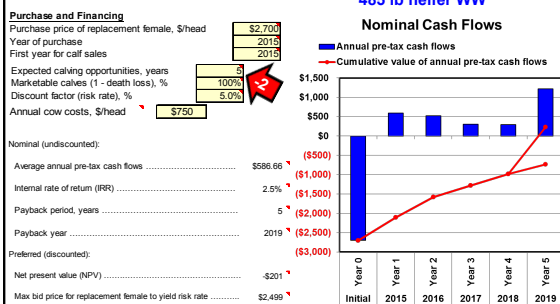


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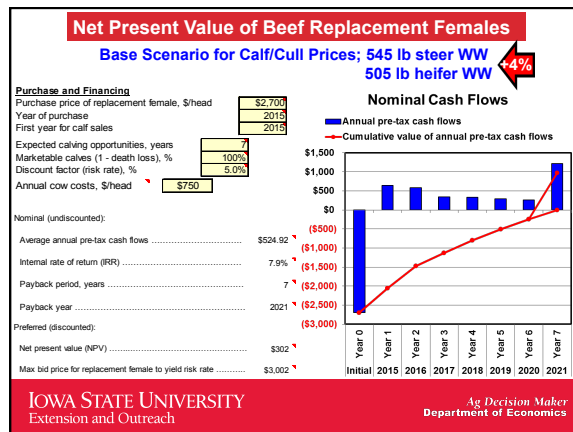
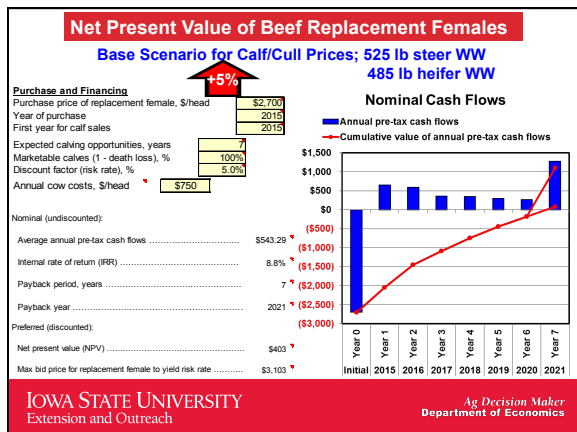
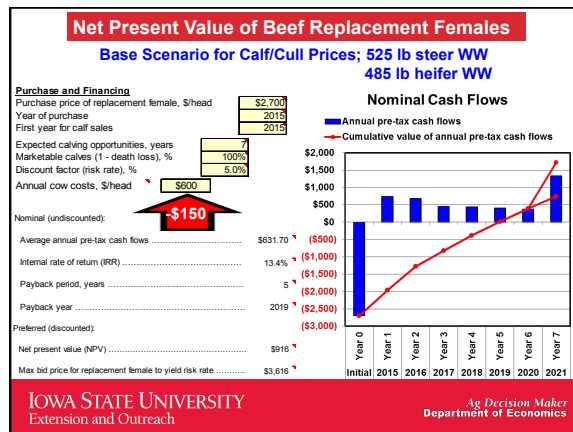
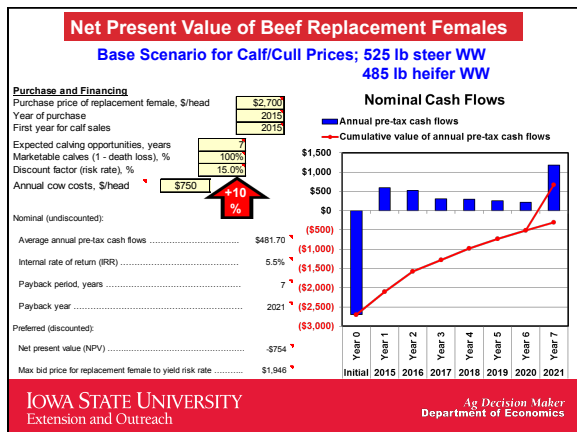
Net Present Value of Beef Replacement Females

Base Scenario for Calf/Cull Prices; 525 lb steer WW
485 lb heifer WW



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Net Present Value of Beef Replacement Females

Using base values; NPV = \$49, Max bid price = \$2,749
(\$2,700 purchase price, 7 calves, 100% marketable, 5% discount rate, \$750 cow costs)

- Marketable calves
 - Every 1% Δ in marketable calves worth ~\$64 in NPV (or in max bid price)
- Calving years
 - Every 1 year Δ in calving year worth ~\$124 in NPV
- Annual cow costs
 - Every \$1 Δ in annual cow cost worth ~\$5.79 in NPV
- Targeted rate of return (discount rate)
 - Every 1% Δ in targeted rate of return worth ~\$80.24 in NPV
- Calf and cull cow prices
 - Every 1% Δ in calf/cull prices worth ~\$70.88 in NPV
- Weaning weights
 - Every 1% Δ in weaning weights worth ~\$63.26 in NPV

Where is your comparative advantage?

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Genetic Selection Decisions Should be Based on Long-Run Profitability

- Focus on genetic goals
 - Efficiency
 - Product quality
 - Management traits
- Progeny prediction more accurate than economic prediction
 - Genetic progress difficult when goals are clearly defined
 - Even more difficult if goals are moving targets
 - Changing consumer tastes & preferences; producer-cost structure
- Current market incentives provide an economic compass rather than a road map

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Thank You!

More information available at:

Iowa Farm Outlook & News
www.econ.iastate.edu/ifo/

Ag Decision Maker
www.extension.iastate.edu/aqdm/

ISU Estimated Livestock Returns
www.econ.iastate.edu/estimated-returns/

ISU Livestock Crush Margins
www.econ.iastate.edu/margins/



<http://www.iowabeefcenter.org/>



<http://www.ipic.iastate.edu/>

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