Kansas State University

Department of Agricultural Economics

K-State Beef Conference

Managing in a Transitioning Industry

August 16, 2011
9AM - 5PM

123 Weber Hall
Kansas State University
Manhattan, KS

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Sell cows, build herds, or get out?

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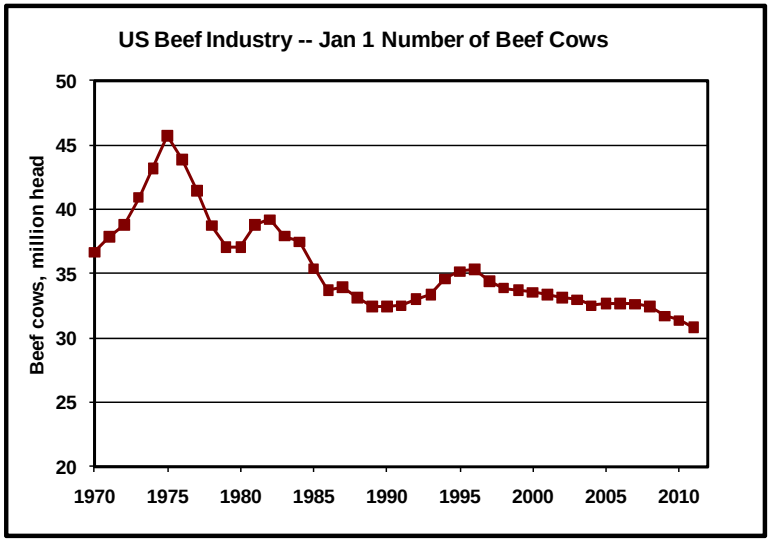
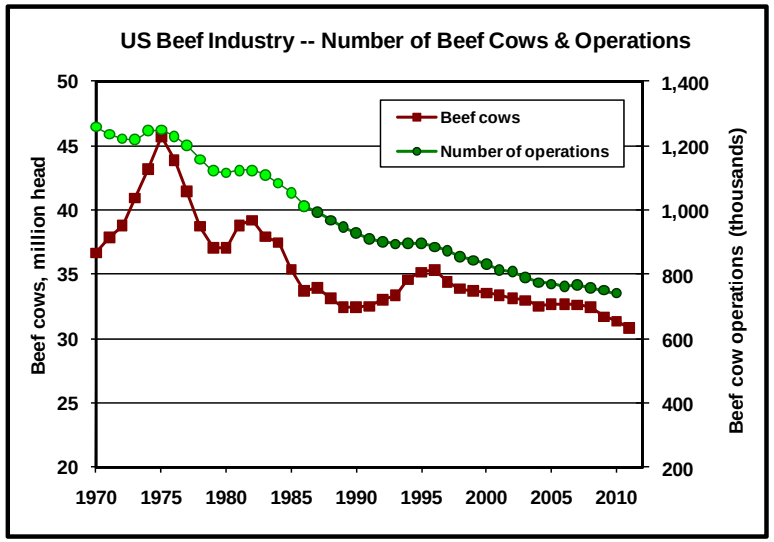
We have been "selling cows" for a long time…



Source: USDA-NASS, LMIC and K-State

We have been "getting out" for a long time…



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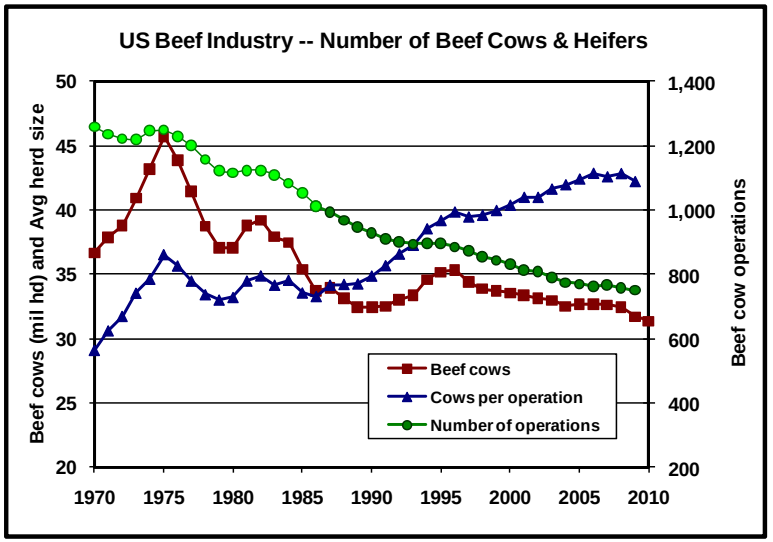
Producers have been "building herds" over time…



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Sell cows, build herds, or get out?

- **Question is often asked from the perspective of where we are at in the cattle cycle.**
- **Do cattle cycles exist? If so, are there culling and replacement strategies we can use to profit from them?**

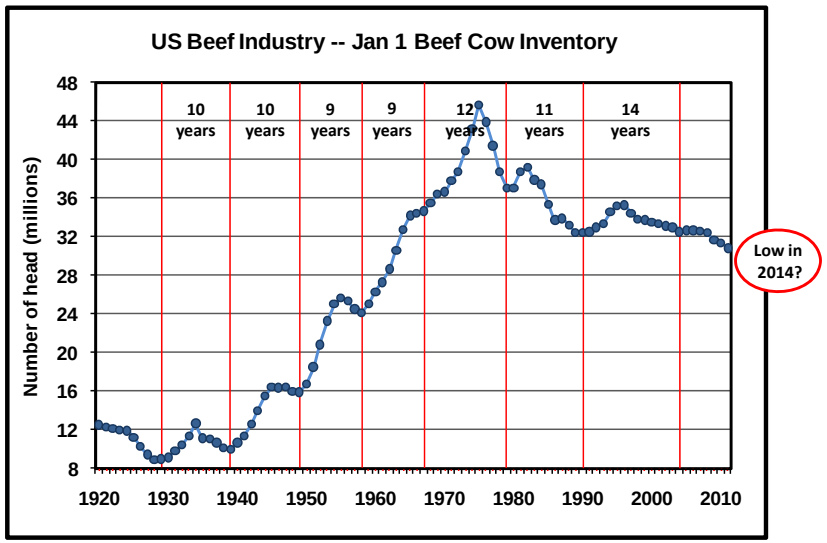
Why culling / replacement strategies might exist…

"… and the knowledge that the cattle cycle ***likely will repeat itself*** can help producers improve their investment decisions." (Lawrence)

"Cattle cycles refer to the ***relatively predictable*** rise and fall in US cattle inventories over a period of years (normally 9-13 years)…" (Bailey and Aadland)

"We know that a typical cattle cycle lasts about 10 years. … The beef price cycles of the 1980's and 1990's share much in common and ***future cattle cycles will likely have much in common with past cycles***." (Hughes)

The existence of cattle cycles…



Source: USDA-NASS, LMIC and K-State

Research looking at cattle cycle investment strategies

- **Trapp (1940-1977)**
  Identified optimal culling/replacement strategy
- **Hamilton and Kastens (1974-1998)**
  Representative producer (RP), Constant inventory (CI), and Counter-cyclical (CC)
- **Lawrence (1970-1999)**
  Steady size (SS), Cash flow (CF), Dollar cost averaging (DCA), and Rolling average value (RAV)
- **Fanning, Marsh, and Jones (1975-1999)**
  Optimization (PM), Constant inventory (CI), Counter-cyclical (CC), and Dollar cost averaging (DCA)

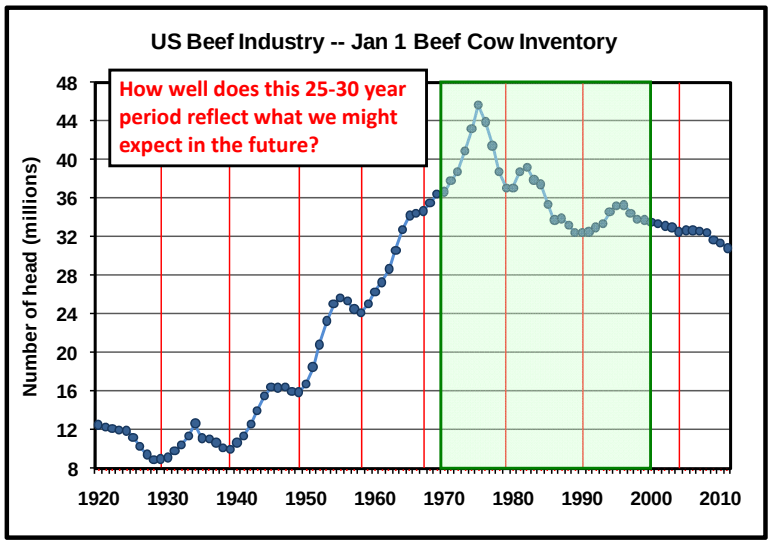
So what did the studies find? (basically a little of everything)

- **Trapp (1940-1977)**
  Flexible culling/replacement is optimal (counter-cyclical)
- **Hamilton and Kastens (1974-1998)**
  Net returns: CC > CI > RP
  Market timing effects (voluntary or involuntary) exist
- **Lawrence (1970-1999)**
  Return over TC: DCA > RAV > CF > SS
  Range of returns: DCA > RAV > SS > CF (increased risk w/DCA)
- **Fanning, Marsh, and Jones (1975-1999)**
  NPV: PM > DCA > CI > CC
  Net income: PM > CC > DCA > CI

Assumptions often used in analyses…

- **Normal weather (i.e., fixed stocking rate)**
- **Flexible land base from year to year**
- **Production not impacted by replacement rate**
- **Producers have perfect foresight of prices (assumption in optimization studies)**
- **Future cattle cycles and corresponding price relationships will be similar as in the past**

Existence of cattle cycles…



Source: USDA-NASS, LMIC and K-State

Research looking at cattle cycle investment strategies

- **Bailey and Aadland – discussed ability to use counter-cyclical strategy**

"… it may be **rational for a risk-averse producer to not attempt to time the market**. To be successful in a counter cyclical strategy, producers need to be able to forecast with a reasonable degree of certainty the future path of prices during a cattle cycle. This is difficult for a couple of reasons. First, **every inventory cycle is different**. Although inventory cycles are fairly regular lasting approximately 10 years, some cycles have been as long as 15 years and some as short as six years. Second, **supply and demand shocks are continuously hitting the market making it difficult to judge price movements purely by changes in cattle inventory**."

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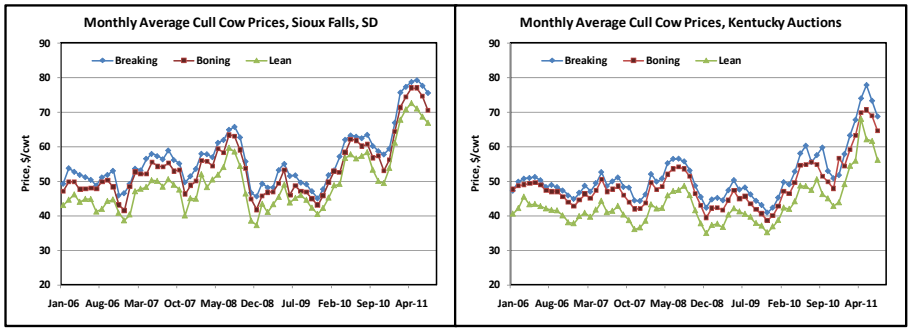
Sell cows, build herds, or get out?

"Correct" answer will vary for every individual operation due to varying production and economic factors as well as personal goals and objectives...

Sell cows?

- Cull cow prices have been at record high prices



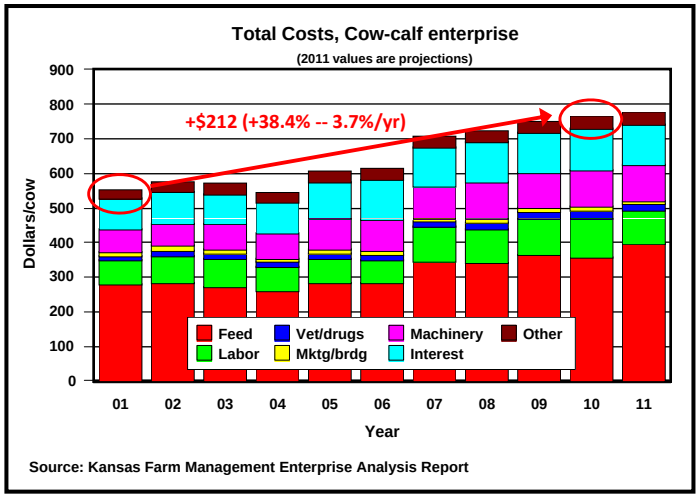
Prices obviously vary from location to location, but prices are generally up everywhere (extreme liquidations due to drought have impacted general price trend at some locations in the short run).

Sell cows?

- Cull cow prices have been at record high prices
- If there is $0 tax basis in cows, you might have significant tax consequences by selling cows.
- Are you looking at selling cows as a "culling" or as a "transitioning out" strategy?
- What is your feed resources situation?

Get out?

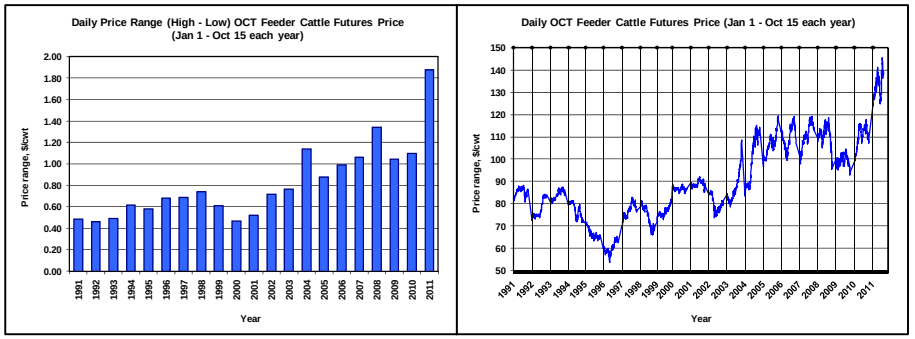
- Input costs keep increasing



Source: Kansas Farm Management Enterprise Analysis Report

Get out?

- **Variability in feeder calf prices is increasing**



Variability of feeder cattle futures prices both within the day and during the year has been increasing in recent years.

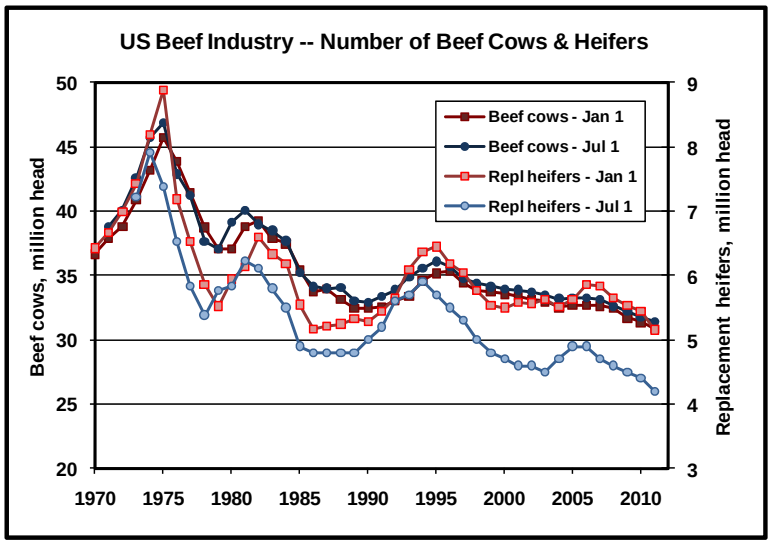
Get out?

- **Input costs keep increasing**
- **Variability in calf prices is increasing**
- **Many things *changing* in the industry…**
  (VAC 45, SAV, NHTC, RFID, traceability, animal welfare)

Build herd?

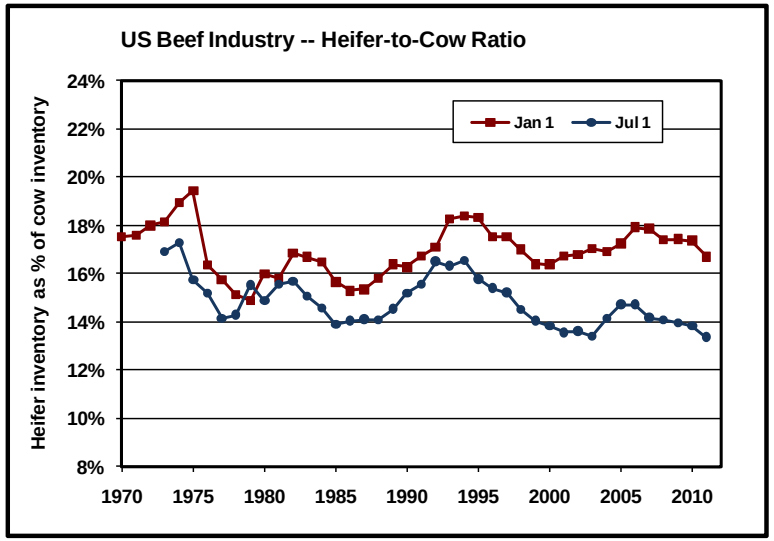
- **Cow numbers are extremely low**
  (expected to stay that way for a while?)
- **Calf prices are at extremely high levels**
- **What do projected returns look like?**
- **Can I afford these high $ replacements?**

Very low inventory levels, especially Jul 1 heifers…



Source: USDA-NASS, LMIC and K-State

Jul 1 ratio suggests building herd might be tough…



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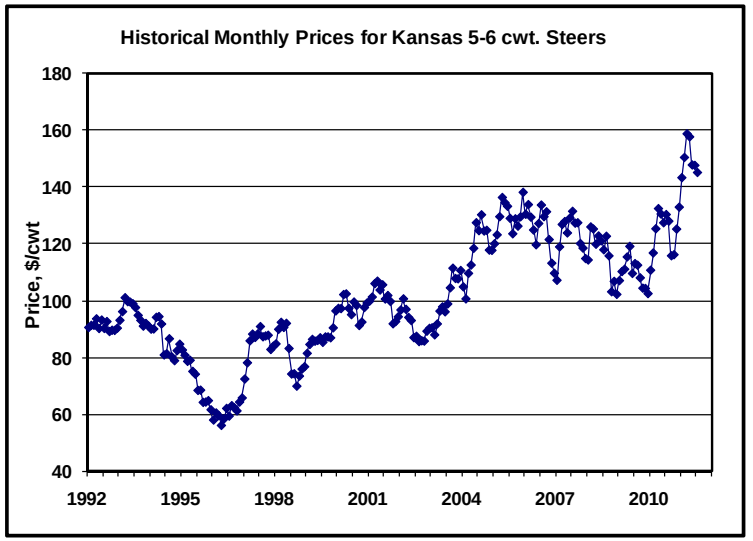
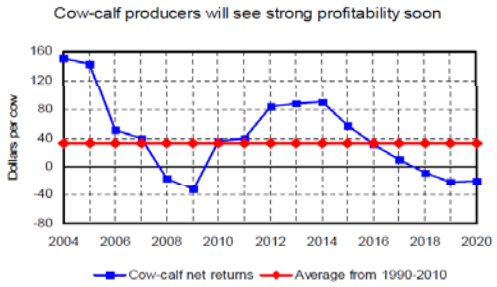
Nominal calf prices in 2011 have hit all time highs…



Source: USDA-NASS, LMIC and K-State

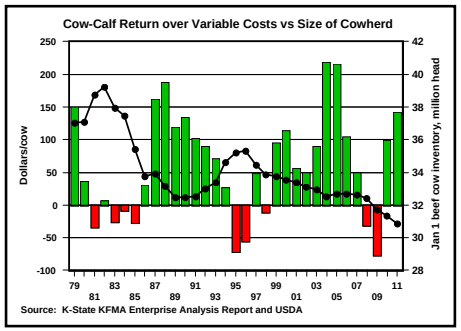
Outlook for cow-calf sector…

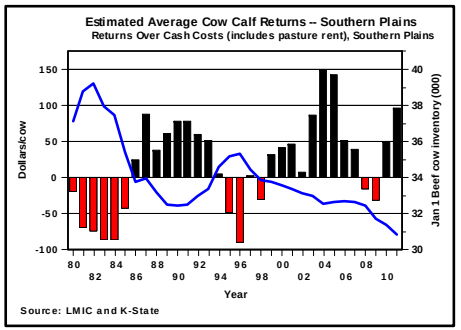
- Cow-calf net returns increased to the long-run average level in 2010, after posting their worst level since 1996 in 2009.
- While fed steer prices will experience strong growth this year, expensive corn will limit the amount that feedlots are willing to pay for feeder animals, holding 2011 returns to a level similar to last year.
- The profitability outlook is bright beginning in 2012, as economic recovery continues to propel beef demand.



Food and Agricultural Policy Research Institute
FAPRI
University of Missouri
March 2011
US Baseline Briefing Book
FAPRI-MU Report #02-11

Outlook for cow-calf sector…





While absolute values for cow-calf returns vary based on source/methodology, projections for 2011 suggest returns will be up considerably from 2010.

(FAPRI projected 2011 to be similar to 2010 and then for returns in 2012-14 to be up significantly).

Build herd -- How much can I pay for a heifer/cow?

Input Assumptions

Number of replacements purchased	100	Percent marketable calves (1 - death loss)	97.0%
Year of purchase	2012	Annual cow death loss	0.5%
First year for calf sales	2012	Cows culled for non-breeding reason (health)	3.5%
Cull cow weight, lbs/hd	1,250		
Annual cow costs, $/year	$600	Annual inflation rate on costs	1.0%
Price scenario to use (1-4) (FAPRI (adjusted))	4	Annual increase in average weaning weight	0.0%
Weaning weight scenario to use (1-3)	1	Discount rate (interest rate)	6.5%

Net Present Value Analysis

	Cows at			Prices, $/cwt		Calf	Cull Income			Cost	Net	Discount	
Year	BOY*	Calf	Calf wt	Calf	Cull	Income	Health	Quality	Cost	Adj.	Income	factor	NPV**
2012	100.0	1	542	$140.28	$66.43	$738	$29.06	$797	$600	$0	$167	1.0000	$964
2013	96.0	2	552	$143.57	$67.80	$738	$28.47	$780	$582	$0	$185	0.9390	$1,072
2014	92.2	3	562	$145.61	$68.85	$732	$27.76	$757	$564	$0	$195	0.8817	$1,180
2015	88.5	4	567	$141.97	$66.03	$691	$25.56	$702	$547	$0	$169	0.8278	$1,233
2016	84.9	5	572	$139.01	$63.20	$655	$23.49	$648	$530	$0	$148	0.7773	$1,271
2017	81.5	6	572	$136.65	$60.90	$618	$21.73	$594	$514	$0	$126	0.7299	$1,293
2018	78.3	7	567	$135.48	$60.03	$583	$20.56	$563	$499	$0	$105	0.6853	$1,317
2019	75.1	8	565	$134.82	$59.13	$555	$19.44	$532	$483	$0	$91	0.6435	$1,333
2020	72.1	9	562	$137.29	$59.61	$540	$18.81	$514	$469	$0	$90	0.6042	$1,355
2021	69.3	10	559	$137.29	$59.61	$516	$18.06	$492	$454	$0	$79	0.5674	$1,369
* BOY = Beginning of year			562	$139.20	$63.16							** Net present value if replacement is sold in this year	

Build herd -- How much can I pay for a heifer/cow?

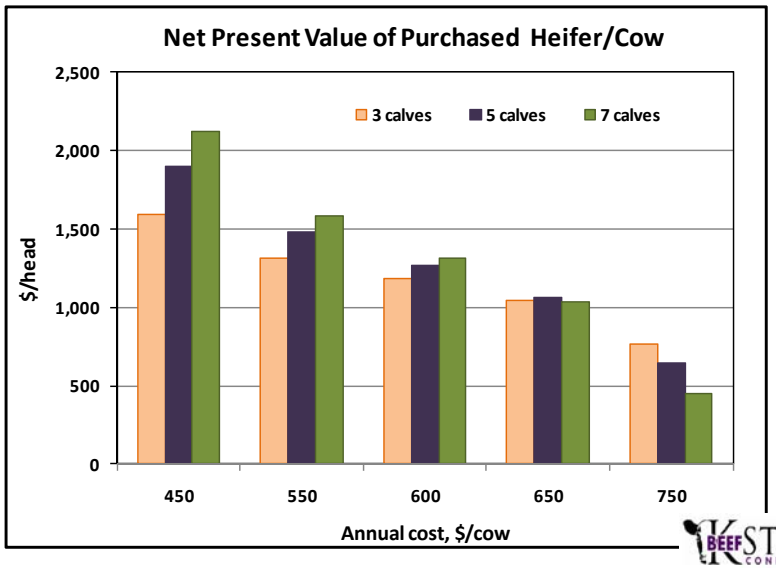
Net Present Value Analysis

		Annual cost = $450		Annual cost = $550		Annual cost = $650		Annual cost = $750	
Year	Calf	NPV*	Calf 2 NPV diff**	NPV*	Calf 2 NPV diff**	NPV*	Calf 2 NPV diff**	NPV*	Calf 2 NPV diff**
2012	1	$1,114	-$245	$1,014	-$154	$914	-$63	$814	$28
2013	2	$1,359	$0	$1,168	$0	$977	$0	$786	$0
2014	3	$1,591	$232	$1,317	$149	$1,043	$66	$769	-$17
2015	4	$1,757	$399	$1,408	$240	$1,059	$82	$709	-$76
2016	5	$1,898	$540	$1,480	$313	$1,062	$86	$644	-$141
2017	6	$2,014	$655	$1,533	$366	$1,053	$76	$572	-$214
2018	7	$2,124	$765	$1,586	$418	$1,048	$72	$511	-$275
2019	8	$2,217	$858	$1,627	$460	$1,038	$62	$449	-$337
2020	9	$2,310	$952	$1,674	$506	$1,037	$60	$400	-$385
2021	10	$2,388	$1,029	$1,708	$541	$1,029	$52	$349	-$436

* Net present value if replacement is sold in this year

** Difference in NPV between selling in this year versus after the second calf

Build herd -- How much can I pay for a heifer/cow?

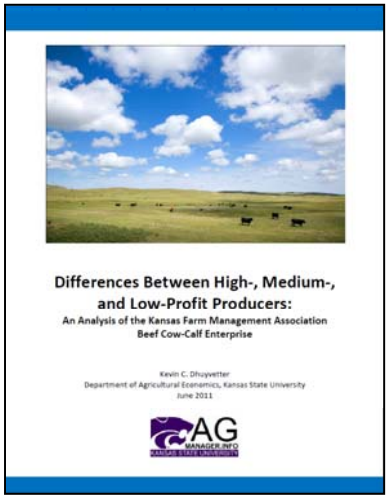


Factors impacting ability/desire to build herd --

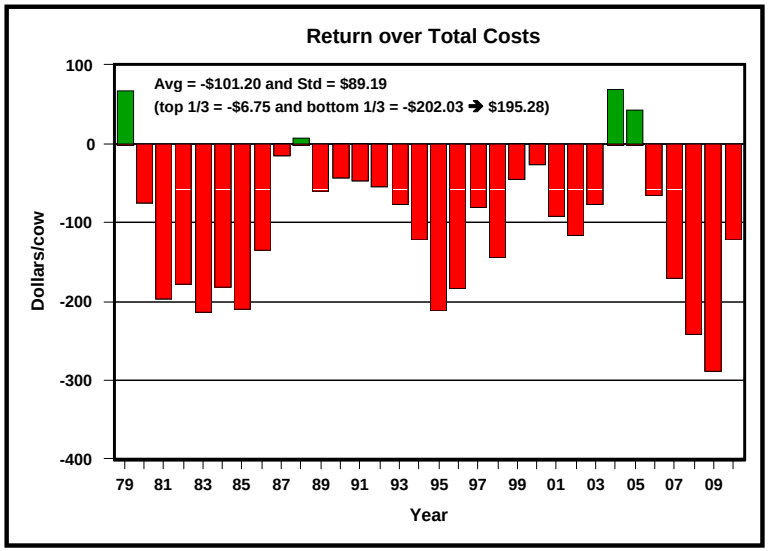
- **Drought**
- **Profit expectations relative to risk**
- **Hay land/pasture availability** (going to other uses?)
- **Increased capital/equity requirements**
- **Age of operators**
  (especially important as it relates to factors above)
- **Regulatory and legal uncertainty**

Cow-calf profitability drivers…

- **Analysis of KFMA cow-calf enterprise analysis returns**
  - **1979-2010 all operations (examine time effect)**
  - **2006-2010 operations with at least three years of data (examine producer effect)**
- **Paper available on web (www.agmanager.info)**



Average returns are highly variable over time…



Source: Kansas Farm Management Association (KFMA) Annual Enterprise Analysis Reports

Returns are more variable across producers…

Beef Cow-calf Enterprise, 2006-2010 (min of 3 years)*

	All Farms	Profit Category High 1/3 Head / $	Mid 1/3 Head / $	Low 1/3 Head / $	Difference between High 1/3 and Low 1/3 Absolute	%
Number of Farms	88	29	30	29		
Labor allocated to livestock, %	36.9	47.3	32.0	31.5		
Number of Cows in Herd	134	187	131	85	103	121%
Number of Calves Sold	122	173	118	77	96	126%
Weight of Calves Sold	576	587	570	573	14	3%
Calf Sales Price / Cwt	$105.99	$107.19	$105.07	$105.73	$1.46	1%
Gross Income	**$517.70**	**$561.41**	**$525.20**	**$466.24**	**$95.16**	**20%**
Feed	$353.91	$306.48	$361.24	$393.76	-$87.28	-22%
Interest	$123.81	$106.20	$124.66	$140.53	-$34.33	-24%
Vet Medicine / Drugs	$18.99	$18.25	$17.92	$20.84	-$2.60	-12%
Livestock Marketing / Breeding	$13.01	$10.86	$13.24	$14.93	-$4.07	-27%
Depreciation	$34.39	$25.53	$33.96	$43.71	-$18.18	-42%
Machinery	$71.05	$56.93	$72.72	$83.46	-$26.54	-32%
Labor	$107.81	$86.28	$91.21	$146.52	-$60.24	-41%
Other	$36.20	$25.87	$40.22	$42.38	-$16.50	-39%
Total Cost	**$759.19**	**$636.40**	**$755.16**	**$886.14**	**-$249.74**	**-28%**
Net Return to Management	**-$241.48**	**-$74.99**	**-$229.97**	**-$419.89**	**$344.90**	

27.6%

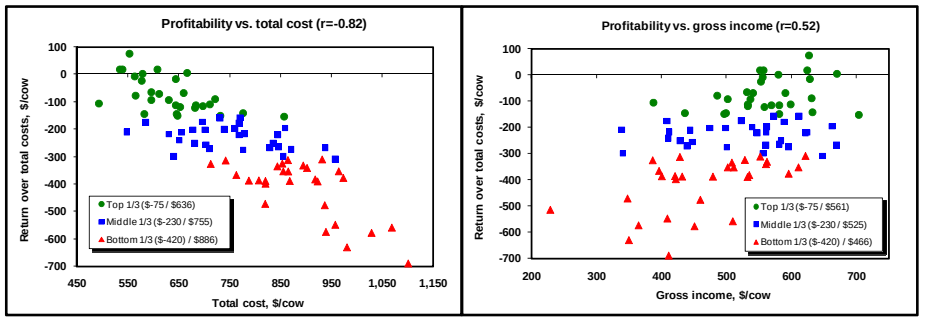
72.4%

* Sorted by Net Return to Management (Returns over Total Costs) per Cow

Compared to $195 between top and bottom third years.

Cow-calf profitability drivers…

- **Returns are more variable across producers at a point in time than they are on average over time (i.e., even in "hard times" some producers are profitable)**
- **Cost differences explain a bigger portion of profitability differences across producers than does income differences**



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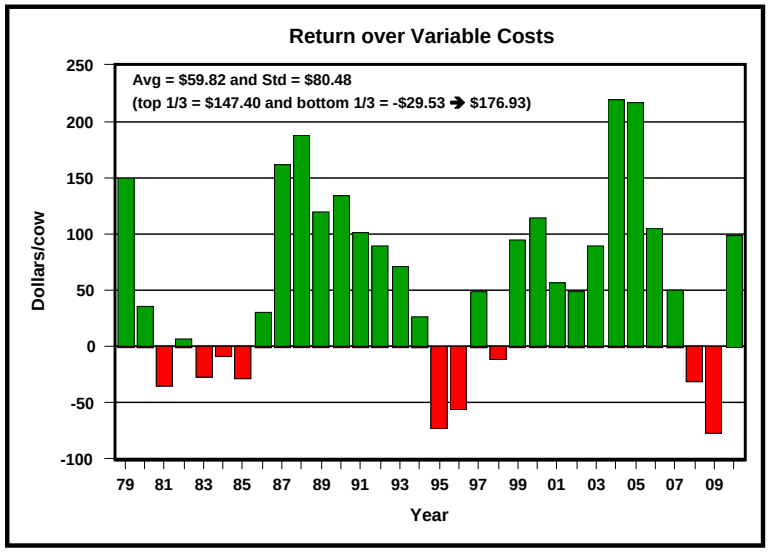

Source: Kansas Farm Management Association (KFMA) Annual Enterprise Analysis Reports

Returns are more variable across producers…

Beef Cow-calf Enterprise, 2006-2010 (min of 3 years)*

	All Farms	Profit Category: High 1/3 Head / $	Profit Category: Mid 1/3 Head / $	Profit Category: Low 1/3 Head / $	Difference between High 1/3 and Low 1/3: Absolute	Difference between High 1/3 and Low 1/3: %
Number of Farms	88	29	30	30		
Labor allocated to livestock, %	36.9	46.2	39.0	25.3		
Number of Cows in Herd	134	165	124	114	51	45%
Number of Calves Sold	122	153	114	101	51	51%
Weight of Calves Sold	576	595	570	565	29	5%
Calf Sales Price / Cwt	$105.99	$106.24	$106.95	$104.74	$1.51	1%
Gross Income	**$517.70**	**$567.55**	**$532.72**	**$452.31**	**$115.24**	**25%**
Feed	$353.91	$307.04	$367.32	$386.91	-$79.87	-21%
Interest	$28.12	$20.39	$27.77	$36.20	-$15.81	-44%
Vet Medicine / Drugs	$18.99	$16.93	$18.53	$21.53	-$4.60	-21%
Livestock Marketing / Breeding	$13.01	$11.18	$11.78	$16.13	-$4.95	-31%
Depreciation	$0.00	$0.00	$0.00	$0.00	$0.00	n/a
Machinery	$71.05	$56.61	$74.54	$81.89	-$25.27	-31%
Labor	$10.72	$11.73	$5.71	$14.91	-$3.18	-21%
Other	$36.20	$27.06	$40.19	$41.22	-$14.16	-34%
Total Variable Cost	**$532.02**	**$450.94**	**$545.85**	**$598.78**	**-$147.85**	**-25%**
Return over Variable Costs	**-$14.31**	**$116.61**	**-$13.12**	**-$146.47**	**$263.08**	

43.8%

56.2%

* Sorted by Net Return to Management (Returns over Variable Costs) per Cow

Compared to $175 between top and bottom third years.

Sell cows, build herds, or get out?

- **Sell cows** – if your forage resources are limited or you are starting to transition out of business this might be a reasonable strategy
- **Get out** – stress of high costs and price volatility and many changes occurring in the industry might be reasons to get out of the industry for some
- **Build herd** – if long-term goal is to remain in industry and your costs are average or better and you are willing to embrace new technologies, this could be a good time to add cows

For more information and decision tools related to farm management, marketing, and risk management go to www.AgManager.info

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