

2011-2012
Kansas State University
AG PROFITABILITY CONFERENCE

January 23, 2012

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Kansas State University
Department of Agricultural Economics

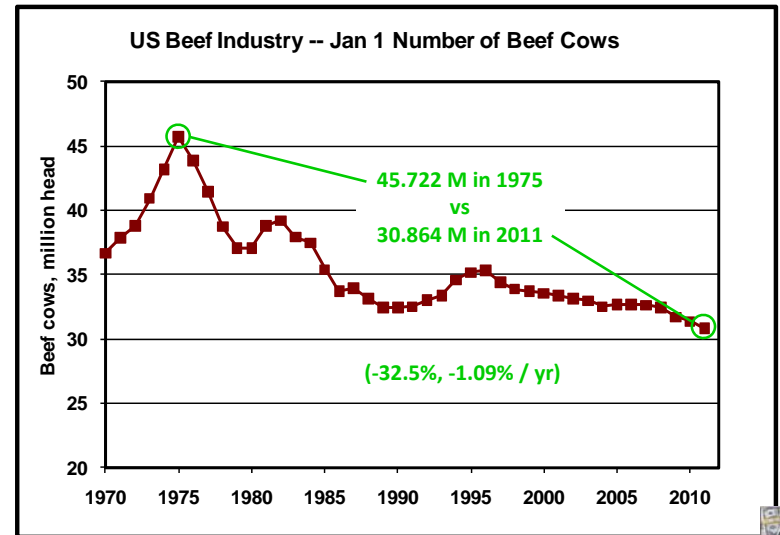
Sell cows, build herds, or get out?

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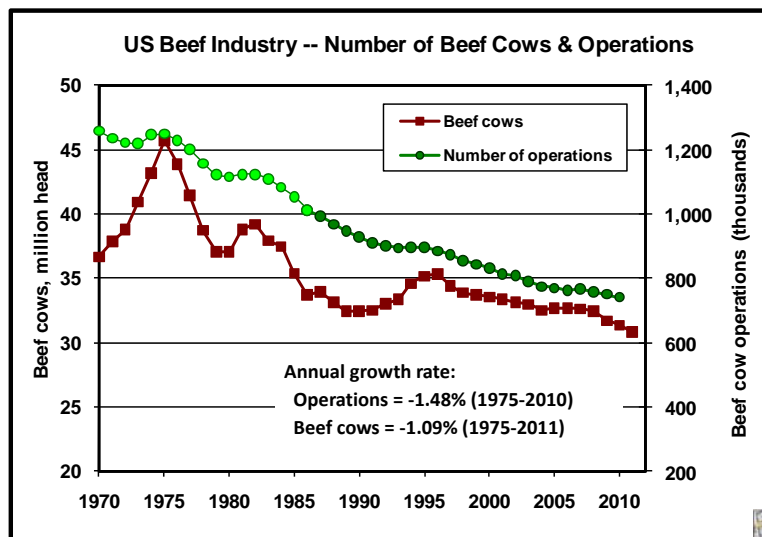
We have been “selling cows” for a long time...



Source: USDA-NASS, LMIC and K-State



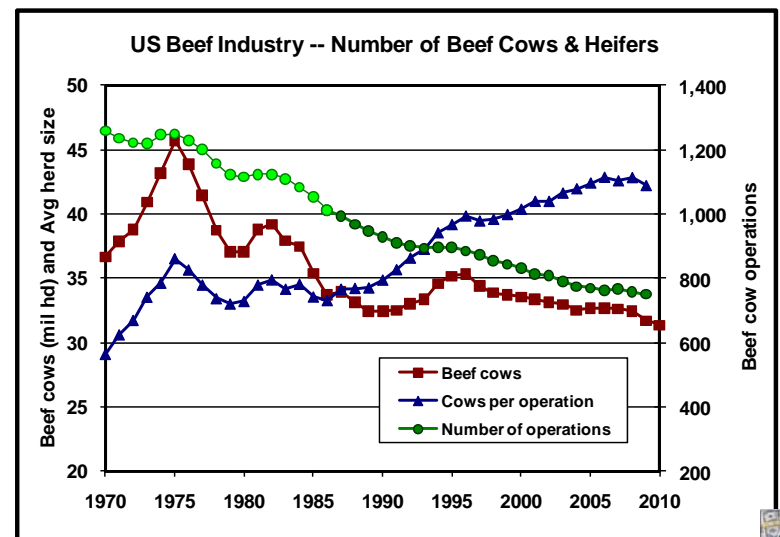
We have been “getting out” for a long time...



Source: USDA-NASS, LMIC and K-State



Producers have been “building herds” over time...



Source: USDA-NASS, LMIC and K-State



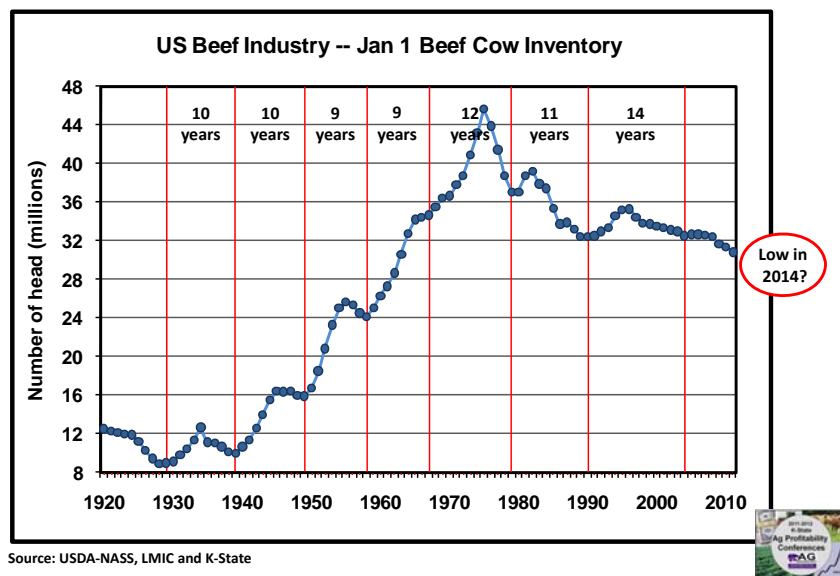
Sell cows, build herds, or get out?

- 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...



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)

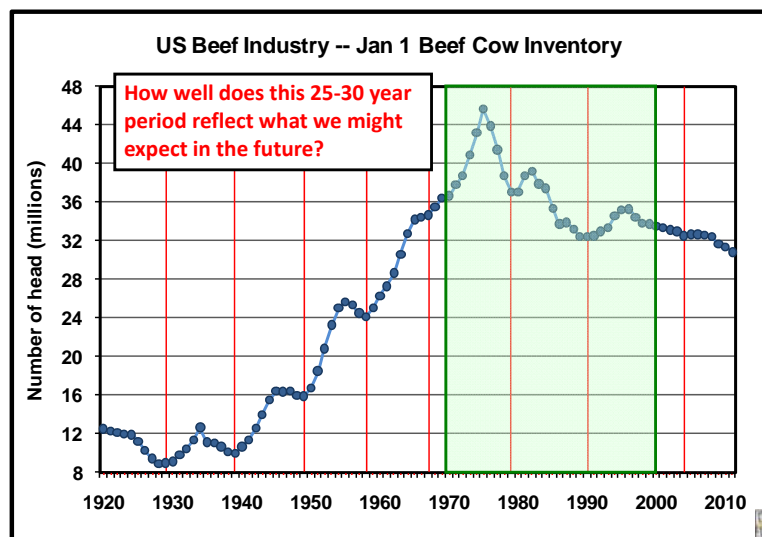
So what did the studies find? (basically a little of everything)

- **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

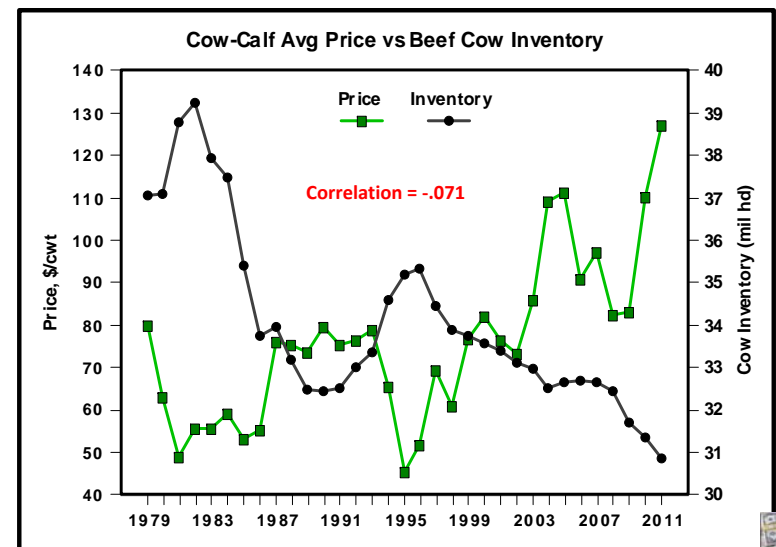
Existence of cattle cycles...



Source: USDA-NASS, LMIC and K-State



Existence of cattle cycles...



Source: K-State KFMA Enterprise Analysis Report and USDA



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

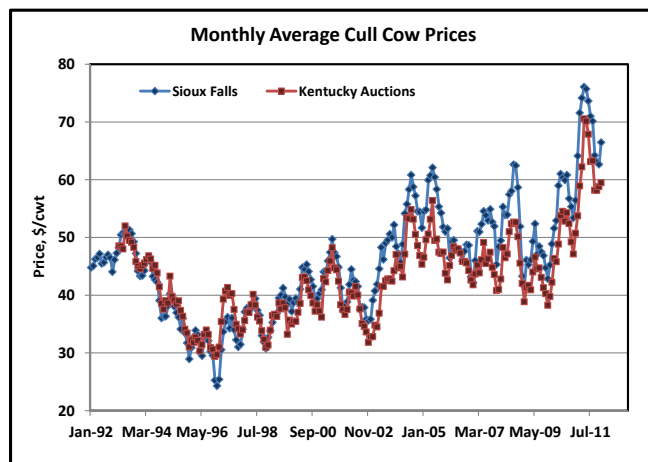
“... it may be *rational for a risk-averse producer to not attempt to time the market*. To be successful in a counter cyclical strategy, producers need to be able to forecast with a reasonable degree of certainty the future path of prices during a cattle cycle. This is difficult for a couple of reasons. *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.*”

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 come down from record highs this summer, but still remain strong by historical standards...**

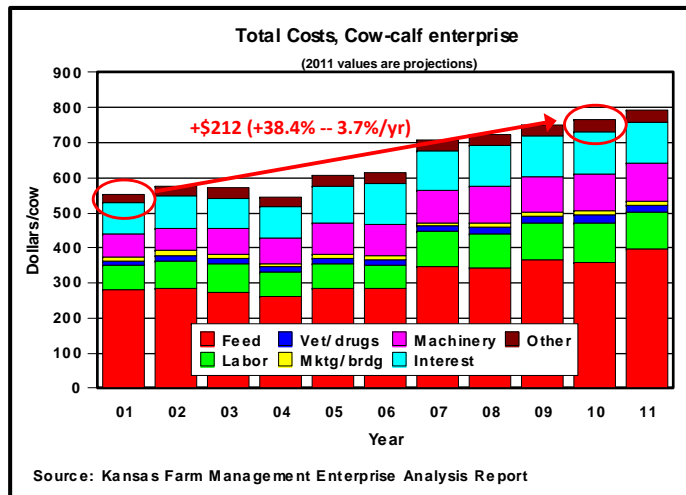


Sell cows?

- **Cull cow prices have been at historically high prices which might encourage some to sell.**
- **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?**

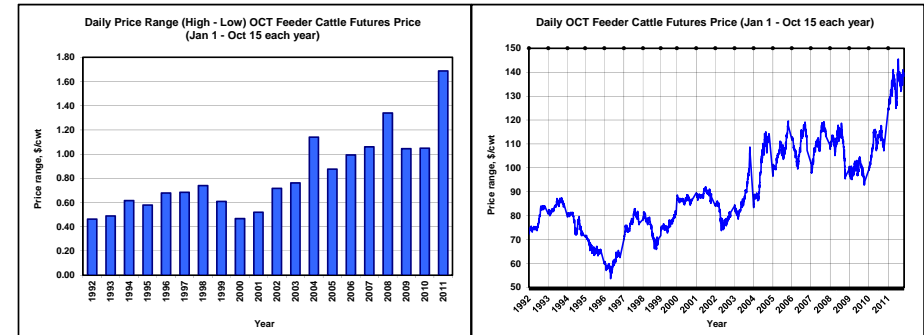
Get out?

- Input costs keep increasing



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.

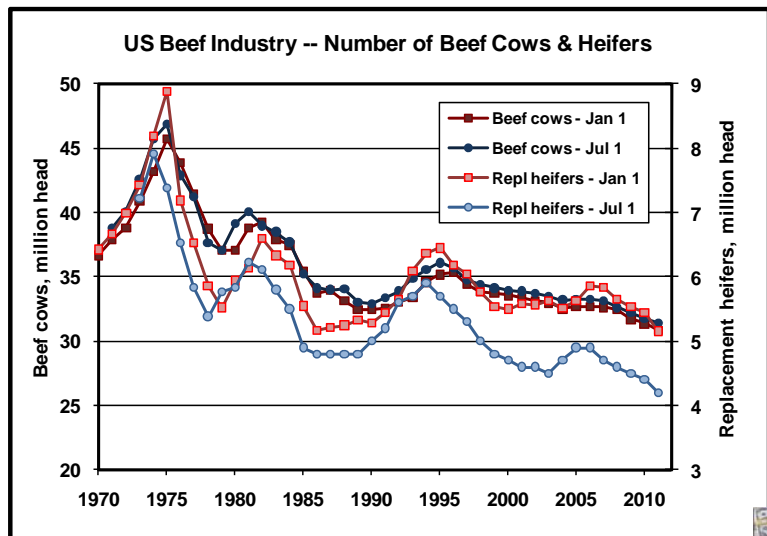
Get out?

- Input costs keep increasing
- Variability in calf prices is increasing
- Many things are changing in the industry...
(VAC 45, SAV, NHTC, EID, 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?

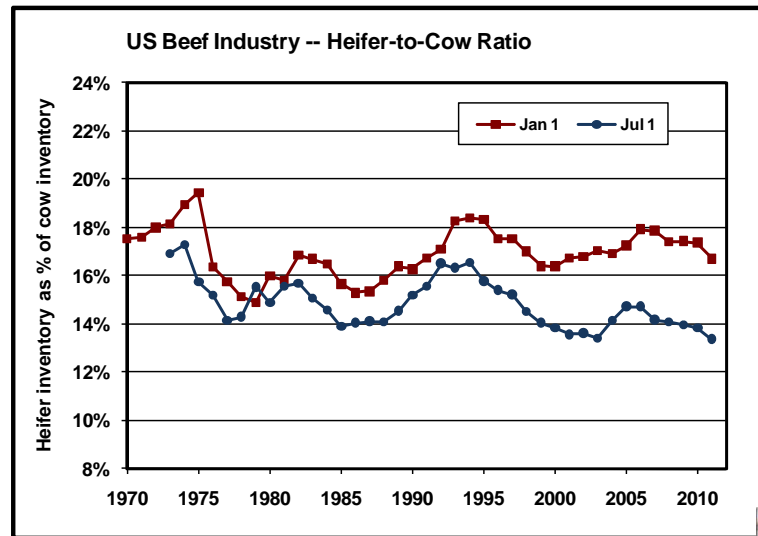
Very low inventory levels, especially Jul 1 heifers...



Source: USDA-NASS, LMIC and K-State



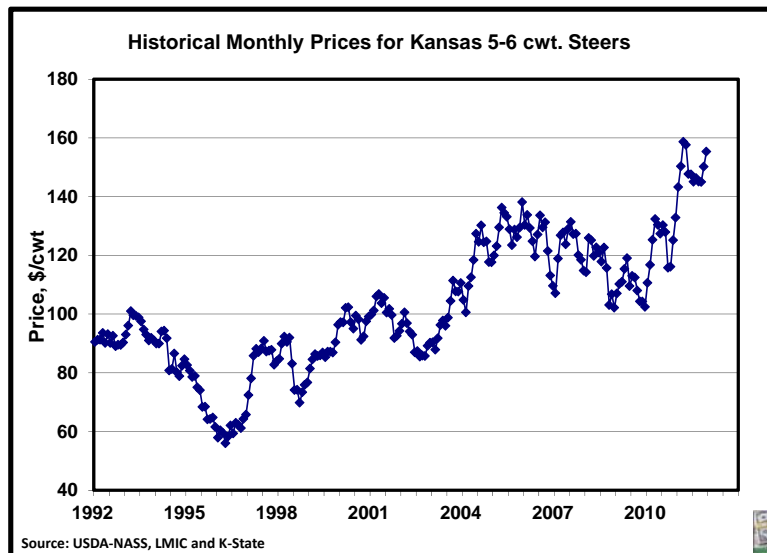
Jul 1 ratio suggests building herd might be tough...



Source: USDA-NASS, LMIC and K-State



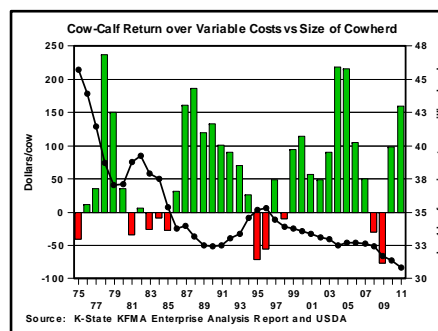
Nominal calf prices in 2011 have hit all time highs...



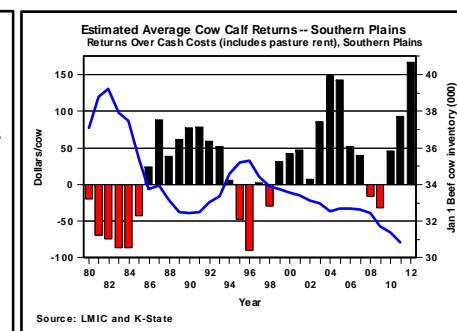
Source: USDA-NASS, LMIC and K-State



Outlook for cow-calf sector...



Source: K-State KFMA Enterprise Analysis Report and USDA



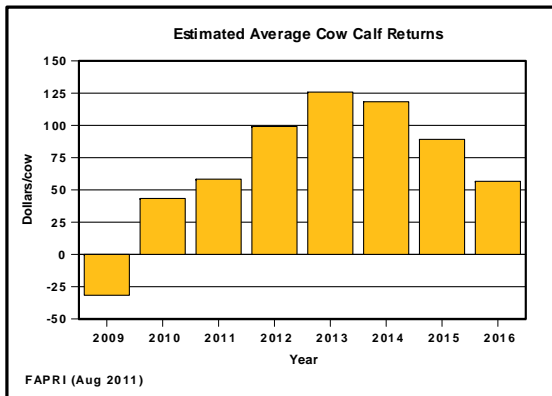
Source: LMIC and K-State

While absolute values for cow-calf returns vary based on source/methodology, projections for 2011 suggest returns will be up considerably from 2010 and projections for 2012 are better yet...

Outlook for cow-calf sector...

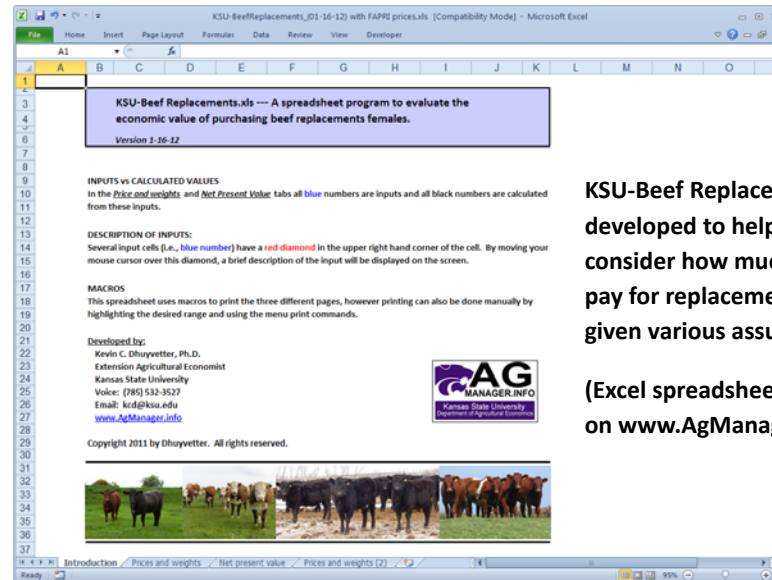


Things look quite positive for the cow-calf sector beyond 2012...



So the question is, how much can I pay for a replacement?

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



KSU-Beef Replacements.xls developed to help producers consider how much they can pay for replacement females given various assumptions. (Excel spreadsheet available on www.AgManager.info)

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	Annual cull rate	12.0%
Cull cow weight, lbs/hd	1,250		
Annual cow costs, \$/year	\$600	Annual inflation rate on costs	1.0%
Price scenario to use (1-3) (KCD Adj FAPRI)	1	Annual increase in average weaning weight	0.0%
Weaning weight scenario to use (1-3)	1	Discount rate (interest rate)	6.5%

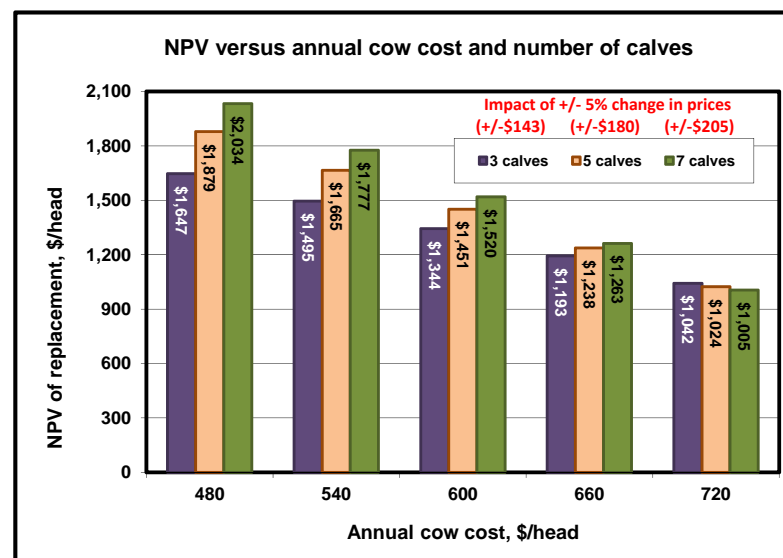
Net Present Value Analysis

Year	Cows at		Prices, \$/cwt		Calf Income	Cull Income		Net Cost	Net Income	Discount factor	NPV**	
	BOY*	Calf	Calf wt	Calf		Cull	Annual					Age
2012	100.0	1	542	\$147.85	\$72.16	\$777	\$108.24	\$794	\$600	\$286	1.0000	\$1,079
2013	87.5	2	552	\$156.83	\$72.99	\$735	\$95.80	\$703	\$530	\$300	0.9390	\$1,227
2014	76.6	3	562	\$156.72	\$73.04	\$654	\$83.88	\$612	\$469	\$269	0.8817	\$1,344
2015	67.0	4	567	\$153.27	\$69.95	\$565	\$70.29	\$516	\$414	\$221	0.8278	\$1,415
2016	58.6	5	572	\$147.13	\$66.68	\$479	\$58.63	\$425	\$366	\$171	0.7773	\$1,451
2017	51.3	6	572	\$146.68	\$64.84	\$417	\$49.88	\$365	\$323	\$144	0.7299	\$1,492
2018	44.9	7	567	\$145.72	\$63.90	\$360	\$43.02	\$312	\$286	\$117	0.6853	\$1,520
2019	39.3	8	565	\$145.12	\$62.95	\$312	\$37.08	\$268	\$253	\$97	0.6435	\$1,541
2020	34.4	9	562	\$147.98	\$63.46	\$277	\$32.71	\$238	\$223	\$87	0.6042	\$1,564
2021	30.1	10	559	\$151.16	\$64.73	\$246	\$29.19	\$210	\$197	\$78	0.5674	\$1,584

* BOY = Beginning of year

** Net present value if replacement is sold in this year

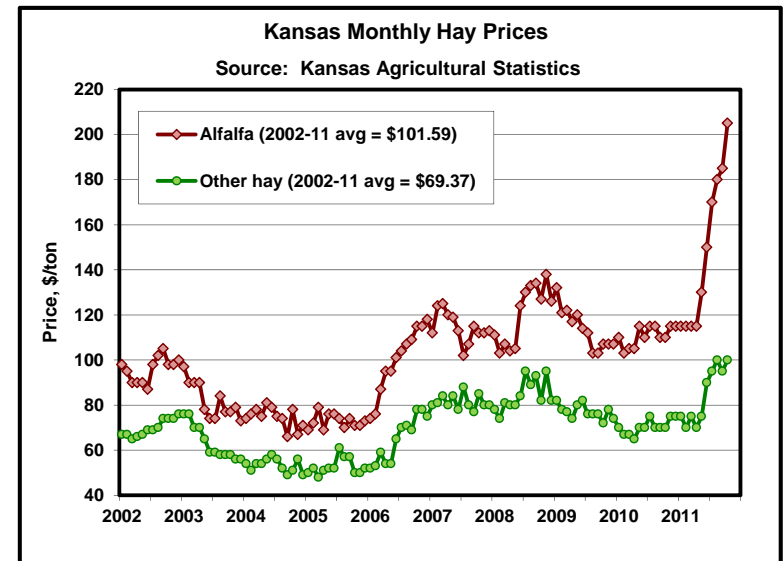
Build herd -- How much can I pay for a heifer/cow?



Factors impacting ability/desire to build herd --

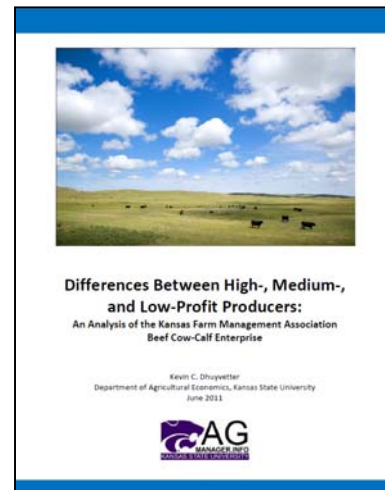
- Drought
- Profit expectations relative to risk
- Hay land/pasture availability (going to other uses?)
- Increased capital/equity requirements
- Age of operators
(especially important as it relates to factors above)
- Regulatory and legal uncertainty

Do you want to expand herd if buying forages?

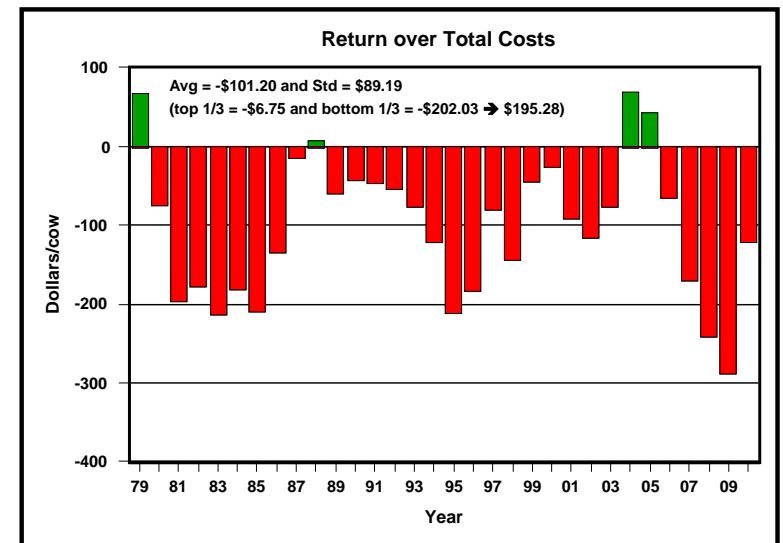


Cow-calf profitability drivers...

- 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)*

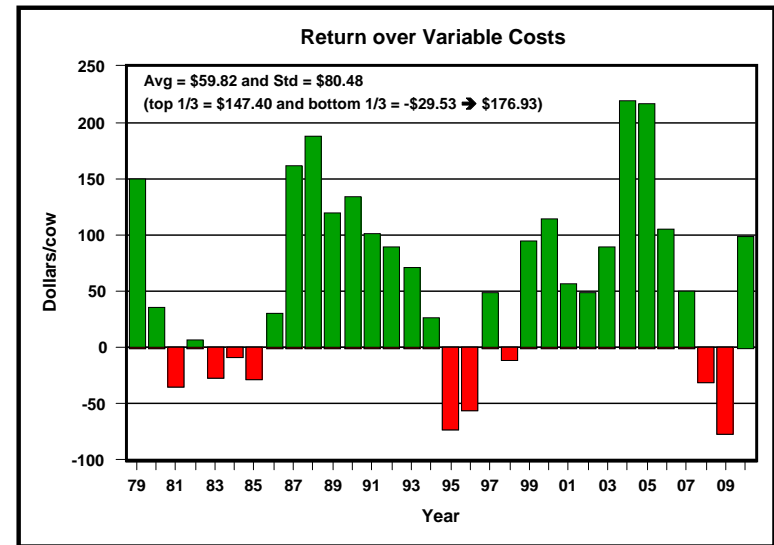
	All Farms	Profit Category			Difference between High 1/3 and Low 1/3	
		High 1/3 Head / \$	Mid 1/3 Head / \$	Low 1/3 Head / \$	Absolute	%
Number of Farms	88	29	30	29		
Labor allocated to livestock, %	36.9	47.3	32.0	31.5		
Number of Cows in Herd	134	187	131	85	103	121%
Number of Calves Sold	122	173	118	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	27.6%	-\$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	72.4%	-\$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	

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

Compared to \$195 between top and bottom third years.



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			Difference between High 1/3 and Low 1/3	
		High 1/3 Head / \$	Mid 1/3 Head / \$	Low 1/3 Head / \$	Absolute	%
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	43.8%	-\$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	\$107.72	\$11.73	\$5.71	\$14.91		-\$3.18 -21%
Other	\$36.20	\$27.06	\$40.19	\$41.22	56.2%	-\$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	

* 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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