

Economic Considerations in Beef Production



Kevin Dhuyvetter and Glynn Tonsor
Department of Agricultural Economics
Kansas State University



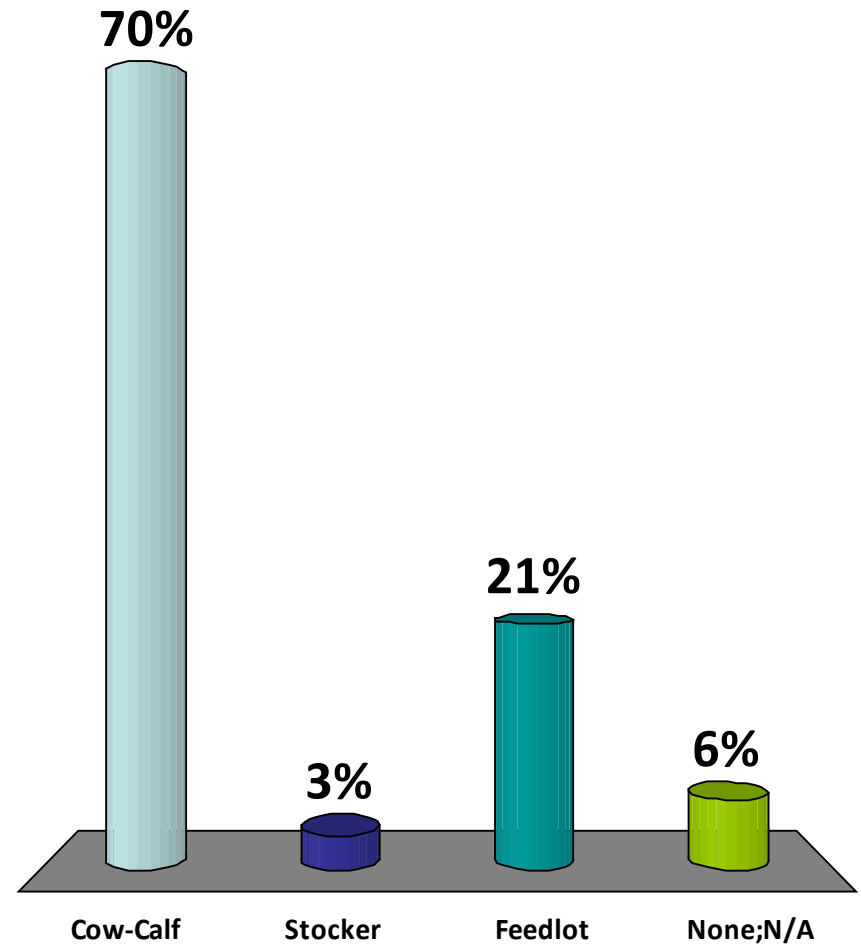
Novartis Veterinary Meeting
Kansas State University
Manhattan, KS. October 7, 2011



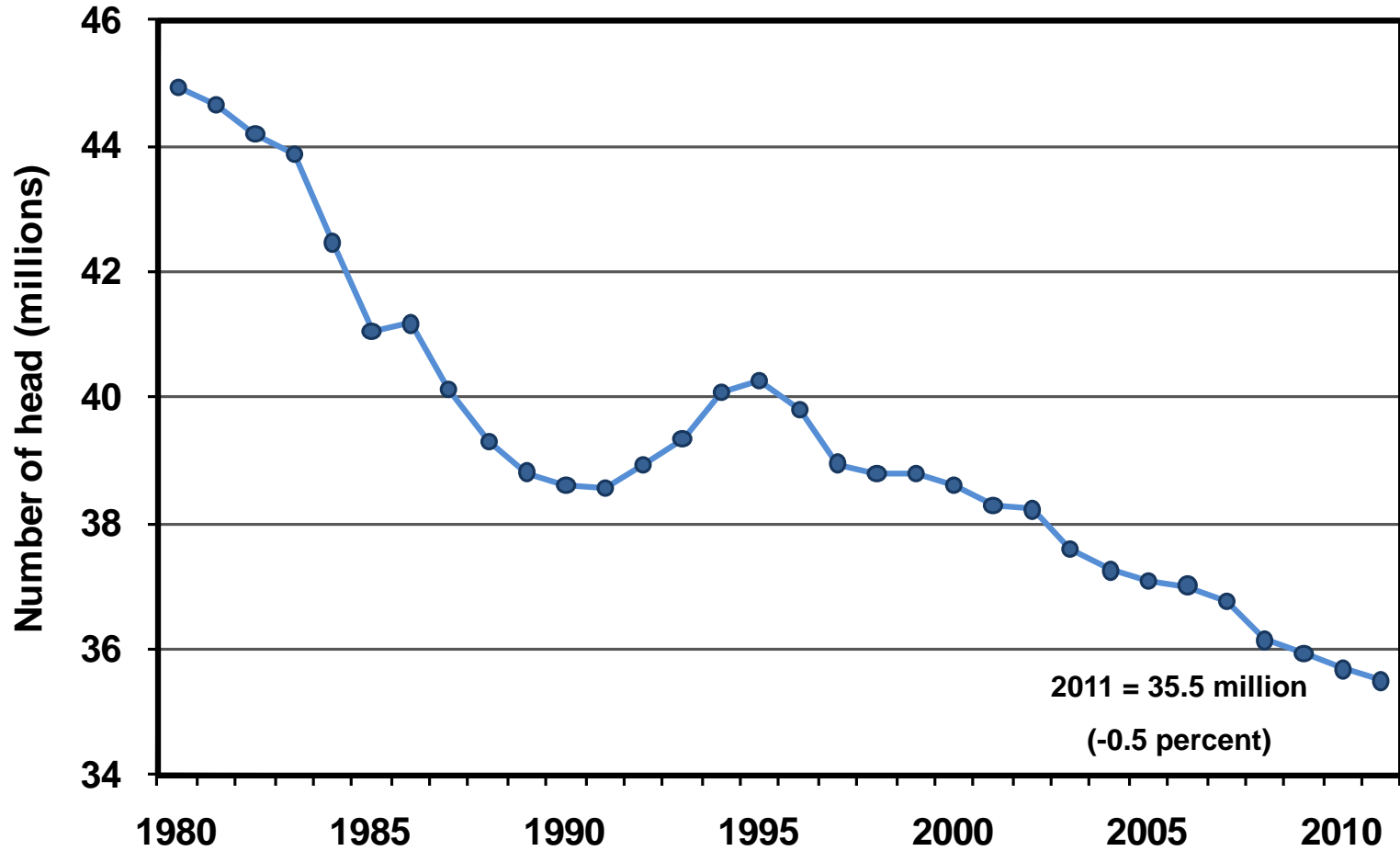
Which industry segment do you work most closely with?



1. Cow-calf
2. Backgrounder/Stocker
3. Feedlot
4. None of the above; N/A



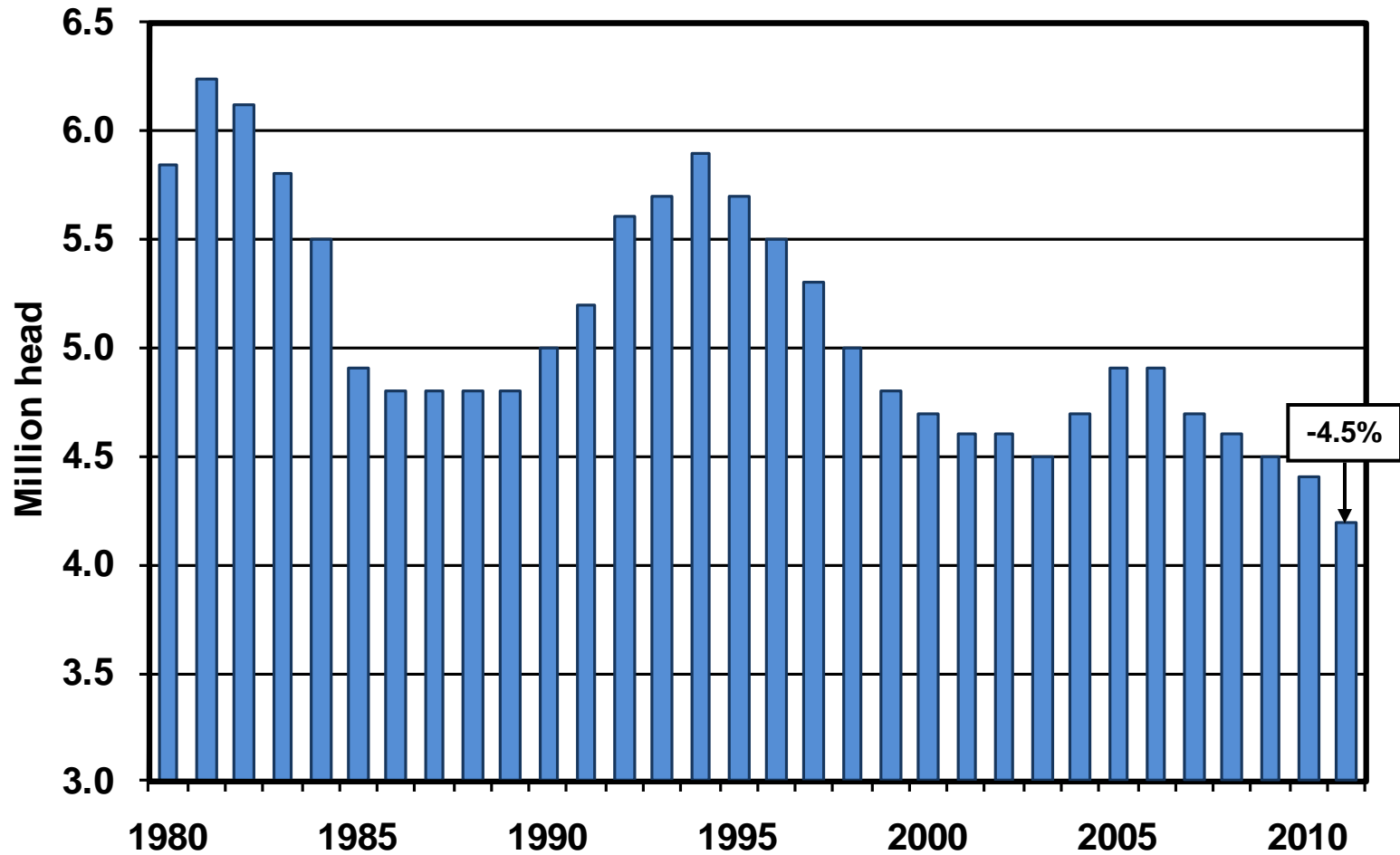
US Annual Calf Crop (2011 is July 1 estimate)



Data source: USDA-NASS



Heifers Held as Beef Cow Replacements -- July 1, U.S.



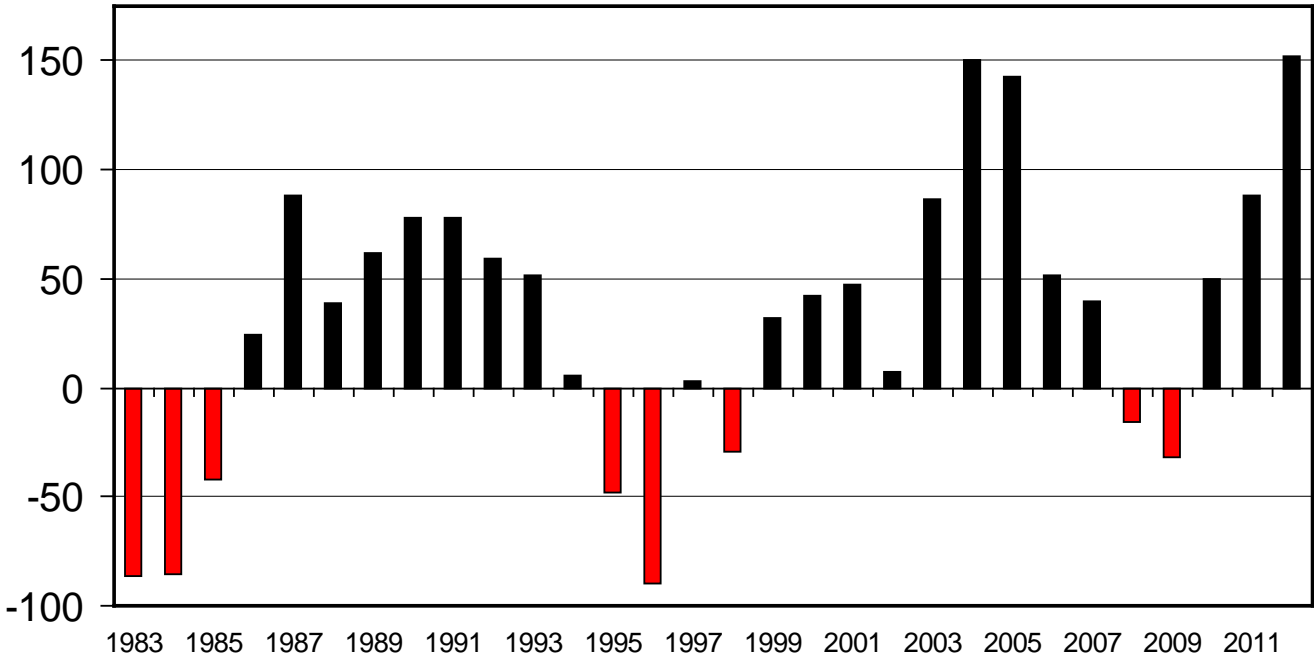
Data source: USDA-NASS



ESTIMATED AVERAGE COW CALF RETURNS

Returns Over Cash Cost (Includes Pasture Rent), Annual

\$ Per Cow



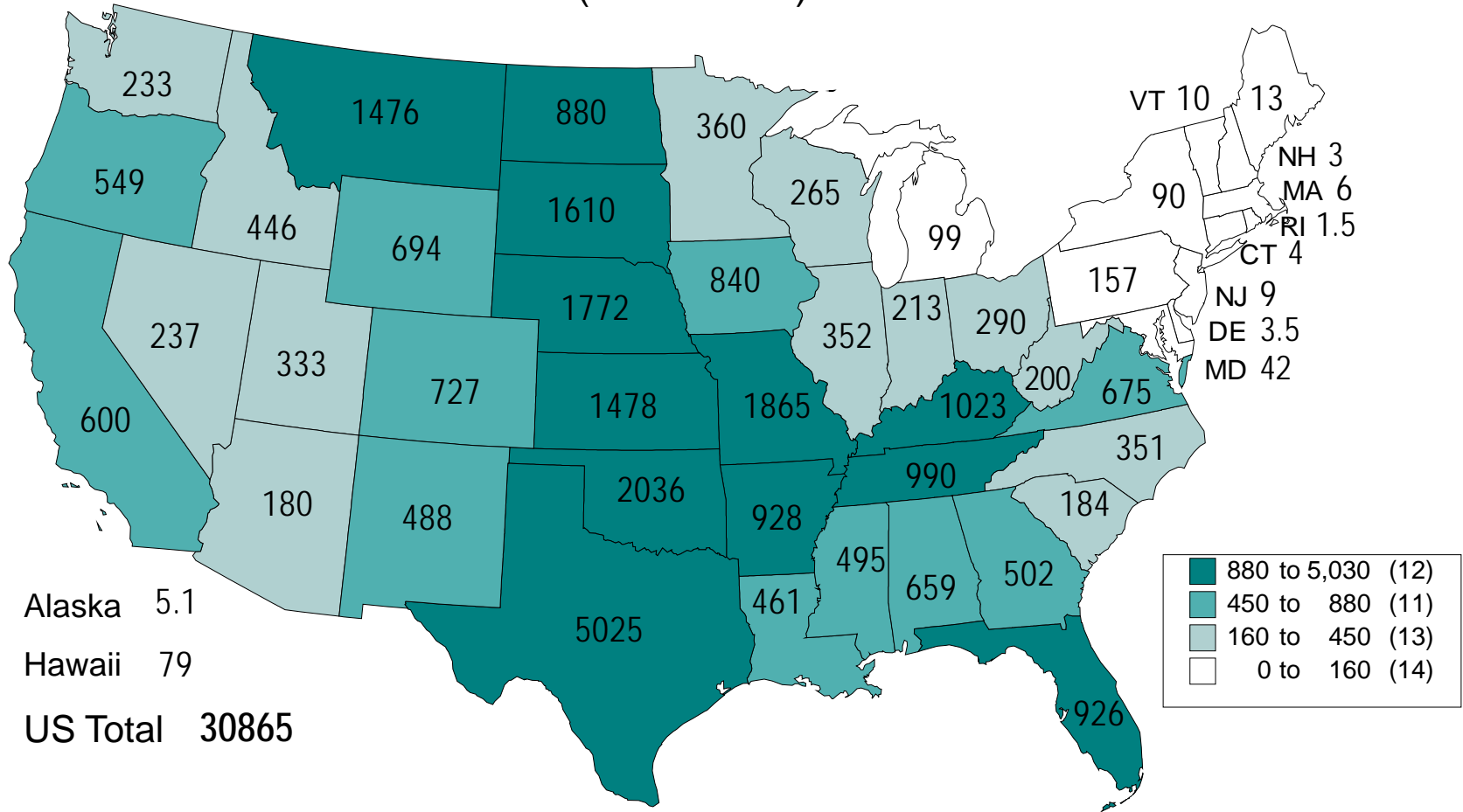
Livestock Marketing Information Center

Data Source: USDA-AMS & USDA-NASS, Compiled & Analysis by LMIC

C-P-66
08/16/11



BEEF COWS THAT HAVE CALVED JANUARY 1, 2011 (1000 Head)



Livestock Marketing Information Center

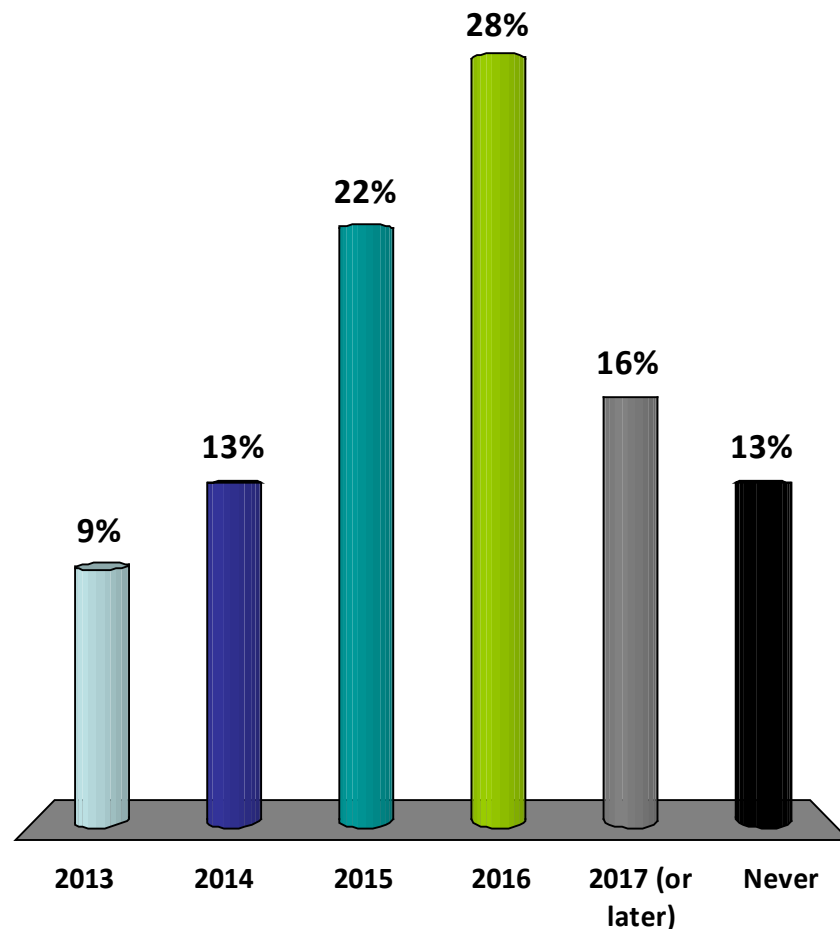
Data Source: USDA/NASS

C-N-15
01/28/11



When do you think the national beef cow herd will expand?

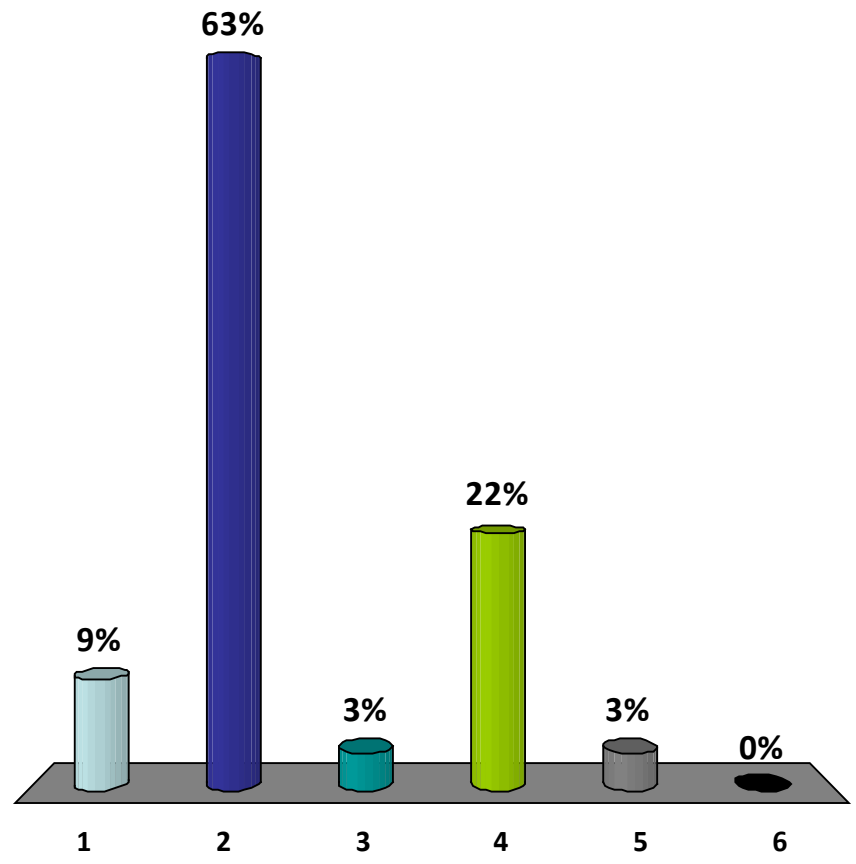
1. 2013
2. 2014
3. 2015
4. 2016
5. 2017 or later
6. Never





What region do you expect to most expand (as % of current #'s)?

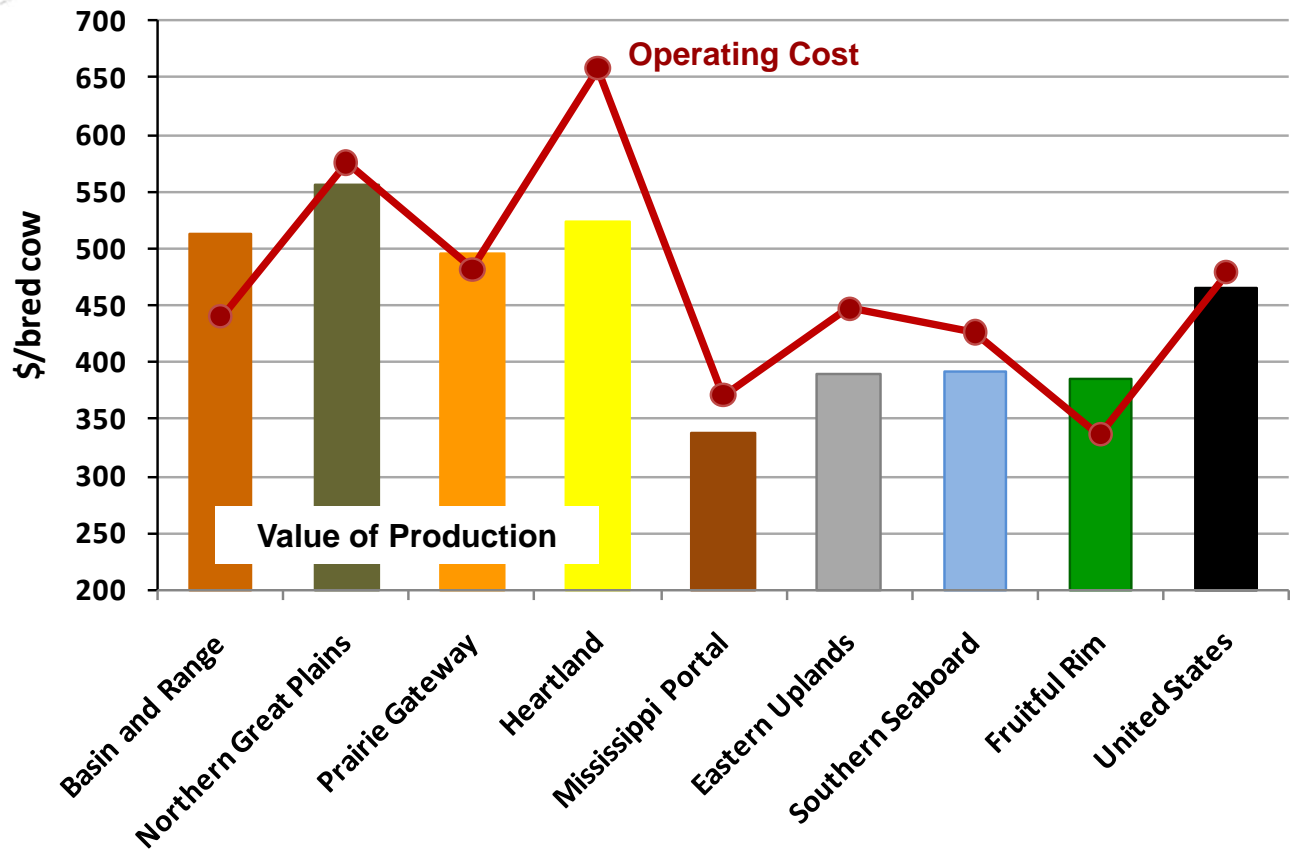
1. West (MT,WY,ID,...)
2. N. Plains (KS, NE, ND, SD)
3. N. Central (MO, IA)
4. S. Plains (TX, OK)
5. Southeast (KY, TN,...)
6. N/A – No expansion



Do some regions have an economic advantage for expansion?



Value of Production and Operating Cost by Region, 2008-2010

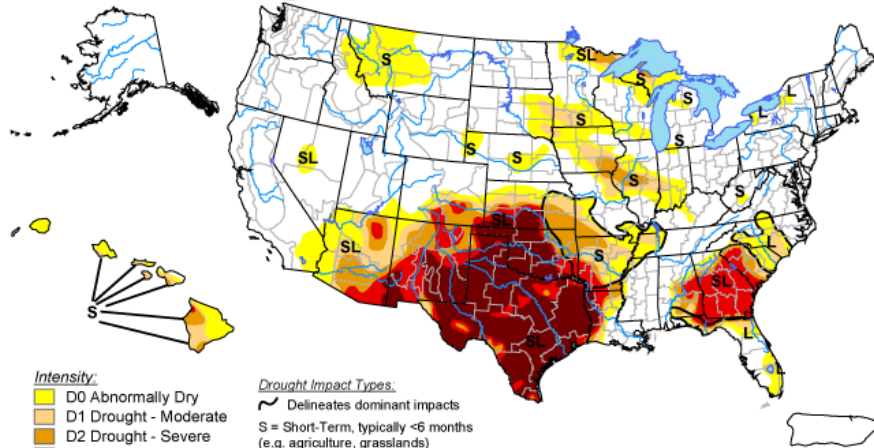


Data source: USDA-ERS



U.S. Drought Monitor

September 27, 2011
Valid 8 a.m. EDT



Intensity:
 D0 Abnormally Dry
 D1 Drought - Moderate
 D2 Drought - Severe
 D3 Drought - Extreme
 D4 Drought - Exceptional

Drought Impact Types:
 ~ Delineates dominant impacts
 S = Short-Term, typically <6 months
 (e.g. agriculture, grasslands)
 L = Long-Term, typically >6 months
 (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

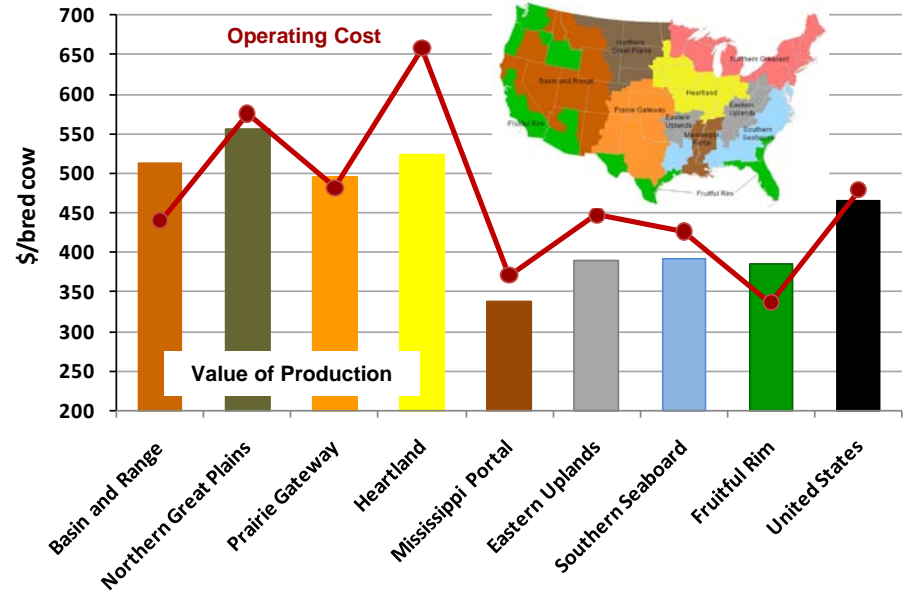
<http://droughtmonitor.unl.edu/>



Released Thursday, September 29, 2011

Author: Michael Brewer/Liz Love-Brotak, NOAA/NESDIS/NCDC

Value of Production and Operating Cost by Region, 2008-2010



Data source: USDA-ERS

Will current drought impact longer term expansion and where cows are located in the future?

July 1 Canadian beef cow inventory down 2%; but +7% in heifer retention...



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)**



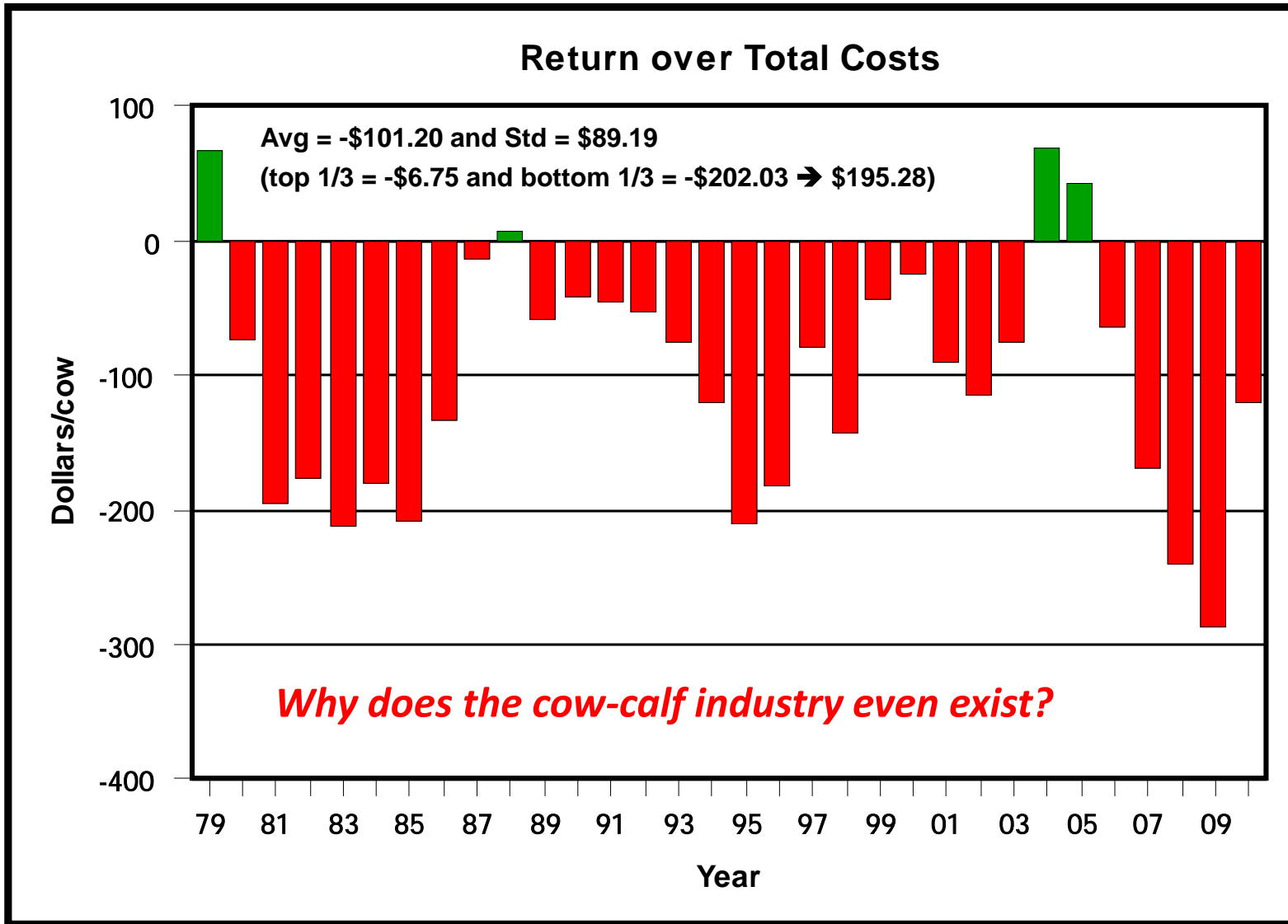
Differences Between High-, Medium-, and Low-Profit Producers:
An Analysis of the Kansas Farm Management Association
Beef Cow-Calf Enterprise

Kevin C. Dhuyvetter
Department of Agricultural Economics, Kansas State University
June 2011





Average returns are highly variable over time...

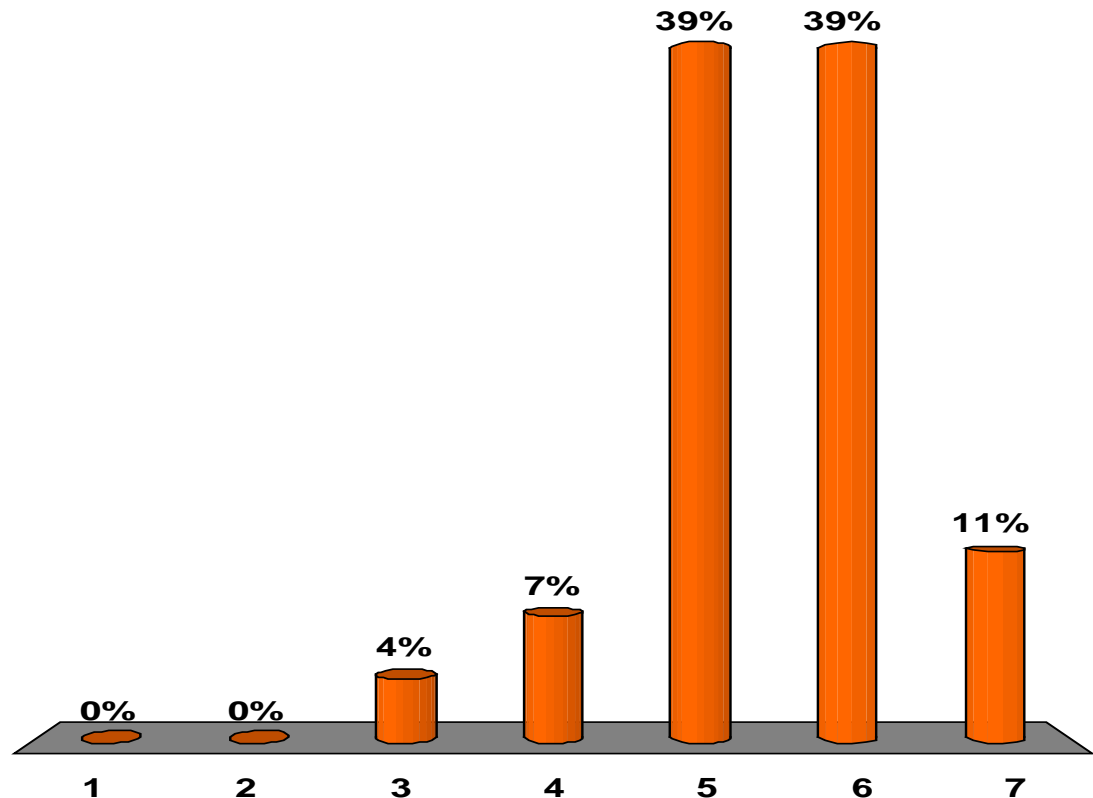


Source: Kansas Farm Management Association (KFMA) Annual Enterprise Analysis Reports

Variability over time versus across KFMA producers...

The difference in average returns across time (best 1/3 vs. worst 1/3 years) is ~\$200 per head, what is the difference between the top 1/3 and bottom 1/3 of producers at a point in time?

1. \$50
 2. \$100
 3. \$150
 4. \$200 (same)
 5. \$250
 6. \$300
 7. \$350
- less
- more



Returns are more variable across producers...

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

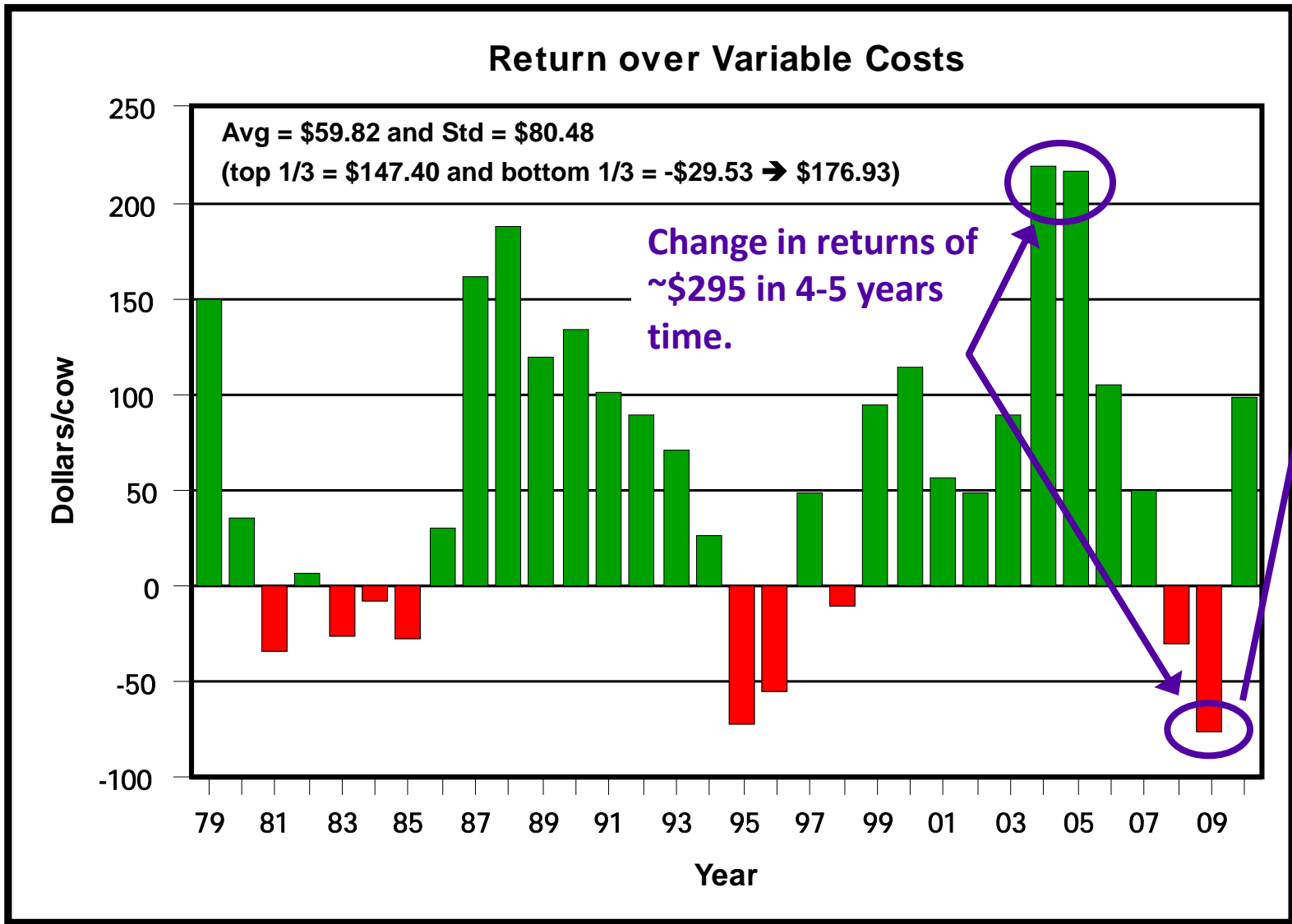
	All Farms	Profit Category			Difference between High 1/3 and Low 1/3		
		High 1/3 Head / \$	Mid 1/3 Head / \$	Low 1/3 Head / \$	Absolute	%	
Number of Farms	88	29	30	29			
Labor allocated to livestock, %	36.9	47.3	32.0	31.5			
Number of Cows in Herd	134	187	131	85	103	121%	
Number of Calves Sold	122	173	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%	-22%	34.9%
Interest	\$123.81	\$106.20	\$124.66	\$140.53		-24%	13.7%
Vet Medicine / Drugs	\$18.99	\$18.25	\$17.92	\$20.84		-12%	1.0%
Livestock Marketing / Breeding	\$13.01	\$10.86	\$13.24	\$14.93		-27%	1.6%
Depreciation	\$34.39	\$25.53	\$33.96	\$43.71		-42%	7.3%
Machinery	\$71.05	\$56.93	\$72.72	\$83.46		-32%	10.6%
Labor	\$107.81	\$86.28	\$91.21	\$146.52	72.4%	-41%	24.1%
Other	\$36.20	\$25.87	\$40.22	\$42.38		-39%	6.6%
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.



Big changes can occur quite rapidly...



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

Outlook for cow-calf sector...



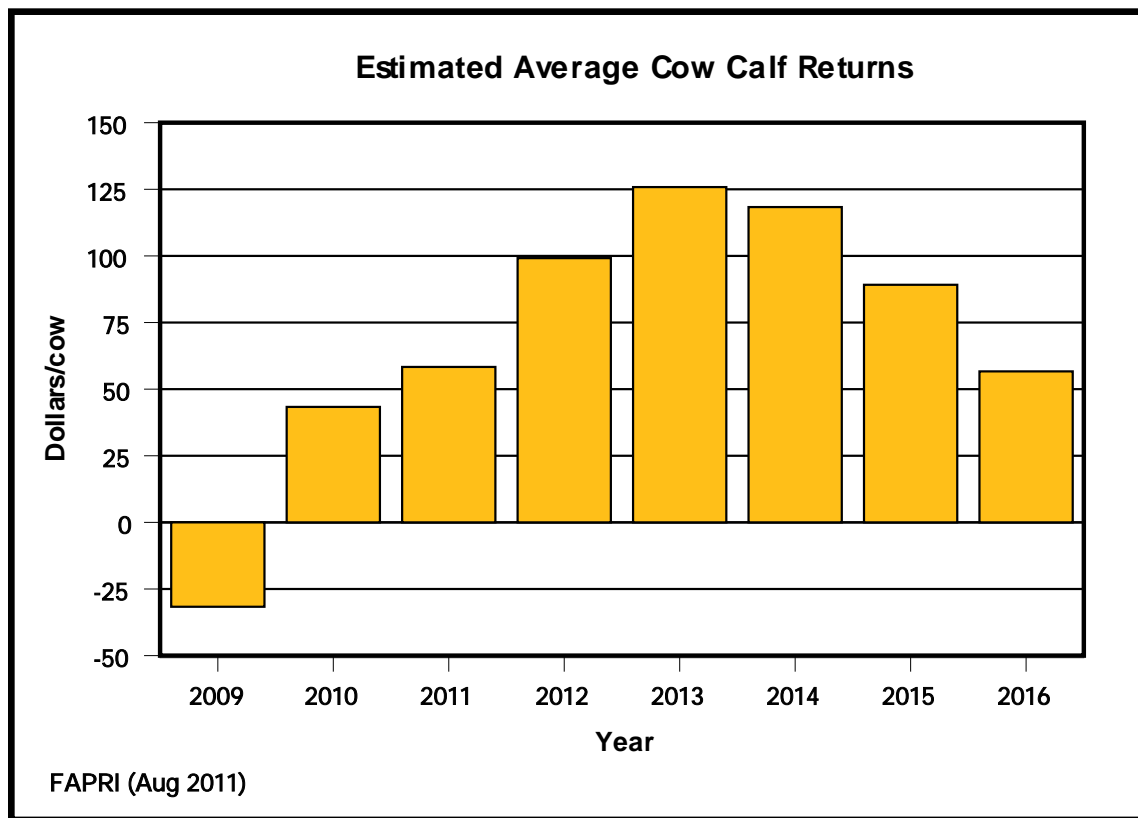
August 2011

FAPRI-MU August 2011 Baseline Update for US Agricultural Markets

FAPRI-MU Report #10-11

Providing objective analysis for more than 25 years
www.fapri.missouri.edu

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



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



KSU-Beef Replacement, Excel Spreadsheet Decision Tool (<http://www.agmanager.info/livestock/budgets/production/default.asp>)

KSU-Beef Replacements.xls --- A spreadsheet program to evaluate the economic value of purchasing beef replacements females.

Version 8-17-11

INPUTS vs CALCULATED VALUES

In the *Price and weights* and *Net Present Value* tabs all blue numbers are inputs and all black numbers are calculated from these inputs.

DESCRIPTION OF INPUTS:

Several input cells (i.e., blue number) have a red diamond in the upper right hand corner of the cell. By moving your mouse cursor over this diamond, a brief description of the input will be displayed on the screen.

MACROS

This spreadsheet uses macros to print the three different pages, however printing can also be done manually by highlighting the desired range and using the menu print commands.

Developed by:

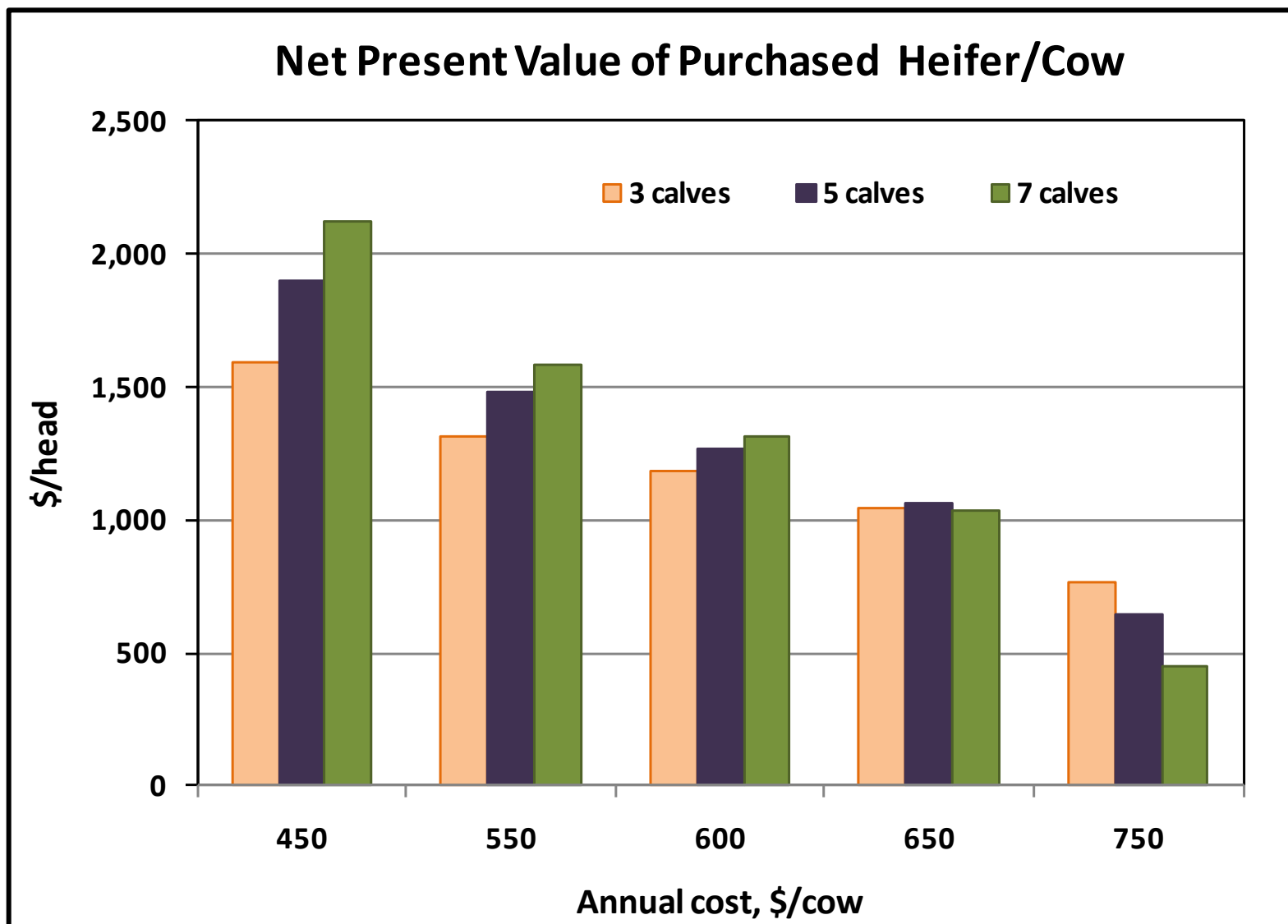
Kevin C. Dhuyvetter, Ph.D.
Extension Agricultural Economist
Kansas State University
Voice: (785) 532-3527
Email: kcd@ksu.edu
www.AgManager.info



Copyright 2011 by Dhuyvetter. All rights reserved.



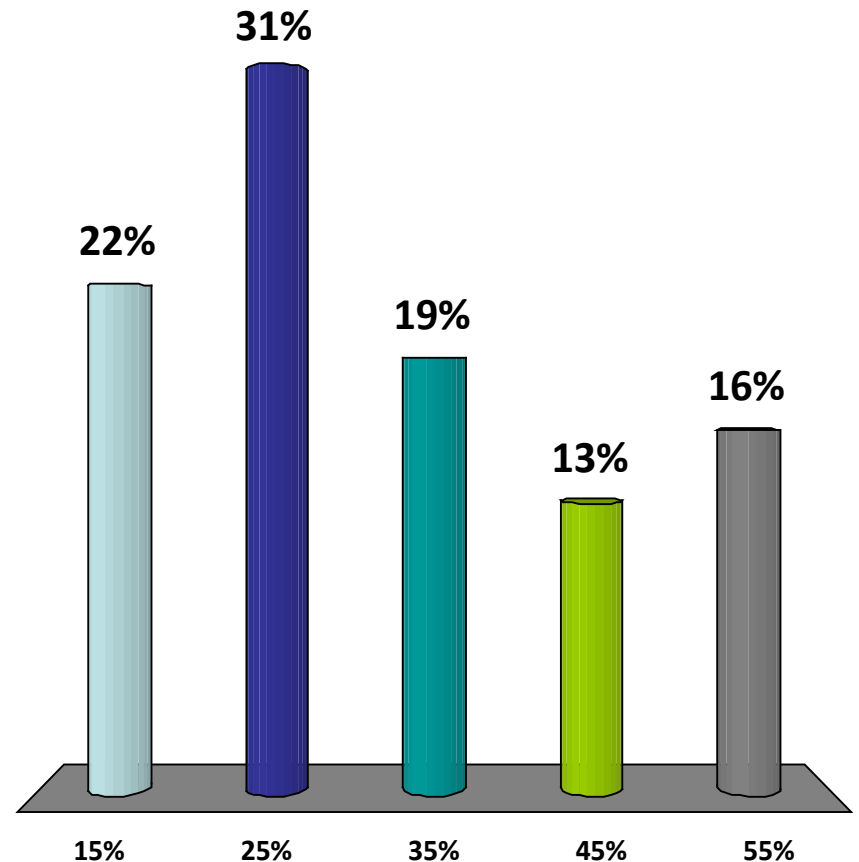
How much can I pay for a heifer/cow if I want to expand?



What portion of the 2.2 million farms in the U.S. have a beef cow?



1. 15%
2. 25%
3. 35%
4. 45%
5. 55%



Current U.S. Cow-Calf Industry

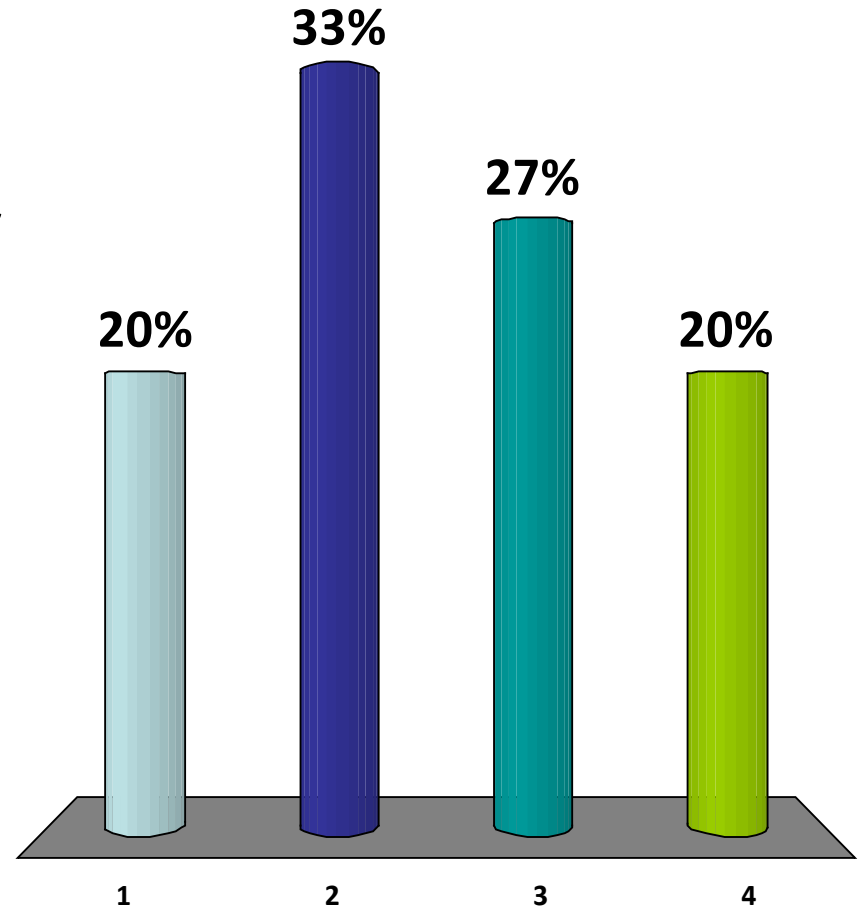
(March '11 ERS Report: <http://www.ers.usda.gov/publications/eib73/>)

- 35% of 2.2. million farms have a beef cow
 - 50% have fewer than 20 cows
- Cow-calf only, CC/Stocker, & CC/Feedlot comprise 36%, 53%, and 10% of cows...
- Internet use, NAIS familiarity, and host of other issues vary notably across op. sizes..



What characteristic most distinguishes “large” (>500) from “small” (<100) cow-calf operations?

1. Weaning weights
2. Retention of calves after weaning
3. Use of public grazing land
4. Operator age



U.S. Cow-Calf Industry: Size Differences

(March '11 ERS Report: <http://www.ers.usda.gov/publications/eib73/>)

	20-49 cows	50-99 cows	100-249 cows	250-499 cows	500 or more cows
Percent of farms/beef cows	41/13	32/21	21/31	5/15	2/20
Beef cows—average per farm	29	54	116	260	640
Weaning weight (lbs)	494	493	523	538	522
Sold at weaning (%)	63	62	51	49	39
Backgrounded then sold (%)	31	35	43	45	55
Retained until slaughter (%)	6	3	6	6	6
Percent using public grazing land	1	3	8	24	29
Operator:					
Age (percent greater than age 65)	38	40	32	30	22
Completed college (percent)	23	26	27	37	42
Off-farm occupation (percent)	47	37	21	18	10
Exit within 5 years (percent)	26	26	17	10	7

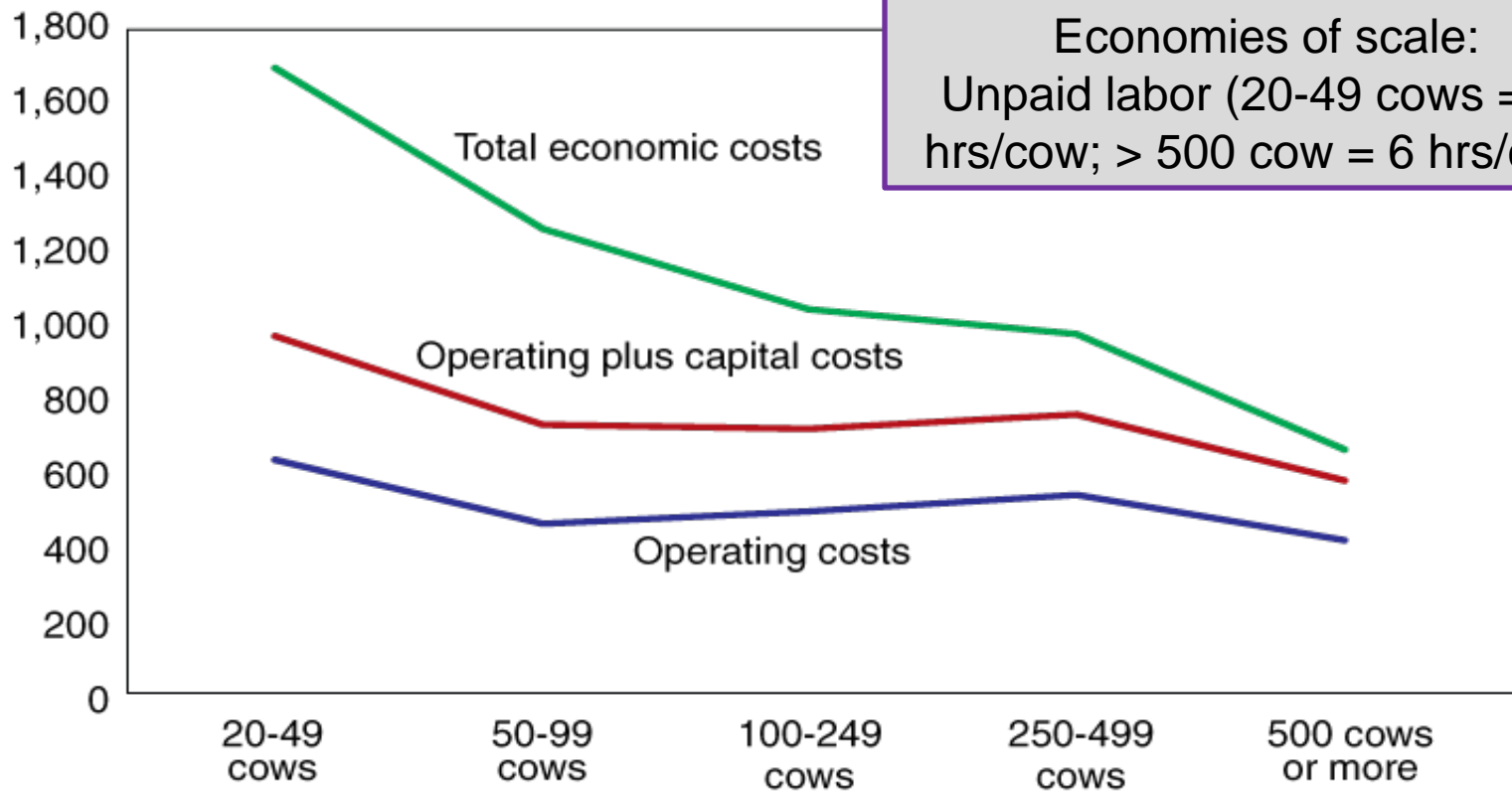


Figure 6

Beef cow-calf cost of production per cow by size, 2008

Economies of size are apparent in beef cow-calf production, particularly for total economic costs.

Dollars per cow



Economies of scale:
Unpaid labor (20-49 cows = 31 hrs/cow; > 500 cow = 6 hrs/cow)

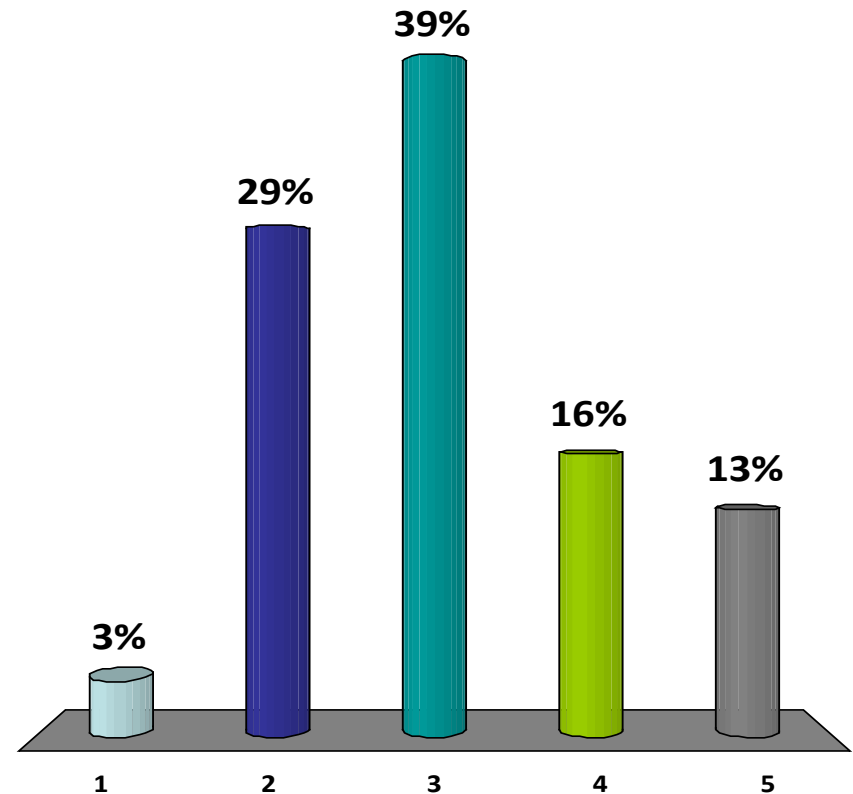
Notes: Production cost estimates for operations with less than 20 beef cows are not available because the ARMS sample is limited to operations with 20 or more beef cows. The number of cows refers to the peak number on the operation at any time during 2008.

Source: USDA, Economic Research Service using USDA's 2008 Agricultural Resource Management Survey (ARMS).



The average hog operation doubled in size between 1997 & 2007. How much did the average beef cow operation size increase?

1. 0% (no change)
2. +3%
3. +13%
4. +23%
5. +33%



Current U.S. Cow-Calf Industry

(March '11 ERS Report: <http://www.ers.usda.gov/publications/eib73/>)

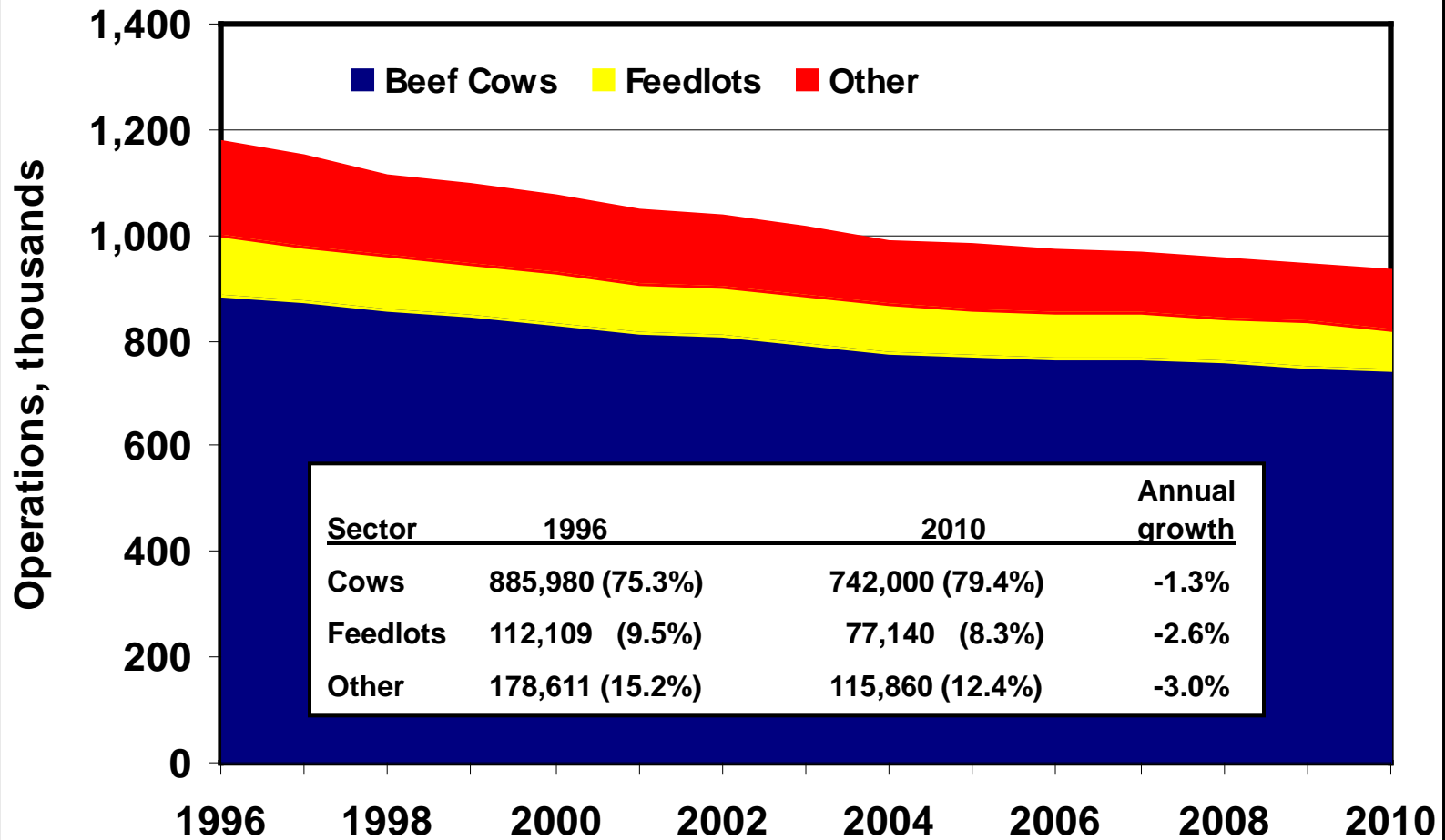
- Hog & Dairy operations (avg size) fell by 40% (doubled) between 1997 & 2007
 - Beef cow operations fell by only 15% and avg. size went from 38 to 43 head (13% increase)
 - Land constraint is different;
 - But is consolidation coming???
 - is it already under-way???





Fewer operations in all sectors in beef industry...

US Beef Industry -- Number of Operations



Financial importance of cow-calf operation...

Contributions to Income and Labor Input

Reason	Percent of Operations				All
	Herd Size (Number of Beef Cows)				
	1-49	50-99	100-199	200+	
Primary source of income	5.3	24.1	42.8	65.0	14.3
Supplemental source of income	78.0	68.3	50.9	31.7	71.9
Other	16.7	7.6	6.3	3.3	13.8

Source: USDA NASS APHIS, Beef 2007-08, NAHMS report.

One of the characteristics of the beef cow-calf industry slowing consolidation is that many participants are not necessarily motivated by economics...



Average herd size and distribution

Average beef cow herd size increased from 40.4 in 2000 to 42.3 in 2010, but averages can be somewhat deceiving...

Farm size (cows/farm)	Percent of operations		Percent of inventory	
	2000	2010	2000	2010
1-49	78.8	79.2	29.5	28.0
50-99	12.0	11.1	19.1	17.4
100-499	8.5	8.9	36.7	38.0
500+	0.7	0.8	14.7	16.6

Roughly 10% of the operations control over 55% of the cows (diverse cow-calf sector)

Concentration of U.S. animal agriculture in 2010

(production from approximately 10% of operations)

	Size of operation (hd)	Percent of operations	% of I, M, or P*
Beef cows	100+	9.7%	54.6% (I)
1000+ head Feedlots**	24,000+	8.9%	61.7% (M)
Dairy	200+	11.8%	73.7% (P)
Swine	2,000+	12.2%	86.0% (I)

* I = Inventory, M = Marketings, P = Production

** Feedlots with 1000+ head represented 2.8% of all feedlots and accounted for 84.6% of marketings

Source: USDA NASS and K-State



Beef industry changes underway...

- BEEF Magazine Poll (N=99 as of 8/17)
 - “If you had to liquidate cattle this year because of flooding or drought, what do you plan to do with the proceeds?”
 - 47% Restock with cows when conditions improve
 - 9% Restock but change production models (e.g., buy stockers rather than cows)
 - 27% Keep the cash; leave the business
 - 6% Reinvest the cash in another non-livestock ag enterprise
 - 10% Don't know
- Sales value of cull cows is about = for all
 - Those with higher costs, opportunities to row crop, etc. may increasingly exit
 - Expansion will not come from those with higher costs and notable alternative opportunities...



Cow-calf marketing strategies



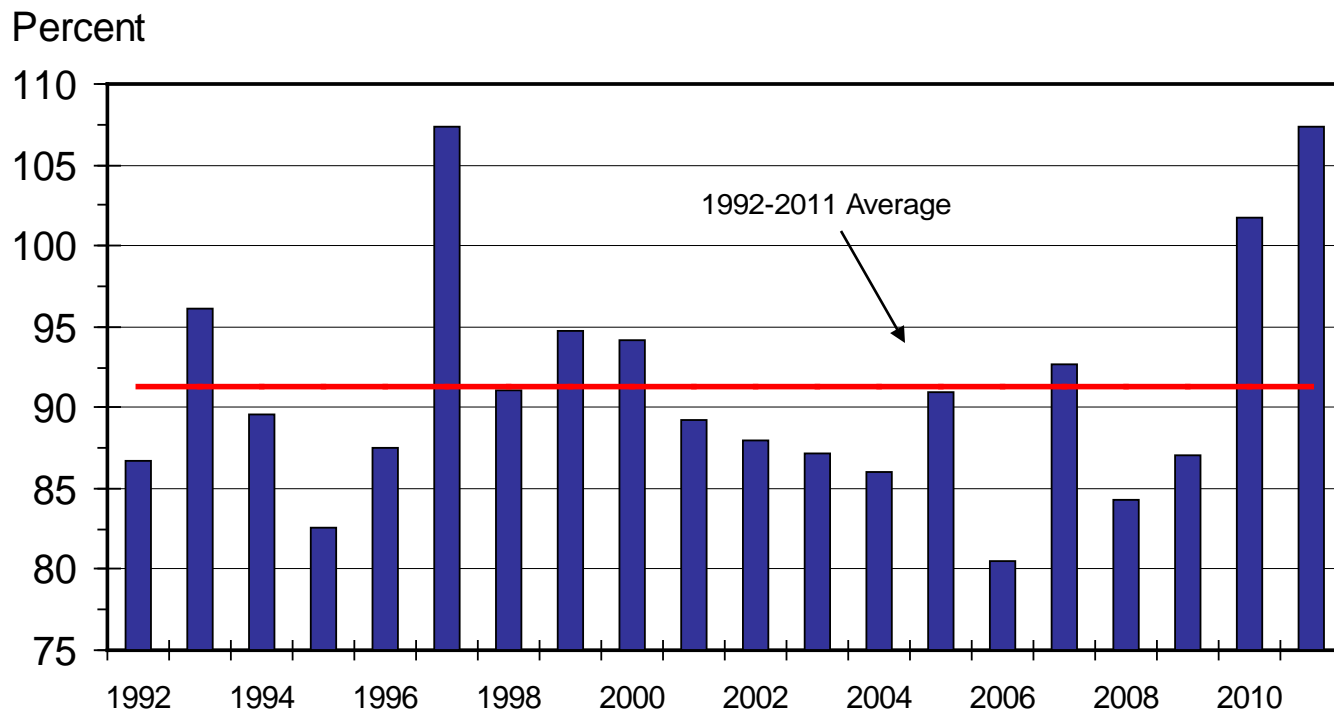
- Will cow-calf operations start routinely retaining calves to add weight with “low cost” feedstuffs?
- If so, tools are available to help producers analyze the economics of these decisions...



Also see: *Value of Gain* Factsheet and Decision Tool Overview
(http://www.agmanager.info/livestock/budgets/production/beef/Value-of-Gain_FactSheet_AM-GTT_2011.pdf)

BUY/SELL MARGINS

S. Plains, Mar. 7-800 lb. Steer as % of Nov. 5-600 lb. Steer



Livestock Marketing Information Center

Data Source: USDA-AMS, Compiled & Analysis by LMIC

C-P-60
08/17/11



9/27/11 Salina, KS Situation:

- BeefBasis.com forecasted price of 800 lb steer March 1, 2012 is \$133.91/cwt
- What is break-even purchase price of a 500 lb steer purchased on October 1, 2011? – forecasted price is \$150.91



“Buy-Sell” spreadsheet tool

(<http://www.agmanager.info/livestock/budgets/production/beef/cattlebuysell.swf>)

Breakeven Buying Price Worksheet

Selling weight after shrink (pay-weight)	800
Expected selling price (\$/cwt)	\$133.91
Average Daily Gain (pay-to-pay)	2.00
Feeding cost of gain (\$/cwt)	\$75.00
Interest rate on feeder	7.00%
Percent death loss*	2.00%
Costs per head (trucking, etc.)**	\$10.00
Desired profit per head	\$0.00

* Enter ONLY if death loss is NOT included in feeding cost of gain, otherwise enter zero.

** Do not enter any costs included in feeding cost of gain.



“Buy-Sell” spreadsheet tool

(<http://www.agmanager.info/livestock/budgets/production/beef/cattlebuysell.swf>)

Purchase Weight ¹	<u>Selling Price</u>						
	\$127.91	\$129.91	\$131.91	\$133.91	\$135.91	\$137.91	\$139.91
	Breakeven Purchase Price ²						
450	158.66	162.03	165.40	168.78	172.15	175.52	178.89
500	150.98	154.03	157.07	160.12	163.17	166.22	169.27
550	144.73	147.51	150.30	153.08	155.87	158.65	161.43
600	139.56	142.12	144.68	147.25	149.81	152.38	154.94
650	135.21	137.59	139.97	142.35	144.72	147.10	149.48
700	131.52	133.74	135.96	138.18	140.39	142.61	144.83
750	128.35	130.43	132.51	134.59	136.67	138.75	140.83

¹ Enter the minimum purchase weight you are willing to consider.

² Based on a feeding cost of gain of \$75/cwt.

Expected Sales Price: \$133.91/cwt:

Expected Return: \$46.05/head [5.0 * (\$160.12 - \$150.91)]



Demand Side Issues & Trends

- Long run decline in domestic overall meat consumption
 - 2018 poultry consumption > (beef + pork)
 - Poultry grows every year from 2011-2020
- Global growth likely to exceed domestic
 - Heightens industry fragmentation issues such as animal ID/traceability, marketing arrangements, ...
 - Non-price factors increasingly important for beef...
 - Prevalence of E-coli vs. irradiation acceptance
 - Incomes, convenience, health information, recalls matter...



Animal Welfare Events Summary

- **State-by-State: Ballot initiatives & Legislature**
 - FL ('02), AZ ('06), OR ('07), CA & CO ('08), ME & MI ('09)
 - OHIO:
 - *Ohio Livestock Care Standards Board* ('09)
 - *Agreement w/ HSUS* (June '10)
 - Phase out gestation stalls by Dec. 2025; no new facilities after Dec. 2010
 - No new permits for new egg facilities with battery cages
 - Downer cattle & humane euthanasia language included...
- **Live Trade**
 - May '11: Australia banned live cattle exports to Indonesia because of inhumane treatment
- **National Legislation & Labeling?**
 - July '11: UEP & HSUS agreement



Animal Welfare Summary Points:

- No species is immune
- Consumer/resident desires regularly initiate change
 - Perception drives decisions; “knowledge” NOT necessary to be influential
- Ballot voting behavior & regulation impacts all:
 - Product choice set for all is impacted
 - Even if only a minority $WTP > MC$...
- Dilemma created by voting n.e. purchasing ...
- Meat demand impacts do exist
- National housing standards & mandatory labeling discussions picking up...



Policy/Regulation Issues & Trends

- GIPSA “fair market” proposed rules / “anti-competition” listening sessions ...
 - No timetable on USDA’s benefit-cost assessment...
 - environmental regulation concerns
 - animal welfare/mandatory labeling???
- Is overall uncertainty holding back investment throughout supply chain???



Production “sectors” in the U.S. beef industry



1) Cow-calf



2) Stocker/backgrounder



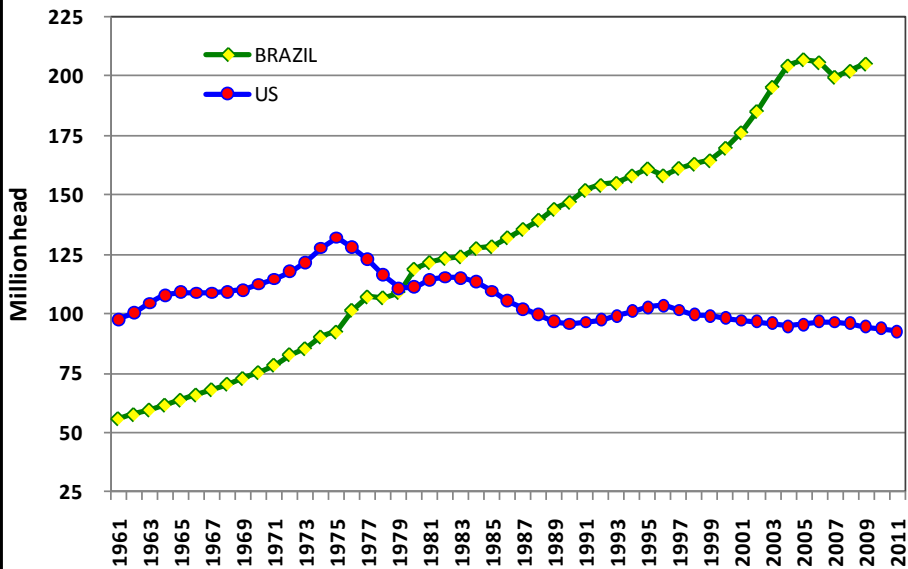
3) Feedlot

Ownership is generally separate across the three sectors

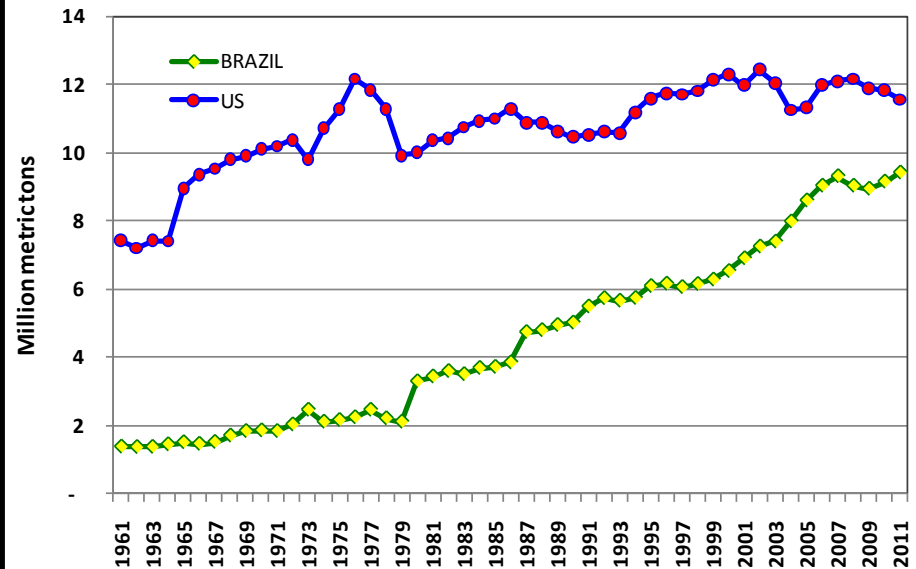
Implications – competition, industry polarization, and slow response to changing markets.

U.S. and Brazil cattle industries...

Size of Cattle Herd



Beef and Veal Production



- A “mature” industry versus a “growing/evolving” industry...
- Should same management approach be used in both countries?
- Identify and capitalize on comparative advantages

What do you think is the biggest threat/constraint to expansion?

1. Profit potential
2. Credit availability
3. Land availability
4. Market access
5. Regulatory/legal issues
6. Consumer issues
7. Other



What do you think is the biggest opportunity for expansion?

1. Profit potential
2. Value-added programs
3. Land availability
4. Technology (e.g., RFID)
5. Genetic advancements
6. Geographical location
7. Other



More information available at:
AgManager (<http://www.agmanager.info/>)

