KSU BEEF STOCKER FIELD DAY

September 22, 2011
KSU Beef Stocker Unit

PROCEEDINGS

Beef Stocker Field Day 2011
September 22, 2011
KSU Beef Stocker Unit

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Beef Stocker Field Day 2011
September 22, 2011
KSU Beef Stocker Unit

Welcome to the 12th annual KSU Beef Stocker Field Day. We appreciate your attendance and support of this educational event. We are fortunate to have assembled an outstanding list of presenters and topics that we believe are relevant to your bottom line.

As always, if you have any questions on the program or suggestions for future topics, please let us know. Our strength in delivering relevant information lies in working closely with you, our stakeholder.

Sincerely,

Dale A. Blasi, PhD
Extension Beef Specialist
Department of Animal Sciences and Industry
College of Agriculture

THANK YOU

We would like to express a special “THANK YOU” to Pfizer Animal Health for their support of today’s educational program and activities for the beef stocker segment. With their financial assistance, we are able to deliver the caliber of programming that today’s events have in store for you. Please take a moment to stop by their display to see the line of products that they have to offer.

Pfizer Animal Health

Beef Stocker Field Day 2011
September 22, 2011
KSU Beef Stocker Unit

9:30 a.m.	Registration/Coffee
10:15 a.m.	Introductions
10:30 a.m.	**Cattle Market Outlook** *Dr. Glynn Tonsor, Kansas State University*
11:15 a.m.	**How Much Can I Pay for Grass?** *Dr. Kevin Dhuyvetter, Kansas State University*
12:00 Noon	Barbecue Lunch
1:30 p.m.	**A Systems Perspective to Managing Yearlings** *Dr. Gerald Horn, Oklahoma State University*
2:15 p.m.	**Managing Stocker Cattle for Growth and Health: Applying Science and Technology to Improve Forage-Based Beef Production** *Dr. Mark Branine, Pfizer Animal Health*
3:15 - 5:30 p.m.	**Breakout Sessions**

Byproduct Storage Systems – What Works?
Dr. Justin Waggoner, Kansas State University

Vaccineology
Dr. Gregg Hanzlicek, Kansas State University

By-products and Corn Processing for Lightweight Cattle
Dr. Sean Montgomery, Corn Belt Livestock Services

5:30 p.m.	Complimentary Cutting Bull's Lament BBQ

Notes – Notes -- Notes

Cattle Market Outlook

Dr. Glynn Tonsor
Kansas State University

BEEF STOCKER

Beef & Cattle Market Outlook

Glynn Tonsor
Dept. of Agricultural Economics
Kansas State University

K-State Stocker Field Day
September 22, 2011

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OVERVIEW

- FEEDSTUFFS:
  - Drought: triggering liquidations; expensive and "hard to find" forage and grain for feed…
- SUPPLY:
  - Short-run (drought) vs. long-run (herd) perspectives
    - Shrinking cow herd, expansion uncertainty
    - Structural changes underway…
- DEMAND:
  - Export demand remains strong
  - Domestic demand surpassing expectations but remains worrisome…

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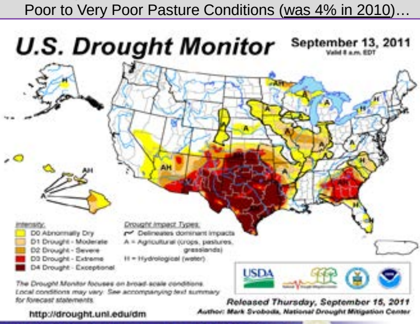
July '11: 40% of Beef Cows in States with > 40% Poor to Very Poor Pasture Conditions (was 4% in 2010)…



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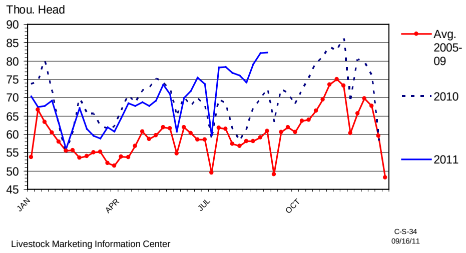
BEEF COW SLAUGHTER
Federally Inspected, Weekly



Livestock Marketing Information Center
Data Source: USDA-AMS & USDA-NASS

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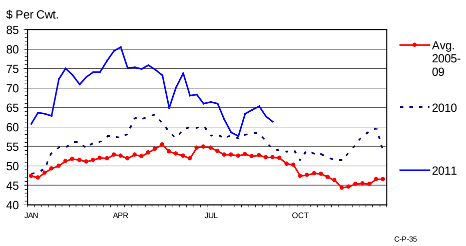
SLAUGHTER COW PRICES
Southern Plains, 85-90% Lean, Weekly



Livestock Marketing Information Center
Data Source: USDA-AMS

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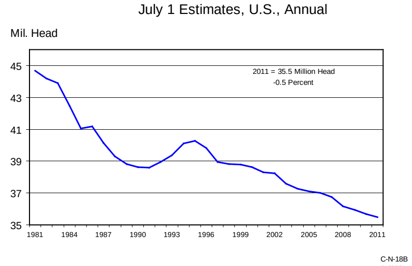
CALF CROP
July 1 Estimates, U.S., Annual



Livestock Marketing Information Center
Data Source: USDA-NASS

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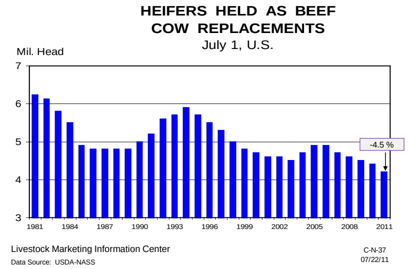
Will U.S. national herd expand by 2014???
-- who & where will expansion occur???



July 1st Canadian Inventory down 2%; <u>BUT</u> +7% in heifer retention…

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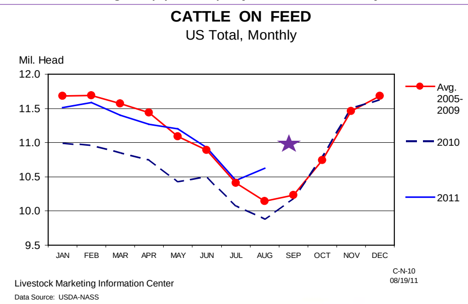
Pre-Report Estimates (Sept. 23 release):
On Feed Sept 1 (up 7.9%) {+6.1% to +9.1%}
Placed in August (up 7.7%) {+0.4% to +12.3%}



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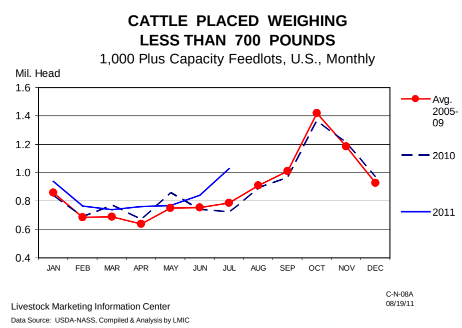

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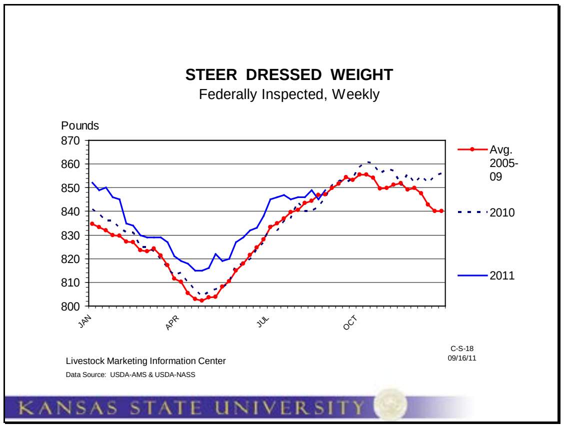
STEER DRESSED WEIGHT
Federally Inspected, Weekly
Pounds
870
860
850
840
830
820
810
800
JAN
APR
JUL
OCT
Avg. 2005-09
2010
2011
C-S-18
09/16/11
Livestock Marketing Information Center
Data Source: USDA-AMS & USDA-NASS
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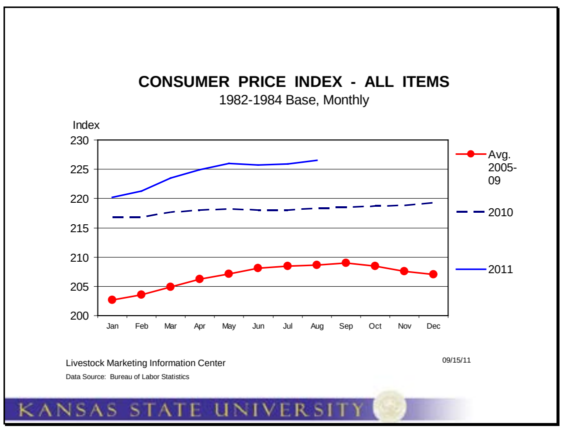
CONSUMER PRICE INDEX - ALL ITEMS
1982-1984 Base, Monthly
Index
230
225
220
215
210
205
200
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Avg. 2005-09
2010
2011
09/15/11
Livestock Marketing Information Center
Data Source: Bureau of Labor Statistics
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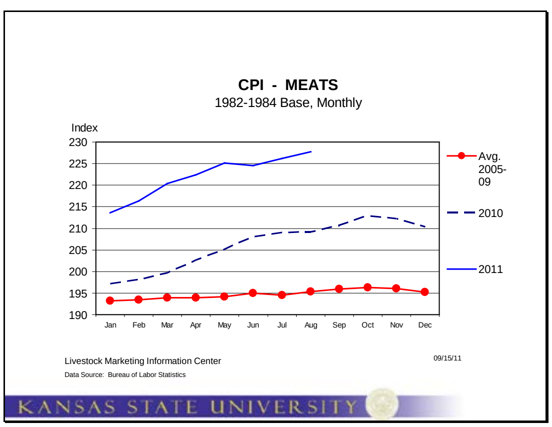
CPI - MEATS
1982-1984 Base, Monthly
Index
230
225
220
215
210
205
200
195
190
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Avg. 2005-09
2010
2011
09/15/11
Livestock Marketing Information Center
Data Source: Bureau of Labor Statistics
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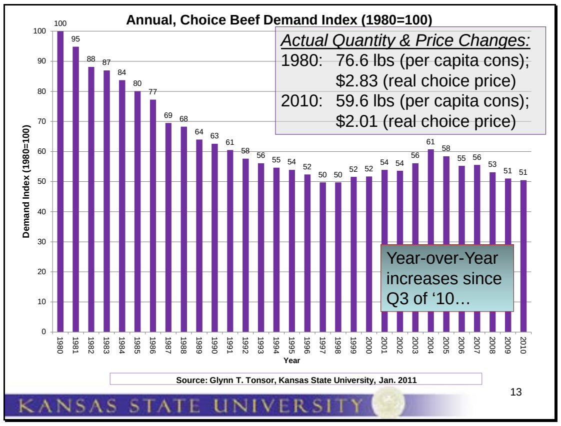
Annual, Choice Beef Demand Index (1980=100)
Actual Quantity & Price Changes:
1980: 76.6 lbs (per capita cons); $2.83 (real choice price)
2010: 59.6 lbs (per capita cons); $2.01 (real choice price)
Year-over-Year increases since Q3 of '10…
Demand Index (1980=100)
Year
Source: Glynn T. Tonsor, Kansas State University, Jan. 2011
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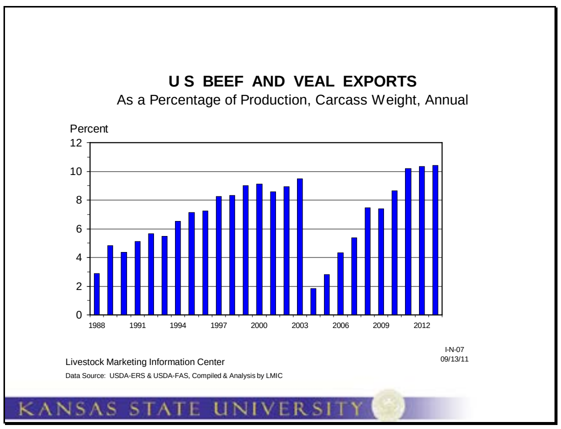
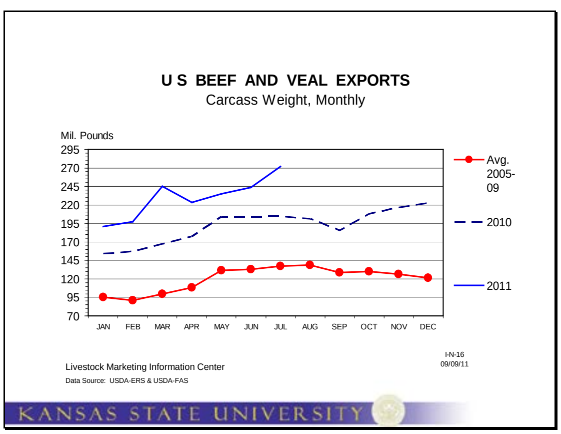

U S BEEF AND VEAL EXPORTS
As a Percentage of Production, Carcass Weight, Annual
Percent
Livestock Marketing Information Center
Data Source: USDA-ERS & USDA-FAS, Compiled & Analysis by LMIC
I-N-07
09/13/11
KANSAS STATE UNIVERSITY


U S BEEF AND VEAL EXPORTS
Carcass Weight, Monthly
Mil. Pounds
Avg. 2005-09
2010
2011
Livestock Marketing Information Center
Data Source: USDA-ERS & USDA-FAS
I-N-16
09/09/11
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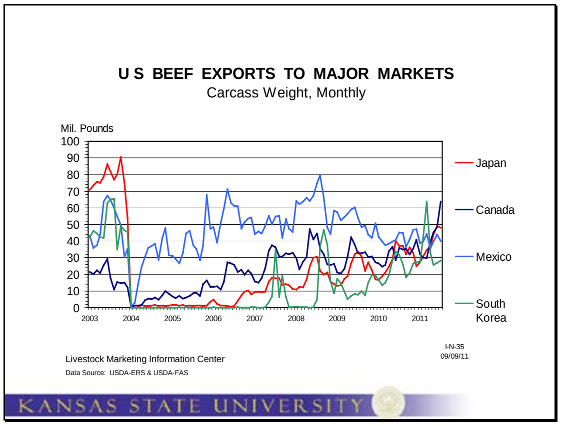
U S BEEF EXPORTS TO MAJOR MARKETS
Carcass Weight, Monthly
Mil. Pounds
100
90
80
70
60
50
40
30
20
10
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
Japan
Canada
Mexico
South Korea
I-N-35
09/09/11
Livestock Marketing Information Center
Data Source: USDA-ERS & USDA-FAS
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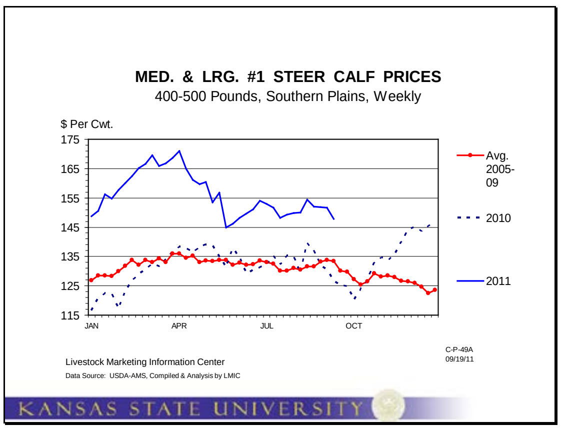
MED. & LRG. #1 STEER CALF PRICES
400-500 Pounds, Southern Plains, Weekly
$ Per Cwt.
175
165
155
145
135
125
115
JAN
APR
JUL
OCT
Avg. 2005-09
2010
2011
C-P-49A
09/19/11
Livestock Marketing Information Center
Data Source: USDA-AMS, Compiled & Analysis by LMIC
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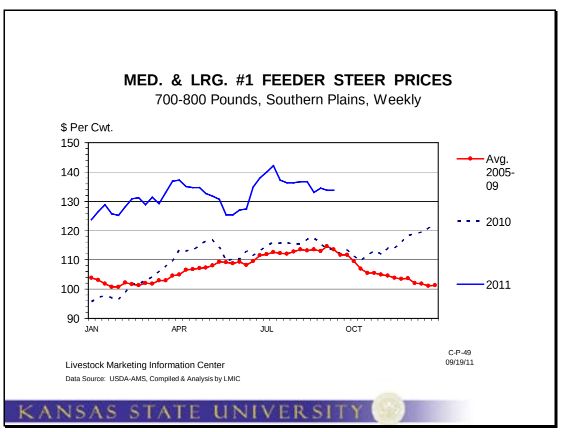
MED. & LRG. #1 FEEDER STEER PRICES
700-800 Pounds, Southern Plains, Weekly
$ Per Cwt.
150
140
130
120
110
100
90
JAN
APR
JUL
OCT
Avg. 2005-09
2010
2011
C-P-49
09/19/11
Livestock Marketing Information Center
Data Source: USDA-AMS, Compiled & Analysis by LMIC
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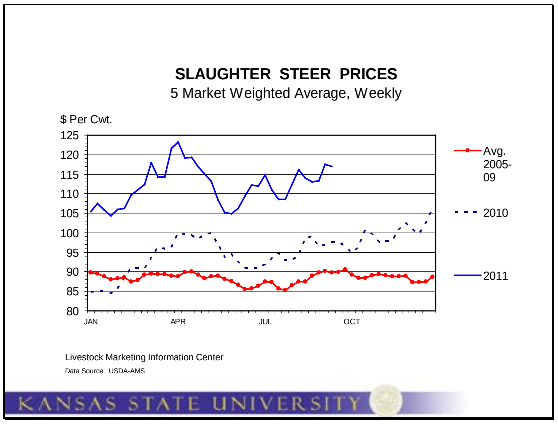
SLAUGHTER STEER PRICES
5 Market Weighted Average, Weekly
$ Per Cwt.
125
120
115
110
105
100
95
90
85
80
JAN
APR
JUL
OCT
Avg. 2005-09
2010
2011
Livestock Marketing Information Center
Data Source: USDA-AMS
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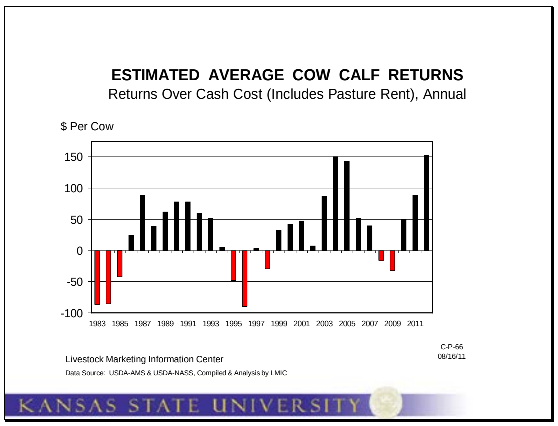
ESTIMATED AVERAGE COW CALF RETURNS
Returns Over Cash Cost (Includes Pasture Rent), Annual
$ Per Cow
150
100
50
0
-50
-100
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011
C-P-66
08/16/11
Livestock Marketing Information Center
Data Source: USDA-AMS & USDA-NASS, Compiled & Analysis by LMIC
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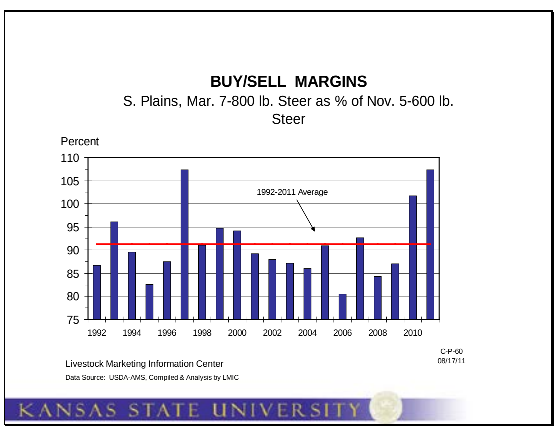
BUY/SELL MARGINS
S. Plains, Mar. 7-800 lb. Steer as % of Nov. 5-600 lb. Steer
Percent
110
105
100
95
90
85
80
75
1992-2011 Average
1992 1994 1996 1998 2000 2002 2004 2006 2008 2010
C-P-60
08/17/11
Livestock Marketing Information Center
Data Source: USDA-AMS, Compiled & Analysis by LMIC
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"Buy-Sell" spreadsheet tool
(http://www.agmanager.info/livestock/budgets/production/beef/cattlebuysell.swf)

9/21/11 Salina, KS Situation:

- Basis.com forecasted price of 800 lb steer March 1, 2012 is $137.37/cwt
  - What is break-even purchase price of a 500 lb steer purchased on October 1, 2011? – forecasted price is $165.67

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"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)	**$137.37**
Average Daily Gain (pay-to-pay)	**2.00**
Feeding cost of gain ($/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.

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"Buy-Sell" spreadsheet tool
(http://www.agmanager.info/livestock/budgets/production/beef/cattlebuysell.swf)

Purchase Weight[1]	Selling Price $131.37	$133.37	$135.37	$137.37	$139.37	$141.37	$143.37
	Breakeven Purchase Price[2]						
450	164.49	167.87	171.24	174.61	177.98	181.35	184.72
500	156.25	159.30	162.35	165.40	168.44	171.49	174.54
550	149.55	152.33	155.11	157.90	160.68	163.47	166.25
600	143.99	146.56	149.12	151.68	154.25	156.81	159.38
650	139.33	141.70	144.08	146.46	148.84	151.22	153.59
700	135.36	137.58	139.80	142.01	144.23	146.45	148.67
750	131.95	134.03	136.11	138.19	140.27	142.35	144.43

[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: $137.37/cwt:
Expected Return: -$1.35/head [5.0 *($165.40 - $165.67)]

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“Buy-Sell” spreadsheet tool
(http://www.agmanager.info/livestock/budgets/production/beef/cattlebuysell.swf)

Purchase Weight	Feeding Cost of Gain $67.50	$70.00	$72.50	$75.00	$77.50	$80.00	$82.50
	Breakeven Purchase Price[1]						
450	180.08	178.26	176.43	174.61	172.78	170.96	169.13
500	169.60	168.20	166.80	165.40	164.00	162.60	161.20
550	161.05	160.00	158.95	157.90	156.85	155.80	154.74
600	153.96	153.20	152.44	151.68	150.93	150.17	149.41
650	148.00	147.48	146.97	146.46	145.95	145.44	144.93
700	142.91	142.61	142.31	142.01	141.72	141.42	141.12
750	138.53	138.42	138.30	138.19	138.08	137.96	137.85

[1] Based on a purchase price of $137.3/cwt.

Expected Purchase Price: $165.67/cwt
Feeding COG $70 = +$12.65/head Expected Return
Feeding COG $80 = -$15.35/head Expected Return

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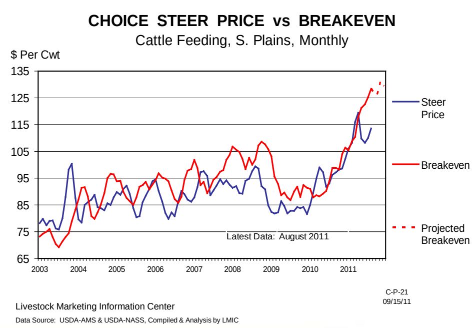

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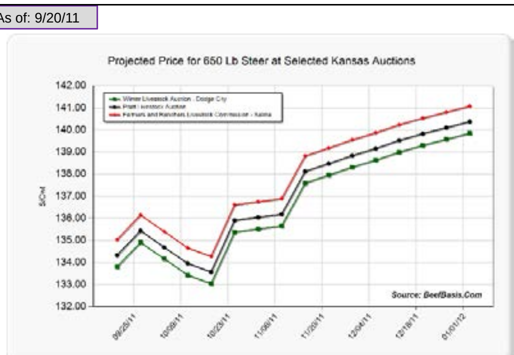
As of: 9/20/11



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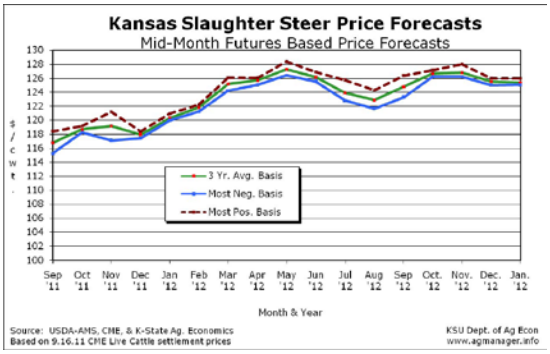

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QUARTERLY FORECASTS (LMIC: 9/20/11)

Year Quarter	Comm'l Slaughter	% Chg. from Year Ago	Average Dressed Weight	% Chg. from Year Ago	Comm'l Beef Production	% Chg. from Year Ago
2011						
I	8,317	1.9	771	0.7	6,411	2.6
II	8,639	-0.5	759	0.7	6,559	0.2
III	8,771	0.2	773	-0.1	6,778	0.1
IV	8,195	-5.3	782	0.4	6,406	-5.0
Year	33,922	-1.0	771	0.4	26,154	-0.6
2012						
I	7,934	-4.6	779	1.1	6,182	-3.6
II	8,180	-5.3	766	0.9	6,269	-4.4
III	8,182	-6.7	786	1.7	6,428	-5.2
IV	7,914	-3.4	788	0.9	6,239	-2.6
Year	32,210	-5.0	780	1.1	25,118	-4.0
2013						
I	7,483	-5.7	788	1.2	5,898	-4.6
II	7,766	-5.1	772	0.7	5,995	-4.4
III	8,116	-0.8	793	1.0	6,438	0.2
IV	7,657	-3.2	794	0.8	6,083	-2.5
Year	31,022	-3.7	787	0.9	24,414	-2.8

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QUARTERLY FORECASTS (LMIC: 9/20/11)

Year Quarter	Live Sltr. Steer Price 5-Mkt Avg	% Chg. from Year Ago	Feeder Steer Price Southern Plains 7-800#	Feeder Steer Price Southern Plains 5-600#
2011				
I	110.12	23.11	129.06	150.07
II	112.79	17.08	132.03	148.61
III	112-113	17.84	135-137	141-143
IV	115-118	16.18	130-134	136-140
Year	112-114	18.47	131-133	142-147
2012				
I	116-120	7.16	126-131	139-146
II	118-123	6.84	130-137	144-153
III	114-120	4.00	133-141	146-156
IV	117-124	3.43	128-137	141-152
Year	117-121	5.31	129-137	142-152
2013				
I	119-127	4.24	129-139	143-157
II	121-130	4.15	133-144	146-159
III	116-126	3.42	135-147	147-161
IV	119-130	3.32	131-144	143-158
Year	120-127	3.78	133-143	146-158

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Looking Beyond Today's Ps & Qs

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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…

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Beef industry changes underway…

- Expansion of stocker segment continues…
- Feedlot closeout trends:
  - Increasing final weights, ADG, & Feeding costs
  - Decreasing DOF & Feed-to-Gain
    - Overall movement to more forage based gain = opportunity for cow-calf/stockers with associated comparative advantages…

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Policy/Regulation Issues & Trends

- GIPSA “fair market” proposed rules / “anti-competition” listening sessions …
  - No timetable on USDA’s ben.-cost assessment…
- environmental regulation concerns
- WTO MCOOL ruling in fall of 2011?
- animal welfare/mandatory labeling?
  - Is overall uncertainty holding back investment throughout supply chain???

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Ending thought…

- Beef-cattle industry is facing increasing volatility and uncertainty while also being asked to do more with less…
- Increased risk may signal opportunity and higher average returns…
  - within industry variations in views and comparative advantages will determine the ability to profit and shape future of industry…

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

Glynn T. Tonsor
Assistant Professor
Dept. of Agricultural Economics
Kansas State University
gtt@agecon.ksu.edu

AG MANAGER.INFO
www.agmanager.info

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Other References of Notable Interest:

- http://www.agmanager.info/livestock/budgets/production/default.asp
  - Value of Gain (Situation and Decision Tool Overview)
  - Cattle Cycles (Historical Overview and Implications)
  - KSU-Beef Replacement (Calculate Economic Value of Purchasing Replacements)

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Notable AgManager Resources

(http://www.agmanager.info/livestock/marketing/)

- Weekly commentary & newsletters
- Current & historical price information
- Risk management/forecasting tools

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Weekly Email Distribution of AgManager Updates

- http://listserv.ksu.edu/web?SUBED1=AGMANAGERUPDATE&A=1

OR email your request to:

- Rich Llewelyn [rllewely@AGECON.KSU.EDU]

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Regular Newsletters & Commentary

- KSU Radio Interview
  - (http://www.agmanager.info/livestock/marketing/outlook/newsletters/default.asp)
  - OR (http://www.ksre.k-state.edu/news/DesktopDefault.aspx?tabid=66)
  - Weekly, released on Mondays (Tonsor, Mark, Peel, LMIC)
- "In the Cattle Markets"
  - (http://www.lmic.info/memberspublic/InTheCattleMarket/CattleMktsframe.html)
  - Weekly (Mark, Feuz, Petry, Riley/Anderson)
- Recent Cattle Finishing Returns
  - (http://www.agmanager.info/livestock/marketing/outlook/newsletters/FinishingReturns/default.asp);
  - monthly updates based on *Focus on Feedlots* newsletter

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Regular "Situation Update" Commentary: LMIC

- "Chart of the Week"
  - (http://www.lmic.info/index.shtml)
- "Weekly Price & Production Summary"
  - (http://www.lmic.info/priprod/pandp.html)
- "Quick Market Reports"
  - (http://www.lmic.info/quick/quickdr.html)

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Current Price & Basis Information

- Futures Markets
  - (http://www.cmegroup.com/trading/commodities/) OR (http://www.agmanager.info/livestock/marketing/futures/default.asp)
  - LC, FC, LH & C, SB, S, W
- Cash Markets
  - http://www.agmanager.info/livestock/marketing/graphs/default.asp#Price Charts
  - http://www.agmanager.info/livestock/marketing/database/default.asp#Cattle and Beef Databases
    - Dodge City, Pratt, & Salina 700-800 lb steer; KS Direct Slaughter steer prices
- Basis (Cash - Futures) Information
  - http://www.agmanager.info/livestock/marketing/graphs/default.asp#Basis Charts
  - BeefBasis.com (http://www.beefbasis.com/)

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Risk Management and Return Forecasting Tools Available:

- Feeder Cattle Sales Risk Management Tool,
  - Compare expected sales prices of alternative FC marketing strategies
  - (http://www.agmanager.info/livestock/marketing/LRP/default.asp)
- Feedlot Profitability Tool: NAIBER's Feeding Risk Analyzer
  - Forecasts feedlot returns and variability in returns for future placements
  - (http://www.naiber.org/cattleriskanalyzer/)
- BeefBasis.com
  - Decision support for hedging feeder cattle (output for cow-calf; input for feedlots)
  - (http://www.beefbasis.com/Home/tabid/53/Default.aspx)

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Other References of Interest:

- March '11 ERS Report on Cow-Calf Industry
  - http://www.ers.usda.gov/publications/eib73/
- Beef Demand Information
  - Journal articles, fact sheet, annual & quarterly demand indices
  - http://www.agmanager.info/livestock/marketing/Beef%20Demand/default.asp
- Animal Well-Being Information
  - Journal articles, fact sheets, and short video summaries
  - http://www.agmanager.info/livestock/marketing/AnimalWelfare/default.asp
- Animal Identification & Traceability Information
  - Journal articles, fact sheets, and short video summaries
  - http://www.agmanager.info/livestock/marketing/AnimalID/default.asp

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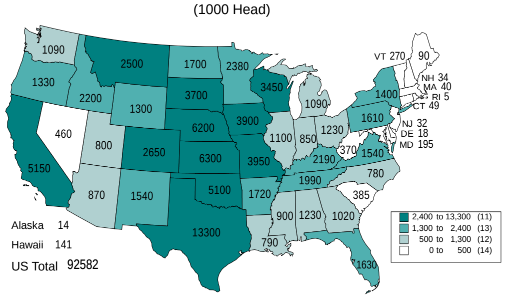
TOTAL CATTLE NUMBERS JANUARY 1, 2011
(1000 Head)



Livestock Marketing Information Center
Data Source: USDA/NASS

C-N-23
01/28/11

45

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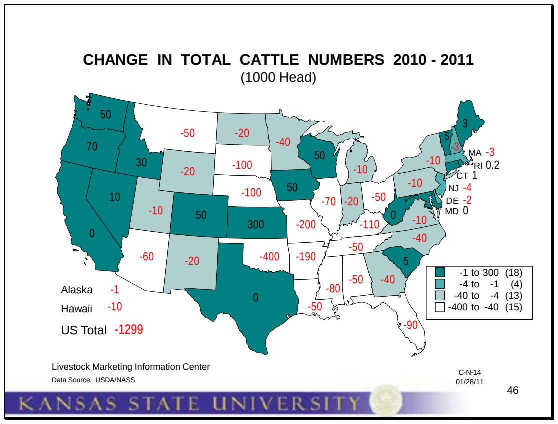
CHANGE IN TOTAL CATTLE NUMBERS 2010 - 2011
(1000 Head)
Alaska -1
Hawaii -10
US Total -1299
-1 to 300 (18)
-4 to -1 (4)
-40 to -4 (13)
-400 to -40 (15)
Livestock Marketing Information Center
Data Source: USDA/NASS
C-N-14
01/28/11
46
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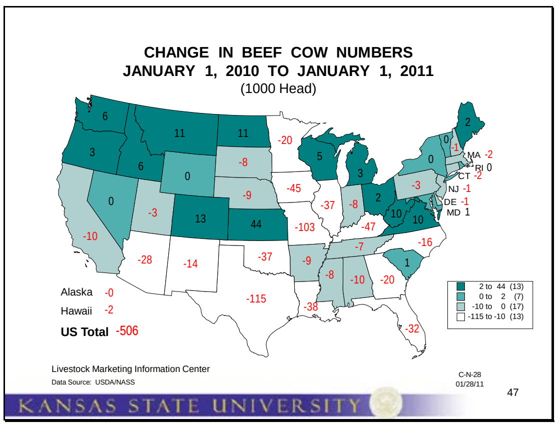
CHANGE IN BEEF COW NUMBERS
JANUARY 1, 2010 TO JANUARY 1, 2011
(1000 Head)
Alaska -0
Hawaii -2
US Total -506
2 to 44 (13)
0 to 2 (7)
-10 to 0 (17)
-115 to -10 (13)
Livestock Marketing Information Center
Data Source: USDA/NASS
C-N-28
01/28/11
47
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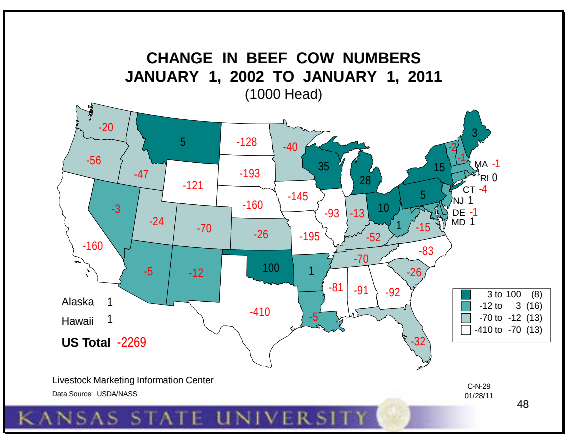
CHANGE IN BEEF COW NUMBERS
JANUARY 1, 2002 TO JANUARY 1, 2011
(1000 Head)
Alaska 1
Hawaii 1
US Total -2269
3 to 100 (8)
-12 to 3 (16)
-70 to -12 (13)
-410 to -70 (13)
Livestock Marketing Information Center
Data Source: USDA/NASS
C-N-29
01/28/11
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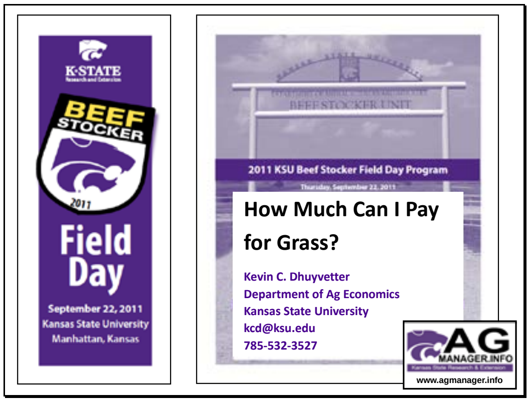
Notes – Notes -- Notes

How Much Can I Pay for Grass?

Dr. Kevin Dhuyvetter
Kansas State University



Everything is in the words we use…

Which of the following questions are we trying to answer?

- How much ***can I pay*** for grass?
- How much ***do I have to pay*** for grass?
- How much is grass ***worth***?
- How much ***should I pay*** for grass?

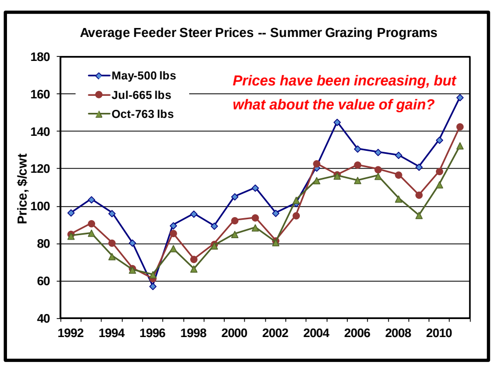
Different ways of determining rental rates…

- How much ***can I pay*** for grass?
  - Estimated based on value of gain and non-pasture cost of gain in two different summer grazing programs
  - Short-season (SS)
    - 75 days (May 1 to Jul 15)
    - ADG = 2.2 lbs (total gain of 165 lbs/head)
  - Full-season (FS)
    - 150 days (May 1 to Oct 1)
    - ADG = 1.75 lbs (total gain of 262.5 lbs/head)

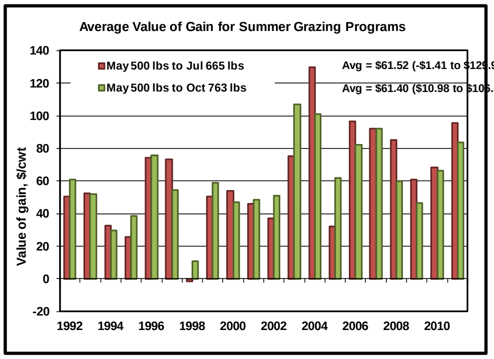
How much ***can I pay*** for grass? -- Value of gain

Monthly average prices from 1992-2011 (forecasted several months with www.BeefBasis.com)

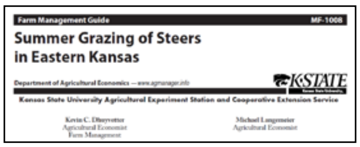
How much ***can I pay*** for grass? -- Value of gain



How much *can I pay* for grass? -- Value of gain

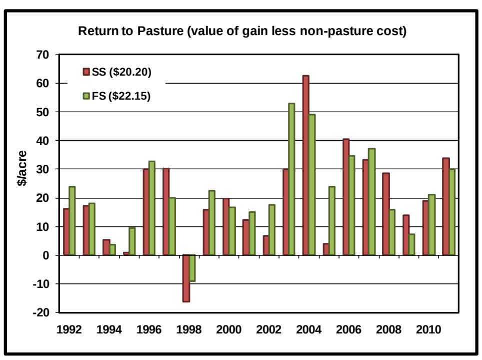


How much *can I pay* for grass? -- Cost of gain

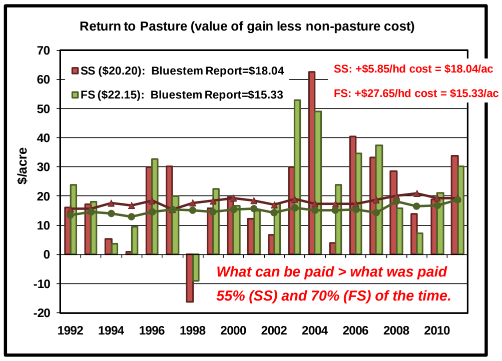


- Non-pasture costs based on historical projected budgets (total costs included)
  - Short-season (SS)
    - Per head: Average = $46.83 ($35.45 to $66.20)
    - Per cwt: Average = $28.38 ($21.48 to $40.12)
  - Full-season (FS)
    - Per head: Average = $71.42 ($56.07 to $97.45)
    - Per cwt: Average = $27.21 ($21.36 to $37.12)

How much *can I pay* for grass?



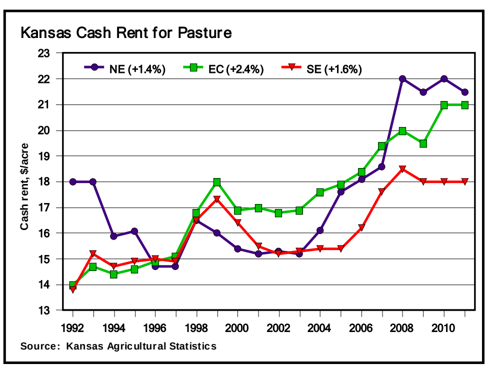
How much *can I pay* for grass?



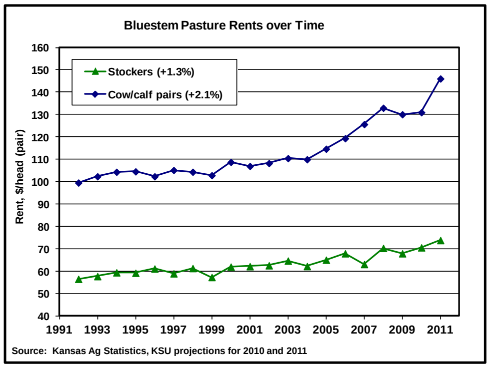
Different ways of determining rental rates…

- How much ***do I have to pay*** for grass?
  - Only “need” to pay what it takes to get the land rented (what are others in the area paying?)
  - Average rental rates reported by USDA/KAS
    - CRD / County-level (1972-2011)
    - Bluestem pasture report (1978-2009)
  - Potential problems with reported averages
    - Do the averages reflect your situation?
    - Many reasons rates should vary from what others are paying
    - Averages are likely biased relative to market for “new” land
  - $/ac rates have little meaning (use for indexing?)

How much *do I have to pay* for grass?



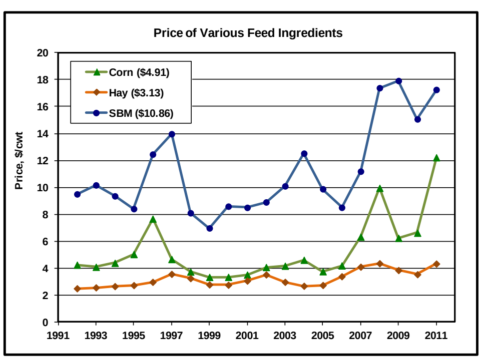
How much *do I have to pay* for grass?



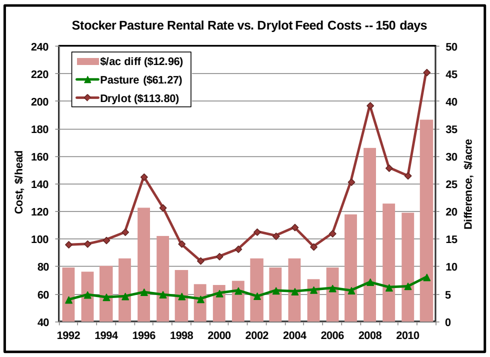
Different ways of determining rental rates…

- How much is grass ***worth***?
  - Calculated based on cost of gain from drylot program
  - SS/FS stocker programs versus drylot gain
    - SS daily feed: 5 lbs hay, 8.65 lbs corn, 1.7 lbs sbm
    - FS daily feed: 8 lbs hay, 7.25 lbs corn, 1.4 lbs sbm
  - Cow-calf (spring calving) versus drylot
    - Daily feed: 26 lbs hay, 2.0 lbs corn, 1.0 lb sbm
  - Monthly average prices for May-Oct
    - Difference vs Bluestem rental rate -- $/hd, $/ac, %

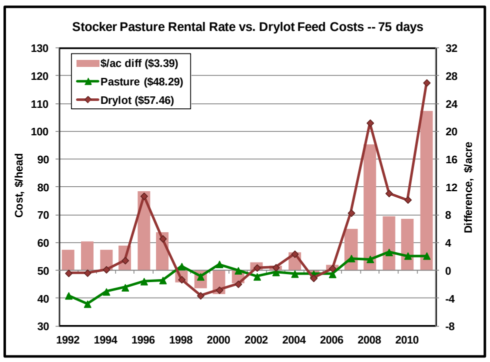
Prices of other feedstuffs are up significantly…



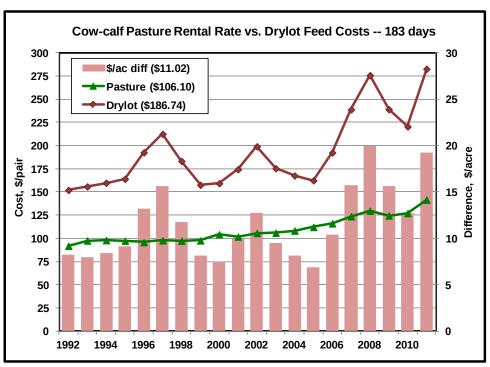
How much is grass *worth*?



How much is grass *worth*?



How much is grass *worth*?



Different ways of determining rental rates…

- How much ***should I pay*** for grass?
  - Very normative question, thus there is not a “right” answer to this question.
  - However, if your rent has not changed for 5, 10, or 20+ years, likely you *should* be paying more than you are…

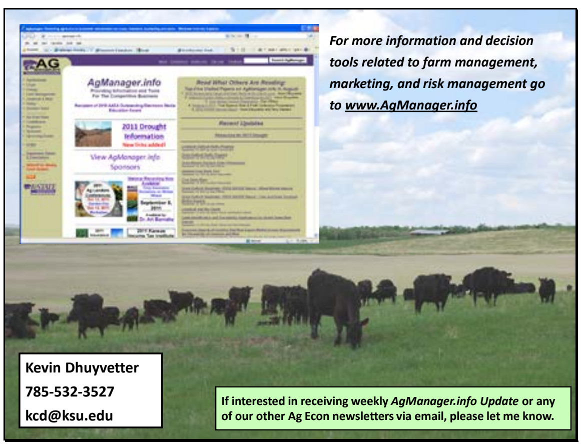
Summary…

- How much *can I pay* for grass and what is grass *worth*?

Difference between what could be paid for grass and what grass is worth compared to Bluestem Report rate
(all values are $/acre)

	Value of Gain		Alternative Feedstuffs		
Time period	SS	FS	SS	FS	Cow-calf
1992-96	-$2.93	$3.68	$5.00	$12.26	$9.38
1997-01	-$5.52	-$2.21	-$0.79	$9.18	$10.60
2002-06	$11.05	$20.40	$0.94	$10.05	$9.52
2007-11	$6.03	$5.42	$12.47	$25.79	$16.65
1992-11	$2.16	$6.82	$3.39	$12.96	$11.02

- While values vary, hard to argue that pasture rates won’t be increasing in the future…



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

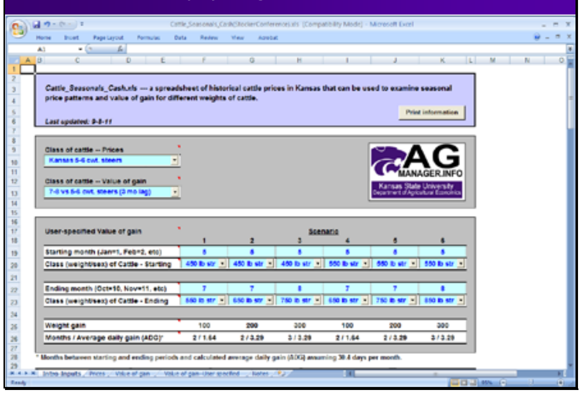
Kevin Dhuyvetter
785-532-3527
kcd@ksu.edu

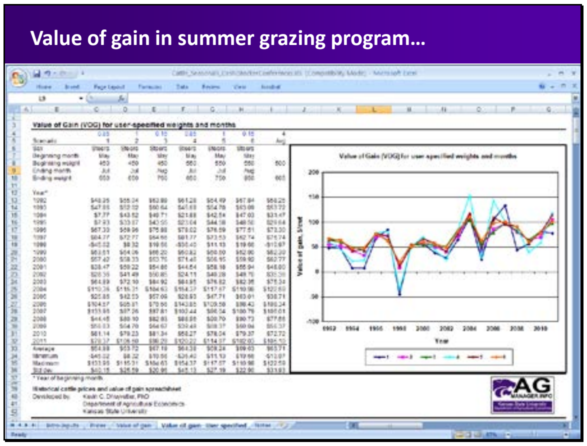
If interested in receiving weekly *AgManager.info Update* or any of our other Ag Econ newsletters via email, please let me know.

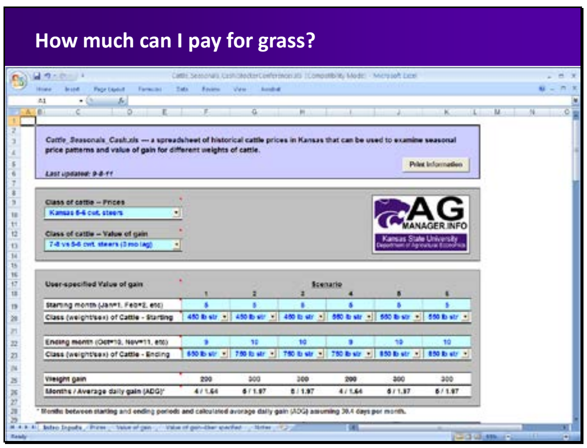
Different ways of determining rental rates…

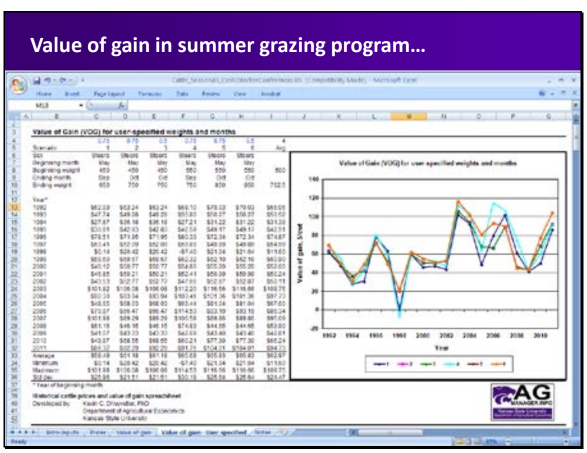
- How much ***can I pay*** for grass?
  - Estimated based on value of gain/expected value of gain in a summer grazing program
- How much ***do I have to pay*** for grass?
  - What are others paying (i.e., publicly reported rates)
- How much is grass ***worth***?
  - Calculated based on cost of gain from drylot program
- How much ***should I pay*** for grass?

How much can I pay for grass?




Value of gain in summer grazing program…

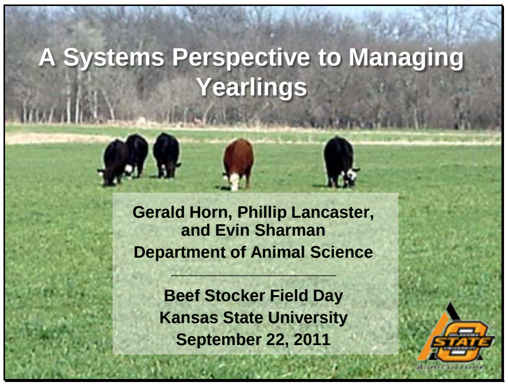

How much can I pay for grass?


Value of gain in summer grazing program…

Notes – Notes -- Notes

A Systems Perspective to Managing Yearlings

Dr. Gerald Horn
Oklahoma State University

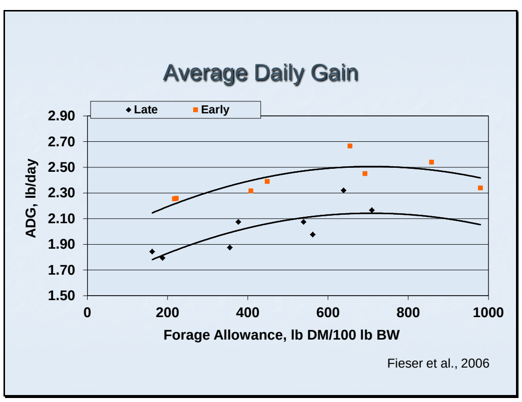


Initial Stocking Rate, Standing Crop, Forage Allowance for "Control" Steers. (Means for recent years at Marshall)

- Placement Date: November 7 – 14
- Initial Standing crop, lb DM/acre: 1100
- Stocking Rate, 1.8 acres/steer *or* 0.56 steers/acre).
  310 lb of cattle/acre
- 350 lb of forage DM/ 100-lb steer body wt.
- Steer wt gain (fall-winter): 2.35 lb/day


11-5-04; 1345 lb DM/acre


11-10-05
552 lb DM/acre


Average Daily Gain
Late
Early
ADG, lb/day
2.90
2.70
2.50
2.30
2.10
1.90
1.70
1.50
0
200
400
600
800
1000
Forage Allowance, lb DM/100 lb BW
Fieser et al., 2006

Grazing cattle on wheat pasture is a production risk management practice!

Producer owns wheat pasture and cattle (112 d grazing):

- Wt gain = 2.20 lb/d @ $0.55/lb = $139/steer
- Stocking rate at 1.8 acres/steer
- Profit/steer = $126
- Returns to wheat & cattle = $265 or $147/acre.

Farmer who owns wheat pasture:

- Wt gain = 2.20 lb/d @ $0.55/lb = $139/steer
- Stocking rate at 1.8 acres/steer
- Profit/steer = N/A
- Returns to wheat = $77/acre.

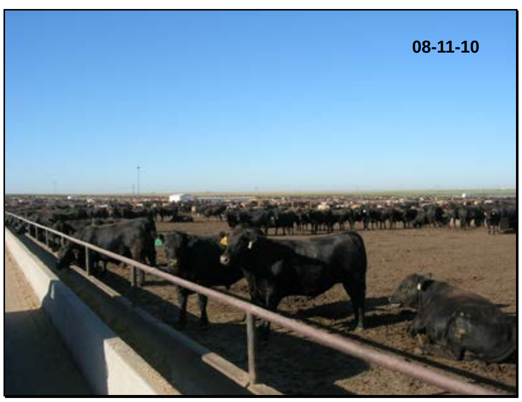
Bellwether Management Practices for Growing Cattle on Pasture . . .

I. Implants . . .

- Deliver growth-promoting, anabolic compounds
  - Increase ADG
  - Increase protein deposition and decrease fat deposition
    - Shifts growth curve to the right
    - Increases nitrogen retention
- Provide the greatest return per $ invested of any management practice

Recent Implant Studies on Wheat Pasture

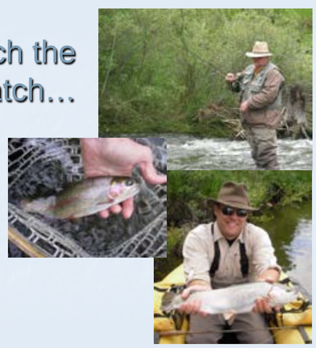
		ADG, LB			
		Control	Component E-S w/Tylan	Component TE-G w/Tylan	Revalor-G
Horn et al., 2006-07	**Steers;** 89 days	2.37^{a}	2.70^{b} +0.33 (15%)		2.64^{b} +0.27 (11%)
Sharman et al., 2009-10	**Steers;** 111 days	2.10		2.42 +0.31 (15%)	



Effects of implanting on wheat pasture on carcass value

- Carcass weight increased 33 lb.
- REA tended to be increased
- Did not affect marbling score
- Did not change distribution of carcass quality grades

Match the Hatch…



Bellwether Management Practices for Growing Cattle on Pasture (con't)

II. Strive to get an efficacious dosage of an ionophore into your cattle.

Treatments:

- Negative control (**NC**) - - Wheat pasture; no supplement .
- Mineral mixture without monensin (**MIN**)
- Mineral mixture with 1620 grams/ton of monensin (**RMIN**)

Mineral Mixture Intake[1] (as-fed lb/steer/day)

Year	MIN[2]	RMIN[2]	Monensin[3]
2000-01[4]	0.47 ± 0.11	0.10 ± 0.02	83 ± 17
2001-02[4]	0.52 ± 0.13	0.15 ± 0.02	125 ± 16
2004-05[5]	0.43 ± 0.03	0.16 ± 0.03	129 ± 22
2005-06[5]	0.40 ± 0.06	0.18 ± 0.02	148 ± 18
Combined	0.46 ± 0.10	0.15 ± 0.04	121 ± 29

[1]raw means ± SD
[2]MIN = non-medicated, free choice mineral mixture; RMIN = free-choice mineral mixture with 1,620 mg monensin/lb.
[3]Monensin intake from RMIN, $mg \cdot steer^{-1} \cdot d^{-1}$.
[4]Gibson (2002).
[5]Fieser et al. (2007).
*$P \leq 0.05$.

ADG[1] (lb/steer/day)

Year	NC[2]	MIN[2]	RMIN[2]	SEM[3]	P-value[4]
2000-01[5]	0.69[b]	0.91[ab]	1.20[a]	0.132	0.04
2001-02[5]	2.40[c]	2.59[b]	2.71[a]	0.026	< 0.01
2004-05[6]	1.23	1.31	1.66	0.186	0.09
2005-06[6]	1.91[b]	2.39[a]	2.54[a]	0.095	0.01
Combined	1.56[c]	1.80[b]	2.03[a]	0.382	< 0.01

[1]lsmeans by treatment for each year and combined.
[2]NC = negative control; MIN = non-medicated, free choice mineral; RMIN = free-choice mineral mixture with 1,620 mg monensin/lb.
[3]n = 12 for Gibson, 2002; n = 10 for Fieser et al., 2007.
[4]Observed significance level for the main effect of treatment.
[5]calculated from data of Gibson, 2002.
[6]calculated from data of Fieser et al., 2007.
[a,b,c]Means within a row with different superscripts differ ($P < 0.05$).

Feeding R-1620 Mineral Mixtures to Stocker Cattle on Wheat Pasture **(Will it pay?)**

- Cost/ton is HIGH. $980/ton
- Consumption/cost per animal is low.
  0.15 lb/day x 110 days x $0.49/lb =
  $8.09/steer
- ADG response: + 0.45 lb as compared with "negative control"
- Gross return/steer: + $35.47 (+ 49.5 lb of added gain x $ 0.88/lb value of gain) minus $8.09).

- Grazing treatments:
  1. High Gain Wheat (HGW; 2.67 lb/d)
  2. Low Gain Wheat (LGW; 1.34 lb/d)
  3. Native Range (NR; 0.33 lb/d supplemented with 2.0 lb/d of 41% CP supplement)

Hersom et al., 2004

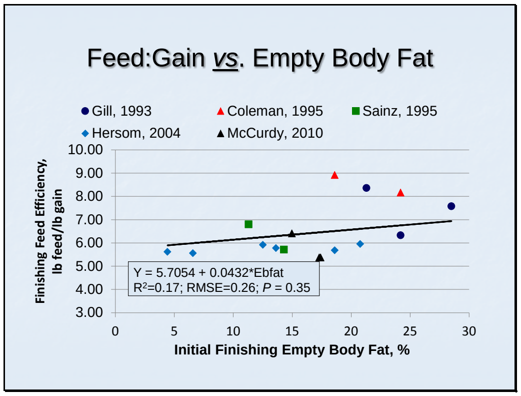
Carcasses at end of winter grazing

HGW, 20.5% fat

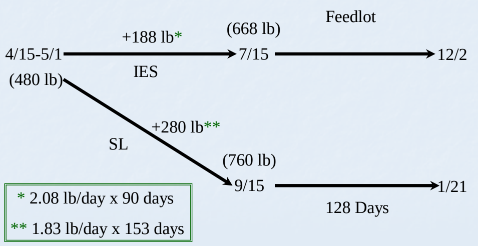
LGW, 13.6% fat

NR, 6.1% fat

- Differences in ADG during winter grazing and initial empty body/carcass fat did not affect rate of empty BW gain or gain efficiency during finishing.
- Contrary to industry dogma and Level 1 model of Beef Cattle NRC


Feed:Gain vs. Empty Body Fat
Gill, 1993
Coleman, 1995
Sainz, 1995
Hersom, 2004
McCurdy, 2010
Finishing Feed Efficiency, lb feed/lb gain
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
Y = 5.7054 + 0.0432*Ebfat
R²=0.17; RMSE=0.26; P = 0.35
0
5
10
15
20
25
30
Initial Finishing Empty Body Fat, %

Intensive Early Stocking (IES) *vs.* Season-Long Summer Stocker Programs



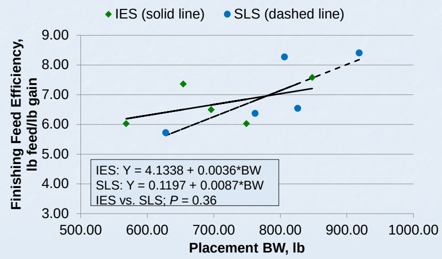
Stocker Performance (IES *vs.* SLS Grazing Management)

Item	IES	SLS
No. Steers	267	266
No. Treatment means	5	5
Stocker performance		
Winter phase		
Length, d	161	
Total gain, lb	84	
ADG, lb/d	0.52	
Summer phase		
Length, d	72	142
Total gain, lb	115	208
ADG, lb/d	1.57	1.47

Finishing Performance (IES *vs.* SLS Grazing Management)

	IES	SLS	SEM	P-value
Days on feed, d	147	132	10	0.14
Initial BW, lb	703	788	47.1	0.01
Final BW, lb	1201	1228	15.6	0.25
ADG, lb/d	3.52	3.39	0.22	0.32
DMI, lb/d	23.46	23.48	0.90	0.98
DMI, % BW	2.46	2.33	0.07	0.03
F:G, lb/lb	6.68	7.03	0.44	0.21

Feed:Gain *vs*. Placement Weight



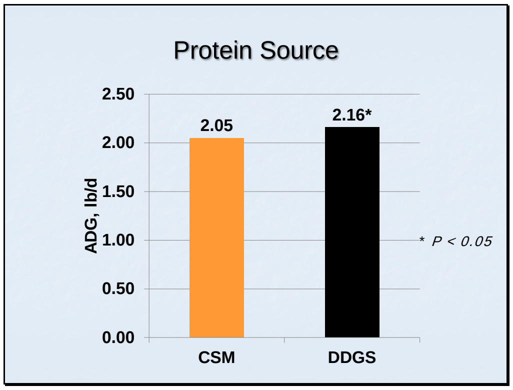
Oklahoma Gold Supplementation Program

- 38 – 41% CP all-natural suppl.
- Feeding rate: 1 lb/day or 2 lb every other day
- Mean response (7-trial summary)[a]:
  - Daily gain: + 0.38 ± lb
  - With monensin[b]: + additional 0.15 – 0.20 lb = 0.53 – 0.58 gain response
  - Supplement Conversion: 1/.53 = 1.9 lb per lb of increased weight gain per head

[a]Lalman, 2008; [b]Lusby et al, 1984 and McCollum et al., 1988.

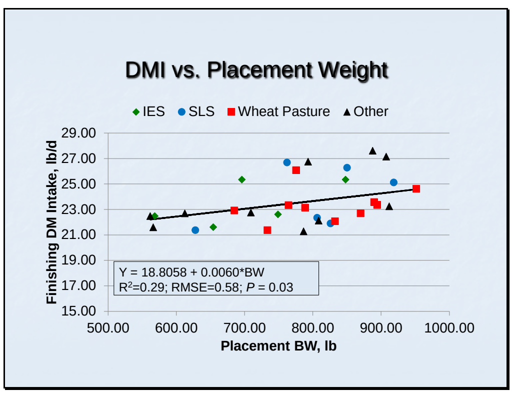
Supplements

	Supplement	
Ingredients, %DM	CSM	DDGS
CSM	55.70	31.49
DDGS	-	61.11
Wheat Middlings	37.74	-

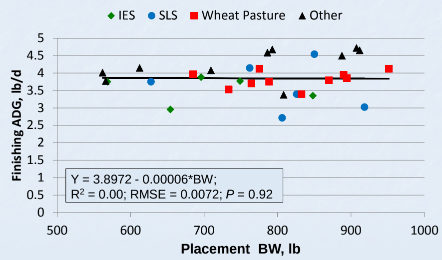


Regression of feedlot performance (ADG, DMI, F:G) on stocker period characteristics

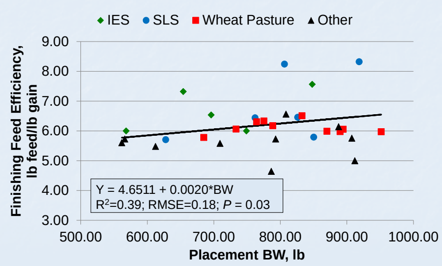
- Dataset of yearling production systems that differed for one or more of the following:
  - ADG during stocker period
  - Length (days) of stocker period
  - Total BW gain during stocker period
  - Feedlot placement BW
- 12 studies, 31 treatment means, 1022 steers
- Regression analysis conducted between finishing performance and stocker period characteristics



ADG vs. Placement Weight



Feed:Gain *vs*. Placement Weight



Summary

Growing cattle to heavier weights on grass . . .

- Decreases BE selling price of cattle (“cheapens cattle back”) prior to feedlot placement
- Increases final live and carcass weights
- Feed DM:Gain inceased 0.20 lb per 100 lb increase in placement wt.
- Mother nature doesn’t give us many “free lunches”!
- Many options
- Challenge is finding the “ever changing” optimums.

General Comments

- Cost of weight gain by cattle on grass is higher and will continue to increase.
  - All input costs (fuel, fertilizer, feed, trucking, etc) for the stocker/feeder operator have increased.
- The beef cattle industry must embrace every proven "efficiency improving technology" to:
  - Increase cost competitiveness of the industry as a whole
  - Meet the increasing global demand for animal protein

A Systems Perspective to Managing Yearlings in the Southern Great Plains

G. W. Horn, P. A. Lancaster, D. L. Lalman and C. R. Krehbiel
Department of Animal Science
Oklahoma State University, Stillwater

Introduction

The price of feed grains has dramatically increased in recent years because of increased demand for export markets and ethanol production. Corn grain in the southern Great Plains is costing $7.85/bu (TCFA Market Report; September 16, 2011) and cost of finishing diets is upwards of $350/ton (DM basis). Feed costs of this magnitude are not economically sustainable for the beef industry and utilization of less expensive ethanol co-products in finishing rations has limitations. Part of the solution to this problem will be to take advantage of the unique ability of beef cattle to utilize forages to grow them to heavier weights prior to placing them on feed. However, a myriad of stocker production systems exist and the influence of previous grazing systems on subsequent feedlot performance is not completely understood. Therefore, the objective of this paper was to evaluate the effect of stocker production systems in the Southern Great Plains on subsequent feedlot performance and carcass characteristics of finished cattle.

Methods

Studies were obtained from the literature evaluating feedlot performance and carcass characteristics of steers from Southern Great Plains growing/finishing beef cattle production systems. Datasets were compiled using treatment means to compare calf-fed vs. yearling production systems, winter wheat pasture vs. winter/summer tallgrass native range stocker production systems or stocker production systems using intensive early stocking (**IES**) vs. season-long stocking (**SLS**) management on summer pasture. A fourth dataset consisted of treatment means of yearling production systems from the above studies plus 5 additional studies, and was used to evaluate the relationship between performance during finishing and characteristics of the stocker period. Characteristics of the stocker period included length of the stocker period from weaning in the fall to feedlot placement, total BW gain during the stocker period, rate of gain during the stocker period, and placement BW. Start dates for the stocker period and winter performance were not available for 6 of the 31 treatment means (3 studies comparing IES and SLS systems), thus length of the stocker period was estimated from December 1 and rate of gain during the winter portion of the stocker period was estimated at 0.50 lb/day for these observations based on previous studies of steers grazing dry winter forage (Gill et al., 1991; Choat et al., 2003; Hersom et al., 2004a; Sharman et al., 2010; Sharman et al., 2011).

Regression of finishing performance traits (ADG, DMI, feed:gain) on stocker period characteristics was conducted using a mixed model (SAS Inst. Inc.) with study and study × independent variable interactions as random effects. A fifth dataset consisted of treatment means of growing programs (drylot or pastured) that included estimates of empty body fat at start of the finishing phase. Data were compiled from 6 studies that included Gill et al. (1993a,c), experiments 1 and 2 of Hersom et al. (2004a), McCurdy et al. (2010a), Coleman et al.(1995a, b) and Sainz et al., 1995. This dataset was used to evaluate the relationship between performance during finishing and initial finishing empty body fat. Regression of finishing performance traits (ADG, DMI, feed:gain) on initial finishing empty body fat was performed as described above. The quadratic term was evaluated in all regression models (stocker period characteristics and initial empty body fat) and was observed to be not significant ($P > 0.15$) in all cases. Details of studies included in each of the datasets and the statistical analyses are included in the paper of Lancaster et al., 2011.

Results and Discussion

Comparison of Growing/Finishing Systems

Wheat Pasture vs. Native Range. Data for steers previously grazing winter wheat pasture vs. winter/summer tallgrass native range are presented in Table 1. Average daily gain during finishing was similar between wheat pasture and native range steers, but numerically wheat pasture steers gained 0.3 lb/day less. Wheat pasture steers consumed less ($P < 0.05$) feed than native range steers, such that feed efficiency was similar. Carcass weight, ribeye area, and yield grade were similar between wheat pasture and native range steers, but native range steers had greater ($P < 0.05$) marbling scores than wheat pasture steers. Inconsistent results were reported among individual studies for ADG, DMI and feed:gain. Sharman et al. (2010) reported no differences in ADG, DMI, or feed:gain between steers previously grazing wheat pasture or native range. However, Gill et al. (1993a) reported that steers previously grazing wheat pasture had greater ADG and lower feed:gain, but similar DMI compared with steers previously grazing native range. Sharman et al. (2011) observed that steers previously grazing native range had greater ADG and DMI, but similar feed:gain compared with steers previously grazing wheat pasture. In contrast to the finishing performance data, results for carcass weight, REA, marbling score, and yield grade were consistent among individual studies; carcass characteristics were similar between steers that previously grazed wheat pasture or winter/summer tallgrass native range. However, in 2 of the 3 studies native range steers had numerically greater marbling scores than wheat pasture steers resulting in significantly greater marbling scores in our analysis.

Managing Cattle on Wheat. Some key management practices for growing cattle on wheat pasture include (1) stocking rate, (2) planting date and wheat variety selection, and (3) use of various supplementation strategies. In any grazing program stocking rate is the “holy grail” of cattle performance. Winter wheat forage mass typically varies tremendously both within and among years. Using non-linear regression procedures to fit quadratic models with a plateau function, plateaus for diet organic matter disappearance, forage intake, and estimated daily gain were achieved at forage allowances between 20 to 24 kg DM/100 kg BW/day, and decreased markedly at herbage allowances below this range (Redmon et al., 1995). Similarly, Pinchak et al. (1996) reported that ADG of steers grazing wheat pasture increased as forage allowance increased up to 27.3 kg DM/100 kg BW/day. Further increases in forage allowance had little effect on ADG. While these 2 studies are in good agreement, forage allowance expressed as kg DM/100 kg BW/day is not a “user friendly” observable management variable. In a planting date by stocking rate study, Fieser et al. (2006) reported that ADG, total steer gain, and grain yield all responded in a quadratic ($P \leq 0.06$) manner and peaked around a forage allowance of 700 kg DM/100 kg BW.

Length of the grazing period and total weight gain by cattle on dual-purpose wheat are greatly influenced by the combination of planting date and variety selection. Fieser et al. (2006) reported that all cattle performance measures were greater ($P \leq 0.01$ for early- [September 4] than late-planted [September 25] wheat). Early planting provided 24 more grazing days than late planting (120 *vs*. 96 days). Averaged across all stocking rates, weight gain/steer and gain/acre were increased 95 and 55 lb, respectively, by early planting whereas grain yield was decreased 8 bu/acre. Edwards et al. (2011) summarized 11 years of Oklahoma data comparing wheat grain yield from dual-purpose and grain-only systems. The dual-purpose system had an inherent yield disadvantage of 3.5 bu/acre that was primarily attributed to early planting. After adjustment for the early planting penalty, wheat yield in the dual-purpose system was approximately 93% of that in the grain-only system. The data indicate that once the decision is made to plant early and implement the dual-purpose system, the impact of grazing on grain yield is minimal. In studies reported by Horn et al. (1996) and Paisley (1998a) stocking rate had a much greater effect on total gain per steer and gain/acre than wheat variety. We have not conducted recent variety by stocking rate grazing trials. Date of first hollow stem can differ by as little as 14 days and as much as 21 days among hard winter wheat varieties in the southern Great Plains. Length of the grazing period for dual-purpose enterprises can be increased by selecting varieties that are later maturing with respect to when they reach first hollow stem.

Horn et al. (2005) and Horn (2006) reviewed several supplementation strategies for growing cattle on wheat pasture. One is a small-package monensin-containing energy supplement designed to provide (1) additional degradable OM relative to the excess degradable N in wheat forage and increase non-ammonia nitrogen supply per unit of ME, and (2) monensin to improve the economics of the supplementation program and to decrease bloat (Branine and Galyean, 1990; Paisley et al., 1998a,b). Feeding rate is 2 lb/head/day or 4 lb every other day, and ADG was increased by 0.44 ± 0.16 lb/day (7 trial summary) with a mean supplement conversion (lb of supplement per lb of increased weight gain) of 4.83 ± 1.22. In all trials control cattle had free-choice access to a non-medicated high-calcium mineral mixture. Analysis of the data using a normal probability distribution function shows that the probability of obtaining at least a 0.35 or 0.40 lb/day improvement in ADG is 71% and 60%, respectively.

Because of the added cost of hand feeding on pasture, Gibson (2002), Horn et al. (2002), and Fieser et al. (2007) evaluated the use of monensin-containing mineral mixtures ("R1620") on intake and weight gain of wheat pasture stocker cattle. In each of 4 trials (i.e., 4 years), three common treatments were: (1) negative control (**NC**), no mineral or any other supplement; (2) free-choice non-medicated mineral (**MIN**); (3) free-choice, medicated mineral containing 1,620 g monensin/ton (**RMIN**). Mean daily intakes of the MIN, RMIN mineral mixtures, and monensin over the 4 trials were 0.46 ± 0.19 lb, 0.15 ± 0.07 lb and 121 ± 29 mg/head. The RMIN increased ADG ($P < 0.01$) by 0.23 lb/day compared with MIN and by 0.47 lb/day compared with the NC. The probability of obtaining at least a 0.40 or 0.45 lb/day improvement in ADG due to providing RMIN was 70% and 54%, respectively.

Intensive Early vs. Season-Long Stocking. Steers grazing summer pasture using season-long stocking management entered the feedlot at heavier BW compared with steers under intensive early stocking management (Table 2). Average daily gain, DMI, and feed:gain were similar between summer pasture production systems. Carcass weight, REA, marbling score, and yield grade were also similar between intensive early stocking and season-long stocking systems. Results of finishing ADG among individual studies were inconsistent. Brandt et al. (1995) and Gill et al. (1993a) reported that IES steers had greater ADG compared with SLS steers, but Gill et al. (1991), Gunter and Phillips (2001), and Bodine et al. (2002) observed no difference in ADG. Although all studies consistently reported no difference in DMI between IES and SLS steers. Similar to ADG, results of feed:gain were inconsistent among individual studies. Brandt et al. (1995) and Bodine et al. (2002) observed that IES steers had lower feed:gain compared with SLS steers, but Gill et al. (1991) and Gill et al. (1993a) observed that feed:gain was similar. Only Brandt et al. (1995) reported a difference in carcass weight with SLS steers having greater carcass weight than IES steers. Consistent among individual studies, no differences in marbling score or yield grade were observed between steers under intensive early stocking or season-long stocking systems.

"Oklahoma Gold" Supplementation Program. The "Oklahoma Gold" supplementation program was developed to meet the degradable intake protein (DIP) deficiency, during mid- to late-summer, of stocker cattle grazing tallgrass native range under season-long grazing management. The 38-41%, all-natural crude protein supplement was designed for a feeding rate of 1 lb/head/day or 2 lb/head every other day. In a summary of 7 trials evaluating this supplementation program, ADG was increased 0.38 lb/day and supplement conversion averaged 2.77 (Lalman, 2008). Addition of monensin to this supplement to provide 100 mg/head/day has increased ADG by an additional 0.15-0.20 lb and decreased supplement conversion to about 1.9 (Lusby et al., 1984; McCollum et al., 1988). This supplementation program has been a “game changer” for many of our producers and has greatly improved the profitability of season-long stocker programs on tallgrass native range.

Thus, there are many ways by which the beef cattle industry can add weight to cattle and cheapen them back (i.e., decreased breakeven selling price) prior to placement on feed. However, mother-nature doesn’t give us many “free lunches”. In our analysis, feed:gain was similar for wheat pasture vs. winter/summer tallgrass native range cattle and IES vs. SLS cattle, although feed:gain was numerically 4 and 5% greater (i.e., poorer) for native range and SLS cattle, respectively. In a comparison of multiple production systems, Gill et al. (1993a) reported that native range steers entered the feedlot 118 lb heavier, but had 26% greater feed:gain than wheat pasture steers (7.95 vs. 6.32; $P < 0.05$). Of the studies that we included in the IES/SLS dataset, the two-year study on tallgrass native range by Brandt et al. (1995) had by far the largest number of cattle (144/year). In this study, SLS cattle (averaged across implant treatments) were 86 lb heavier at feedlot placement and feed:gain was increased 8.8% (6.42 *vs*. 5.90; P <.0.05) compared with IES cattle. Comparison of feedlot performance of IES vs. SLS cattle is confounded by different placement weights and potentially large environmental differences because the cattle are in the feedlot at different times of the year. Drouillard and Kuhl (1999) included an excellent discussion of this in their review paper. Therefore, the positive attributes resulting from one segment (i.e., increased placement BW and decreased breakeven selling price) are often accompanied by decreased biologic efficiencies (i.e., lower feed efficiency during finishing) in the next segment. The challenge is to find the optimums.

Regression Analysis of Finishing Performance

Regression coefficients of finishing performance with stocker period characteristics are presented in Table 3. Finishing ADG was not influenced by any of the stocker performance traits. Feed DM intake during finishing increased as length of the stocker period increased (Figure 1), total gain during the stocker period increased (Figure 2), and as placement BW increased (Figure 3). Feed:gain during finishing increased as total gain during the stocker period (Figure 4) and placement BW (Figure 5) increased. The regression equation using placement BW only explained 29 and 39% of the variation in DMI and feed:gain during the finishing phase, respectively, but the model could predict DMI to within 0.58 lb /day and feed:gain to within 0.18 lb feed/lb gain. Based on observed differences in the literature, these values are reasonably acceptable to estimate changes in feed intake and feed efficiency of feedlot cattle. For each 100 lb increase in placement BW feed DM:gain during finishing increases by 0.20

lb or about 3.3%. However, carcass weight also increases by 17 lb (*P* < 0.05; data not shown). A 3.3% increase in feed:gain is very substantial especially with high ration costs. However, the decreased total feed consumed and greater carcass weight may compensate for the increased feed:gain associated with adding an additional 100 lb BW during the stocker period. Using the relationships from our data, finishing a 700 lb steer to 1300 lb with a feed:gain of 6.05 lb DM/lb gain will require $635 in feed costs at a ration cost of $350/dry ton, but adding 100 lb of BW during the stocker period will reduce feed costs to $576 for a 800 lb steer to reach a finish BW of 1327 lb (assuming dressing percentage of 64%) even though feed:gain increased to 6.25 lb DM/lb gain (i.e., 3.3% greater than 6.05). Therefore, even though feed:gain is expected to be poorer as cattle enter the feedyard at heavier weights, a substantial savings in feed costs may be realized by increasing weight gain on pasture.

Results are similar for total gain during the stocker period and placement BW because these two variables are inextricably linked. However, length of the stocker period can be independent of total gain and placement BW. Regression of finishing DMI on length of the stocker period and placement BW revealed that length of the stocker period was still significantly (*P* = 0.06) related to finishing DMI, and placement BW tended to be significantly related (*P* = 0.12). This result indicates that cattle entering the feedlot at a greater age will consume more feed even though placement BW may not be larger (i.e., greater intake as percentage of BW). However, this may be confounded by previous diet. Cattle entering the feedlot at a greater age have most likely been backgrounded on dry winter forage followed by summer grazing programs where cattle consume moderate to low-quality forage leading to increased gastrointestinal tract weight (Hersom et al., 2004a,b). In our analysis, cattle that previously grazed dormant winter/summer tallgrass native range (average length = 255 d) had greater feed intake as percentage of BW during finishing than cattle that previously grazed winter wheat pasture (average length = 121 days; Table 1).

Regression analysis was conducted to evaluate the relationship between feed:gain during finishing and placement BW for IES and SLS stocking management systems (Figure 6). Consistent with our previous analysis (Figure 5), feed:gain increased as cattle entered the feedyard at heavier weights. However, the intercept by stocking management and slope by stocking management interactions were not significant (*P* > 0.30) indicating no difference in the relationship of feed efficiency during finishing with placement weight between IES and SLS management systems. This suggests that type of summer pasture stocking management does not affect the relationship between feed:gain and placement BW. However, given the trend lines illustrated in Figure 6 and the fact that only 5 data points were available for each pasture stocking system, feed:gain for SLS steers may increase more rapidly as placement BW increases. A larger dataset is needed to adequately evaluate whether differences exists between SLS and IES steers with respect to feed efficiency.

It is generally considered that ADG and feed efficiency decrease during finishing as initial body fat increases. In contrast, our analysis revealed that initial finishing empty body fat did not significantly affect ADG, DMI, or feed:gain (Figure 7) during finishing. In 2 experiments, Hersom et al. (2004a) observed no difference in feed efficiency during finishing of steers ranging in empty body fat from 4 to 20% at the start of finishing. Gill et al. (1993a,c) observed that steers previously grazing wheat pasture had lower feed:gain than steers grazing winter/summer native range using intensive early stocking or season-long stocking management; however, wheat pasture steers were intermediate in terms of empty body fat percentage resulting in no clear relationship between empty body fat and feed efficiency during finishing. Coleman et al. (1995a,b), Sainz et al. (1995), and McCurdy et al. (2010a) observed that fatter steers had improved feed efficiency during finishing, but these steers had been limit-fed a high-grain diet during the backgrounding period and this response may have been due to compensatory gain. Therefore, within the range of typical stocker and backgrounding programs, accumulating greater empty body fat during the stocker period may not negatively affect finishing performance.

In Search of a Common Thread

Reynolds et al. (1991) fed growing beef heifers two types of diet (75% alfalfa or 75% concentrate) at two levels of intake and measured the partitioning of ME between heat energy and tissue energy (i.e., energy retention). Their conclusion was that the metabolism of visceral tissues dominates the partitioning of ME to heat energy and tissue energy. Hersom et al. (2004a,b) grew steers on wheat pasture at low and high rates of gain and on dormant native range with protein supplement. Live weight gains and empty body fat at the end of the growing phase, averaged across two years, were 2.66, 1.35 and 0.34 lb/day and 19.7, 13.0 and 5.5%, respectively, for the high-gain wheat pasture (**HGW**), low-gain wheat pasture (**LGW**) and native range (**NR**) steers. Proportional mass of the total GIT, g/kg EBW, and calculated heat production (Mcal/100 kg EBW/day), as an estimate of maintenance energy requirements, were both lower ($P < 0.05$) for HGW than NR steers. Feed intake during finishing (% of mean BW) by HGW steers was lower than NR steers. However, even though empty body fat of HGW steers was considerably greater, empty body ADG and feed:gain were not different among the three treatments.

McCurdy et al. (2010a,b) grew fall-weaned steer calves on three growing programs prior to placement on feed. Growing programs were: 1) grazed on wheat pasture (**WP**); 2) fed a sorghum silage-based diet (**SF**); or 3) program fed a high-concentrate diet (**PF**). Program-fed steers had higher ADG and lower feed:gain during finishing than steers fed the forage-based growing diets even though PF steers had the greatest empty body fat at feedlot placement. The improvement in feed:gain was attributed to less accretion of visceral organ mass resulting in decreased maintenance energy requirement of PF steers. Similarly, Sainz et al. (1995) reported a 21% reduction in maintenance energy requirement during finishing for steers limit-fed a high-concentrate diet during the growing phase compared with steers ad libitum-fed a forage diet, even though empty body fat was greater for the concentrate-fed steers. Collectively, these studies reinforce the concept that feed intake and type of diet (i.e. caloric density, forage to concentrate ratio, forage nutritive value, etc) during the growing phase affect visceral organ mass and maintenance energy requirements of beef cattle during the finishing phase.

These data suggest that performance of cattle making rapid gains on pasture before entering the feedlot contradicts NRC (1996) prediction that performance is negatively related to initial body fat. Variation in mass of specific organs/tissues of the portal-drained viscera resulting from stocker programs are most likely involved in altering maintenance energy requirements. Therefore, we suggest that type of diet, forage quality, and energy intake during the stocker period have a greater effect on energy retention and feed efficiency during finishing than empty body fat (i.e., fleshiness) of stocker cattle.

Conclusions

Use of Southern Great Plains stocker production systems to add weight to cattle can significantly decrease days on feed and total feed consumed while increasing carcass weight and quality grade compared with calf-fed cattle. There are many ways by which the beef cattle industry can add weight to cattle prior to placement on feed. In the Southern Plains, the primary stocker production systems for fall-weaned calves are grazing winter wheat pasture prior to finishing, or grazing dormant winter forage followed by intensive early or season-long stocking on summer pasture prior to finishing. Results of our meta-analysis indicate minimal differences between these stocker production systems in feedlot performance or carcass characteristics. However, increasing weight gain on pasture reduces feed efficiency during finishing, but increases carcass weights and shortens days on feed. In addition, energy intake and type of diet can significantly affect gastrointestinal tract weight (i.e., low-quality forage increases gastrointestinal tract weight) and visceral organ mass (i.e., high energy intake increases liver mass), which increases maintenance energy requirement and decreases feed efficiency. Price relationships between feeder and fed cattle will dictate the profitability of increasing weight gain on pasture, but a substantial reduction in gain efficiency may be overcome by reducing days on feed and total feed consumed in combination with increased carcass weights.

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Table 1. Feedlot performance and carcass merit of yearling steers that previously grazed winter wheat pasture or winter/summer tallgrass native range

Item	Wheat	Native Range	SEM[1]	P-value
No. Steers	84	92		
No. Treatment means	5	5		
Stocker performance				
Winter phase				
Length, d	121	161		
Total gain, lb	258.1	135.2		
ADG, lb/d	2.29	0.84		
Summer phase				
Length, d		94		
Total gain, lb		168.3		
ADG, lb/d		1.79		
Finishing performance[2]				
Days on feed, d	123	112	7	0.35
Initial BW, lb	822.4	859.5	28.4	0.39
Final BW, lb	1279.7	1311.1	30.9	0.24
ADG, lb/d	3.72	4.02	0.33	0.27
DMI, lb/d	23.72	26.08	0.72	0.01
DMI, % BW[3]	2.26	2.41	0.05	0.05
F:G, lb feed/lb gain	6.38	6.66	0.46	0.52
Carcass characteristics[4]				
HCW, lb	812.3	820.9	15.4	0.49
Dress, %	63.48	62.65	0.59	0.12
Ribeye area, in^2	12.80	13.22	0.61	0.36
REA, $in^2 \cdot 100$ lb HCW^{-1}	1.57	1.61	0.05	0.55
12^{th} rib fat thickness, in	0.61	0.55	0.04	0.24
KPH, %	1.98	2.14	0.13	0.39
Marbling score[5]	419	435	4.3	0.04
Yield Grade	3.50	3.16	0.16	0.18

[1]SEM = standard error of the mean.
[2]ADG = average daily gain; DMI = dry matter intake; F:G = ratio of feed to gain.
[3]DMI, % BW = DMI divided by the average of initial and final BW multiplied by 100.
[4]HCW = hot carcass weight; REA = ribeye area; KPH = kidney, pelvic and heart fat.
[5]Marbling grid: 300 = $Slight^{00}$; 400 = $Small^{00}$; 500 = $Moderate^{00}$.

Table 2. Feedlot performance and carcass merit of yearling steers from intensive early stocking (**IES**) and season-long stocking (**SLS**) grazing management systems

Item	IES	SLS	SEM[1]	P-value
No. Steers	267	266		
No. Treatment means	5	5		
Stocker performance				
Winter phase[2]				
Length, d	161			
Total gain, lb	84.1			
ADG, lb/d	0.52			
Summer phase				
Length, d	72	142		
Total gain, lb	115.1	208.7		
ADG, lb/d	1.57	1.47		
Finishing performance[3]				
Days on feed, d	147	132	10	0.14
Initial BW, lb	703.1	788.1	47.1	0.01
Final BW, lb	1200.9	1227.7	15.6	0.25
ADG, lb/d	3.52	3.39	0.22	0.32
DMI, lb/d	23.46	23.48	0.90	0.98
DMI, % BW[4]	2.46	2.33	0.07	0.03
F:G, lb feed/lb gain	6.68	7.03	0.44	0.21
Carcass characteristics[5]				
HCW, lb	758.1	768.9	15.1	0.52
Dress, %	63.12	62.61	0.70	0.34
Ribeye area, in^2	13.00	13.12	0.22	0.55
REA, $in^2 \cdot 100$ lb HCW^{-1}	1.71	1.72	0.04	0.62
12th rib fat thickness, in	0.46	0.45	0.03	0.91
KPH, %	2.04	2.06	0.09	0.86
Marbling score[6]	408	409	10	0.90
Yield Grade	2.88	2.83	0.12	0.65

[1]SEM = standard error of the mean.

[2]Data for the winter phase of the stocker period was not reported except for Gill et al (1991). Expected winter performance was estimated from December 1 to start of summer grazing for each study using previously published results of cattle grazing dry winter forage as outlined in the methods of this paper.

[3]ADG = average daily gain; DMI = dry matter intake; F:G = ratio of feed to gain.

[4]DMI, % BW = DMI divided by the average of initial and final BW multiplied by 100.

[5]HCW = hot carcass weight; REA = ribeye area; KPH = kidney, pelvic and heart fat.

[6]Marbling grid: 300 = Slight^{00}; 400 = Small^{00}; 500 = Moderate^{00}.

Table 3. Intercept and slope (± SE) of the regression[1] of finishing performance traits on stocker performance traits, placement body weight, and initial finishing empty body fat

Independent Variable	Dependent Variable[2]	R^2	RMSE[3]	Intercept Estimate	Slope Estimate	Slope *P*-value
Stocker period length, d	Finishing ADG, lb/d	0.23	0.0937	3.5595 ± 0.1817	0.001533 ± 0.001081	0.19
	Finishing DMI, lb/d	0.41	0.5285	21.4626 ± 0.7374	0.009857 ± 0.004136	0.05
	Finishing Feed:Gain	0.06	0.0637	5.9459 ± 0.2399	0.000945 ± 0.001524	0.55
Stocker period total gain, lb	Finishing ADG, lb/d	0.01	0.0243	3.8873 ± 0.1663	-0.00023 ± 0.000748	0.76
	Finishing DMI, lb/d	0.22	0.5562	21.8843 ± 0.7190	0.005916 ± 0.002842	0.06
	Finishing Feed:Gain	0.44	0.1786	5.6083 ± 0.1790	0.002259 ± 0.001035	0.05
Stocker period ADG, lb/d	Finishing ADG, lb/d	0.03	0.0545	3.9370 ± 0.1588	-0.07528 ± 0.1188	0.54
	Finishing DMI, lb/d	0.01	0.1128	23.2930 ± 0.6930	0.1537 ± 0.4775	0.75
	Finishing Feed:Gain	0.04	0.0851	6.0444 ± 0.2406	0.1179 ± 0.1820	0.53
Placement body weight, lb	Finishing ADG, lb/d	0.00	0.0072	3.8972 ± 0.4626	-0.00006 ± 0.0000624	0.92
	Finishing DMI, lb/d	0.29	0.5802	18.8058 ± 1.8449	0.006065 ± 0.002437	0.03
	Finishing Feed:Gain	0.39	0.1771	4.6511 ± 0.5521	0.001996 ± 0.000775	0.03
Initial finishing empty body fat, %	Finishing ADG, lb/d	0.05	0.0517	3.7593 ± 0.2615	-0.00799 ± 0.02100	0.72
	Finishing DMI, lb/d	0.05	0.2010	22.2426 ± 0.9683	0.03114 ± 0.07996	0.71
	Finishing Feed:Gain	0.17	0.2626	5.7054 ± 0.6421	0.04325 ± 0.04230	0.35

[1]Regression analysis was conducted by evaluating the relationship between each of the finishing performance traits and stocker performance traits using a mixed model to adjust for difference in the relationship within individual studies.

[2]ADG = average daily gain; DMI = dry matter intake.

[3]RMSE = root mean square error, which is an estimate of the precision of the regression model.

Table 4. Description of additional studies with yearling production systems included in the fourth dataset to evaluate the relationship of finishing performance with length of stocker period, rate of gain and total gain during the stocker period, and placement body weight

Study	Treatment Description	No. Animals	Feedlot Placement	DOF
McMurphy et al., 2011	Summer-weaned steers grazed late summer and fall native range	34	December 1	147
	Summer-weaned steers grazed late summer and fall native range followed by winter wheat pasture	30	March 12	116
Capitan et al., 2004	Fall-weaned steers grazed winter wheat pasture followed by summer pasture	48	August 19	83
	Fall-weaned steers grazed winter dormant native range followed by summer pasture	50	August 19	83
Choat et al., 2003	Fall-weaned steers grazed winter wheat pasture	59	May 10	88
	Fall-weaned steers grazed winter dormant native range	38	May 10	130
Hersom et al., 2004; exp. 1	Fall-weaned steers grazed winter wheat pasture at a low stocking rate	16	April 6	89
	Fall-weaned steers grazed winter wheat pasture at a high stocking rate	16	April 6	116
	Fall-weaned steers grazed winter dormant native range	16	April 6	163
Hersom et al., 2004; exp. 2	Fall-weaned steers grazed winter wheat pasture at a low stocking rate	16	May 10	85
	Fall-weaned steers grazed winter wheat pasture at a high stocking rate	16	May 10	111
	Fall-weaned steers grazed winter dormant native range	16	May 10	158

Table 5. Description of additional studies included in the fifth dataset to evaluate the relationship of finishing performance with initial finishing empty body fat

Study	Treatment Description	No. Animals	DOF
Coleman et al., 1995a, b	Weaned steers fed a sorghum silage-based growing diet for 145 days in drylot prior to finishing	32	105
	Weaned steers limit-fed a corn grain-based diet to match rate of gain of silage-fed steers for 145 days in drylot prior to finishing	32	105
Sainz et al., 1995	Weaned steers fed an alfalfa hay/oat straw-based diet in drylot to gain 240 lb body weight prior to finishing	30	111
	Weaned steers limit-fed a corn grain-based diet in drylot to match rate of gain of alfalfa hay-fed steers prior to finishing	30	89

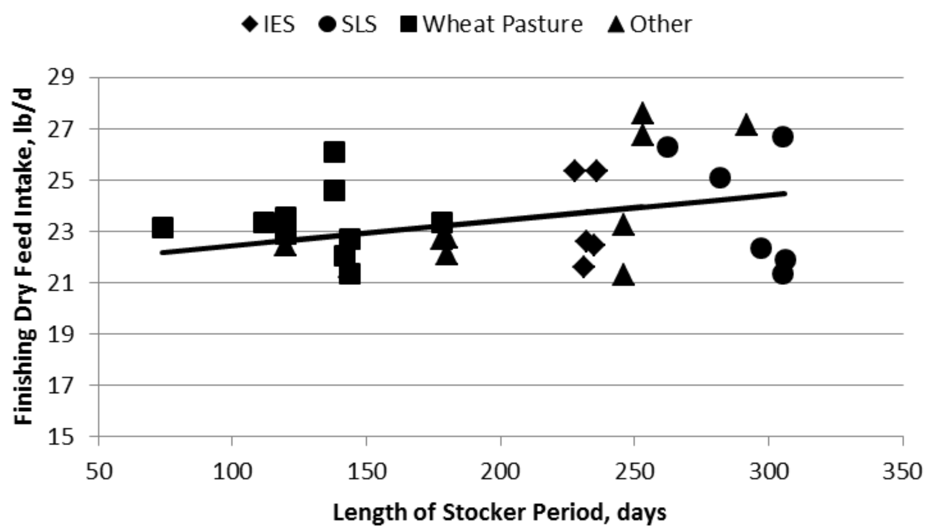


Figure 1. Relationship between feed intake during finishing and length of the stocker period from weaning in the fall to feedlot placement. IES = intensive early stocking management system, SLS = season-long stocking management system, and Other = production systems described in Table 4. See Table 3 for regression statistics.

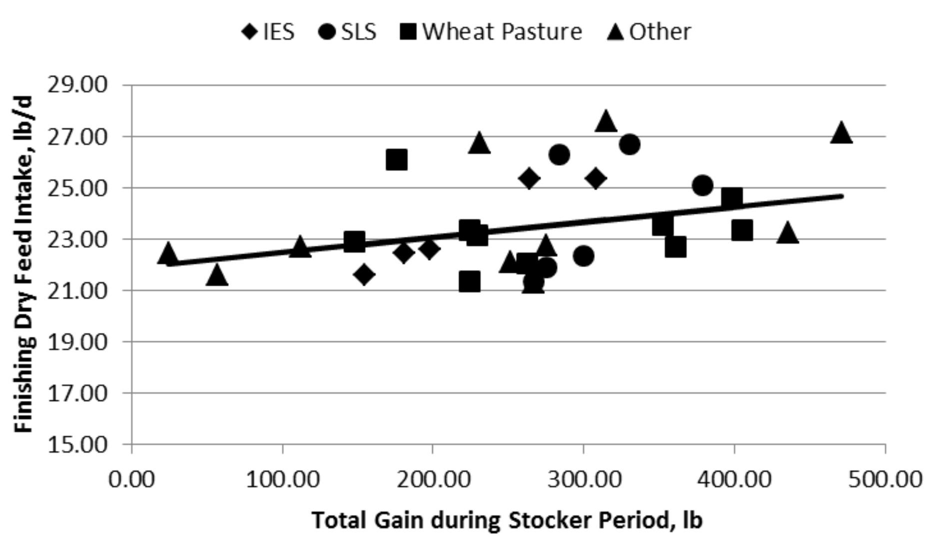


Figure 2. Relationship between dry feed intake during finishing and total gain during the stocker period. IES = intensive early stocking management system, SLS = season-long stocking management system, and Other = production systems described in Table 4. See Table 3 for regression statistics.

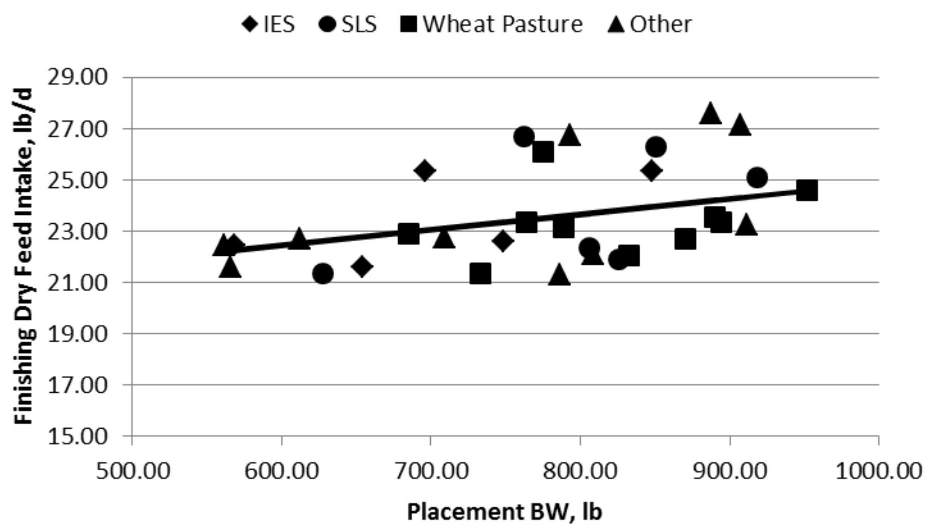


Figure 3. Relationship between dry feed intake during finishing and placement body weight. IES = intensive early stocking management system, SLS = season-long stocking management system, and Other = production systems described in Table 4. See Table 3 for regression statistics.

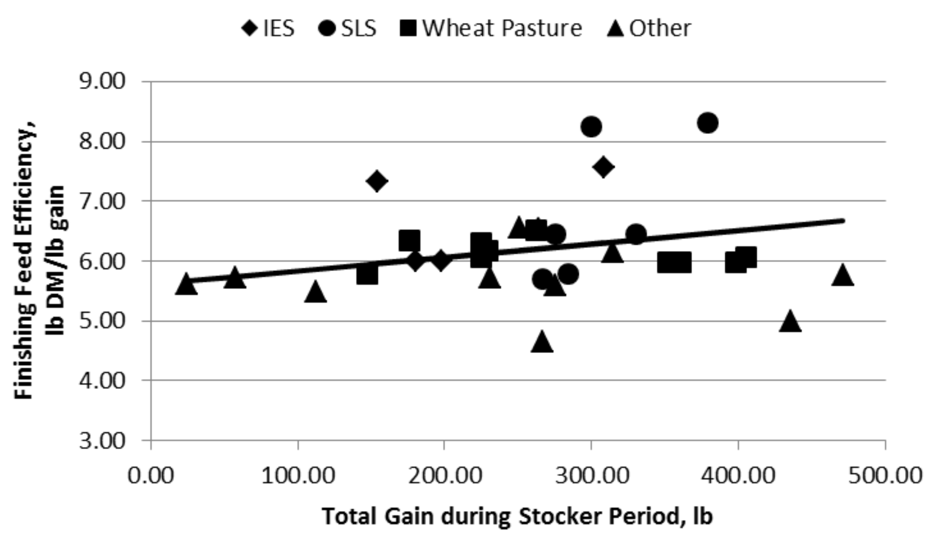


Figure 4. Relationship between feed efficiency during finishing and total body weight gain during the stocker period. IES = intensive early stocking management system, SLS = season-long stocking management system, and Other = production systems described in Table 4. See Table 3 for regression statistics.

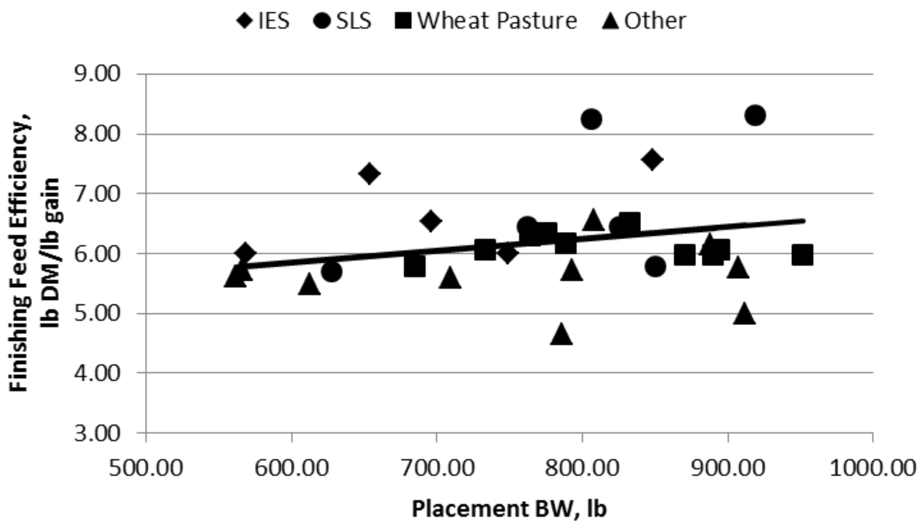


Figure 5. Relationship between feed efficiency during finishing and placement body weight. IES = intensive early stocking management system, SLS = season-long stocking management system, and Other = production systems described in Table 4. See Table 3 for regression statistics.

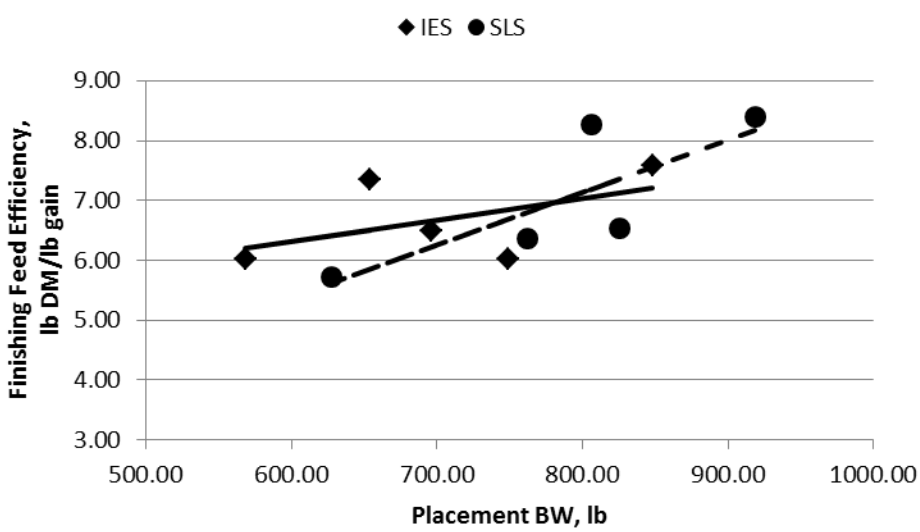


Figure 6. Relationship between feed efficiency during finishing and placement body weight for steers that previously grazed summer pasture under intensive early stocking (IES; solid line) or season-long stocking (SLS; dashed line) management. For IES, y = 4.1338 + 0.003623*BW. For SLS, y = 0.1197 + 0.008773*BW.

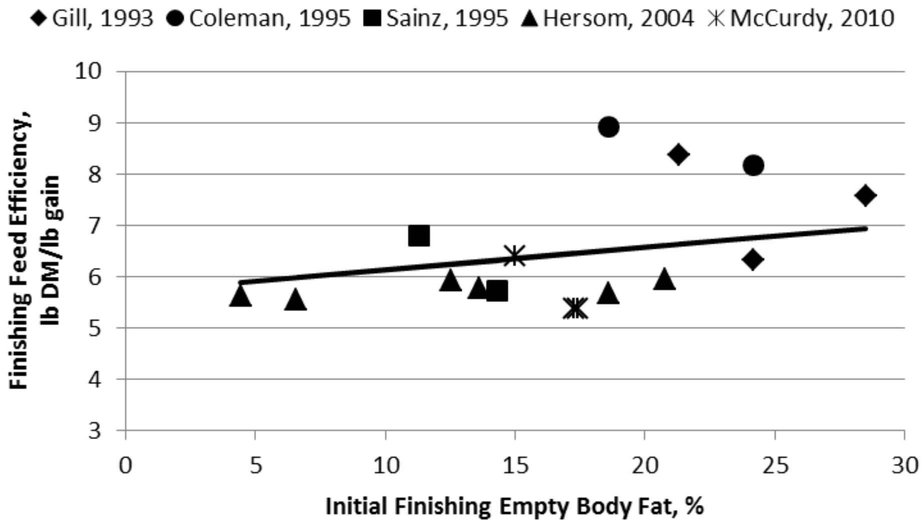
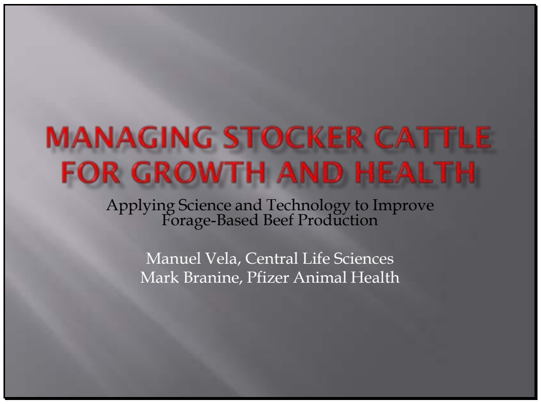


Figure 7. Relationship between feed efficiency during finishing and initial finishing empty body fat. Treatment means of individual studies are represented by different symbols according to the legend. See Table 3 for regression statistics.

Notes – Notes -- Notes

Managing Stocker Cattle for Growth and Health: Applying Science and Technology to Improve Forage-Based Beef Production?

Dr. Mark Branine
Pfizer Animal Health



Corn

- When Corn was $3.60/Bu Oil - $40.00
- When Corn was $7.00/Bu Oil- $100.00

- Where will it go………"OGK"

Ethanol predicted to consume more corn than livestock

//26 Aug 2011 For the first time in US history vehicles are predicted to use more corn than livestock this year. According to USDA estimates, 5.1 billion bushels of corn will be used to make ethanol this year, compared to 4.9 billion for livestock feed.

"Ethanol is taking a larger and larger share of production," said Seth Meyer, an MU agricultural economist with the Food and Agriculture Policy Research Institute. "I know it's been overtaking feed for a long time."

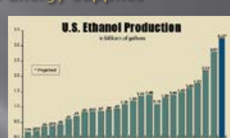
Parcell describes it as a perfect storm, this combination of ethanol-boosting government policies, jumps in oil prices starting in 2007 and a world economy that wants more meat. All these factors contribute to the exploding global demand for corn, which has significantly increased in price.

Higher corn prices provide incentives for farmers to grow more corn. They have also forced the livestock industry to reconsider its options. Livestock producers are looking for lower-cost alternatives, such as distiller grains created during the production of ethanol.

CAST Website

"New Normal"
Beef Production Systems in an Age of Expensive and Limited Grain and Energy Supplies

- Reduced supply and increased price of corn
- Increased use of by-products
- Economic effects
  - Cost
  - Profitability
- Are there Alternatives?



The Stocker Program

- Gain Response
- Morbidity
  - 1st Pulls
  - 2nd Pulls
  - Chronics
  - Med Cost
- Mortality
  - <2%

  - 3.5wt – 7.5wt
  - Genetics ?
  - Nutrition (then & now)
  - Prior Health Program ?

All of this for $.50 $1.00 $1.25 $1.50 $2.00…../hd/day

"Permanently Higher Grain Prices are a Game Changer for US Beef Industry" Dr. Darrell Peel, OSU

- Shift from grain intensive to forage intensive systems to maintain competitiveness
- Higher grain prices increases the value of forage-based beef production
  - Increased potential for forage-based beef production
  - Cattle grown on forage longer to heavy weights
  - Heavier in-weights for entry into feedlot >reduced days on feed > decreased total grain use

"The beef industry can survive high corn (grain) prices better than pork and poultry industries" - Dr. Darrell Peel, OSU

- Ruminants have the capability to utilize both forages and grain-based diets, but…
  - *Ruminants will always be less efficient in utilizing grain than pork and poultry*
- Challenge:
  - Development of production systems that allow for efficient and profitable production of high quality beef using minimal inputs of grain

Potential for Increasing Productivity of Forage-Based Beef Production

- Goal: Efficient production of heavier weight cattle on pasture, range or alternative forage-based system
  - Decrease number days on a grain-based finishing diet
  - Maintain current standards of beef quality (marbling & tenderness)
- Potential Methods:
  - Managing the livestock – forage management interface
  - Application of pharmaceutical technologies for health and productivity

2011 the Year of the "Efficiencies"

- Market Strategies
  - Niche Markets
    - Organic
    - Natural
    - Pure Bred
  - Sale Barns
  - Video
- Minerals (King Ranch Study)
  - Conventional / Tubs
- Internal / External
  - Parasite Control
    - Feed Thru External
    - Dewormer
- Feeding Programs
  - Forage
    - Stocking Rates
    - Delivery System
    - Forage Enhancing
- Vaccines
  - Blackleg
  - Vibrio-Lepto
  - BVD
- Implants / Ionophores/Feed Additives
  - Gain Response

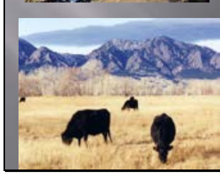
Limitations of Forage-Based Beef Production

(Dr. Anibal Pordomingo, INTA)

Metabolizable energy extraction by ruminants from fibrous diets

✓ Uncertainty:

1. Forage quality
2. Distribution (Spacial and temporal),
3. Quantity (drought)



Optimum Nutritive Value of Forages Required for High Growth Rates in Stocker Cattle

Dr. Anibal Pordomingo, INTA

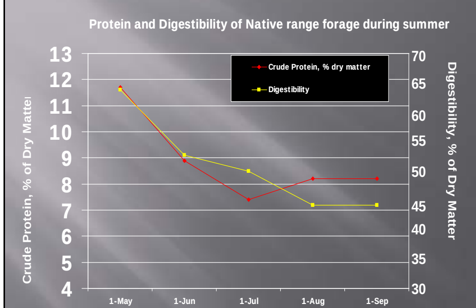
Nutritional Component	Values
Dry matter content, %	Above 20
Crude protein, %	Range 14 to 18% DM
Neutral detergent fiber,%	Below 40
Acid detergent fiber, %	Below 25
In vitro digestibility, %	Above 65
DM intake, % BW	Above 2.5
ME concentration, Mcal/kg DM	Above 2.4

Adequate Nutrient Intake is Required to Meet the Animals Requirements

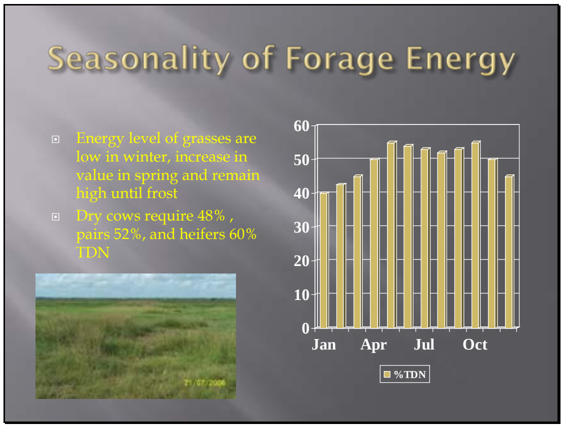
Nutrient Intake is a function of both:

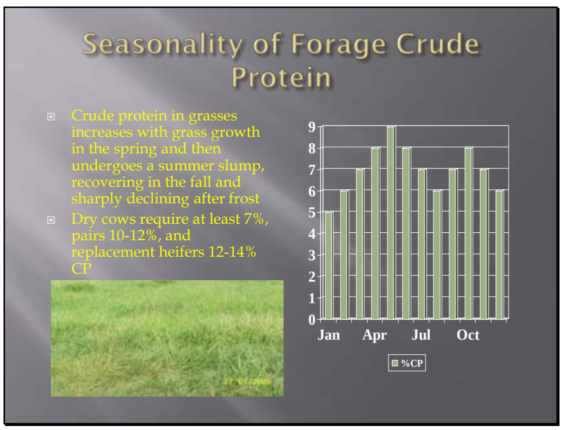
Forage Intake
- **Quantity**
- **Digestibility**
- **Rate of passage**

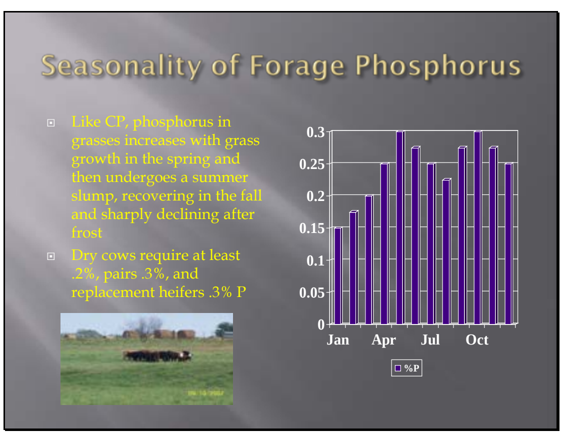
Nutrient Density of Forage
- **Forage type**
- **Stage of growth**
- **Soil fertility**



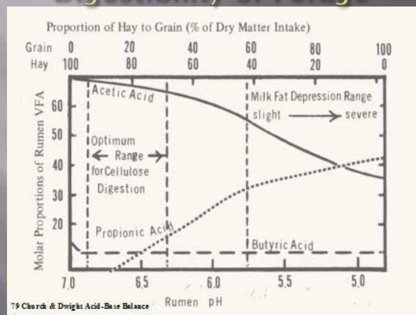
Two-Year Summary; Bogle, Engle and McCollum


Seasonality of Forage Energy
Energy level of grasses are low in winter, increase in value in spring and remain high until frost
Dry cows require 48% , pairs 52%, and heifers 60% TDN
60
50
40
30
20
10
0
Jan
Apr
Jul
Oct
%TDN


Seasonality of Forage Crude Protein
Crude protein in grasses increases with grass growth in the spring and then undergoes a summer slump, recovering in the fall and sharply declining after frost
Dry cows require at least 7%, pairs 10-12%, and replacement heifers 12-14% CP
9
8
7
6
5
4
3
2
1
0
Jan
Apr
Jul
Oct
%CP


Seasonality of Forage Phosphorus
Like CP, phosphorus in grasses increases with grass growth in the spring and then undergoes a summer slump, recovering in the fall and sharply declining after frost
Dry cows require at least .2%, pairs .3%, and replacement heifers .3% P
0.3
0.25
0.2
0.15
0.1
0.05
0
Jan
Apr
Jul
Oct
%P

Effect of Supplement Type on Digestibility of Forage



Supplementation

Something added to complete a deficiency
We Can't forget health

Supplementation Feeding Programs $$$

- Conventional Feeds
  - (Protein / Energy / Minerals)
    - Bulk, Sacked (Hand Fed, Feeders)
- Commodities (Hand Fed)
  - Extension Programs
    - DDG
    - CSM
    - WCS
    - Corn
- *Delivery* Products
  - Blocks
  - Liquid Feed
  - Tubs
    - Chemical
    - Cooked

Supplementation Feeding Programs $$$

- The Stocker Implementation
  - Pasture Programs
    - Grass Management Programs
      - Utilize Forage as the Primary diet and enhance the productive performance of calves and stockers on native ranges or improved forages
    - Oklahoma Gold
    - Oklahoma SuperGold
    - Oklahoma Green Gold
    - Highly Digestible Fiber

Oklahoma Gold

- 1 pound of a 38%-41% High Protein Product
  Plus Rumensin, Bovatec (Aureomycin)
  - Forage intake – Increases 20-30%
  - Forage Digestibility – Improved 15-20%
  - 1lb yields .4 +.2 gain
- Key Point
  - Do Not *Overgraze* Pastures
  - Late Summer – Early Fall

Oklahoma SuperGold

- 2.5 Lbs of a 25% High Quality Protein & Energy Product
- Best if Digestible Fiber ingredients are used
- 2.5 lbs. yields .7 +.2 Gain
- Depends on both forage as well as gain response desired

Oklahoma Green Gold

- Designed for winter pastures
  - Energy supplement to balance the high protein to energy ratio
  - 80-85% concentrate
  - Converts at 5 to 1

3-Phase Seasonal Feeding Program

- I Don't Know of a Keep It Simple Stupid Feeding Program
- Continue Working on Enhancing Performance – Both Forage and Cattle (ADG and Health) at the most economical feeding programs Possible

3-Phase Seasonal Feeding Program

1. Seasonal Feed

   A. High Protein Feeding (1-2 Lbs) (May-Oct)

   B. Mid Level Protein and Energy Feeding (2.5-5 Lbs) (Jan? –Mid July)

   C. Energy Feeding (2-4 Lbs) (Winter Forage)

2. Ration "Full Feed" Last 10 – 14 Days

   Depends On Forage Availability

   1. Dec-March 1

   - Ideality – Where are the cattle Going
     - Think "Microbial" Shift – Performance - 20-80 Rule

3. Mineral *(Insurance)*
   - Palatable
   - Free Choice
     - **Conventional or Tub**

The Prediction Response

- Response to an *Energy Feed* - .09 GAIN/Lb Feed
- *One time Response to a High Protein Feed* - .32 Lb GAIN /Day
- Response to a *Protein Supplement* - .09 GAIN/Lb Feed /Day
- Response to *Ionophore* at the Proper Level - .15-.2

- 1 Lb. High Protein Cube @ Bovatec - = .32+.09+.2 = .61 Improvement - $.23
- 2 Lb. High Protein Cube @ Bovatec - = .32 +.09+.09+.2=.70 Improvement - $.46
- 4 Lb. Energy Feed @ N0 Bovatec - = 4x.09= .36 - $.56

Highly Digestible Fiber

- No Negative Impact on Forage and Digestibility ie. No negative associative effect (starch)
- Rumen Environment not impacted
- No Microbial Shift

Corn

- .3%BW – Reduction fiber digest
- Neg impact will occur when fed @ Levels greater than .5%BW
  5 wt str – 2.5 Lbs. Corn

Corn

High Starch

Low Fiber

Soybean Hulls

Low Starch

High Fiber

Cotton Seed Hulls No

Rice Hulls No

Highly Digestible Soybean Hulls

- When supplemented @ less than .5% BW, the energy value of SBH is equivalent to corn (90% TDN, Dry matter basis)
- Research @ University of Florida

- Other HD Fiber Feedstuffs
  Corn Gluten Feed
  Brewers Grain
  Beet Pulp

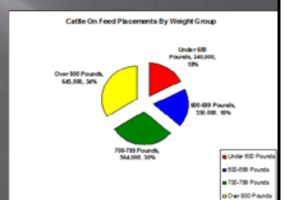
Remember Always watch the Fat % in all diets

Predicted Added Performance

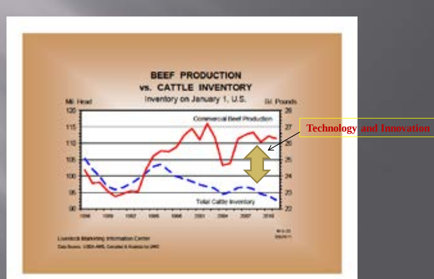
Product	Feeding Rate/Lb /Day	Expected Performance	$ Cost
38% HP Cube + I	1-2	.6	.23/.46
41% CSM	1-2	.4	.23/.46
HP Liquid Feed (32)	1-2	.4	.15/.30
HP Cooked Tub (30)	1-2	.4	.33/.
HP Chemical Tub	2-4	.4	NA
38% Pro Block	1-3	.4	.20/.60
25% PE Cube +I	2.5-5	.9	.38/.72
20%PE Cube	2-4	.4	.30/.60
25% Liquid Feed +I	2-3	.6	.24/.36
25% Cooked Tub	1-2	.4	.28/.56
25% Chemical Tub	2-4	.4	.48/.96
25% Block	2-4	.4	.36/.72
Energy Ration +I	2-4	.4	TBD
Mineral Tub +I	.25	.1-.2	.11
Sacked Mineral +I	.25	.1	.08
DDG			

Stockers
June 10, 2011 Pratt, KS

- 500 lb steer
  $160.00/cwt ($800.00)
- 800 lb steer
- $123/cwt ($984.00)
- The key is to get him to 800 lbs for less than $1.23/ lb. of Gain



Current Situation



Technology Applications to U.S Beef Production – 1955 to 2010

- Improved efficiency of beef production
- Reduced productions costs
- Improved health and well being of cattle
- Reduces the impacts of beef production on land use and environment
- Maintains steady consistent supply of high quality beef products at an affordable price to the consumer

Elam and Preston, 2004

Effect of Pharmaceutical Technologies on Average daily Gain in Stocker Cattle

Technology	Effect on daily growth rate, %
Anabolic Implants	12.85
Ionophores	7.74
Sub-therapeutic antimicrobials	6.87
Dewormers	17.79
Fly control	8.09

John Lawrence and Maro Ibarburu,
"Economic Analysis of Pharmaceutical Technologies in Modern Beef Production"
Iowa State University

Estimated Cost of Production Impact of Pharmaceutical Technologies in Stocker Operations – 2005 data

Technology	Breakeven Price Reduction, %	Cost Savings per animal, $
Anabolic Implants	2.31	18.19
Ionophores	1.46	11.51
Sub-therapeutic antimicrobials	1.22	9.57
Dewormers	2.74	20.77
Fly control	0.80	6.28
Combined technologies	10.40	80.79

John Lawrence and Maro Ibarburu,
"Economic Analysis of Pharmaceutical Technologies in Modern Beef Production"
Iowa State University

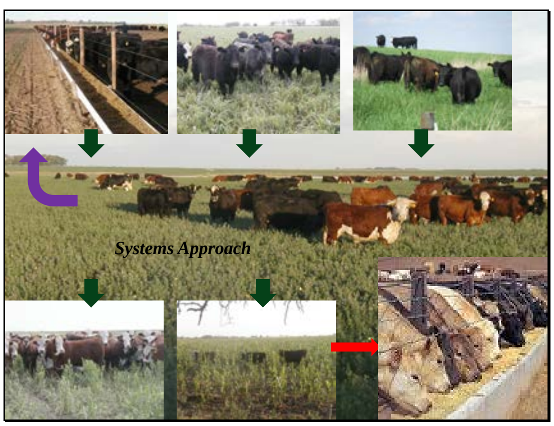
The 10 Hurdles

(14,165 Ranchers) (3,122,710 Cows)

- 94% - Blackleg
- 33% - Shipping Fever / Pneumonia
- 54% - BRD
- 88% - Mineral
- 73% - Salt (yellow/white)
- 15% - Vitamin
- 19% - Liquid Feed
- 19% - Blocks
- 76% - Cake
- 45% - Tubs

- 100% - Forage

Cattle Husbandry Management
A "Team" Approach




Questions

Notes – Notes -- Notes

Byproduct Storage Systems – What Works

Dr. Justin Waggoner
Kansas State University

By-product Storage Systems (What Works)

Justin W. Waggoner, Ph.D.
K-State Beef Systems Specialist
Garden City, KS

Byproducts

- **Corn gluten feed**
  - **Dried (flakes or pellets)**
  - **Wet**
- **Distillers products**
  - **Dried**
  - **Modified**
  - **Wet**

Dry Storage

Dry Storage

- Overhead storage systems work with DDGS and pelleted corn gluten feed
  - Results have been mixed (Bridging)
    - Temperature and moisture
    - Feed should be cool and ~90% dry for success
- Commodity bay storage facilities work well with dried forms
  - Covered, 3 sided structure (wind loss)

K·STATE Research and Extension

Bulk Density

- Bulk Density lbs/cubic foot
  - Ground corn = 40
  - Dried distiller's grain = 18-20
  - Wet distiller's grain = 55-60
  - Dried corn gluten feed (pellets) = 26-33
  - Wet corn gluten feed = 25-30
- Most bins built on average of 50 lbs/cubic foot

K·STATE Research and Extension

Bagging (modified and wet products)

- Must be packed under low/no pressures to avoid bag failure

Bunkers (using forage as bulking agent)

- Key is to achieve a blend of forage and WDGS that may be packed
  - Proportions vary based on moisture content

WDGS Bunker Storage Projects

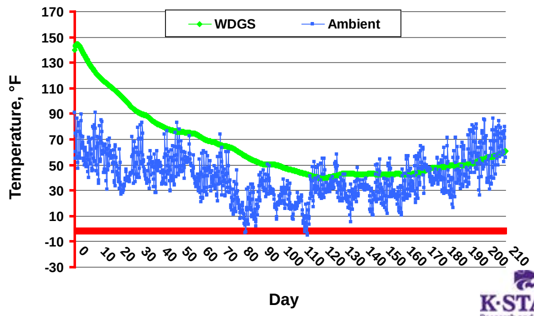
- Conducted 2 independent studies to assess the effects of storage on WDGS
  - A third project is in progress
- Objectives
  - Minimize labor and expense
  - Evaluate storage methods that will work on both large and small operations

September, 2009

KANSAS CORN COMMISSION

April, 2010
(200 days in storage)

Average WDGS Temperature



Effect of Storage on Nutrient Composition

Item	0 day	208 day	SEM	*P*-Value[1]
DM, %	36.3	36.7	0.49	0.64
CP, %	30.9	30.8	0.37	< 0.05
ADF,%	11.5	13.7	0.60	0.24
NDF, %	25.0	26.9	0.41	< 0.05
ADIN, %	3.3	4.1	0.24	0.25
Ca, %	0.08	0.08	0.02	0.62
P, %	0.91	1.04	0.07	< 0.05
S, %	0.67	0.63	0.02	0.69
pH	4.0	4.0	0.10	0.43

[1]Effect of storage

Mold and Aflatoxin

- To date we have not encountered any mycotoxin or aflatoxin levels in stored WDGS that would require any special feeding considerations
  - 3 studies
- A mycotoxin screen is recommended for WDGS stored in bunkers

Shrink and Total cost at Feedout

- Shrink losses have ranged from 6-20%
  - Typically estimate 10% shrink
- Total inputs for bunker storage
  - ARCH Hays (2009/2010 bunkers)
    - In cost = $60/ton
    - Feed out = $65.44 (shrink, plastic, labor, etc.)

K-STATE Research and Extension

1 load bunkers limestone base, highway dividers

Concrete Silage Bunker (20 Loads)

Bale and Concrete Divider bunkers

Bale and Concrete Divider bunkers

K·STATE Research and Extension

Trench silo (30 loads)

Justin W. Waggoner, Ph.D.
jwaggon@ksu.edu
Beef Systems Specialist
Garden City, KS
620-275-9164

K·STATE
Research and Extension

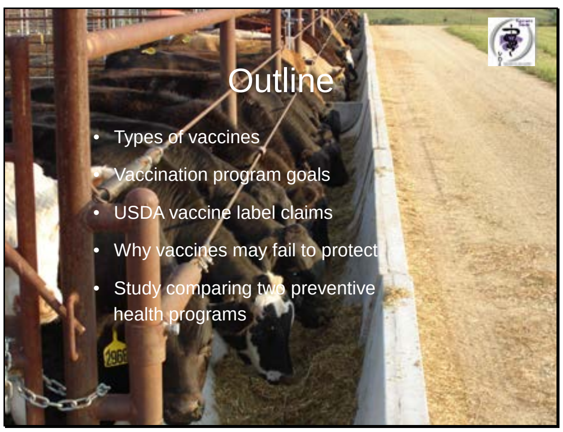
Notes – Notes -- Notes

Vaccineology

Dr. Gregg Hanzlicek
Kansas State University

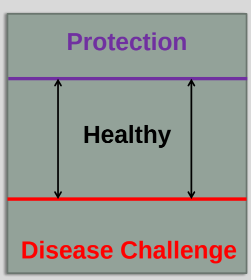
Vaccineology

Gregg A. Hanzlicek, DVM, PhD
Kansas State Veterinary Diagnostic Laboratory



Prevention of Disease at the Herd Level—ULITMATE GOAL

- We are striving to ensure that herd protection (immunity) is above the level of disease challenge



Prevention of Disease at the Herd Level—ULTIMATE GOAL

- If the protection level decreases to a lower level than the disease challenge **OR** the disease challenge increases to above the protection level

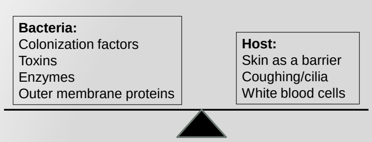
=

UNHEALTHY

Protection vs Disease Challenge

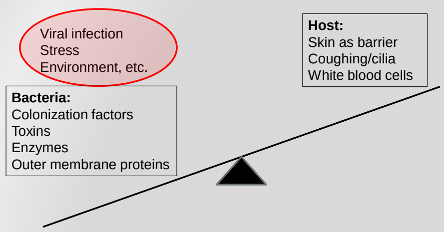
- Protection: colostrum antibodies, vaccinations, dewormers, proper nutrition, metaphylaxis
- Disease challenge: overcrowding, commingling, sanitation, biosecurity, other diseases

Disease Does Not Occur When There is a Balanced State



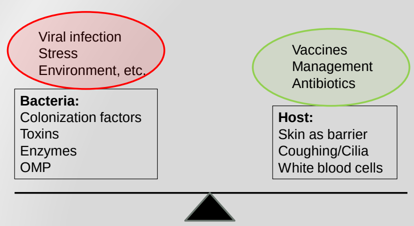
Adapted from: Rice, 2008

Other Factors Tip Balance in Favor of the Bacteria



Adapted from: Rice, 2008

Our Interventions Attempt to Restore the Balance



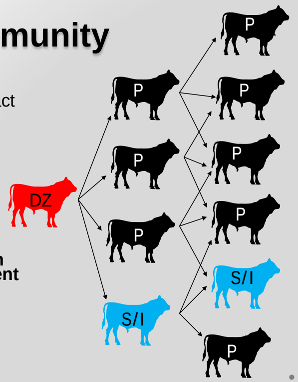
Adapted from: Rice, 2008

Vaccination program goals

- Stimulate an adequate immune response
  - The goal of any vaccination program
- Prevent clinical and subclinical disease
  - Clinical: Reduce treatments costs, mortality & production losses
  - Subclinical: Reduce mortality/ Reduce production losses
- Prevent shedding
  - For organisms not normally present in calf populations
    - Some of the viruses/ what about bacteria?
    - Is BRDC a contagious disease?

Herd Immunity

- Minimize disease impact with high proportion of protected (immune) animals



- **Immunity of less than 100% is often sufficient**

DZ = diseased
S/I = susceptible/infected
P = protected (immune)

The concept of "Herd Immunity"

- Transmission of communicable diseases will not continue within a group of animals if the percentage of resistant (protected/immune) animals in the group is above a certain threshold—(70%-80%?)
- On the other hand if the number of animals within a space (pen) is high or the "bug" dose is sufficiently high, all animals within the pen may be effectively susceptible to infection even with adequate vaccination.

Vaccines and vaccination programs

- No vaccine or vaccination program is 100% effective

Reasons vaccines/programs may fail to protect

- Administered at the improper time
- Administered inappropriately
- Inappropriately handled
- Animal does not respond
- Vaccine strain does not match field strain

Reasons vaccines may fail to protect

Administered at the "improper" time

- Maternal antibodies present
  - Antibodies interfere with both MLV & Killed vaccines (Myth/measuring the wrong thing?)
- Calf is already incubating the disease
- Vaccines administered upon arrival
  - When does exposure occur?
    - Prior to or shortly after delivery (salebarn, pot, commingled pen)
  - How long after vaccination before an active immunity occurs?
    - Modified live—antibodies (protection) present in 4-5 days (?)
    - Killed—antibodies (protection) present in 10-14 days (?)

Reasons vaccines may fail to protect

Vaccine inappropriately handled

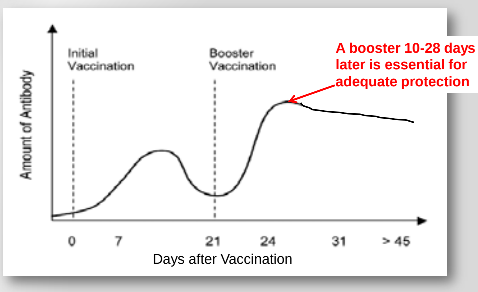
- MLV (Modified Live Vaccine) left in sun/allowed to heat
- MLV given when ambient temps >90°F
- MLV administered in a vaccine gun containing disinfectant
- Killed vaccine that was frozen then thawed
- Expired vaccine

Reasons vaccines may fail to protect

Administered inappropriately

- Intramuscular vaccine given subcutaneously or vice versa
- Injectable vaccine given intranasally
- Vaccinate the hair and not the animal (or reduced dose)
- Killed vaccine not boostered or poor booster timing

1 dose vs. 2 dose killed vaccine



Reasons vaccines may fail to protect

Animal does not respond to the vaccine

- Age: maternal antibody blocked ; maternal antibodies interfere with MLV & Killed vaccines (Myth?/measuring the wrong thing?)
- Immunosuppressed animal: stress (travel, commingling, dietary change, social disruption, other pathogens such as BVDV
- Genetics
- Concurrent diseases (BVDV, Mycoplasma, etc.)
- Bad luck (response is not absolute)

Reasons vaccines may fail to protect

Vaccine strain/serotype does not match field strain

- o Not all vaccine strains protect against all field strains
  - Depends some on how closely the strains are related
  - Most BVDV field strains are 1b whereas vaccine strains are 1a
    - o Vista™ products have been shown to have the ability to protect against 1b challenge after inoculation with the Vista™ that contains strain 1a.

Vaccine label claims

- *Prevention of infection:* A claim that it is intended to prevent infection may be made only for products able to prevent all colonization or replication of the challenge organism in vaccinated and challenged animals
- *Prevention of disease:* A claim that it is intended to prevent disease may be made only for products shown to be highly effective in preventing clinical disease in vaccinated and challenged animals.
- *Aid in disease prevention:* A claim that it is intended to aid in disease prevention may be made for products shown to prevent disease in vaccinated and challenged animals by a clinically significant amount.
- *Aid in disease control:* A claim that it is intended to aid in disease control may be made for products which have been shown to alleviate disease severity, reduce disease duration, or delay disease onset.
- *Other claims:* Products with beneficial effects other than direct disease control, such as the control of infectiousness through the reduction of pathogen shedding, may make such claims if the size of the effect is clinically significant and well supported by the data.

Modified Live Viral Vaccine Label Comparison

Category	Indications	Product A	Product B	Product C	Product D	Product E	Product F	Produc
Respiratory Claims & DOI Claims	BVD Type 1	Aids in Prevention	Aids in Prevention	Aids in Control and DOI of [illegible] days	Aids in Prevention	Aids in Prevention	Aids in Reduction	[illegible]
	BVD Type 2	Aids in Prevention	Aids in Prevention	Aids in Prevention and DOI of [illegible] days	Aids in Prevention	Aids in Prevention	Aids in Reduction	[illegible]
	IBR	Aids in Prevention	Aids in Reduction	Aids in Prevention and DOI of [illegible] days	Aids in Prevention	Aids in Prevention	Aids in Reduction	[illegible]
	BRSV	Aids in Prevention	Aids in Prevention	Aids in Prevention	Aids in Prevention	Aids in Prevention	Aids in Reduction	[illegible]
	PI_3	Aids in Prevention	Aids in Prevention	Aids in Control	Aids in Prevention	Aids in Prevention	Aids in Reduction	[illegible]
Reproductive Claims & DOI Claims	BVD Type 2 Testicular Infection	Aids in Prevention	NO LABEL CLAIM	NO LABEL CLAIM	NO LABEL CLAIM	NO LABEL CLAIM	NO LABEL CLAIM	[illegible]
	IBR Abortion	Aids in Prevention and DOI of [illegible] days	NO LABEL CLAIM	Aids in Reduction and DOI of [illegible] days	NO LABEL CLAIM	NO LABEL CLAIM	NO LABEL CLAIM	[illegible]
	BVD Type 1 PI	Prevents Disease and DOI of [illegible] days	Aids in Prevention	Aids in Prevention and DOI of [illegible] days	Aids in Reduction	NO LABEL CLAIM	Prevents Disease	[illegible]
	BVD Type 2 PI	Prevents Disease and DOI of [illegible] days	Aids in Prevention	Aids in Prevention and DOI of [illegible] days	NO LABEL CLAIM	NO LABEL CLAIM	Prevents Disease	[illegible]
	Leptospirosis L5	Aids in Prevention SINGLE DOSE	Aids in Prevention SINGLE DOSE	Aids in Prevention SINGLE DOSE	NOT AVAILABLE	Aids in Prevention SINGLE DOSE	Aids in Reduction 2 DOSE	[illegible]
	Vibrio (C. fetus)	Aids in Prevention [illegible]	NOT AVAILABLE	Aids in Reduction SINGLE DOSE	NOT AVAILABLE	NOT AVAILABLE	Aids in Reduction [illegible]	[illegible]
Approved for Pregnant Cows		APPROVED	APPROVED	CONTRAINDICATED	CONTRAINDICATED	CONTRAINDICATED	APPROVED	[illegible]
12 Month Safety Interval		YES	NO	NO	NO	NO	NO	NO
12 mo. PC Vaccination Window		YES	NO	NOT APPROVED	NOT APPROVED	NOT APPROVED	NO	[illegible]
Age restrictions		No age restrictions	No age restrictions	6 months or older	2 weeks or older	No age restrictions	No age restrictions	[illegible]

USDA LABEL CLAIMS
Prevents infection
Prevents disease
Aids in prevention
Aids in control or reduction
Other claims

Vaccine Approval by USDA

- Does NOT require evidence of field efficacy
- Subsequent lack of field efficacy does NOT jeopardize the USDA license
- Link to "Veterinary Services Memorandum No. 800.202 "General Licensing Considerations: Efficacy Studies"

http://www.aphis.usda.gov/animal_health/vet_biologics/publications/memo_800_202.pdf

"The effect of an intervention program in the population is often termed effectiveness." USDA memorandum

Vaccine approval by USDA, cont.

"USDA vaccine licensing does not require evidence of efficacy in cattle under normal farm and ranch conditions and only requires evidence of efficacy against specific aspects of disease."

Vaccineology Recommendations

- Work with your veterinarian for help choosing the appropriate vaccines for YOUR operation
  - No one program fits all operations!!
- Work with your veterinarian to set up appropriate vaccination schedules
  - Timing is important!!
- Work with your veterinarian to set up appropriate vaccination monitoring systems
  - Is my program working??

A field study evaluating health, performance, and behavior differences in crossbred beef calves administered different vaccine-parasiticide product combinations

Published in *Vaccine* 2010; 28 : 5998-6005

Gregg A. Hanzlicek, Brad J. White, David G. Renter, Dale E. Blasi

Study Objective

- Compare health, performance, and behavior differences between two stocker-calf arrival health programs-one a <u>minimally invasive program (MIN)</u> and the other a <u>more invasive program (MOR)</u>
- Hypothesis: calves administered the minimally invasive program may outperform in health and performance and behave differently than calves administered the more invasive program.

Minimal Invasive (MIN)

- Arrival
  - 1 intranasal 4- way BRDC viral vaccine
  - 1 subcutaneous 2 cc Clostridium
  - Oral parasiticide
  - Topical parasiticide
- Revaccination (day 28)
  - 1 subcutaneous 2 cc Clostridium

More Invasive (MOR)

- Arrival
  - 1 intramuscular 4 –way BRDC viral vaccine
  - 1 subcutaneous 5 cc Clostridium
  - 1 subcutaneous parasiticide
- Revaccination (day 28)
  - 1 single antigen BRDC intramuscular vaccine
  - 1 subcutaneous 5 cc Clostridium

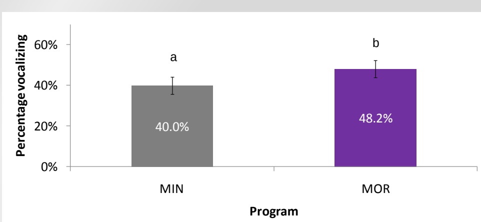
Outcomes

- Calf aversion to program administration (arrival only)
  - o Vocalization
- Health-bovine respiratory disease (BRDC)
  - o Morbidity
  - o Mortality
  - o Case-fatality
  - o 1st treatment success
  - o Chronicity
- Performance
  - o ADG
    - Arrival to day 28
    - Day 28 to day 42
    - Arrival to day 42
  - o Feed to gain
  - o Feed intake (feed delivered)
- Behavior: 2 weeks after arrival and 2 weeks after revaccination (day 28)
  - o Mean steps taken/24 hours
  - o Percentage of time spent lying down/24 hours

Study overview

- Kansas State Beef Stocker Unit (KBSU)
- Two replicates
  - o Approx. 300 calves each
  - o 3 truckloads/ replicate
- Approximately 42 days in length
- Crossbred bulls and steers
- Purchased through order-buyer
- Each truckload housed within 8 pens
  - o 11-14 calves per pen

Percentage Vocalizing at Initial Program Administration



Health—(BRDC)

Percentages and *p*-values for health outcomes by program			
Health Outcome	Program		*p*-value**
	MIN	MOR	
Morbidity	**59.7% (184/308)**	**47.8% (146/305)**	**0.02**
Mortality	3.5% (11/308)	1.9% (6/305)	0.25
Case Fatality	5.9% (11/184)	4.1% (6/146)	0.53
Chronic	16.8% (31/184)	11.6% (17/146)	0.24
1st Treatment success	39.1% (72/184)	35.6% (52/146)	0.58

Performance
(mortalities removed from data set)

	Combined Reps		
Production parameter*	**MIN**	**MOR**	***p*-value**
ADG, (lbs) arrival to day 28	**2.74**	**2.95**	**0.04**
ADG, (lbs) day 28 to day 42	2.18	2.27	0.46
ADG, (lbs) arrival to day 42	**2.55**	**2.71**	**0.04**
Feed: gain (lbs as fed: lbs gain)	7.31	6.91	0.72
Feed intake (mean pounds/pen/day)	192.3	191.8	0.17

*Model included program as fixed and load and replicate as random effects

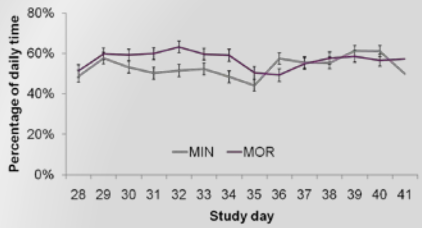
Behavior—steps taken/24 hours

(morbid calves removed from data set)

Least square mean steps taken per 24 hour by program*			
	MIN	MOR	*p*-value
Arrival (day 1-13)	2620	2449	0.07
Revaccination (day 28-42)	3584	3362	0.23

Measured by pedometer
*Gender, replicate and pen random effects

Behavior: Percentage of time lying down revaccination to day 41 (morbid calves removed from data set)



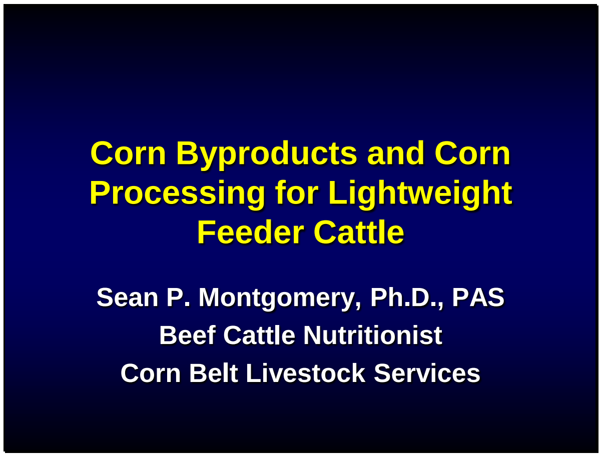
Summary

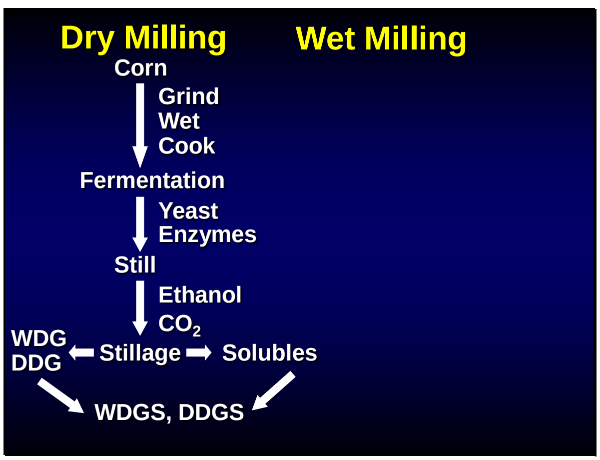
- Unique study looking at complete arrival health programs
- Neither program was particularly effective in preventing BRDC in this study
- Differences found
  - Vocalization
  - Morbidity
  - Average daily gain
  - Activity

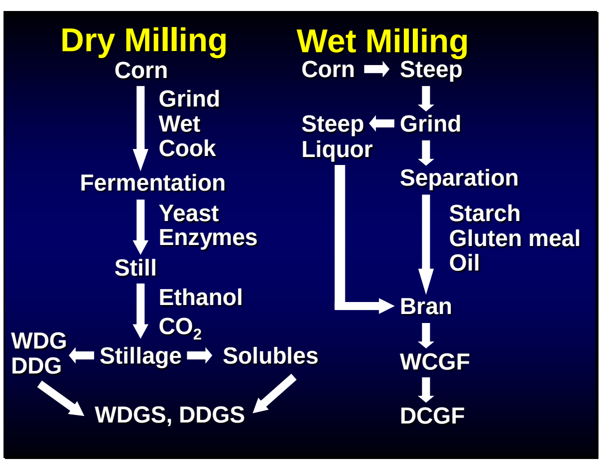
Notes – Notes -- Notes

By-products and Corn Professing for Lightweight Cattle

Dr. Sean Montgomery
Corn Belt Livestock Services



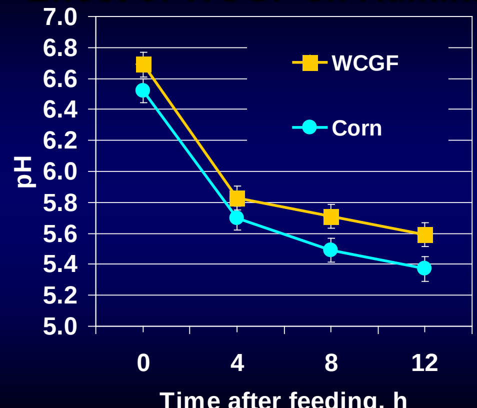




Comparing DGS and CGF

	DGS	CGF
Protein	30	20
Fat	10 - 14	3 - 3.5
ADF	15	12
NDF	46	40
NE gain	0.78 - 0.85	0.60 - 0.65
CP / DIP	30 / 45	20 / 75

Effect of WCGF on Ruminal pH



Effect of WCGF ($P < 0.01$).

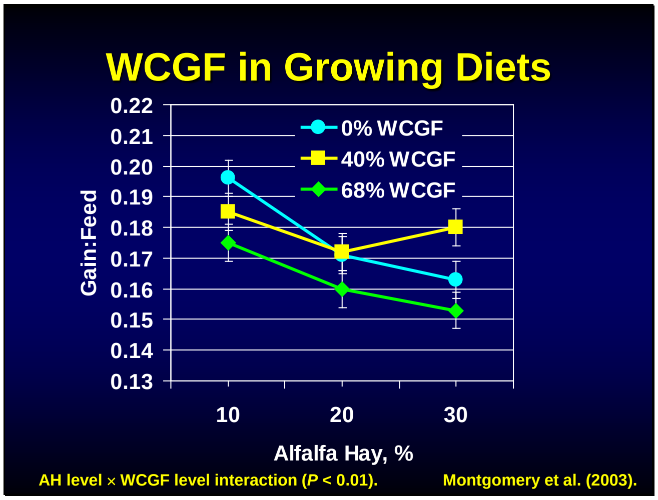
Montgomery et al. (2004).

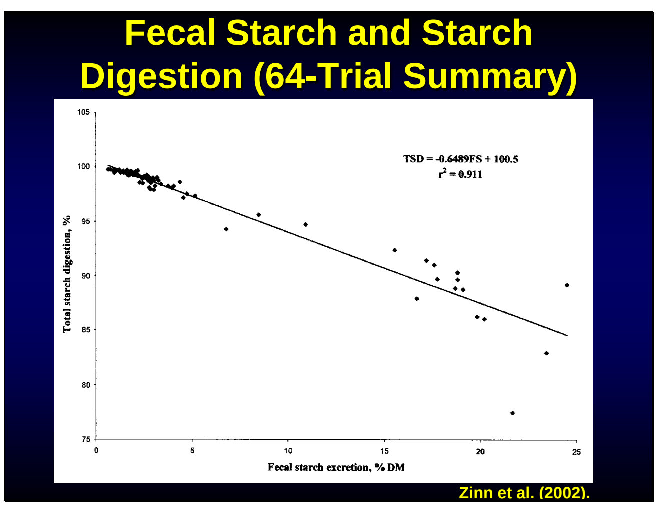
Digestibility and Passage Rate[a]

Item	WCGF	Corn	P =
OM	86.8	84.0	0.02
NDF	75.7	58.2	0.01
Starch	96.7	92.7	0.03
Passage rate, %/h	3.8	2.7	0.01

[a]Both diets contained 20% hay; WCGF diet = 40% WCGF.

Montgomery et al. (2004).


WCGF in Growing Diets
0.22
0.21
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
Gain:Feed
0% WCGF
40% WCGF
68% WCGF
10
20
30
Alfalfa Hay, %
AH level × WCGF level interaction (P < 0.01).
Montgomery et al. (2003).

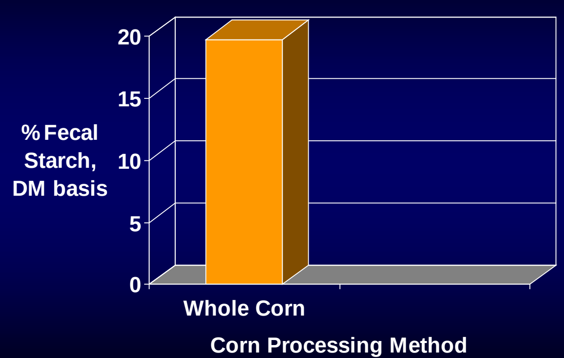

Fecal Starch and Starch Digestion (64-Trial Summary)
TSD = -0.6489FS + 100.5
r² = 0.911
105
100
95
90
85
80
75
0
5
10
15
20
25
Total starch digestion, %
Fecal starch excretion, % DM
Zinn et al. (2002).

Fecal Starch Equations

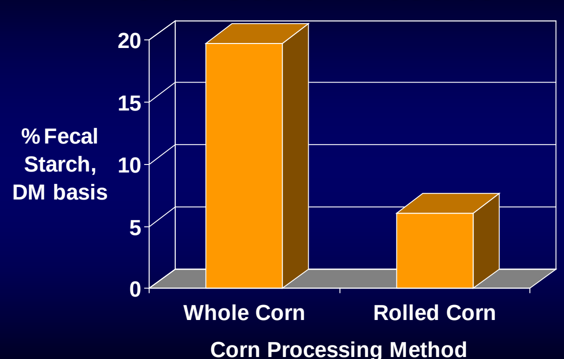
- **Total Tract Starch Digestion (TTSD)**
  - TTSD = -0.6489(%FS) + 100.5
- **Net Energy for Maintenance (NEm), Mcal/lb**
  - NEm, Mcal/lb = (2.50 - (0.021(%FS)) / 2.204
- **Net Energy for Gain (NEg), Mcal/lb**
  - NEg, Mcal/lb = (0.877(%FS)) - 0.41 / 2.204

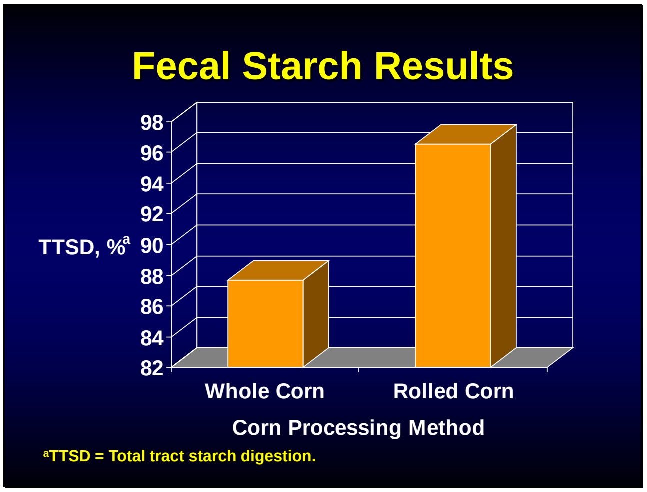
Adapted from Zinn et al. (2002).

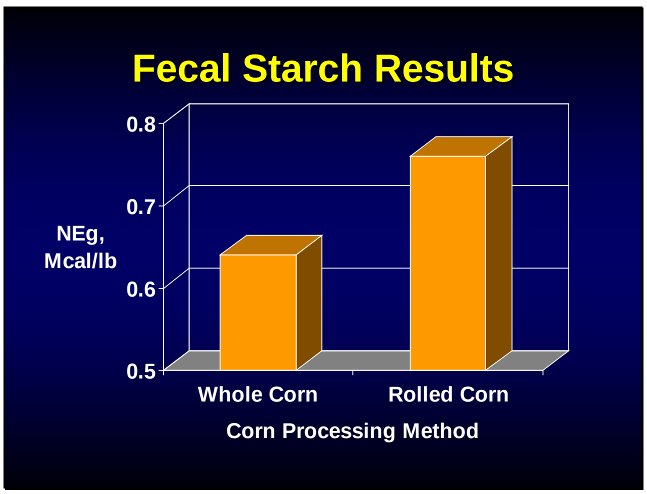
Fecal Starch Results



Fecal Starch Results







Diets Contained 25% WCGF (DMB)

Item	DRC	FGC	GHMC	SFC
Feed:Gain	5.49[a]	5.29[b]	5.05[c]	4.91[d]
% Incr., diet[e]	-	3.6	8.0	10.6
% Incr., corn[e]	-	6.1	13.4	17.7
Fecal starch, %	19.2[a]	11.8[b]	8.4[c]	4.1[d]

[a,b,c,d]Means within a row with uncommon superscripts differ (*P* < 0.10).
[e]Expressed as % above DRC, calculated for diet and corn only (60%).
Macken et al. (2003).

Diets Contained 32% WCGF (DMB)

Item	WC	DRC	FGC	HMC	SFC
Feed:Gain	5.95[a]	5.56[b]	5.35[c]	5.29[cd]	5.21[d]
% Incr., diet[e]	-	6.6	10.1	11.1	12.4
% Incr., corn[e]	-	12.5	19.2	21.1	23.6
Fecal starch, %	30.5[a]	14.5[bc]	7.1[c]	5.9[cd]	3.3[d]

[a,b,c,d]Means within a row with uncommon superscripts differ ($P < 0.10$).
[e]Expressed as % above WC, calculated for diet and corn only (52.5%).
Scott et al. (2003).

Diets Contained 30% WDGS (DMB)

Item	WC	DRC	FGC	HMC	SFC
Feed:Gain	6.07[a]	5.68[bc]	6.15[a]	5.46[b]	5.70[c]
% Incr., diet[e]	-	6.4	- 1.3	10.0	6.1
% Incr., corn[e]	-	10.4	- 2.1	16.3	9.9

[a,b,c]Means within a row with uncommon superscripts differ ($P < 0.05$).
[e]Expressed as % above WC, calculated for diet and corn only (61.4%).
Vander Pol et al. (2006).

Effect of WDGS on Receiving Cattle[a,b]

Item	0 WDGS	15 WDGS	30 WDGS	P =
DMI, lb	10.47	11.37	11.11	0.27
ADG, lb	2.12	2.49	2.51	0.20
Feed:Gain	4.50	4.69	4.72	0.79
Morbidity, %	19	20	23	0.20

[a]180 high-risk crossbred steers (initial BW = 468 ± 4 pounds).
[b]Treatments were fed during a 42 day receiving period.
Wagner et al. (2011).

Effect of WDGS on Receiving Cattle[a]

Item	0 WDGS	12.5 WDGS	25.0 WDGS	37.5 WDGS	*P* =
Initial BW, lb	465	458	461	461	0.78
Final BW, lb	558	551	549	553	0.61
DMI, lb	13.33	12.94	13.03	12.92	0.76
ADG, lb	2.64	2.67	2.58	2.64	0.76
Feed:Gain	5.00	4.76	5.26	4.76	0.36

[a]Treatments were fed during a 35 day receiving period. Smith et al. (2011).

KSU Experiment

- What are the effects of corn processing and feeding diets containing wet corn gluten feed (WCGF) to newly arrived calves?

KSU Experiment

- Two hundred seventy-nine newly arrived steers (initial BW = 508 lb)
- 2 × 2 factorial arrangement of treatments
- Treatments consisted of whole or dry-rolled corn with 0 or 30 percent Sweet Bran® brand WCGF
- Steers were stratified by arrival weight and blocked by truck

KSU Experiment

- A total of 24 pens were used providing 6 pens per treatment
- Treatments were fed continuously for a total of 60 days (28 day receiving period followed by a 32 day growing period)

Experimental Diets (% of DM)

Item	WC 0 WCGF	DRC 0 WCGF	WC 30 WCGF	DRC 30 WCGF
Whole corn	47		29	
Dry-rolled corn		47		29
Corn supp.	13	13		
WCGF supp.			6	6
Liq. molasses	5	5		
Hay	35	35	35	35
WCGF			30	30

Siverson et al. (unpublished).

Diet Nutrient Composition (% of DM)

Item	WC 0 WCGF	DRC 0 WCGF	WC 30 WCGF	DRC 30 WCGF
Crude protein	14.07	14.07	14.96	14.96
Calcium	0.62	0.62	0.63	0.63
Phosphorus	0.43	0.43	0.49	0.49
Salt	0.39	0.39	0.39	0.39
Potassium	1.17	1.17	1.19	1.19
Fat	3.46	3.46	3.07	3.07
ADF	15.80	15.80	17.44	17.44

Siverson et al. (unpublished).

Effect of Corn Processing

Item	Whole	Rolled	*P* =
Initial BW, lb	508	508	0.70
Final BW, lb	711	711	1.00
DMI, lb	16.88	16.61	0.45
ADG, lb	3.40	3.39	0.93
Feed:Gain	4.98	4.99	0.60

Siverson et al. (unpublished).

Effect of WCGF

Item	0 WCGF	30 WCGF	*P* =
Initial BW, lb	508	508	0.70
Final BW, lb	706	717	0.03
DMI, lb	16.47	17.02	0.13
ADG, lb	3.30	3.49	0.05
Feed:Gain	5.00	4.88	0.47

Siverson et al. (unpublished).

Energy Value of WCGF

- Based upon cattle growth performance and 1996 Beef NRC equations:
- The corn only diet provided 78 Mcal/lb of NEm and 50 Mcal/lb of NEg
- The WCGF diet provided 79 Mcal/lb of NEm and 51 Mcal/lb of NEg

Energy Value of WCGF

- Therefore WCGF calculates to contain 70 Mcal/lb of NEg or 101 percent the energy of whole or dry-rolled corn when fed with 35 percent hay on a dry matter basis

Evaluating Ration Consistency

- Coefficient of variation (CV)
  - Describes the variation within a set of observations
  - Calculated by dividing the standard deviation of a set of numbers by their mean (expressed as a percent)
- Commercial feedlot industry targets a CV of 10% or less

Coefficient of Variation (CV)

	Feedlot		
	A	B	C
Nutrient CV, %[abc]	4.7	8.9	5.0

[a]Nutrients analyzed consisted of DM, CP, ADF, Ca, P, K, and Mg.
[b]Calculated using a total of three bunk samples from each feedlot.
[c]Values reported on a dry matter basis.

Montgomery (2006).

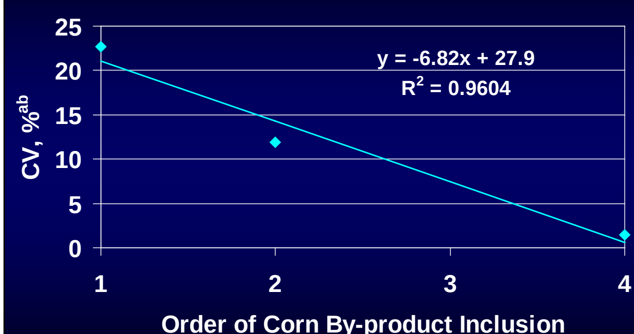
Coefficient of Variation (CV)

	Feedlot		
	A	B	C
Nutrient CV, %[abc]	4.7	8.9	5.0
Rumensin CV, %[bc]	22.7	11.9	1.4

[a]Nutrients analyzed consisted of DM, CP, ADF, Ca, P, K, and Mg.
[b]Calculated using a total of three bunk samples from each feedlot.
[c]Values reported on a dry matter basis.

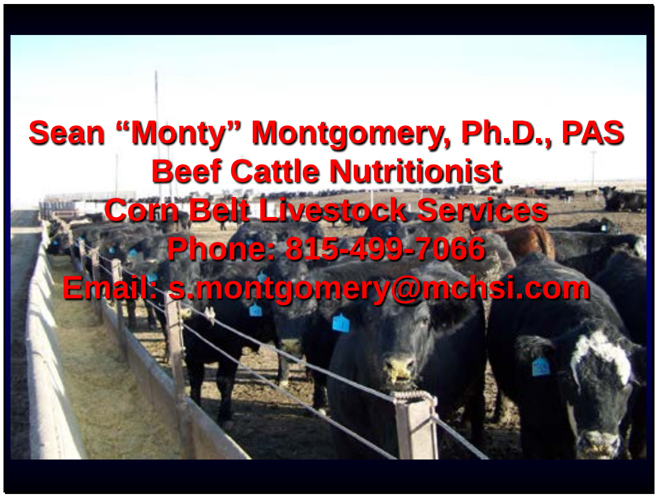
Montgomery (2006).

Rumensin Coefficient of Variation (CV)



[a]Calculated using a total of three bunk samples from each feedlot.
[b]Values reported on a dry matter basis.

Montgomery (2006).


Sean “Monty” Montgomery, Ph.D., PAS
Beef Cattle Nutritionist
Corn Belt Livestock Services
Phone: 815-499-7066
Email: s.montgomery@mchsi.com

Notes – Notes -- Notes

Be sure to visit the BeefStockerUSA website at:

www.beefstockerusa.org

An information site for stocker producers presented by Kansas State University Research and Extension:

Department of Animal Sciences & Industry

Food Animal Health and Management Center
College of Veterinary Medicine

"Knowledge for Life"