

# KSU BEEF STOCKER FIELD DAY

September 19, 2019  
KSU Beef Stocker Unit



# PROCEEDINGS





**Beef Stocker Field Day 2019**  
**September 19, 2019**  
**KSU Beef Stocker Unit**

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**Table of Contents**

	<u>Page No.</u>
Table of Contents .....	i
Welcome and Thank You .....	ii
Program Agenda .....	ii
Beef Cattle Market Outlook..... <i>Glynn Tonsor, Ph.D., Kansas State University</i>	1
Changing Industry Structure in Forging a Closer Relationship Between Grow Yards And Feeders .....	20
<i>Don Close, Rabo AgriFinance</i>	
Internal Parasite Management..... <i>David Pugh, Traxx Farm and Forge</i>	27
Humane Euthanasia Practices .....	54
<i>A.J. Tarpoff, KSU Extension Beef Veterinarian</i>	
BeefBasic: Better Information for Better Marketing Decisions .....	73
<i>Brett Crosby, Custom Ag Solutions</i>	
Health Management of High Risk Calves .....	86
<i>Dan Thomson, KSU College of Veterinary Medicine</i>	



# Beef Stocker Field Day 2019

## September 19, 2019

### KSU Beef Stocker Unit

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Welcome to the 20<sup>th</sup> 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 Bayer 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.



**CYDECTIN<sup>®</sup>**  
(moxidectin)





# Beef Stocker Field Day 2019

## September 19, 2019

### KSU Beef Stocker Unit

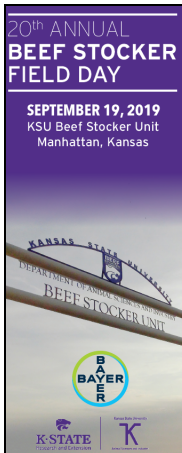
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- 9:30 am Registration/Coffee
- 10:15 am Introductions
- 10:30 am Beef Cattle Market Outlook  
*Dr. Glynn Tonsor, KSU Agricultural Economist*
- 11:15 am Changing Industry Structure in Forging a Closer Relationship  
Between Grow Yards and Feeders  
*Don Close, Rabo AgriFinance*
- 12:00pm Niman Ranch CAB® Natural Prime Ribeye Lunch – View posters
- 1:00 pm Internal Parasite Management  
*David Pugh, Southern Traxx Farm and Forge*
- 2:00 pm Humane Euthanasia Practices  
*Dr. AJ Tarpoff, KSU Extension Beef Veterinarian*
- 2:45 pm Break
- 3:15 pm BeefBasic: Better Information for Better Marketing Decisions  
*Brett Crosby, Custom Ag Solutions*
- 4:15 pm Health Management of High Risk Calves  
*Dan Thomson, KSU College of Veterinary Medicine*
- 5:00 pm Panel Discussion: Beef Parasite Control  
Wes Ishmael, moderator  
*Ty Brunswig, Animal Medical Center*  
*AJ Tarpoff, KSU Extension Beef Veterinarian*  
*David Pugh, Southern Traxx Farm and Forge*
- 5:30 pm Cutting Bull's Lament 2019

# **Notes – Notes -- Notes**

# Beef Cattle Market Outlook


Glynn Tonsor, Ph.D.  
Kansas State University



20<sup>th</sup> ANNUAL  
**BEEF STOCKER  
FIELD DAY**  
SEPTEMBER 19, 2019  
KSU Beef Stocker Unit  
Manhattan, Kansas

*Beef Cattle Market  
Outlook*

Glynn T. Tonsor  
Dept. of Ag. Economics, Kansas State University  
[gtonsor@ksu.edu](mailto:gtonsor@ksu.edu) Twitter: @TonsorGlynn



Logos for Kansas State University, Beef Stocker Unit, Bayer, and K-State are also present.

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## Overarching Beef Industry Economic Outlook

- Supplies
  - Commercial Beef Production Up, Increases Moderating
    - +3.8% in 2017, +2.6% in 2018, +1.2% in 2019, +1.0% in 2020

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## Overarching Beef Industry Economic Outlook

- Supplies
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- Demand
  - Key to supporting prices

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## Overarching Beef Industry Economic Outlook

- Supplies
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    - +3.8% in 2017, +2.6% in 2018, +1.2% in 2019, +1.0% in 2020
- Demand
  - Key to supporting prices

**Consider Price Changes (vs. prior year)**

- 5-mkt Live avg:     2017 (+1%), 2018 (-4%), 2019f (0%)
- 7-800# SP:         2017 (+2%), 2018 (+1%), 2019f (-4%)
- 5-600# SP:         2017 (0%), 2018 (+3%), 2019f (-4%)

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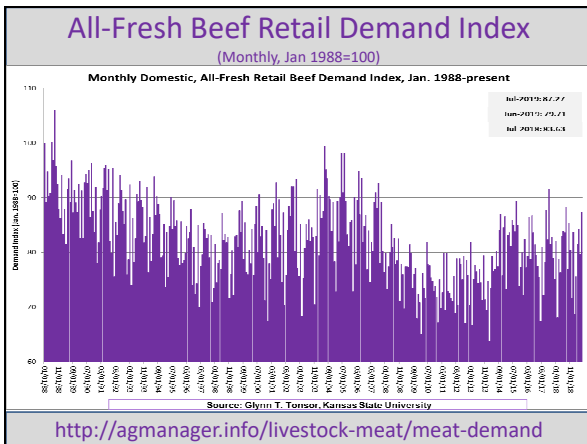
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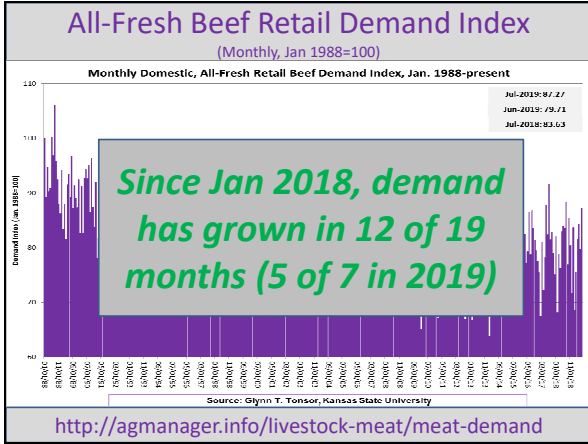
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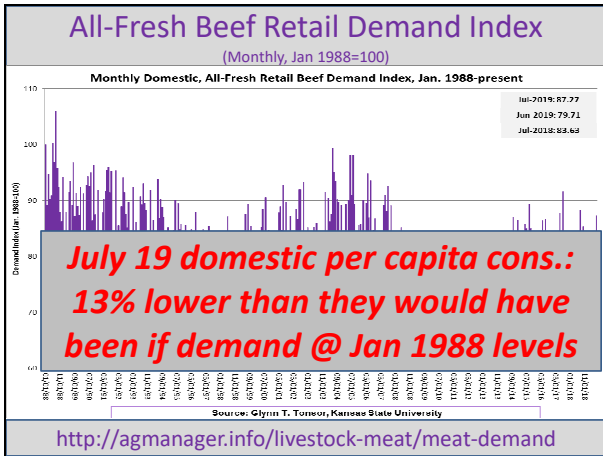
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## Beef Demand Overview

Glynn T. Tonsor  
Dept. of Ag. Economics  
Kansas State Univ.  
[gtonsor@ksu.edu](mailto:gtonsor@ksu.edu) @TonsorGlynn

Committee Leadership Summit  
Denver, CO  
December 11, 2018

<https://www.agmanager.info/beef-demand-overview>

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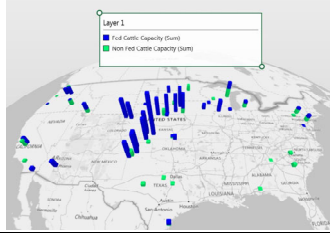
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## Holcomb-Tyson Plant Fire

- Date: August 9th
- Processing Capacity Involved: 6k/day
  - ~5% of US Capacity (~24% of KS Capacity)
- Processor Map




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## Holcomb-Tyson Plant Fire

**USNews** CIVIC  
**Tyson Officials Say Welding Spark Likely Caused Holcomb Fire**  
 Tyson officials say a spark from welding during maintenance is the likely cause of a fire that damaged the company's plant in Holcomb.  
 By Associated Press, Wire Service Content Aug. 15, 2019

8/21/2019 Tyson Foods slaughterhouse fire ignites U.S. beef prices - Reuters  
**REUTERS**

Markets  
**Livestock Markets Jolted by Tyson Beef Plant Fire**  
 By Lydia Mulvany  
 August 19, 2019, 12:29 PM CDT  
 ▶ Retail buyers are in a bidding frenzy, fearing shortfalls  
 ▶ Pricier beef may be coming to consumers sooner than expected  
 8/21/2019 Fire That Destroyed Top U.S. Beef Plant Upends Livestock Market - Bloomberg

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## Holcomb-Tyson Plant Fire

- Price Impact on Cattle
  - Expected:
    - Derived Demand Decline = Cattle Price Decline
  - Realized:
    - CME limit down 1<sup>st</sup> two days
    - LC Cash down \$5-\$7 1<sup>st</sup> week; FC Cash down ~\$10




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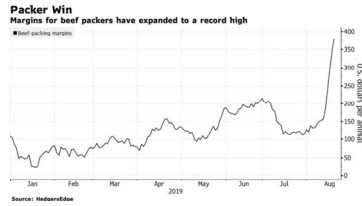
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## Holcomb-Tyson Plant Fire

- Price Impact on Beef
  - Expected:
    - Processing Cost Up = Beef Price Increase
  - Realized:
    - Two largest daily cutout price increases on-record (post-MPR)




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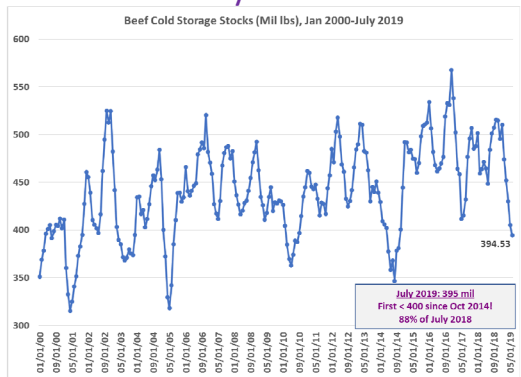
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## Holcomb-Tyson Plant Fire




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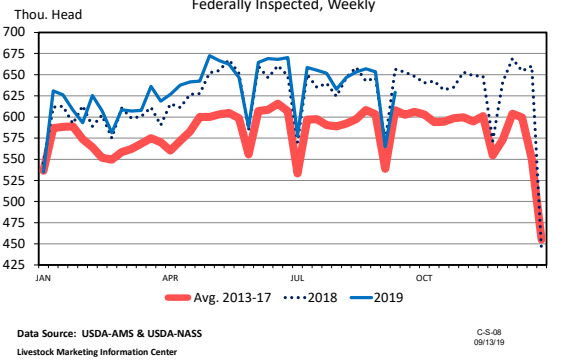
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## CATTLE SLAUGHTER

Federally Inspected, Weekly




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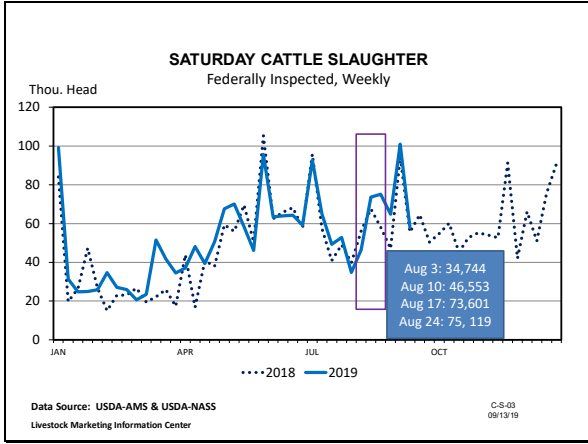
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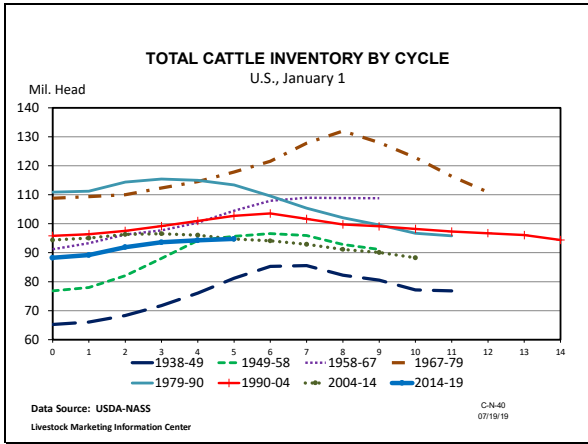
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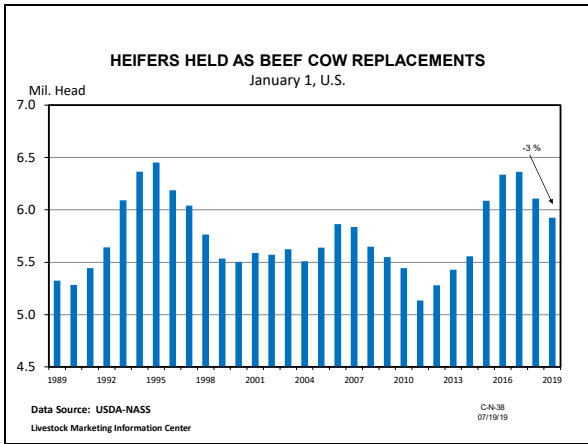
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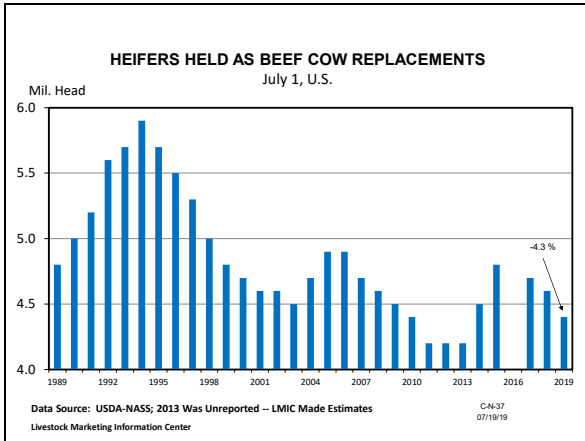
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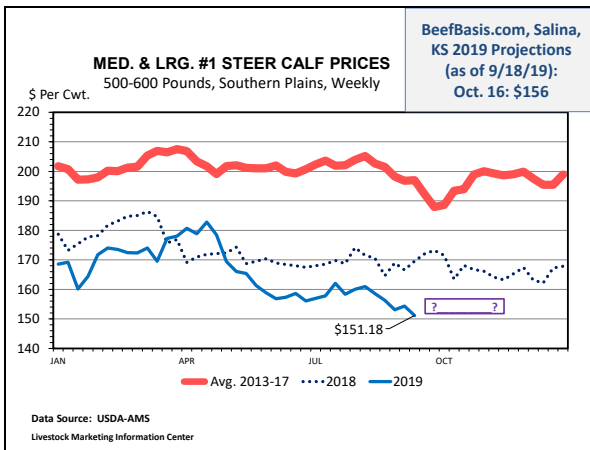
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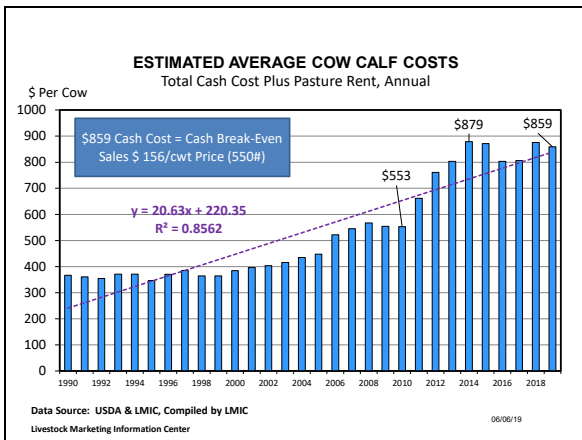
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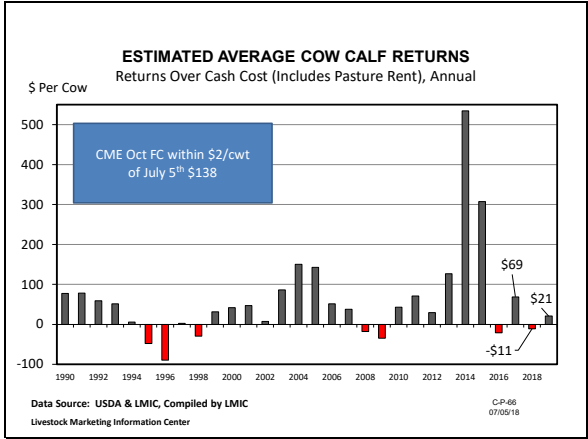
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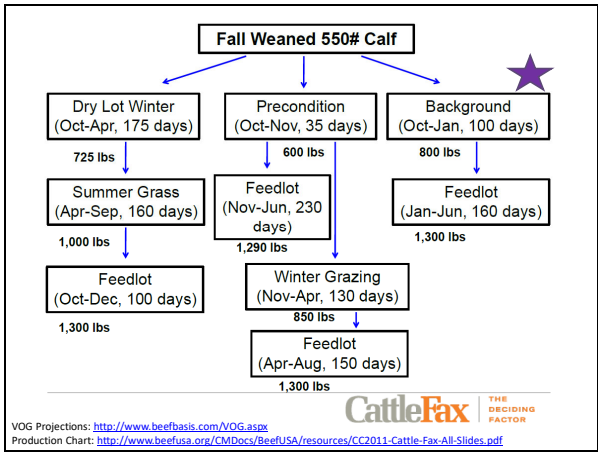
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**Economic Outlook Overview: Post Weaning**  
*Forward-Looking Margin Perspective*  
<http://www.beefbasis.com/VOG.aspx>

- Salina, KS 9/18/19 Backgrounding situation:
  - Buy/Retain 550 lb steer on 10/16/19 (\$156)
  - Sell 750 lb steer on 1/15/20 (\$136) {2.2 ADG}
  - VOG: \$80/cwt
    - Compare to COG & Assess “stomach” for volatility

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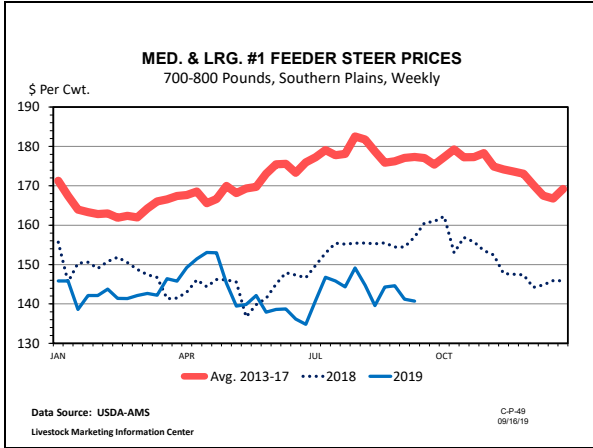
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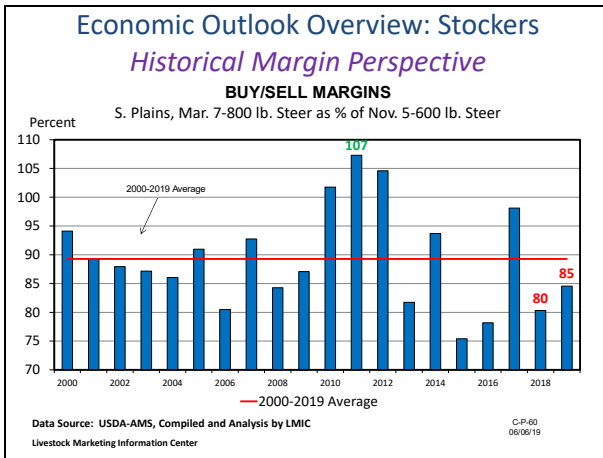
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## USDA LRP Changes July 1

<https://www.fsa.usda.gov/News-Room/Press-Releases/2019/USDA-Announces-Enhancements-to-Livestock-and-Dairy-Insurance-Programs>

4/29/2019    USDA Announces Enhancements to Livestock and Dairy Insurance Programs | IRMA

**USDA**  
United States Department of Agriculture

**News Release**

### USDA Announces Enhancements to Livestock and Dairy Insurance Programs

**KSU-Feeder Cattle Risk Management Tool**

An Excel spreadsheet for evaluating feeder cattle risk management strategies

**AgManager**  
Version- 4.24.2019

<https://www.agmanager.info/k-state-feeder-cattle-risk-management-tool>

KANSAS STATE UNIVERSITY    Agricultural Economics

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USDA United States Department of Agriculture <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/livestock-indemnity/index>

Farm Service Agency  
LIP

## Livestock Indemnity Program

FACT SHEET  
July 2019

The Agriculture Improvement Act of 2018 (the 2018 Farm Bill) authorized the Livestock Indemnity Program (LIP) to provide benefits to eligible livestock owners or contract growers for livestock deaths in excess of normal mortality caused by eligible loss conditions, including eligible adverse weather, eligible disease and attacks by animals reintroduced into the wild by the federal government or protected by federal law, including wolves and avian predators. In addition, LIP provides assistance to eligible livestock owners that must sell livestock at a reduced price because of an injury from an eligible loss condition.

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USDA United States Department of Agriculture <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/livestock-indemnity/index>

Farm Service Agency  
LIP

## Livestock Indemnity Program

FACT SHEET  
July 2019

DATE OF LIVESTOCK DEATH AND/OR INJURY	FINAL DATE TO FILE NOTICE OF LOSS	FINAL DATE TO SUBMIT AN APPLICATION FOR PAYMENT
Calendar year 2019 and all subsequent years	30 calendar days of when the loss is first apparent	60 days after the calendar year in which the eligible loss condition occurred

"Yes, Republic County, Kansas has about 110 Notice of Losses filed for 2019 LIP - compared to last year with zero Notice of Losses filed under LIP. The majority of the Notice of Losses were filed due to the extreme cold, there are a few losses due to blizzard as well," said Sarah Heeger, County Executive Director/Republic County FSA in Belleville, Kansas.

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## Economic Outlook Overview: Feedlots

- 2019 remains rough

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**Historical and Projected Kansas Feedlot Net Returns  
(as of 9/13/19')**

<http://www.agmanager.info/livestock/marketing/outlook/newsletters/FinishingReturns/default.asp>

**July 19':  $-\$77/\text{steer}$**

**Table 1. Projected Values for Finishing Steers in Kansas Feedyards\***

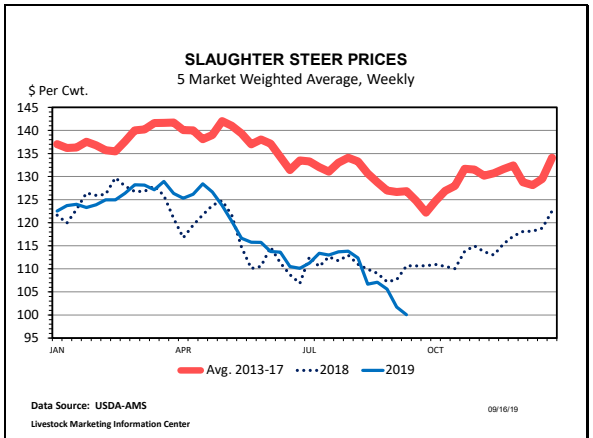
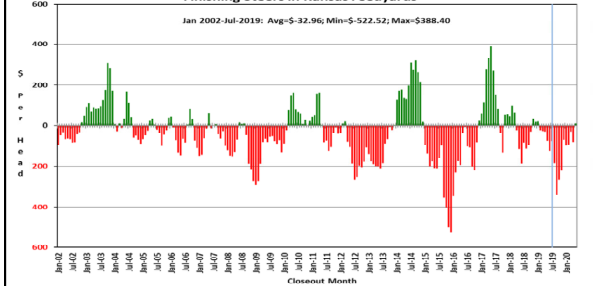
Closeout Mo-Yr	Net Return	FCOG**	Fed Price	Fed Futures	Fed Basis	Feeder Price	Breakeven FCOG**	Breakeven Fed Price	Breakeven Feeder Price
Aug-19	-184.99	88.84	106.97	104.55	2.41	141.45	58.91	120.17	117.83
Sep-19	-339.70	89.69	98.44	98.07	0.36	143.01	33.21	122.41	101.37
Oct-19	-263.99	89.11	105.82	104.38	1.45	148.98	47.15	124.48	115.40
Nov-19	-223.43	90.83	106.45	104.38	2.08	144.23	56.96	121.95	115.66
Dec-19	-69.68	91.25	112.60	111.10	1.50	135.60	80.55	117.45	126.70
Jan-20	-99.60	91.86	112.42	111.10	1.32	139.20	76.46	119.50	126.08
Feb-20	-93.64	97.68	115.86	115.05	0.81	138.13	82.23	122.59	126.19
Mar-20	-28.89	97.16	119.07	115.05	4.02	136.14	92.27	121.22	132.30
Apr-20	-81.02	93.19	111.15	107.95	3.20	133.23	80.02	117.15	122.21
May-20	9.91	91.53	116.55	107.95	8.60	133.18	93.08	115.82	134.55

Representative Barometer for Trends in Profitability

**Historical and Projected Kansas Feedlot Net Returns  
(as of 9/13/19')**

<http://www.agmanager.info/livestock/marketing/outlook/newsletters/FinishingReturns/default.asp>

**Figure 1. Historical & Projected Average Net Returns for  
Finishing Steers in Kansas Feedyards**



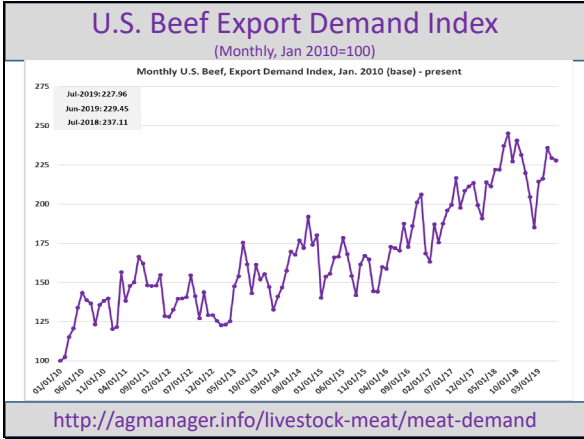
Quarterly Forecasts (LMIC: 7/28/19)

Year	Comm'l Slaughter	% Chg. from Year Ago	Average Dressed Weight	% Chg. from Year Ago	Comm'l Beef Production	% Chg. from Year Ago
2018						
I	7,878	2.1	820.9	0.5	6,466	2.6
II	8,426	4.3	798.2	0.6	6,726	5.0
III	8,361	1.3	815.5	-0.1	6,819	1.2
IV	8,341	2.4	822.7	-0.6	6,862	1.8
Year	33,005	2.5	814.2	0.1	26,872	2.6
2019						
I	7,934	0.7	808.4	-1.5	6,414	-0.8
II	8,573	1.7	794.8	-0.4	6,814	1.3
III	8,599	2.8	817.2	0.2	7,027	3.1
IV	8,365	0.2	829.0	0.8	6,926	0.9
Year	33,461	1.4	812.3	-0.2	27,182	1.2
2020						
I	7,996	0.8	818.1	1.2	6,542	2.0
II	8,489	-1.0	808.9	1.8	6,867	0.8
III	8,480	-1.4	831.8	1.8	7,054	0.4
IV	8,247	-1.3	847.8	2.3	6,992	0.9
Year	33,212	-0.7	826.6	1.8	27,453	1.0

Quarterly Forecasts (LMIC: 7/28/19)

Quarter	J-Mkt Avg	% Chg. from Year Ago	Feeder Steer Price Southern Plains	
			7-800#	5-600#
2018				
I	125.60	2.1	148.73	180.01
II	116.72	-12.1	144.52	170.11
III	111	-1.7	156	170
IV	115	-2.4	151	166
Year	117	-3.7	150	171
2019				
I	125.27	-0.1	142.87	171.41
II	118.79	1.5	143.23	167.22
III	110-112	0.2	143-146	156-160
IV	114-117	0.2	143-147	156-161
Year	117-118	0.3	143-145	163-166
2020				
I	122-126	-1.0	140-145	160-167
II	118-123	1.4	143-149	161-169
III	106-112	-1.8	144-151	163-172
IV	113-120	0.9	146-154	163-174
Year	116-119	0.0	144-149	163-169

Trade & Total Meat Context Update




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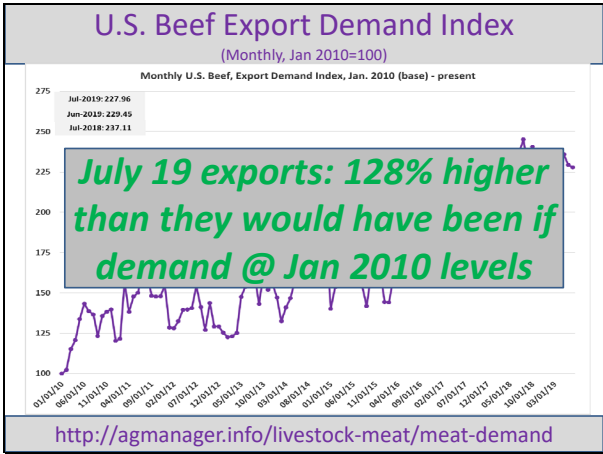
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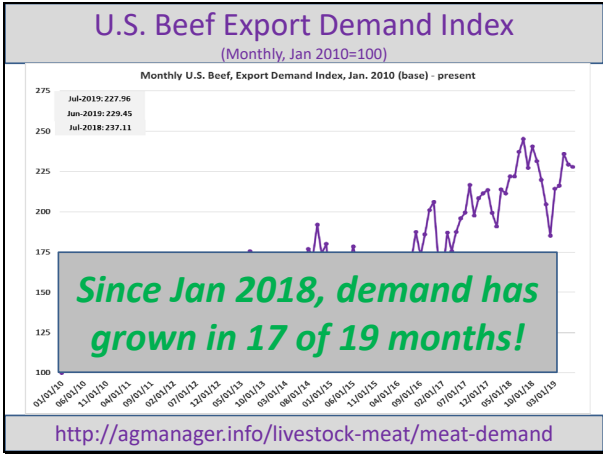
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## 2018 Beef Exports were stellar!

- USMEF, 2018 (estimated) vs. 2017:
  - U.S. exports +15% in value (~ \$8.3 Billion)
    - ☐ U.S. export growth: Korea, Japan, & Taiwan
- Global trade value +9%
  - China accounts for 80% of global trade growth
    - ☐ Dominated by South America & Australia (U.S. ~2% share)

[https://www.usda.gov/oce/forum/2019/speeches/Erin\\_Borrer1.pdf](https://www.usda.gov/oce/forum/2019/speeches/Erin_Borrer1.pdf)

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## USDA Long-Term projections

3/13/19 report (<http://www.usda.gov/oce/commodity/projections/>), October 2018 Projections

Per capita meat consumption, retail weight				
Item	2018	2019	2020	2028
Beef	57.2	58.8	59.7	58.4
Pork	50.8	53.1	53.4	54.3
Total red meat	109.3	113.2	114.4	114.0
Broilers	92.4	93.4	93.7	94.3
Turkeys	16.2	16.4	16.2	15.5
Total poultry	110.0	111.1	111.2	111.2
Red meat & poultry	219.3	224.3	225.6	225.2

Note: Totals may not add due to rounding.

Year	Total Red Meat & Poultry
1995	205.4
2000	214.4
2005	219.7
2010	207.5
2014	200.1

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## USDA Long-Term projections

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Total poultry	110.0	111.1	111.2	111.2
Red meat & poultry	219.3	224.3	225.6	225.2

Note: Totals may not add due to rounding.

**Projections INCLUDE export maintenance & growth**

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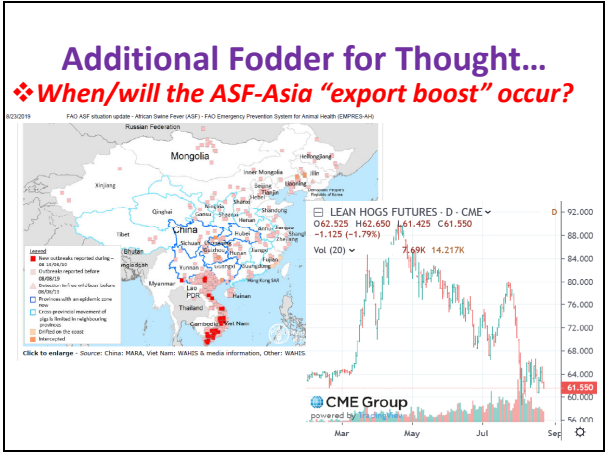
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### Additional Fodder for Thought...

**❖ What is role of "alternative proteins" in future of U.S. livestock?**

BUSINESS NEWS  
 AUGUST 19, 2019 / 1:13 PM / 3 DAYS AGO

**REUTERS**

**Plant-based meat alternatives crowd U.S. grocery stores**

1. Beyond Meat (Whole Foods, Kroger, Albertsons)
2. Impossible Foods (July 31<sup>st</sup> FDA approval to sell in grocery stores)
3. Nestle (Awesome Burger in Germany, US plans for fall 2019)
4. Tyson Foods (Vegetarian-Mixed Protein lines; nuggets in already)
5. Smithfield Foods (Plant-based burgers – Kroger, Sprouts, Target)

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### Additional Fodder for Thought...

**❖ What is role of "alternative proteins" in future of U.S. livestock?**

BUSINESS NEWS  
 AUGUST 19, 2019 / 1:13 PM / 3 DAYS AGO

**REUTERS**

**Plant-based meat alternatives crowd U.S. grocery stores**

**& IMO:**  
**Role in Food Service is even greater...**

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## Outlook Wrap-Up

- Broad Profitability Outlook
  - Supply side factors are “well established”
    - Herd size plateau (?)
  - Demand factors are key and uncertain
    - What will be beef (and meat broadly) export situation?
    - When will next U.S. recession occur?
  - **Will favorability of high-protein diet (and cattle’s role) persist?**

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More information available at:



This presentation will be available in PDF format at:  
<http://www.agmanager.info/about/contributors/individual/tonsor.asp>

Glynn T. Tonsor  
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Email: [gtonsor@ksu.edu](mailto:gtonsor@ksu.edu)  
Twitter: @TonsorGlynn

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**Utilize a Wealth of Information Available at  
AgManager.info**

### About AgManager.info

AgManager.info website is a comprehensive source of information, analysis, and decision-making tools for agricultural producers, agribusinesses, and others. The site serves as a clearinghouse for applied outreach information emanating from the Department of Agricultural Economics at Kansas State University. It was created by combining departmental and faculty sites as well as creating new features exclusive to the AgManager.info site. The goal of this coordination is to improve the organization of web-based material and allow greater access for agricultural producers and other clientele.



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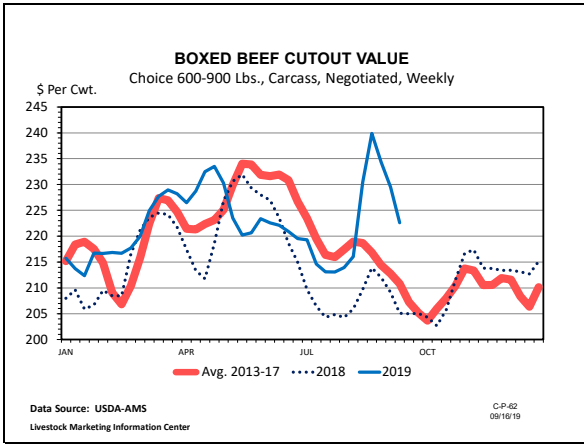
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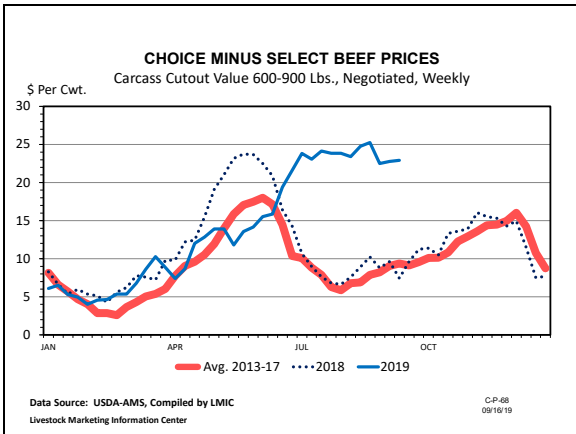
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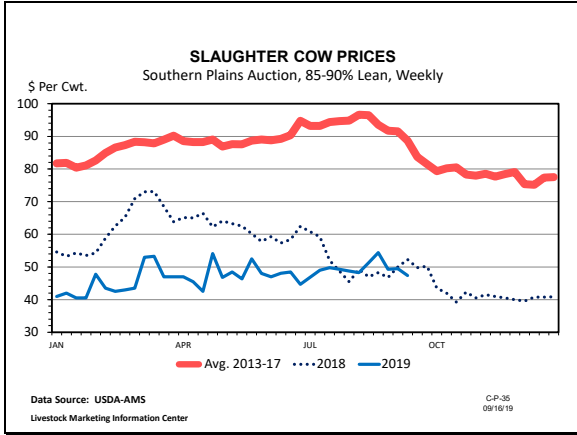
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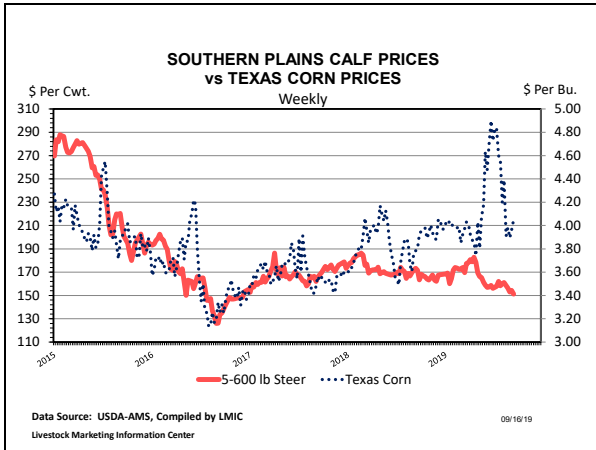
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# Notes – Notes -- Notes

# Changing Industry Structure in Forging a Closer Relationship Between Grow Yards and Feeders

Don Close  
Rabo AgriFinance

**GROWING AMBITION**

**Growth in the Background**

Changing Cattle Industry Structure Increases the Role for Grow Yards

Presented By:  
Don Close

Rabo AgriFinance

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**GROWING AMBITION**

**Conventional Role of Grow Yards**

- Care for High Risk Cattle
- Residual Housing for When the Market Became Out of Balance
  - Poor Grazing Conditions
  - Feed Yards Became Backed up
  - Calf Prices Extremely Under Valued

Rabo AgriFinance

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**GROWING AMBITION**

**Drivers Behind the Change**

- Growth Potential in the Cattle
- Labor Availability
- Feed Yards are Bigger, Often Multiple Locations Making Handling Light-Weight and High-Risk Cattle a Bigger Challenge
- Formula Marketing has Feeders Needing More Assurance of Gains, Costs and Out Dates
- Efficiencies and Economy of Scale

Rabo AgriFinance

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GROWING AMBITION

### Benefits for Commercial Feeders

- A Central Collection Point for Cattle
- A Place to Enable Cattle to Mature and Grow Structurally
- A Pre-Conditioning Area to Get Cattle to Desired Weight and Condition to be Ready to Perform
- Enables the Opportunity to Identify and Pull Non-Performing Cattle Early




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GROWING AMBITION

### Benefits to Commercial Feeders (Cont.)

- Expands Purchase Weights to Take Advantage of Seasonal Cattle Movement
- Enables Buying Staff to Have Cattle In Inventory
- Earlier Ownership Enables Cattle Feeders to Identify Hedge Opportunities
- Better Determines Cost and Projected Out Dates to Commit to Limited Hook Space




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GROWING AMBITION

### Grow Yard Owners

- Currently Grow Yards Say Their Best Spot is to Have 2 to 4 Commercial Feeders to Assure an Active Buyer
- Multiple Feed Yard Clients Allows Targeting Specific Cattle Types to Specific Feeders





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GROWING AMBITION

### Rabo Projects Stronger Alliances Coming

- Drive to Increased Efficiencies
- Improves Economy of Scale
- Allows Use of Same Nutritionist and Veterinarians
- Enables Almost Seamless Transition to Feed Yard




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GROWING AMBITION

### Challenges to Alignment

- Fair Compensation to Grow Yard Owners
- Clear Expectations for Grow Yard and Feeders
- Clear Understanding of Death Loss Accountability
- Determination of Accepting Stressed or High-Risk Cattle




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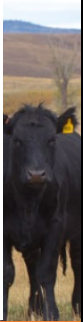

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GROWING AMBITION

### Industry Impacts

*Cow /Calf Sector*

- Increases Bidders for Cow/ Calf Sector
- Allows Moving Away From Periods of Peak Sales
- Potentially Eases Pressure On Grazing Lease Rates


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GROWING AMBITION

## Industry Impacts

### Conventional Stocker

- Increases Competition for Calves
- Potentially Eases Competition for Available Grass, Slowing Increase in Grass Lease Rates




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GROWING AMBITION

## Cattle Feeders

- Eases Labor Requirements for Feed Yards
- Cattle are Pre-Conditioned to Bunk Feeding & Water
- Eases Risk of Pen Pulls in the Feed Yard
- Identifies Non-Performing Cattle Before Yard Placement
- Increases Chances of Cattle Meeting Performance Expectations
- Better Project Daily Gains, Cost and Potential Out Dates
- Eases Pressure on Procurement Teams




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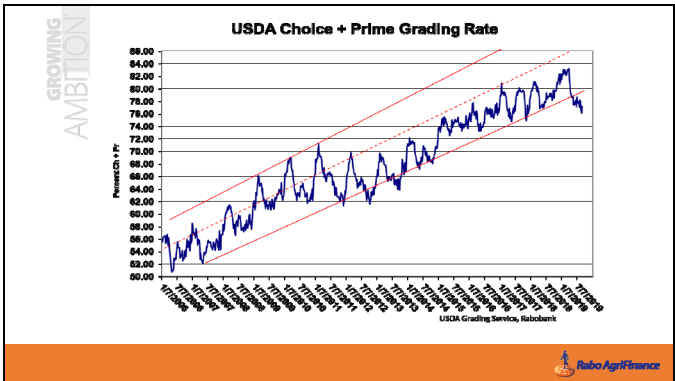
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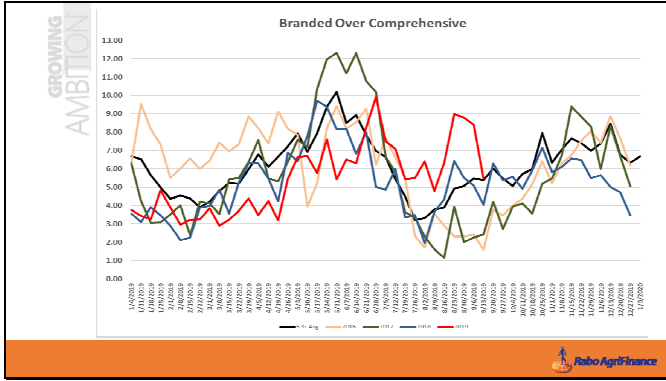
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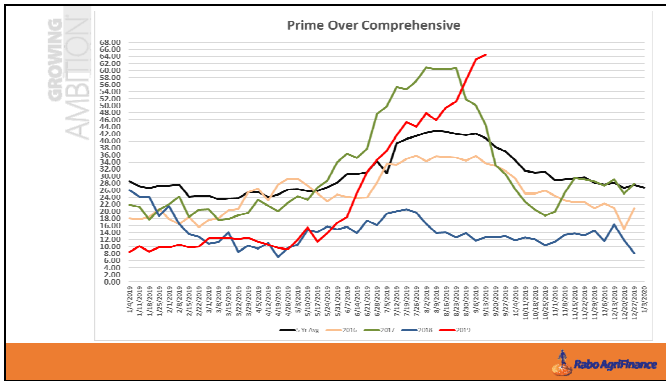
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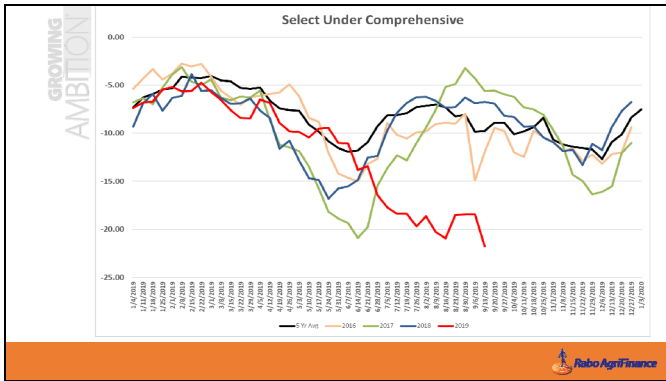
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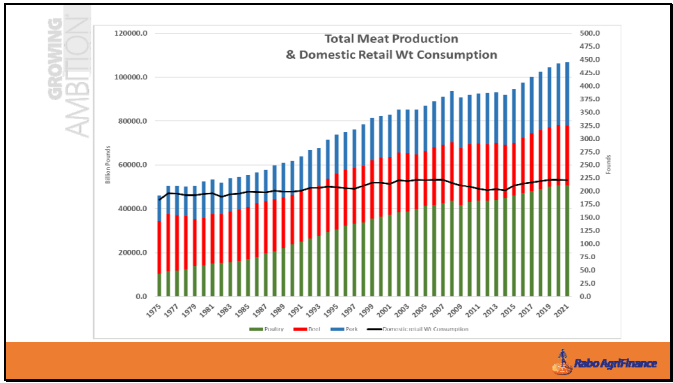
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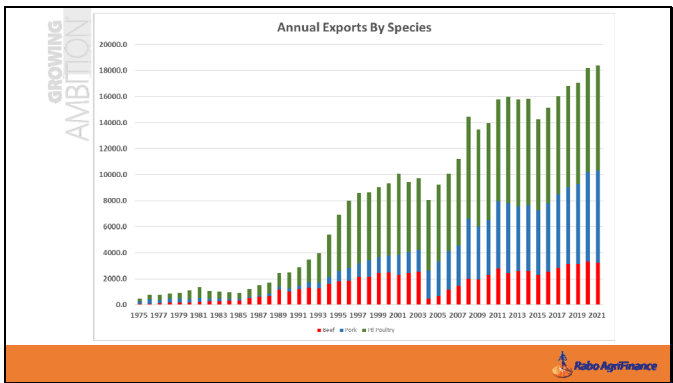
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**Thank you**


**Don Close**  
*VP, Food and Agribusiness Research,  
 Animal Protein*

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**Notes – Notes -- Notes**

# Internal Parasite Management

David Pugh  
Southern Traxx Farm and Forge



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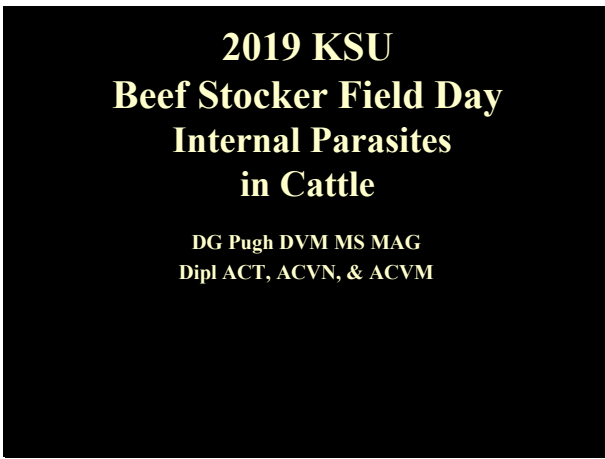
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## Herd Health

Nutrition

## Parasite Control

(Internal & External)

Biosecurity

Reproduction

(cows, heifers, bulls, calving management, etc)

Vaccination

Genomic

Stress Management

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## Value added Forage Producers



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## What do Cattle Producers Do?

- "WE ARE GRASS FARMERS" (Gordon Hazard, DVM)
- We are **Green**

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“The FAQ, which Alexandria Ocasio-Cortez’s office removed from her website amid online backlash (although it is still available on NPR’s website) “  
<https://apps.npr.org/documents/document.html?id=5729035-Green-New-Deal-FAQ>

LAUNCH: Thursday, February 7, at 8:30 AM.

Overview

We will begin work immediately on **Green** New Deal bills to put the nuts and bolts on the plan described in this resolution.....

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Pg 2

“We set a goal to get to net-zero, rather than zero emissions, in 10 years because we aren’t sure that we’ll be able to fully get rid of **farting cows** and airplanes that fast.....”

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### What do Cattle Producers Do?

- “WE ARE GRASS FARMERS” (Gordon Hazard, DVM)
- We are **Green**
- Converting Grass to Beef
- Feeding People

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What do Cattle Producers Do?  
Help feed the World

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Source of greatest amount of  
Dis-Ease



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GI Nematodes can cause dramatic performance loss without overt signs of disease

Most of production loss is due to decreased appetite

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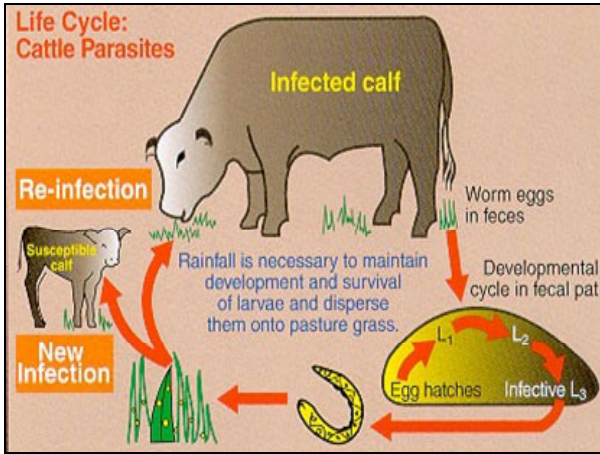
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**Gastro-intestinal Parasites**

- Appetite suppression
- Protein loss
- Host expenditures
  - Tissue repair
  - Mounting an immune response



- Bottle jaw
- Scours
- Weight loss
- Poor hair coat




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**Parasites Generally**

- Have more impact on younger animals in the herd
  - Calves > replacement heifers = second calf
  - heifers > adult animals
- Most parasitism is SUBCLINICAL in nature
  - Clinical parasitism is rare

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## BENEFITS OF DEWORMING

- Improved Health - Better Immune Status, feed efficiency  
(Gasbarre and Stromberg, 1994)
- Increased Weaning Weights - >17-37# ..... Milk production & calf growth (L Jones, WVC 2014)
- Increased Breeding Efficiency - Fertility, Onset of Puberty
- Reduced Pasture Contamination

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## Strongyle Parasites in Cattle

ML resistance in cattle documented 2003, and suspected in AI, Tn, Fl, La, SC, NC, ???... **But inj IVM still >90% reduction**

Strategic Deworming... deworm early in the grazing season.

Poor-ons poorly absorbed

*C puncta*, *Nematodirus*, *Haemonchus* the most significant internal nematode parasites

And ... *Ostertagia* less significant.

( Gasbarre , AVC, Denver 2012)

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## How to Recognize a Resistance Problem

### The warning signs:

- Lower than expected weight gain
- Diarrhea
- Rough hair coat
- Delayed conception
- Increased incidence of disease



If you suspect a resistance problem  
=> Fecal Egg Count Reduction Test (FECRT)  
14 days after the last treatment.

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**Resistance in Cattle Worms  
Does it Occur in USA?**

- Resistance is reported to benzimidazoles (albendazole, fenbendazole) and ivermectin based on <90% reduction in parasites or FEC
- Species involved in USA include *Cooperia*, *Ostertagia* and *Haemonchus* in Ohio, *Haemonchus* and *Cooperia* in the Midwest, and *Ostertagia*, ***Trichostrongylus* in Georgia (6 treatments of IVOMEC and 1 each of EPRINEX and DECTOMAX in a single year)**
  - True resistance must be differentiated from mis-dosing, mis-use or mis-diagnosis

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Increase resistance by the parasites to a de- wormer - Deworm entire group & move to a 'clean 'pasture

Graze stocker calves on a permanent pasture

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**“Now, we are forced to accept the reality that chemical control of helminths is not, by itself, sustainable.**

Strategically and effectively applied chemical intervention, coupled with a raft of non-chemical measures designed to lessen 'economic parasitism' is the recommendation that most parasitologists appear to be advocating.”

(Yazwinski et al, Proceed KVMA, 2018)

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Endectocides Pour- On fly control?

**NO**

**Use Arthropod control  
drugs & programs**

**DUH .....**

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### U of Arkansas Heifer Stocker Study

- 42 mixed breed heifers, for 56 d
- ADG (lb/d)

<b>Cooper Mec</b>	- 1.21
<b>Ivermectin Pour On</b>	- 1.28
<b>Top Line</b>	- 1.30
<b>CONTROL</b>	- 1.30
<b>Ivercide</b>	- 1.36
<b>Ivomec Pour On</b>	- 1.42

Note: NO Significant difference in ADG between groups

Yazwinski et al U of Arkansas 2005

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### Parasite control

- **Avoid Generic pour-ons, dose accurately, handle drugs properly**
- **Maintain Refugia**
  - Avoid deworming all prior to turn out onto clean pastures (worse with ML's)
  - Avoid deworming adult cows going into summer
  - Treat Replacement heifers differently than stockers
  - Avoid permanent pastures for stockers, yr after yr
  - If use LA products ++> feedlot, till ground, use for hay, and keep replacement heifers off Stocker pastures (?)

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## “Important” Nematodes

*Haemonchus placei* & *Cooperia* sp

Mature cows will have low numbers and may serve as source of pasture contamination

*Cooperia* & *Haemonchus* spp resistant to ML's are Dx in > 50% of cattle operations, when examined (reduced feed intake → reduced productivity → economic losses)

(Gasbarre, Vet Parasit, 2014)

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Anthelmintic resistance has continued to increase over the past ~15 years

*Cooperia* & *Haemonchus* spp resistant to ML's are Dx in > 50% of cattle operations, when examined (reduced feed intake → reduced productivity → economic losses)

(Gasbarre, Vet Parasit, 2014)

### Why do we now see anthelmintic resistance ?

Probably the use of very effective nematode control programs

(improved the productivity)

Programs which place selective pressure on the parasite genetics → Resistance

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Anthelmintic resistance has continued to increase over the past ~15 years

### Why do we now see anthelmintic resistance ?

Probably the use of very effective nematode control programs

(improved the productivity)

Programs which place selective pressure on the parasite genetics → Resistance

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## “Important” Nematodes

- #1 *Ostertagia ostertagi*
- Can impact Young & Mature cow productivity
- Cool season lover & do not survive well in hot environments
- Arrested development in animal
  - Hypobiosis - Summer in South
  - Winter in the North

Some Bulls with Type II *Ostertagia* will have scarred gut, poor condition and low FEC (r/o Johnes)

Brahama and x's have very poor immunity to *Ostertagia*



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## “Important” Nematodes

*Haemonchus placei* & *Cooperia* sp

Calves Stocker (mostly)

Warm Season parasite

Cattle develop immunity by yearlings (usually)

Mature cows will have low numbers and may serve as source of pasture contamination

*Cooperia* & *Haemonchus* spp resistant to ML's are Dx in > 50% of cattle operations, when examined (reduced feed intake, reduced productivity, economic losses)  
(Gasbarre, Vet Parasit, 2014; Kaplan, NAVC, 2010)

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## “Important” Nematodes

*Haemonchus placei*

Barber pole worm

Likes it hot

**Ivermectin resistance** (Kaplan, 2010)

*Cooperia* species

Prolific egg producers

Not notorious pathogen, but ...**stockers**

White wormers – good control

**Ivermectin resistance** (Kaplan, 2010; Yazwinski, 2014)

(Driven by pour-on's) (Jones, 2014)

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## Parasite Problems in Cattle

Stocker operations => buildup of anthelmintic resistance parasites

Intensive rotational grazing + young animals + frequent deworming + **Cooperia**  
=> Resistant Parasites

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ML resistant *Cooperia* & *Haemonchus* spp can survive a single TX with a single ML and be transported in the calf from southeastern USA to Mid western states.

A combo of ML & levamisole was very effective in decreasing the transport of ML surviving parasite to the upper Mid west  
(LL Smith, 2013)

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Topical generic Ivermectin efficacy (%'s) against:  
*Cooperia oncophora* - **93.0**  
*C. punctata* - **73.4**

Topical moxidectin efficacy (%'s) against:  
*Cooperia oncophora* - **99.3**  
*C. punctata* - **99.9**

Injectable moxidectin efficacy (%'s) against:  
*Cooperia oncophora* - **46.1**  
*C. punctata* - **93.6**

This data suggest Tx of calves soon after weaning with topical moxidectin is effective (>90% efficacy) for all common nematodes in cattle; where, injectable MOX & Topical IVM have limited effectiveness against *Cooperia* spp.

(Yazwinski et al, Vet Parasit, 195: 95-101, 2013)

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**ML's**

**PO** – reduced systemic availability → high conc at site of GI parasite  
→ enhanced parasite exposure to active drug at mucosa and GI lumen  
→ **Improved clinical efficacy against GI resistant nematodes**

**SC** – enhanced absorption, increased systemic availability/reduced drug conc in GI lumen  
→ reduced exposure to GI located nematodes to active drug  
→ **Limited efficacy** (Lanusse et al , Vet Parasit, 204;18, 2014)

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**Evaluation of long-acting eprinomectin compared to conventional anthelmintics in cow/calf production**

**MOX + OXF ( PO & Orally) vs LAE in fall born, weaned heifer calves over 182 d ~? ?**

**OXF vs LAE in Spring calving cows were treated, weaning weights were lower (P=0.03) for LAE compared to OXF.**

(Backes, PHD dissertation UA, ProQuest Dissertations Publishing, 2016)

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**122 yearling pastured heifers with a history of anthelmintic resistance (California), moved to dry lot (Idaho)**

**Fifty highest FEC were examined for Tx and FECRT**

**Ivermectin treatment (SC) resulted in no reduction in adult *Cooperia* spp.**

**vs**

**Moxidectin TX (SC) caused an **88%** parasite reduction**

(Edmonds +, Vet Parasit 2010)

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2017 Stocker cattle study:  
Cattle were treated w/ saline, OR doramectin (INJ) + albendazole (PO) OR eprinomectin extended-release injection then continuously grazed by treatment group for **118d**

This study cattle were treated with Injectable ivermectin, doramectin, and moxidectin

Day 15 post TX FEC were:

<u>FEC</u>	<u>FECR</u>	<u>Drug</u>
177	57%	Ivermectin
335	41.2%	Doramectin
28	91.2%	Moxidectin

Coproculture larvae populations were mostly **Haemonchus placei** & **Cooperia punctate**

(Yazwinski ++ Bovine Practitioner, 2017)

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## Parasites Problems in Cattle

Cow-calf herds are less likely to experience resistance (although documented)

Stocker heifers redirected back to cow-calf may intro resistant parasites

Deworming all prior to turnout to summer pastures unused (refugia killer)

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## Parasite control

### - Maintain Refugia

Avoid deworming all prior to turn out onto clean pastures (worse with ML's)

Avoid deworming adult cows going into summer

Treat Replacement heifers differently than stockers

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## Parasite control

Avoid permanent pastures for stockers, yr after yr  
If use LA products ++> feedlot, till ground, use for hay, and keep replacement heifers off Stocker pastures (?)

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## Parasite control

- Cull poor doers
- Avoid Generic pour-ons, dose accurately, handle drugs properly

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## Parasite control

- Graze adult cows (or horses/goats) after calves...  
Thus using adult cows as 'vacuum cleaners' for calf parasites
- Avoid 'resistant worms' being introduced to the herd
- Deworm with multiple classes of dewormer (or MOX)
  - drylot for 2 day
  - then move to contaminated pasture
- **Proper nutrition (enhance overall immunity)**

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## Parasites in Cattle

Rotate pastures to maximize nutrition and pasture use, not to control parasites

(but.. will help with parasites)

Drylot for 24-48 hours then turn out onto contaminated pasture

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### Smart grazing management:

Avoid graze below about 5-6 cm (2-3 inches) pasture height.  
Over 80% of larvae are within 3 cm of the soil surface.

#### Manage pasture quality:

To ensure high quality regrowth for next time it is grazed

1- Goat to cattle system; 5-6 cm deep pasture left behind by the goats, it is acceptable to production from cattle.

2 - Goats + cattle Integrated system: cattle and goats prefer different species of forage.

- Goats + cattle

(do not share the same parasite species)

- Goats + sheep

(share the same parasite species)

- Cattle + Sheep

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## Parasites in Cattle

Do not under-dose animals

& (teach) follow label directions for storage

Never deworm all animals pre turnout onto clean pastures (ML's worst) => Refugia Killer

Never deworm older cows pre summer in the south

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Post de-worming, turn out onto contaminated pasture

Never keep replacement heifers that are dewormed and placed on clean pasture

Never use permanent pastures for young stock

Use long-acting dewormers for stockers going to feedyards **ONLY!**

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**Parasites in Cattle**

Pastures grazed by other livestock species

Cows 'clean' stocker pastures

Non-permanent pastures (tilled & planted, hay pastures, crops) are clean  
(Navarre, personal communication, 2017)

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Macrocyclic lactones have been available for >30 years in the USA

ML resistance has been reported and appears to be increasing in U.S.

**Obstacles to change**

Cattle producers are traditionally reluctant to abandon historical practices

Veterinary Practitioners have not traditionally worked with parasite epidemiology

Pharmaceutical companies stockholders have "strong economic incentives for maintaining the status quo"

(McArthur & Reinemyer, Vet Parasit 204:34, 2014)

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Heritability for GIT resistance by cattle is **~0.3**

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**What can we do ?**  
Develop sustainable parasite control protocols which place less selective pressures on the parasites **but** maintain good productivity  
ex: simultaneous use of multiple classes of anthelmintics with different modes of action  
  
targeted/selective treatment of different classes of animals avoid blanket treatment  
(Gasbarre, Vet Parasit 204:3, 2014)

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**In Southern USA Deworm**  
-- 1<sup>st</sup> to 2<sup>nd</sup> calf Heifers (unless Zebu x)  
(Zebu & x's have very poor immunity to Ostertagia)  
-- Adult cows with <5 BCS  
-- Spring born calves in Mid Summer near or at Weaning  
-- Fall born calves near or at weaning  
-- Bulls pre breeding  
(Some Bulls with Type II Ostertagia will have scarred gut , poor condition, and low FEC - r/o Johnes)

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## Beef Cow BCS

-- BCS 6 → pregnancy rate should approach 100%

(if bulls, mineral, etc, etc are normal...???, Spitzer, 1995)

-- BCS 5 → pregnancy rate should approach 94%

-- <BCS 5 → deworm (?)

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## Fecal Egg Counts (FEC)

**Fecal Egg Reduction Test (FERT)** – 90+ % → good

85 % → OK

<70 % → **BAD**

**Fecal Egg Count (FEC)** adult cow – 10

(Bagley)

– 20

(Navarre)

At calving FEC will rise (Immune suppression)

Usually

Lush feed intake → increase FEC

Dry feed intake → decrease FEC

Stocker & Replacement Heifers have highest FEC from 6-18 mo of age → then immunity

**Fecal Egg Count** calf – 50 → 500

Young/new calves will shed few eggs until mid summer

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## To detect Anthelmintic Resistance in Cows

Collect 20 fecal samples from rectum into plastic bag of similar aged animals at time of deworming. Remove excess air & refrigerate

Perform a McMasters

In 14 d collect sample from the 10 highest initial EPG cows

$\frac{\text{Sample 1 EPG} - \text{Sample 2 EPG}}{\text{Sample 1 EPG}} \times 100 = \% \text{ reduction in EPG}$

-- Consider pooled samples for coproculture and sp ID

(C Navarre , 2017)

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Perform McMaster's technique for quantitative fecal egg counts. If sample is 0 on McMaster's, perform a Wisconsin Double Centrifugal Sugar Flotation.

Consider turning pooled fecal samples pre and post treatment for parasite species identification via coproculture

(C Navarre, 2017)

Fecal Egg Count – In cattle, McMasters & Modified Wisconsin double centrifugation have good correlation.

(Divide cow number by 2.3 to compare more favorably with Double Centrifugation Tech's)

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- Short grass favors more aggressive parasite transmission.
  - Cows and especially calves
- Cattle concentration from feeding further increases parasite loads
- Malnutrition diminishes parasite resistance
  - Calves may require additional deworming in early summer.

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- Dewormers will not perform well in malnourished cattle
- If cattle are in poor condition deworming, protein (& E) supplementation, and good quality forage are all needed
- Early wean calves on particularly thin cows

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## Parasitism & Nutrition

- Poor nutrition (protein specifically) diminishes acquired resistance to parasites.
- 
- PPRI periparturient relaxation of immunity
  - Post Partum loss of GIT Immunity  
( Br J Nutr. 2010 Nov;104(10):1477-86; Proc Nutr Soc. 2001 Nov;60(4):515-25)
- Heavy fecal pat density increases parasite deposition and survival (**overstocking**)

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## Parasites in Cattle

Proper nutrition => Increase herd immunity  
=> healthy cows => **Better Productivity**

Use adult cows as “vacuum cleaners”

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Feeding protein at 130% of the required level to ewes will actually abolish the periparturient rise (PPR) in fecal egg count.  
Donaldson et al, JAnimal Science 1998; 67:523-33.

Ewes that were fed high quality protein early in pregnancy developed more body fat. Near lambing time, ewes supplemented with protein early in their pregnancy were able to prevent establishment of an experimental larval challenge better than the unsupplemented counterparts, even though their nutritional plane at time of challenge was the same. The “fatter” more resistant ewes had higher serum leptin levels, suggesting that leptin might be a link between nutritional status and immune function. Valderrabano et al, Vet Parasitol, 141:122-131, 2006.

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**Nematode infected ruminants have higher protein requirements, caused by anorexia, the predominant effect of helminth infections (sheep)** (Coop and Holmes, 1996)

**Cattle benefit from anthelmintic treatment and/or protein supplementation .... But the added value of protein supplementation was unclear from the study.**

(Veronique, Veterinary Parasitology, 235: 15, Pages 113-122)

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Protein supplementation and anthelmintic treatment in cattle resulted in higher weight gains than in cattle receiving an anthelmintic treatment only.

Between those groups, no significant differences could be observed in fecal worm egg counts and hematocrit

(Magaya et al., J. S. Afr. Vet. Assoc 71, 2000, pp. 31-37).

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## **Diet Effects on Immunity**

### **Protein**

**During disease or infection, proteins and amino acids are diverted from normal functions to support the synthesis of immunoglobulins and T-cell- and B-cell-mediated immunity, and they are catabolized for energy production**

(Scrimshaw and SanGiovanni 1997).

**Inadequate protein nutrition impairs cell-mediated immunity and immunoglobulin production**

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## Protien

Blocks, lick tubs and cubes are the most convenient ways to feed

Care should be taken to prevent overeating

Overeating can be partially controlled by feeding plenty of roughage and supplying plenty of fresh water



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## Aqueous Humor

### Cows Not suspected of Ammonia Toxicity

295 µg/dl

495 µg/dl

524 µg/dl

### Cows suspected of Ammonia Toxicity

3,736 µg/dl

6,101 µg/dl

4,118 µg/dl

4,671 µg/dl

2,631 µg/dl

1,479 µg/dl

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## Mechanical Methods

### Non-chemical prevention and control

- Drag harrow or Chain

- Pro: Cowpats unsuitable for fly development

- Con: Pasture less attractive to cattle (harm dung beetle)

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## Decreasing Exposure

- harrowing of un-occupied pastures
  - hot dry summer – safe in 2 – 3 weeks
  - cool wet fall/winter - not safe until spring



(DC Taylor, personal communication, 2013)

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Cattle can produce enough **Dung** to cover 5% to 10% of an acre each year.

If the **Dung** is allowed to set on top of the soil ~ 80% of nitrogen will be lost.

By burying manure, the dung beetle helps save or recycle nitrogen, improving the plant health and pasture production of forage is made available for plant use.

A 650 lb animal will produce 60 lbs of wet manure daily.

One animal - 12 fecal mounds per day

One animal - 4300 fecal mounds per year  
(over 10 tons)



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## What is a dung beetle, and why should we care ?

Dung beetles consume, burying, breed in, and lay eggs in animal fecal waste, improve nutrient recycling and soil structure, help protect livestock from flies and internal parasite.

It is estimated that Dung beetles save the US cattle industry ~\$380 million/ yr

(Losey, & Vaughan, BioScience, 2006)

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## Dung Beetle Fun Facts

Dung Beetles – Bury Feces => decrease irritants by up to 95% (Bornemissza, J Austr Ent Soc, 9:31-41, 1970), decrease GIT nematodes by 55-95% (Fincher, J Parasit 59:396-399, 1973; Fincher, J Parasit 61:759-762, 1975)



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### Dung Beetle Activity Decreasing



Dung beetles reduce viable populations of *Cryptosporidium* oocysts ....58-10%  
(Ryan Exp Parasit 129:1-4, 2011)



[http://ochresearchives.blogspot.com/2012\\_12\\_01\\_archive.html](http://ochresearchives.blogspot.com/2012_12_01_archive.html)

Finished Product !

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Chinese researchers showed that tunneling **Dung beetles** **increased the** amount of inorganic nitrogen found in the soil, enhanced forage production, and promoted **dung** decomposition. (Yamada et al, Grassland Sci, 2007)



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## Save the Dung Beetle

In the 1980's, studies showed the use of avermectins (**ivermectin, eprinomectin, doramectin**) adversely affected dung beetle larvae.

Mortality of larvae occurred in dung from several days to several weeks after treatment.

These drugs are commonly used to control internal parasites in livestock

After routine deworming of livestock with avermectins, the breeding capacity of further generations is reduced for many species of **Dung Beetles**.

(Erouiss, Vet Rec, 2001; Riddill-Smith, Vet Parasit, 1993; Lumaret et al, J App Ecology, 1993; Fincher, Environ Ent, 1992; Floate et al. Annu Rev Entomol, 2005; Kadiri et al Ann Soc Entomol Fr, 1999; Lumaret et al, Vet Res, 2002)

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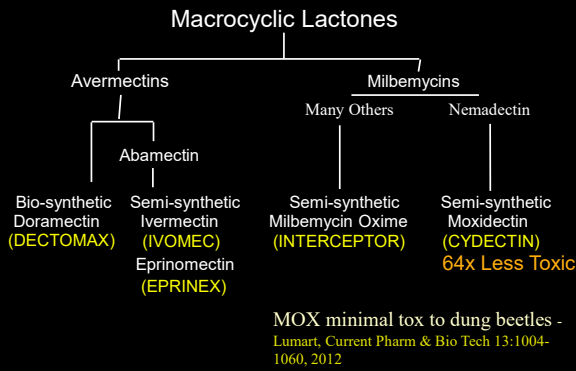
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## Family Tree for Endectocides



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## Any Questions?



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[dgpugh@southerntraxx.com](mailto:dgpugh@southerntraxx.com)

DG Pugh DVM, MS, MAG  
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'We will handle your 2, 4, and reproductive Cycle needs'

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**Keep the Faith**

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### **Drug Resistance**

**Refugia** – The proportion of the population  
(*Haemonchus* - goats & sheep, *Ostertagia* & *Cooperia* – cattle)  
that is not selected by drug treatment

It provides a pool or reservoir of drug-susceptible genes and dilutes the prevalence of resistant genes, and maintains biodiversity within a species

(Martin, Int J Parasit 1981; Van Wyk, Onderstepoort J Vet Res 2001; Sissay, Vet Parasit 2006; Miller, Pugh, Kaplan, Sheep & Goat Med 2, 2012)

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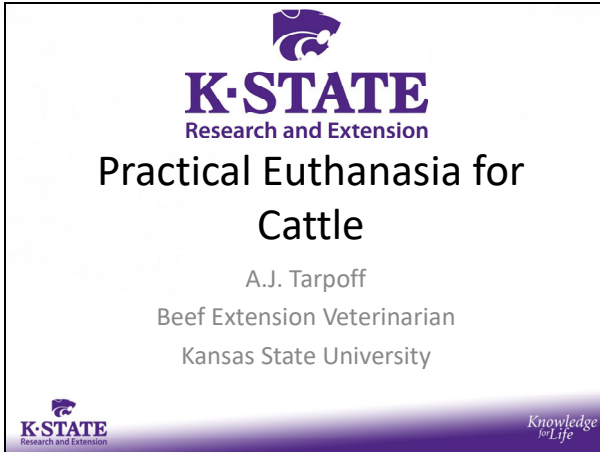
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**Notes – Notes -- Notes**

# Humane Euthanasia Practices

A.J. Tarpoff  
KSU Extension Beef Veterinarian



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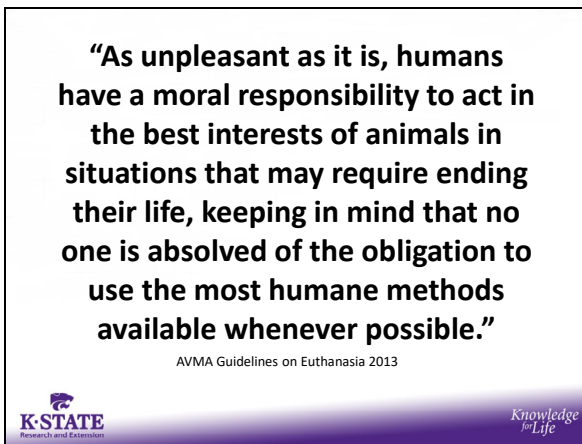
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**Introduction**

- The humane termination of an animals' life
- Use of firearms, captive bolts, or veterinary euthanasia drugs



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Euthanasia means good death



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**Goals**

- Performed in a timely manner
- Method of euthanasia should minimize
  - Pain
  - Distress
  - Anxiety prior to loss of consciousness
- Methods should be:
  - Rapid
  - Performed correctly



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## Animal Selection

- Severely injured and unable to recover e.g. broken leg, broken jaw
- Chronic, severe, or debilitating pain and distress from chronic disease
  - Chronic pneumonia, septic arthritis, poly-arthritis
- Show continuous weight loss or emaciation
  - BCS < 2
- Non ambulatory and nonresponsive for more than 24 hours
  - Nonambulatory animals are not to be dragged



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## Decision Making

1. Pain & distress of animal
2. Likelihood of recovery
3. Ability to get to feed & water
4. Medications used on the animal
5. Drug withdrawal time
6. Economics
7. **Condemnation potential**
8. Diagnostic information



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## Animal Selection



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## Animal Selection for Euthanasia

- Its better to be a week early than a day late!!!
- Euthanasia is meant to end animal suffering
- **Does not = failure**



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## Approved Methods and Equipment

- Firearms
- Penetrating captive bolt
- IV barbiturate overdose



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## Considerations

- Human Safety
- Animal Welfare
- Restraint
- Practicality
- Skill
- Cost
- Aesthetics
- Carcass Disposal



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## Equipment: Firearms

- Firearms used for euthanasia in feedlots may include:
  - Rifles
  - Shotguns
  - Pistols
- Storage may include a locked gun cabinet or trigger lock



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## Equipment: Firearms



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## Equipment: Captive Bolts

- There are several types of captive bolt tools. Two common types are
  - Penetrating or Non-penetrating
- Some captive bolts are designed to stun, where a secondary kill step must be used.
  - Often called a stun gun
- Others are designed as a single step euthanasia method



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### Equipment: Captive Bolts



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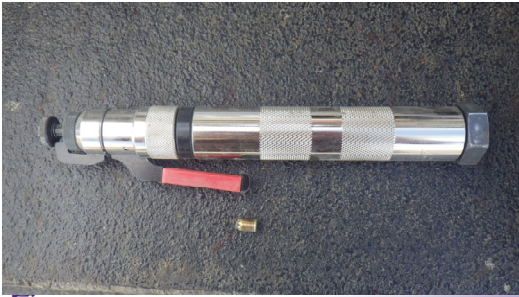
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### Equipment: Captive Bolts



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## Equipment: Cleaning Kit



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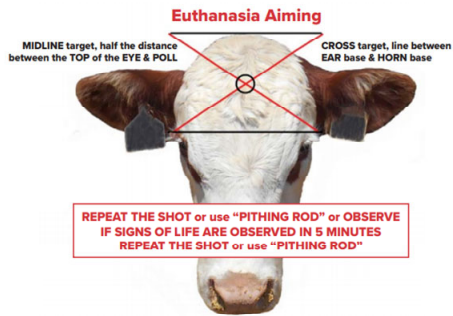
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## Euthanasia Anatomical Landmarks



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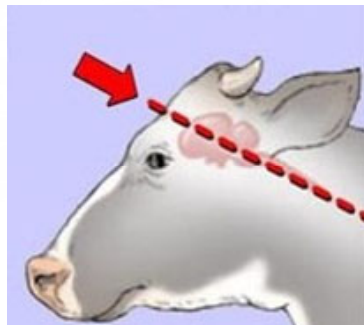
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## Euthanasia Anatomical Landmarks



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**Box 1**  
Safety considerations for firearm use

1. Always treat firearms as though they are loaded.
2. Always be sure that the firearm is pointed in a safe direction.
3. Avoid contact with the trigger until you are ready to fire.
4. Be sure of your target and what is beyond it.
5. Keep bystanders a safe distance behind the shooter at all times.
6. Be sure you are familiar with the firearm and how it functions.
7. To avoid possible explosion of the barrel, never hold the muzzle of a firearm flush against the skull.

Vet Clin Food Anim 34 (2018) 355–374  
<https://doi.org/10.1016/j.cvfa.2018.03.004>

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## Caliber Choice?

- Handguns generally for close proximity only
- Rifles/shotguns give more flexibility
- 450-800lbs- **350ft-lb of ballistic energy**
  - Feeder cattle
- Mature Cattle- **at least 500 ft-lb of ballistic energy**



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**Table 1**  
General recommendations on firearm and ammunition selections for euthanasia of cattle

	Handguns	Rifles	Shotguns
Calves/young animals	.32 or larger caliber Solid-point bullet (within 2-3 ft)	.22 long rifle or larger caliber Solid-point bullet (at close range)	.410-20 gauge 4-6 birdshot or buckshot (within 3-6 ft)
Adult cattle	.32-.45 caliber Solid-point bullet (within 2-3 ft)	.22 magnum or higher caliber Solid-point bullet (at close range)	20-12 gauge Buckshot or slug (within 3-6 ft)
Mature bulls	.38-.45 caliber Solid-point bullet (within 2-3 ft)	.22 magnum or higher caliber Solid-point bullet (at close range)	20-12 gauge Buckshot or slug (within 3-6 ft)

Shearer et. al. *Vet Clin Food Anim* 34 (2018) 355-374  
<https://doi.org/10.1016/j.cvfa.2018.03.004>



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Cartridge Ballistic Energy	ft-lb
<b>Ballistics*</b>	
<b>Small Handgun &amp; Small Caliber Rifle</b>	
22 Magnum	360
22 Hornet	733
<b>Handgun (FMJ unless otherwise noted)</b>	
9 MM	360
357 Magnum, SP (Soft Point)	537
40 SW (Smith & Wesson)	490
44 Magnum	741
45 ACP (Automatic Colt Pistol)	404
45 Colt, LRN (Lead Round Nose)	410
<b>Large Caliber Rifle</b>	
223 Remington	1099
243 Winchester	1819
270 Winchester	2754
308 Winchester	2800
30-06 Springfield	2997
30-30 Winchester	1611
7.62x39 FMJ (Full Metal Jacket) - SKS (Savez Komunista Srbije)	1653
<b>Shotgun Rifled Slugs</b>	
410 Gauge Rifled Slug, 2.5"	654
410 Gauge Rifled Slug, 3"	783
20 Gauge Rifled Slug, 2.75"	1863
16 Gauge Rifled Slug, 2.75"	1989
12 Gauge Rifle Slug, 2.75"	2808

\* Ballistics is the energy profile of ammunition measured in "Foot-Pounds" (ft-lb).



*Vet Clin North Am Food Anim Pract.* 2015 Nov;31(3):465-82, vii-viii. doi: 10.1016/j.cvfa.2015.05.009. Epub 2015 Jul 16

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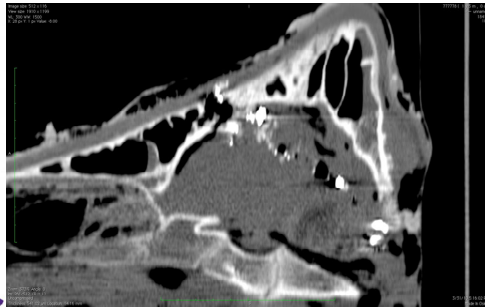
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CT scan of the mid-sagittal view of a representative skull from the .22 solid point treatment group



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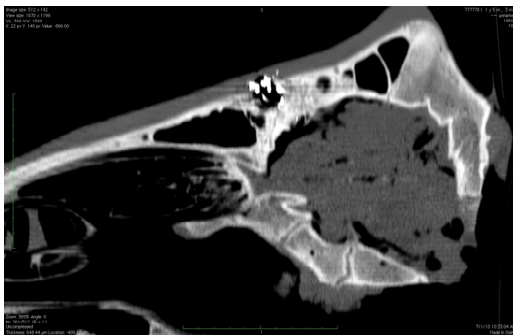
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CT scan of the mid-sagittal view of a representative skull from the .22 hollow point treatment group.



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Euthanasia  
Gunshot

A .22 caliber solid point bullet from pistol or rifle is sufficient for young animals

Hollow point .22 caliber bullets are NOT recommended

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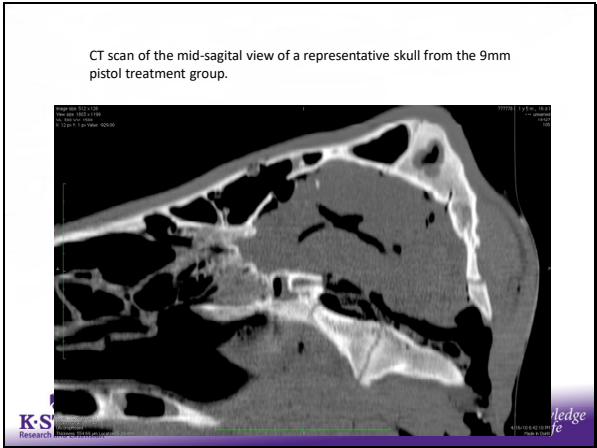
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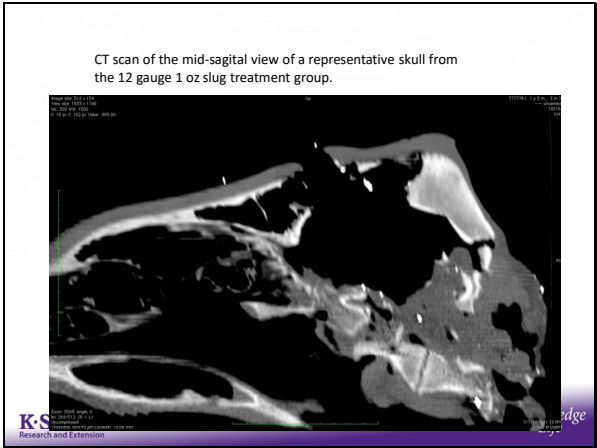
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## Euthanasia



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## Euthanasia



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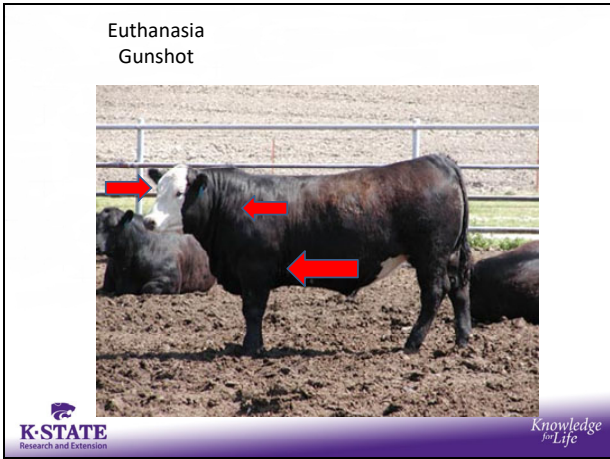
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Euthanasia  
Captive Bolt



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Euthanasia  
Captive Bolt



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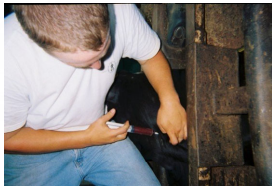
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Euthanasia

- IV injection of euthanasia solution administered by a registered veterinarian



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## Barbiturate Overdose

- 60-80 mg/kg sodium pentobarbital IV
- Administer quickly. Bolus dose IV
  - Keep in mind, this may be multiple 60cc syringes
  - Need easy access to IV
- Carcass disposal concerns
  - Rendering?
  - Wildlife concerns



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Euthanasia by either technique results in involuntary movement



**Therefore, when where possible, it is recommended that such procedures be performed in areas out of the public view**



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## Confirmation

- Lack of corneal reflex
- Large dilated pupil (returns to center of socket)
- Lack of rhythmic respiration
  - Agonal breaths are expected
- Absence of vocalization
- Lack of heart beat (stethoscope)/Pulse
- No attempt to rise or right itself
- Rigor Mortis



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Confirmation of Unconsciousness/Death



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Research and Extension

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Euthanasia Confirmation of Death



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Euthanasia  
Confirmation of Death



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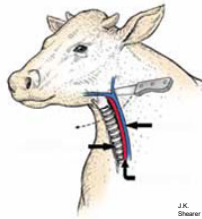
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Secondary Kill Step

- Used as an adjunct method to ensure death
- Must be used with some equipment (captive bolt)
  - Second shot
  - Exsanguination
  - Pithing



K-STATE  
Research and Extension

Knowledge  
for Life

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Pithing

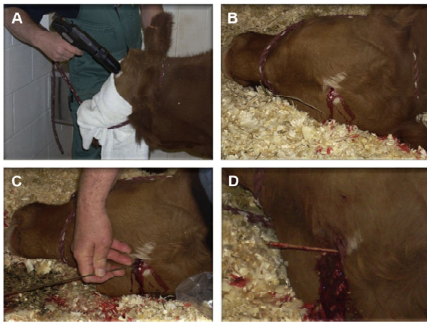


Fig. 2. Pithing procedure. (A) euthanasia through the use of a penetrating CB, (B) brain matter is visible protruding through the hole in the skull produced by the bolt, (C) a pithing rod is inserted into the hole in the skull and directed toward the brainstem where it is manipulated to maximize damage to brainstem tissues, and (D) pithing rod fully inserted through brainstem tissues into the spinal canal.

K-STATE  
Research and Extension

Knowledge  
for Life

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## Secondary Kill Step

- Potassium Chloride/Magnesium Sulfate
  - Produces cardiac arrest
  - **Not acceptable** to use in a conscious animal
  - Xylazine has **not** been shown to induce anesthesia
  - Could be used after Captive Bolt
  - ~250cc of saturated KCL
    - Continue giving until desired effect
  - Mg Sulfate, similar to KCL, but much slower effects



Knowledge  
for Life

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## Unacceptable methods of euthanasia

- Manually applied blunt trauma to the head
- Injection of any non approved chemical substance
- Injection of air into a vein
- Electrocutation as with 120 or 220 volt electrical cord



Knowledge  
for Life

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## Summary

- Timely, effective, and efficient euthanasia is essential
  - Technique is crucial (landmarks/trajjectory)
  - Confirmation of death
- There is a wide array of euthanasia equipment that could be used at feedlots



Knowledge  
for Life

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**Notes – Notes -- Notes**

# BeefBasic: Better Information for Better Marketing Decisions

Brett Crosby  
Custom Ag Solutions

 **BeefBasis.com** 

**Decision Support For Cattle Producers**



**Brett Crosby**  
Custom Ag Solutions

**September 19, 2019**  
**K-State Beef Stocker Field Day**  
**Manhattan, KS**

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**Brett Crosby**

- 5<sup>th</sup> generation rancher
- Cow-calf and stocker operation
- Partner in Custom Ag Solutions
- Accredited Rural Appraiser





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## Custom Ag Solutions



CAS  
Custom Ag Solutions

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## Risk: Chance and Bad



CAS  
Custom Ag Solutions

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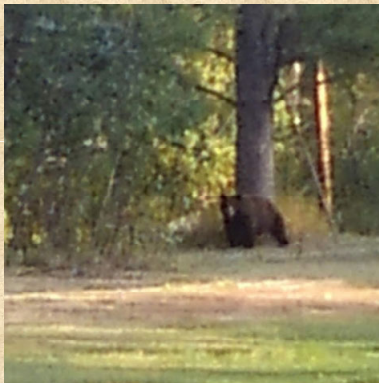
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## Risk: Chance and Bad



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## Key Risk Management Tools for Livestock Producers

- Common Insurance Products (life, health, etc.)
- Crop Insurance Programs
  - Livestock Risk Protection (LRP)
  - Pasture, Rangeland, Forage (PRF)
  - Whole Farm Revenue Protection (WFRP)
- Management Strategies (diversify, etc.)
- Hedging Instruments (futures and options)
- Analytical Tools like [www.BeefBasis.com](http://www.BeefBasis.com)



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## Management Practices

- The best risk management is good management
- "The difference between a good farmer and a poor farmer is two weeks"
- Ranchers who have survived this long understand the science of production
- Successful ranchers are efficient, and most have specific goals (weaning weight, preg rate, etc.)
- Successful ranchers are production-oriented because production is something they can control



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## Two Universal Rules

1. People will do anything to keep themselves and the environment healthy  
Except take a science class
2. People will do anything to succeed financially  
Except math



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## How Will You Be Affected?

- Sell cattle 10% lighter
- Preg rate drops from 90% to 80%
- Price drops 10%
- Feed costs increase by 10%
- Total expenses increase 10%



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## How Will You Be Affected?

Cow-Calf Operation		Stocker Operation	
Calves	100	Steers	100
Weight	600	Weight	800
Price	\$ 150	Price	\$140
Slide	\$ 10	Slide	\$ 6
Heifers	(\$ 90)	Feed Cost \$/lb	\$ 0.55
Replacements	\$1,350	Total Cost \$/lb	\$ 0.85
Feed Cost \$/hd	\$ 200	Total lbs	300
Total Expenses	\$ 800		



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## How Will You Be Affected?

Cow-Calf Operation	
Calves	100
Weight	600
Price	\$ 150
Slide	\$ 10
Heifers	(\$ 90)
Replacements	\$1,350
Feed Cost \$/hd	\$ 200
Total Expenses	\$ 800



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## How Will You Be Affected?

Cow-Calf	Wt	Price	Income
Expected Income	600	\$150.00	\$90,000
Calves 10% lighter	540	\$156.00	\$84,240
Price drops 10%	600	\$135.00	\$81,000
	\$/Hd	Total Cost	Income
Preg rate 10%	\$750	\$7,500	\$82,500
Feed costs 10%	\$ 20	\$2,000	\$88,000
Total expenses 10%	\$ 80	\$8,000	\$82,000



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## Risk vs. Forecasts

- Forecast represents the most likely scenario
- Risk encompasses all possible scenarios
- Good risk managers plan for the best, prepare for the worst




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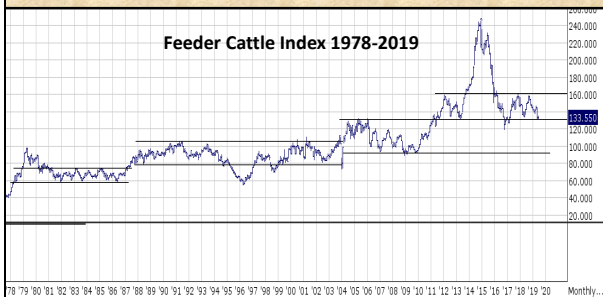
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## Cattle Price Cycles




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## Current Price Cycle

LIVE CATTLE \$96 - \$132

FEEDER CATTLE \$122 - \$162

Prices can break out of ranges

Most years provide opportunity



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## When Cattle Prices Decline, What Can You Do?

- 1) Search for ways to lower unit cost of production (such as more efficient use of inputs, reduce wastes, scrutinize capital purchases, debt, etc.)
- 2) Identify opportunities to enhance cattle market prices (improve quality and quantity, identify economical weights, months to sell, price protection, etc.) **FLEXIBILITY**



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## Price and Price Risk

- Equal in impact to # of live calves sold (death loss)
- Likely contributes the most volatility to a budget
- One of the least controllable budget factors
- Information and knowledge are power



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## Information and Knowledge

Prices often approach cycle lows at the end of the cycle

Prices can have a wide range within and between years

Even bad years, there is opportunity if one has information and knowledge

Decision support tools are critical



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## Feeder Cattle Index

Seven day rolling sale barn average in 13-state area

Steer calves

Feeder cattle futures represent the market's best guess of the index on a specific date.

Prices are different for different weights, locations and sex

Basis: Cash – Futures



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## Basis and the Information Gap

- Futures markets rely on a reliable basis forecast to be useful for risk management
- Forecasting basis enables the use of futures for
  - Hedging
  - Forecasting
  - Cost-Benefit
  - Other



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## BeefBasis.com

- Decision support for cattle producers
- Data resources and analytical tools and calculators
- Learning library with text and video tutorials
- Currently free to all producers
- Additional features coming soon for registered users





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## BeefBasis.com

- **Estimate Calf Values Based on CME Futures**
  - Sex, Weight, Frame, Date, Location
- Uses:
  - Make market timing decisions
  - Estimate floors for forward (ex, video) contracts
  - Estimate impact of price moves
  - Manage exposure to price risk

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## BeefBasis.com



**DECISION SUPPORT FOR CATTLE PRODUCERS**



**Industry Expertise**  
With over 25 years of experience in managing and marketing cattle, the BeefBasis team can help you solve today's market uncertainties.



**Data and Analytics**  
Fast and easy access to the information and tools needed to improve your buying and selling decisions.



**We Have Your Back**  
Need a on-site consultant? We've got you covered - click here.



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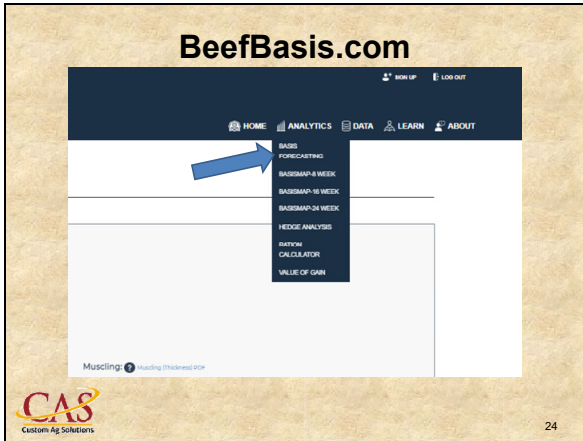
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### BeefBasis.com- Price Forecast

1 Sell Date:

2 State:  Location:

3 Sex:  Frame:  Muscling:

4 Weight:  lbs Head:  number  head

5 Feeder Cattle Futures Price:  \$ /cwt Corn Futures Price:  \$ /bu

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### BeefBasis.com- Price Forecast

#### Model-Estimated Feeder Cattle Basis Values

Model-Estimated feeder cattle basis, \$/cwt	27.86
Confidence interval for basis, \$/cwt	22.16 to 33.56
Expected cash price, \$/cwt	166.26
Confidence interval for expected cash price, \$/cwt	160.56 to 171.96
Optimal hedge ratio	1.30
Number of calves hedged per contract	77.08

Analysis

CAS Custom Ag Solutions

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## BeefBasis.com – Basis Forecast

### Analysis

Feeder Cattle Basis Model							
C O R N \$/bu	1.71	21.94	23.43	24.92	26.40	27.89	30.86
	2.21	21.93	23.42	24.91	26.39	27.88	30.86
	2.71	21.92	23.41	24.90	26.39	27.87	30.85
	3.21	21.92	23.40	24.89	26.38	27.86	30.84
	3.71	21.91	23.39	24.88	26.37	27.86	30.83
	4.21	21.90	23.39	24.87	26.36	27.85	30.82
	4.71	21.89	23.38	24.86	26.35	27.84	30.81
	5.21	21.88	23.37	24.86	26.34	27.83	30.80
	5.71	21.87	23.36	24.85	26.33	27.82	30.80
		118.40	123.40	128.40	133.40	138.40	143.40
<b>Feeder Cattle \$/cwt</b>							

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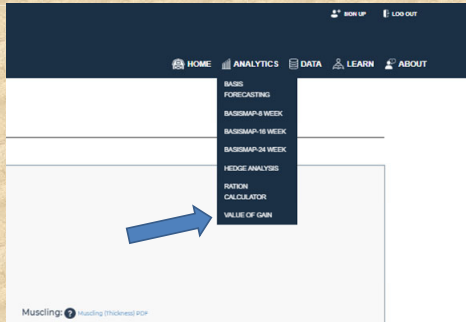
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## BeefBasis.com – Value of Gain



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## BeefBasis.com – Value of Gain

### Value of Gain <sup>1</sup>

1 Buy Date:  Sell Date:

2 State:  Location:

3 Sex:  Frame:  Muscling:

4 Buy Wt:  Sell Wt:  Head:

5 Feeder Cattle Futures Price:  Corn Futures Price:

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## BeefBasis.com – Value of Gain

Analysis

Value of Gain Analysis				Projected Cross Value of Gain		
Sell Date	Sell Price	Days on Feed	ADG, lbs	Total Return	\$/Head	\$/cwt
02/20/2020	137.09	128	2.34	18,107.42	270.26	90.09
02/25/2020	137.00	133	2.26	18,059.18	269.54	89.85
03/02/2020	136.84	139	2.16	17,978.11	268.33	89.44
03/09/2020	136.72	146	2.05	17,911.11	267.33	89.11
03/16/2020	136.60	153	1.96	17,847.46	266.38	88.79
03/24/2020	138.13	161	1.86	18,615.95	277.85	92.62
04/02/2020	137.93	180	1.67	18,561.01	277.03	92.34
04/23/2020	137.87	191	1.57	18,527.51	276.53	92.18

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## BeefBasis.com – Other Tools

- Stocker Cattle Index – 5-wt steers
- Ration calculator
- Historical data
- Location comparisons



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## BeefBasis.com – Coming Soon

- Lot tracking
- Hedge tracking
- Income forecasts
- Other



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## Summary

Price risk poses a substantial economic threat

Good risk managers plan for the best and prepare for the worst

Prices can have a wide range within and between years

Even bad years, there is opportunity if one has information and knowledge

Decision support tools are critical



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*Thank you for your attention.  
I hope you have a profitable 2019!*

**Brett Crosby**

[bcrosby@casnow.com](mailto:bcrosby@casnow.com)

307 272-5165

Twitter: @mbacowboy

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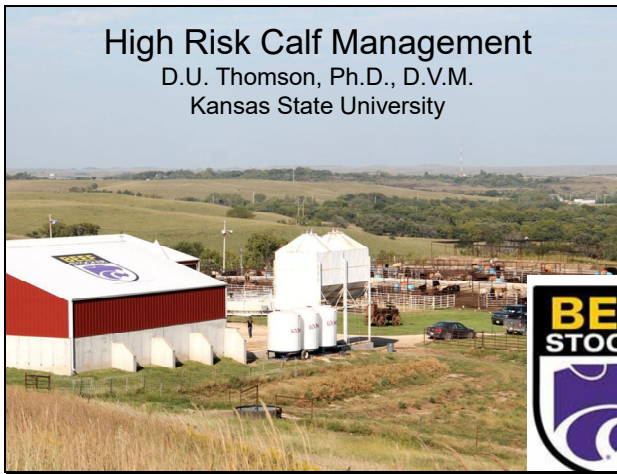
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**Notes – Notes -- Notes**

# Health Management of High Risk Calves

Dan Thomson  
KSU College of Veterinary Medicine



High Risk Calf Management  
D.U. Thomson, Ph.D., D.V.M.  
Kansas State University

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**WHAT IS THE FIRST QUESTION DURING HIGH MORTALITY EPISODES?**

- Morbidity problem
- Case fatality problem – the drug quit working
- CFR =  $\frac{\text{number treated that died}}{\text{total number treated}}$



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# FACTORS AFFECTING MORBIDITY RATES IN NEWLY ARRIVED CALVES



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## CATTLE FLOW

- Cattle market dictates cattle type and flow
- Overwhelming the system
- Weather affects what cattle and people will endure in farmer feeder operations



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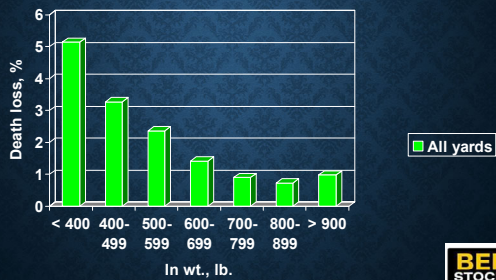
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## EFFECTS OF INITIAL WEIGHT ON DEATH LOSS OF FEEDER CATTLE.



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## TRANSPORTATION AND COMMINGLING

ONE ORDER BUYER = 32 SALE BARNS

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## COMMINGLING AT ARRIVAL: ADDING ON PENS

- **More large pens being built or were built?**
- **Increased number of add ons?**
- **How many days to build a pen?**

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## BVD PI: WHERE AND HOW MANY?

- Estimated that 1% of cattle born in the U.S. are persistently infected with BVD
- Half of these calves die before weaning
- Prevalence on arrival at feedyard = .5 to .3%
  - Based on post-weaning management
- Half of PIs die or are railered at the feedlot
  - 4% of the dead cattle were persistently infected
  - 3.6% of the railers were PI cattle

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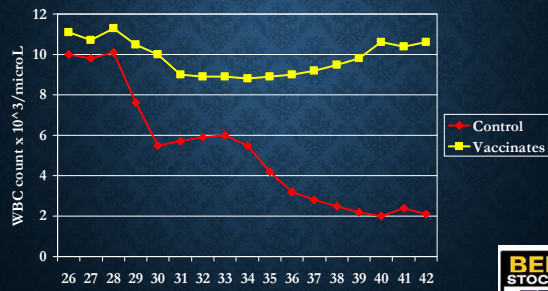
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## EFFECTS OF BVD VACCINATION ON WBC DURING A BVD II CHALLENGE



Recreated from Ellsworth and Tucker, 2003




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## WHAT ARE THE CREWS SEEING WHEN PULLING BVD PI CATTLE?

- Many of the PI cattle are pulled for coccidiosis
- The doctors have treated many of the cattle as Coccidiosis and Salmonella cases
- Necropsy diagnosis has been mainly abomasal ulcers, coccidiosis and pen dead enteritis




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## PROCESSING IS NOT A TIMED EVENT!

WHEN TO PROCESS?




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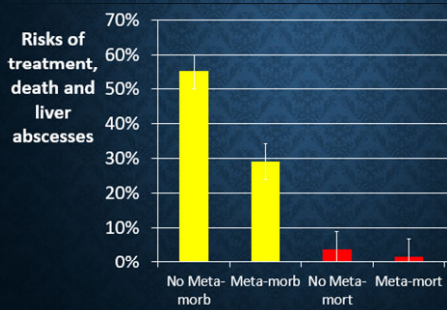
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## VACCINE RECOMMENDATIONS BY 23 CONSULTING FEEDYARD VETERINARIANS

	High risk calves	Low risk calves
IBR	100%	100%
BVD Type 1	90.9%	90.9
BVD Type 2	90.9%	95.6%
BRSV	68.2%	50%
PI3	68.2%	54.5%
Histophilus	31.8%	0%
Moraxella bovis	0%	0%
Mycoplasma bovis	9.1%	0%
Leptospira	0%	0%
Clostridials	45.5%	31.8%
Mannheimia	73.9%	0%
Autogenous	22.7%	0%
Pasturella	36.4%	0%

Lee, Thomson et al. 2014

## EFFECTS OF MASS TREATMENT ON BEEF CATTLE HEALTH AND MORTALITY



## IMMUNE MODULATION

Study	Study Description	Location	Study Duration	Treatment Group	n	Mortality		
						Risk (%)	Absolute Reduction	Relative Reduction
1	Ranch and auction derived ~550 lbs steers	Idaho	60 days	Micobi® Micobi + Zelnite	1022 1018	1.57% 1.38%	0.19%	12.10%
2	Auction derived ~420 lbs steers	Texas	Closeout	Draxcin® Draxcin + Zelnite	303 303	4.98% 3.62%	1.26%	25.82%
3	Auction derived ~25 lbs heifers	Kansas	Closeout	Micobi Micobi + Zelnite	2586 2593	5.01% <sup>a</sup> 4.36% <sup>b</sup>	1.25%	22.28%
4	Holstein steer calves ~300-350 lbs	Idaho	Closeout	Draxcin Draxcin + Zelnite	1307 1304	4.96% 4.23%	0.73%	14.72%
5	Auction derived ~650 lbs heifers	Colorado	Closeout	Micobi Micobi + Zelnite	750 750	2.38% 1.59%	0.79%	33.19%
6	Auction derived steers ~500 lbs	Nebraska	Closeout	Draxcin Draxcin + Zelnite	182 182	8.29% <sup>a</sup> 5.49% <sup>b</sup>	2.00%	33.70%
Overall	-	-	-	Con Zel	6160 6156	4.45% <sup>a</sup> 3.35% <sup>b</sup>	0.95% <sup>b</sup>	20.83% <sup>b</sup>



# WHEN AND WHY DID THE ANIMAL DIE?

## CASE FATALITY RATE PROBLEM



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# CAN WE FIND SICK CATTLE?

- Wittum - 1996
  - Treated 78% LL, Untreated - 68% LL
- Bryant - 1999
  - Treated - 44% LL, Untreated - 42% LL
- Gardner - 1999
  - Treated - 37% LL, Untreated - 29% LL
- Thomson - 2004
  - Treated - 62% LL, Untreated - 43% LL
- Friton et al., 2005
  - Treated - 32% LL, Untreated - 35% LL



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# ACCLIMATION, HAY AND PEN RIDING



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## NEWLY RECEIVED CALVES...

- Stressed

- Sick



- We want them eating 1.5% of body weight by 1.5 weeks on feed.



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## DESCRIPTION OF PERFECT FEEDING PEN FOR STARTING CALVES

- Max – 200 head, Min – 50, Mean – 103 head

- Bunk space, Max 21 in., Min 10 in, Mean – 13 in

- One load pens with 116 ft of bunk space



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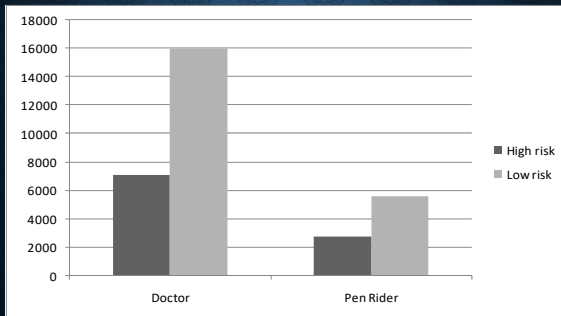
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## HOW MANY PEOPLE DO YOU NEED?



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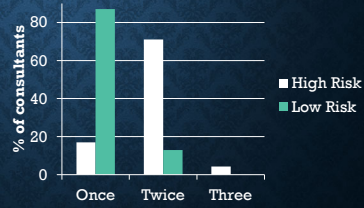
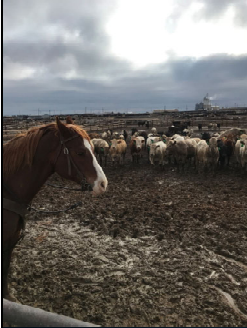
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## HOW MANY TIMES DO YOU RECOMMEND THAT THEY RIDE PENS ON HIGH RISK CALVES?




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## IN THE CHUTE EXAMINATION

- Begin with a rectal temperature
- Sunken flank – diarrhea?
- Eyes and skin for dehydration
- Nose – dry or moist
- Ears – cold?




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## NORMALS

	Normal
Rectal temperature	101.5 to 103.5
Respiration rates	10 to 40 breaths per minute
Heart rates	60 to 80 beats per minute
Rumen contractions	1 to 2 contractions per minute




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## COMMON QUESTIONS

- Single or combination antimicrobials?
- How long to I wait to treat again?
- When should you switch to the next drug?
- Route of delivery and speed to infection?
- Low dose multiple days or larger dose on one day?
- What is considered normal antibiotic success?
- What about ancillary therapy?



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## HOSPITAL PENS

- Hospital pens are the most abused pens in the feedyard.
- Comfort – pen floors and shade
  - Need at least as much room or more than a feeding pen (150 to 200 sq. ft.)
  - Water tanks must be clean
  - Fresh feed and hay available
  - Shades



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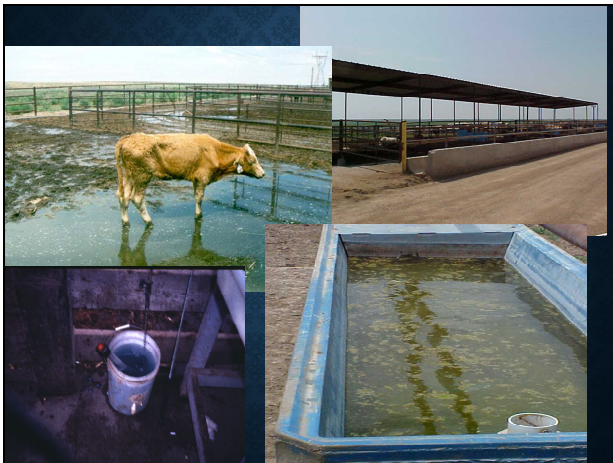
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**Notes – Notes -- Notes**