Proceedings

Kansas State University Agricultural Experiment Station
and Cooperative Extension Service

Beef Stocker Conference 2007

September 27, 2007

Clarion Hotel, Manhattan, KS

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Beef Stocker Conference 2007

Welcome

Welcome to the 2007 KSU Beef Stocker Conference. 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 Merial 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.

Beef Stocker Conference 2007

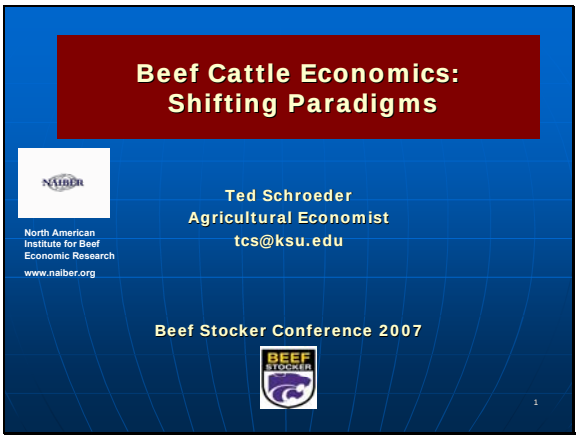
Program Agenda

9:30 a.m.	Registration/Coffee
10:15 a.m.	Introductions
10:30 a.m.	**Cattle Market Outlook** *Ted Schroeder, Kansas State University*
11:15 a.m.	**Health Protocols that Add Value** *Van Ricketts, D.V.M., Merial Ltd.*
12:00 Noon	Barbecue Lunch
1:00 p.m.	**Evaluating Your Sick Calf** *Brad White, Kansas State University*
1:30 p.m.	**Selecting Your Antibiotic** *Hans Coetzee, Kansas State University*
2:00 p.m.	**Break**
2:30 p.m.	**Strategies for Controlling Input Costs** *Dale Blasi, Kansas State University*
3:15 p.m.	**Using By-product Feeds for Receiving and Growing Diets** *Sean Montgomery, Corn Belt Livestock Services*
4:00 p.m.	Questions/Answers
5:00 p.m.	Tour of the new Beef Stocker Unit and evening barbecue

Notes – Notes -- Notes

Cattle Market Outlook

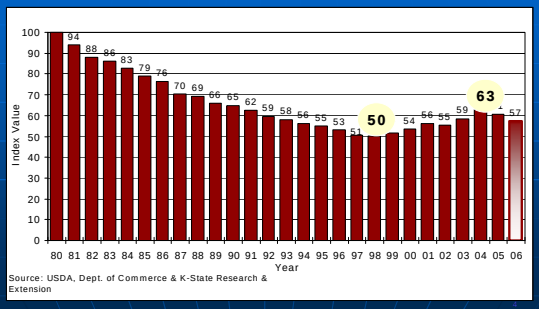
Ted Schroeder
Kansas State University



Change Agents:

1. Beef Demand
2. Global Competition
3. Ethanol
4. Information

US Beef Demand, 1980-2006

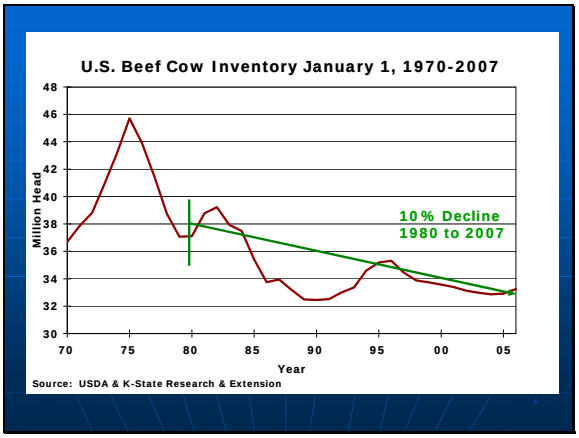


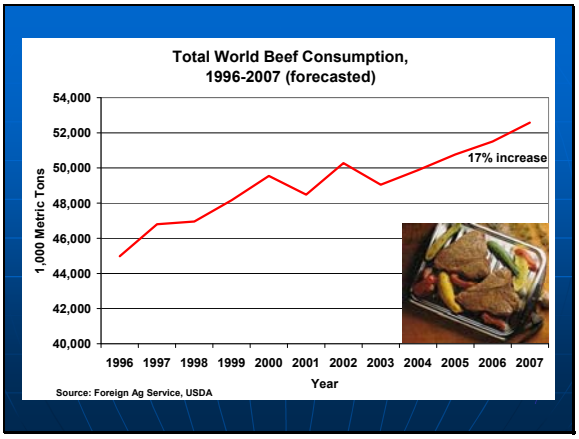
Source: USDA, Dept. of Commerce & K-State Research & Extension

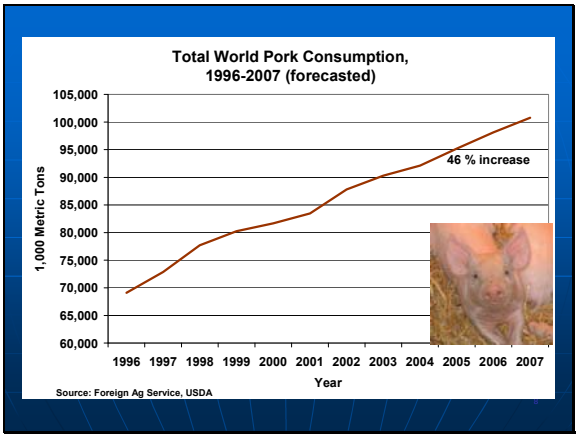
Does Beef Demand Affect Producers?

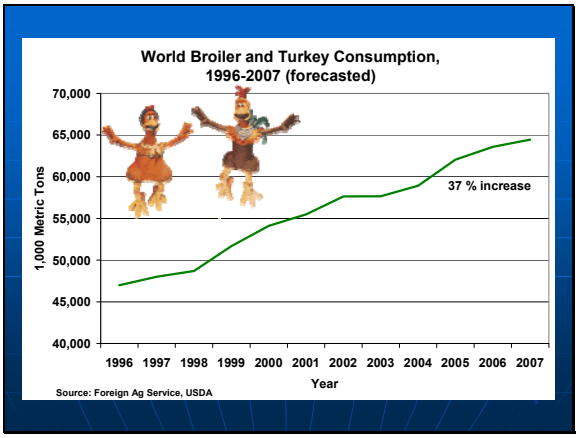
Year	US Per Capita Beef Supply (lbs./capita)	US Beef Demand Index	KS Fed Cattle Price ($/cwt)	KS 7-800 lb Steer Price ($/cwt)	US Average Corn Price ($/bu)
1998	94.8	50	$61.84	$76.15	$2.22
2004	94.1	63	$84.52	$106.51	$2.47

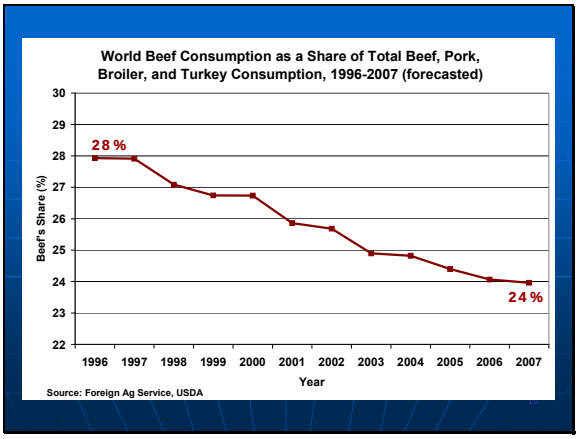
Source: USDA

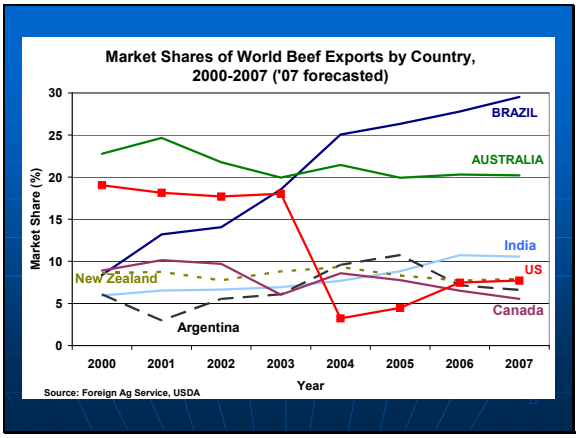

U.S. Beef Cow Inventory January 1, 1970-2007
Million Head
48
46
44
42
40
38
36
34
32
30
70
75
80
85
90
95
00
05
Year
10% Decline
1980 to 2007
Source: USDA & K-State Research & Extension

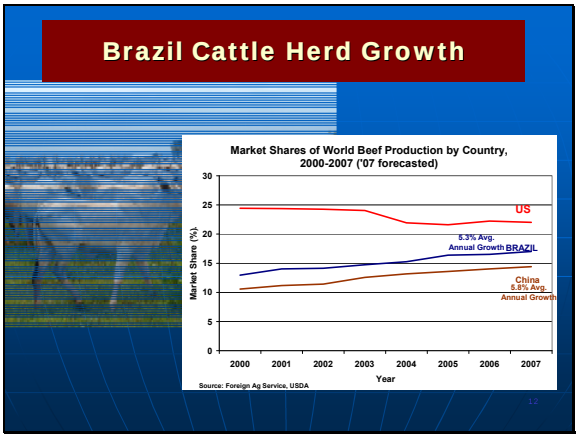

Total World Beef Consumption,
1996-2007 (forecasted)
1,000 Metric Tons
54,000
52,000
50,000
48,000
46,000
44,000
42,000
40,000
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
Year
17% increase
Source: Foreign Ag Service, USDA

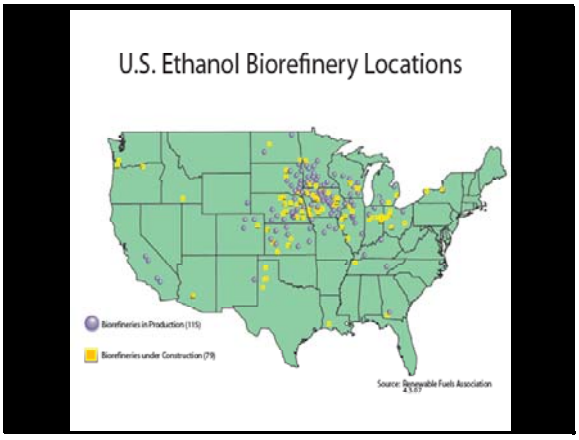

Total World Pork Consumption,
1996-2007 (forecasted)
1,000 Metric Tons
105,000
100,000
95,000
90,000
85,000
80,000
75,000
70,000
65,000
60,000
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
Year
46 % increase
Source: Foreign Ag Service, USDA

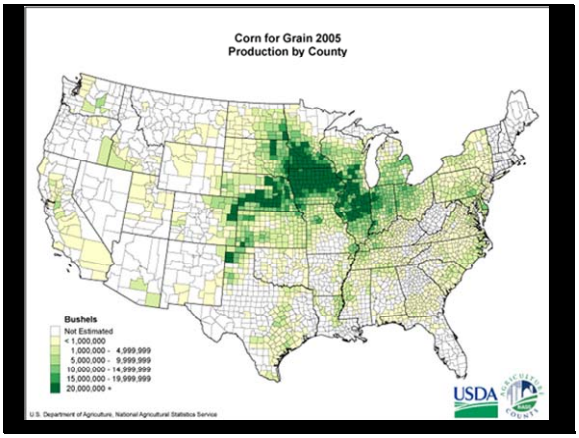

World Broiler and Turkey Consumption,
1996-2007 (forecasted)
70,000
65,000
60,000
55,000
50,000
45,000
40,000
1,000 Metric Tons
37 % increase
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
Year
Source: Foreign Ag Service, USDA

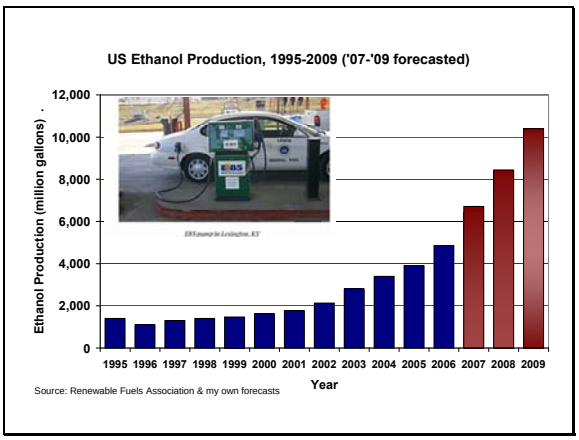

World Beef Consumption as a Share of Total Beef, Pork,
Broiler, and Turkey Consumption, 1996-2007 (forecasted)
30
29
28
27
26
25
24
23
22
Beef's Share (%)
28 %
24 %
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
Year
Source: Foreign Ag Service, USDA

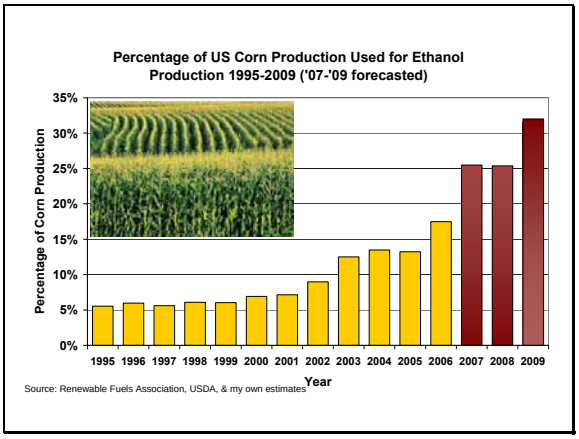

Market Shares of World Beef Exports by Country,
2000-2007 ('07 forecasted)
30
25
20
15
10
5
0
Market Share (%)
BRAZIL
AUSTRALIA
India
US
New Zealand
Canada
Argentina
2000 2001 2002 2003 2004 2005 2006 2007
Year
Source: Foreign Ag Service, USDA


Brazil Cattle Herd Growth
Market Shares of World Beef Production by Country, 2000-2007 ('07 forecasted)
Market Share (%)
30
25
20
15
10
5
0
US
8.3% Avg. Annual Growth BRAZIL
China 5.8% Avg. Annual Growth
2000
2001
2002
2003
2004
2005
2006
2007
Year
Source: Foreign Ag Service, USDA

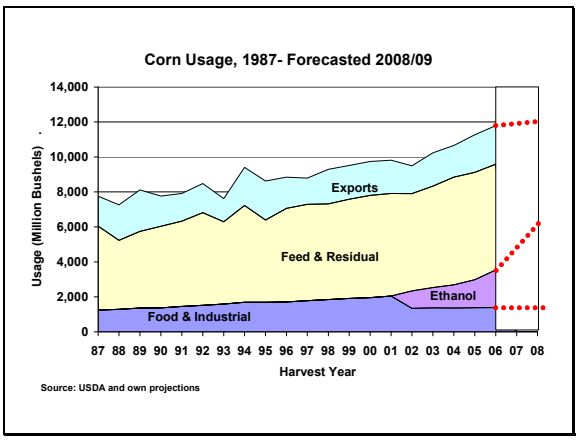

U.S. Ethanol Biorefinery Locations
Biorefineries in Production (115)
Biorefineries under Construction (79)
Source: Renewable Fuels Association

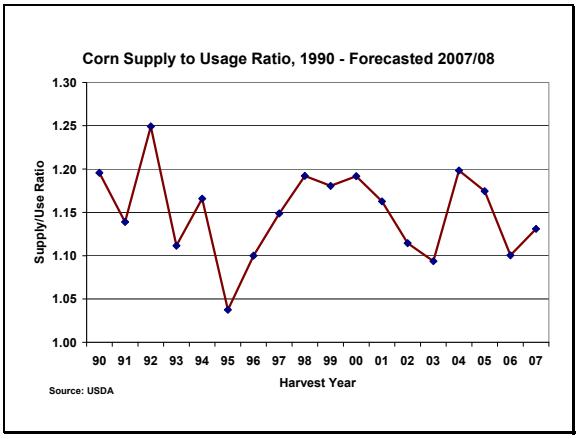

Corn for Grain 2005
Production by County
Bushels
Not Estimated
< 1,000,000
1,000,000 - 4,999,999
5,000,000 - 9,999,999
10,000,000 - 14,999,999
15,000,000 - 19,999,999
20,000,000 +
USDA

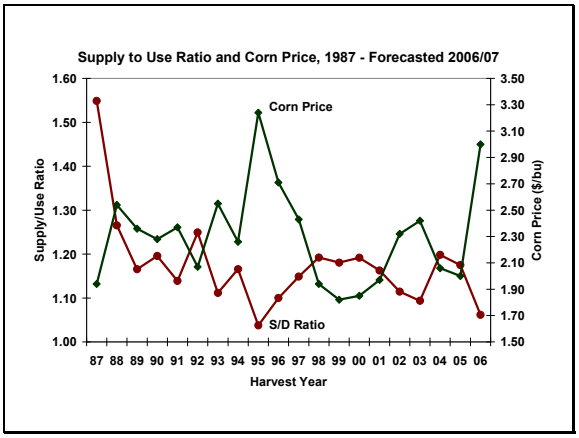

US Ethanol Production, 1995-2009 ('07-'09 forecasted)
Ethanol Production (million gallons)
12,000
10,000
8,000
6,000
4,000
2,000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Year
Source: Renewable Fuels Association & my own forecasts

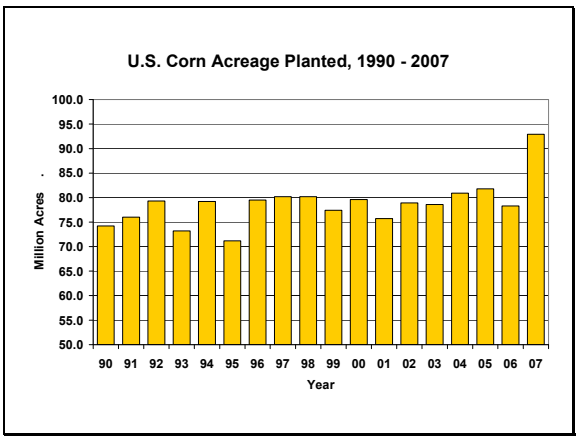

Percentage of US Corn Production Used for Ethanol Production 1995-2009 ('07-'09 forecasted)
Percentage of Corn Production
35%
30%
25%
20%
15%
10%
5%
0%
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Year
Source: Renewable Fuels Association, USDA, & my own estimates

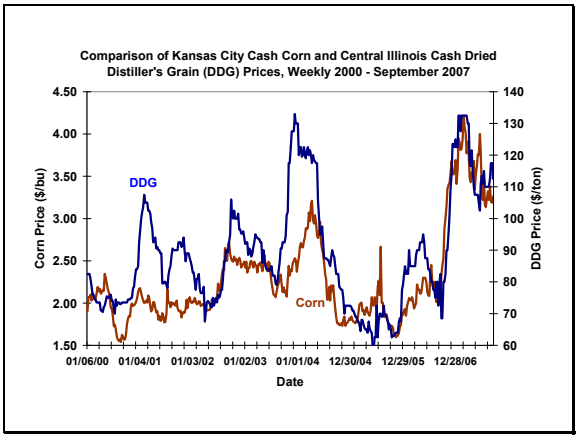

US President George Bush
State of Union Address Jan. 23, 2007
"To reach this goal, we must increase the supply of alternative fuels, by setting a mandatory fuels standard to require 35 billion gallons of renewable and alternative fuels in 2017
-- and that is nearly five times the current target."
ETHANOL REDUCES AMERICA'S DEPENDENCE ON FOREIGN OIL. ►


Corn Usage, 1987- Forecasted 2008/09
Usage (Million Bushels)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Exports
Feed & Residual
Ethanol
Food & Industrial
87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08
Harvest Year
Source: USDA and own projections


Corn Supply to Usage Ratio, 1990 - Forecasted 2007/08
Supply/Use Ratio
1.30
1.25
1.20
1.15
1.10
1.05
1.00
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07
Harvest Year
Source: USDA


Supply to Use Ratio and Corn Price, 1987 - Forecasted 2006/07
Supply/Use Ratio
1.60
1.50
1.40
1.30
1.20
1.10
1.00
Corn Price ($/bu)
3.50
3.30
3.10
2.90
2.70
2.50
2.30
2.10
1.90
1.70
1.50
Corn Price
S/D Ratio
87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06
Harvest Year





Implications for Cattle Industry

- $3.20 - $4.00 corn here for a while
- Corn and feed grain market volatility will be high
- Less days on intensive grain diet, more forage feeding
- Substitute more corn with more ethanol byproducts
- Smaller cattle industry is probable
- Higher production cost and higher prices for beef
- Discourages exports; encourages imports

1. Fresh Branded Case-Ready Products

Branded beef was nonexistent

USDA certification programs:
2000 - 3.5 million carcasses
2006 - 6.0 million carcasses

Original Alberta Beef

Which Steak is from your Cattle?

Retail Grocery Strip Loin Steak Prices in Kansas City on 5/13/2006

Price ($/lb)	Store	Description
$5.99	HyVee	Store Brand
$6.48	Wal-Mart	Store Brand
$8.69	Dillons	Store Brand
$10.99	Dillons	USDA Choice
$10.99	Price Chopper	Creekstone Farms
$13.99	Hen House	Natural Black Angus
$21.50	Rancher's Gourmet	USDA Prime
$21.99	Price Chopper	USDA Prime

2. Meal Packages

Single dish quick fix meal consumer expenditures expanded 83% in 2001 to $141 million – AC Nielsen

472 beef products introduced in 2001
Compared to 70 in 1997 - NCBA

3. Food Service








- Food service continues to grow
- Diversity of product needs
- Quality control in volume are critical
- Contracts

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What do they require?

- Product integrity – quality, consistency
- High level of accountability of input supplier
- Product safety assurances – mega responsibility/risk
- Production practice assurances (including location?)
- Traceability
- Consistent continuous supply

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How will producers get the signal?

<u>What Won't Work:</u>

1. Relying on visual sorting for quality differentiation
2. Buying/Selling cattle without knowing how they will perform and with as little information transfer as you can get away with
3. Marketing cattle on average live or dressed weight basis for same price

.
.
.

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How will producers get the signal?

What can work:

1. Increase Vertical Alignment
cow/calf - stocker - feedlot - processor - retail/food service

2. Objective information measured, accounted, and transferred both directions

3. Responsibilities & Rewards clearly identified
   System must be set up to:
   - penalize nonperformance
   - reward superior performance

4. Commitment to a common goal is essential

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Notes – Notes -- Notes

Health Protocols that Add Value

Van Ricketts, D.V.M.
Merial, Ltd.

SUREHEALTH® Source & Age

- SUREHEALTH is approved by the USDA as a Quality System Assessment (QSA) Program
- Meets requirements for QSA certification at point of origin, for export to QSA-requiring countries
- The *first* nationwide animal health program with QSA capabilities
- Data managed by IMI Global

SUREHEALTH® Source & Age allows you to attract feedyards involved in:

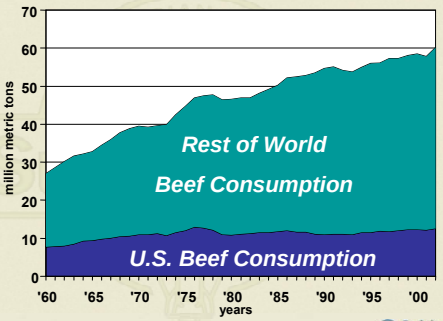
- The export market
- Selling to major beef marketers
- Branded beef programs

The market is changing. People want to know where beef is coming from.

Human population proves: Growth potential lies overseas.

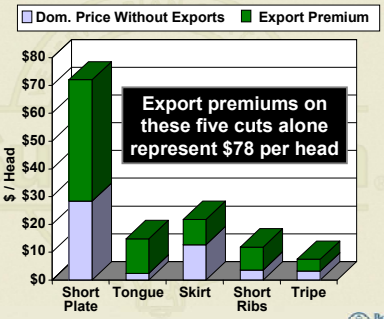
Source: Cattle-Fax

Benefits of U.S. beef trade.



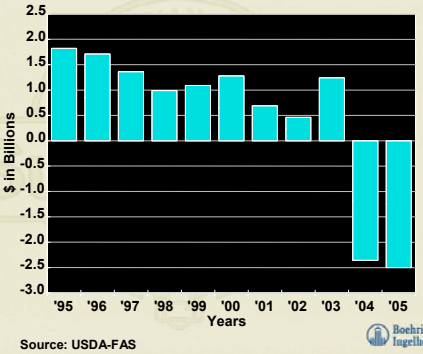
Source: FAO

Beef export premiums.



Source: U.S. Meat Export Federation

Net value of beef and variety meat trade.



Source: USDA-FAS

Top five U.S. trading countries (2003).

- Japan – 35%
- Mexico – 23%
- S. Korea – 21%
- Canada – 9%
- Hong Kong – 2%

TOTAL = 90% of value of beef exports

Today, all of these countries now require a QSA.

Export opportunities for QSA-certified cattle.

- Growing populations
- Increasing beef consumption
- More countries requiring QSA
- Large premiums in the beef export market
- SUREHEALTH® Source & Age helps your cattle meet this market

Domestic opportunities for QSA-certified cattle.

- McDonald's®, Wal-Mart®, Costco®
- All three are seeking origin-verified beef to protect consumer confidence in the products they sell
- SUREHEALTH® Source & Age helps your cattle meet this market

Domestic opportunities for QSA-certified cattle.

- Branded beef programs also want origin-verified beef
- SUREHEALTH® Source & Age helps your cattle meet this market

Domestic opportunities for QSA-certified cattle.

- Packers are paying premium prices for source-and-age verified cows
- Currently: $7 to $15 per head
- The market continues to differentiate with these premiums

Source: Cattle-Fax

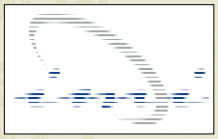
How can you get involved?

Are you eligible? A quick quiz.

- √ Do you have a defined breeding season?
- √ Do you pull your bulls at certain times of the year? If not, can you segregate your calf crops by age groups?
- √ Do you record calf birth dates?
- √ Do you identify your calves by tagging them?
- √ Are you willing to keep this information for three years?
- √ Are you willing to share these records with a third-party evaluator or USDA auditor?

SUREHEALTH® Source & Age partner: IMI Global.

- USDA-approved Process-Verified Data service provider
- Will process and maintain all data
- Has a step-by-step process to get you started
- USVerified™ SupplyVerified™ Program will track records through the channel



Working with IMI Global: What does the producer do?

- Complete contents of USVerified™ Supply Verified™ Source & Age kit
- Provide copy of calving records (group or individual)
- Provide other supporting documents
- Conduct telephone interview

Working with IMI Global: What does IMI Global do?

- Issue and ship program-compliant tags according to the head count approved
- List producer on cow/calf producer-approved supplier list
- Enable retrieval of source and age information for buyers
- Promote special sales at www.CattleNetwork.com

Age verification.

- Producer records will be used
- Individual animal age verification

OR

- Group age verification

Individual animal age verification.

- A birth date is recorded for every animal
- Every animal receives unique identification

Cow Number	Calf Number	Breed	Color	Sex	Calving Date	Weaning Date	Weaning Wt.
457	45705	AngX	BWF	B	2/22/05		
223	22305	CharX	Smokey	H	2/23/05		
576	57605	Angus	Blk	H	2/23/05		
129	12905	Angus	Blk	H	2/26/05		
964	96405	CharX	White	B	2/27/05		
924	92405	AngX	BWF	B	2/28/05		
982	98205	Angus	Blk	B	2/29/05		
573	57305	Angus	Blk	B	2/29/05		
222	22205	Angus	Blk	B	2/29/05		

Group age verification.

- Oldest animal's birth date is recorded for the group
- Every animal receives unique identification

Value options from SUREHEALTH®.

Qualifying Protocols	SUREHEALTH	SUREHEALTH Source & Age
Parasite control	√	√
Viral respiratory vaccination	2 doses	2 doses
Bacterial respiratory vaccination	1 dose	1 dose
Clostridial vaccination	2 doses	2 doses
Castrated and dehorned or tipped	√	√
45-day weaning	√	√
Adjusted to feedbunk and water tank	√	√
Veterinarian certified	√	√
Source & Age		√
RFID		√

Program-compliant ear tags.

- Shipped from IMI, attached to approved animals and never removed
- Required: nested tag set (a.k.a. button tag and dangler tag)
- Provides for potential compliance with National Animal Identification System (NAIS)
- Benefit for livestock markets and stockers

SUREHEALTH® Source & Age.

- Meets the USDA requirement for QSA certification at point of origin
- The *first* nationwide animal preconditioning program with QSA capabilities
- Helps you capitalize on export and domestic marketing opportunities
- Is available to you *now*

To order your SUREHEALTH® Source & Age kit:

- Call 1-816-858-4796
- E-mail Verified@imiglobal.com
- Talk to your animal health supplier

Qualifying products for SUREHEALTH®.

Parasite Control

- IVOMEC® Plus (ivermectin/clorsulon)
- IVOMEC (ivermectin) Pour-On
- IVOMEC 1% Injection for Cattle & Swine
- IVOMEC EPRINEX® (eprinomectin)

Qualifying products for SUREHEALTH®.

Respiratory Vaccines (4-Way)

Modified-Live Vaccines (MLV)

- EXPRESS® 5
- EXPRESS 5-HS
- EXPRESS 5-PHM
- RELIANT® 4
- RELIANT PLUS
- RELIANT PLUS BVD-K

Killed Viral/Non-Replicating Vaccines

- ELITE™ 4
- ELITE 4-HS
- RESPISHIELD®4

Qualifying products for SUREHEALTH®.

Pasteurella Vaccines

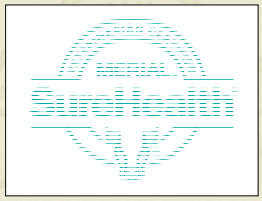
Killed Bacterial/Non-Replicating Vaccines

- PULMO-GUARD™ PHM-1
- RESPISHIELD HM

Qualifying products for SUREHEALTH®.

Clostridial Vaccines (7-Way)

- ALPHA™-7
- ALPHA-7/MB™-1
- BAR-VAC® 8
- BAR-VAC 7 Somnus
- CALIBER® 7



A sure way to add value to your cattle.

Notes – Notes -- Notes

Evaluating the Sick Calf

Brad White, DVM, MD
Kansas State University
College of Veterinary Medicine

Disease Identification

- Case Definition
- Diagnosis

Are Sick Cattle All the Same?

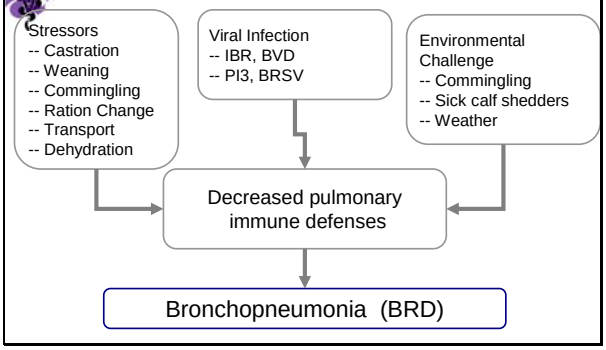
- BRD vs. other diseases?
- Which pathogen is causing the disease?
- When did disease occur relative to arrival?
- When is disease diagnosed relative to onset?

Case Definition

- ***What*** is the problem?
  - Could someone else identify only by reading case definition?
- Objective, repeatable
  - Clinical vs. subclinical

- Example: Respiratory disease in stocker calves: clinical depression and T > 105

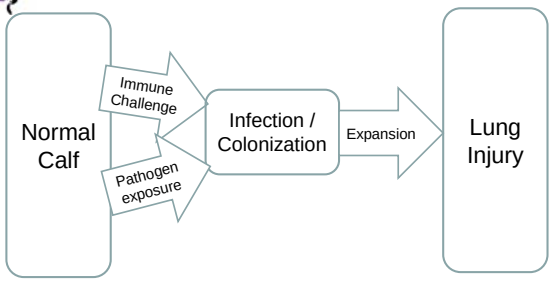
Bovine Respiratory Disease



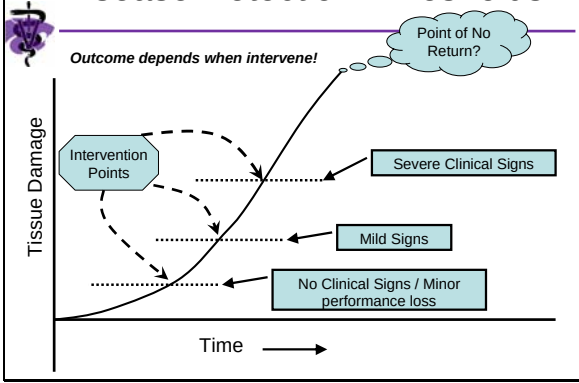
Bovine Respiratory Disease

- Etiology not normally a single pathogen
- *Mannheimia haemolytica* most common isolate from fatal BRD cases
  - Normal inhabitant of upper respiratory tract
  - Opportunistic when normal defense mechanisms break down

BRD Progression



Disease Detection Thresholds



Disease Identification

- Case Definition
- **Diagnosis**

Sick vs. Ugly

"You can observe a lot by just watching."

- Yogi Berra

BRD – Clinical Signs

Sick calves!

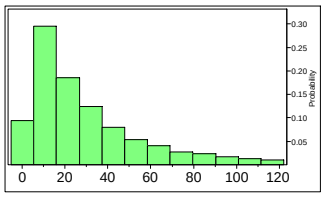
- Temp: 104º - 108º
- Head down
- Ears low
- Sunken flanks
- Nasal discharge
- Decreased appetite

BRD – Identifying Cases

- Early diagnosis → better Tx response
- *Labor Allocation:* At high risk times, check 2-3 times/day
- Hiding in group

Temporal disease risk

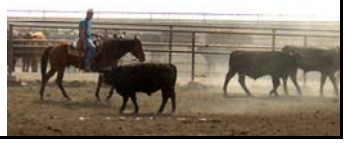
- BRD in stockers most likely in first 21 DOF
- Pen / group effect of infectious disease
- Pull with bias toward trend



BRD – Case ID

- Observe individuals
  - Fenceline
  - Away from group

- Observe prior to entering pen
- Feed bunk



Diagnosis

- Animal Evaluation
- Temperature
  - 5% < 105

Characteristics at Initial Treat:

	No Repull	Repull
Head:	108	32
DOF:	15.8	14.8
Wt:	485.7	467.3
Temp:	105.1	104.9

Clinical Illness Scores

- Criteria for placement of score on animal
- Not always necessary to formalize

CIS	*Description*	*Clinical Appearance*
1	Normal	No abnormalities noted.
2	Slightly Ill	Mild depression, gaunt, +/- cough
3	Moderate Illness	Severe depression, labored breathing, ocular/nasal discharge, +/-cough
4	Severe Illness	Moribund, near death, little response to human approach.

Diagnosis

- Use all available information
  - Treatment history
  - Clinical signs (Illness score)
  - DOF (relative risk)
  - Temperature

Animal Health Records

Daily Pull Treatment Record

Tag (color, #)		Lot:	Dx:	Pull #:	Tx:	ml:	Wt:	Temp:	Comments

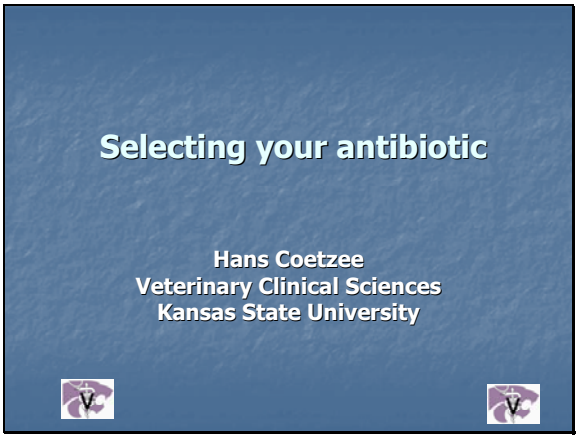
Track outcomes to improve decisions.

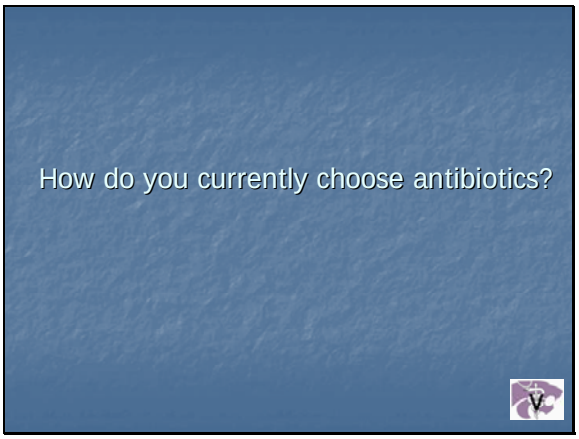
Brad White, DVM, MS
bwhite@vet.ksu.edu

Notes – Notes -- Notes

Selecting Your Antibiotic

Hans Coetzee
Kansas State University
College of Veterinary Medicine





How do I decide which antibiotic to use?

- Consult your Veterinarian
  - → Develop Treatment Protocols
  - → Dose, route, duration, frequency, withdrawal times
- Monitor disease outcomes
  - → DIY "Trials" in you own production system
- Ask the right questions
  - → Population of animals used in comparative trials
  - → Inclusion criteria and outcomes (Case definitions)
  - → Will this work in **MY SYSTEM**

What are some of the things I should think about before using an antibiotic?

S.P.A.C.E.

The Final Frontier!

SPECTRUM

PK/PD

ADVERSE REACTIONS

COMPLIANCE

ENVIRONMENT

What does it all mean?

SPECTRUM- Is this drug effective against this bug?

PK/PD- Can the drug get to the bug:- Conc > MIC?

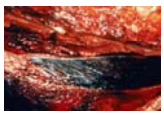
ADVERSE REACTIONS- Is it safe to use this drug?

COMPLIANCE- Can I get arrested for using this drug?

ENVIRONMENT- Where is the infection I'm treating?

Spectrum

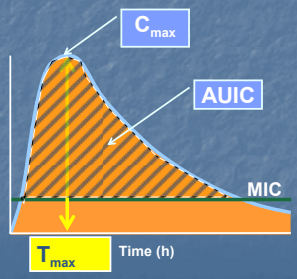
4-Quadrant System

	Aerobic	Anaerobic
Gram (+)	*St* *St* *Ar* *Lis* 	*Clostridium* 
Gram (-)	 *Haemophilus* *Moraxella* 	

	Aerobic	Anaerobic
Gram (+)	*St* *St* *Ar* *Lis* *Ba* 	*Clostridium* 
Gram (-)	 *Haem* 	

Pharmacokinetics/ Dynamics

Pharmacokinetics



- **Aminoglycosides**
  - → Conc > MIC
  - → C_{max} > 10X MIC
- **B-lactams**
  - → Time above MIC
  - Gram +ve: 50% > MIC
  - Gram –ve: 75% >MIC
- **Fluoroquinolones**
  - → AUC > 125 X MIC
  - → C_{max} > 10X MIC

What does this mean to me?

- Penicillin:- It makes more sense to give penicillin every day for 5 days than one big dose for a day
- Baytril:- Can be given as a single dose that will be effective for 3 days
- Some long acting drugs will form a deposit at the site of injection and "leak" slowly into the blood

Adverse Effects

	Cattle
Gastro-intestinal	Erythromycin increase GIT motility Lincomycin: Gut upset Florfenicol: Loss of appetite Tetracyclines: possible gut upset
Skeletal	Muscle Blemishes and irritation on IM Injection:- Oxytetracycline IM / Macrolides IM/ Sulfonamides IM/Florfenicol IM
Cardio-vascular	Tilmicosin IV is FATAL Collapse after RAPID IV injection of OTC
Renal	High Dose tetracyclines can hurt the kidneys

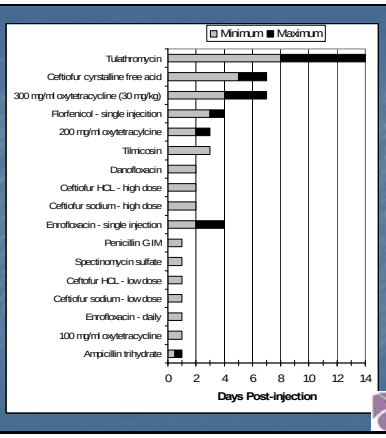
Compliance

Single Dose, Long-Acting Drugs for Food Animals

- Procaine Penicillin G
- Ceftiofur Crystalline Free Acid (Excede)
- Enrofloxacin (Baytril @ 12.5 mg/kg)
- Tulathromycin (Draxxin)
- Tilmicosin SQ (Micotil)
- Florfenicol (Nuflor@ 40 mg/kg)
- Oxytetracycline LA (IM/ SQ ONLY)

Current suggested minimum and maximum times before moving to additional therapy in non-responding BRD cases.

Suggested time periods are days (24 hour periods) after the only or last administration



Injection Site Blemishes/ Residues

Tissue Irritation/ Blemishes

- Oxytetracycline IM
- Macrolides IM
- Sulfonamides IM
- Florfenicol IM
- Enrofloxacin Intrauterine (mare)

Residues

- **AMINOGLYCOSIDES**
- Ceftiofur Crystalline Free Acid (Excede®) Intramuscular
- Florfenicol in Veal Calves/ Dairy Cows
- Tilmicosin in dairy cows

Antimicrobials banned for extralabel use in Food Animals

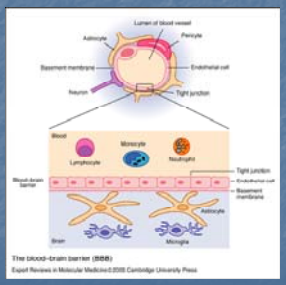
- Chloramphenicol
- Fluoroquinolones
- Dimetridazole
- Ipronidazole
- Other Nitroimidazoles
- Nitrofurazones
- Glycopeptides
- Sulfonamide drugs (except approved use of sulfadimethoxine, sulfabromomethazine, and sulfaethoxypyridazine) are banned in lactating dairy cattle.

Antimicrobials with Potential Risks in Humans

- **Tilmicosin:** Cardiotoxic on Accidental Injection (Heart Failure!)
- **Chloramphenicol:** Aplastic Anemia in humans

Environment

"Privileged" Sites:



- Central Nervous System
- Prostate
- Bone
- Seminal vesicles
- Eye
- Joints

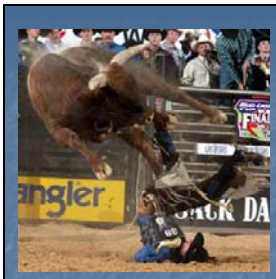
→ May become more "permeable" if inflamed

- Abscesses

Take Home Messages

- Develop treatment protocols with your veterinarian
- Treat early and treat right!
- Monitor treatment outcomes in your system
- Ask the right questions
- Know when to quit!

Acknowledgements



Notes – Notes -- Notes

Strategies for Controlling Input Costs

Dale Blasi
Kansas State University
Animal Sciences and Industry

Strategies for Controlling Input Costs

Dale Blasi, Chad Anglin, Marc Epp and Rodney Derstein

Beef Stocker Unit
Dept. of Animal Sciences & Industry
Kansas State University

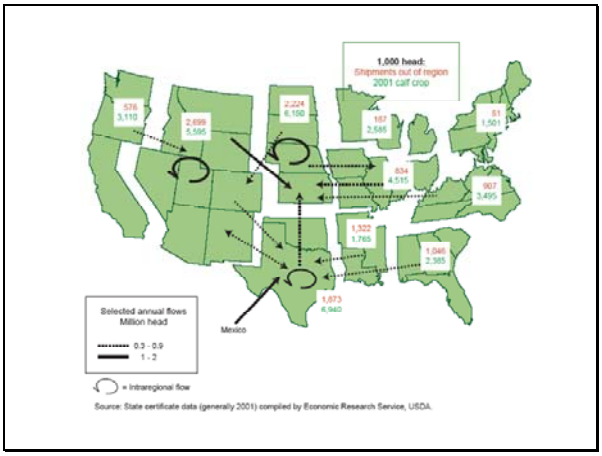
Beef Stocker Segment Trends

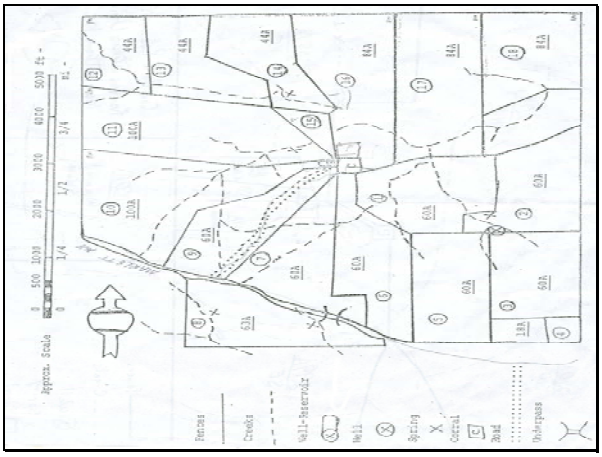
- Increasing importance in Beef Chain
- Operations becoming more coordinated
- Operations are more technology driven
- Contractual arrangements and alliances
- Product differentiation – natural and organic markets

Controlling Input Costs

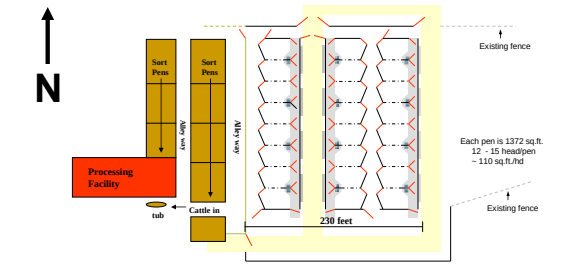
What Are the Challenges?

- Increasing/available pasture leases and structured care rates
- Increased feed and fuel input costs
- Available labor supply
- Volatile market conditions

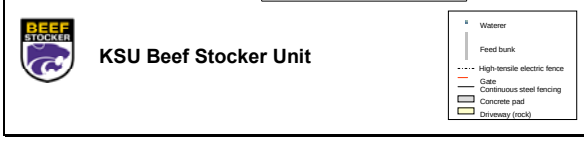

1,000 head:
Shipments out of region
2001 calf crop
576
3,110
2,699
5,595
2,224
6,100
187
2,585
51
1,501
634
4,515
907
3,495
1,322
1,765
1,046
2,385
1,073
4,940
Mexico
Selected annual flows
Million head
0.9 - 0.9
1 - 2
= Intraregional flow
Source: State certificate data (generally 2001) compiled by Economic Research Service, USDA.


Approx. Scale
Fences
Creeks
Wells
Roads

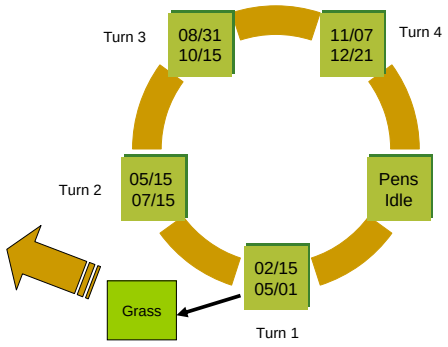
Beef Stocker Receiving Pens



KSU Beef Stocker Unit



Beef Stocker Unit Cattle Use Plan



Kuhl's Axiom

- Buy em Cheap
- Keep em Alive
- Make em Gain
- Sell em High

Buy em "Cheap" ?

- What does that mean?
  - Pay on the front or on the back end
- Expected vs Unknown

What Does "Buy Them Cheap" Really Mean?

- In a perfect world, all calves destined to KS would be:
  - Healthy (not stale)
  - Right breed combination
  - Castrated
  - Dehorned
  - Upper medium/large frame
  - Heavy (not extreme) muscling
  - Available in truck-sized lots

Cattle Sources

- SE US Auction Markets
  - Dickson, TN
  - Waynesboro, TN
  - Guthrie, KY
  - Sweetwater, TN
  - Lebanon, TN

Successful Receiving Programs

- Proper planning
- Functional equipment
  - Working facilities
  - Waterers
  - Feeders
- Quality ration ingredients
- Astute management and labor

Incoming Calf Weight Variation

Lot #	# Hd.	Avg. Wt.	Min	Max	S.D.	Range
102	102	459	366	524	34.1	158
103	102	463	388	542	30.8	154
104	104	440	362	520	32.6	158
105	99	474	400	540	31.3	140
106	102	439	328	520	33.3	192
107	100	453	372	516	31.6	144
108	95	503	424	596	34.7	172
109	96	513	442	612	26.9	170
110	92	520	444	642	33.1	198

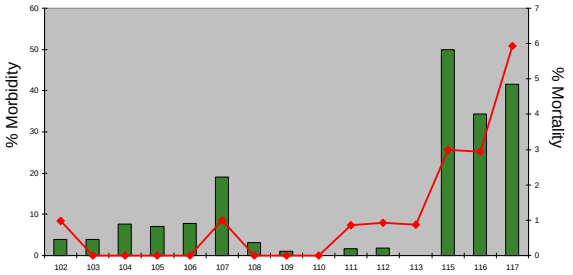
Kuhl's Axiom

- ~~Buy em Cheap~~
- Keep em Alive
- Make em Gain
- Sell em High

Bull vs Steer Performance

Lot #	% Cutting Bulls	45 day diff. (lbs.)
102	66	2
103	68	28
104	51	18
105	73	6
106	59	37
107	72	44
108	49	9
109	57	5
110	43	21
115	68	28
116	67	7
117	55	19

Morbidity and Mortality Rates (%)



Health Summary - 15 Loads

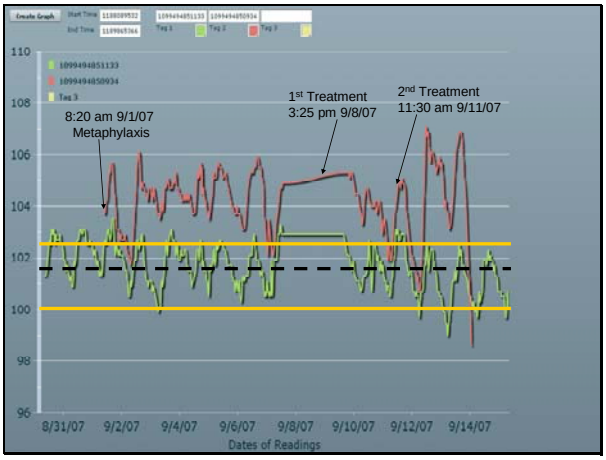
Item			Range Min	Range Max
Total incoming head	1532	head		
Avg. bulls	62.8	%	43.5	73.5
Avg. Incoming weight (no shrink adjust)	460.5	lbs	402	520
Avg. morbidity (1st pull respiratory only)	11.37	%	0	49.5
Avg. mortality	1.10	%	0	5.94

Compiled by Marc Epp

Technology and Health Detection


TekVet™
UNLAWFUL TO REMOVE
0741


0751


8:20 am 9/1/07
Metaphylaxis
1st Treatment
3:25 pm 9/8/07
2nd Treatment
11:30 am 9/11/07
110
108
106
104
102
100
98
96
8/31/07
9/2/07
9/4/07
9/6/07
9/8/07
9/10/07
9/12/07
9/14/07
Dates of Readings

Kuhl's Axiom

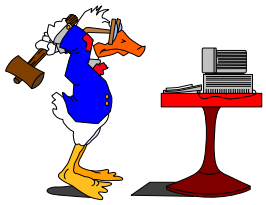
- Buy em Cheap
- Keep em Alive
- Make em Gain
- Sell em High

Receiving Ration Management

- **Quality feed ingredients**
- **Clean bunks/stale feed removed**
- **Feed analysis - Critical**
- **Formulated nutritionally balanced diets**
- **Standardized, thorough mixing**
- **Timed, uniform delivery**

Receiving Ration Philosophy

- Do not Compound Stress!!!!!!!

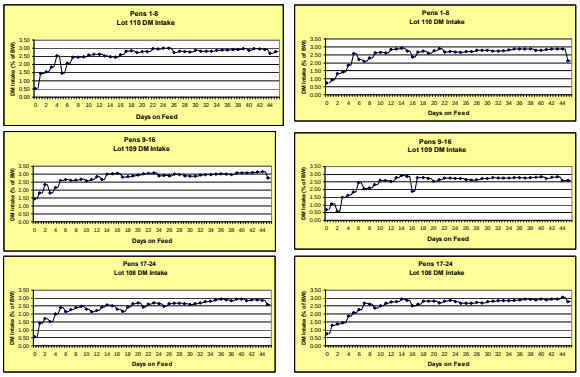


Feed Intake of Newly Weaned/Stressed Calves

Days after Arrival and/or Weaning	DM Intake (% of BW)
1 to 7	.5 to 1.5
8 to 14	1.5 to 2.5
15 to 28	2.5 to 3.5

Hutchison and Cole, Texas A&M

Summer, 2006 **Fall,2006**

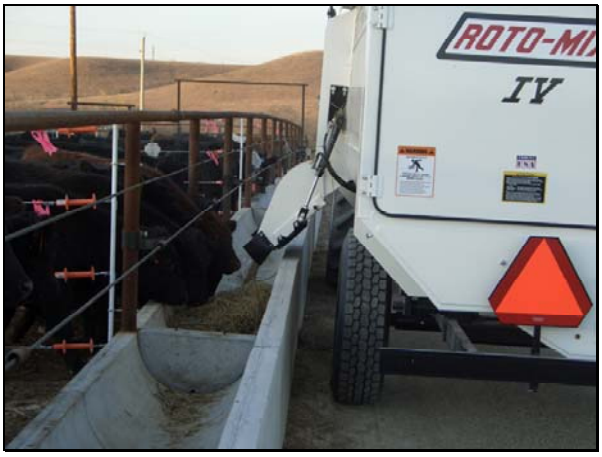


Needs of a 400 lb Calf at Different Rates of Gain

Level of intake	ADG	Protein %	NEg Mcal/lb
1% BW (4 lb)	0	15.0	0
	0.5	21.2	61
2% BW (8 lb)	0	7.0	0
	1.0	13.0	46
	2.0	15.2	70
3% BW (12 lb)	2.0	10.5	20
	2.5	11.1	49

Cross-Section of a Successful Starter Ration

- **Palatable**
- **High (rumen friendly) energy and protein**
- **Fortified with minerals and vitamins**
- **Expense will vary depending upon situation**
- **Avoid least cost formulations**



Stocker Unit Diets, 100% DM Basis

	Base #1	Base #2	Base #3
Days fed post arrival	10 days	10 days	30 days
Feedstuff, %			
Alfalfa	30.0	15.0	9.0
Prairie Hay	16.0	15.0	15.0
Dry – Rolled Corn	28.0	30.5	36.5
Wet Corn Gluten Feed	23.0	15.0	9.0
Supplement	3.0	3.0	3.0

Factors Which Determine Effective Use of Byproducts

- **Distance between production/use site**
- **Nutrient composition and variability**
- **Processing costs**
- **Uniformity of supply**
- **Marketing availability**
- **Handling and storage concerns**

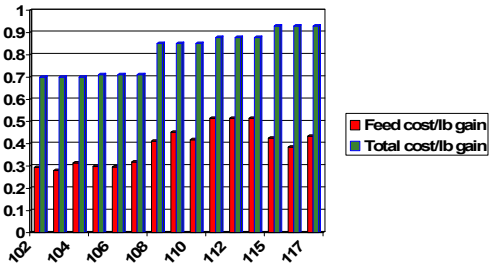
Performance Summary - 15 Loads

Item			Range Min	Range Max
Total incoming head	1532	head		
Avg. Incoming weight (no shrink adjust)	460.5	lbs	402	520
Avg. ADG (full-fed only; after 6-8% shrink)	2.38	Lbs/day	2.01	2.76
Avg F:G (full-fed only; after 6-8% shrink)	6.06	Feed:Gain	7.14	5.49

Compiled by Marc Epp

Forage Issues

Total and Feed Costs/Lb Gain



- Feed cost based on Shrunk basis

Make em Gain ?

- Given the increase in feed and forage costs, when/where should calves gain?

Effect of Backgrounding Performance on Subsequent Pasture Performance on Double Stocked Bluestem Pastures – Anglin et al. 2007

- Study objective:
  - Evaluate differences among pens fed full-fed dry-matter intake and three various levels of restricted dry-matter intakes fed in the receiving yard and their respective performance during the subsequent grazing phase.

Background Rations Prior to Pasture Turnout – Anglin et al., 2007

Limit Fed Treatments

Item	Full Fed	2.50%	2.25%	2.00%
# Pens (animals)	6 (83)	6 (81)	6 (81)	6 (82)
Ontest wt	420	419	420	420
Offtest wt	587[a]	562[b]	558[b]	530[c]
Total wt gain	167[a]	143[b]	138[b]	110[c]
ADG, lbs/day	3.13[a]	2.28[b]	2.13[b]	1.60[c]
F:G	5.67	5.34	5.25	5.76

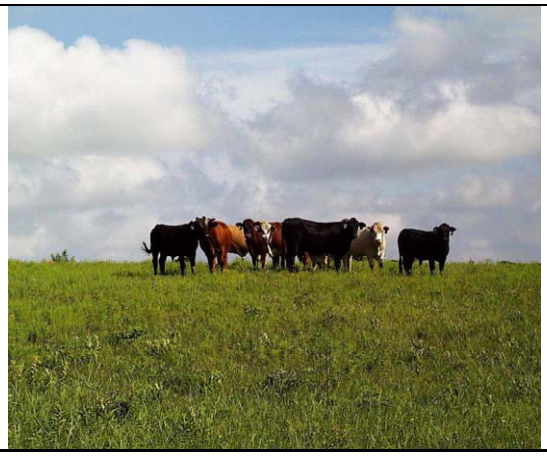
[a,b,c] P<.05

Calculated Background Feed Costs Anglin et al., 2007

Limit Fed Treatments

Item	Full Fed	2.50%	2.25%	2.00%
# Pens (animals)	6 (83)	6 (81)	6 (81)	6 (82)
ADG, lbs/day	3.13[a]	2.28[b]	2.13[b]	1.60[c]
F:G	5.67	5.34	5.25	5.76
Cost, $/hd/day	1.03	.79	.78	.74
Cost, $/hd/period	69.14	53.17	52.55	49.85

[a,b,c] P<.05



Grazing Performance Based on Previous Backgrounding Diet

Limit Fed Treatments

Item	Full Fed	2.50%	2.25%	2.00%
Turnout wt.	587	562	558	530
Day 45 wt.	692	671	671	645
Offtest wt.	782[a]	769[a]	769[a]	745[b]
Overall wt. gain	195	207	211	215
Day 1 – 45 ADG	2.33	2.43	2.50	2.57
Day 46 – 90 ADG	1.88	2.04	2.05	2.07
Overall ADG	2.10	2.24	2.28	2.32

Anglin et al., 2007 [a,b,c] P<.05

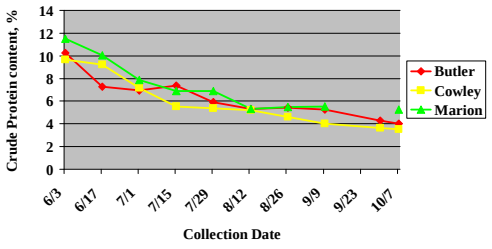
Native Grass Management

Impact of Spring Pasture Burning on Stocker Calf Performance[a]

Item	Burned Pastures	Unburned Pastures	SEM
No. Steers	181	261	-
No. Pastures	6	6	-
Stocking rate, lbs/acre	291	288	-
Starting wt, lbs	497	495	0.58
Final shrunk wt, lbs	643	627	3.45
ADG, lb/day	1.81	1.65	0.05
Gain per acre, lbs.	85	76	2.19

[a]Barnhardt et al., 2006

% Crude Protein Content of Native Grass Hay by Harvest Date, 1997



Dave Kehler, Chris Baker and Steve Tonn: CEA in Butler, Cowley and Marion Counties

Effect of Supplementation on Grazing ADG

Item	Treatment		SEM	*P* =
	Con	Energy		
No. steers	140	188	-	-
No. pastures	4	4	-	-
In wt, lb	495	495	0.3	0.82
Out wt, lb	638	706	11.2	0.01
Supp. Intake, lb DM	-	5.4	0.5	-
ADG, lb	1.47	2.20	0.11	0.01
Supp. conversion	-	8.0	1.6	-

Montgomery et al. (2002)

Effect of Supplementation on Ultrasound Data During Grazing

Item	Treatment		SEM	*P* =
	Control	Energy		
No. steers	140	188	-	-
No. pastures	4	4	-	-
Ribeye area, inch^2	7.0	7.9	0.13	0.01
Rib fat, inch	0.08	0.10	0.003	0.01
Rump fat, inch	0.10	0.14	0.005	0.01

Montgomery et al. (2002)

Grazing Supplementation and Finishing Performance

Item	Treatment		SEM	*P* =
	Control	Energy		
No. steers	140	188	-	-
No. pens	4	4	-	-
Initial wt, lb	623	684	11.9	0.01
Final wt, lb	1272	1272	10.8	0.98
DMI, lb	21.1	21.3	0.35	0.90
ADG, lb	3.61	3.61	0.051	0.95
G:F	0.170	0.170	0.002	0.95
DOF	180	162	2.5	0.01

Montgomery et al. (2002)

Grazing Supplementation and Carcass Characteristics

	Treatment			
Item	Contrl	Energy	SEM	*P* =
No. steers	140	188	-	-
No. pens	4	4	-	-
HCW, lb	832	832	7.0	0.99
Dressing percent	65.7	65.1	0.25	0.15
Ribeye area, inch^2	12.7	12.9	0.17	0.38
Fat thickness, inch	.72	0.67	0.020	0.16

Montgomery et al. (2002)

Grazing Supplementation and Carcass Yield Characteristics

	Treatment			
Item	Control	Energy	SEM	*P* =
No. steers	140	188	-	-
No. pens	4	4	-	-
YG 1, %	1	2	0.8	0.49
YG 2, %	10	12	2.9	0.65
YG 3, %	76	72	4.0	0.53
YG 4 & 5, %	13	14	2.7	0.77

Montgomery et al. (2002)

Grazing Supplementation and Carcass Quality Characteristics

	Treatment			
Item	Control	Energy	SEM	*P* =
No. steers	140	188	-	-
No. pens	4	4	-	-
Marbling score	Sm^{75}	Sm^{93}	8.3	0.19
USDA Prime, %	3	7	1.3	0.09
USDA Choice, %	84	73	4.9	0.16
USDA Select, %	13	20	4.9	0.33

Montgomery et al. (2002)

Controlling Input Costs

- Buy the right calves
  - Stocker returns begin with purchased or breed value attributes
- Feed inputs
  - Where/when?
- Labor
- Marketing considerations

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Using By-Product Feeds for Receiving and Growing Diets

Sean Montgomery
Corn Belt Livestock Services

Using By-product Feeds for Receiving and Growing Diets

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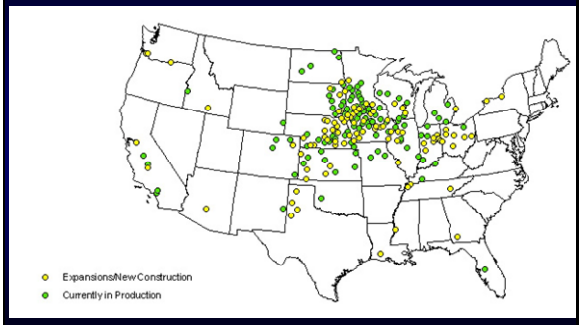
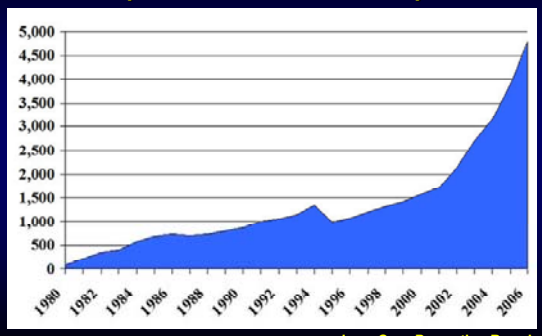
Corn Belt Livestock Services

US Ethanol Plants



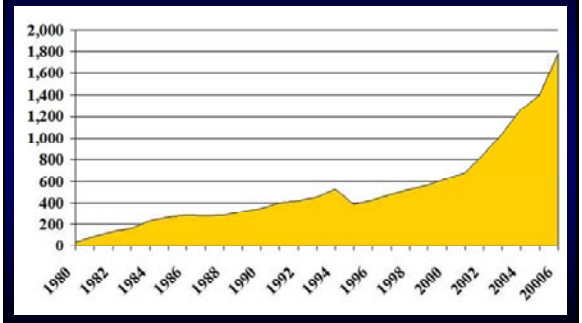
ISU: 5/11/07

US Ethanol Production (Millions of Gallons)



Iowa Corn Promotion Board

US Corn Used for Ethanol (Millions of Bushels)

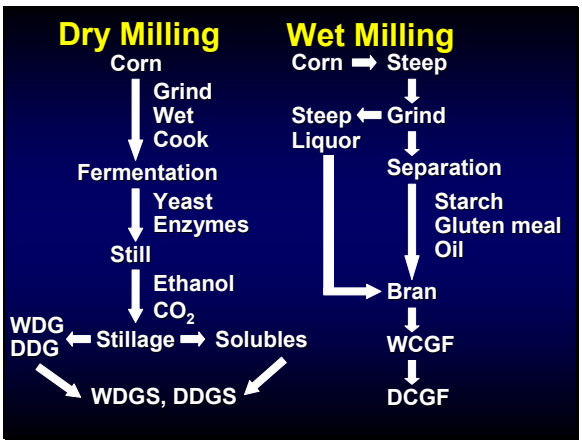


Iowa Corn Promotion Board

Distillers Grains Production

- 1998 produced ≈ 1 million tons of distillers grains
- 2006 produced ≈ 10 million tons of distillers grains
- 2010 estimated to produce ≈ 16 million tons of distillers grains

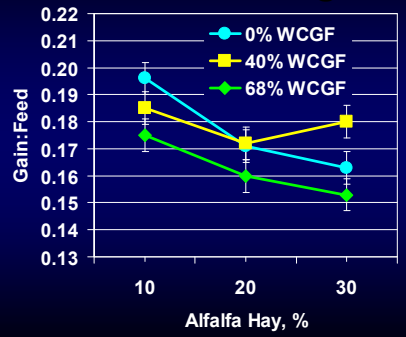
Weiss et al. (2007).



Comparing WDGS and WCGF

	WDGS	WCGF
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 / 35	20 / 75

WCGF in Growing Diets



AH level × WCGF level interaction ($P < 0.01$). Montgomery et al. (2003).

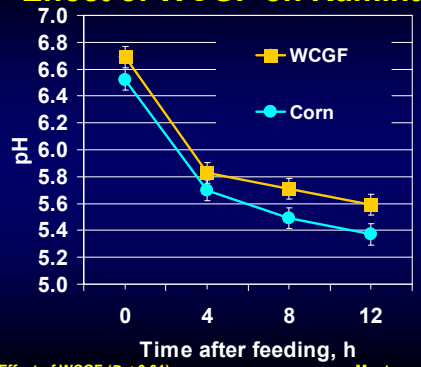
Digestibility and Passage Rate[a]

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).

Effect of WCGF on Ruminal pH



Effect of WCGF (*P* < 0.01).

Montgomery et al. (2004).

DDGS in Receiving Diets[a]

	Treatment		
Item	DRC	DDGS	*P* =
No. pens	7	7	-
No. steers	186	187	-
DMI, lb	11.0	11.9	0.05
ADG, lb	2.36	2.72	0.11
F:G	4.73	4.48	0.55
Pulls, %	14.8	26.7	0.09
Repulls, %	3.1	8.7	0.09

[a]Both diets contained 40% hay; DRC diet = 52% corn, DDGS diet = 53% DDGS.

Drouillard et al. (1999).

Fat in Receiving Diets

	Added Fat	
Item	0	4
No. pens	7	7
No. steers	186	187
DMI, lb	14.0	14.4
ADG, lb	3.37[a]	3.65[b]
F:G	4.17	3.92
Morbidity, %	72	82
Death loss, %	4	14

[a,b]Means within a row with uncommon superscripts differ ($P < 0.10$).

Cole and Hutcheson (1987).

Metabolism of Linoleic Acid

Linoleic acid (C18:2)

↓

Arachidonic acid (C20:4)

↓

PGH_2, PGE_2, $PGF_{2\alpha}$, PGI_2, PGD_2

Eicosanoids

Corn By-products in Receiving Diets

Item	Control	DCGF[a]	DDGS[b]	1[c]	2[d]
ADG, lb	3.96	3.72	4.11	NS	0.03
DMI, lb	14.7	14.8	15.1	NS	NS
Feed:Gain	3.7	4.0	3.7	NS	NS

[a]Diet contained 14% DCGF.

[b]Diet contained 7% DDGS.

[c]1 = Corn vs. the mean of DCGF and DDGS.

[d]2 = DCGF vs. DDGS.

Mueller and Boggs (2005).

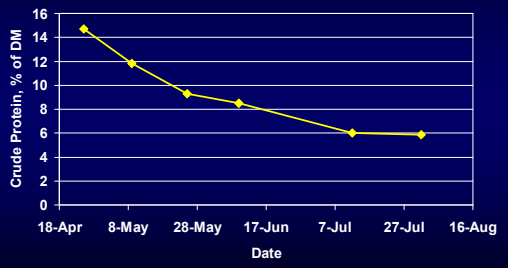
DGS in Growing Diets[a]

	Treatment		
Item	Corn/SBM	DDGS	WDGS
ADG, lb	2.55	2.68	2.90
DMI, lb	17.5	17.5	16.7
Feed:Gain	6.93[b]	6.56[b]	5.77[c]

[a]All diets contained 50% hay (DMB); DGS diets contained 20% DGS (DMB).
[b,c,d]Means within a row with uncommon superscripts differ ($P < 0.05$).

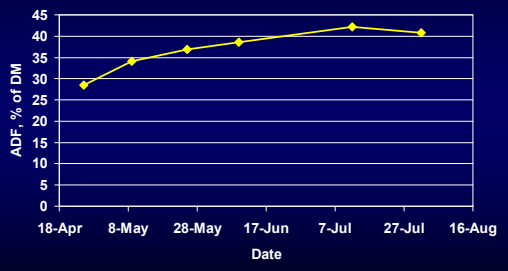
Mateo et al. (2004).

Crude Protein of Native Range



Montgomery et al. (2002).

ADF of Native Range



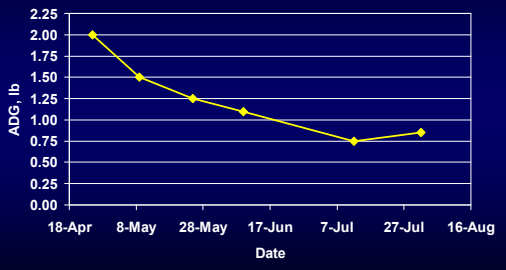
Montgomery et al. (2002).

Net Energy of Native Range Calculated from ADF

- %TDN = 88.9 - (0.779 × ADF)
- ME (Mcal/kg) = (TDN% × 0.044) × 0.82
- NEm (Mcal/lb) = (1.37 × ME) – (.138 × ME^2) + (.0105 × ME^3) – 1.12 / 2.204
- NEg (Mcal/lb) = (1.42 × ME) – (.174 × ME^2) + (.0122 × ME^3) – 1.65 / 2.204

NRC (1996).

Predicted ADG based on ADF



Montgomery et al. (2002).

DDG and Grazing Cattle

Experiment	Cont ADG	DDG % BW[a]	DDG ADG	DDG % BW[a]	DDG ADG
KS06	1.55	0.50	2.12	1.00	2.39
KS	2.31	0.41	2.81	0.83	3.17
UNL06	1.48	0.50	2.18	0.75	2.53
UNL04	1.50	0.50	1.70	0.60	1.75
UNL07	1.36	0.55	1.96	-	-
UNL06	1.63	0.50	1.98	1.00	2.42
Unpublished	1.08	-	-	0.90	2.38
Unpublished	1.94	-	-	1.30	2.79
Mean	1.60	0.48	2.13	0.92	2.49

[a]Dry matter as a percentage of body weight.

Klopfenstein et al. (2007).

DDG and Grazing Cattle

Klopfenstein et al. (2007)

- Subsequent growth performance during the finishing period was not affected by supplementing DDG
- Each one pound of DDG dry matter fed decreases forage dry matter intake by 0.5 pounds

Allow for increased stocking density?

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

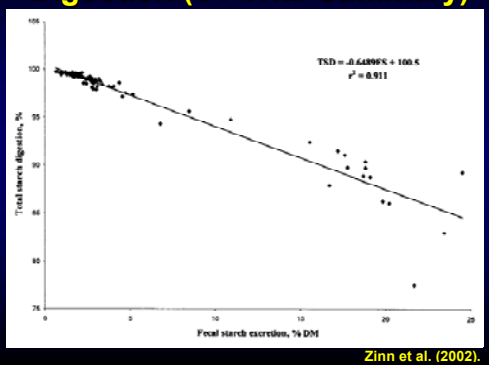
[a,b,c]Means within a row with uncommon superscripts differ ($P < 0.05$).
[e]Expressed as % above WC, calculated for diet and corn only (61.4%).
Vander Pol et al. (2006).

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]

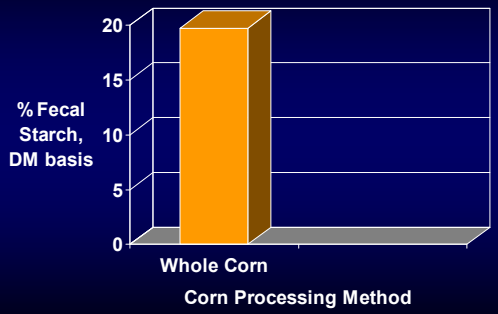
[a,b,c,d]Means within a row with uncommon superscripts differ ($P < 0.10$).
[e]Expressed as % above WC, calculated for diet and corn only (52.5%).
Scott et al. (2003).

Fecal Starch and Starch Digestion (64-Trial Summary)

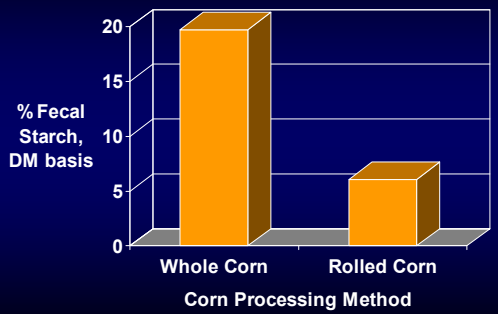


Zinn et al. (2002).

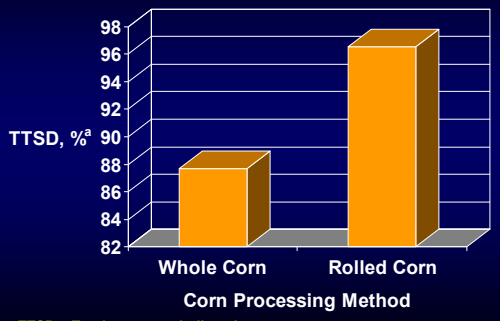
Fecal Starch Results



Fecal Starch Results



Fecal Starch Results



[a]TTSD = Total tract starch digestion.

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

Evaluating Ration Consistency

- Out of 153 commercial feedlots
  - Average CV of 9.5 percent
  - Sixty-six percent had CVs below 10 percent
  - Thirty-one percent had CVs between 10 and 20 percent
  - Three percent had a CV greater than 20 percent

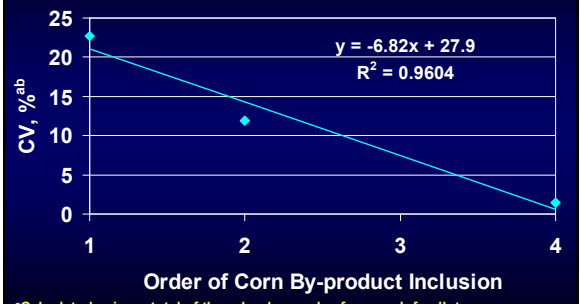
  (Vogel, 2000)

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.

Rumensin Coefficient of Variation (CV)

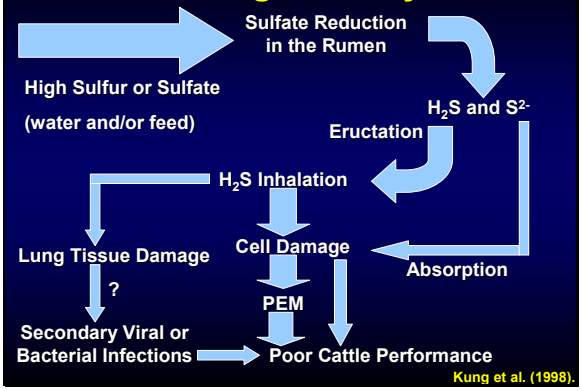


[a]Calculated using a total of three bunk samples from each feedlot.
[b]Values reported on a dry matter basis.

Sulfur Requirements (NRC,1996)

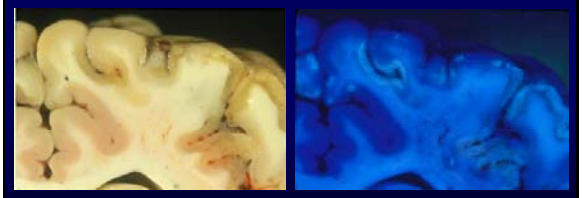
- Requirement
  - 0.15 percent of diet DM
- Maximum tolerable level
  - 0.40 percent of diet DM

Effects of High Dietary Sulfur



Kung et al. (1998).

Etiology of PEM



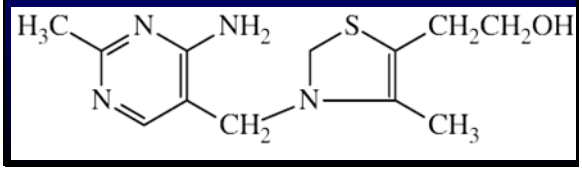
Merck and Co., Inc. (2006).

Symptoms of PEM

- Blindness
- Ataxia (incoordination)
- Recumbency with seizures
- Bloat?

Thiamine

- Necessary cofactor in the tri-carboxcylic acid cycle
  - Pyruvate dehydrogenase
  - Alpha ketogluterate



Rumen pH and $[H_2S]$

$$[H_2S] \longleftrightarrow [HS^- + H^+]$$

pKa = 6.89

Concentrations of H_2S and HS^- are equal at a rumen pH of 6.89 (50% of each)

Rumen pH and $[H_2S]$

What if rumen pH = 5.80?

$$pH = pKa + \log\frac{[HS^- + H^+]}{[H_2S]}$$

$$5.80 = 6.89 + \log\frac{[HS^- + H^+]}{[H_2S]}$$

$$\frac{[H_2S]}{[H_2S] + [HS^- + H^+]} \times 100\% = \frac{1}{1 + 0.08} \times 100\% = 93\%$$

$[H_2S]$

Sulfur Variability in MWDGS

Managing Sulfur

- Know sulfate concentration of water
- Know sulfur concentration of dietary ingredients
- Formulate diets to contain ≤ 0.3% sulfur on a DM basis
- Add thiamine to the diet
- Heat stress and PEM?
- Use CTC during a PEM outbreak?
- Rapid method test for sulfur?

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