

15. How Downstream Market Changes Impact Cattle Producers

Melissa McKendree

<mgsm@ksu.edu>

Melissa is a Doctoral Candidate in Agricultural Economics. She received her B.S. in Food and Resource Economics from the University of Florida in 2011 and a M.S. in Agricultural Economics from Purdue University in 2013. Melissa's research is focused on numerous issues related to the livestock industries. She is interested in studying issues spanning the supply chain from consumer preferences through producers. Melissa's current areas of concentration include general livestock economics, food demand, supply chain relationships, and agribusiness marketing and management. Upon graduation she hopes to become a faculty member at a land-grant institution.

Glynn Tonsor

<gtonsor@ksu.edu>

Glynn Tonsor is an Associate Professor in the Department of Agricultural Economics at Kansas State University (KSU). Glynn grew up on a farrow-to-finish swine farm in Monroe City, Missouri. Tonsor obtained a B.S. from Missouri State University and Ph.D. from KSU. He was a faculty member at Michigan State University from May 2006 to March 2010 when he joined the KSU faculty.

Tonsor has broad interests and experiences which span issues throughout the meat supply chain. Through active research, engaged outreach with industry, and first-hand knowledge with livestock production, Glynn has economic expertise in an array of topics of importance to Kansas, U.S. and global stakeholders. These topics include animal identification and traceability, animal well-being and welfare, commodity market analysis, consumer demand, food safety, meat labeling policies, producer perceptions and preferences, risk management, and technology acceptance. Glynn's integrated research and extension program has resulted in multiple journal article publications and numerous outreach contributions. Glynn and his wife, Shauna, live in Saint George, Kansas with their children Ethan, Levi, and Aubree.

Abstract/Summary

The beef complex iswell... complex. What happens in one sector of the beef industry can impact other sectors of the beef industry. Specifically, how do changes in retail beef demand impact fed cattle and feeder cattle supply and demands? How are changes in fed cattle and corn prices passed through to feeder cattle prices? Implications surrounding generic advertising and exports will be discussed.

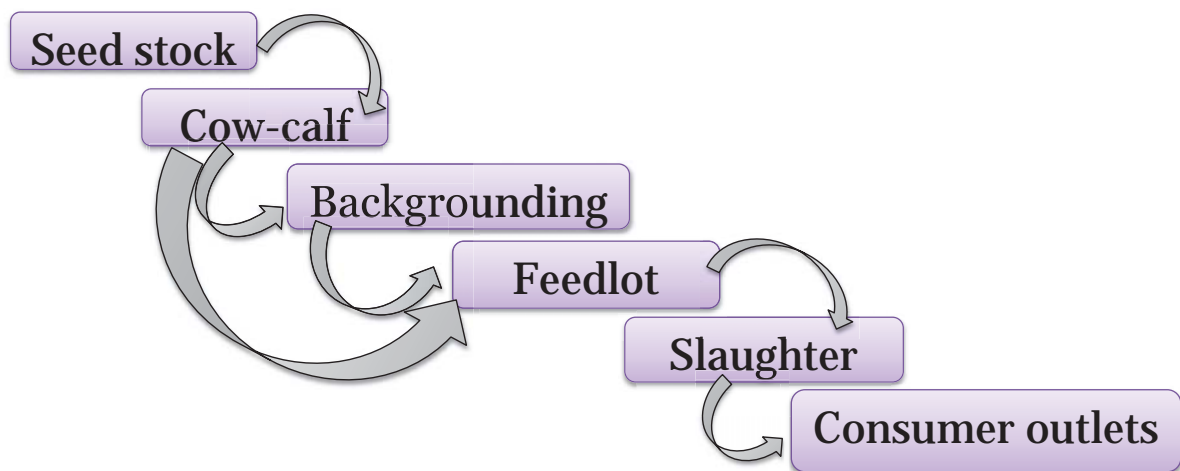
How Downstream Market Changes Impact Cattle Producers

Melissa G.S. McKendree, PhD Candidate
Glynn T. Tonsor, Professor



KANSAS STATE
UNIVERSITY

US Cattle Industry



KANSAS STATE
UNIVERSITY



What happened to land value in the late 2000s when crop prices increased?

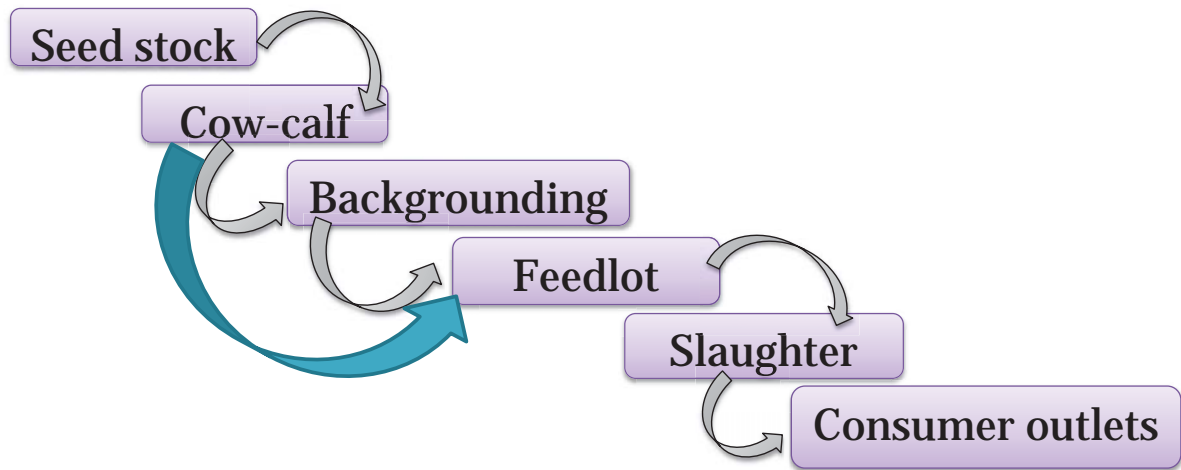
KANSAS STATE
UNIVERSITY



What is the limiting resource in the beef industry?

KANSAS STATE
UNIVERSITY

US Cattle Industry



KANSAS STATE
UNIVERSITY

Objectives

- The objectives are to update and expand Zhao, Du, and Hennessy (2011) in the following ways:
 1. More recent data and investigation into structural breaks
 2. Update assumptions in paper using the *Focus on Feedlot* series
 3. Incorporate basis into price expectations
 - Kastens, Jones and Schroeder (1998)

KANSAS STATE
UNIVERSITY

Pass-through calculations

1. Fed cattle to feeder cattle
 2. Corn to feeder cattle
- Based on an expected profit function, calculated pass-through hypotheses using Focus on Feedlot data for assumptions
 - Estimated actual pass-through using regression analysis
 - Compare the two pass-through values

Assumptions

Assumption	Full Time		
	Period	RA	RB
	02/94 to 05/16	02/94 to 05/12	06/12 to 05/16
Feeder weight (lbs.)			
Finish weight (lbs.)			
Pounds of gain			
Feed conversion ratio			
Total lbs of corn needed			
Pounds of corn per bu			
Corn needed (bu.)			
Deathloss (%)			
Discount rate			
ϕ_1 - Live cattle pass-through			
ϕ_2 - Corn pass-through			

Assumptions

Assumption	Full Time		
	Period	RA	RB
	02/94 to 05/16	02/94 to 05/12	06/12 to 05/16
Feeder weight (lbs.)	783.87	775.36	822.84
Finish weight (lbs.)	1301.32	1280.60	1396.33
Pounds of gain	517.46	505.23	573.50
Feed conversion ratio	6.08	6.09	6.02
Total lbs of corn needed	3145.50	3077.97	3450.77
Pounds of corn per bu	56.00	56.00	56.00
Corn needed (bu.)	56.17	54.96	61.62
Deathloss (%)	1.24%	1.20%	1.40%
Discount rate	2.7%	3.6%	2.1%
ϕ_1 - Live cattle pass-through	1.62	1.57	1.64
ϕ_2 - Corn pass-through	-7.17	-7.09	-7.49

KANSAS STATE
UNIVERSITY

Assumptions

Assumption	Full Time		
	Period	RA	RB
	02/94 to 05/16	02/94 to 05/12	06/12 to 05/16
Feeder weight (lbs.)	783.87	775.36	822.84
Finish weight (lbs.)	1301.32	1280.60	1396.33
Pounds of gain	517.46	505.23	573.50
Feed conversion ratio	6.08	6.09	6.02
Total lbs of corn needed	3145.50	3077.97	3450.77
Pounds of corn per bu	56.00	56.00	56.00
Corn needed (bu.)	56.17	54.96	61.62
Deathloss (%)	1.24%	1.20%	1.40%
Discount rate	2.7%	3.6%	2.1%
ϕ_1 - Live cattle pass-through	1.62	1.57	1.64
ϕ_2 - Corn pass-through	-7.17	-7.09	-7.49

KANSAS STATE
UNIVERSITY

Assumptions

Assumption	Full Time		
	Period 02/94 to 05/16	RA 02/94 to 05/12	RB 06/12 to 05/16
Feeder weight (lbs.)	783.87	775.36	822.84
Finish weight (lbs.)	1301.32	1280.60	1396.33
Pounds of gain	517.46	505.23	573.50
Feed conversion ratio	6.08	6.09	6.02
Total lbs of corn needed	3145.50	3077.97	3450.77
Pounds of corn per bu	56.00	56.00	56.00
Corn needed (bu.)	56.17	54.96	61.62
Deathloss (%)	1.24%	1.20%	1.40%
Discount rate	2.7%	3.6%	2.1%
ϕ_1 - Live cattle pass-through	1.62	1.57	1.64
ϕ_2 - Corn pass-through	-7.17	-7.09	-7.49

KANSAS STATE
UNIVERSITY

Data

- Monthly data from February 1994 to May 2016
- LMIC
 - Expected live cattle price per cwt
 - » Kansas 4 year historical average basis
 - Weighted feeder cattle cash price per cwt
 - Corn cash price per bu
- Assumed 5 month feeding period

KANSAS STATE
UNIVERSITY

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						
Cash corn						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						

Results

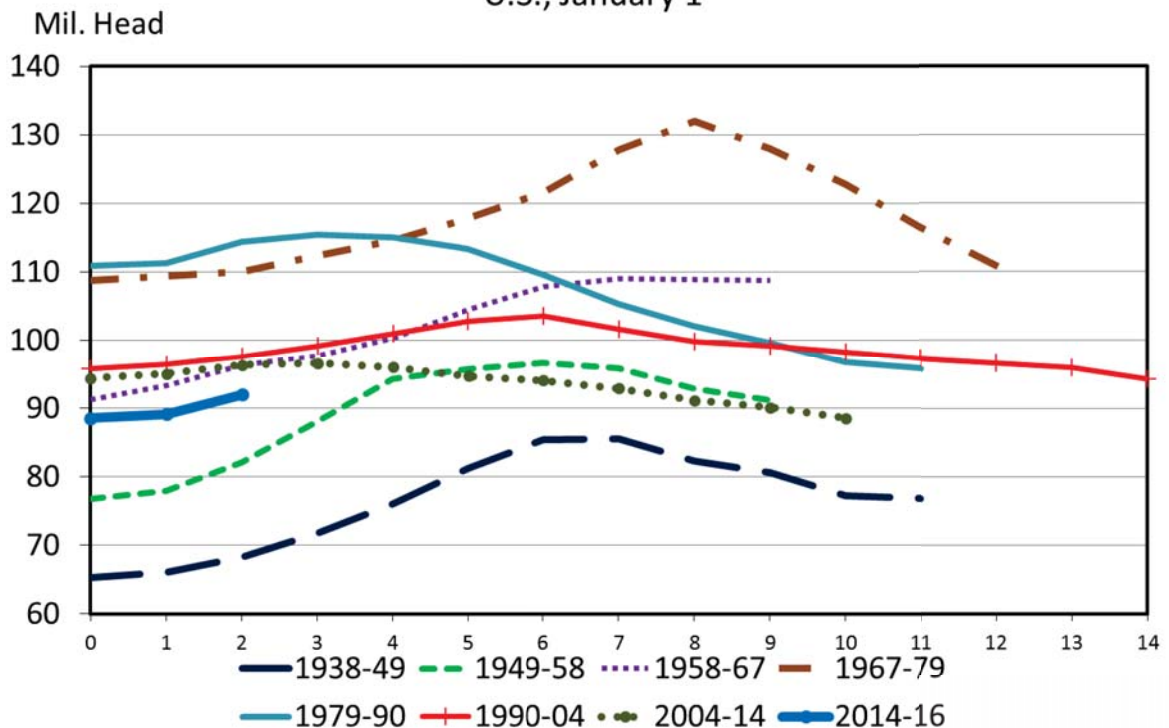
	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						

Results

	Hypothesized pass-through	Calculated pass-through	Percent pass-through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)						
RA (02/94 to 05/12)						
RB (06/12 to 05/16)						

TOTAL CATTLE INVENTORY BY CYCLE

U.S., January 1



Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)	-7.17	-9.36	131%	1.93	0.17	Fail to reject 100% PT
RA (02/94 to 05/12)	-7.09	-5.92	84%	1.08	0.30	Fail to reject 100% PT
RB (06/12 to 05/16)	-7.49	-9.79	131%	0.25	0.62	Fail to reject 100% PT

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)	-7.17	-9.36	131%	1.93	0.17	Fail to reject 100% PT
RA (02/94 to 05/12)	-7.09	-5.92	84%	1.08	0.30	Fail to reject 100% PT
RB (06/12 to 05/16)	-7.49	-9.79	131%	0.25	0.62	Fail to reject 100% PT

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)	-7.17	-9.36	131%	1.93	0.17	Fail to reject 100% PT
RA (02/94 to 05/12)	-7.09	-5.92	84%	1.08	0.30	Fail to reject 100% PT
RB (06/12 to 05/16)	-7.49	-9.79	131%	0.25	0.62	Fail to reject 100% PT

Results

	Hypothesized pass-through	Calculated pass- through	Percent pass- through	F-value	p-value	Conclusion
Expected live cattle						
Full Dynamic (02/94 to 05/16)	1.62	1.86	115%	4.63	0.03	Reject 100% PT
RA (02/94 to 05/12)	1.57	1.48	94%	0.57	0.45	Fail to reject 100% PT
RB (06/12 to 05/16)	1.64	2.35	143%	5.67	0.03	Reject 100% PT
Cash corn						
Full Dynamic (02/94 to 05/16)	-7.17	-9.36	131%	1.93	0.17	Fail to reject 100% PT
RA (02/94 to 05/12)	-7.09	-5.92	84%	1.08	0.30	Fail to reject 100% PT
RB (06/12 to 05/16)	-7.49	-9.79	131%	0.25	0.62	Fail to reject 100% PT

Conclusions

- Basis expectations matter in pass-through calculations (see paper)
- Evidence for 100% pass-through in corn to feeder cattle
- Mixed evidence for 100% pass-through in fed to feeder cattle
 - Often >100%

Moving Forward

- Other levels of the cattle complex can be investigated
 - Calves to replacement heifers
 - Contingent upon data availability
- Different basis expectations by state to see if RRT conclusions vary by state

Discussion

- Excess capacity
- Changes in retail or export demand
- Generic advertising
- Trade agreements

KANSAS STATE
UNIVERSITY

Thank you!

Melissa McKendree
mgsm@ksu.edu

KANSAS STATE
UNIVERSITY