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Biofuels and Feed Costs: Implications for Poultry Producers

Elanco Poultry Meetings

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Current U.S. biofuel supports

- Fixed payments for biofuel use:
  - $0.12/liter of ethanol used for fuel
  - $0.26-0.13/liter for biodiesel (depends on feedstock)
- Usage mandates
- R & D grants
- USDA grants for plant construction
- State and local support – grants and rebates
- Total cost is about $0.20/liter produced

What is the effect of the tax credit?

- Increases ethanol value by $0.12 per liter
- Creates “value wedge” between ethanol and gasoline
- Indirectly supports corn prices by up to $50/mt ($0.12 x 420 liters/mt)
- Grants ethanol a favored market position vs. food and feed producers

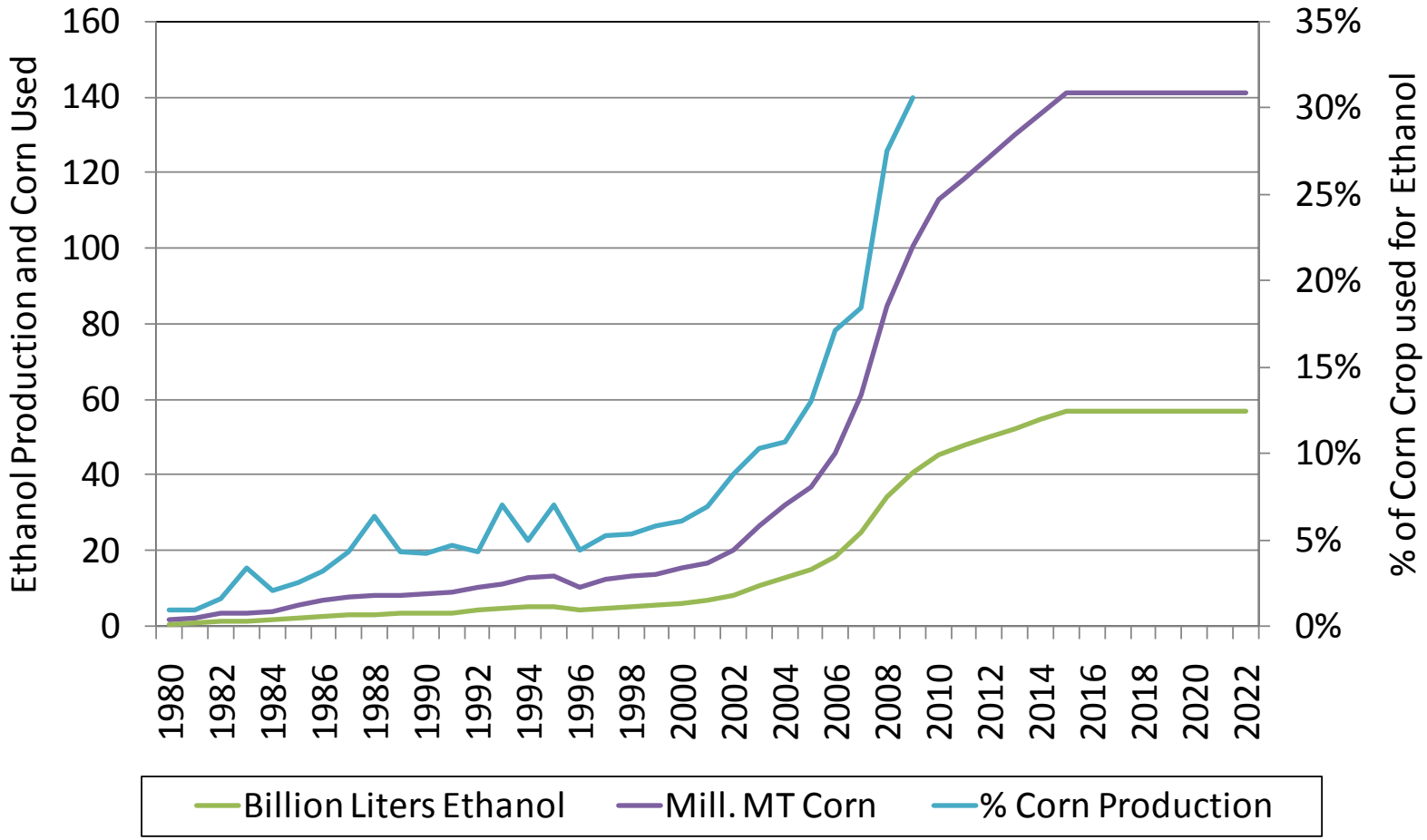
What is the effect of the RFS?

- Sets a minimum amount of use
- Establishes incentives to build ethanol capacity
- Also establishes demand floor for corn
- 2009 U.S. RFS isolates 3% of global grains from market forces
- Creates increased grain price volatility
- Partially isolates ethanol production from price competition with gasoline

Current RFS schedule
(Billion Liters/Year)

Year	Renewable Biofuel	Advanced Biofuel	Cellulosic Biofuel	Biomass-based Diesel	Undifferentiated Advanced Biofuel	Total RFS
2008	34.1					34.1
2009	39.8	2.3		1.9	0.4	42.1
2010	45.5	3.6	0.4	2.5	0.8	49.1
2011	47.8	5.1	0.9	3.0	1.1	52.9
2012	50.0	7.6	1.9	3.8	1.9	57.6
2013	52.3	10.4	3.8		6.6	62.7
2014	54.6	14.2	6.6		7.6	68.8
2015	56.9	20.8	11.4		9.5	77.7
2016	56.9	27.5	16.1		11.4	84.3
2017	56.9	34.1	20.8		13.3	91.0
2018	56.9	41.7	26.5		15.2	98.5
2019	56.9	49.3	32.2		17.1	106.1
2020	56.9	56.9	39.8		17.1	113.7
2021	56.9	68.2	51.2		17.1	125.1
2022	56.9	79.6	60.6		19.0	136.4

Renewable biofuel and corn use



Other Biofuels Programs

- EU has targets, but without major budget support
- Brazil's energy tax system
  - High tax on petroleum fuels
  - Minimum tax on ethanol
  - Indirect subsidy, but on sugar, not grain
- Mandates and other support programs in Asia, Latin America, Canada
  - None approach scale and impact of U.S./Brazil/EU

Feed costs, energy prices and energy policy

- The feed ingredient game has changed
- Higher petroleum prices = biofuels profits
- Even without government support biofuel production would be increasing
- Supports lower biofuel cost relative to fossil fuels
- Limiting resource is feedstocks, not demand
- Feedstock prices linked to energy value

Why now?

- Until 2005/2006
  - Gasoline/diesel prices low relative to biofuel feedstocks
  - U.S. biofuel supports designed to promote niche use
  - Biofuel production too small to affect demand
  - Feed costs set by crop market supply and demand
- Today
  - Gasoline/diesel prices much higher
  - Energy value of feedstocks above 2005 feed value
  - Government supports boosting feedstock value
  - Crop production, energy prices and support are all important
  - Energy and crop prices linked by biofuel to petroleum prices

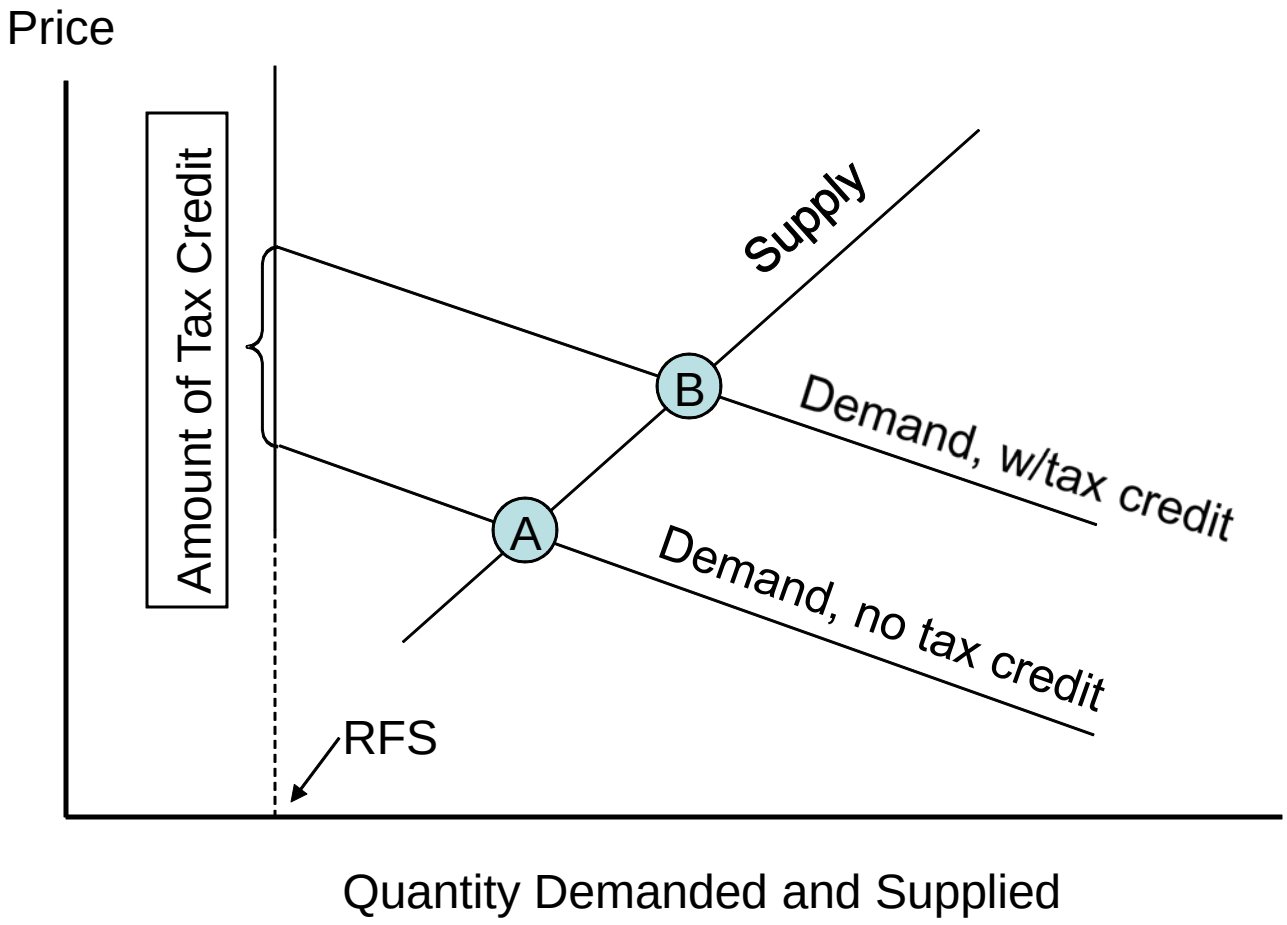
The energy-crop price linkage: Energy prices increase, then…

- Biofuel demand curve shifts up
- Biofuel price increases
- Quantity supplied increases
- Feedstock value increases
- Feedstock demand increases
- Feedstock prices increase
  - Until biofuel windfall profits disappear
- Decline in energy price lowers feedstock price

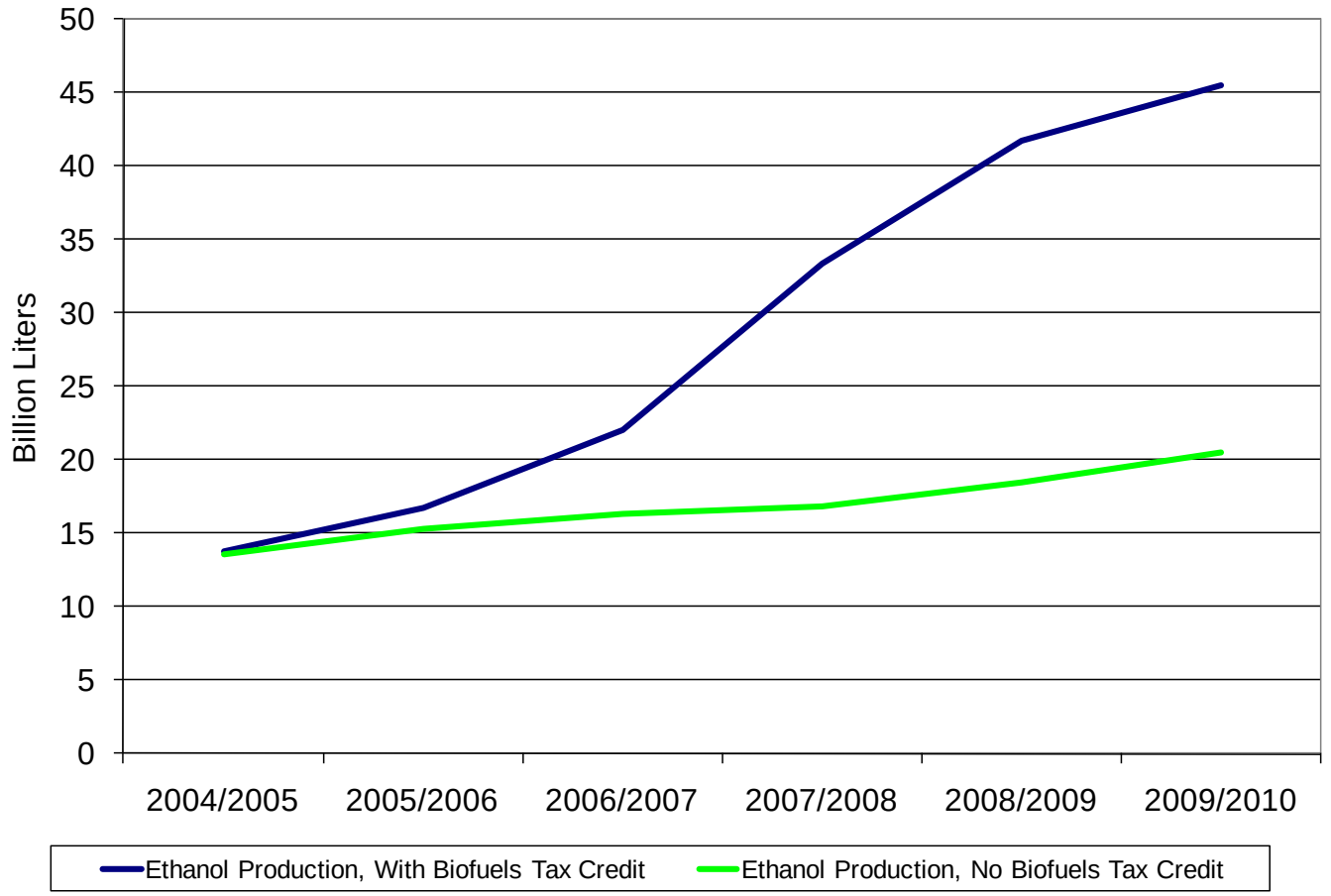
U.S. tax credit/RFS market effects

- Fixed tax credit/gallon
  - Increases demand for the biofuel
  - Demand curve shifts up by fixed credit amount
  - Market value of biofuel and feedstock inflated
  - Feedstock price increases by net value as fuel
  - Quantity of biofuel supplied increases
- RFS
  - Creates price inelastic demand
  - Result is increased feedstock price instability

Effect of tax credit and RFS on feedstock supply and demand



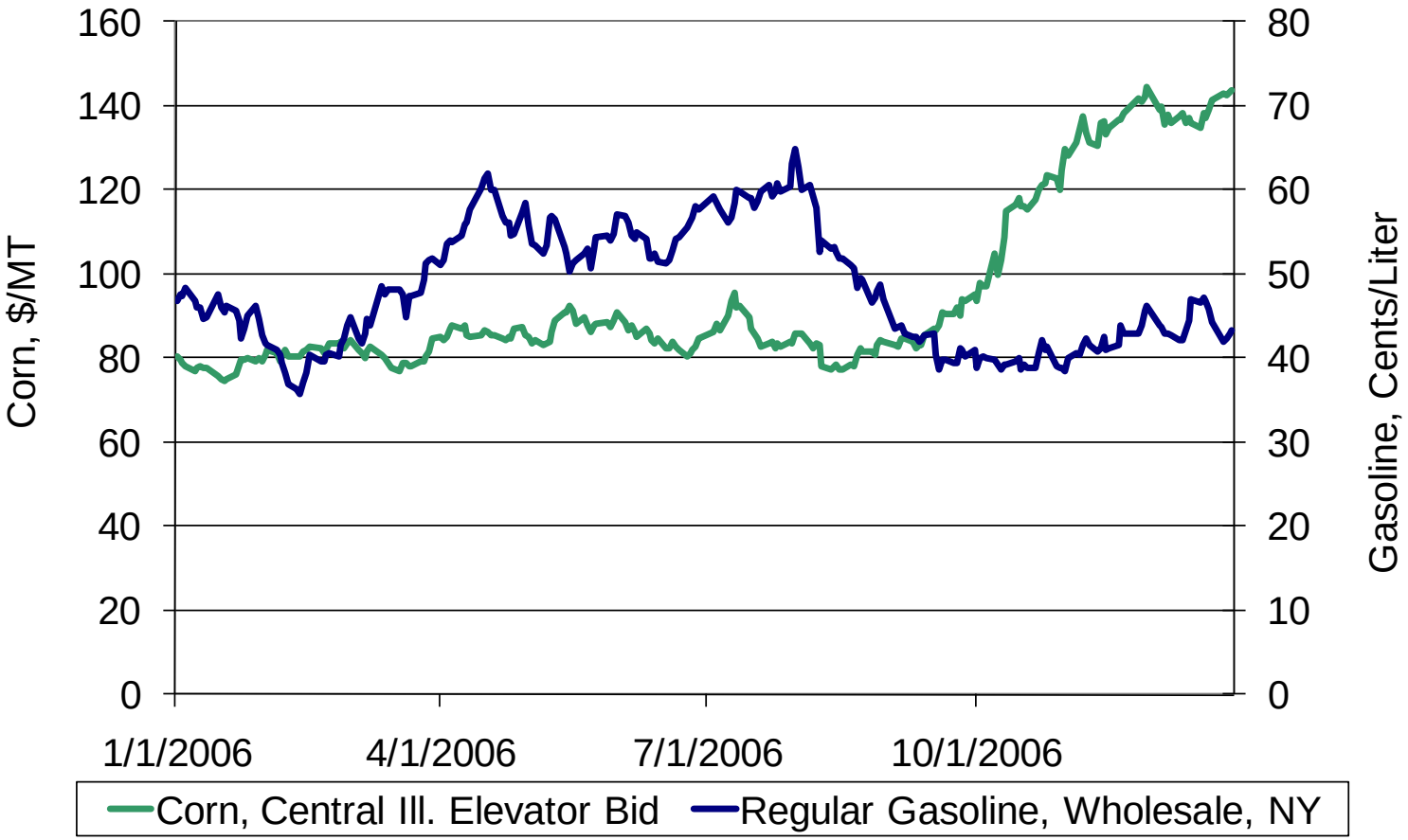
Biofuel policy effect – ethanol production



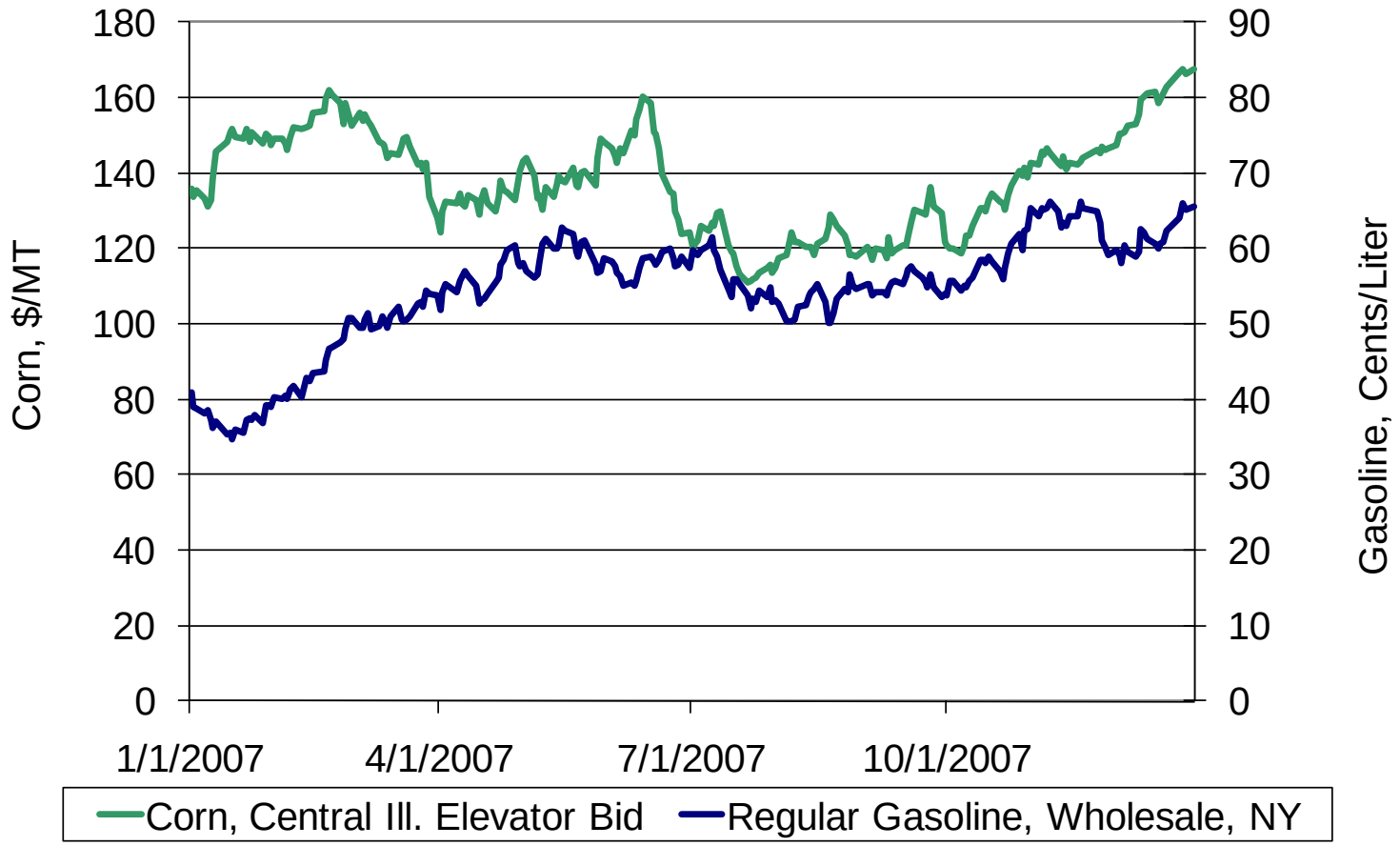
Long term implications

- **Potential** demand for ethanol/biodiesel is unlimited relative to feedstock production
- Fuel prices one key to feedstock prices
- Biofuel support programs influence:
  - Biofuel production
  - Feedstock prices
  - Other prices – grains, oilseeds and feedstuffs
  - Potential feedstock price instability
  - Supply of feedstocks for feed/food use

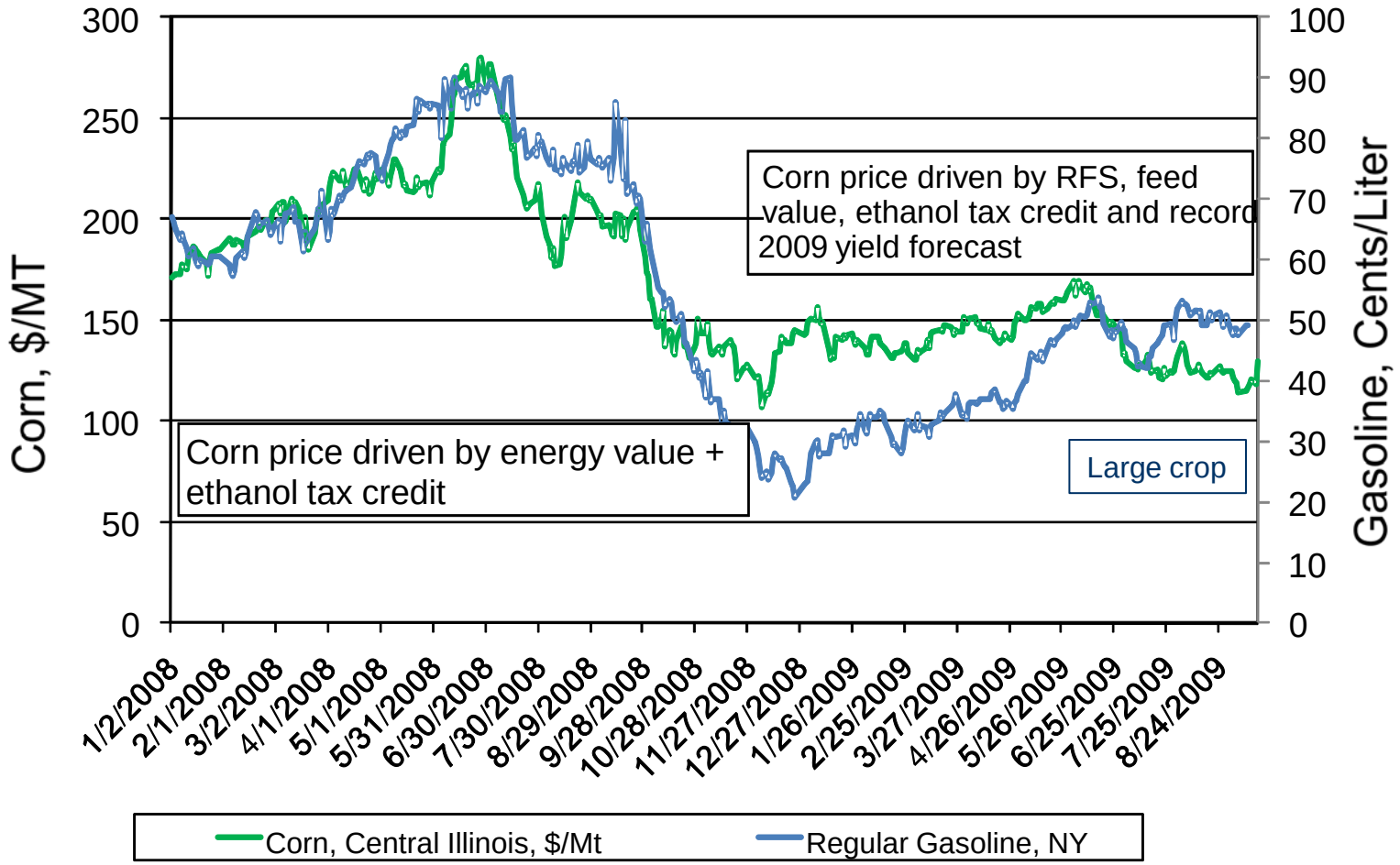
Corn and gasoline prices, 2006
Correlation almost 0



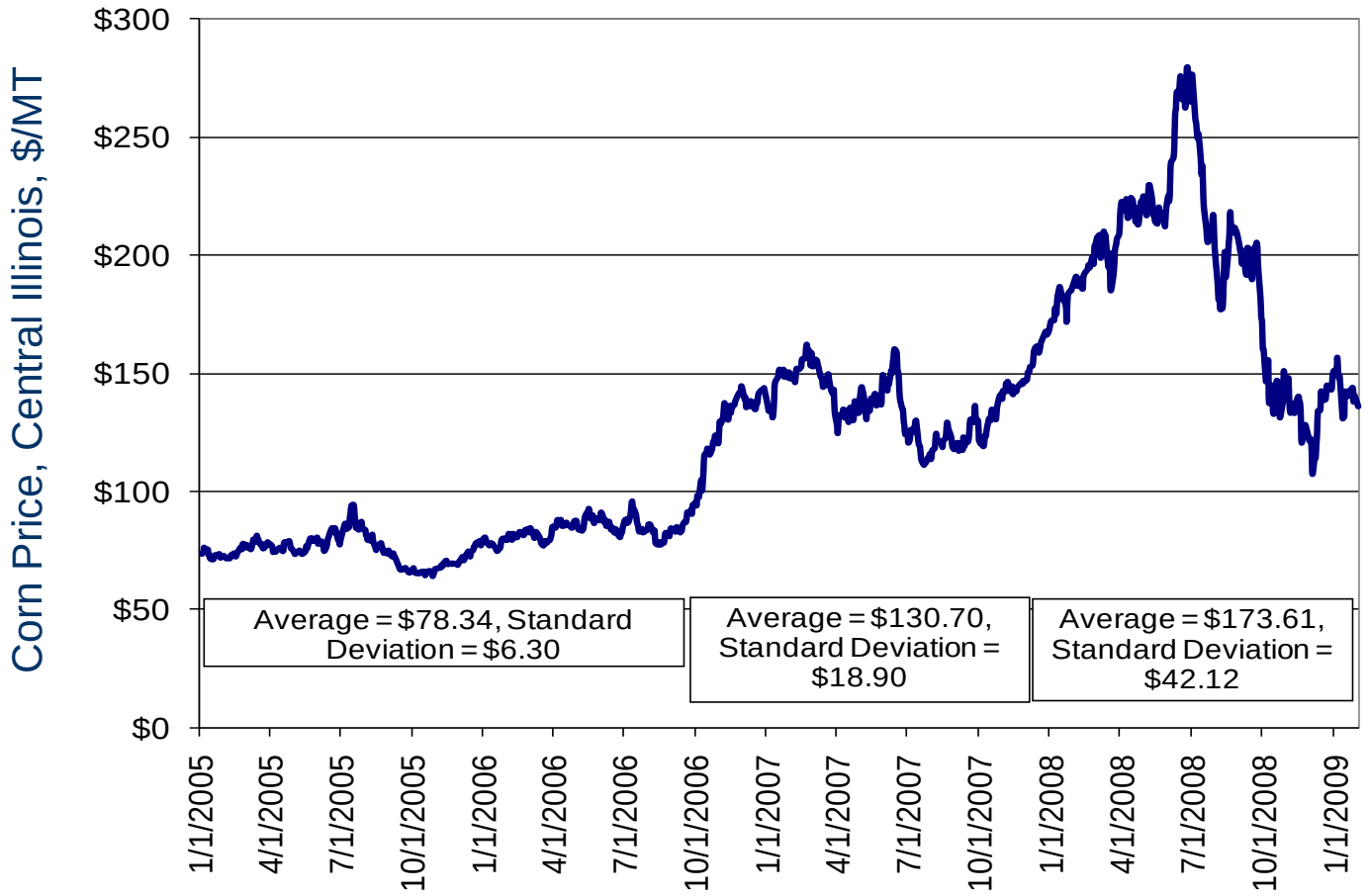
Corn and gasoline prices, 2007



Corn and gasoline prices, 2008/09 Correlation = 0.89



And, volatility has increased…



Energy, corn, other crop price linkages

Correlation of gasoline and corn prices

Sub-Period	***Correlation***
1/1/2000 to 12/31/06	0.11
1/1/2007 to 9/9/2009	0.75
1/1/08 to 9/9/09	0.89

Correlation of corn and other crop/DDGS prices, 1990-2008

	Correlation with U.S. Average Farm Price, Corn
U.S. Average Farm Price, Soybeans	0.930
U.S. Average Farm Price, Sorghum	0.949
U.S. Average Farm Price, Barley	0.866
U.S. Average Farm Price, Oats	0.872
Average Price, DDGS, Lawrenceburg IN	0.869
U.S. Average Farm Price, Wheat	0.956

U.S. biofuel policy cost increase, 2008/09 crop year

($ Million)

2008/2009						
User	Corn Cost	Soybean Meal Cost	Other Protein Cost	Soybean Oil Cost	Other Fats Cost	Total
Broilers	$1,897	$2,154	$266		$280	$4,597
Turkeys	$487	$272	$57		$60	$876
Layers	$1,116	$1,008			$280	$2,403
Swine	$2,440	$1,193				$3,633
Fed Cattle	$2,092		$815			$2,907
Dairy - Milk Cows	$2,852	$222	$791			$3,865
Corn - food & industrial	$2,765					$2,765
Soybean Oil - Food				$3,625		$3,625
Ethanol	$8,163					$8,163
Biodiesel				$250		$250
Total of Above	$21,813	$4,848	$1,929	$3,875	$619	$33,084

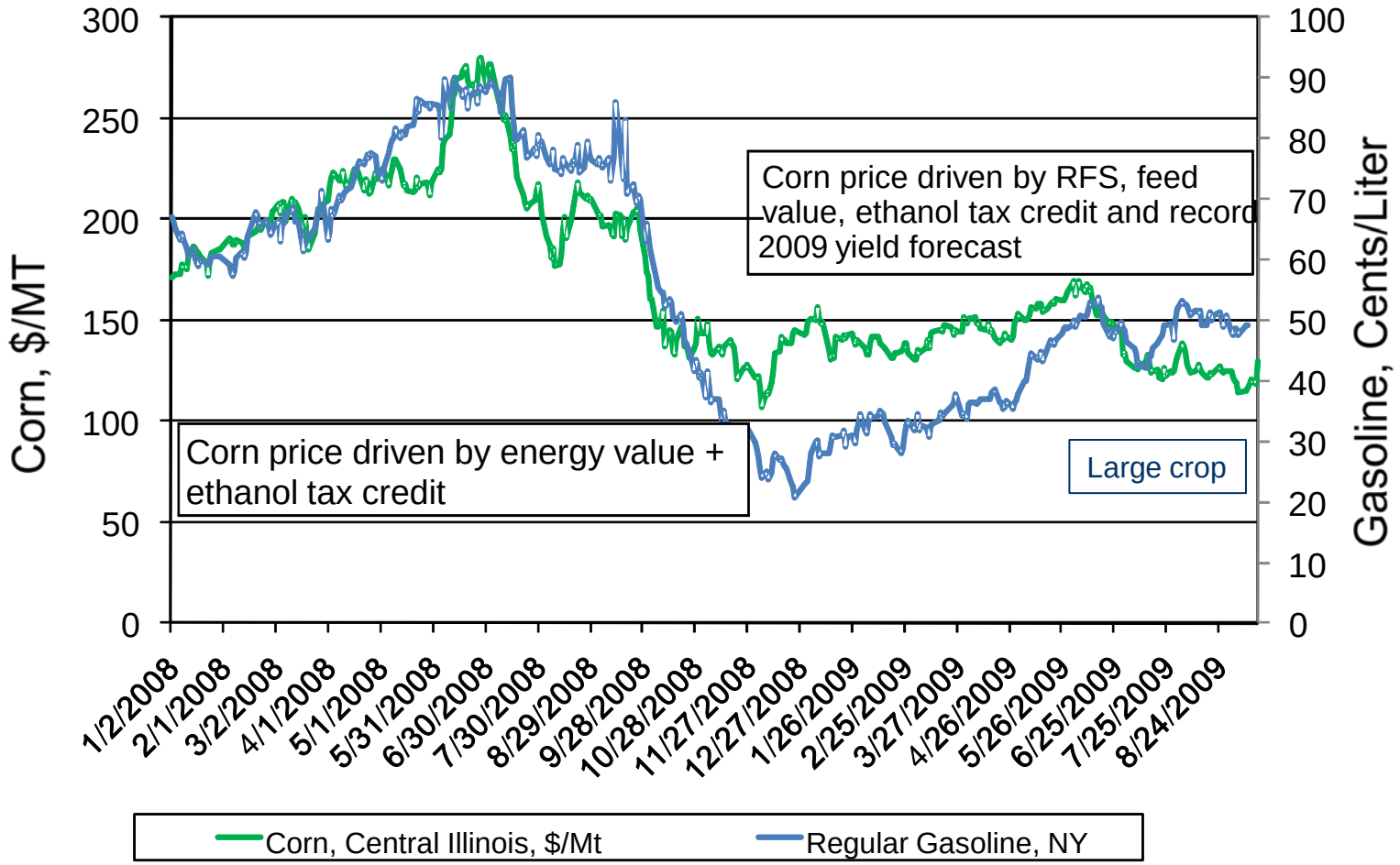
U.S. cost increases by sector

Category	Added Cost, 2007/2008	Added Cost, 2008/2009	Cost Basis
Broilers	$0.39	$0.53	(Per Head Sold)
Turkeys	$2.46	$3.40	(Per Head Sold)
Layers	$0.23	$0.32	(Per Dozen Eggs)
Market Hogs	$27.98	$38.69	(Per Head Sold)
Fed Cattle	$81.51	$117.50	(Per Head Sold)
Dairy Cows in Milk	$0.12	$0.17	(Per Gallon of Milk)
Other Food and Industrial Uses	$35.45	$48.85	(Per Person Per Year)

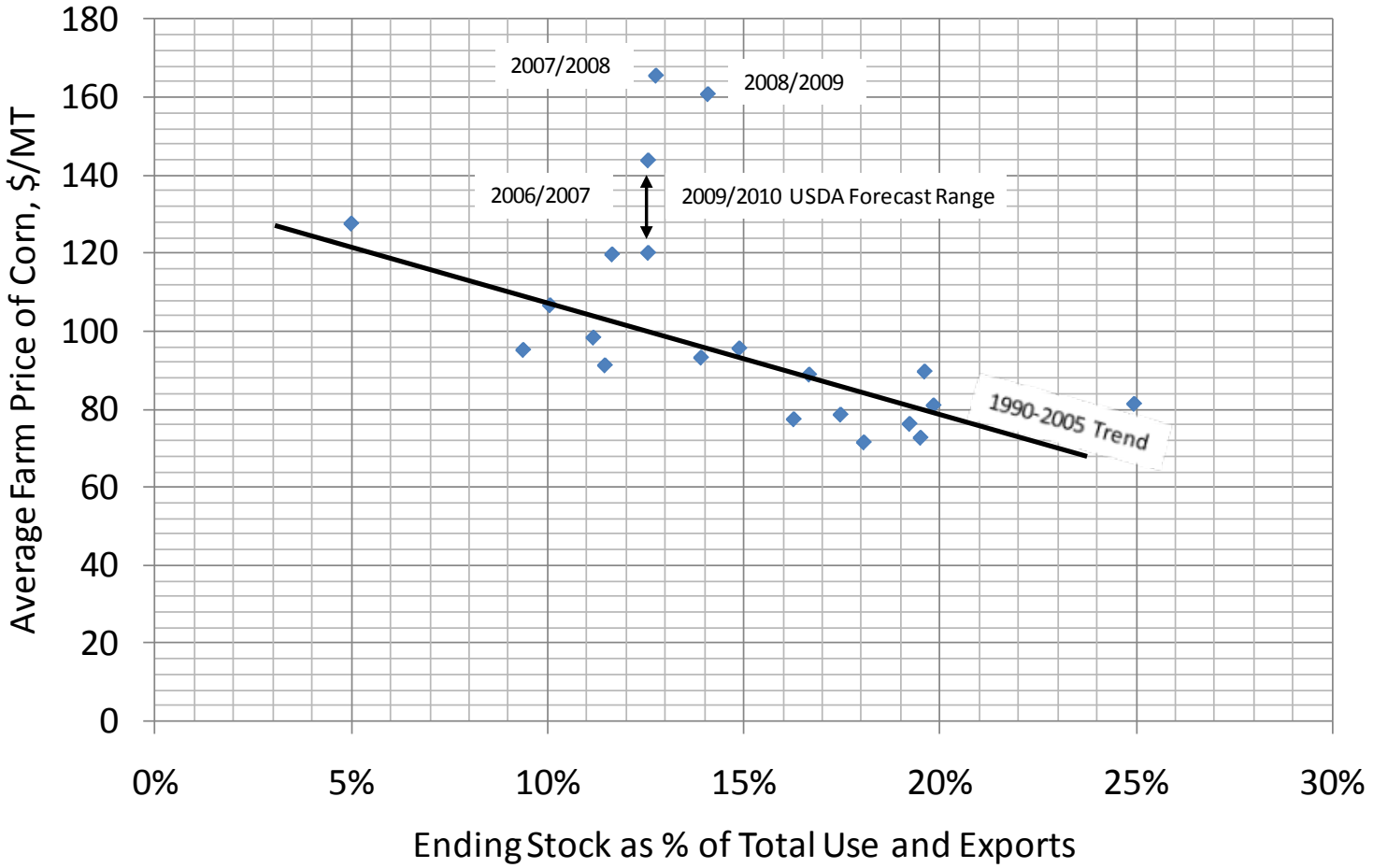
What else matters?

- Crop market fundamentals still important
- Underlying structure has not changed
  - Prices distorted by tax credit/RFS
  - Production and demand for food/feed move prices
- Can see underlying market effects in 2009
  - Bumper U.S. corn and soybean crops
  - Corn prices have dropped below energy value

Corn and gasoline prices, 2008/09 Correlation = 0.89



Corn price and stocks/use ratio



What is the impact on raising broilers?

- All competing meats also affected
  - Pigs more affected than poultry
  - Effects on costs are also global
- Increased cost of poor performance
- Increased value of feed efficiency
- Increased business risk
  - May demand higher level of capital reserves
  - Lender relationship becomes more important

Value of a 1% improvement in FCR

2 kg liveweight x 1,000 broilers

	Feed Cost, $/MT										
FCR	$150	$170	$190	$210	$230	$250	$270	$290	$310	$330	$350
2.20	$6.60	$7.48	$8.36	$9.24	$10.12	$11.00	$11.88	$12.76	$13.64	$14.52	$15.40
2.15	$6.45	$7.31	$8.17	$9.03	$9.89	$10.75	$11.61	$12.47	$13.33	$14.19	$15.05
2.10	$6.30	$7.14	$7.98	$8.82	$9.66	$10.50	$11.34	$12.18	$13.02	$13.86	$14.70
2.05	$6.15	$6.97	$7.79	$8.61	$9.43	$10.25	$11.07	$11.89	$12.71	$13.53	$14.35
2.00	$6.00	$6.80	$7.60	$8.40	$9.20	$10.00	$10.80	$11.60	$12.40	$13.20	$14.00
1.95	$5.85	$6.63	$7.41	$8.19	$8.97	$9.75	$10.53	$11.31	$12.09	$12.87	$13.65
1.90	$5.70	$6.46	$7.22	$7.98	$8.74	$9.50	$10.26	$11.02	$11.78	$12.54	$13.30
1.85	$5.55	$6.29	$7.03	$7.77	$8.51	$9.25	$9.99	$10.73	$11.47	$12.21	$12.95
1.80	$5.40	$6.12	$6.84	$7.56	$8.28	$9.00	$9.72	$10.44	$11.16	$11.88	$12.60
1.75	$5.25	$5.95	$6.65	$7.35	$8.05	$8.75	$9.45	$10.15	$10.85	$11.55	$12.25

Value of improvement increases with feed cost no matter how good you are now

What is the global meat impact?

- Likely to see a slight slowing of growth
- May favor poultry and grass fed beef/dairy
- Pig – less efficient than poultry, can't use forage
- Increased pressure on:
  - Industry consolidation
    - Including cross border mergers and acquisitions
  - Vertical integration/contracting
  - Risk management skills