



Sustainable Intensification: One Company's Experience

Smithfield Foods



International Food Company

- Operations in 12 countries
 - 80 + facilities
 - 510 + company-owned farms
 - 2,800 + contract growers
- 48,000 employees
- Sales to 36 + countries
- 12 + strategic brands
- Annual sales > \$11 billion



Our Brand Portfolio

United States



Smithfield



International



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Food Industry Leader

#1 U.S. Packaged Pork Company

#1 World Pork Processor

#1 World Hog Producer

#1 Market share Europe

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Smithfield's Sustainability Program



Environment

**ISO 14001
Certification**

**Environmental
Awards**

**Web-based
Training
Program**

**Environmental
Compliance
Committee
(ECC)**



Animal Welfare

**PQA Plus®
Certification**

**Conversion to
Group Housing**

**Animal Welfare
Committee**

**Limited use of
Antibiotics**

CO2 Stunning



Food Safety

**State-of-the-Art
Facilities/
Technology**

**New Food
Safety Policy**

**Food Safety
Auditing**

Traceability

Cloning Policy



Employees

**Employee
Injury
Prevention
Management
System (EIPMS)**

**Corporate
Director of
Health and
Safety**

Safety Awards

**Human Rights
Policy**



Community

**Learners to
Leaders®**

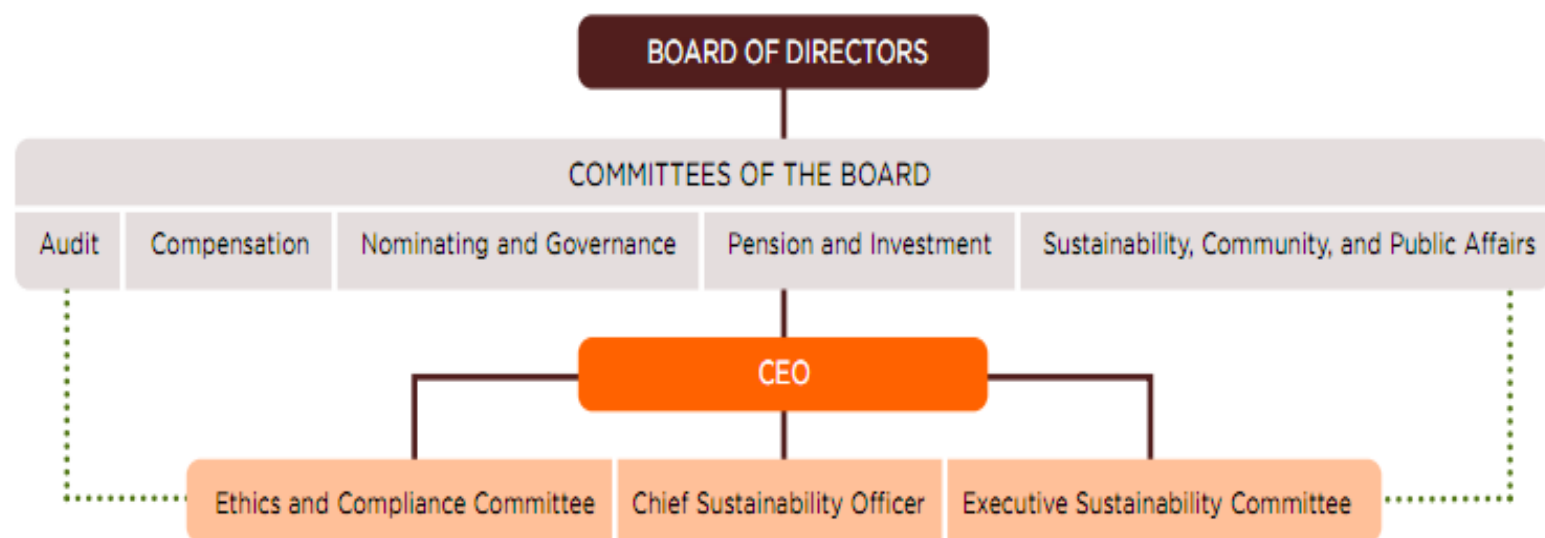
**Helping Hungry
Homes®**

**World Water
Monitoring Day**

**FFA
Environmental
and Natural
Resources
Award**

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SUSTAINABILITY GOVERNANCE



ISO 14001 Certified

Industry first in hog
production and
processing

AgriPlus became the first
Polish operation to obtain
ISO 14001 certification in
2005, with feed mills added
in 2010

Meet a stringent set of
internationally
respected
environmental
management
standards

More than **95 percent** of
Smithfield Foods locations
worldwide are now
certified

ISO
14001
Certified

Steady reduction
in NOV's and fines

--**60%** reduction in
water use

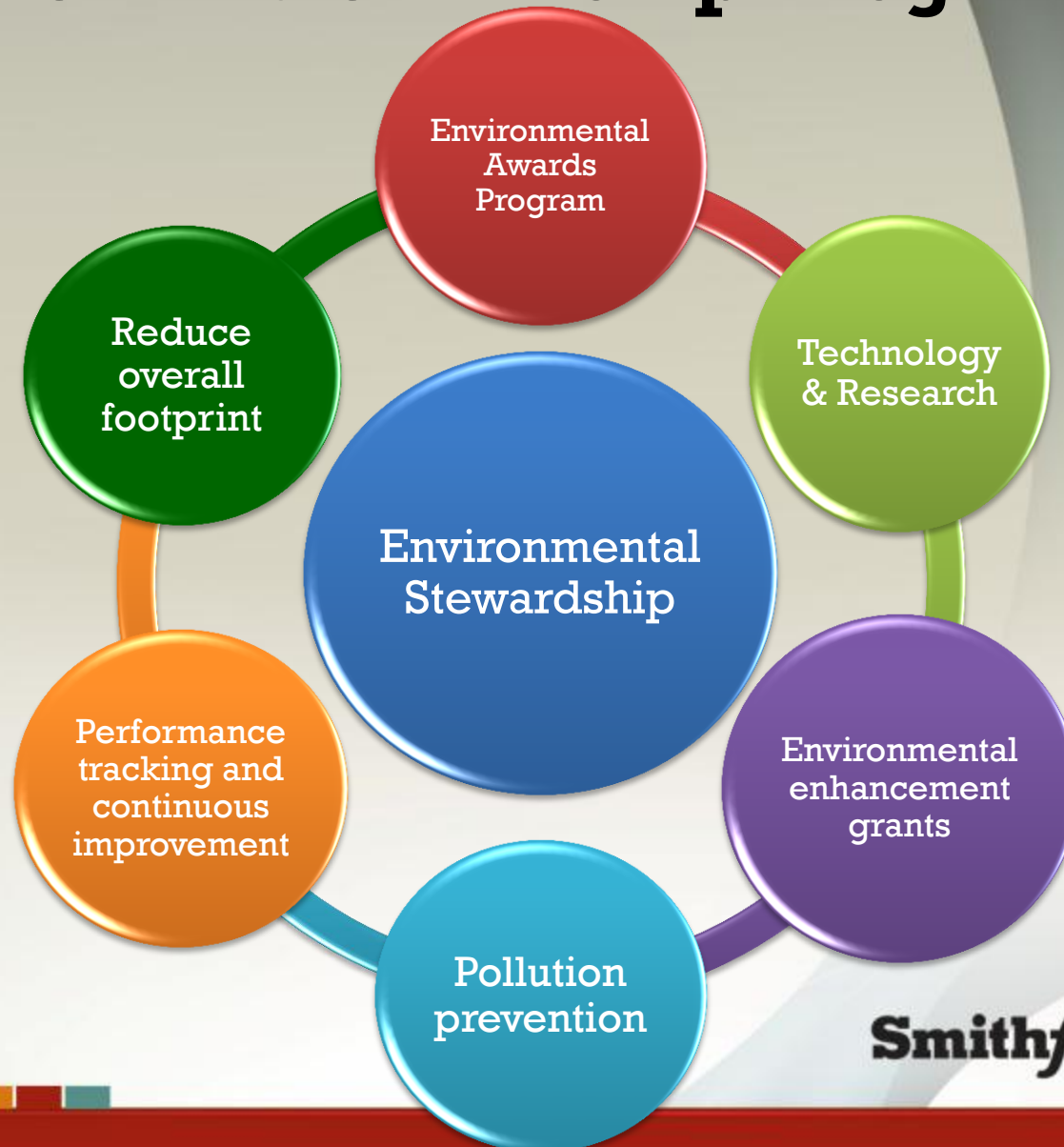
--**46%** reduction in
electricity
consumption

--**\$100M** net
cumulative cost
reductions

-- **4%** reduction in
absolute GHG
emissions

Third party
recognition and
improved
reputation

Environmental Stewardship Program





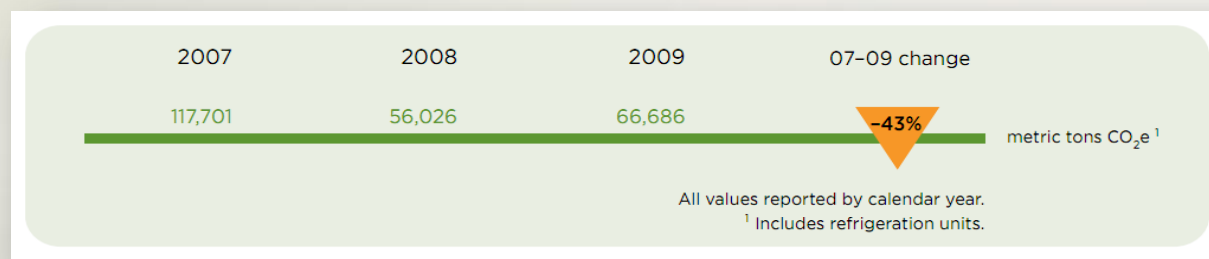
Greenhouse Gas Emissions

GHG EMISSIONS	EMISSIONS (Metric tons CO ₂ e) ¹				EFFICIENCY ²							
	2007	2008	2009	07-09 Change	First Processing (kg CO ₂ e per animal unit)				Further Processing (kg CO ₂ e per 100 lbs.)			
					2007	2008	2009	07-09 Change	2007	2008	2009	07-09 Change
Total Direct & Indirect Carbon Dioxide (CO ₂) Emissions	1,150,346	1,348,988	1,111,261	-3%	37	35	22	-41%	37	28	14	-62%
Direct Methane (CH ₄) Emissions ³	200	229	132	-34%	0.006	0.006	0.004	-33%	0.006	0.004	0.003	-50%
Direct Nitrous Oxide (N ₂ O) Emissions ³	3,088	5,423	220	-93%	0.158	0.146	0.006	-96%	0.158	0.105	0.001	-99%
Total Direct & Indirect GHG Emissions	1,153,634	1,354,640	1,111,613	-4%	37	35	22	-41%	37	28	14	-62%

All values reported by fiscal year. ¹ The universal unit for global warming potential (GWP) expressed in GWP of one unit of CO₂. ² A lower value indicates improvement.

³ The decrease in methane and nitrous oxide emissions was due to a shift toward natural gas, which burns cleaner than fuel oil used in prior years.

GHG Emissions from Transportation



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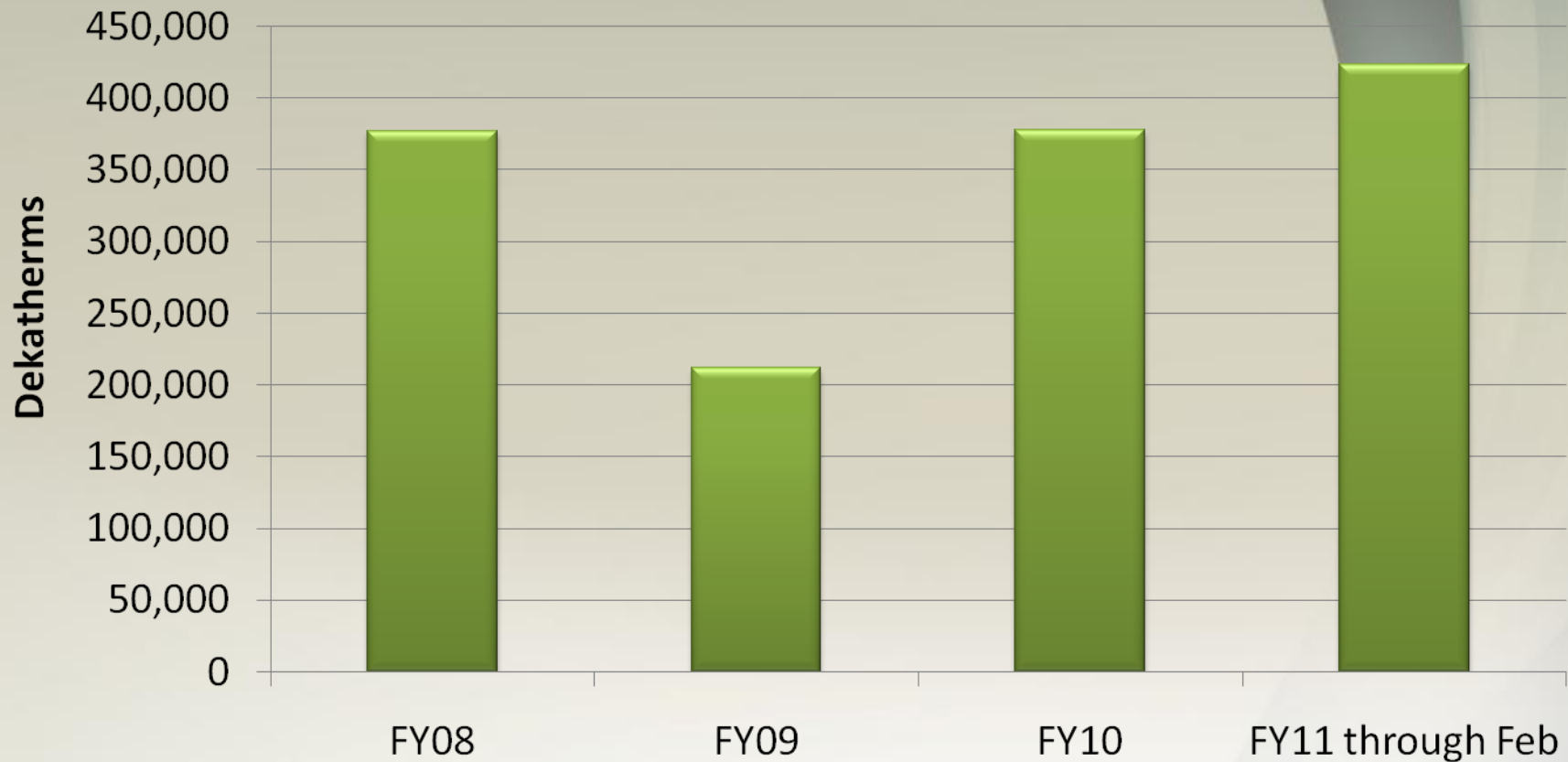
Biogas Production



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Biogas Production



Total \$ Saved = \$21,244,485



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Gestation Stall Conversion





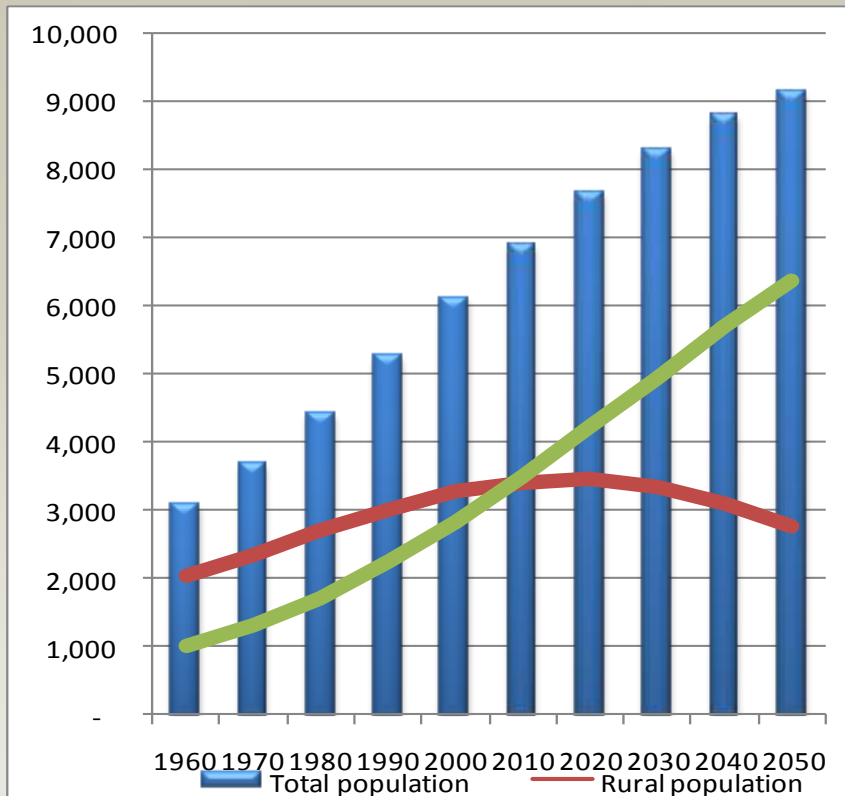
Market Barriers and Limitations



The basics have remained the same...

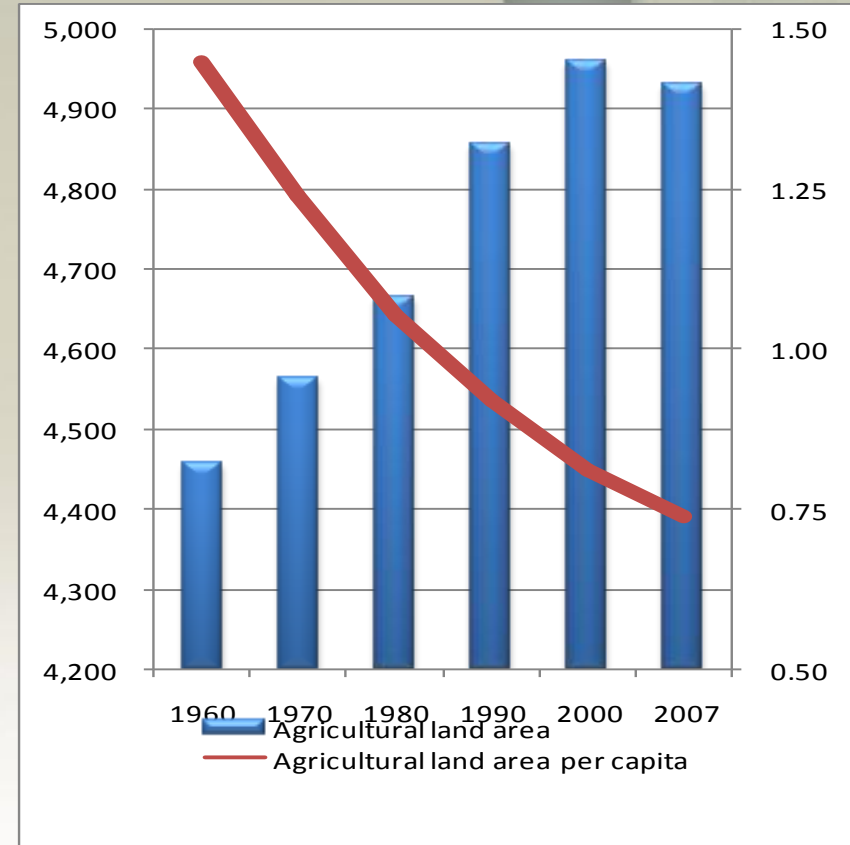
Demand supply imbalance

• Global population (in millions)



Source: FAO Stat

• Agricultural land (1,000 ha)



Source: FAO Stat, Rabobank

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... But GDP growth is accelerating demand growth

The connection to wealth creation...

Higher GDP growth

Higher protein consumption

Higher grain demand

Country	2010 GDP growth rate	Population
Brazil	7.5%	193,734,000
China	10.3%	1,331,460,000
India	8.2%	1,155,348,000
Indonesia	6.9%	229,965,000

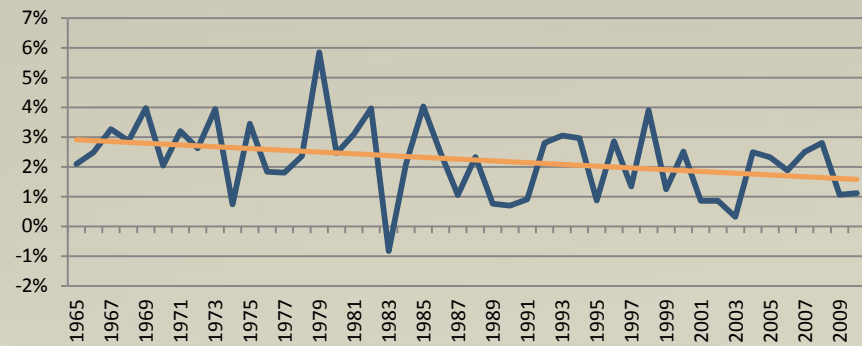
Source: World Bank, IBGE, National Bureau of Statistics China, India Central Statistical Organization; Rabobank

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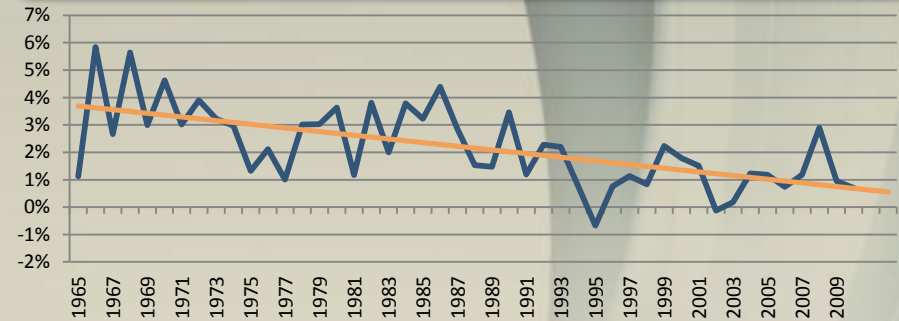


While most yield improvements are decelerating

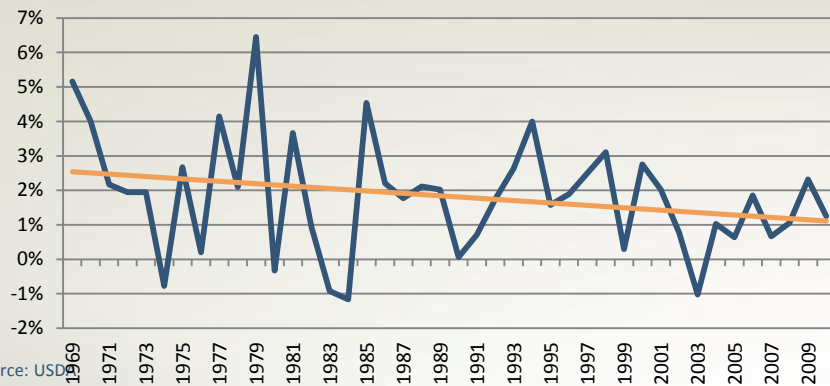
• World corn yield % change, 5 yr moving avg



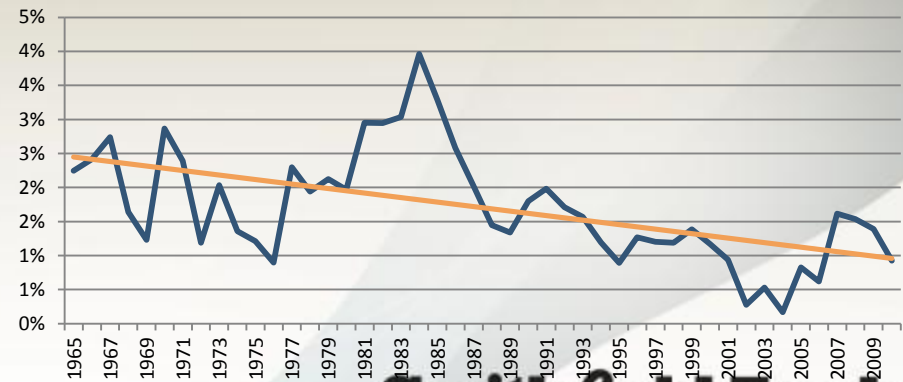
• World wheat yield % change, 5 yr moving avg



• World soybean yield % change, 5 yr moving avg



• World rice yield % change, 5 yr moving avg



Source: USDA

Source: USDA

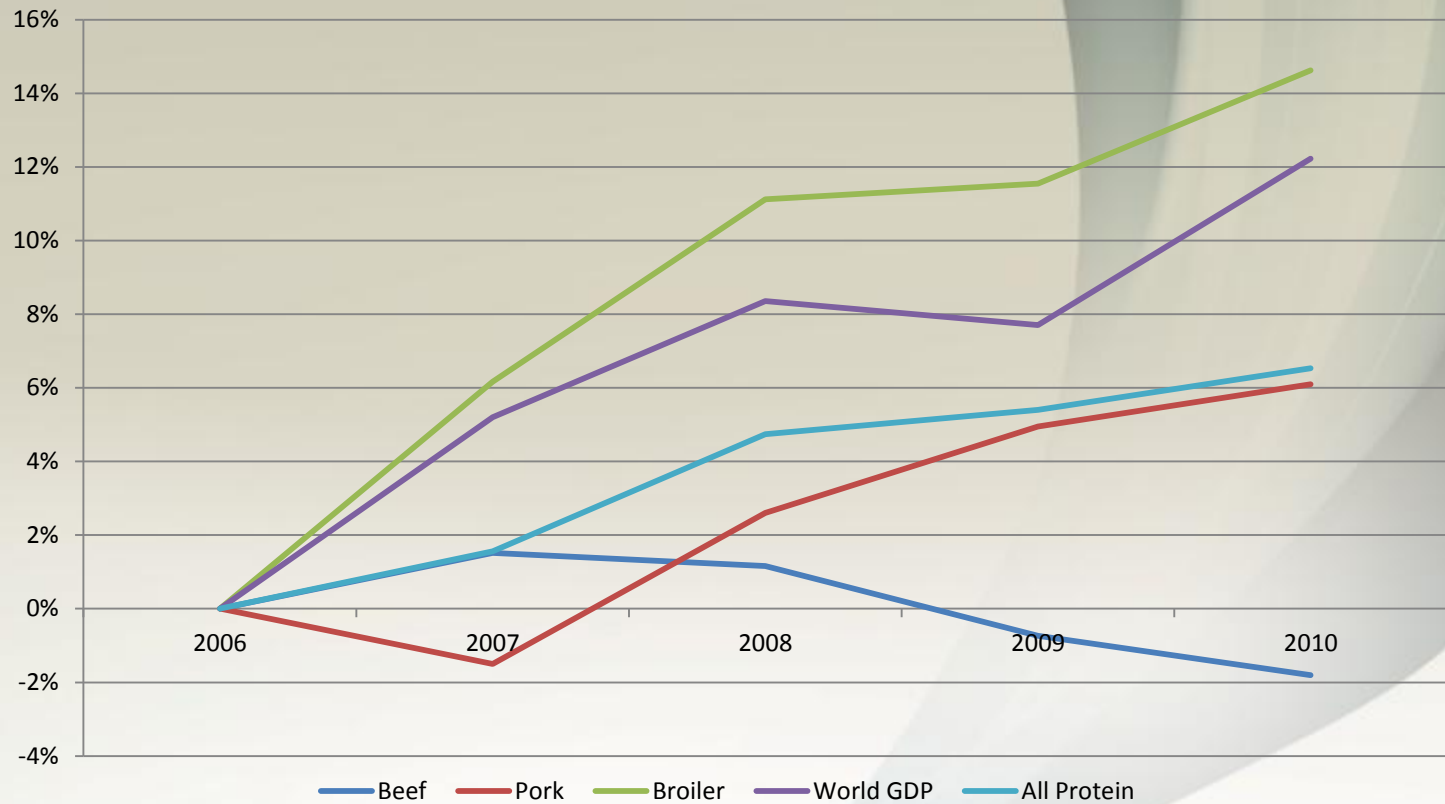
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Meat production demand

World GDP growth = higher prices

• Meat production and GDP, % growth since 2006

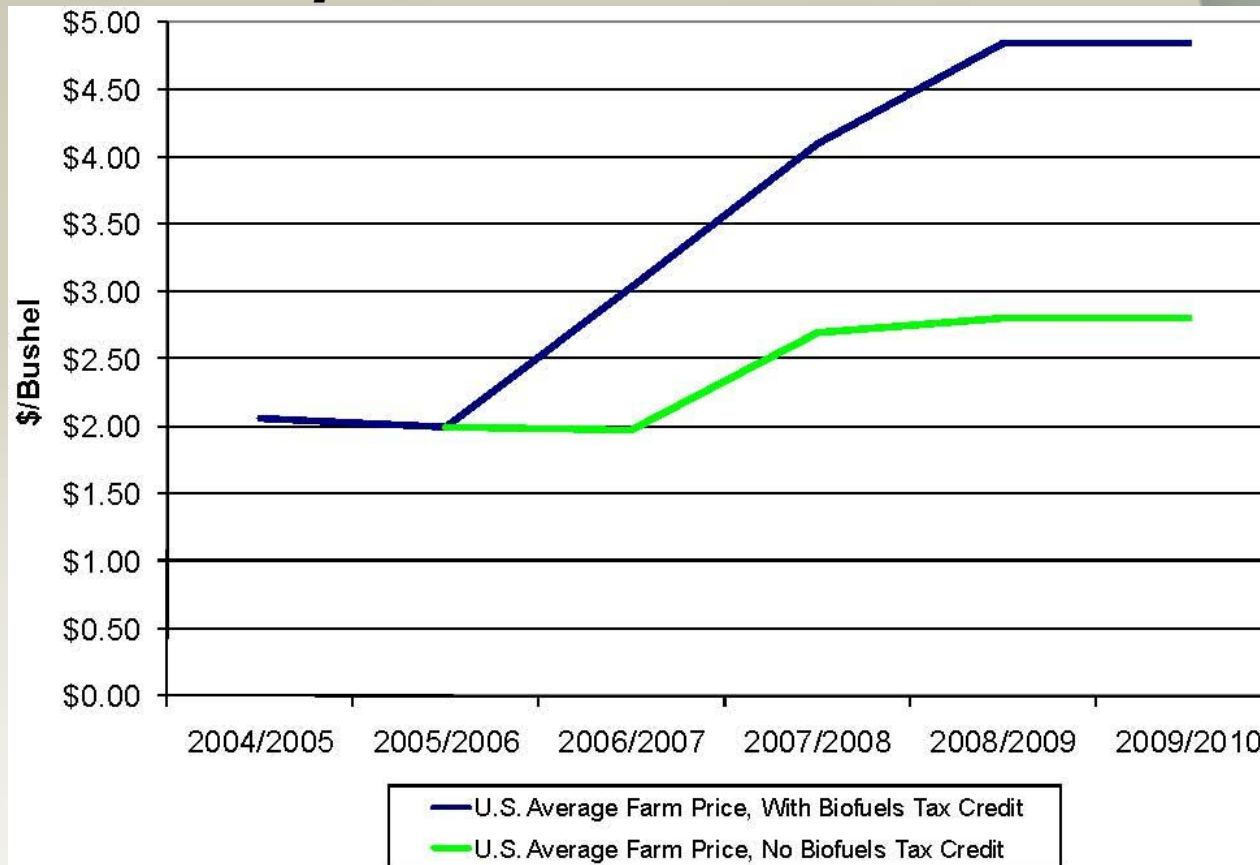


Source: USDA, World Bank, Rabobank

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U.S. Ethanol Policy: Food v. Fuel

Estimated Corn Prices with and Without Ethanol Tax Credit or RFS
Crop Years 2004/2005 to 2009/2010



Perspective on Ethanol & Food

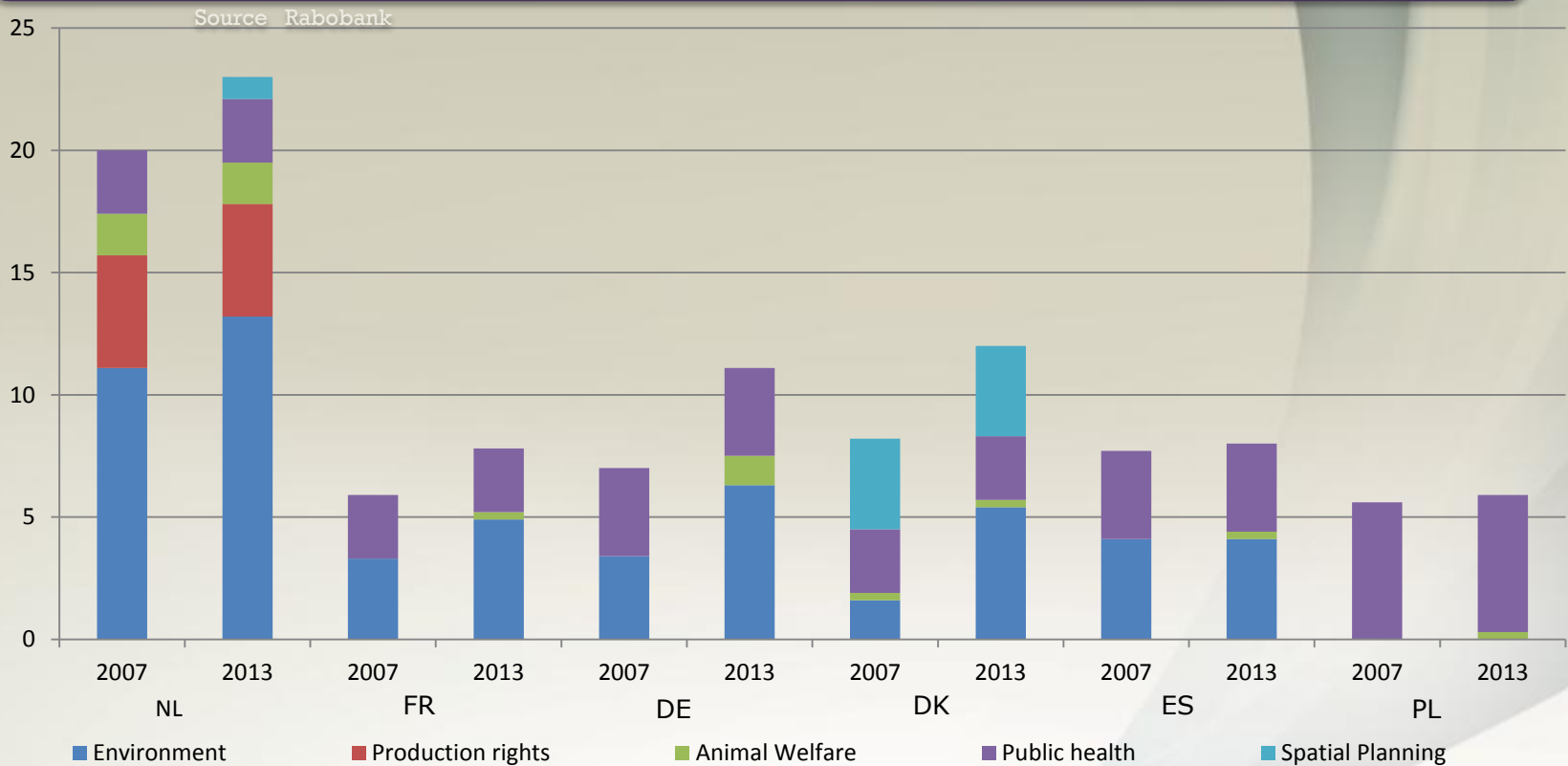
- 1 acre corn raises 12.7 hogs.
- 1 acre corn produces 7.8 barrels of ethanol.
- Thermal Values => 7.8 barrels ethanol = 5.2 barrels gasoline.
- 1 average U.S. automobile traveling 10,000 miles/yr using pure ethanol would need about 20 barrels ethanol = 2.6 acre corn = 33 hogs.

Proposed USDA GIPSA rules

- Packers risk lawsuits for paying premiums for quality.
- Overturns legal “harm to competition” standard upheld by 11 appellate courts => replaced with vague standard which will encourage disgruntled producers lawsuits.
- Bans packer-to-packer sales. Prohibits one packer from purchasing, acquiring, or receiving livestock from another packer.
- New timeframes required for curing contract breaches threaten animal welfare and the environment.

EU policy measures raising cost of pork

Pork cost price increases due to policy measures for selected EU countries (in EUR cent per kg cwe)



Trade Barriers

- Tariffs
- Level playing fields/failure to approve FTAs – e.g., Korea, Panama, Columbia
- Non-tariff barriers – e.g., Ractopomine (approved in 20 countries; banned in China and EU)



The plight of farm animals extends far beyond antibiotics

—MI State News, November 2, 2010

'Good' food movement expands as outbreaks, recalls prove dangers of industrial agriculture —Natural News, October 17, 2010

Conglomerated food industry harms eaters, farmers

—The Daily Campus at UConn, November 1, 2010

Industrial farming puts ecosystems at risk of collapse, warns Prince Charles—*The Guardian* October 25, 2010

Factory animal farms spew toxic chemical fumes, poisoning neighbors —Natural News, November 1, 2010

OBESITY IN AMERICA: ARE FACTORY FARMS, BIG PHARMA AND BIG FOOD TO BLAME?

—Huffington Post Oct. 25, 2010

Activist, author targets food industry in new book —*The New Mexican* October 26, 2010

The Grim Realities of Factory Farms

—Christianity Today November 5, 2010

Wal-Mart Promises Local Food, While Big Ag Gears Up for a Fight —Huffington Post, October 22, 2010

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Benefits of factory
farms just
illusions

—The Arizona Republic, March 4th, 2008

Eating Meat: Is It Killing Us, and the Planet?

—NY Times, January 30, 2008

Control the factory farms: Report says
meat-production practices are
unsustainable, with long-term costs

—Buffalo News, May 20th, 2008

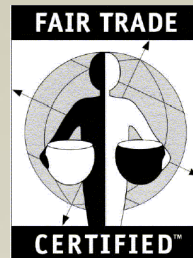
Antibiotics in our livestock

Their overuse in the meat and poultry industries may
help spawn superbugs. The LA Times, May 1, 2008

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Changing perception of “responsibility”





Incentives and Opportunities



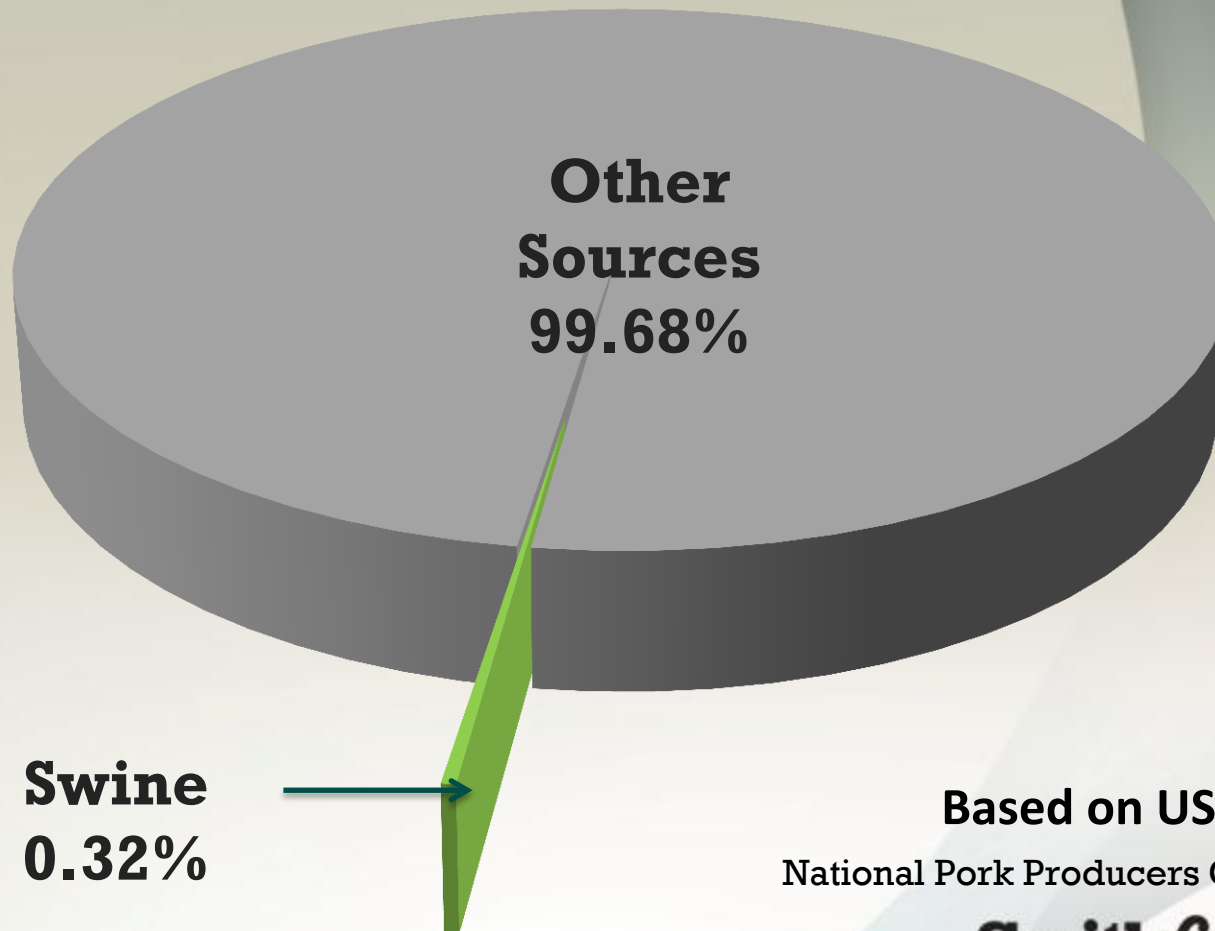
North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard (RPS).

- Investor-owned utilities must supply **12.5%** of 2020 retail electricity sales from renewable energy resources by 2021.
[Municipal utilities and electric cooperatives must meet a target of 10% by 2018.]
- Eligible energy resources include solar-electric, solar thermal, wind, hydropower, ocean/wave energy, biomass.
- Target for renewable energy includes technology-specific targets of **0.2%** energy recovery from **swine waste** by 2018, and 900,000 megawatt-hours (MWh) of electricity derived from **poultry waste** by 2014.

Room for Improvement

- North Carolina program uncommon.
- Also, U.S. incentives/subsidies focus on electricity generation => agriculture renewables disconnect :
 - Most agricultural materials are suited to anaerobic digestion and the production of methane (biogas).
 - Conversion of methane to electricity for the grid reduces efficiency.
- Encouraging use of methane for pipeline use and/or as a substitute for natural gas would:
 - Improve ROI for anaerobic digestion projects (more energy due to improved efficiency).
 - Encourage further intensified food production while minimizing minimal carbon impact.

Swine Production As % of Total US GHG (2007)



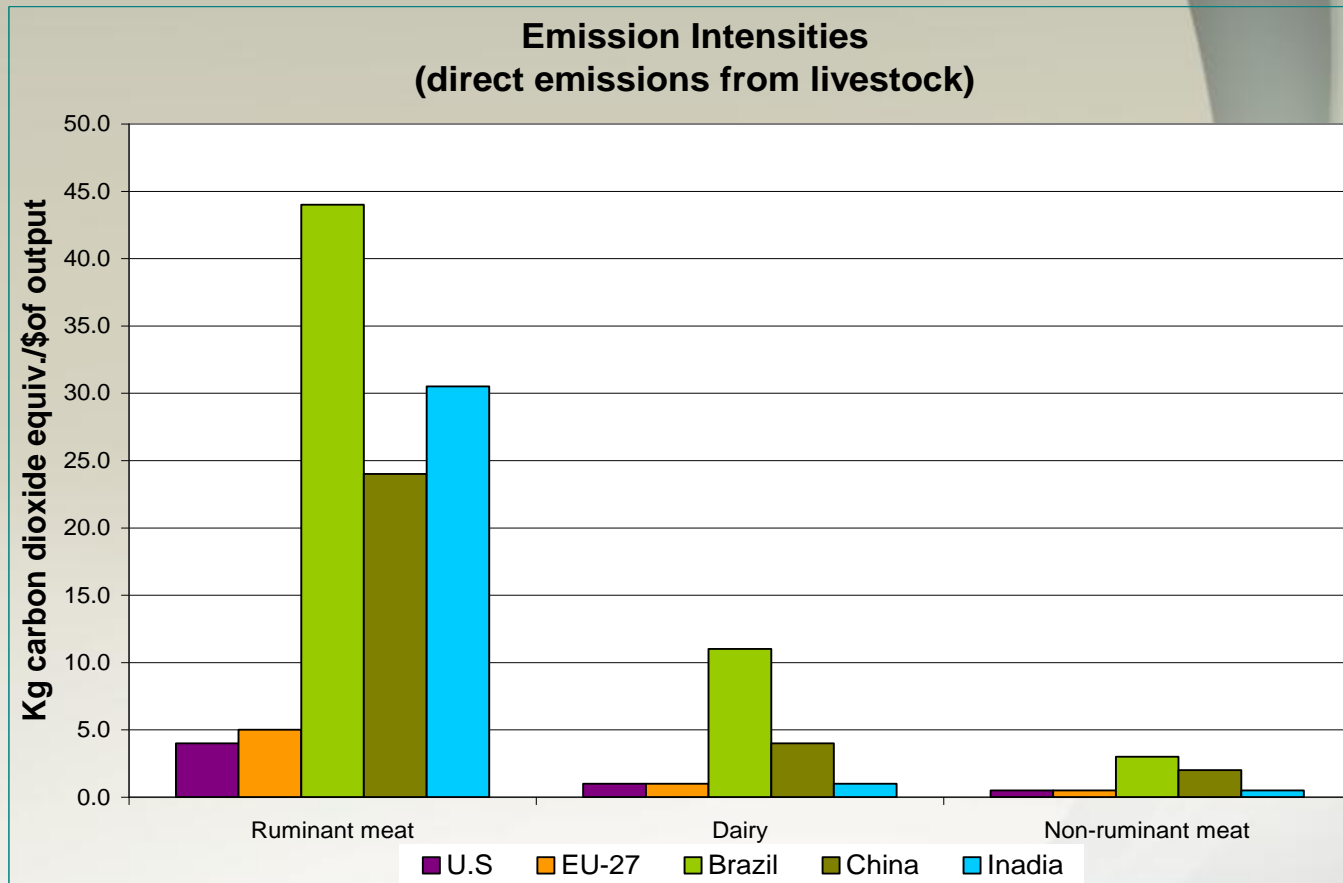
Swine
0.32%

Based on USEPA GHG

National Pork Producers Council, 2011

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GHG From Livestock



EU Biogas

- Mandatory national targets consistent with a 20% share of energy from renewable sources and a 10% share of energy from renewable sources in transport in community energy consumption by 2020.
- Targets provide certainty for investors and encourages technology development.
- Sustainability criteria for use of transportation biofuels in EU include:
 - » Biodiversity
 - » Land use changes (GHG release from soils/forests)
 - » GHG emissions savings
- Priority access for electricity from renewable energy sources important for integrating renewable energy sources into the internal market.

DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources

EU Biogas

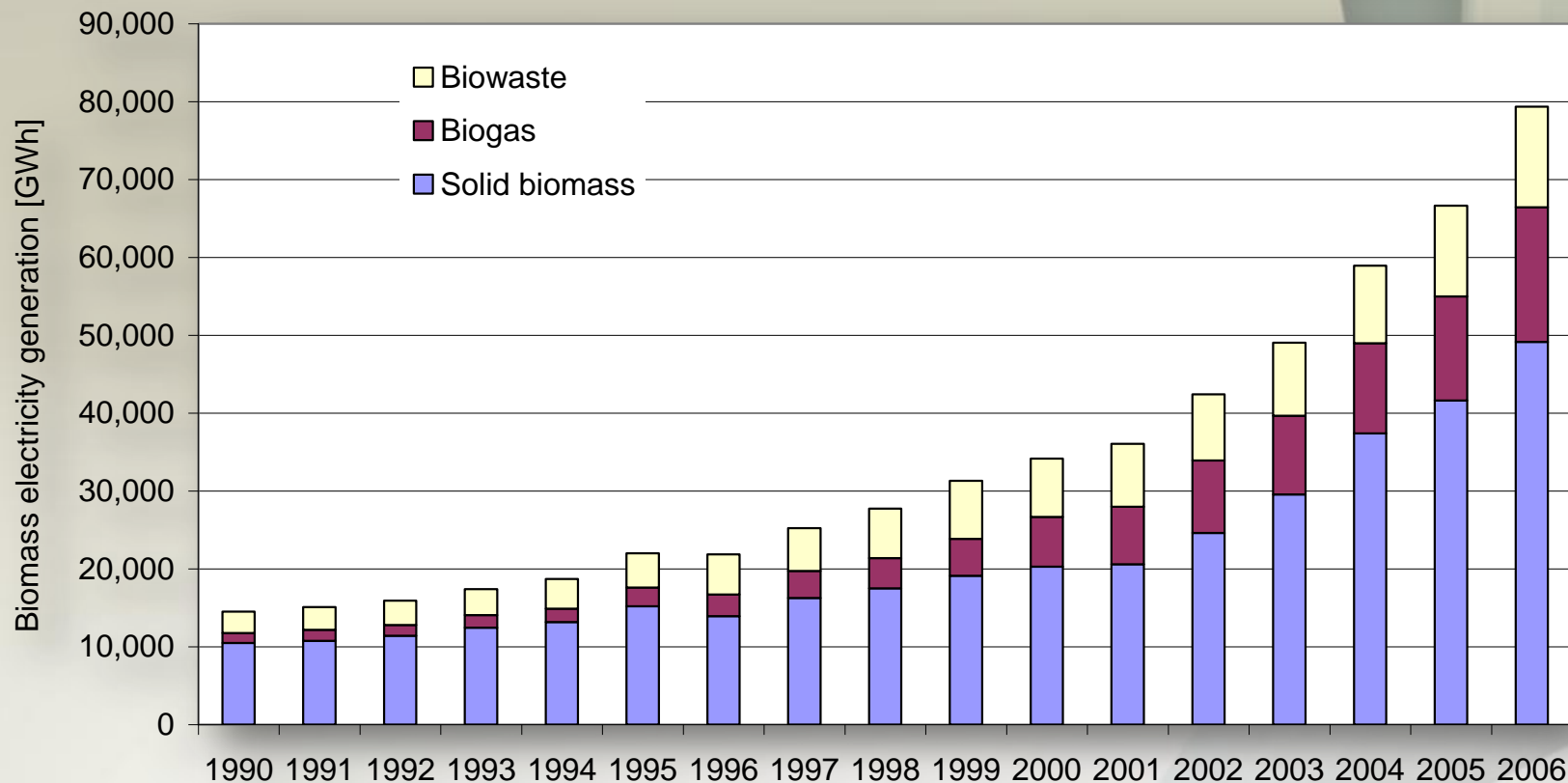
- Feed in tariff regimes the most efficient and effective support schemes for promoting renewable electricity.
- Used in 18 Member States.
- Usually guaranteed for 10-20 years.
- Guaranteed duration provides long term degree of certainty => lowers investor market risk.

Source:

http://ec.europa.eu/energy/renewables/doc/sec_2008_57__electricity_report.pdf



Electricity generation from solid biomass, biogas and municipal solid waste in the EU-27 Member States from 1990 to 2006

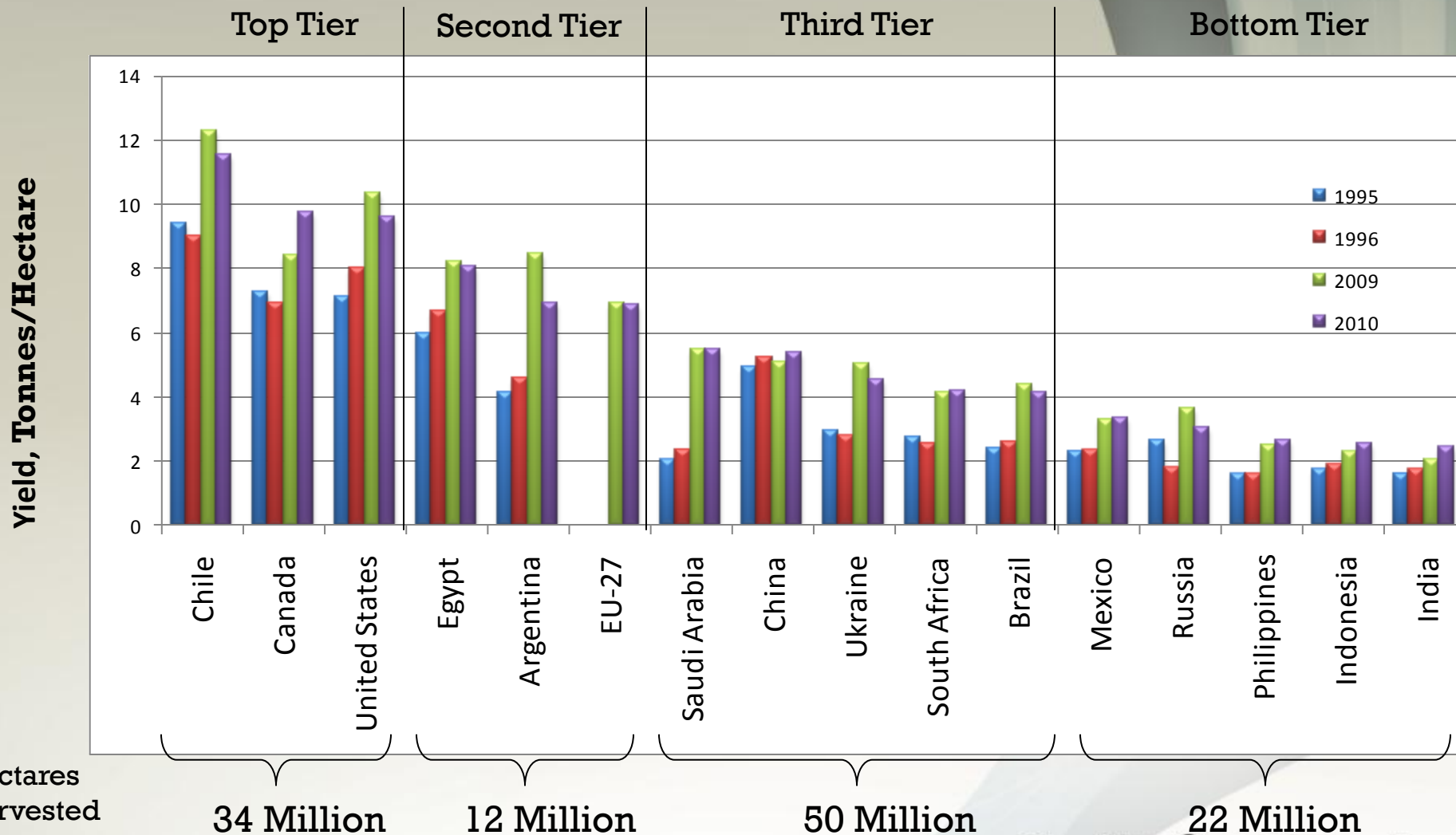


The Renewable Energy Progress Report, Commission Report in accordance with Article 3 of Directive 2001/77/EC, Article 4(2) of Directive 2003/30/EC and on the implementation of the EU Biomass Action Plan, 2009

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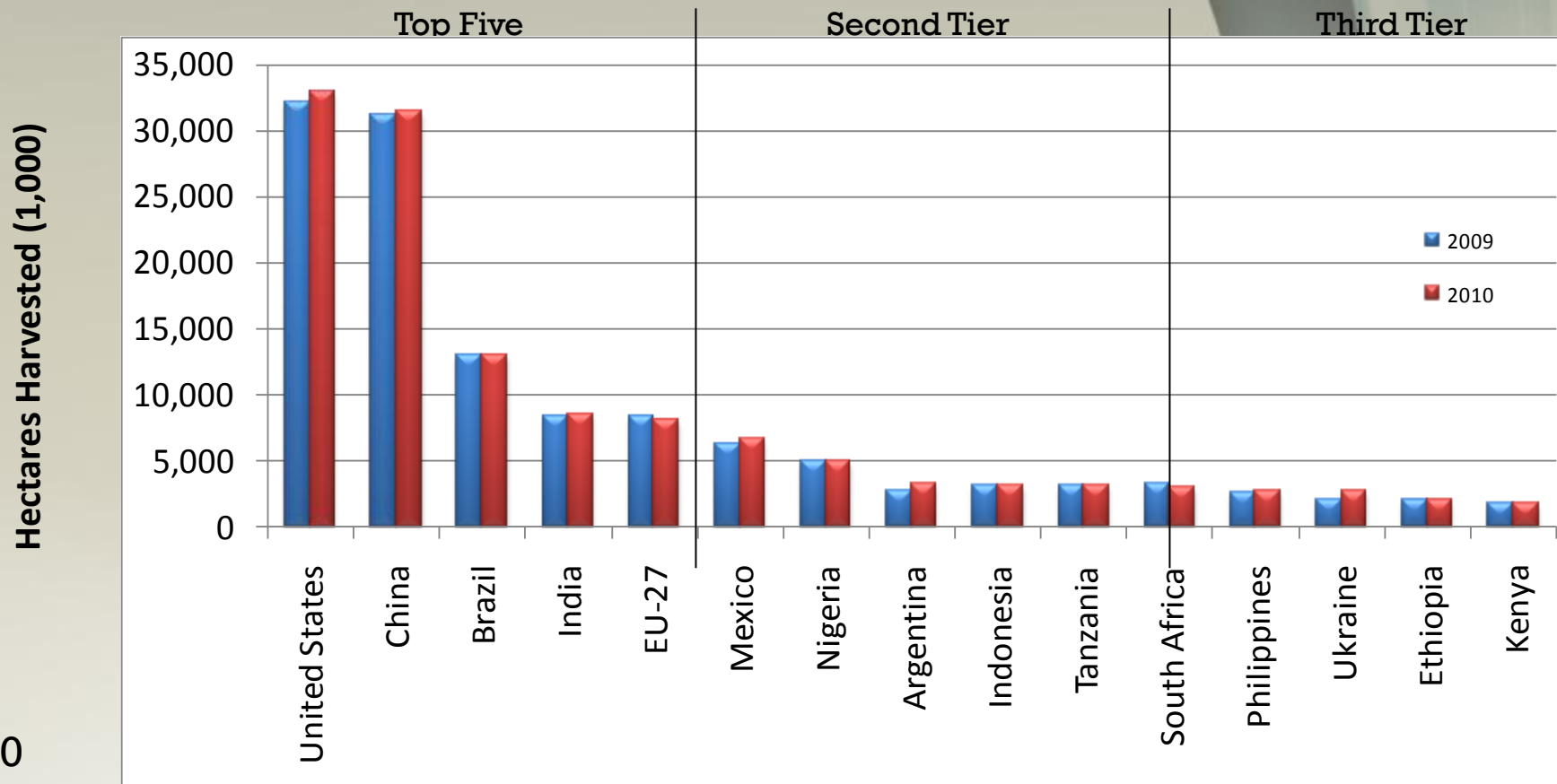
Corn Yield Developments from 1995-96 to 2009-10



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Corn Hectares Harvested: Top 15 Producing Countries



2010

Hectares
Harvested:

93 Million

21 Million

12 Million

Production:

613 Million MT

64 Million MT

39 Million MT

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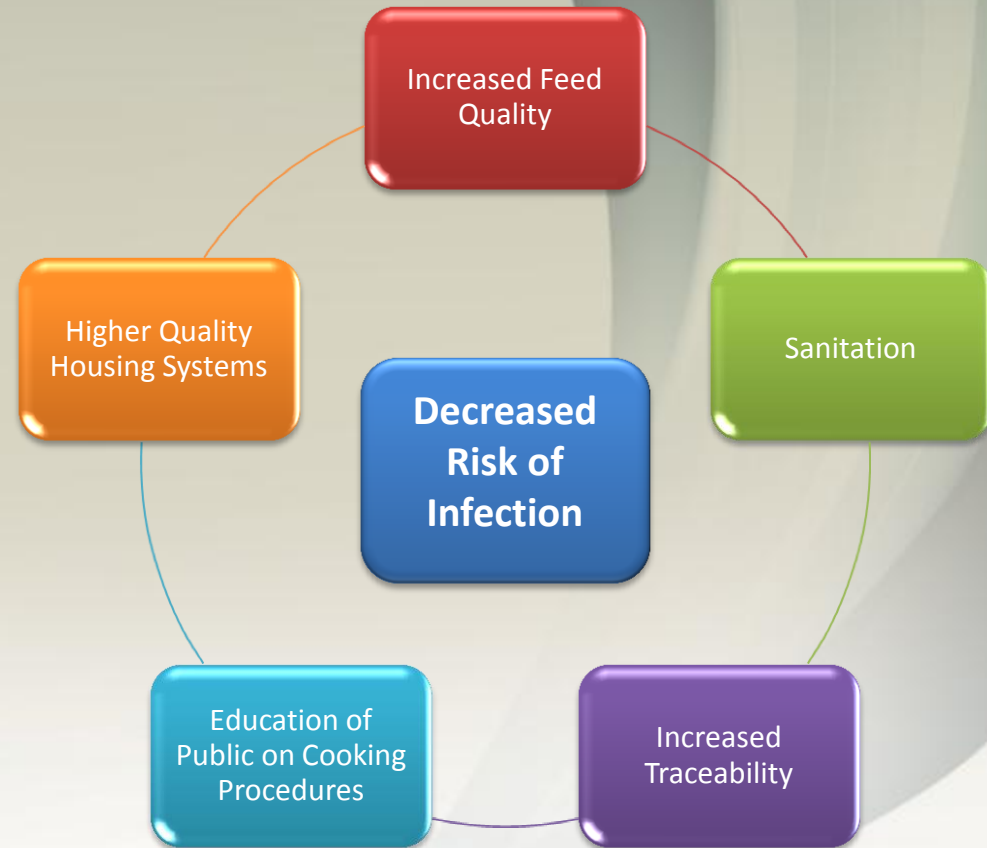
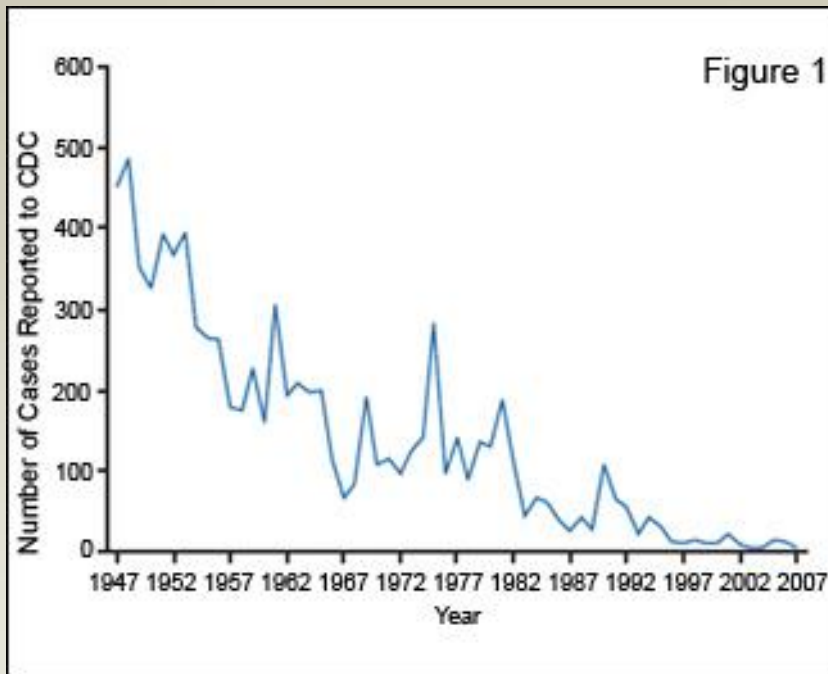
Decreasing Foodborne Pathogens

- Intensive swine production methods virtually eliminate foodborne parasites - *Taenia solium*, *Trichinella spiralis*, and *Toxoplasma gondii*.
- Available evidence does not support claims that (1) intensive systems increase risk for bacterial foodborne pathogens (*Salmonella*, *Campylobacter*, *Listeria*, and *Yersinia enterocolitica*), or (2) that alternative systems reduce risk of colonization with such organisms.
- Pigs raised in traditional outdoor systems inherently confront higher risks of exposure to parasites, particularly *T. gondii*, and bacteria.
- 1997 to 2006, only **15** total trichinosis cases were linked to domestic commercial pork products; **9** cases were associated with "home-raised or direct-from-farm swine" (Roy et al., 2003; Kennedy et al., 2009).

Source: Volume 8, Number 2, 2011, *FOODBORNE PATHOGENS AND DISEASE*, Intensive Swine Production and Pork Safety, Peter R. Davies



National Food Safety Example: Trichinosis



Communications Challenges

- Social media - friend and foe?
- If you don't speak for yourself, others will speak for you—you may not like what they say

WIKIPEDIA

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from YAHOO!

twitter

facebook.

You Tube

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Contact me at:

dennistreacy@smithfieldfoods.com

Conclusions

- Income/animal protein demand increasing
- Reduce regulatory barriers to producing food
- Reduce trade barriers
- Create policy incentives to encourage efficiencies – e.g., RPS
- Balance the debate through science-based examination – e.g., NAS

The End

