Impact of Livestock Industrialization on Smallholders

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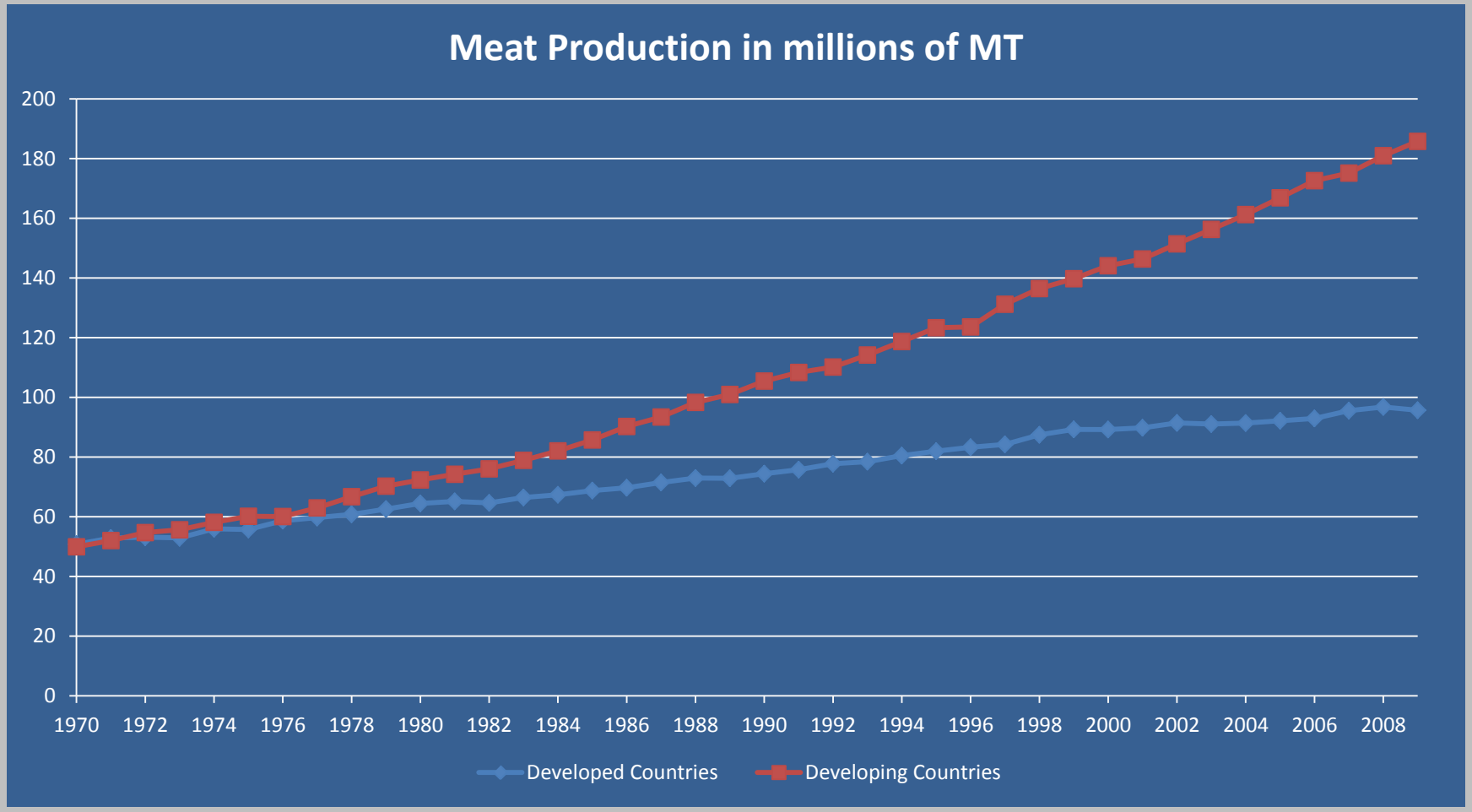
Talk covers

1. Demand and supply trends

2. Discuss a livestock industrialization project (2001-2006) –investigating what has happened to smallholders in the process of industrialization (poultry sector)

3. Will changing demands for food safety, food quality, and ensuring animal health disfavour smallholders?

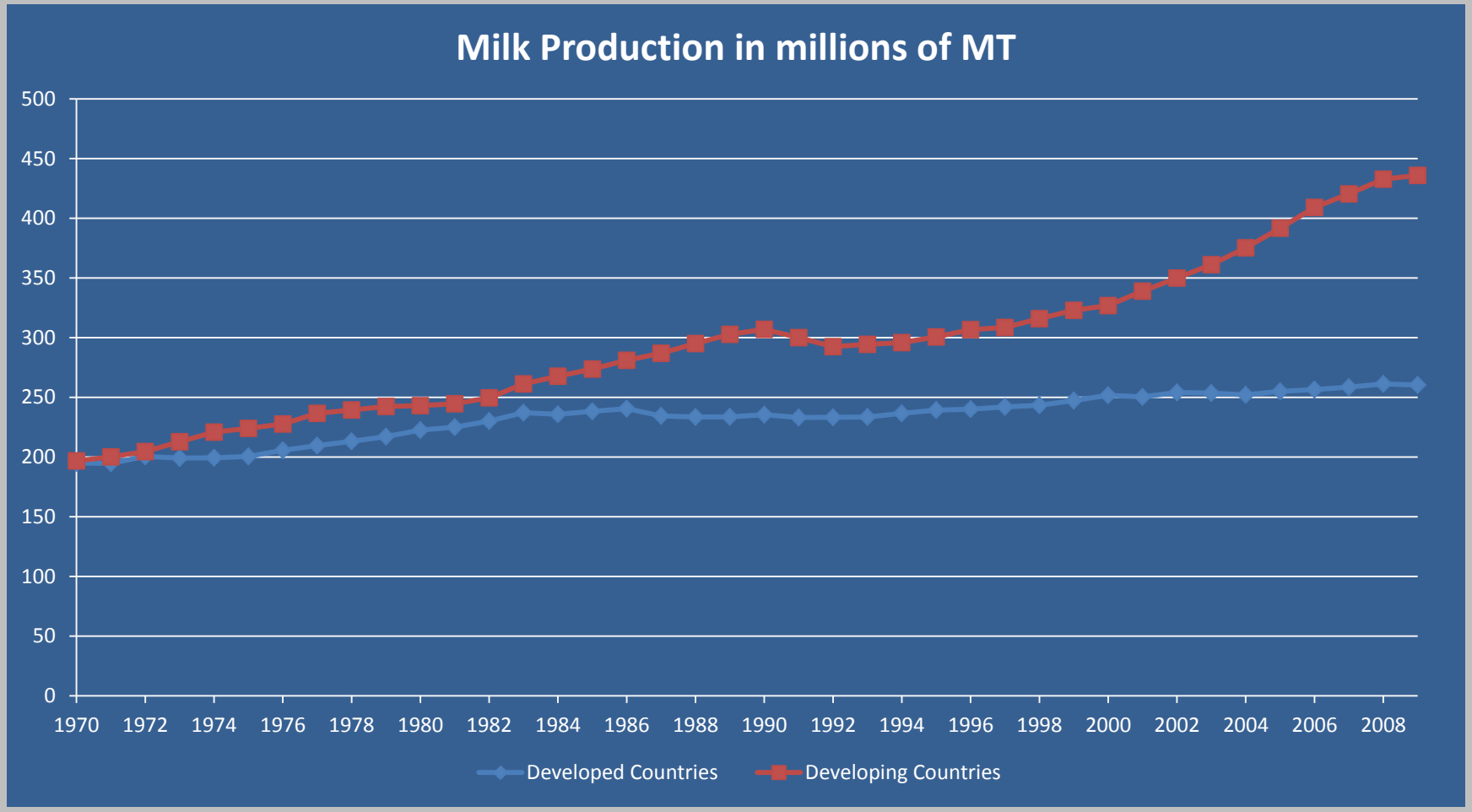
Volume produced in developing world outpaced rest (growth in E. & S. Asia, LA, and Caribbean)



Narrod et al, 2011

Includes USSR and ex Soviet Countries

Volume produced in developing world outpaced rest



Narrod et al, 2011

Includes USSR and ex Soviet Countries

Growth due to demand and supply trends

Trends

- Economic growth and income
- Urbanization
- Move to more industrialized process
- Institutional changes
- Demand for goods with specific attributes

Income effect

- As income rises a smaller share of food budget spent on grain and larger share spent on HVA, processed and prepared food

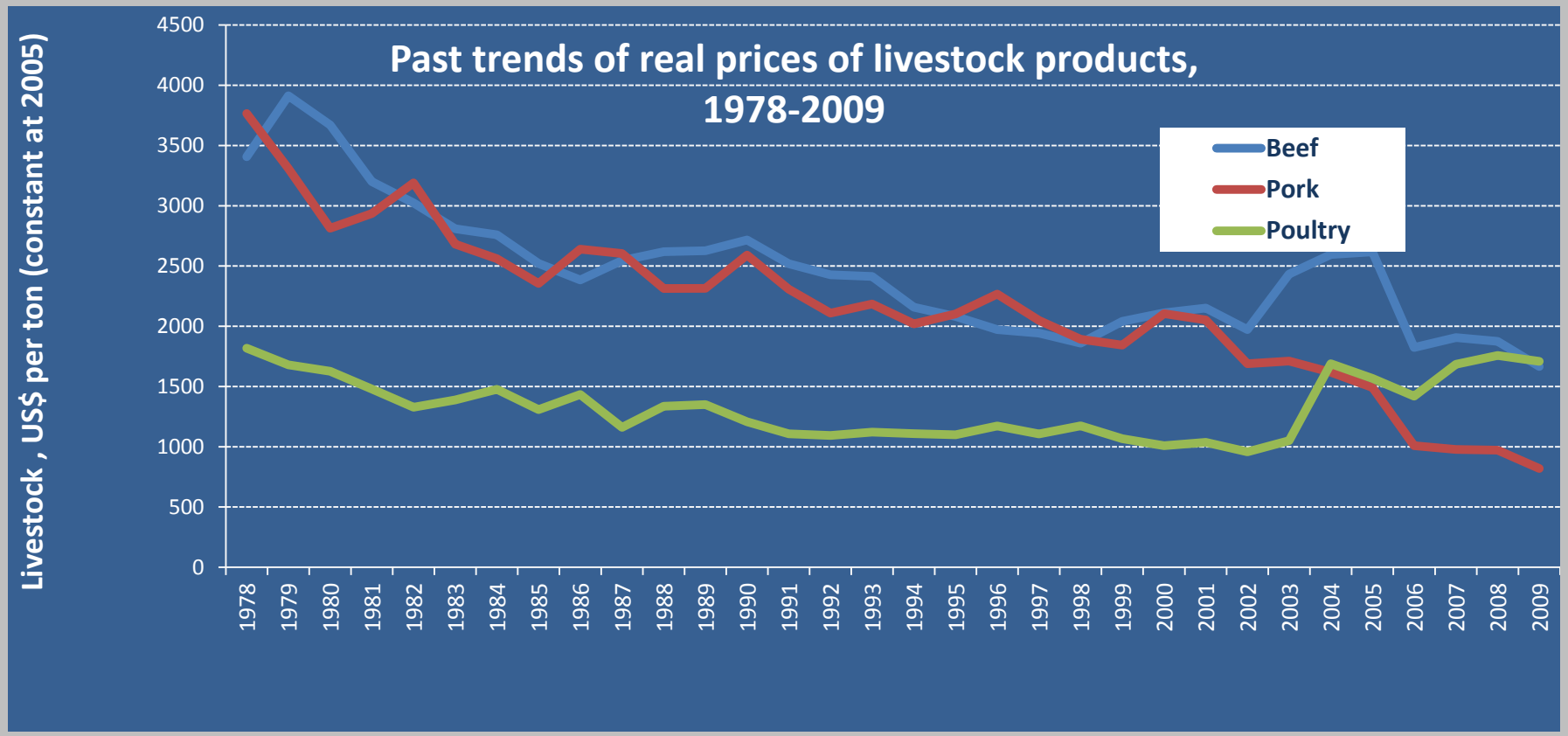
Avg annual growth in global per capita consumption of food items (%)

Food item[(a)]	1962-1971	1972-1981	1982-1991	1992-2001	2002-2007	1962-2007
Cereals (excluding beer)	0.4	0.7	0.3	–0.3	–0.1	0.3
Fruits (excluding wine)	1.4	0.7	0.6	1.4	2.4	1.3
Pulses	–2.5	–1.3	–0.3	0.4	1.2	–0.9
Vegetables	–0.2	1.3	1.2	3.9	1.1	1.5
Eggs	1.4	0.8	1.7	2.5	0.9	1.4
Fish, seafood	2.0	0.4	1.1	2.4	0.8	1.4
Meat	1.7	1.0	1.2	1.2	0.8	1.2
Milk (excluding butter)	0.1	0.2	–0.1	0.6	1.5	0.3

Narrod et al, 2011

Increased demand for HVA, highly perishable

Growth in production/consumption occurred despite price fluctuations



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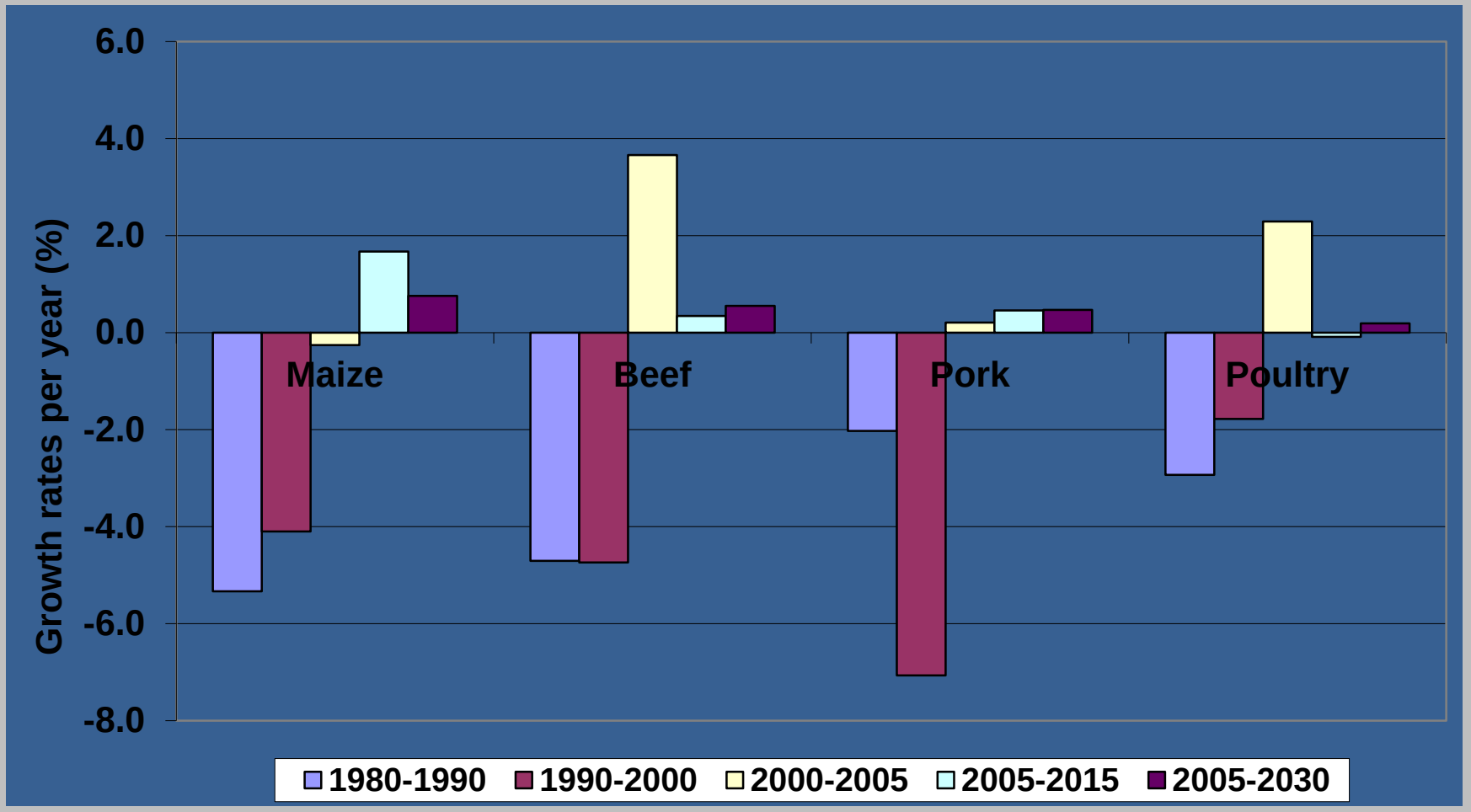
By 2030 Avg meat prices expected to surpass 1990-2000 Avg (in real terms)

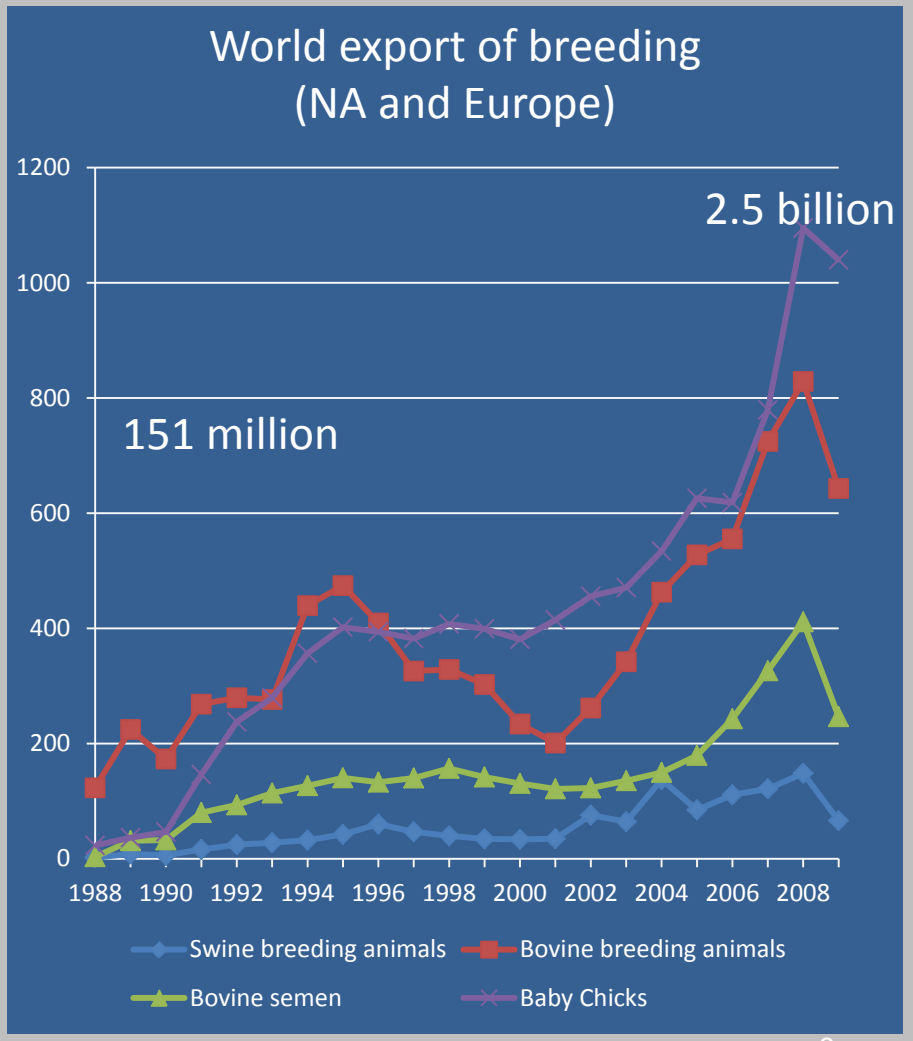


Narrod et al, 2011

Due to lower supplies, higher feed costs, and rising demand for cheaper meats (poultry & pork)
Economic recovery will increase consumption of meats relative to cereals

Moved to more industrialized process to produce high yielding product with specific attributes

- Establishment of specialized enterprises using hired labor, borrowed capital, and purchased inputs
- Increased trade by specialized breeding companies
  - poultry and swine
- Research done in US and Europe; product sold worldwide through franchises
  - Flow of bovine and swine genetic resources segmented
    - trade w/in high-productivity systems
    - trade within low-productivity systems
    - Frozen semen for dairy; difficult for swine
  - Not so much for poultry



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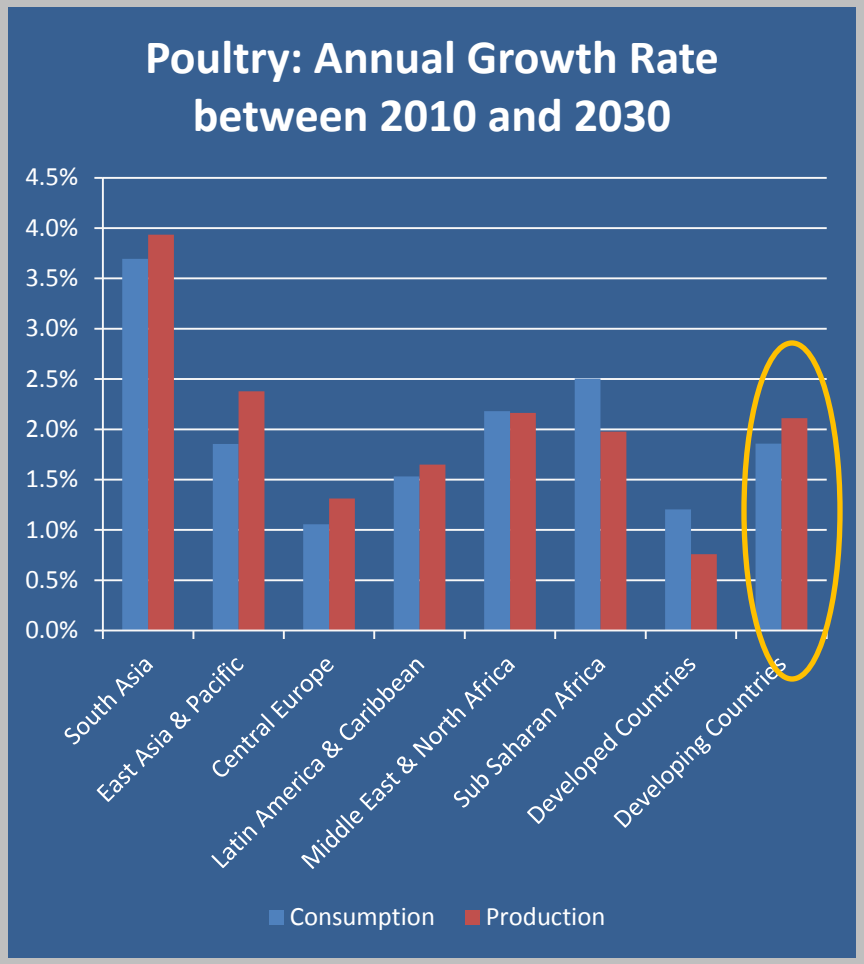
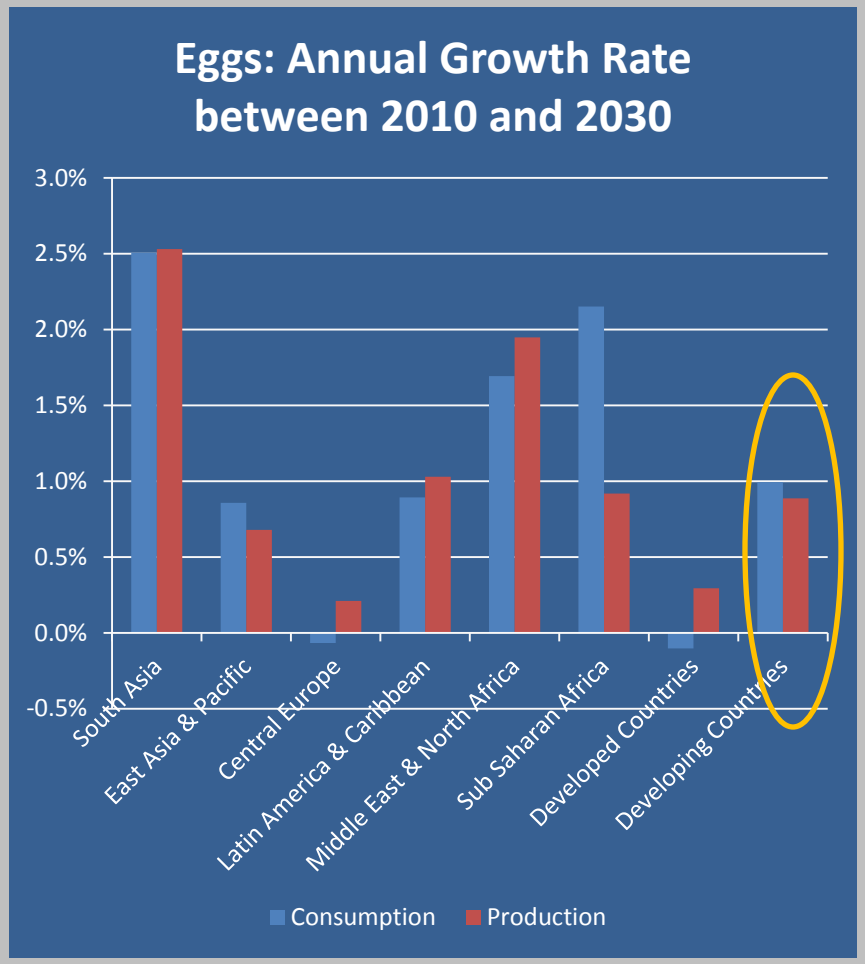
Projected growth of poultry and eggs production and consumption - next 20 yrs





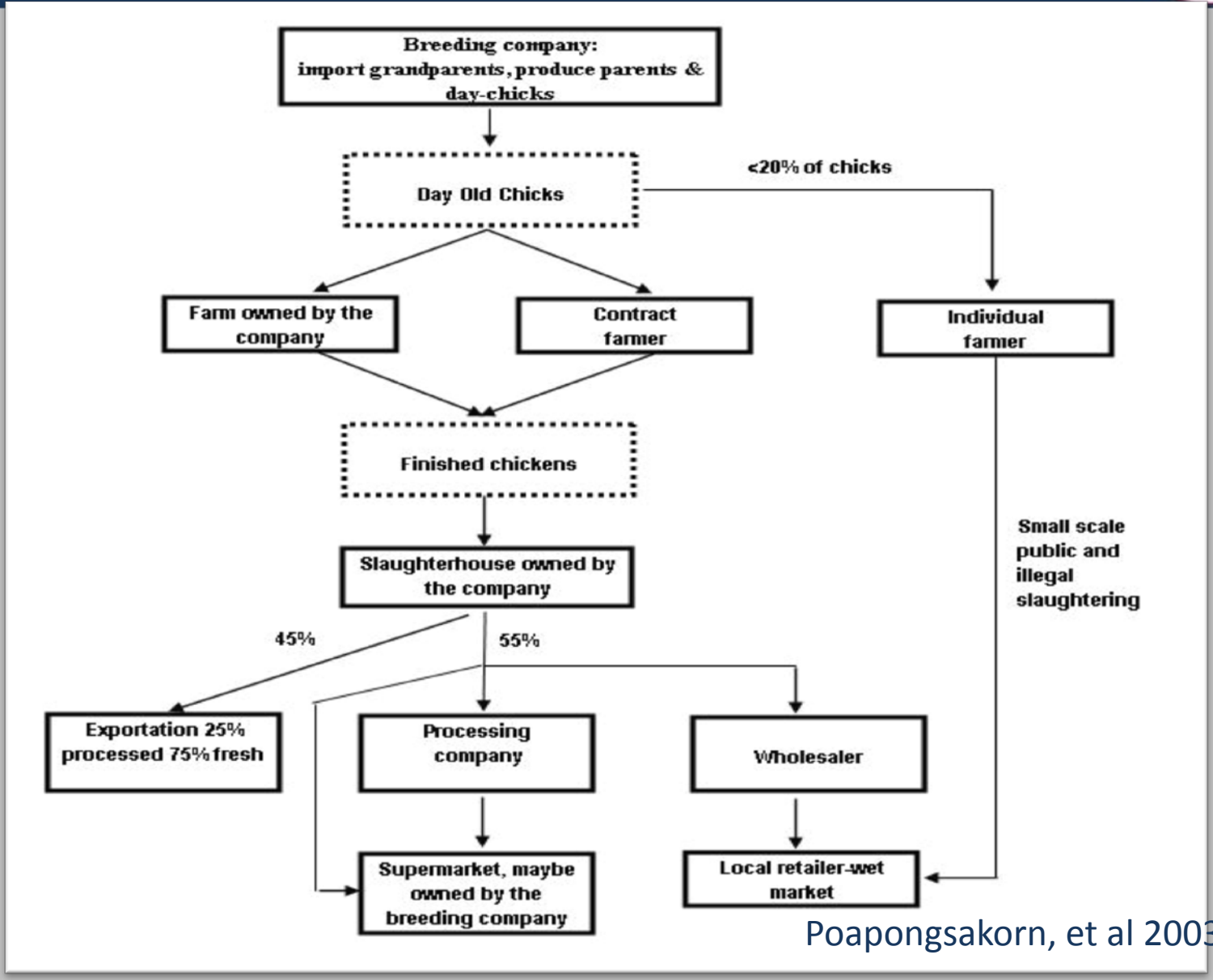
Narrod et al, 2011

Developing countries still not meet egg demand by 2030

Increases in Productivity in LDC's Paralleled those in DC's

Developing countries steadily transiting to more specialized enterprises using **hired labour**, **borrowed capital**, and **purchased inputs** so as to produce a more uniform quality livestock product under different modes of industrial organization so as to meet demand worldwide.

Commercial Broiler Supply Chain: Thailand



Poapongsakorn, et al 2003

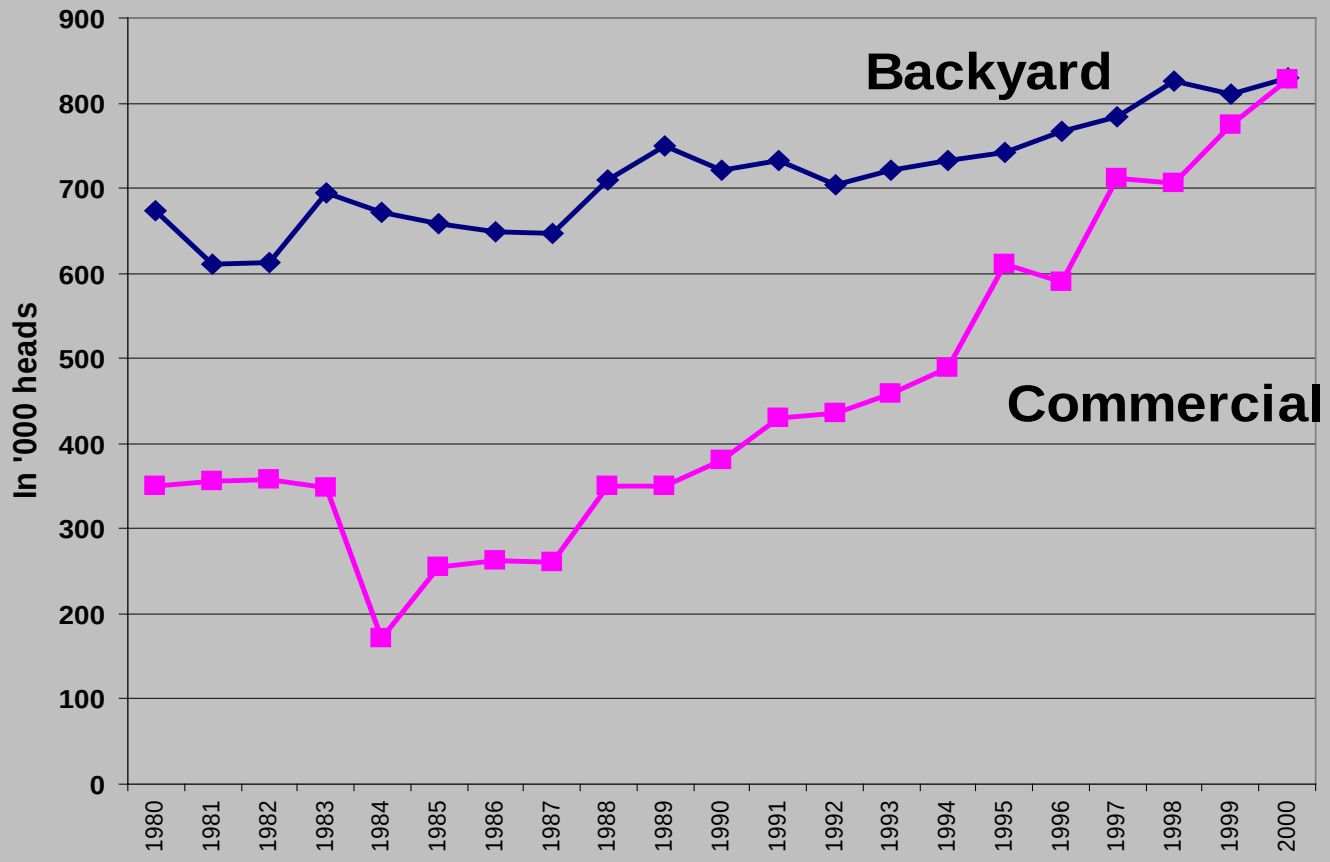
What has happened to smallholders?

Change in the size distribution of poultry farms: Thailand

Flock size (birds/farm)	1988	1998	2003	% change 1988-98	% change 1998-2003	% change 1988-2003
1-19	2,267	1,948	362	-14	-81	-84
20 - 99	946	1,146	581	21	-49	-39
100 - 999	27	66	68	144	3	152
1,000 - 9,999	9	13	14	44	8	56
10,000 and over	0.5	2	4	300	100	700
Total no. of farms ('000)	3,250	3,174	1,028	-2.3	-68	-68

Poapongsakorn, et al 2003

Scaling-up for Hogs in S. Luzon (1980-2000)



Costales, 2003

What is happening to the smallholders?

- Most work to date is descriptive, little systematic empirical analysis
- (2002 – 2006) – group of collaborators set out to empirically capture various factors affecting profitability including transaction costs and efforts to mitigate against environmental externalities for different size producers in a number of countries involving HH surveys
- Case studies in Thailand, the Philippines, India, and Brazil

Research Objectives

- Understand the forces that affect the relative competitiveness of different scales of production operations in livestock (and by hypothesis are displacing smallholders)

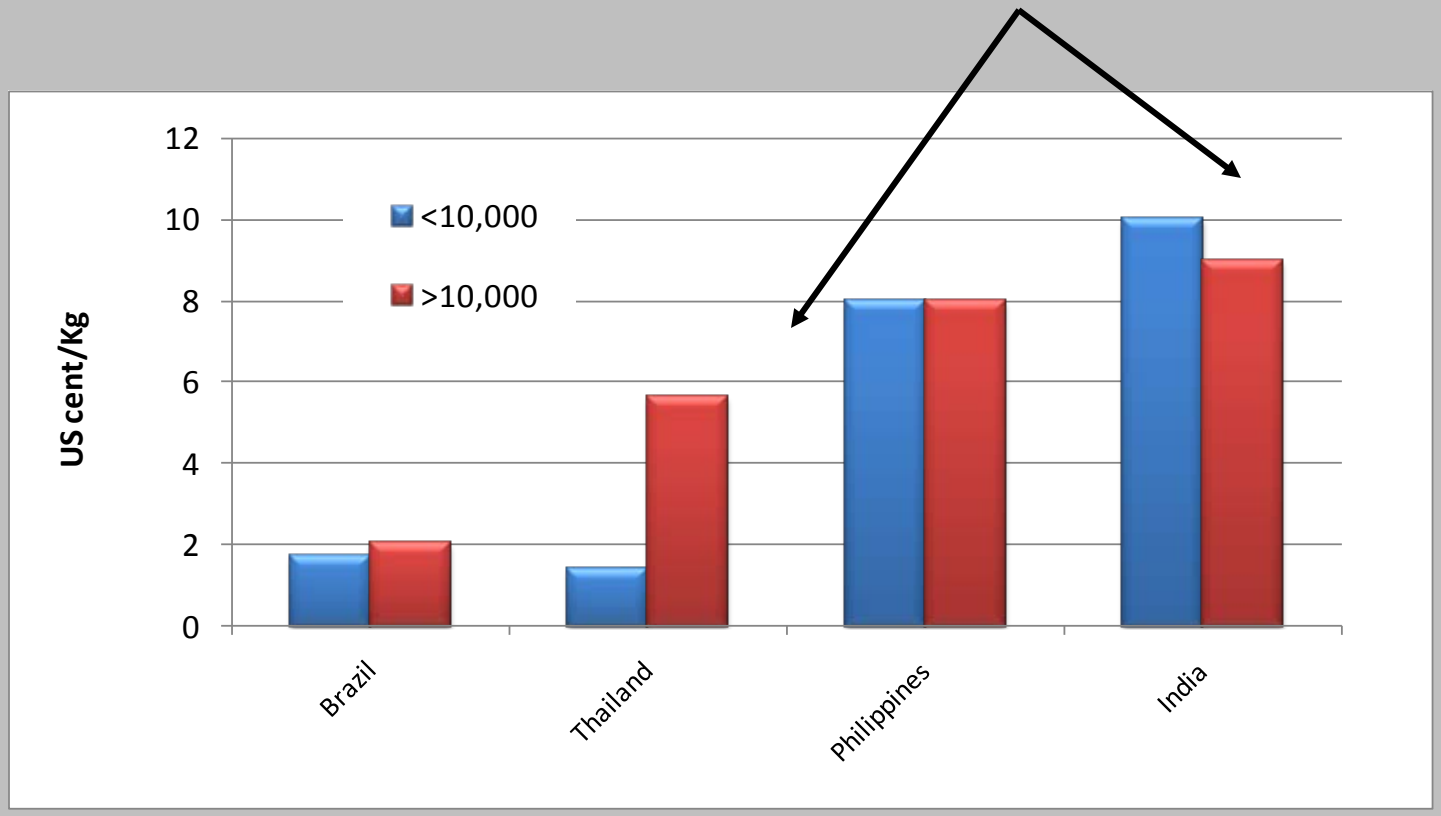
- Quantify the relative contribution to lack of competitiveness from transaction cost barriers and market distortions that impact small-scale operators more than large.

Two Fundamental Premises

(1) Transactions costs, hidden subsidies to better off producers that lead to unfair competition, and negative environmental externalities all decrease the social good

(2) More “efficient” users of inputs in securing farm financial returns will eventually drive less efficient ones out of the market; they are potentially more competitive

Average Profit per kg Broiler



Mixed results

Delgado et al 2003

Average profit per unit of output of liveweight broiler

Country		Farm Size			
		Smallholder <10,000 birds		Large/Commercial >=10,000 birds	
		Independent	*Contract*	*Independent*	*Contract*
India					
Average profit without family labor cost	rupees/bird	13.13	1.03	10.93	3.16
	US$/kg*	(0.11)	(0.01)	(0.09)	(0.03)
	rupees/bird	11.36		9.98	
	US$/kg*	(0.10)		(0.09)	
Average profit with family labor cost	rupees/bird	12.40	0.04	10.80	3.01
	US$/kg	(0.11)	(0.003)	(0.09)	(0.03)
	rupees/bird	10.59		9.85	
	US$/kg	(0.09)		(0.08)	
Philippines					
Average profit without family labor cost	pesos/kg	1.59	4.05	1.07	3.96
	US$/kg	(0.03)	(0.08)	(0.02)	(0.08)
Average profit with family labor cost	pesos/kg	1.34	3.98	1.06	3.95
	US$/kg	(0.03)	(0.08)	(0.02)	(0.08)
Thailand		*Forward Contract & Independent*	*Per–bird Wage Contract*	*Forward Contract & Independent*	*Per–bird Wage Contract*
Average profit	baht/kg live–weight	0.71	1.35	2.48	1.51
	US$/kg live–weight	(0.02)	(0.03)	(0.06)	(0.04)
Brazil					
Average profit	real/kg live–weight	0.05		0.06	
	US$/kg live–weight	(0.02)		(0.02)	

Small indep >$ than Large indep

= CF Better off

Large

=

Delgado et al 2003

Findings-Optimism for smallholders

- Small farms are not less efficient in all cases at securing profits per unit of output when family labour and environmental externalities are controlled for
- For smallholders to survive livestock industrialization process, the key issue is for them to have the ability to use their farm resources more efficiently than large-scale producers
- If large–scale producers are more efficient on average, then they will be able to drive their costs down to survive on smaller unit profits but bigger volume of sales driving smallholders out of the market
- But smallholders have a chance; the issue for them is access to output markets, since they face high transaction costs in selling
- Contract farming schemes enables smallholders to r just as profitable as medium and large farmers if the able to successfully link to the rest of the supply cha

Findings: Internalizing Externalities Does Not Explain Scaling Up

- In general, internalizing negative externalities helps explain why some farms are more or less profit efficient
- However, differences in environmental mitigation do not seem to be strong explainers of differences in profit efficiency across sizes of operations
- Farm-specific transaction costs, such as access to credit and market information, greatly matter in explaining relative profit efficiency across farms are the culprit
- The key to pro-poor livestock development is institutional development to overcome asymmetries in access to information and assets

Findings: Contract Farming Work

- In some cases, contract farmers have higher profits per unit of output than do independent farms
  - Contract farmers tend to be more profit efficient that independent farms in most cases
  - Form of contract matters

- Contract farming has real potential to help better incorporate smallholders in high-value supply chains; needs policy attention to work

Future

- Demand for livestock products will rise much faster in developing counties
- Demand will be stimulated by domestic production
  - Meat- China
  - Milk - India
  - Egg/poultry products – S. East Asia
- HVA products highly perishable
  - livestock products subject to strict SPS & food safety requirements
- Stringency of SPS requirements will exclude some

- Developing country's domestic consumers who will provide producers a dynamic market domestically
- Poor producers could miss growing demand opportunities if they are unable to comply with regulations and requirements of modern market chains

Events Beyond Control of Farmers and Integrators

- There are large economies of scale in marketing chains, where transactions costs also abound
- Food safety concerns and demand for reliable timing and quality drives concentration of supermarkets
- Cheaper to monitor safety & quality from a few larger farms—even most reliable and safe small farmer may be unattractive
- Scaling-up of wholesaling probably leads to scaling-up of primary producers

Reality is that Smallholders Might Disappear

Even with market access they may be unable to meet:

- High transaction costs for certain market outlets
- Costs of compliance to meet standards:
  - Import requirements...disease status, traceability, animal welfare, GAP, SPS, compulsory inspection
  - Product requirement.....quality cuts, hygiene standards, packaging, labelling, traceability
- Changing marketing channels
  - concentration in export, processing, and retailing
  - changes in vertical coordination of supply chains (for example, Thailand is switching from contract farming to full vertical integration because of disease threat (AI) as well as better meet EU stringent requirements for food safety and animal welfare) (NaRanong, 2007)