What's Driving Global Meat Demand, Production and Trade?

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Income and population - the twin engines of demand

- Per capita income powers total per capita meat demand
  - Within total meat demand a pitched competitive battle for market share
  - At very high income levels income is not as effective at driving demand as it is at lower income levels
- Population growth also powers total meat demand growth

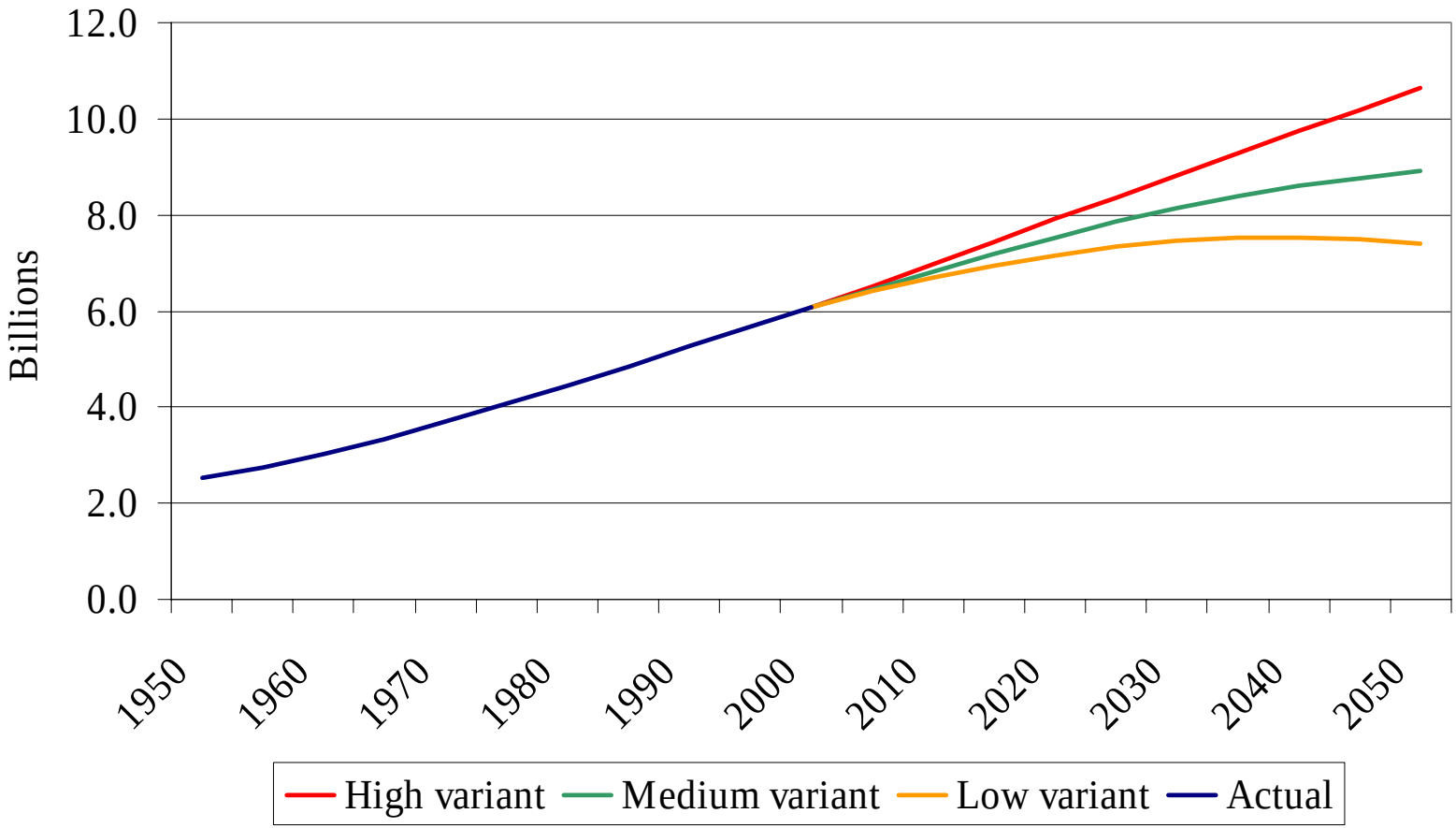
Demand growth powers production growth

- Income and population together drive global total meat demand, and demand growth
- Population growth is slowing, but still significant
  - 6.3 billion today growing to 7.9 in 2025 (UN proj.)
  - That's still a 28% increase in mouths to feed
- Income growth is also significant
  - 2002 - $5,600 global average per capita GDP ($1995)
  - Will grow to about $7,300 by 2025
- Demand growth drives production growth 1:1 (if prices do not change significantly)

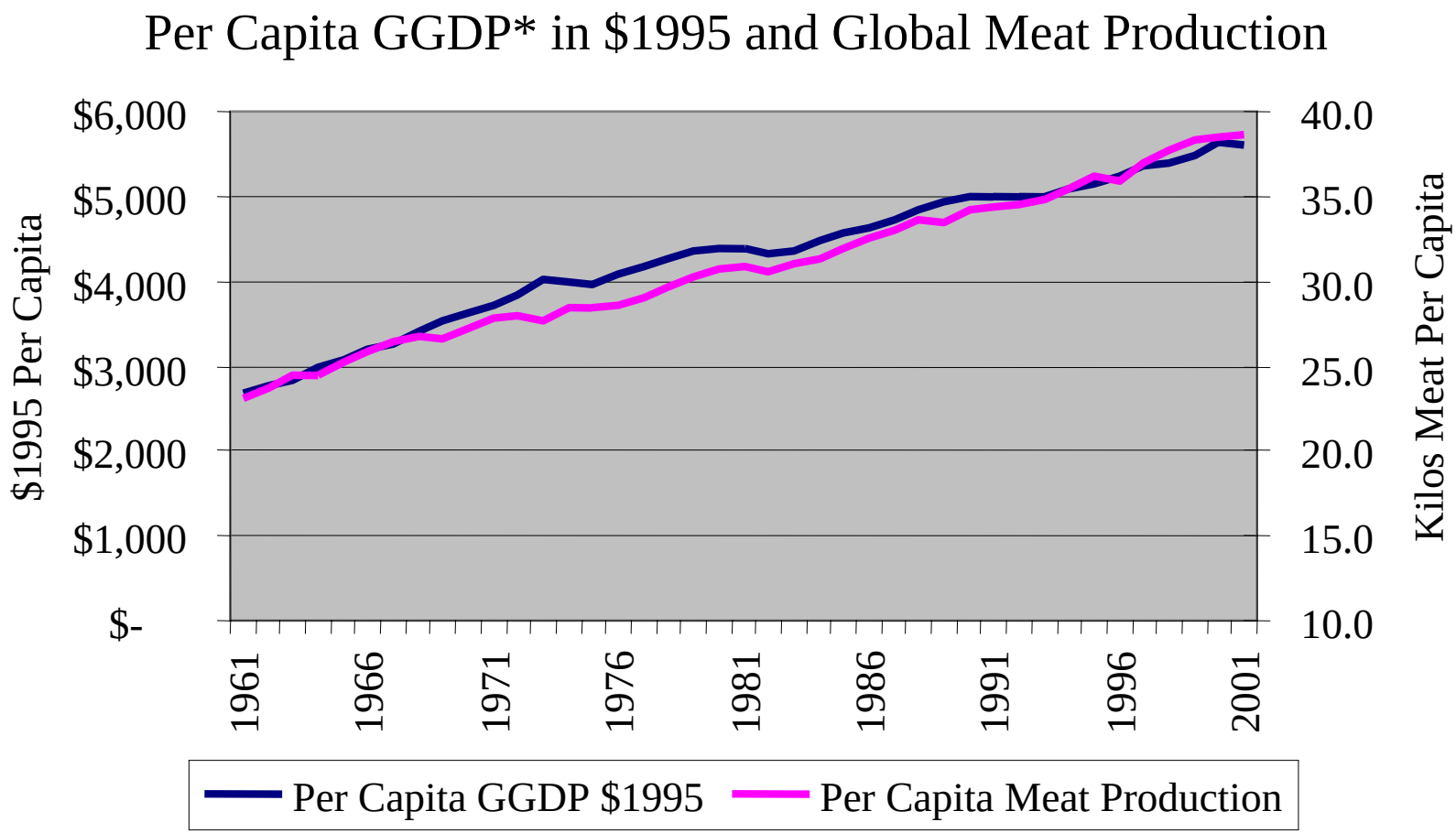
Traditional Capitalism

- You have two cows. You sell one and buy a bull. Your herd multiplies and the economy grows. You sell them, invest the proceeds, and retire on the income.

UN Population Projections



GGDP and meat production are highly correlated (r^2 = .986)



*Global GDP per person

Projected global total meat demand and production

- Population projections taken from the UN medium projection
- Income projected using regression trend of per capita income over time
- Projected meat production per capita from the relationship between per capita income and per capita production
- Multiplied production per capita by projected population to get total production
- Assumes that real meat prices do not rise

Total global meat production projected to 2025

Year	Per Capita GGDP*, $1995	Per Capita Meat Production, Kg	Implied Income Elasticity	Global Population, Billion	Total Meat Production, MMT
1961	$2,676	23.1		3.084	71.2
1971	$3,714	27.8	52%	3.767	104.6
1981	$4,376	30.8	61%	4.513	139.1
1991	$4,992	34.4	83%	5.345	183.8
2001	$5,611	38.6	98%	6.147	237.1
2025p	$7,333	46.7	68%	7.851	366.5
% Increase 2001-25	30.7%	21.0%		27.7%	54.6%

*Global GDP per person

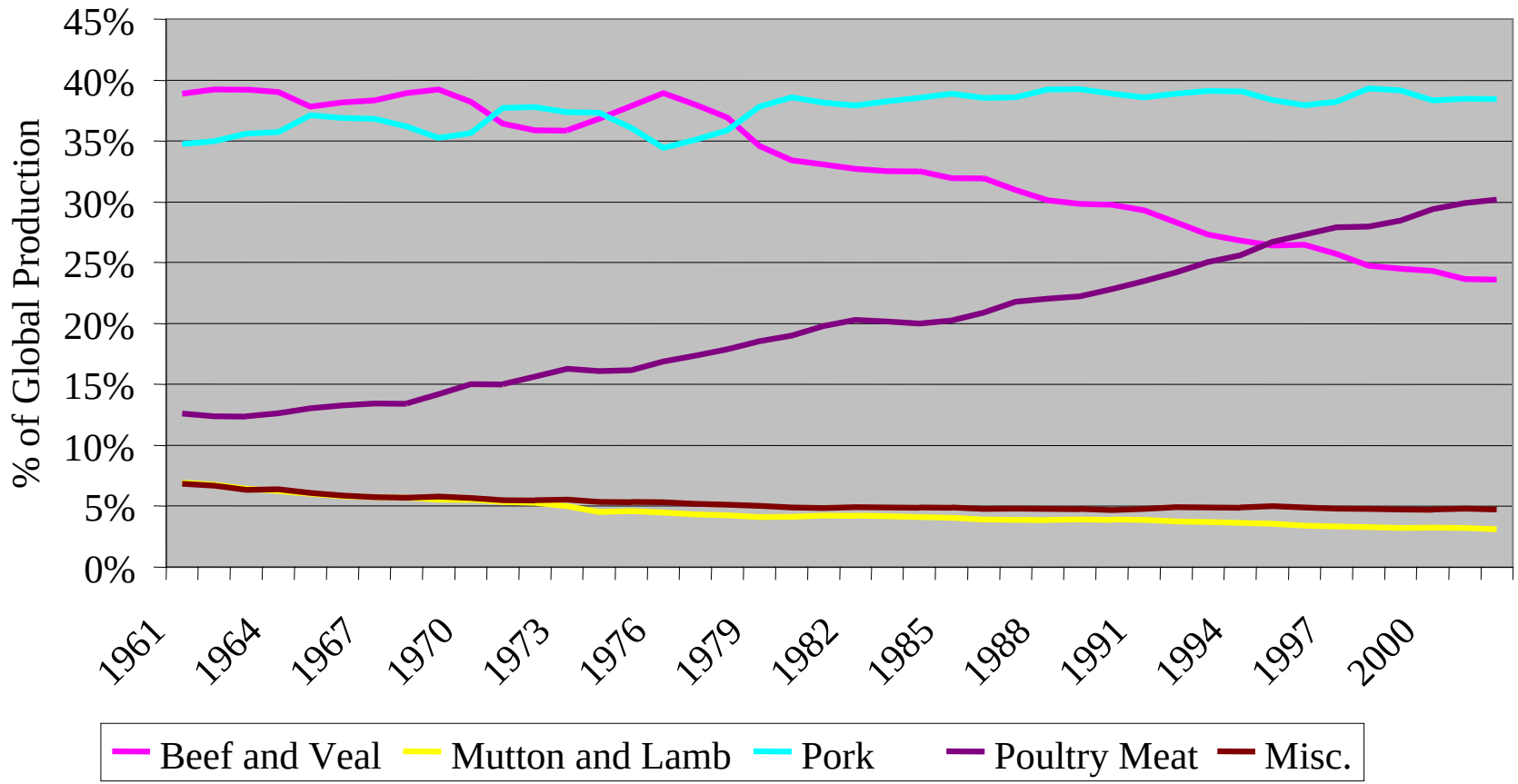
Species global share trends

- Pork share relatively flat since 1980
- Ruminants – cattle and sheep – have lost huge amounts of market share
- Poultry has picked up all that the ruminants lost
- Miscellaneous species have consistently held a 5% share

American and French Capitalism

- An American Corporation
  You have two cows. You sell one and force the other to produce the milk of four cows. You are surprised when the cow drops dead.
- French Corporation
  You have two cows. You go on strike because you want three cows

Global market share trends

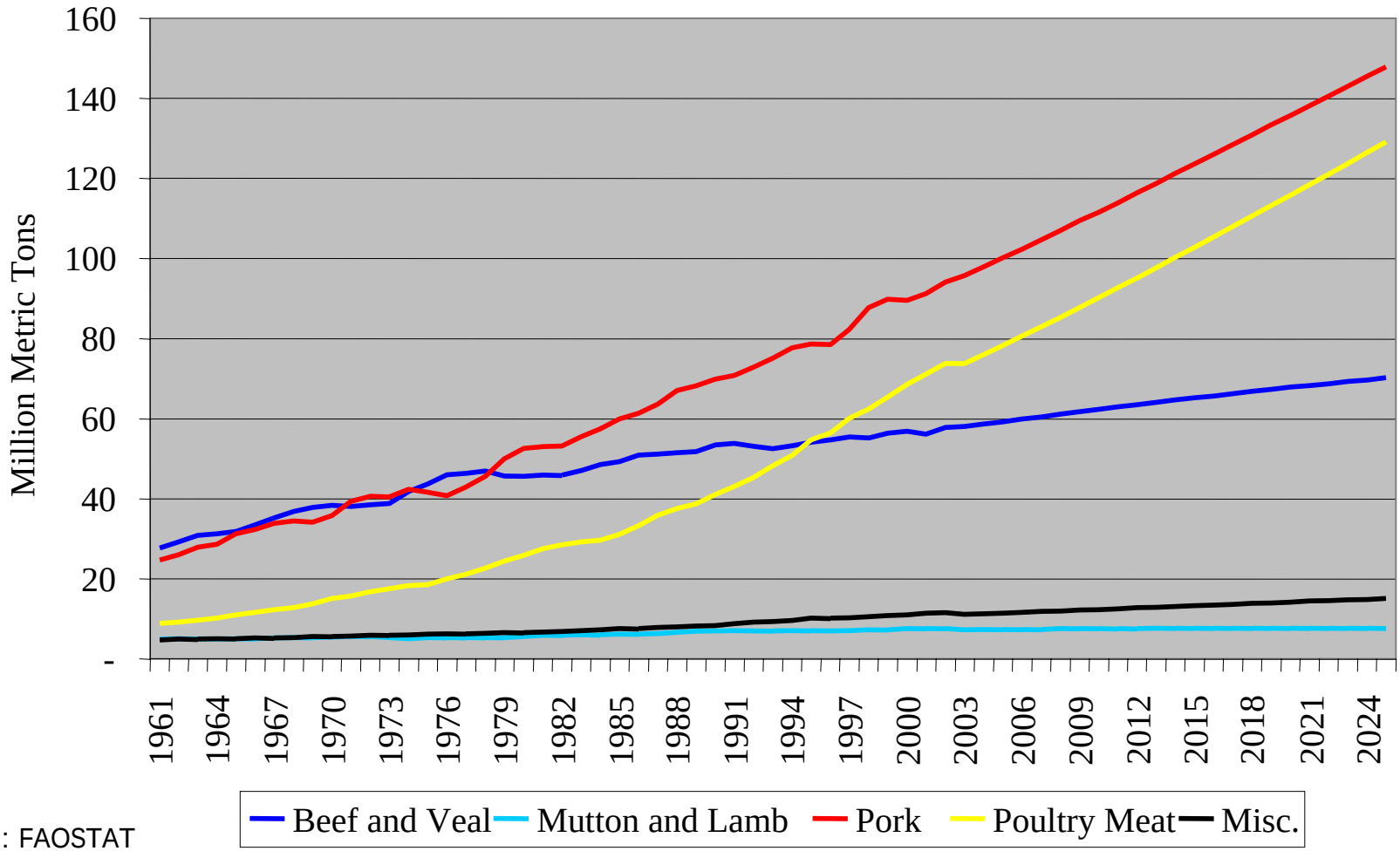


Source: FAOSTAT

How much will species production grow by 2025?

- Share assumptions
  - Pork share holds at 38% through 2025
  - Poultry share gains and beef share losses slow
- Beef/veal production reaches 70 mmt
- Pork reaches 145 mmt
- Poultry reaches 130 mmt
- Mutton/lamb remain at 7-8 mmt
- Miscellaneous grows slightly to 14 mmt

Projected species production



Source: FAOSTAT

Area share trends

- Europe will lag in production growth
  - High costs
  - Low/no demand growth
- Asia will be the leading growth area in pork, and poultry will grow significantly too
  - Trade potential with Asia is huge
- Latin America will also see considerable growth in poultry, enormous potential in beef
- U.S./Canada will also grow, but much slower than Asia

German, British and Italian Capitalism

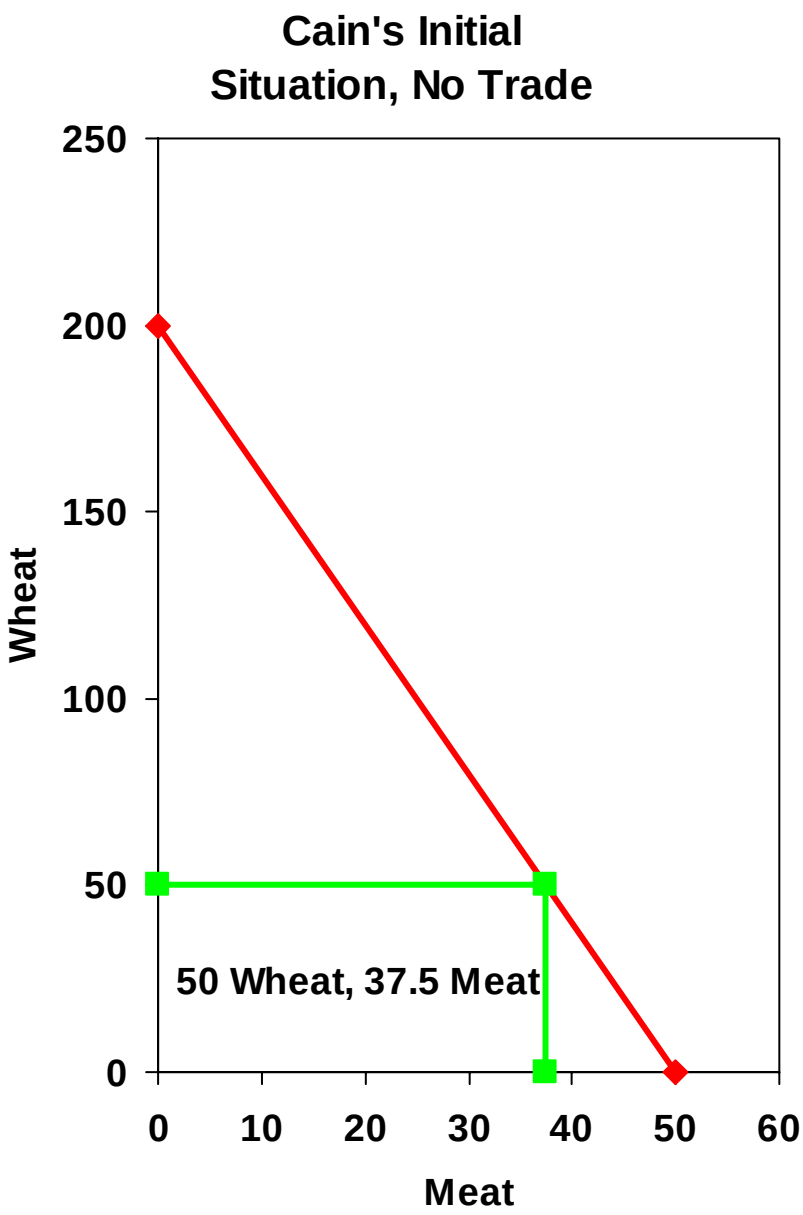
- A German Corporation
  You have two cows. You re-engineer them so they live for 100 years, eat once a month, and milk themselves.
- A British Corporation
  You have two cows. Both are mad.
- An Italian Corporation
  You have two cows. But you don't know where they are. You break for lunch.

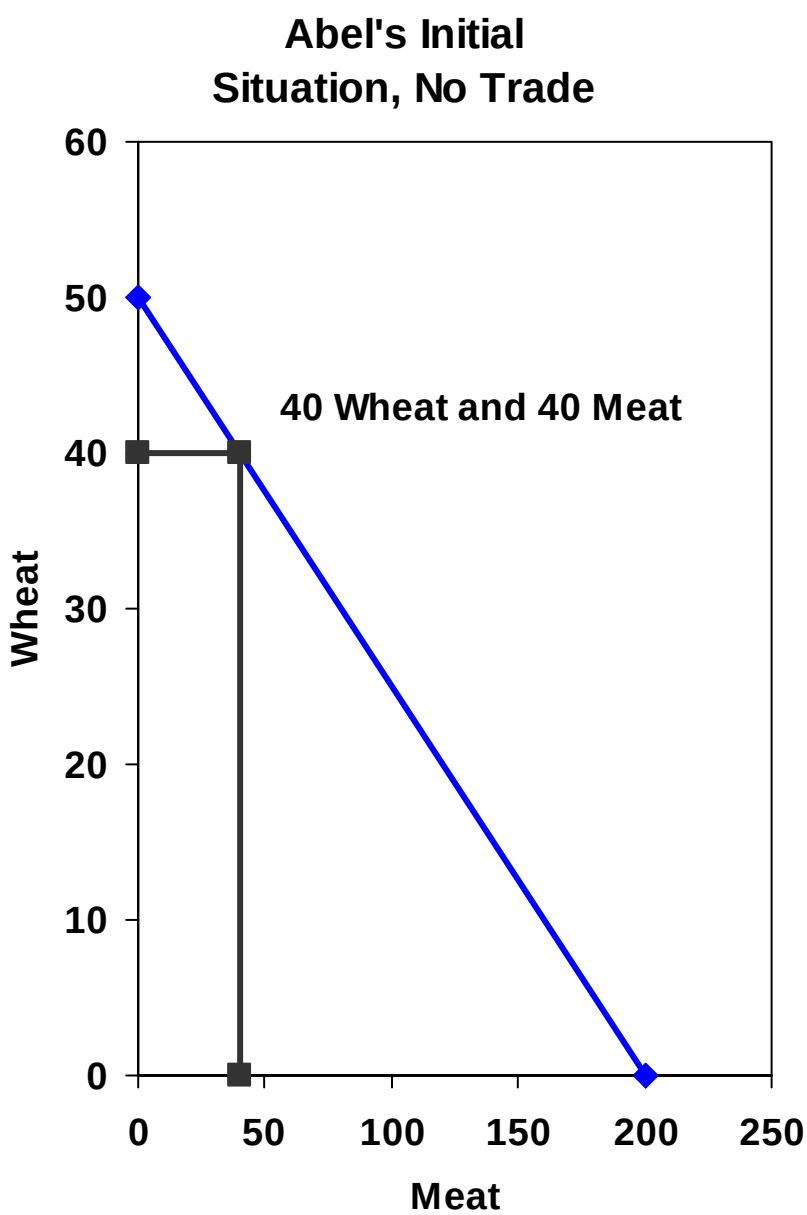
International meat trade

- Trade is growing in general
- Trade increasing faster than production
  - EU Single Market initiative
  - WTO
  - NAFTA
  - Japanese and Korean bilateral treaties
  - Improvements in refrigerated meat transportation
- Increased incomes causing increasing price differentials among parts
  - Role of income growth in trade patterns is the key
  - Increased opportunities to trade parts, not carcasses
  - Live production costs become less important

The world of Cain and Abel

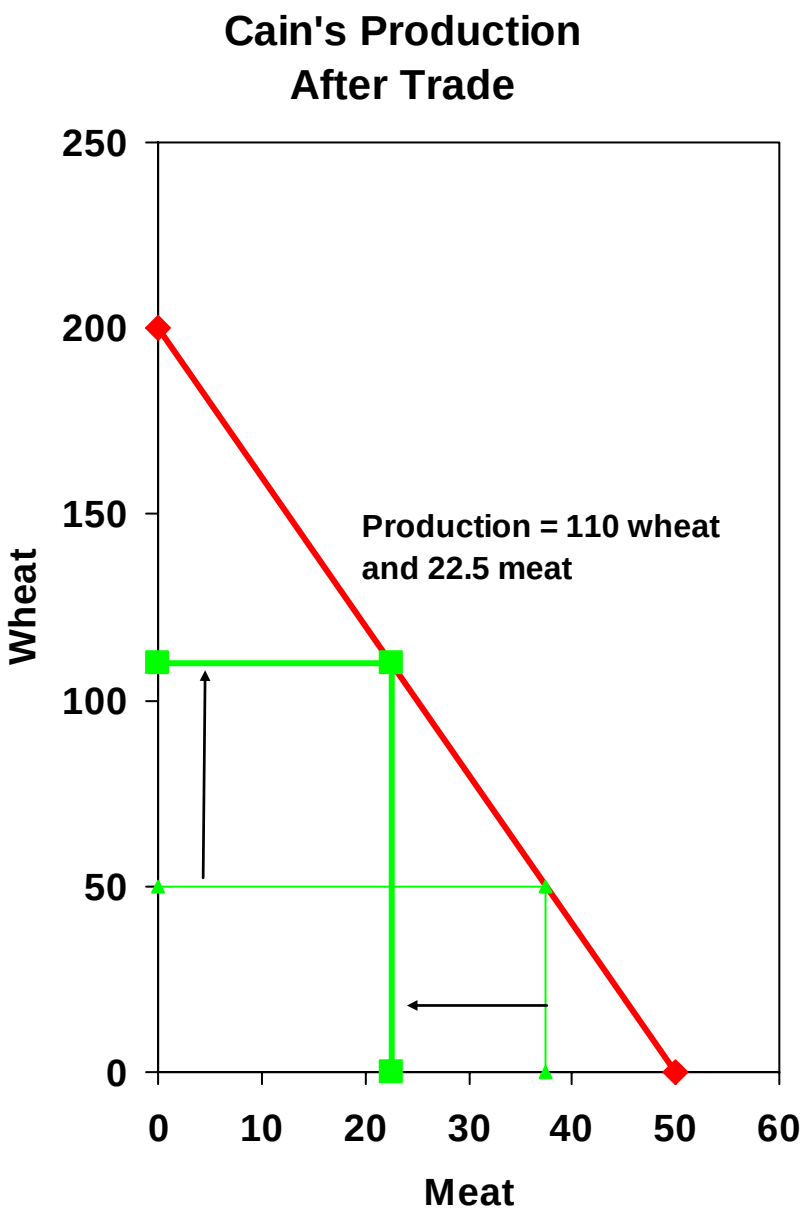
- Cain and Abel are the only two families in the land of Eden
- Both are farmers
- Cain has land that is fertile, but not much of it
- Abel has land that is not fertile, but more than Cain
- Cain and Abel are self-sufficient, they do not trade
- Each raises wheat and meat according to the next slide

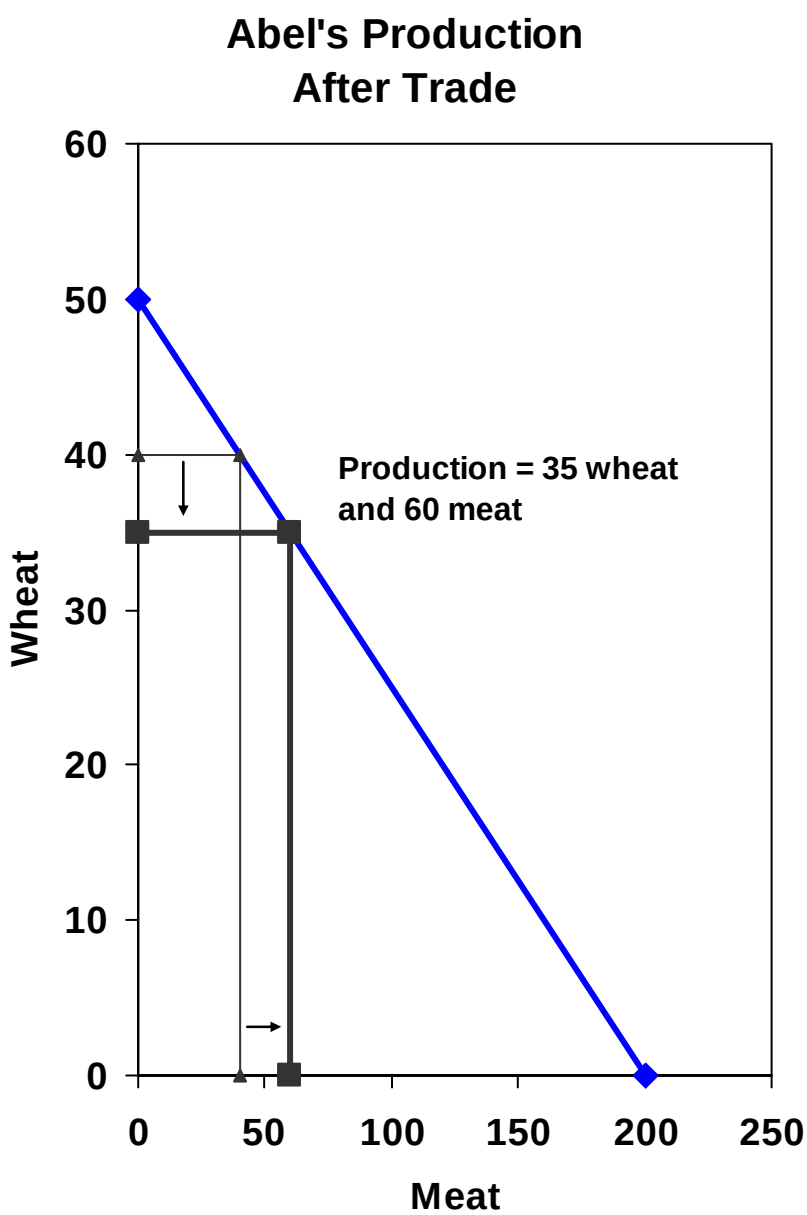

Cain's Initial
Situation, No Trade
250
200
150
100
50
0
Wheat
50 Wheat, 37.5 Meat
0
10
20
30
40
50
60
Meat


Abel's Initial
Situation, No Trade
60
50
40
30
20
10
0
Wheat
40 Wheat and 40 Meat
0
50
100
150
200
250
Meat

What if they decide to give up self-sufficiency?

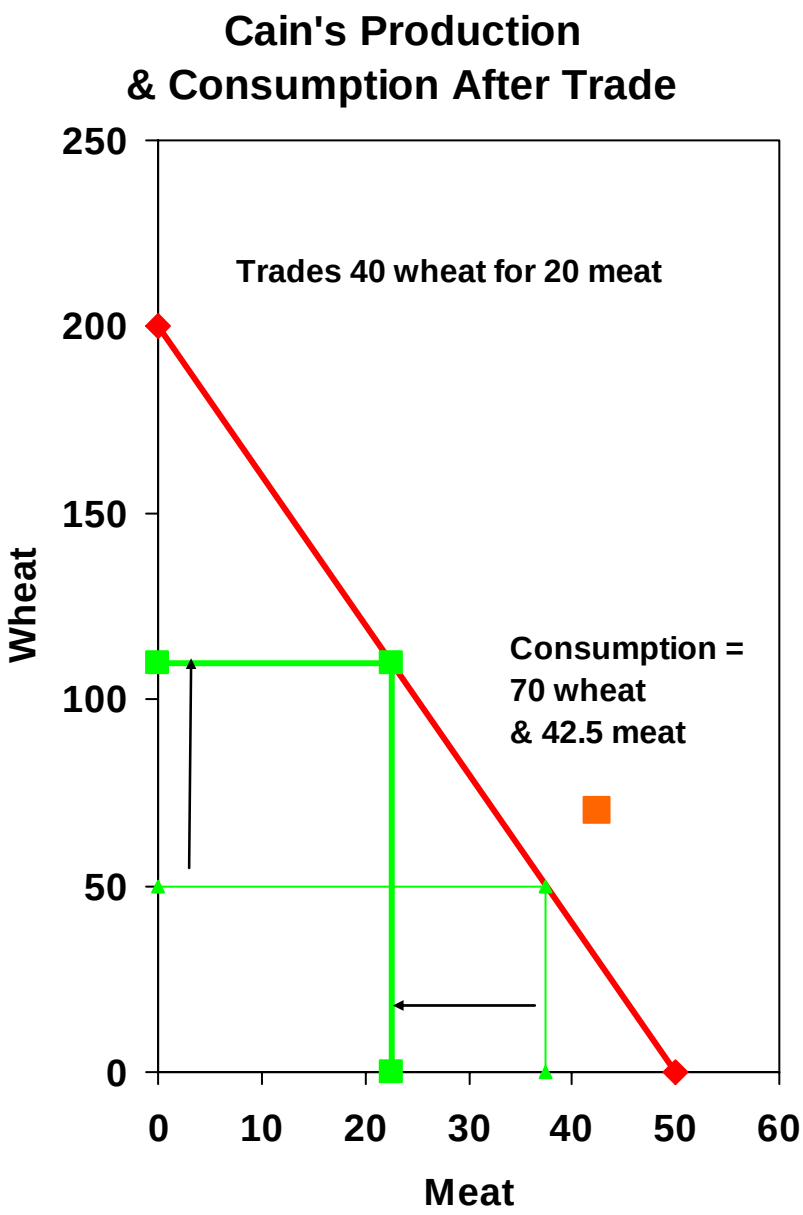
- Cain and Abel meet one day and decide to try trading wheat and meat
- After long and spirited negotiations they arrive at a price of 2 wheat = 1 meat
- They decide that Cain, being a good wheat farmer, will produce 60 more wheat, giving up 15 of his own meat production, and trade 40 of the 60 wheat to Abel for 20 of Abel's meat
- Abel, who can easily produce more meat, and wants more wheat, decides to produce 20 more meat to trade for Cain's 40 wheat, giving up 5 of his own wheat production

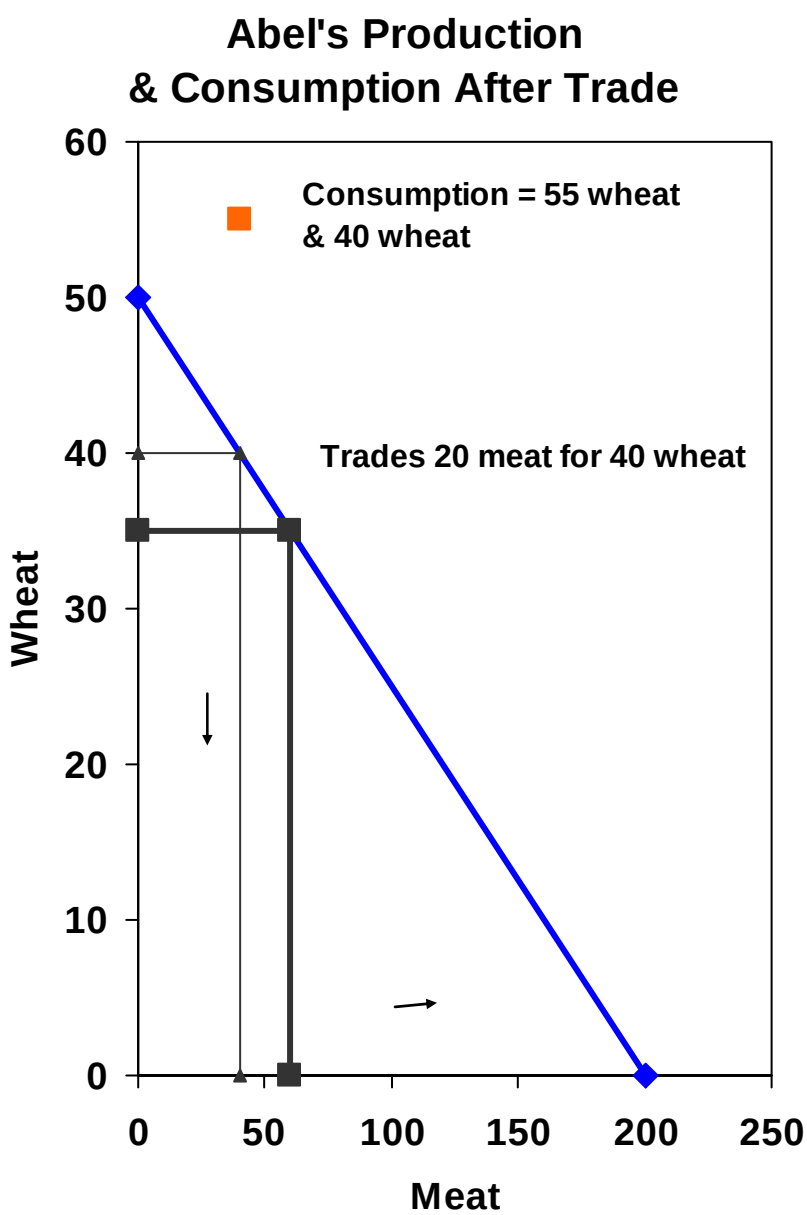

Cain's Production
After Trade
250
200
150
100
50
0
Wheat
Production = 110 wheat
and 22.5 meat
0
10
20
30
40
50
60
Meat


Abel's Production
After Trade
60
50
40
30
20
10
0
Wheat
Production = 35 wheat
and 60 meat
0
50
100
150
200
250
Meat

But how much can each now consume?

- Cain trades 40 of his extra 60 wheat for Abel's extra 20 meat
- Abel now has Cain's 40 wheat and gives up the extra 20 meat
- They can now consume more than they can produce in isolation!


Cain's Production
& Consumption After Trade
Trades 40 wheat for 20 meat
Consumption =
70 wheat
& 42.5 meat
Wheat
Meat
0
50
100
150
200
250
0
10
20
30
40
50
60


Abel's Production
& Consumption After Trade
Consumption = 55 wheat
& 40 wheat
Trades 20 meat for 40 wheat
Wheat
Meat
0
10
20
30
40
50
60
0
50
100
150
200
250

Trading Summary

	Cain		Abel		Total Eden	
	Wheat	Meat	Wheat	Meat	Wheat	Meat
Production Before Trade	50	37.5	40	40	90	77.5
Production After Trade	110	22.5	35	60	145	82.5
Production Difference	60	-15	-5	20	55	5
Trading Activity	-40	20	40	-20	0	0
Consumption Before Trade	50	37.5	40	40	90	77.5
Consumption After Trade	70	42.5	75	40	145	82.5
Consumption Difference	20	5	35	0	55	5

Cain and Abel have both managed to consume more of at least one item and given up nothing but some of their independence! Both are better off by trading.

Trading Summary, with Money

	Cain		Abel		Total Eden	
	Wheat	Meat	Wheat	Meat	Wheat	Meat
Production Before Trade	50	37.5	40	40	90	77.5
Production After Trade	110	22.5	35	60	145	82.5
Production Difference	60	-15	-5	20	55	5
Prices	$1.00	$2.00	$1.00	$2.00	$1.00	$2.00
Prod. Value Before Trade	$50	$75	$40	$80	$90	$155
	$125		**$120**		**$245**	
Prod. Value After Trade	$110	$45	$35	$120	$145	$165
	$155		**$155**		**$310**	
Consumption Before Trade	$50	$75	$40	$80	$90	$155
Consumption After Trade	$70	$85	$75	$80	$145	$165
Consumption Difference	**$30**		**$35**		**$65**	

The value of production and consumption (Eden's GDP) has increased by $65, or over 25%.

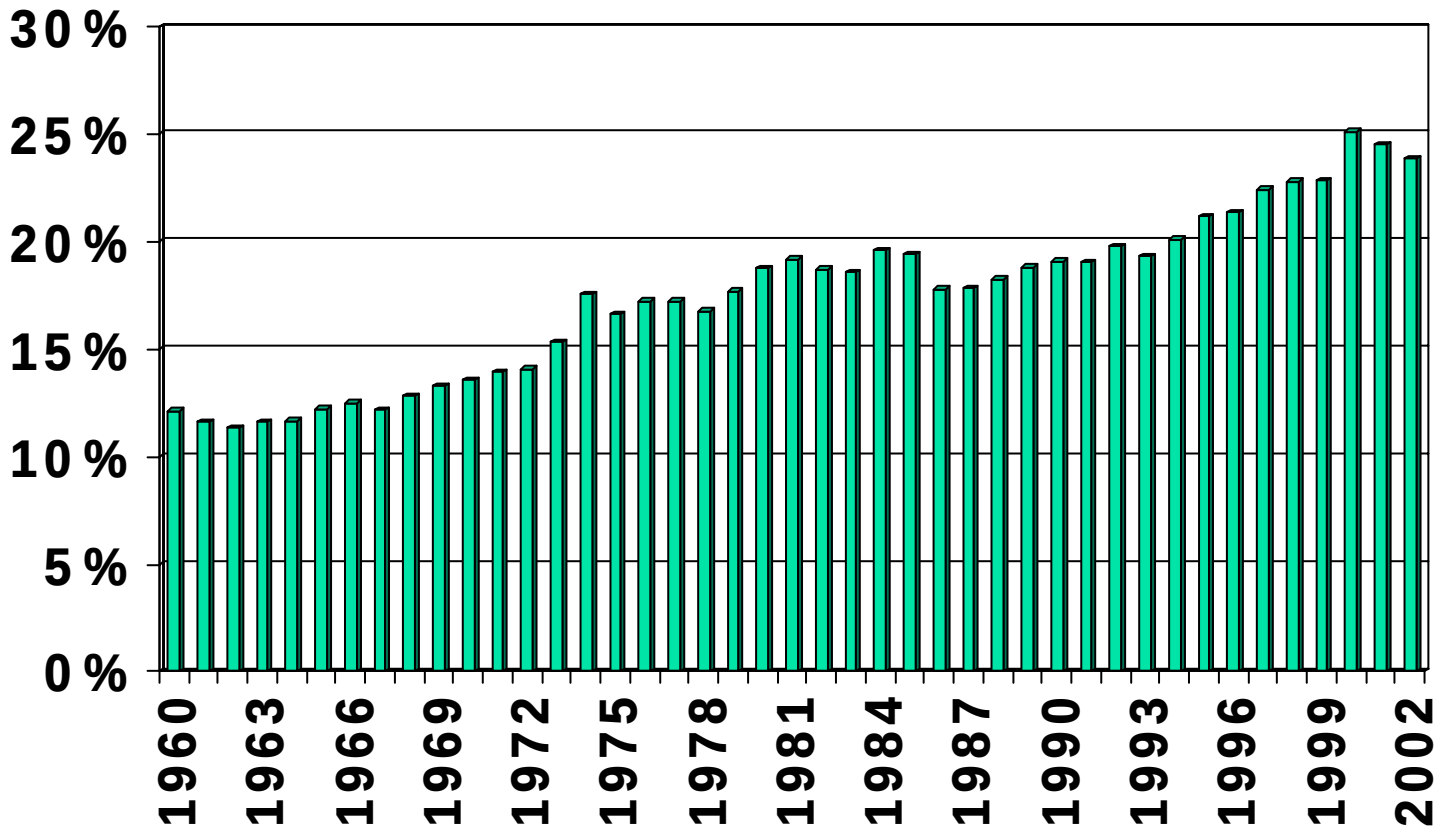
What are the benefits?

- More food production from the same resources (land and labor)
- Increased the income of both families
- Both families have more to eat
- Could use this surplus as a hedge
- Could diversify into other enterprises
- Or, could work fewer hours and still enjoy a better standard of living

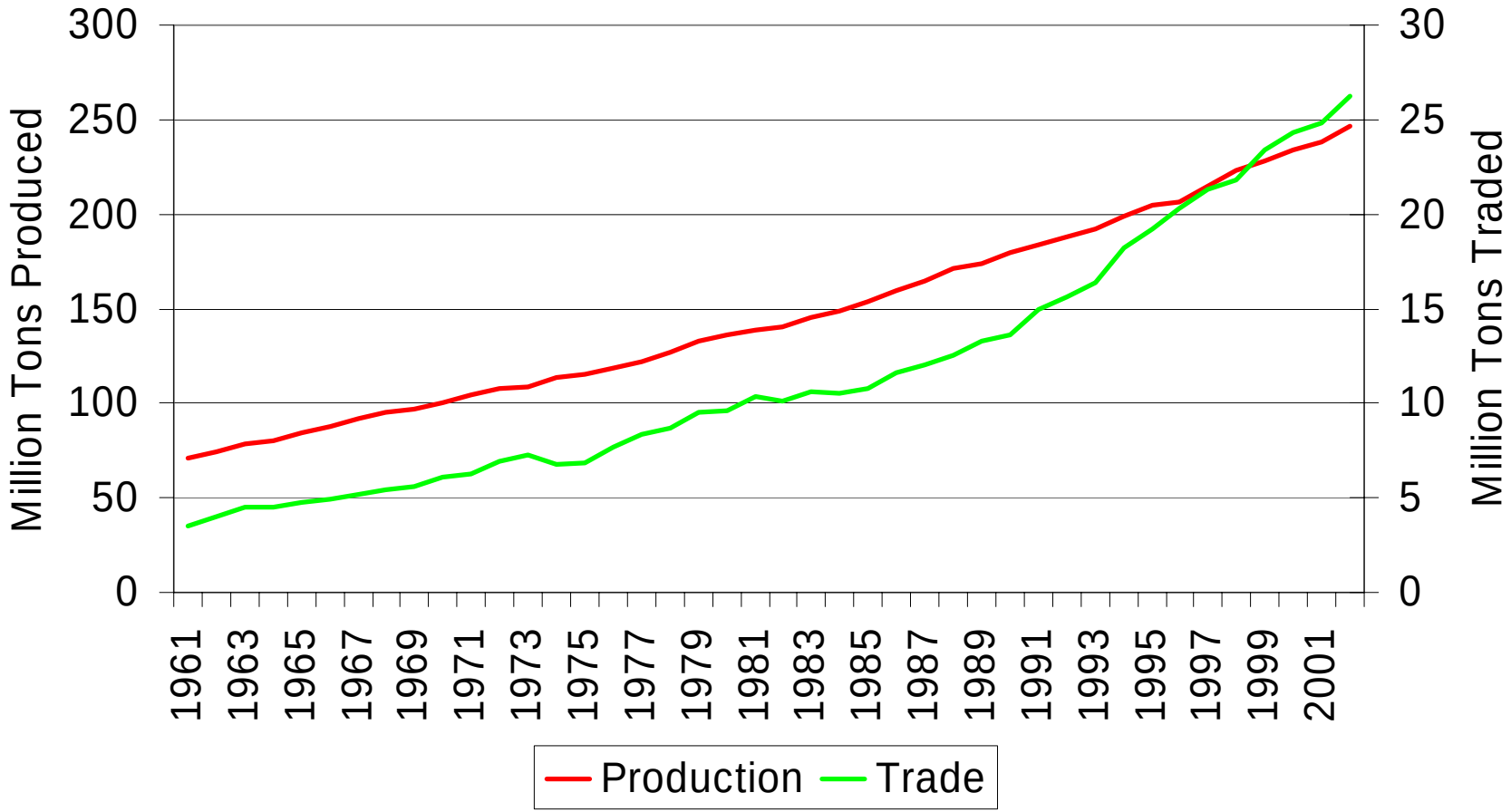
What are the potential issues?

- Cain and Abel become quite dependent on each other (we may have to re-write the Bible)
- Ultimately, Cain may give up meat production and produce only wheat, Abel may give up wheat
- The ability to consume more than they can produce depends on continuing trade
- The terms of trade (price) may become contentious
- We have not discussed the costs of trade (time and transportation)
- Life gets a lot more complicated

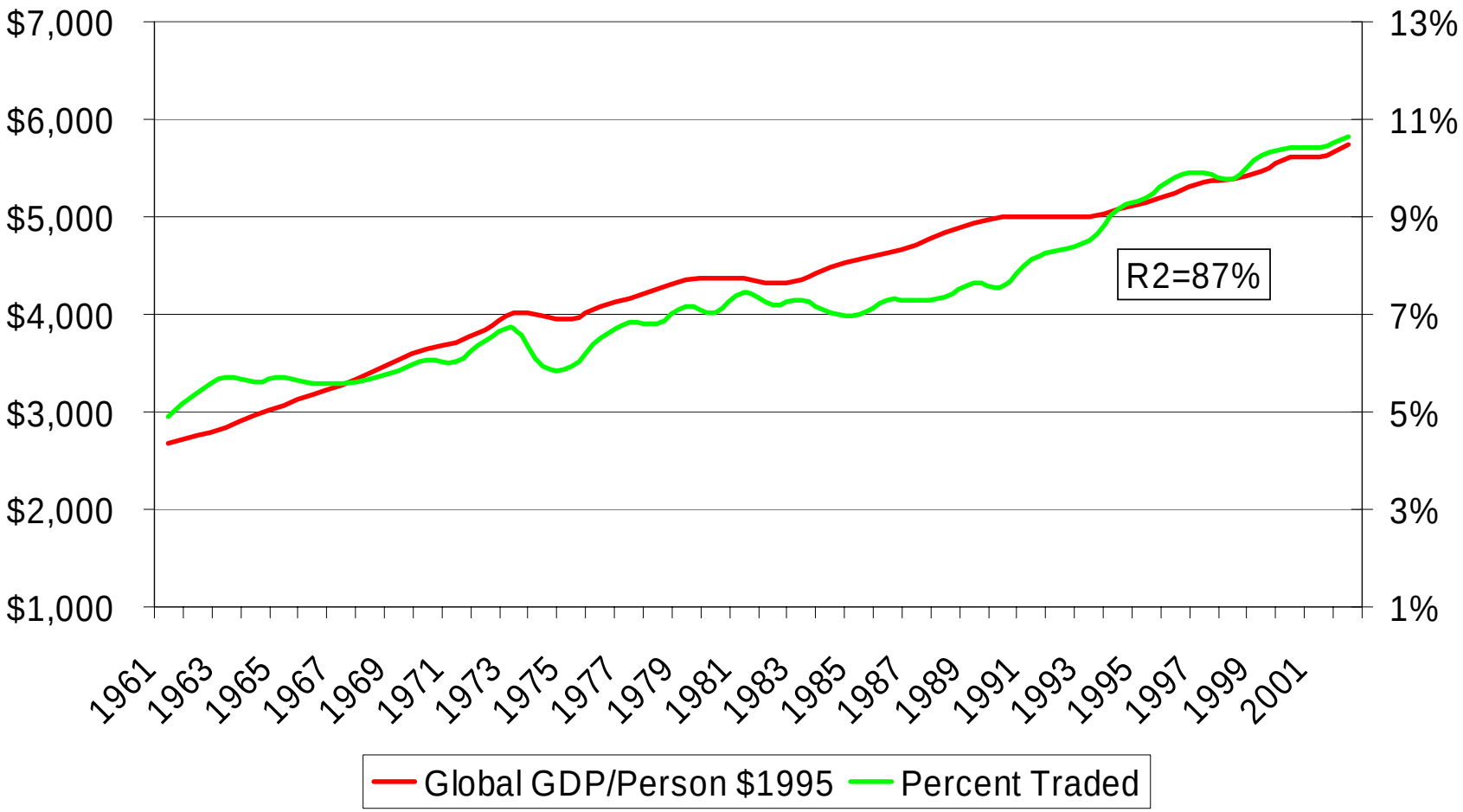
Global trade, % of GDP



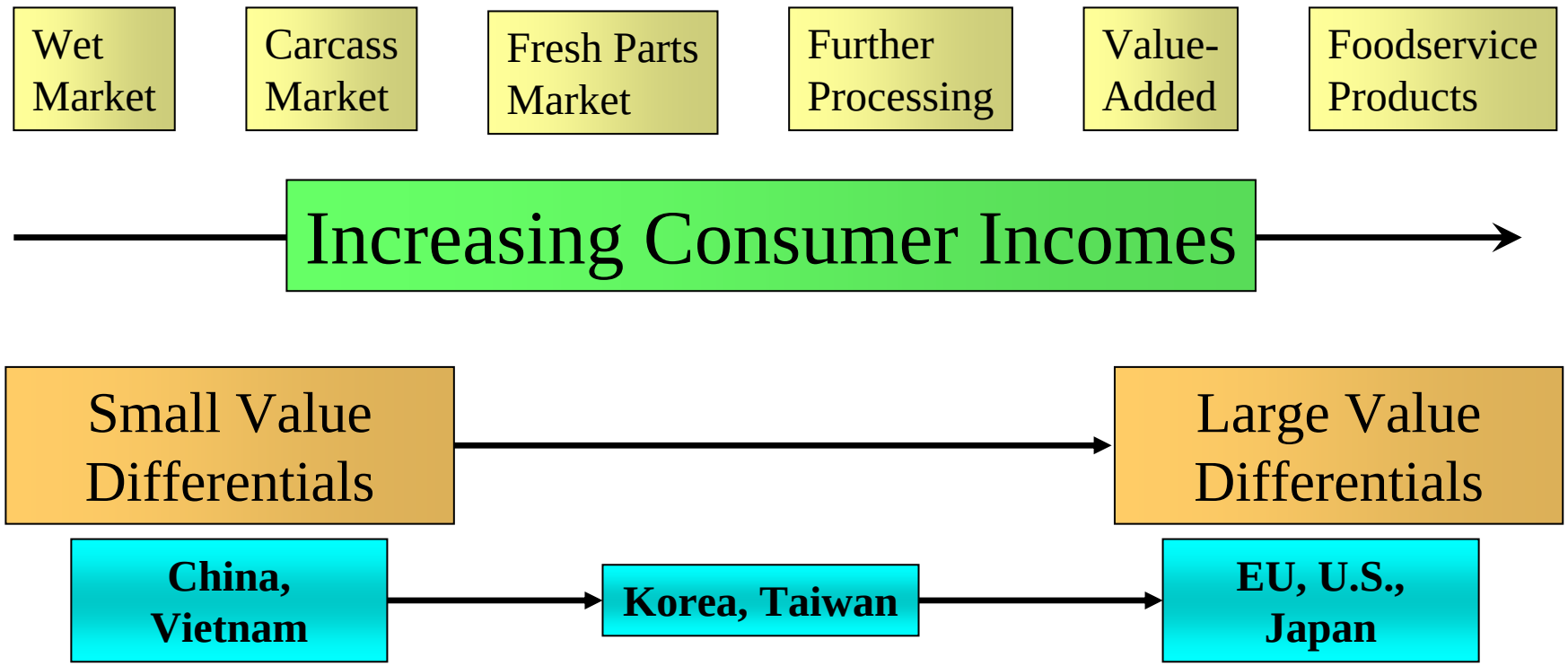
Global meat production & trade



% Production Traded and Global GDP/Person



Parts values differentials and consumer income levels



Why parts trade?

- Consumers in low income countries have preferences, but cannot express them
- As income grows, the preferences show up as increasing value for preferred parts
- What is valued depends on local preferences
- Profits from producing preferred parts drive total production up, decreasing value of non-preferred parts
- End result is very large value differentials that can be very different for different countries

Canadian pork exports, 2002

(FRESH/FROZEN), MT	U.S.	JAPAN	MEX.	KOREA	OTHER	TOTAL
CARCASSES	1305	-	2,871	-	10	4,186
HAMS	27519	45,697	10,973	1	29,824	114,040
BACKS, LOINS	23045	50,286	674	48	6,484	80,537
BELLIES	17488	24,606	3,630	763	1,252	47,739
SHOULDER, BUTTS, PICNIC	21158	46,410	6,282	3,168	7,847	84,865
SIDE & REGULAR	214	893	74	395	4,911	6,487
OTHER BONELESS	105913	13,662	13,187	1,669	52,087	186,518
OTHER BONE-IN	15150	4,824	1,359	20,014	7,148	48,518
OFFALS	11	3,985	4,001	6,124	50,366	64,487
(PROCESSED), MT						
HAMS CURED	2609	1	6	-	538	3,154
BACKS, LOINS	679	41	-	-	245	965
BELLIES, SIDE BACON	0	55	895	-	1,089	2,039
SHLDR/BUTTS/PIC/COT.ROL.	753	-	-	-	18	771
PICKLED IN BARRELS	0	-	-	-	4,495	4,495
CANNED	44489	7	28	5	292	44,821
OTHERS	961	2,030	251	2	814	4,058
TOTAL	261,294	192,497	44,231	32,189	167,420	697,680
% Carcass	0.5%	0.0%	6.5%	0.0%	0.0%	0.6%

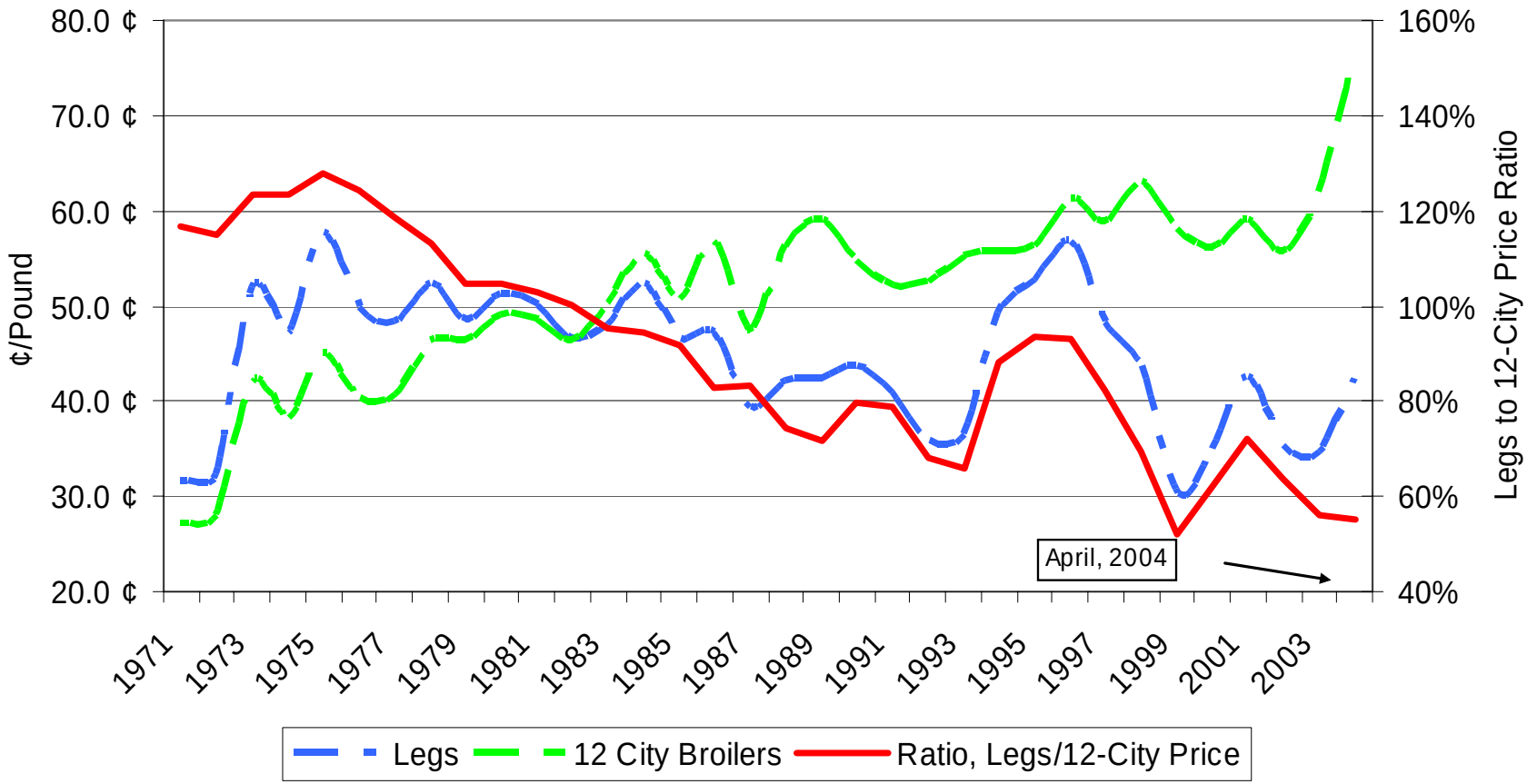
Dumping claims – the enemy of parts trade

- Dumping = selling below cost
- We know costs of producing carcasses
- Production costs of animal parts do not make economic sense
- This does not stop countries from claiming dumping of low value parts
  - U.S. chicken dark meat
  - U.S. variety meats

Income-driven value differentials – examples

- Broiler white meat – U.S. vs. Asia
- Turkey dark meat – U.S. vs. Mexico
- Beef – U.S. fed beef vs. Brazil grass-fed
- U.S. ribs vs. ribs in Denmark
- Hams in Italy vs. the rest of Europe

U.S. chicken leg prices relative to 12-City broilers



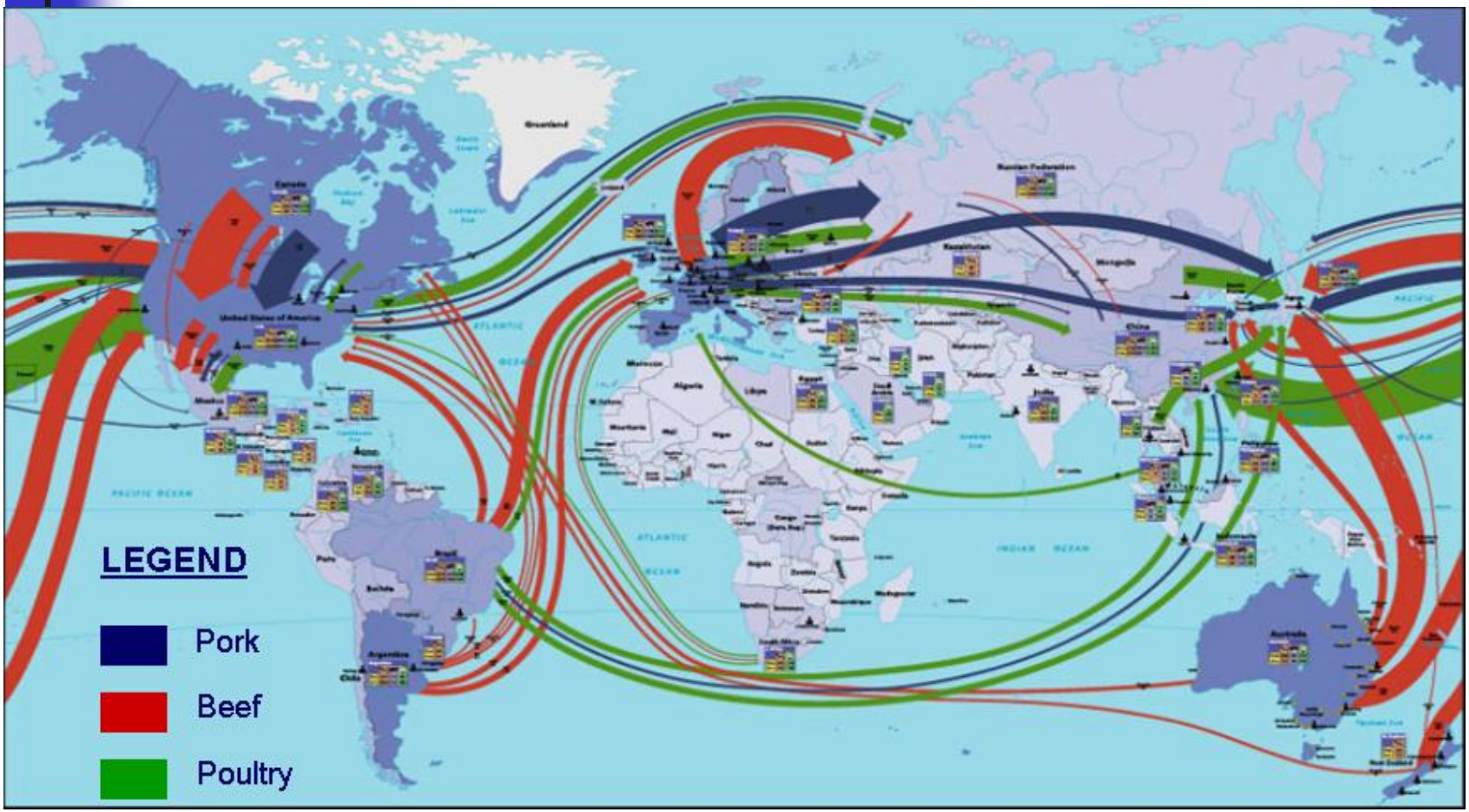
Some important parts trade flows

- U. S. lean beef imports
- High-quality pork loin, beef and chicken leg imports of Japan
- Low value meat parts imports of Russia and Mexico
- Bacon imports of the U.K.
- Ham imports of Italy
- Baby back rib imports of the U.S.

Why does the U.S. need to import beef - of all things?

- U.S. and export consumer tastes drive the demand for U.S. fed beef
- Virtually everything that we can feed now goes through feedlots
- That leaves only cow beef and 50% lean trimmings for grinding
- We have too much 50% trim for our lean cow beef production
- We could produce more lean beef from grass, but it is not our competitive strength
- Therefore we produce/consume/export fed beef and import lean product for ground beef production

Global meat trade is highly concentrated



Source: Rabobank

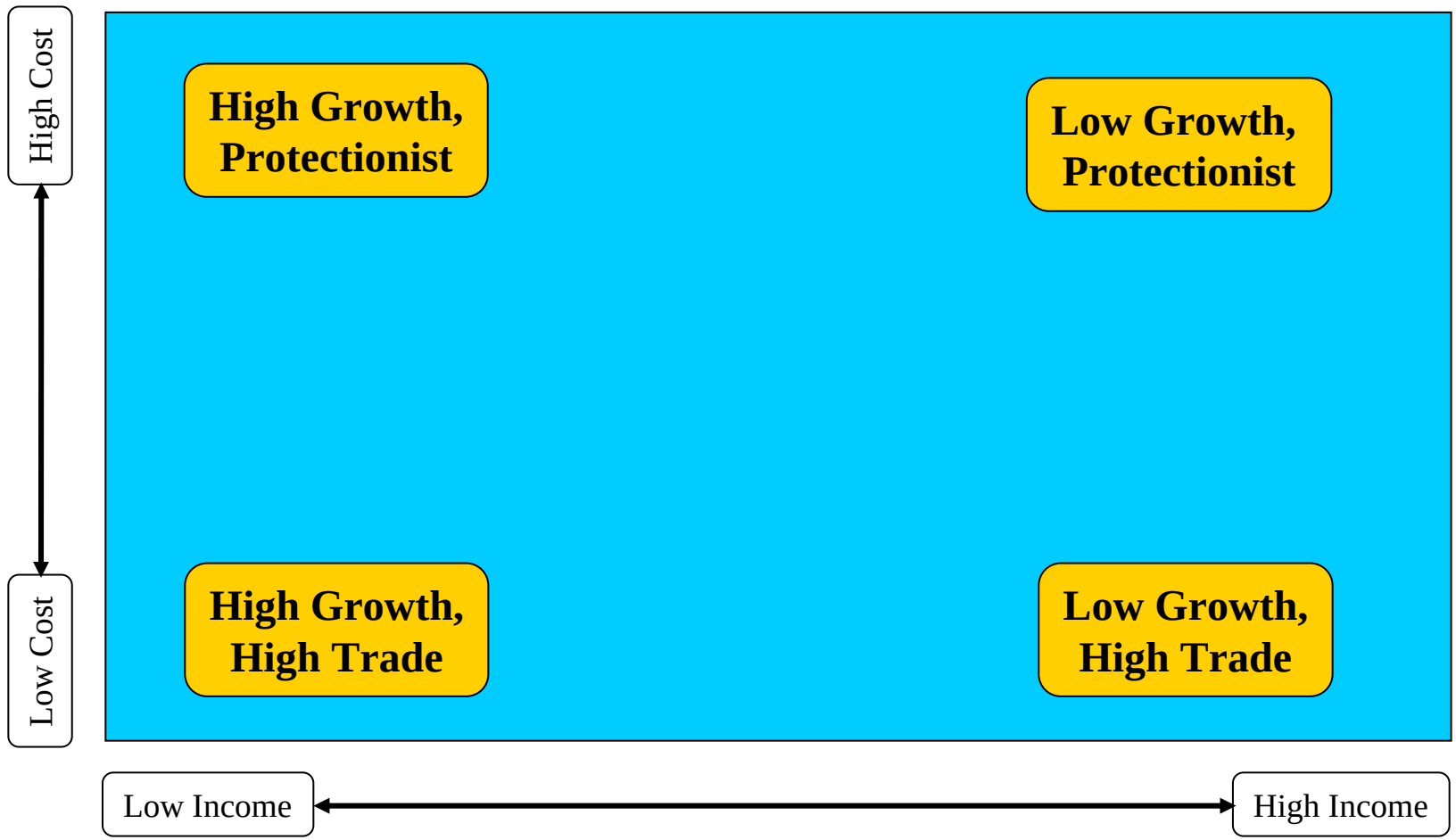
Further trade increases will mean reducing trade barriers

- Some major examples:
  - EU – pork TRQs are under 0.4% of production and meat exports are subsidized
  - U.S. beef import quotas
  - Japan – high tariffs and the pork “safeguard trigger”
  - Sanitary regulations based on questionable science
  - Needlessly complicated technical barriers, including processing plant standards
  - Barriers based on “anti-dumping” that are justified on low costs of specific parts, not overall production costs

Trade and consumption growth potential matrix

- Income and population growth will drive meat demand, production and trade growth
- Any country's production growth will also depend on what happens to trade
- Costs relative to other producers are a major factor in the position on trade vs. protection
- Matrix on the next slide is one way to look at growth potential versus trade position

Income/cost/trade/growth potential matrix



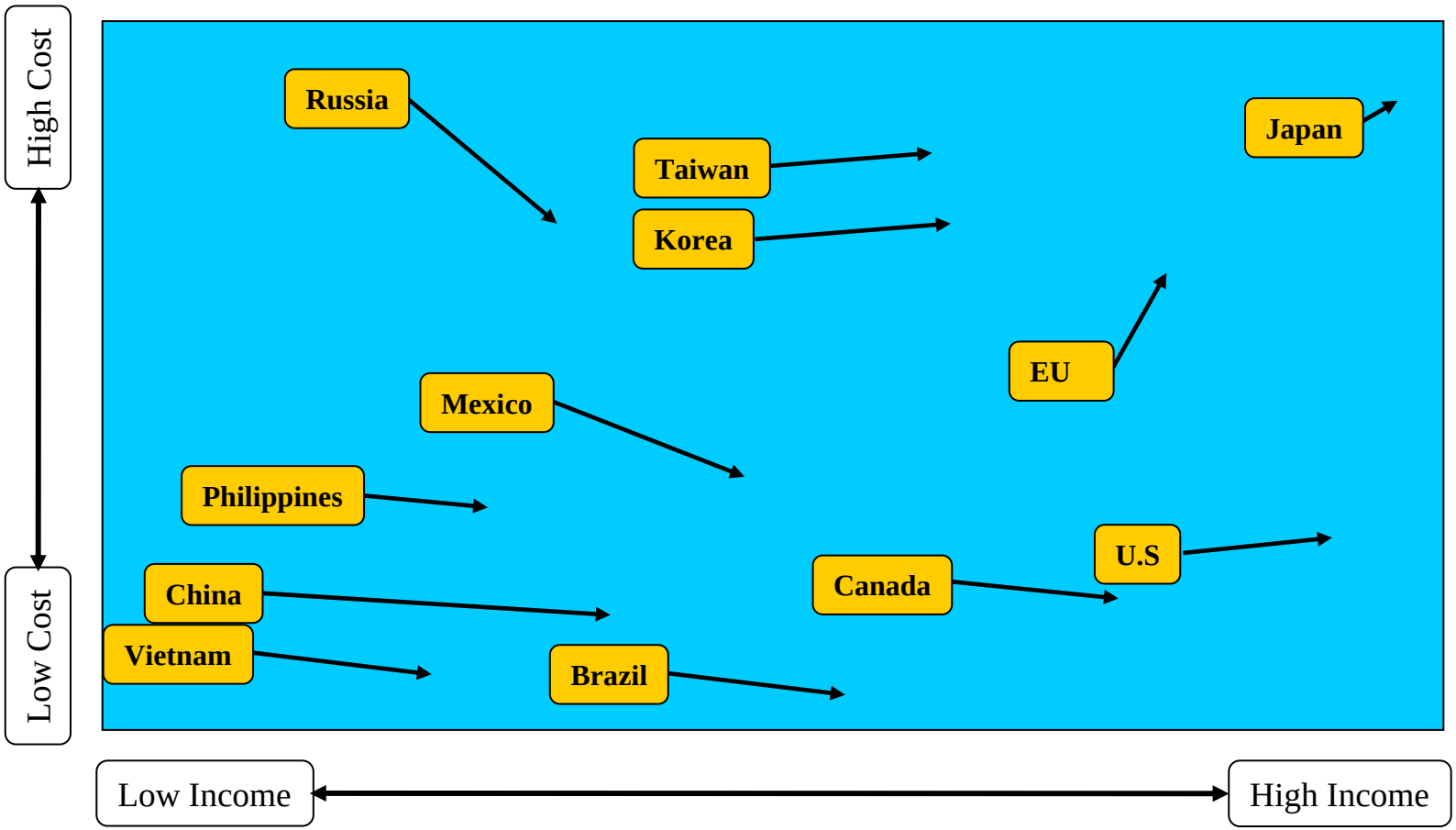
Relative country positions

- The following chart ranks relative positions of selected major producers
- The arrows show the relative trajectories over time
- Arrow lengths show the relative amounts of expected change
- Axes do not indicate absolute positions, only relative rankings

Russian and Swiss Capitalism

- A Russian Corporation
  You have two cows. You count them and learn you have five cows. You count them again and learn you have 42 cows. You count them again and learn you have 12 cows. You stop counting cows and open another bottle of vodka.
- A Swiss Corporation
  You have 5000 cows. None of which belong to you. You charge others for storing them.

Relative country positions on growth and production cost



Note – Income and cost axes indicate relative positions only

Position examples

- Brazil or China
  - Low cost
  - High consumption growth potential
  - Likely to pursue trade opportunities
- EU or Japan
  - Higher cost
  - Low consumption growth potential
  - Likely to protect domestic producers

Production standards

- Significant room for technical improvement in most countries
- Two new standards – traceability and COOL (country of origin labeling)
- Traceability standards increasing with international food safety concerns
- COOL is connected to traceability, but has protectionist overtones

Production methods

- Branding – retailer and producer – becoming more important everywhere
- Brand owners can, and will, use production system standards to differentiate products
  - Animal welfare
  - Animal health programs
  - Environmental standards
  - Processing standards
- Can add significant cost burden to producers

Production methods

- Commodity meat sales are declining in share in developed and developing countries
- Brand standards are driven from the top of the brand owner organization
- Standards will increasingly drive methods
- Producers need to become more involved in the standards-setting process
- Brands will become more important independent of vertical integration

Arkansas Capitalism

- An Arkansas Corporation
  You have two cows. That one on the left is kinda cute.

Conclusions – global overview

- Meat demand, production and trade will both grow significantly over the next 20 years; trade faster than demand or production
- Asia will lead the demand growth, the EU will lag far behind
- Trade in carcass parts becoming much more important, increasing faster than demand
- Trade tensions may increase with drive for fewer trade restrictions

Conclusions – global overview

- Technical production standards will improve in all major producing countries
- Production methods and standards in high income countries will be increasingly driven by brand owners – trade repercussions?
- Focus on end consumers will continue to increase
- Consolidation/vertical integration of production and processing will continue to be a major trend

Canadian Capitalism

- A Canadian Corporation
  - You have two cows.
  - You go to Ottawa and persuade the government to set a limit on how much each cow can produce.
  - You call this limit a “quota”.
  - You sell the cows to a U.S. farmer, the quota to a Canadian farmer, invest the proceeds, and retire on the income.