Outline

1. Motivation
2. Food and Poverty
3. Three Drivers of Food Markets
4. How We Got Here
5. What’s Energy Got to Do With It?
6. Quo Vadis?
1. Motivation

- Food markets are experiencing the greatest turmoil since WWII, while global food trade has increased over 400%.
- Staple food prices have risen more than 60 percent in the last year, yet major producers are closing the door to exports.
- Grains account for over half of all calories consumed by the poor in Asia and Africa.
- Riots have already broken out in a dozen countries.
2. The Poor are More Vulnerable to Food Prices

Percent of Income Spent on Food

2005 Per Capita (PPP) Income in Thousands

50% of World Population
80%
Food Prices May Stabilize, but at High Levels

Source: OECD
Many countries view the urban poor as more dangerous politically, and their responses (price and export controls) reflect this.
North-South Relations and the Cheap Food Consensus

• Higher income economies have long subsidized their own agricultural activities with the combined intent of supporting food security and powerful rural populations.
• In the South, many economic development policies have been built on bedrock of food security and low urban wages, especially for politically sensitive urban poor populations.
• The result has been a de facto global consensus, supporting two generations of monotone decline in food prices.
3. Three Drivers of Commodity Markets

1. Emergent Real Demand
2. Financial Demand
3. Supply Response
Real Demand: BRICs and G6 GDP (USD Billion)

- 2025: BRICs economies over half as large as the G6
- By 2040: BRICS overtake the G6

GS BRICs Model Projections. See text for details and assumptions.

11 July 2008
One Large BRIC in the Wall

- China has 20 percent of the world’s population, but only 7 percent of its arable land
- Because of rising incomes, food consumption is accelerating in resource intensity
- The inevitable result is increased global food absorption
Arable Land is Scarce...
and shrinking.
Half a billion people are moving from the food supply side to the demand side.

Source: CASS.
While income and inequality are both rising,
Diets are Changing

- **Resource intensity**
- kcal/person/day
- Percent of caloric intake
How Big?
Asia Pork and Poultry Production

Million metric tons

Source: USDA.

11 July 2008
All Asia Pork and Poultry

Million metric tons

Source: USDA.
China’s Soy Tsunami

China net trade in soybeans, oil and meal, 1980-2003

Note: net trade = exports - imports.
Source: USDA, Production, Supply, and Distribution data.
4. Supply: How we got here
Total World Grain and Oilseeds

Index: 1975 = 100

Source: USDA.
Margin Changes from Commodity Price Increases in Russia (2007/2008)

Source: IKAR

11 July 2008
Prices from the US Perspective

![Graph showing the price index for Wheat, Corn, and Rice from 2004/5 to 2008. The index is set at 100 in 2004. The graph shows a significant increase in the index for all three crops, particularly in 2007 and 2008.](image)

11 July 2008
Prices from a Global Perspective

Source: FAO
Cereal Demand and Inventories
Speculative Pressure: Cereal Stock Ratios and Prices

Correlation coefficients:
- Price with global stock-to-use ratio: $r = -0.65$
- Price with global stock-to-use ratio excluding China: $r = -0.49$
- Price with exporters’ stock-to-disappearance ratio: $r = -0.47$

Source: FAO CCBS database
Speculators are Not the Only Ones to Blame

Philippines fourth tender > $1,100/ton (April 17, 2008)

Philippines buying > $700/ton

Vietnam tightens export restrictions

India imposes export restrictions

Sources: USDA, FAO

Energy has two critical links to food:
1. It is primary input to food production and distribution
2. With the advent of biofuel, two essential commodities have become substitutes in production.

Food is essential for survival, yet energy is essential for prosperity.
Energy Price Vulnerability in California Agriculture

Figure 1. Direct and Global Cost-Price Pass Through: Oil & Gas

- Agriculture Slope = 2.5
- Food Processing Slope = 14.5
Biofuel Displacement: Calorie availability changes in 2020 compared to baseline (%)

Source: IFPRI IMPACT projections.

Notes: N America = North America; SSA = Sub-Saharan Africa; S Asia = South Asia; MENA = Middle East & North Africa; LAC = Latin America and the Caribbean; ECA = Europe & Central Asia; EAP = East Asia and Pacific.
Higher food prices can make consumers hungry, but higher prices of any necessity make them poorer.
Essential Food

Food income shares for 114 countries.
Essential Energy

- 50% of World Population
- 80%

2005 Per Capita (PPP) Income in Thousands

- 18 May 2008
The Primary Driver: Affluence

Per Capita Steel and Oil

Index China=100

China  Korea  France  Japan  United States

Steel Supply  Oil Demand

Industrial  Post-Industrial
China Again…

Per Capita Residential Electricity Use, Rural and Urban China, 1992-2005

China’s Electricity Plans

- 1.8TW by 2020
- Between now and 2020, more new capacity will be added than the entire installed capacity of the EU
- 87% coal-fired
- 50 year useful life
Demographics and Vehicle Demand

The US and Japan have over 750 cars per capita.

The figure for China is 18.
Another Chinese Tsunami...

China Net Oil Trade

Source: IEA.
What is to be done?

The world must produce more food, but how?
Challenges:

• Government Intervention
  – Export restrictions
  – Biofuel

• Global warming
  – Water and soil capacity may decline in equatorial areas where most of the poor live
  – Lowland agriculture may be inundated, salinated
  – Environmental damage may result from expanded acreage and agrochemical use
Preferred Policy Responses
(Source: FAO Survey of 77 National Governments)
Policy Preferences by Region

The graph illustrates the policy preferences of different regions for various measures in response to food grain crises. The x-axis represents different regions: Africa, East Asia, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, and South Asia. The y-axis shows the percentage of countries carrying out policy actions.

- **Reduce taxes on foodgrains**: Represented by a black bar.
- **Increase supply using food grain stocks**: Represented by a blue bar.
- **Export restrictions**: Represented by a green bar.
- **Price controls / consumer subsidies**: Represented by an orange bar.
- **None**: Represented by a grey bar.

The graph indicates varying degrees of preference for these policies across different regions.
Quo vadis?

Innovation, biological if necessary:

• Conflict over technology or resources?
• Northern taste versus South necessity?
• A multinational food auction would leave many people hungry and angry.

Governments of the South know this, so expect them to take the lead in agbiotech.
Thank You