From Farm to Table…
Why Does a Gallon of Milk Cost $4?

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Topics

- What drives food prices?
  - Farm costs, processing and retail costs, processor & retailer market power, policies & regulations
  - In the particular (milk) & in the aggregate
- To set that up,
  - Food in total household consumption
  - Farm costs in total food costs
- I'll also detour onto farm policy (subsidies)

Outline for Today

1. Income, food consumption, and prices

2. Government policies, especially farm support

3. Differentiating farm products

4. Food prices and monopoly power

5. Farm and food prices in the future

I. Income, Consumption, and Prices

- How do farm prices affect food prices?
- What other factors affect food prices?
- How do food prices and household income affect food consumption?

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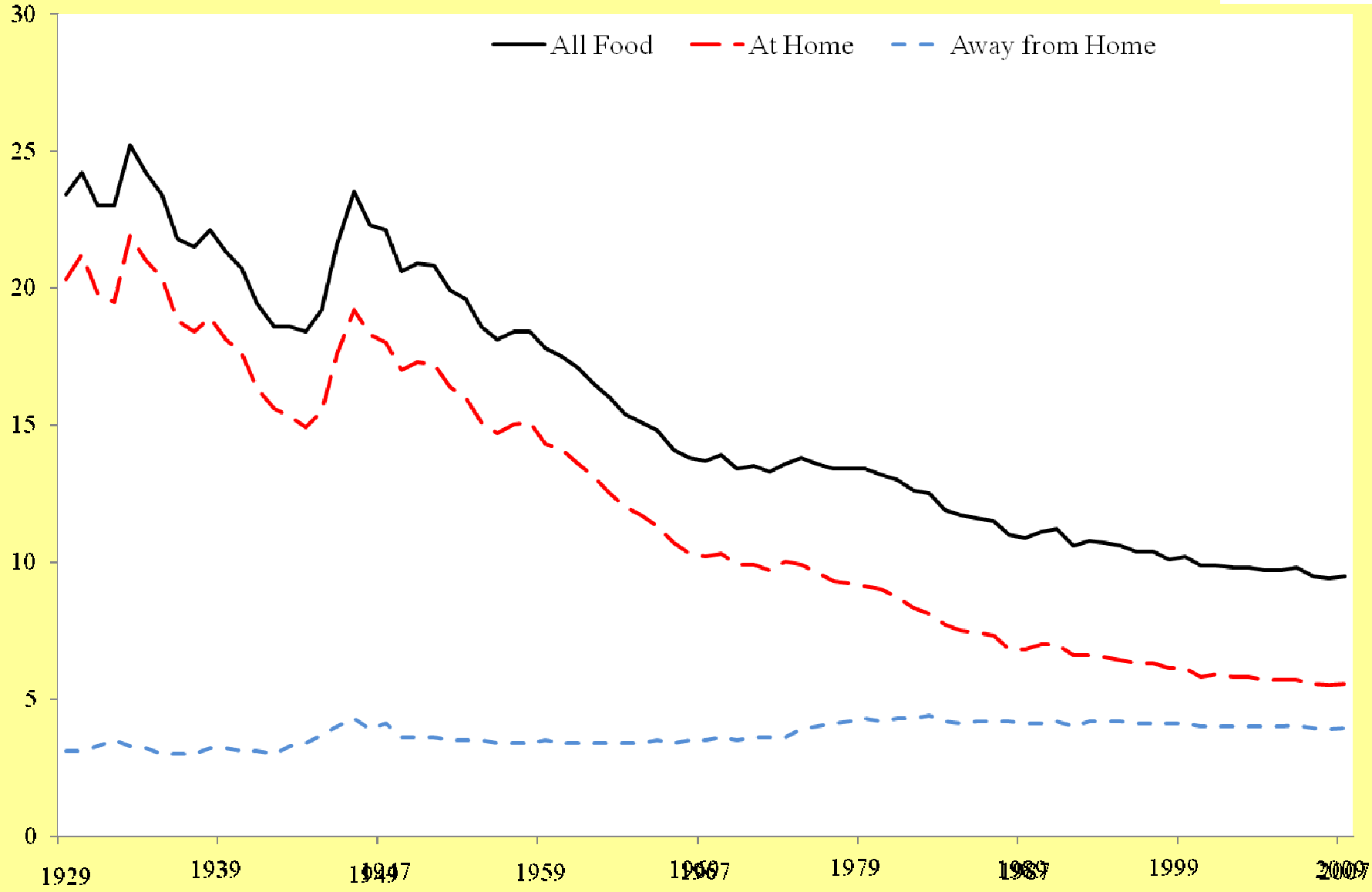
Share of Disposable Income Spent on Food, 1929-2009



What's Happened?

- In 1945, we spent 23.5% of our income on food; now we spend 9.5%

- Two elements to consider
  1. Food prices & food expenditures
  2. Household income & food consumption

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1. Food Prices

- Food share fell because prices fell (relative to other things in the economy)
  - Michael Pollan (and that's a bad thing)
  - Industry lobbyists (and that's a good thing)

- Aside on price elasticities…

Food Prices

- But did real food prices actually fall?
- We know that farm prices fell, relative to other prices in the economy
- But, processing and retailing costs didn't

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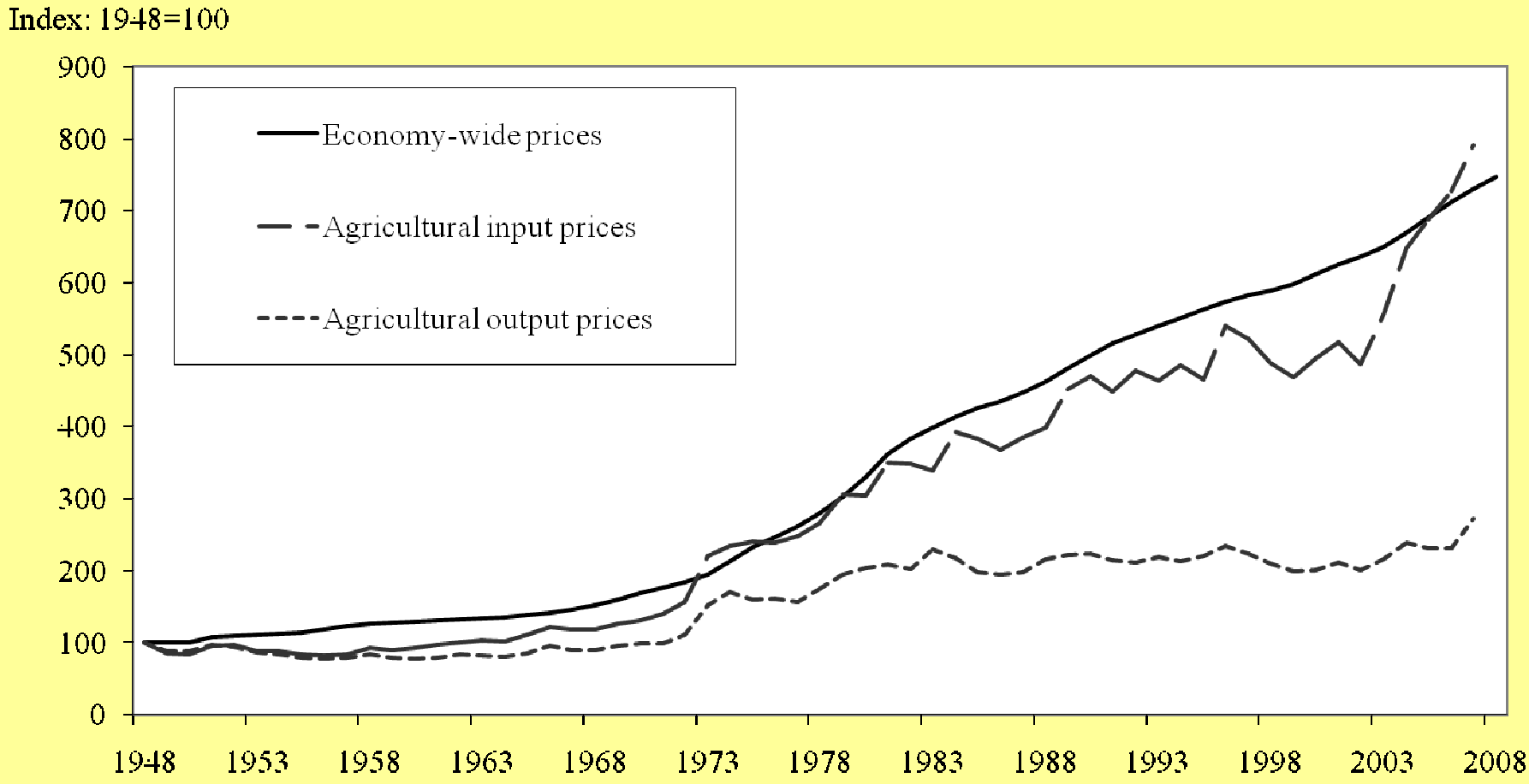
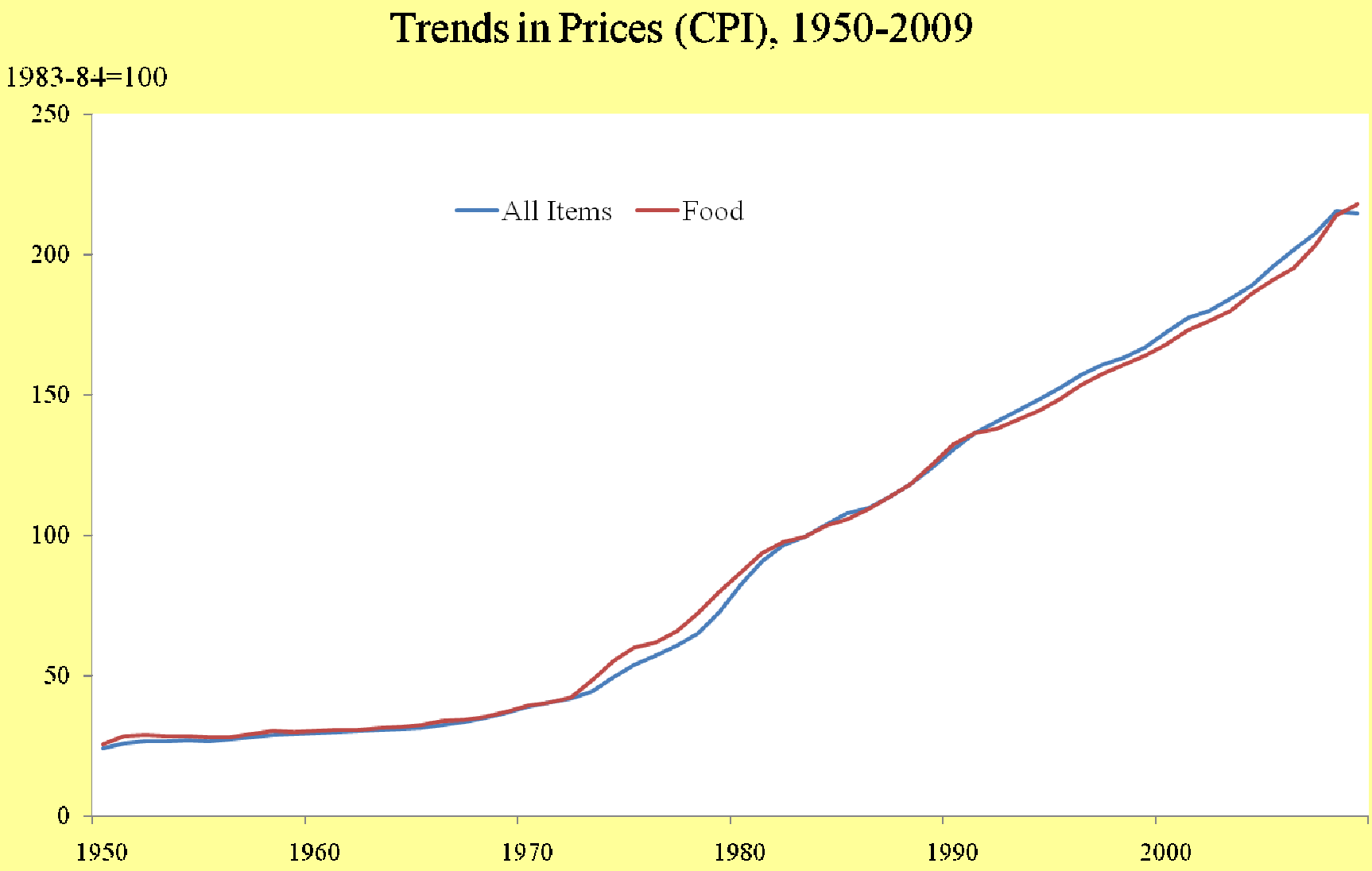
Real Farm Prices Have Fallen Over Time…

Price trends for agricultural inputs and outputs

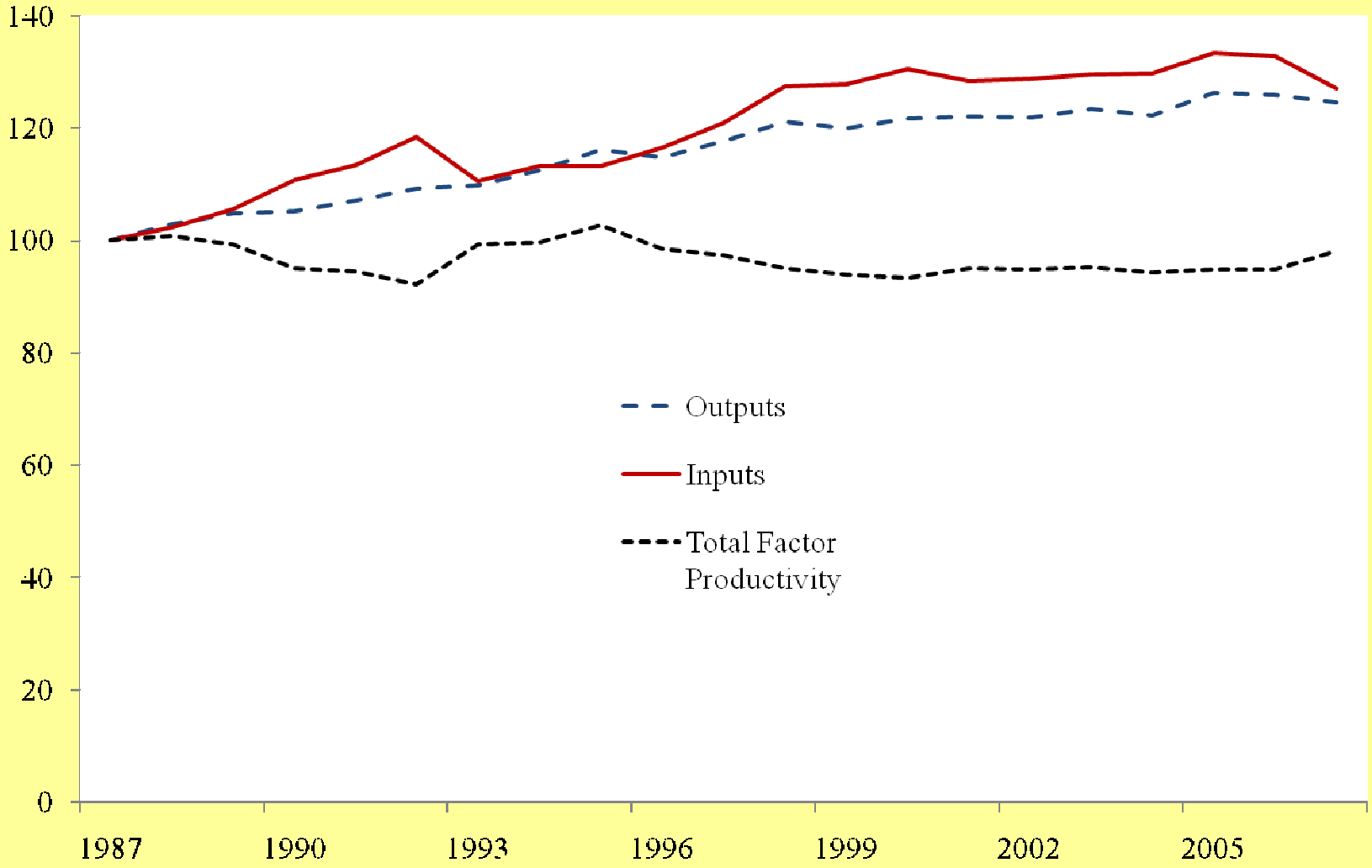


Source: National Agricultural Statistics Service for agricultural price indexes; *Economic Report of the President* for economy-wide price index (GDP implicit price

But Retail Food Prices Match Overall Inflation



Food Processing:
Output, Inputs, and Productivity Growth



Source: US Bureau of Labor Statistics

So What's That Mean?

- Notice, output growth matches input growth
  - No growth in productivity
  - So processing costs will rise with input prices
- Food processing innovations tend to be product innovations that raise costs
  - That is, new products, versions, & packaging
- Relatively few process innovations to lower costs

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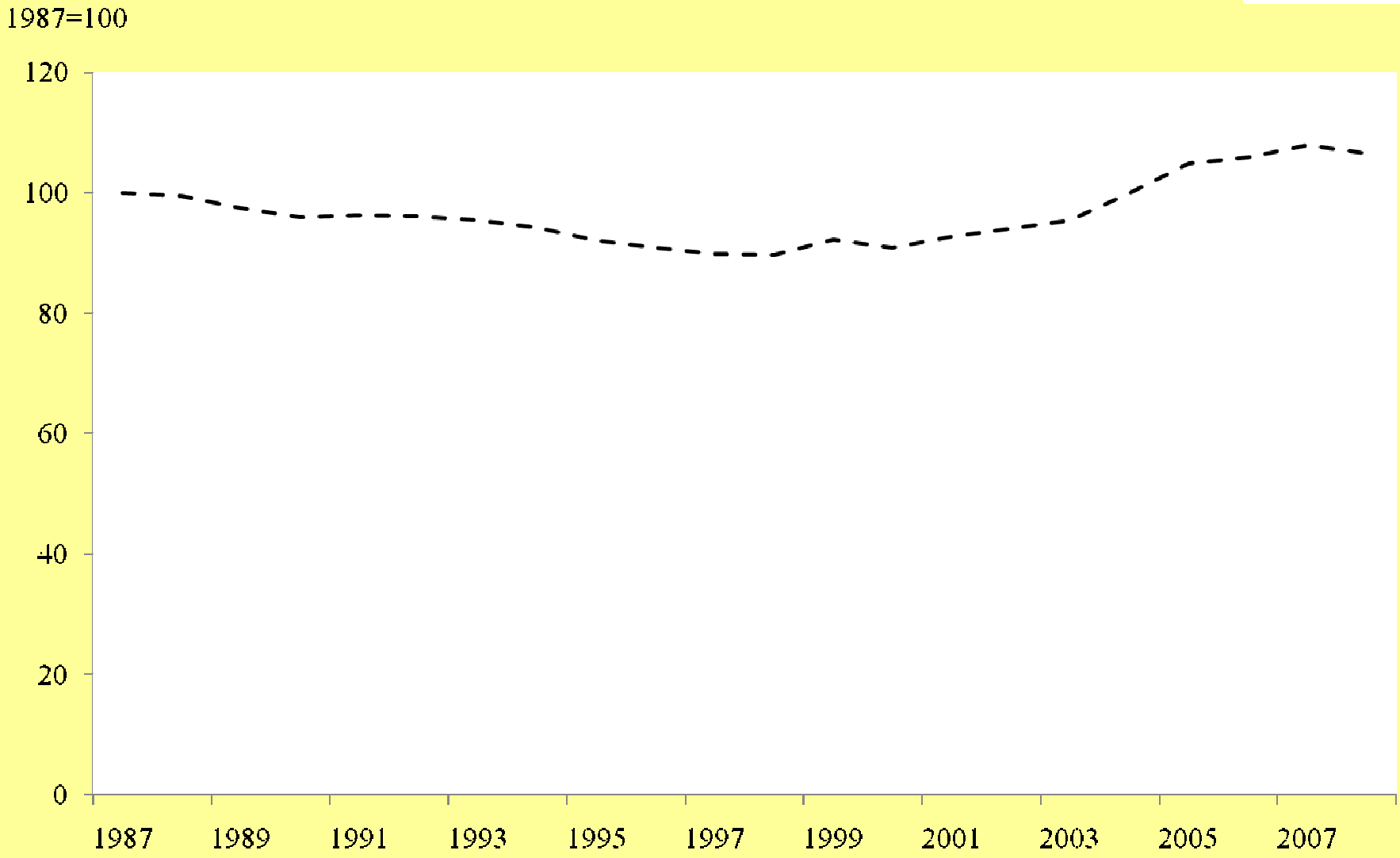
Output per Labor-Hour, Supermarkets



Source: US Bureau of Labor Statistics

Supermarkets and Productivity

- Supermarket innovations tend to raise costs
  - Longer hours
  - Prepared foods
  - Meat, fish, deli, bakery counters
- Some productivity gains from size and density
  - But not much
- So supermarket costs will rise with input prices

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So While Productivity Growth in Agriculture is Rapid…

- And offsets input price increases…
- Productivity growth in processing and retailing is slow (lower than the rest of the economy)…
- So retail food prices match overall inflation
  - & prices didn't cause the food share to decline

2. Incomes and Food Consumption

- Incomes have grown over time…
  - Per capita disposable income, 2005$
    - $15,661 in 1960, $42,242 in 2009
- But food expenditures lag income growth
  - Engel's Law (Ernst, not Friedrich)
  - ERS estimates that food expenditures increase 2% for each 10% increase in income
- So the share of income devoted to food fell largely because incomes grew

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Another Implication

- Farm prices have a weakening connection to U.S. food prices
  - Because the farm share of food costs is falling

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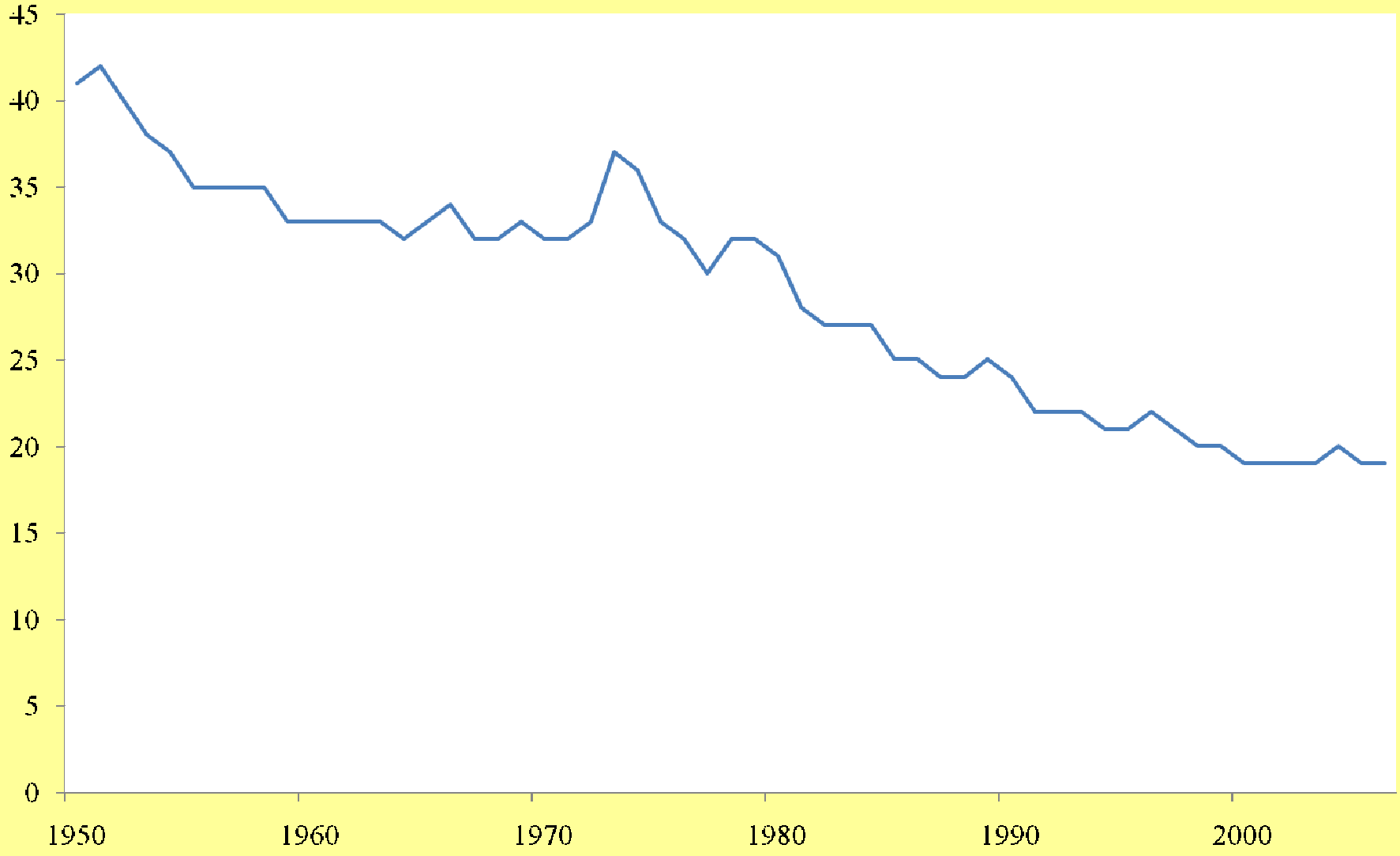
Farm Share of All Retail Food Expenditures, 1950-2006



The Farm Share is Higher for Less Processed Foods

- Fluid milk, versus cheese
- Fresh beef, versus frozen burritos
- Fresh lettuce, versus bagged mixed greens

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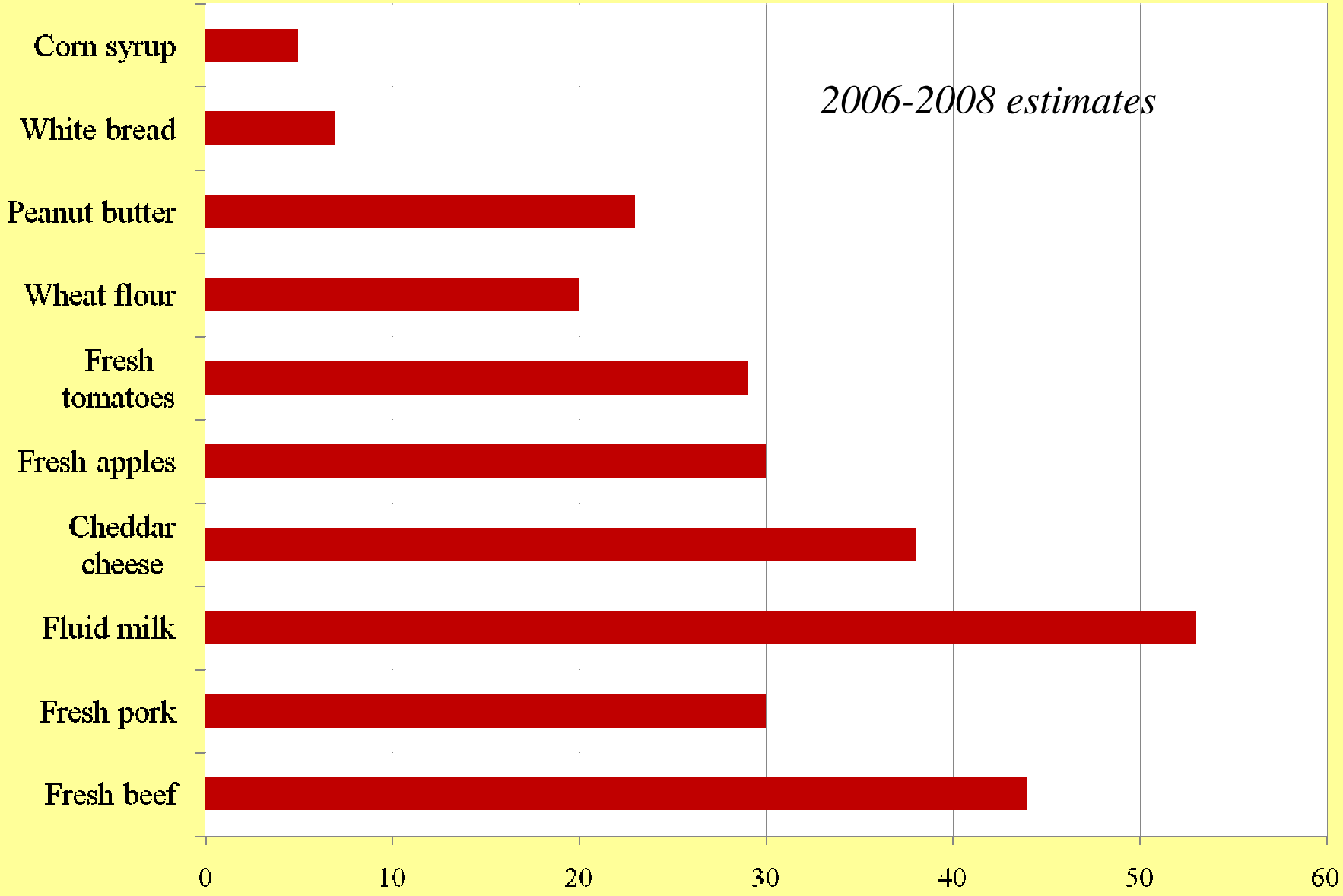
Share of Farm Commodity Cost in Retail Price



More Implications

- The share of food in household budgets varies inversely with income
  - And the farm share of food does as well

- So low-income households, here and abroad, are far more sensitive to food and farm price movements

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Return to the Question in Our Title…

- Why does a gallon of milk cost $4?
- Fluid milk is relatively unprocessed
  - So at $4, farm cost is about half of retail cost
  - Other half is transportation, processing, packaging, and retail display
  - Often in bulk, but with cooling and strict sanitation

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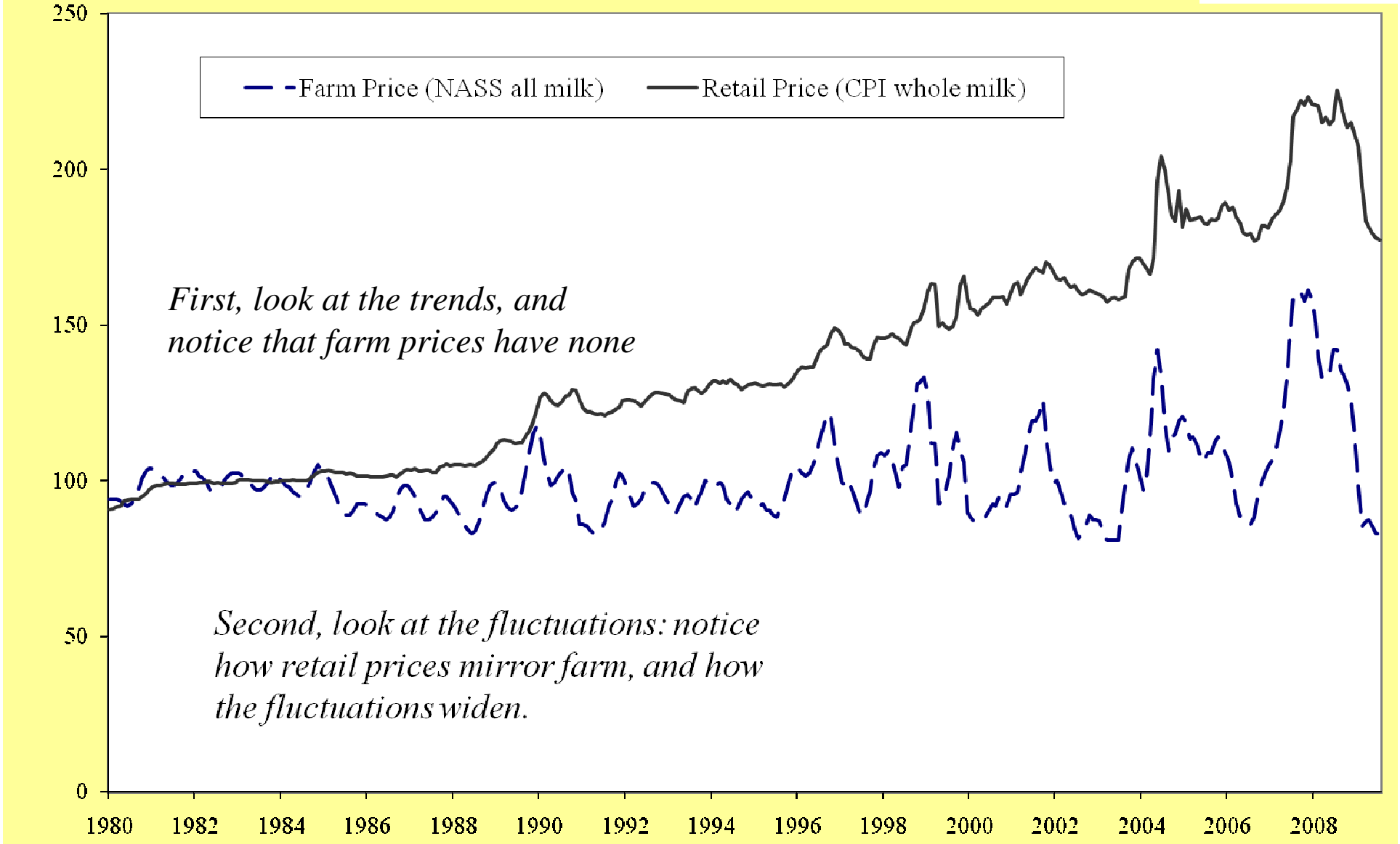
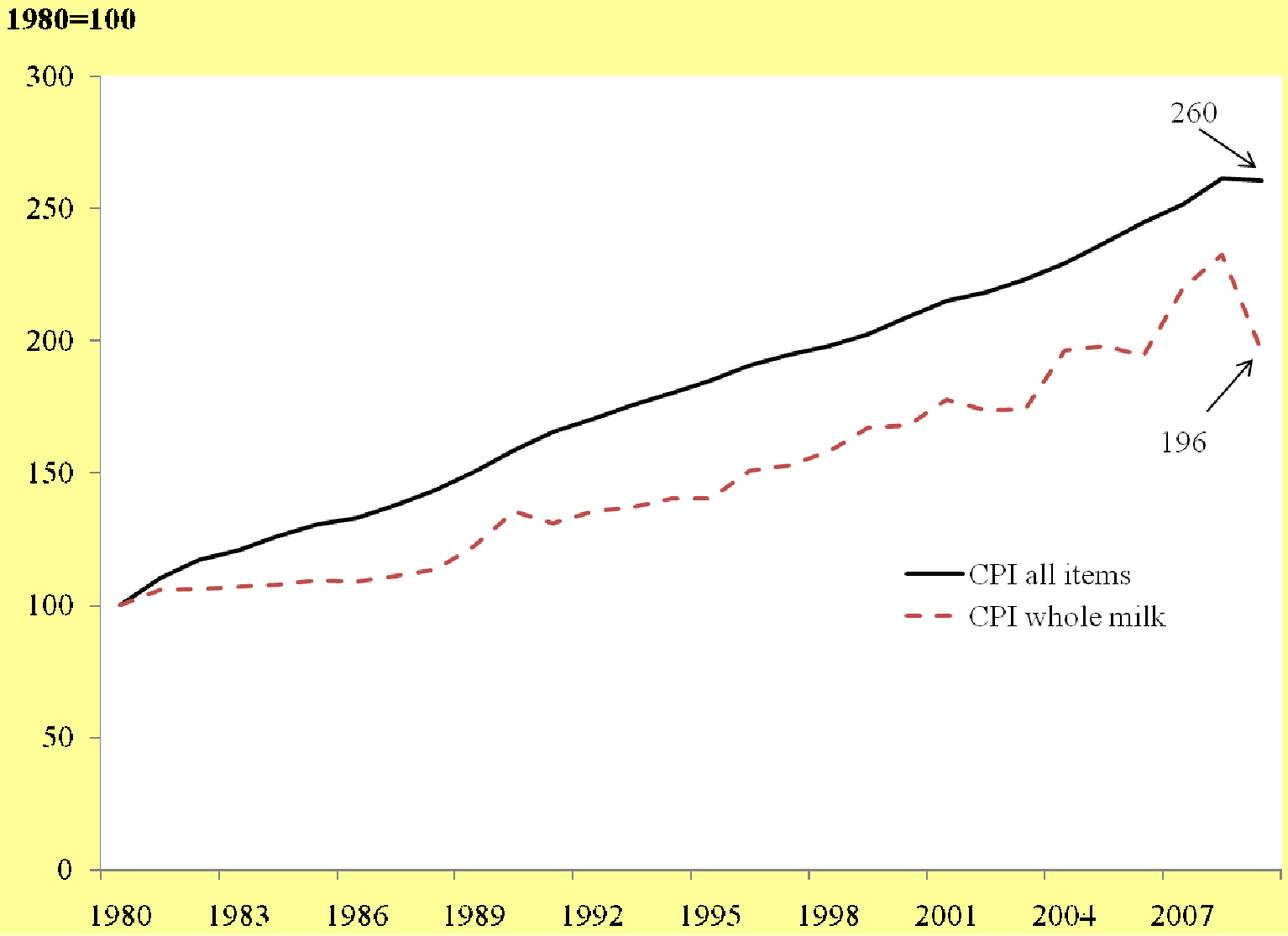
More Broadly: Monthly Milk Prices, Farm and Retail, 1980-2009



But Retail Milk Prices Still Rise Less Than All Prices…



So What Drives Food Prices?

- Farm costs
  - But that's a weakening influence…
- Processing and retail costs
  - Extent of processing, services provided
  - Limited productivity advances
- Retailer and processor market power
  - Raising a wedge between costs & prices
- Regulatory and policy decisions
  - Notice farm milk in 1980's

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II. Agricultural Policy

- Commodity and Conservation Programs
  - How do they affect farming, and food prices?
- Indirect channels of farm support
  - Same question as above?

US Government Farm Support

Direct Payments

- Commodity Programs
- Conservation Programs

Other Support

- Loan Programs
- Crop Insurance
  - Subsidized premiums
- Biofuel Mandates
- Commodity Purchases
  - For food assistance
- Research and Extension
- Marketing

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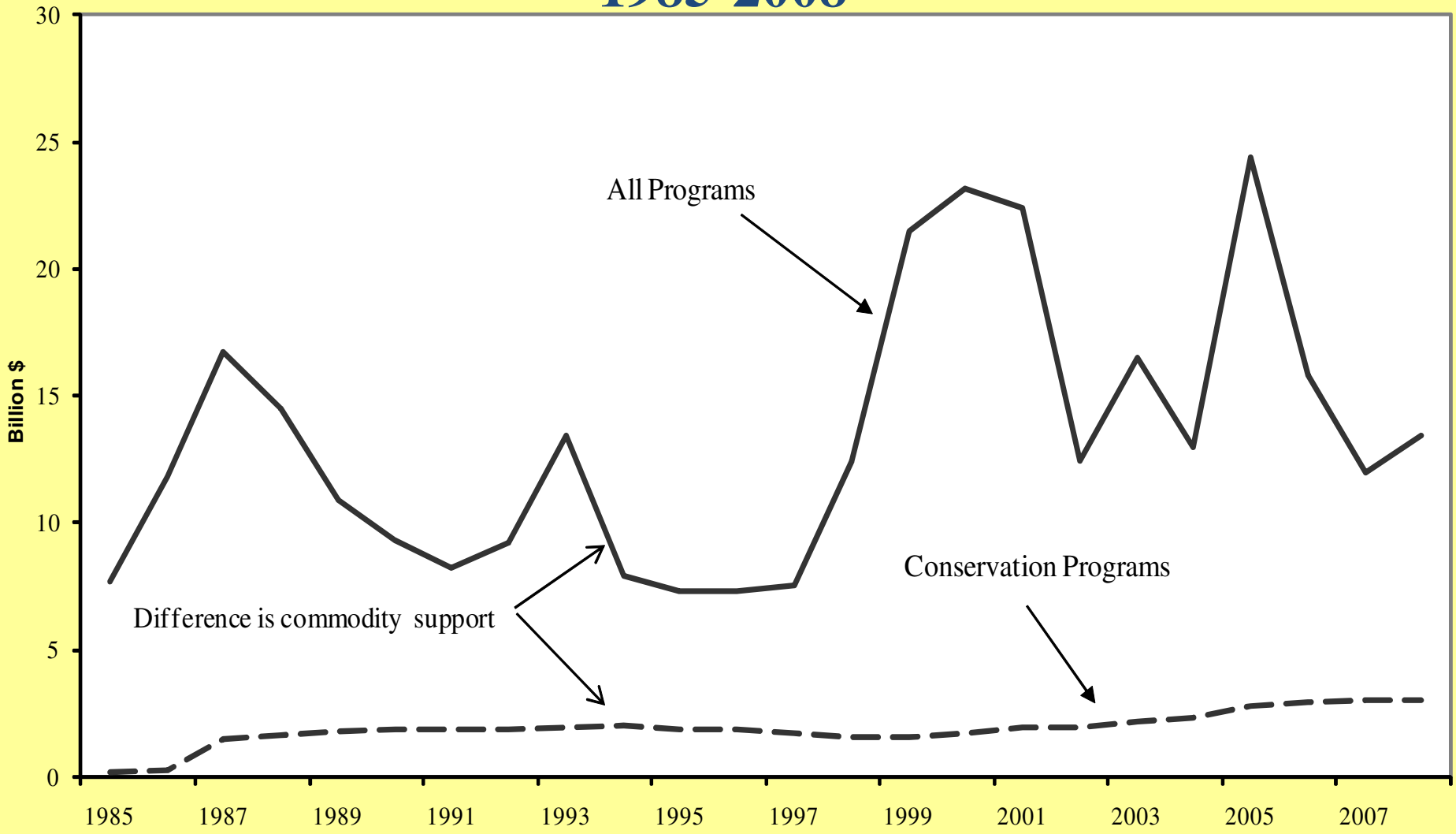
Trends in Direct Government Payments, 1985-2008



Major Conservation Programs
(USDA's total conservation budget is $5.7 B)

- Conservation Reserve Program (CRP, $3 B)
  - Retires erodible land—USDA leases for 10 years
  - About 7.5% of cropland is in CRP
- Environmental Quality Incentives Program (EQIP, $1.2B)
  - Shares cost of conservation practices

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Commodity Programs ($9.4 B in 2010)

- They apply to field crops
  - Corn, soybeans, wheat, barley, oats, cotton, rice, peanuts, etc
- Fixed annual payments ($5.1 B in 2010)
  - Based on base acreage and historic yields
- Countercyclical payments ($1.3 B in 2010)
  - Based on prices & above
- Marketing loans ($2.5B in 2010)
  - Effectively provide minimum price for production

Commodity Program Effects

- Payments transfer income
  - Most goes to large farmers and landowners
  - Little goes to really wealthy people or corporations
  - But very little goes to poor people

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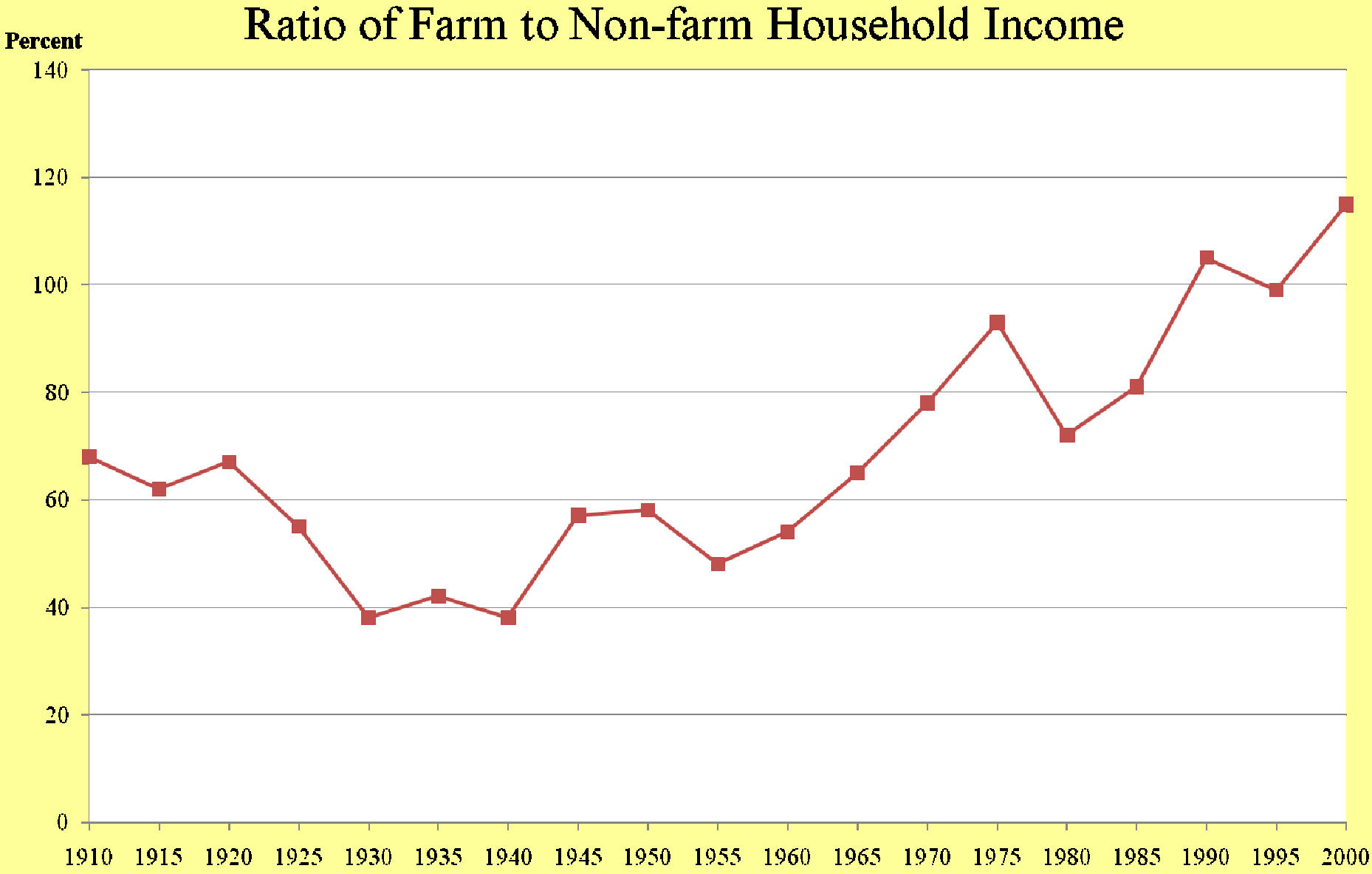
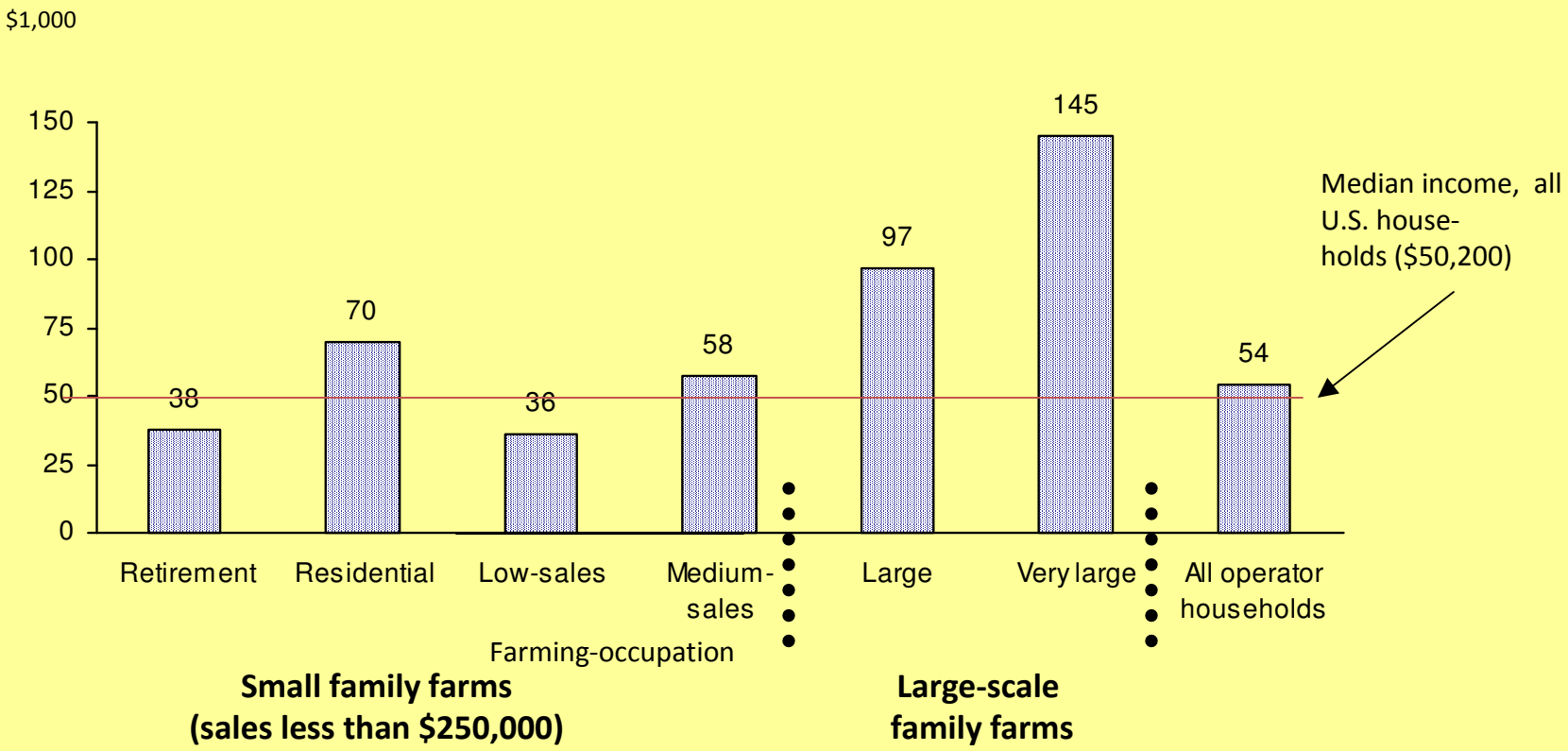
Farmers Used to Be Poor, but No Longer



Median income of farm households, 2007



Note: Median income falls at the midpoint of the distribution of households ranked by income. Half of the households have income above the median, while the other half have income below that level.

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An Example: US Corn Production

(Payments will be proportional to production)

Corn acres harvested in 2008	Share of farms with corn (%)	Share of harvested corn acres (%)	Median household income ($)	Family farm share of production (%)
1-50	36.7	3.5	41,998	97.7
51-199	32.3	15.6	70,301	96.8
200-499	18.8	26.5	106,161	97.6
500-999	8.6	26.0	141,940	96.1
>999	3.7	28.4	227,674	91.0
All farms	100.0	100.0	62,521	95.1

Source: 2008 Agricultural Resource Management Survey

Do Commodity Payments Reduce Commodity and Food Prices?

- Small positive impacts on commodity production
  - Generally, 0-5%, depending on commodity & year
- And small negative impacts on commodity prices
  - 0-15%, depending on the commodity and year
- Very small effects on US consumption
  - Minor retail price impacts (0-2%)
  - (Small farm price impact times small share of retail)
  - Implies limited impact on consumption

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More on Commodity Program Effects

- Mixed effects on environment
  - ↑ production implies ↑ chemical use
  - But compliance rules induce better practices
- Payments reduce farmer price and revenue risks
  - That may induce greater investment
  - Are there better ways to manage risks?
- Payments raise land values and cropland rents
  - So benefits flow through to landowners
  - More than half of cropland is rented

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Emerging Farm Support Issues

- Debate beginning over next farm bill
- Federal budget deficits hang over discussion
- Likely to see proposals for support via prices
  - Sugar and import quotas
  - Bio-fuels standards and corn prices
  - Dairy and supply management

III. Differentiating Farm Products

By how it was raised

Organic

Natural

Cage-free

Sustainable

Free-range

Shade-grown

Raised without antibiotics

GMO-free

By how it is sold

Farmer's Market

Fairtrade

By features of the product

Grade A

Choice

Fancy

No. 2 yellow

Certified Angus

Berkshire

By where it was grown

Vidalia onions

Local

Vermont Maple Syrup

What Does Differentiation Do?

- Provide buyers with useful product information
  - No. 2 yellow corn, Grade B maple syrup
- Allow producers to be compensated for higher costs that provide consumer value
  - Organic, raised without antibiotics, USDA prime
- Allow producers to raise prices over costs
  - Vidalia?
  - But, you need to control entry

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USDA Provides Some Certifications…

- Generally, financed by user fees on industry
- "USDA Organic"
  - Limits on chemical substances
  - Standards for manure application, pasture, feeds
- But also quality grades and standards for beef, dairy, poultry, fruits and vegetables, cotton
- Certification of processes for exports, seeds, beef, pork

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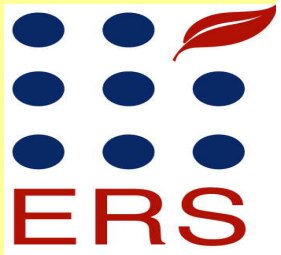
Others are Third-Party…

- That is, a group provides auditing and certification
  - Rainforest alliance, Good Housekeeping

…While others are Seller Claims Only



Lots of Consumer Interest…

- Certified Organic
  - From 560,000 acres of crops in 1994 to 2,655,000 in 2008. From 6,000 milk cows to 210,000.
- Farmers Markets
  - From 1,755 in 1994 to 6,132 in 2010
- But these are still niche products…
  - 2007 Census of Agriculture says organic was 0.7% of value of production, and direct sales to consumers is 0.4%.

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To continue the title question…why does organic milk cost $2 more than conventional?

- Farm production costs are 2/3 higher ($1.30)
  - Higher costs for organic feed (55 cents/gallon)
  - Higher labor costs (40 cents), and higher capital costs (25 cents), due to smaller scale
- Processing and transportation costs are higher
  - Smaller volumes, longer distances
- And buyers may be less sensitive to prices

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IV. Food Prices and Market Power

- So far, my focus has been on costs (farm, processing, & retail) as a driver of prices
- But what about competition—firms in uncompetitive markets could raise prices above production costs.
- DOJ and USDA have been holding joint workshops on the issue

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A Few Facts…

Share of livestock purchases held by four largest processors

	1980	2007
Steers/ heifers	32	80
Hogs	30	65
Broilers	28	54

Can they lower livestock prices, or raise meat prices?

Or, does their expanded size allow them to lower processing costs?

Agribusiness Has Generally Become More Concentrated

- Input suppliers: seeds, equipment, chemicals
- Commodity buyers: meatpacking, milk processing, grain exports, oilseeds
- Services: rail transportation, finance
- Food retailing: supermarkets

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Does ↑ Concentration Mean ↑ Prices?

- A complex question
  - Depends on extent of concentration
  - As well as buyer reactions and ease of entry
  - And ↑ concentration can reflect ↓ costs

- JBS Swift/National merger as an example

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V. Back to Farm and Food Prices

- What does the future hold?
- Continuing decline in real commodity prices?
  - And modest impact on food prices
- Or a break from trend, and sharp increases?

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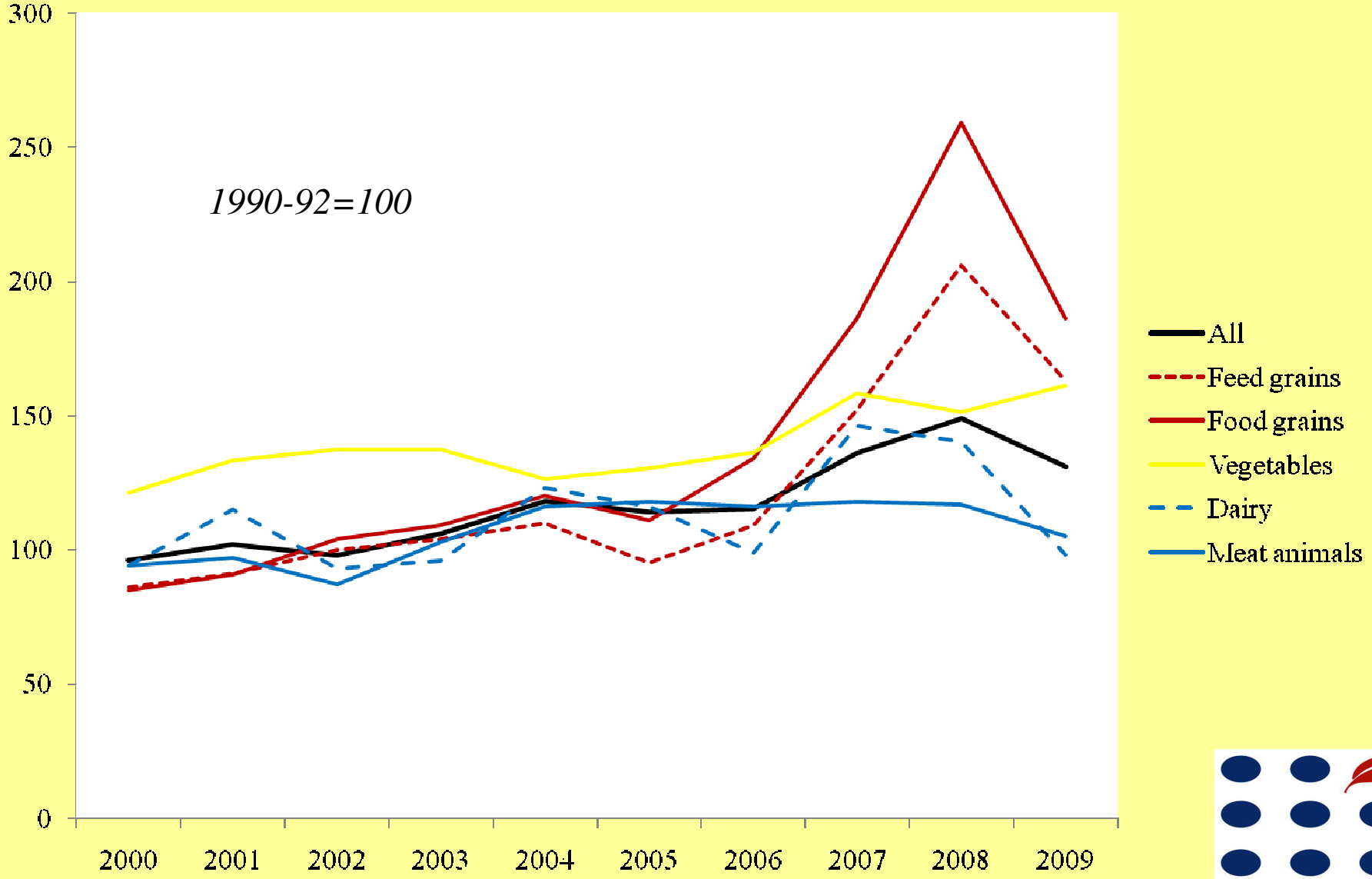
Recent Agricultural Commodity Price Trends



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Farm and Food Prices, 2006-08

- Feed grains prices up 90%, 2006-08
  - Food grains prices up 93%
  - Dairy prices up 44%
- CPI for food up 9.7% in 2006-08
  - Biggest two-year jump since 1980-82
  - But still muted compared to commodity price rise

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Grain Prices Surged: Why?

- Oil prices rose
  - Grains & oil now closely linked
  - Will oil prices rise in the future?
- Growing world demand for feed grains & oil
  - India, China, other emerging countries
  - Slowed by financial crisis and recession

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Will Food Prices Skyrocket Again?

- Corn: $2 to $6 a bushel, 2002-2007
  - Other crops follow, through competition for land
  - Global recession has since slackened demand, prices

- Long run effect depends on production response
  - Land use and environmental degradation?
  - Or accelerated productivity: crop yields, livestock feed conversion, post-harvest retention?

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Could See Repeats in the Future

- Modest impacts on U.S. consumers
  - Because farm cost is small share of retail food
  - And retail food is small share of income
- But could be major impact in poorer regions
  - Where farm cost is larger share of retail
  - And food takes larger share of household income
  - Effects greatest in Africa, Asia

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Questions?

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- ERS website
  - http://www.ers.usda.gov/
- NASS (National Agricultural Statistics Service) website: http://www.nass.usda.gov/index.asp