Effects of Agricultural Research and Farm Subsidy Policies on Human Nutrition and Obesity

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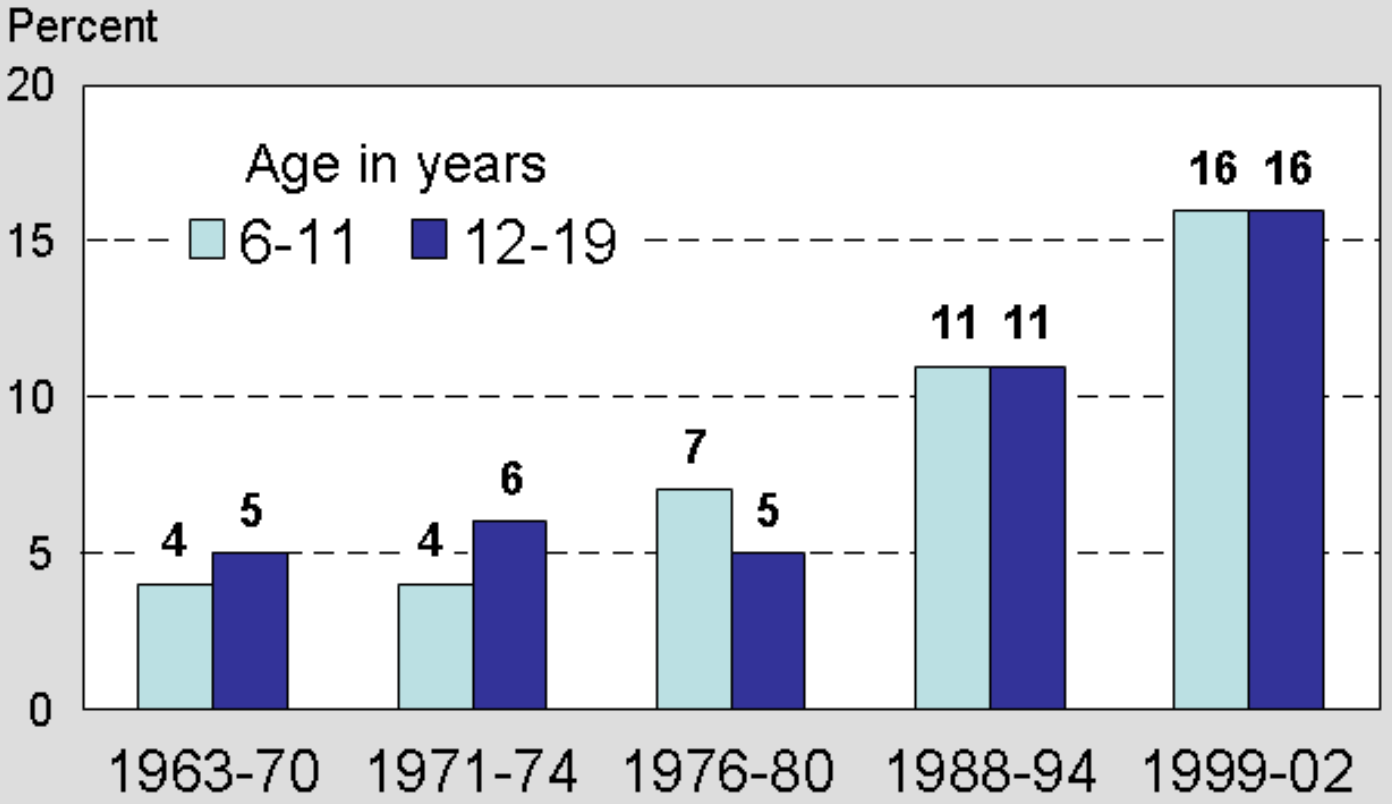
Presentation Outline

- Obesity in the U.S. – Trends, Costs and Presumed Causes
- One ‘Smoking Gun’ – HFCS and ‘Related’ Ag Policies
- A Broader Look at Agricultural Policy – Farm Subsidies and R&D
- Commodity Prices
- Food Prices
- Policy Instrument ‘Test’
- Preliminary Conclusions and Implications for Research and Policy

Prevalence of overweight among children and adolescents ages 6-19 years

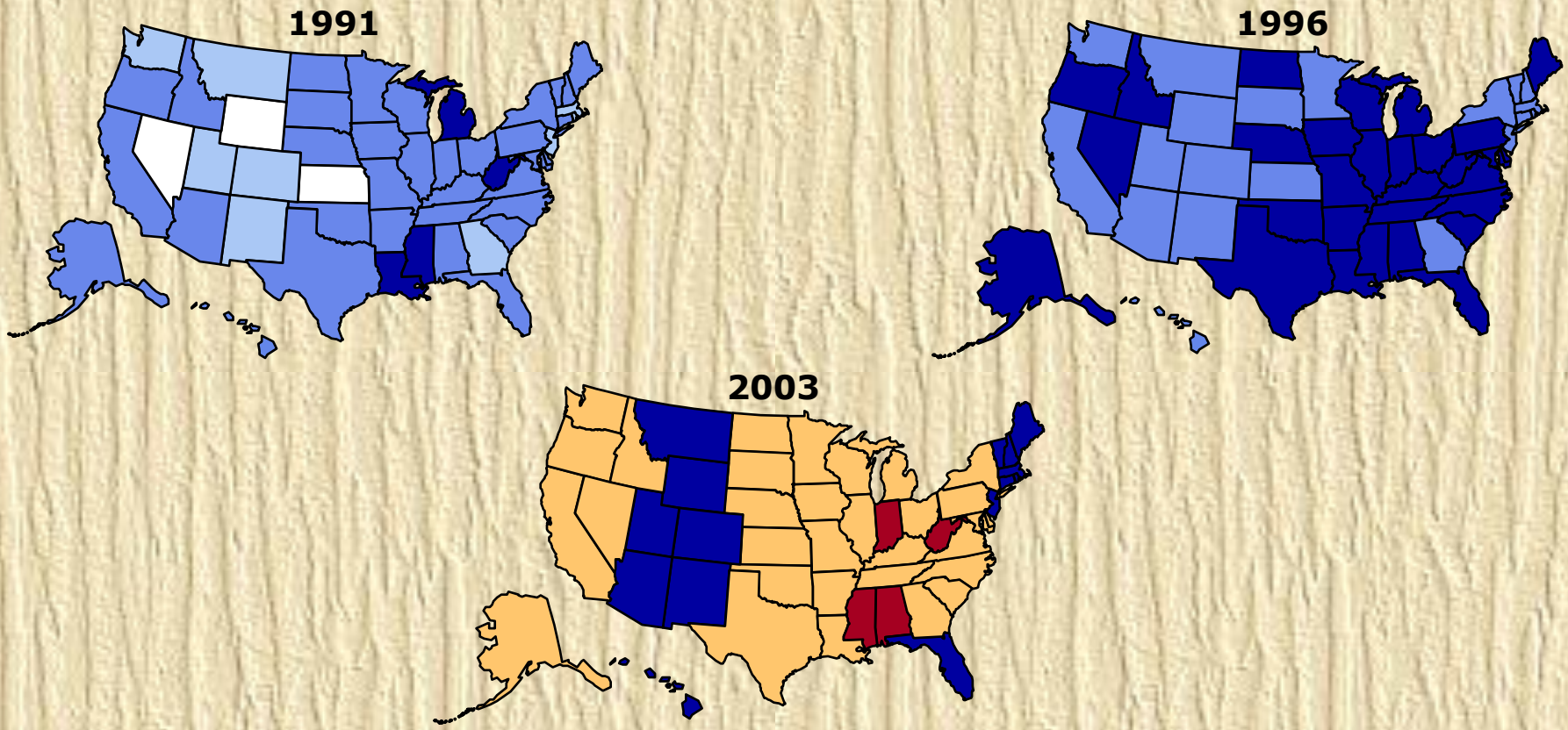


NOTE: Excludes pregnant women starting with 1971-74. Pregnancy status not available for 1963-65 and 1966-70. Data for 1963-65 are for children 6-11 years of age; data for 1966-70 are for adolescents 12-17 years of age, not 12-19 years.
SOURCE: CDC/NCHS, NHES and NHANES

Children with BMI values at or above the 95th percentile of the sex-specific BMI growth charts are categorized as overweight.

Obesity Trends* Among U.S. Adults
BRFSS, 1991, 1996, 2003

(*BMI ≥30, or about 30 lbs overweight for 5'4" person)



Source: Behavioral Risk Factor Surveillance System, CDC.

Economic Costs

- **Direct**
  - **Increased health care costs**
    - **$78.5 billion in the U.S. in 1998**
    - **$7.8 billion in California alone, 1998-2000**
- **Indirect**
  - **Morbidity costs**
    - **Lost productivity**
    - **Absenteeism**
  - **Mortality costs**
    - **Over 300,000 death per year attributable to obesity**
    - **Obese individuals have a 50 to 100% increased risk of premature death from all causes**

Key Issues

- **Why Is Obesity on the Rise?**
  - **Long-Term and Worsening Energy Imbalance**
    - **Energy Intake > Energy Expenditure**
- **Drivers of This Imbalance**
  - **Types and sources of food**
  - **Food portions**
  - **Energy expenditure patterns**
- **What Role of Agriculture and Agricultural Policy?**
  - **Getting us to this point?**
  - **Course correction?**

Food Types and Sources Are Changing

- **Eating More Energy-Dense Foods**
  - Potato chips (23kJ/g), donuts (18 kJ/g), cheese (17 kJ/g), low-fat milk (1.6 kJ/g), raw vegetables and fruits (0.4-2.0 kJ/g)
- **Snacks Versus Meals**
  - Snacks – increasing proportion of caloric intake
  - Meals – decreasing proportion of caloric intake
- **Meals Eaten Away-from-Home**
  - 1977: 16% of food, 38% of all food expenditures
  - 1997: 29% of food, 49% of all food expenditures

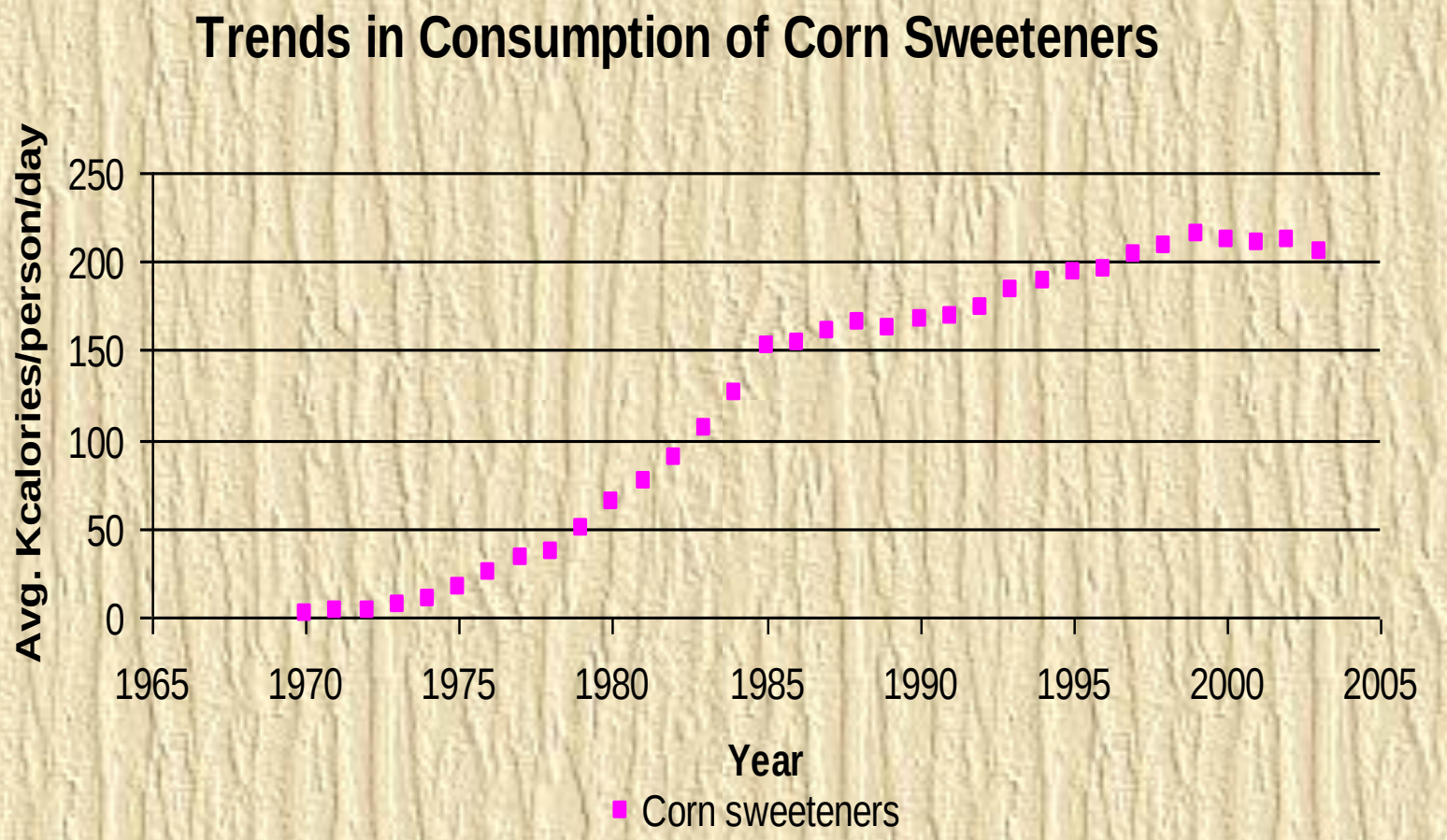
Food Portions On The Rise

- McDonalds French Fries
  - 1950: one size (210 cal.)
  - 1970: small (210 cal.) and large (320 cal.)
  - 1990: small (210 cal.), large (450 cal.) and Super 450 cal.)
  - 2000: small (210 cal.), medium (450 cal.), large (540 cal.) and super (610 cal.)
- Coke
  - Original: 6.75 oz. (75 cal.)
  - Kids: 10 oz. (120 cal.)
  - Small: 12 oz. (150 cal.)
  - Medium: 18 oz. (230 cal.)
  - Large: 24 oz. (300 cal.)
  - King: 36 oz. (450 cal.)
  - Extreme Gulp: 52 oz. (650 cal.)

Is Agricultural Policy (Partially) Responsible?

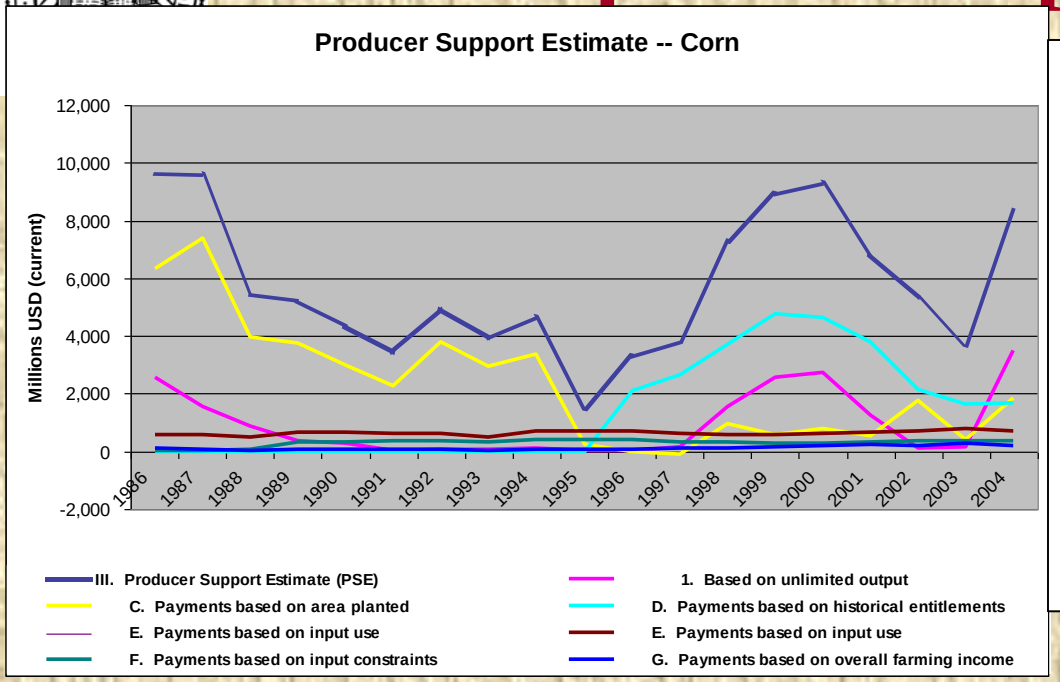
- "[Our] *cheap-food farm policy* comes at a high price: . . . farmers in the United States have managed to produce 500 additional calories per person every day; each of us is, heroically, managing to pack away 200 of those extra calories per day." (Pollan 2003)
- "*Commodity prices . . . are so low* that restaurants have been able to double serving sizes without doubling prices." (Davis 2003)
- "Why *healthier foods are slipping out of reach* of large segments of the US population is a question with many policy and political implications." (Drewnowski and Barratt-Fornell, 2004)

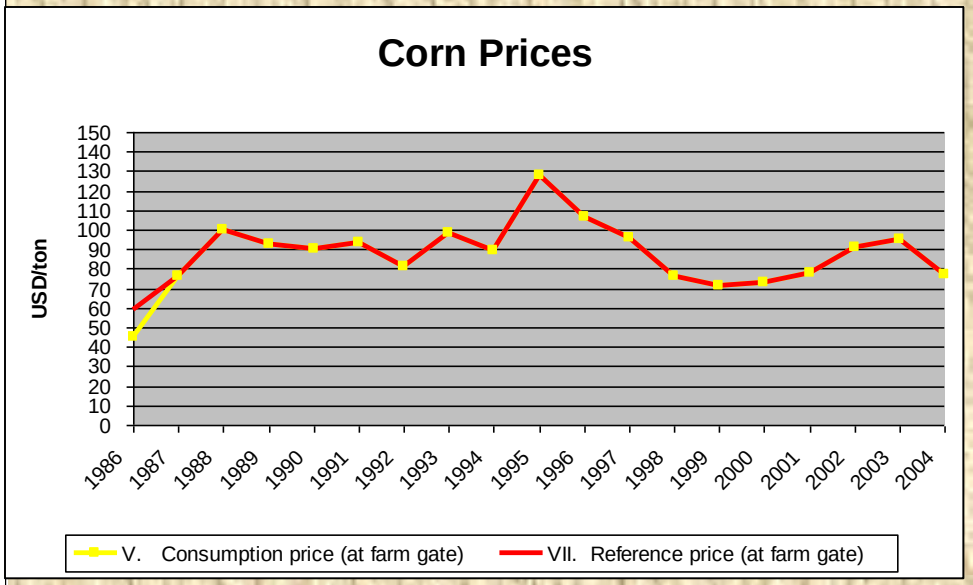
One ‘Smoking Gun’

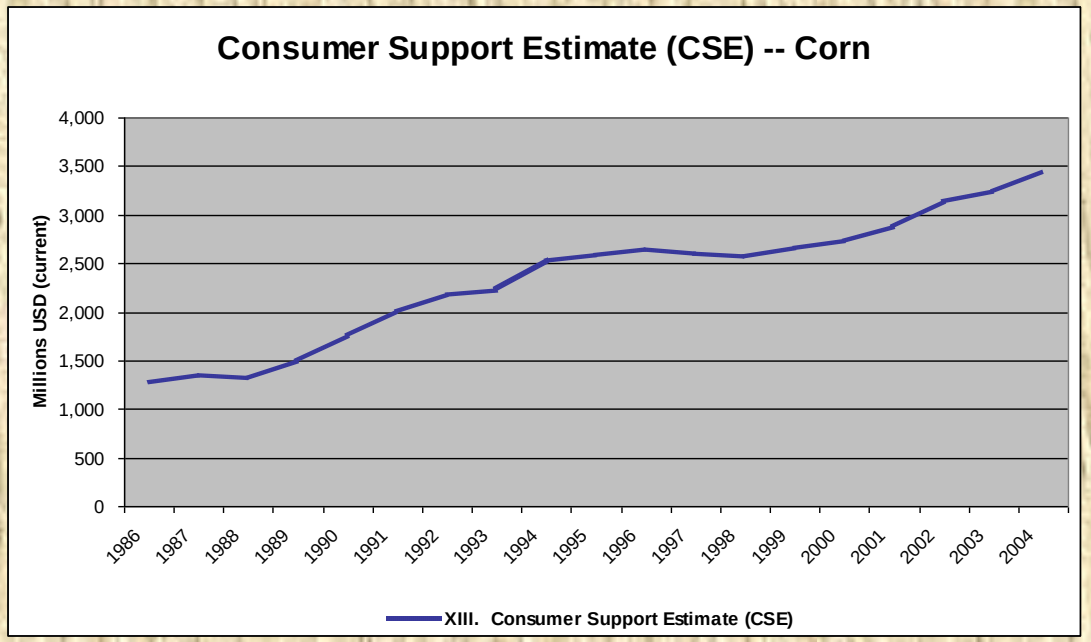


http://www.ers.usda.gov/data/foodconsumption/FoodGuideIndex.htm#calories

The Suspected Culprit – Corn Policy







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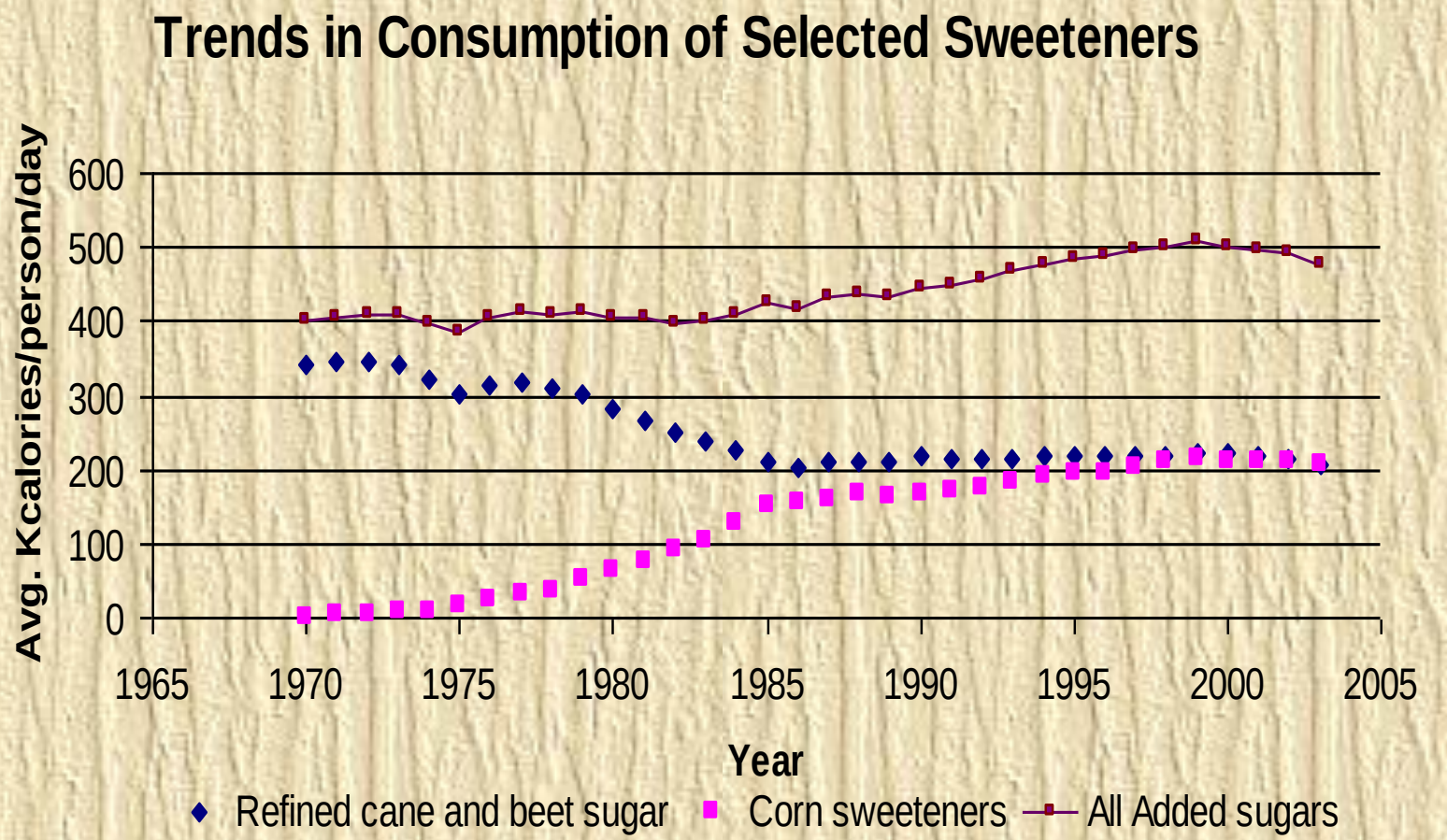
The More Complete Story



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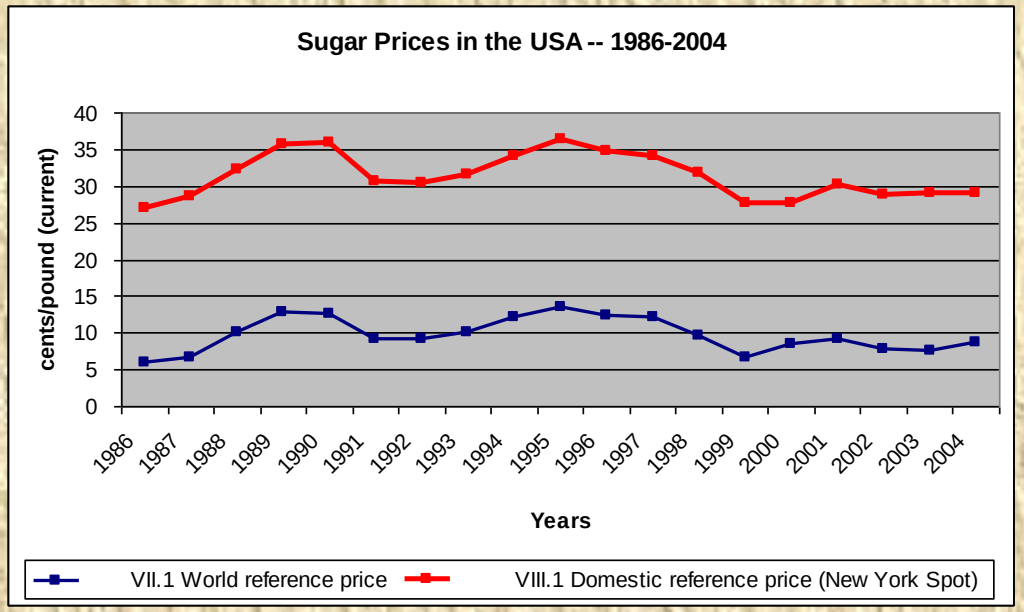
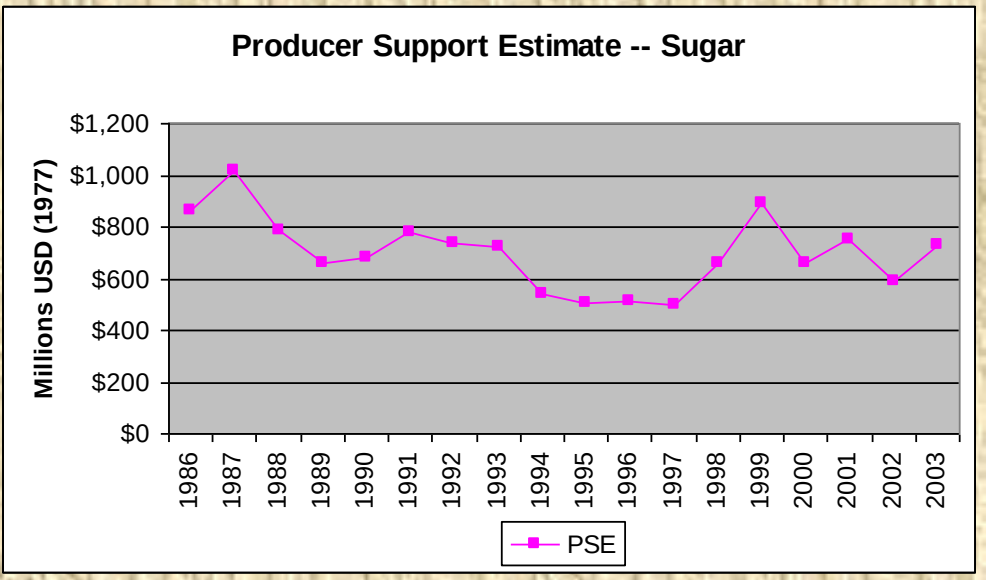
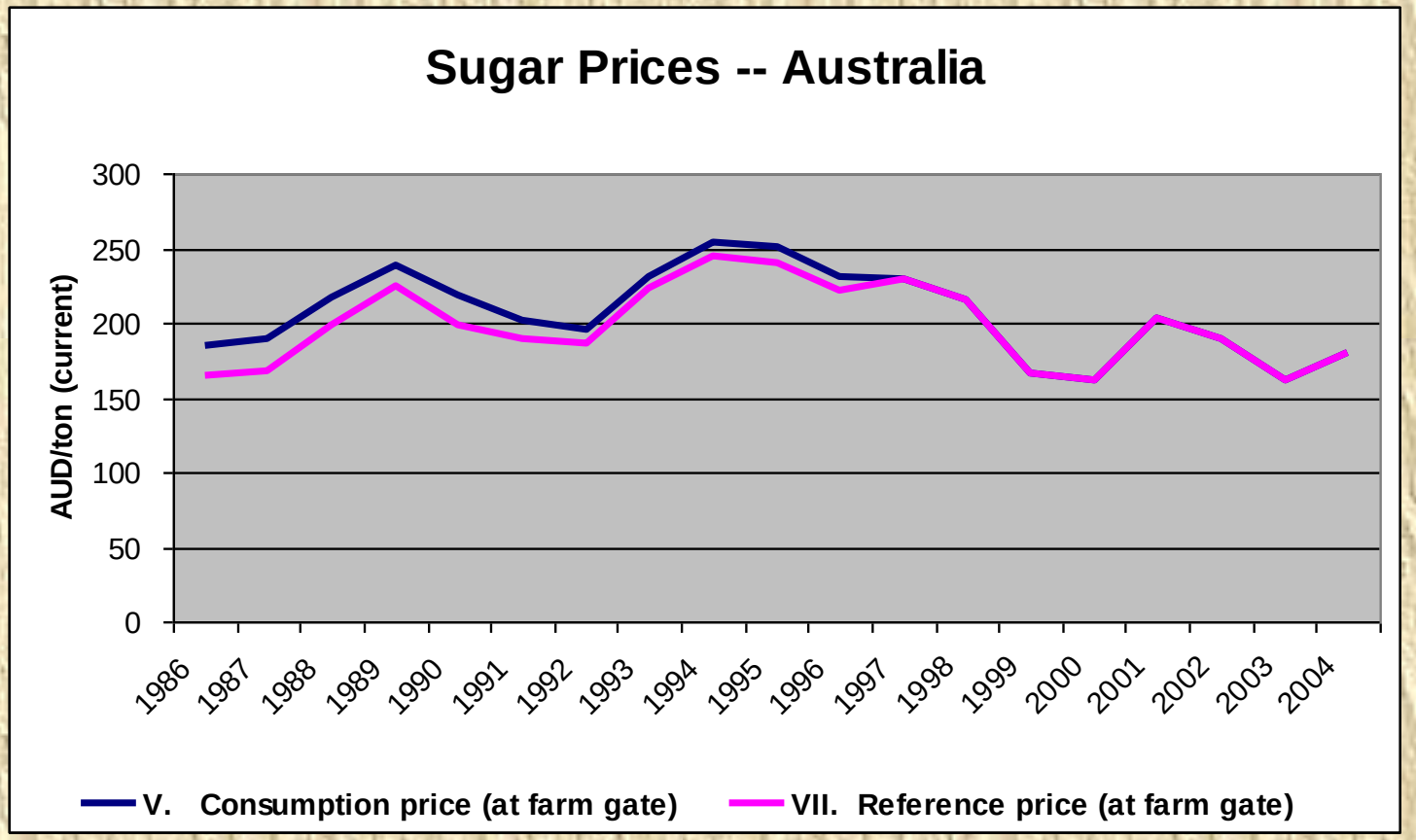
White Sugar Policy – What Role?



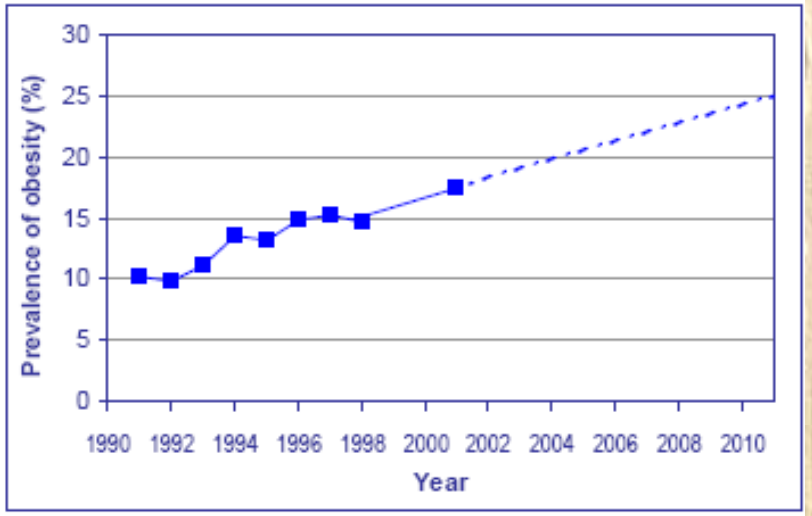


The Australia Story: Sugar Policy



The Australia Story: Obesity Trends

Figure 1: Projected increase in the prevalence of obesity (BMI ≥ 30) in South Australia



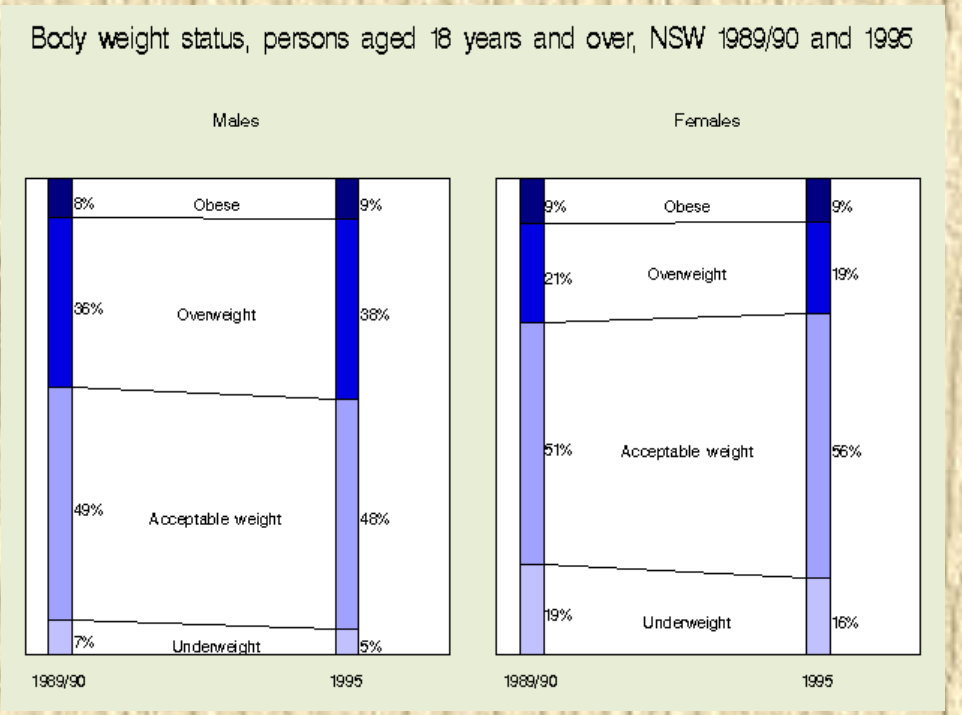
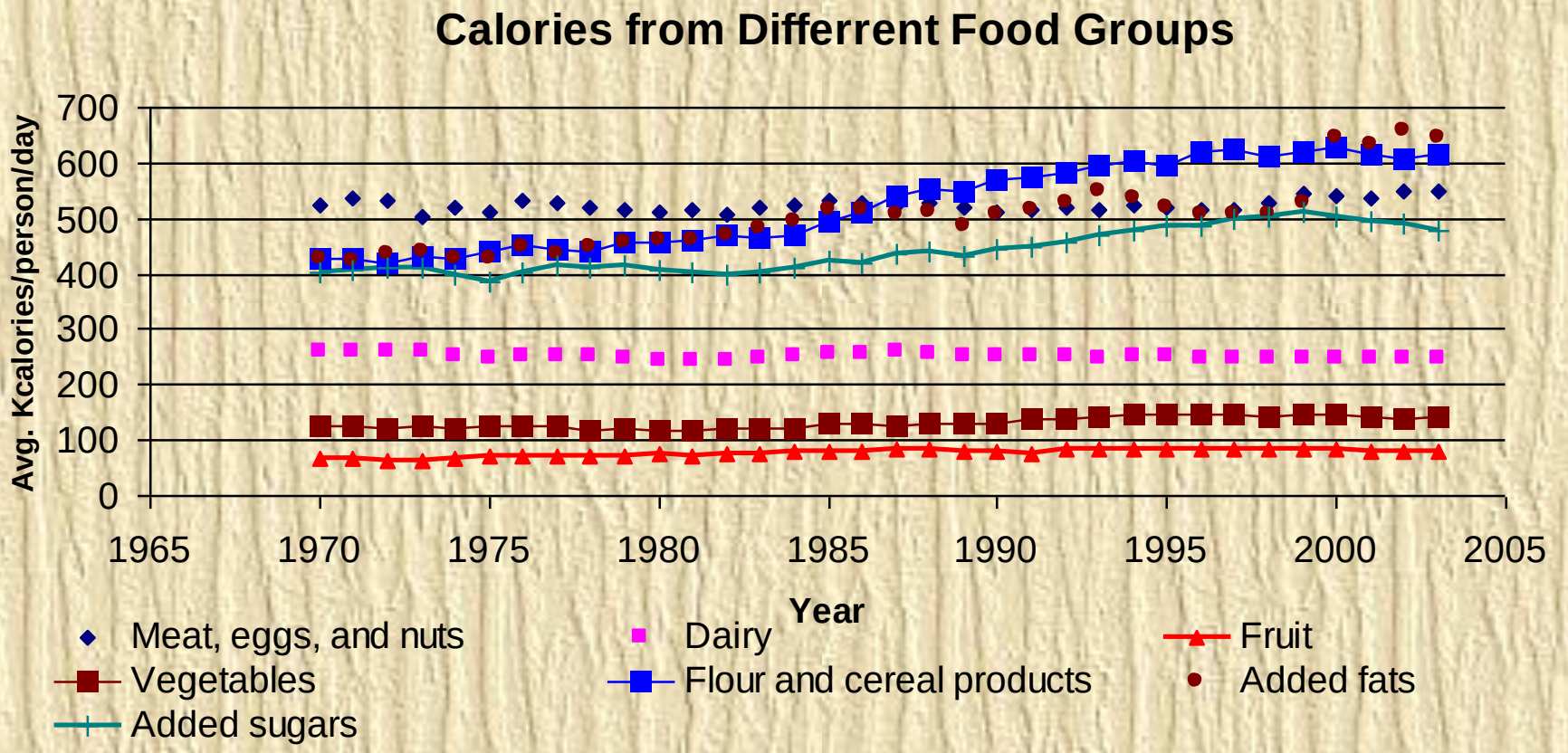


Table 1: Prevalence of BMI categories in 1991 and 2001

BMI category	1991 % (95% CI)	2001 % (95% CI)
Underweight (<18.5)	4.2 (3.5 – 5.0)	3.0 (2.4 – 3.8)
Normal (18.5-24.9)	57.9 (56.1 – 59.7)	46.2 (44.3 – 48.2)
Overweight (25.0-29.9)	27.6 (26.0 – 29.3)	33.0 (31.2 – 34.9)
Obese (30.0-34.9)	8.1 (7.1 – 9.1)	12.1 (10.8 – 13.4)
Severely obese (≥35.0)	2.2 (1.7 – 2.9)	5.7 (4.9 – 6.7)

The Much More Complete Story



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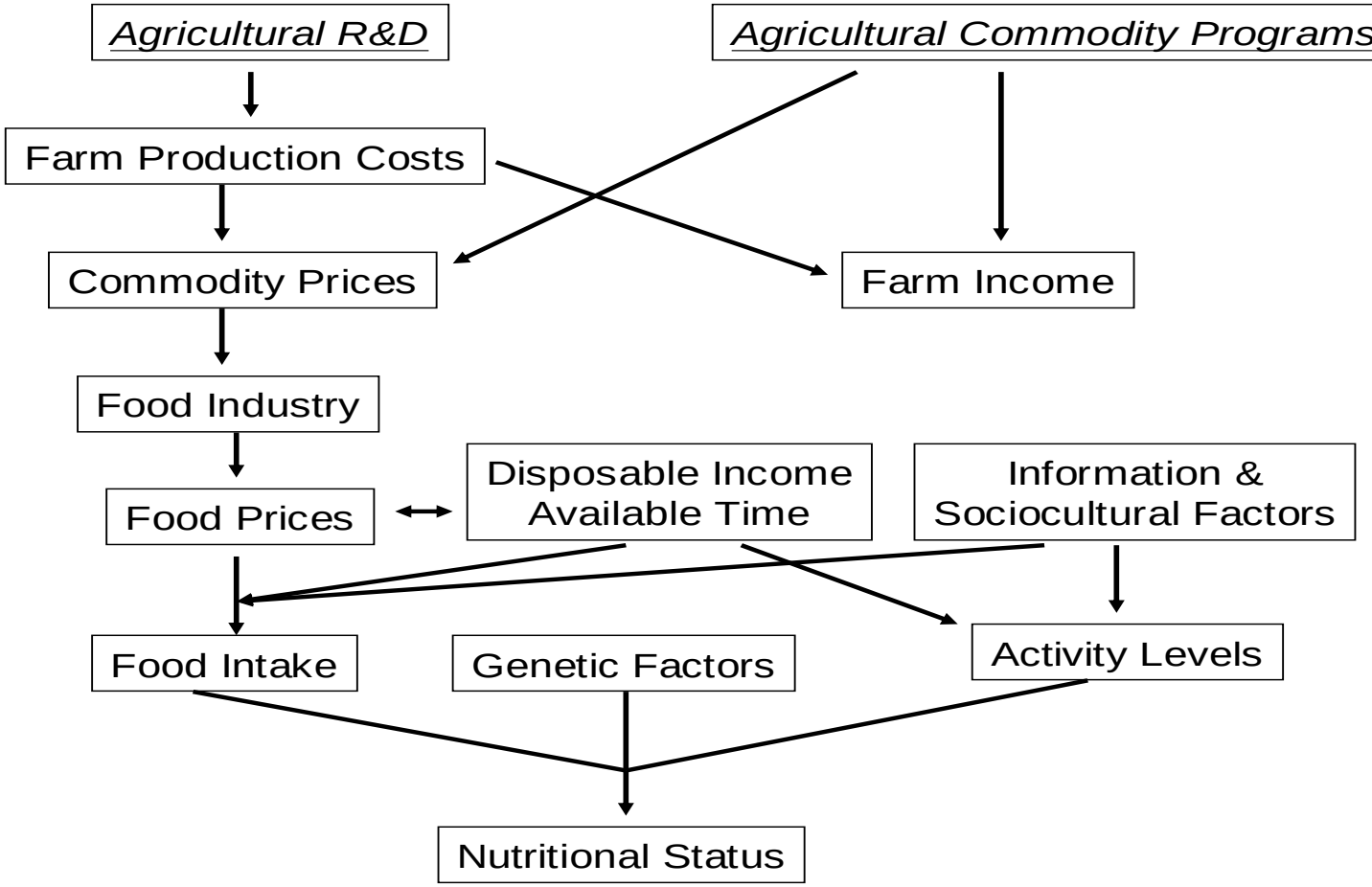
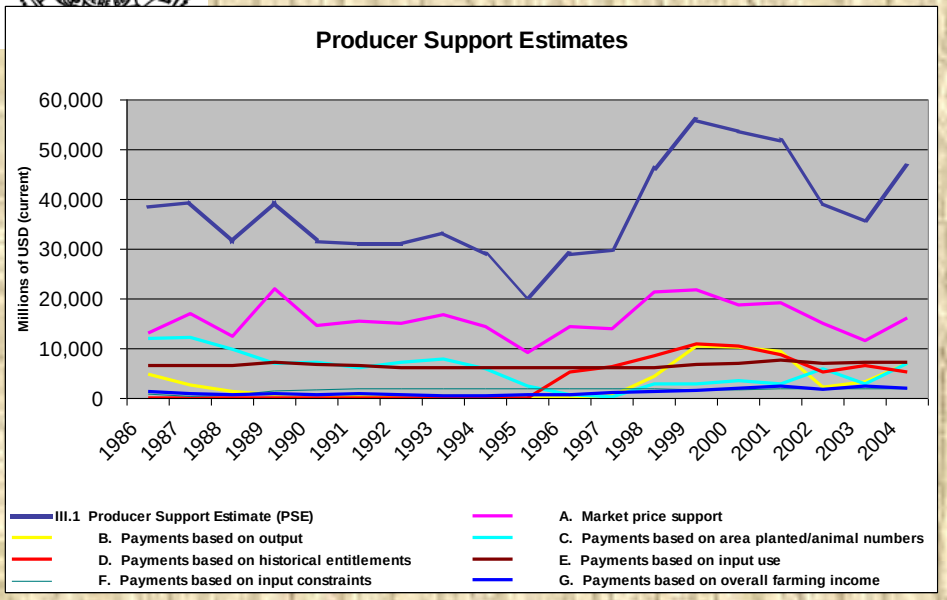
Types and Magnitudes of Agricultural Policies

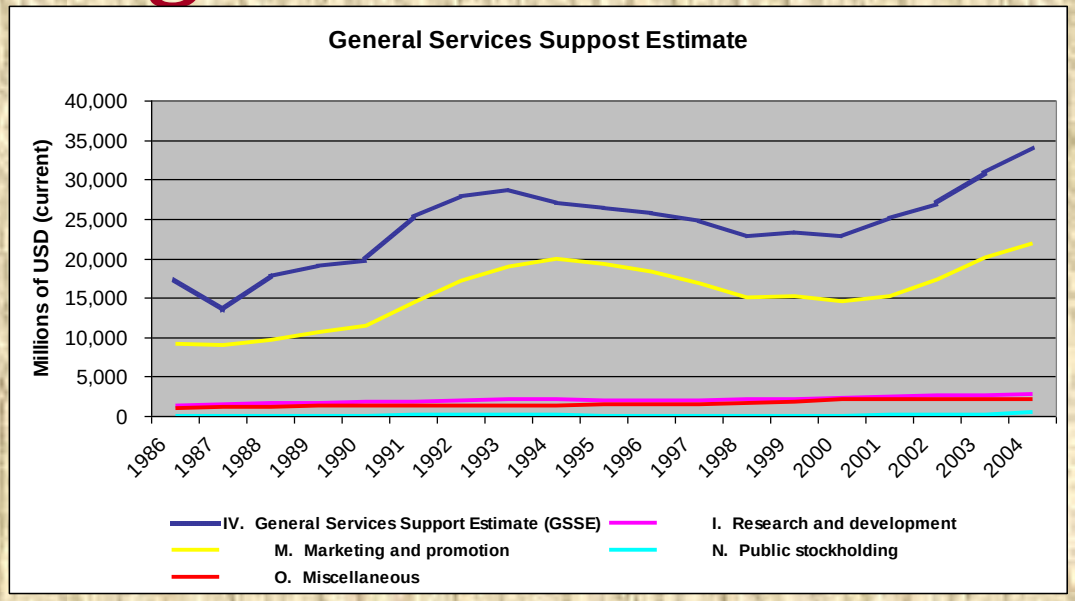
USDA Program	Expenditure in 2004	Percent of Total
	billions of dollars	*percent*
Food, Nutrition, and Consumer Services	45.4	40.2
Farm Service Agency (*mainly farm commodity programs*)	27.4	24.3
Rural Development	15.5	13.7
Natural Resources and Environment	8.4	7.4
Foreign Agricultural Service	6.4	5.7
Risk Management (mainly crop insurance)	4.1	3.6
Research, Education and Economics (*mainly ag. R&D*)	2.5	2.2
Marketing and Regulatory Programs	1.8	1.6
Other	1.4	1.2
TOTAL	112.9	100.0

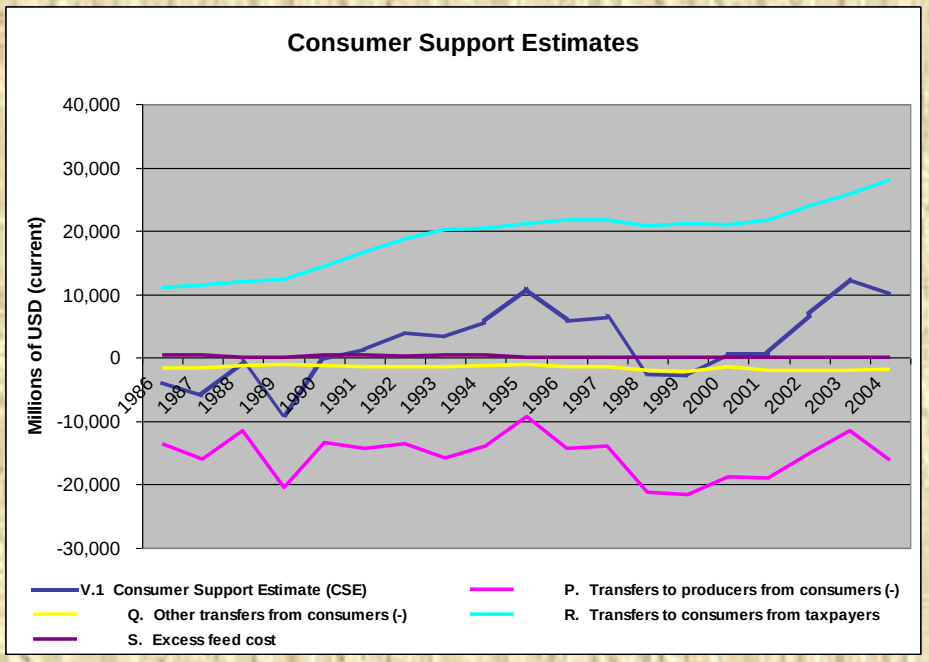
Links Between Selected Agricultural Policies and Human Nutrition

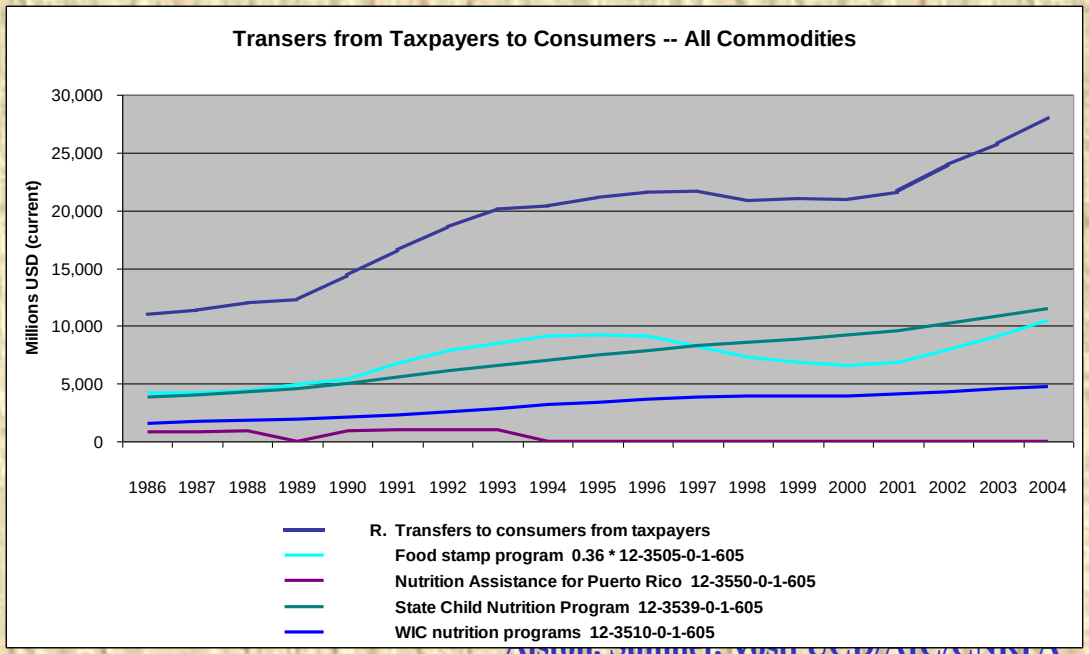


Support to Agriculture

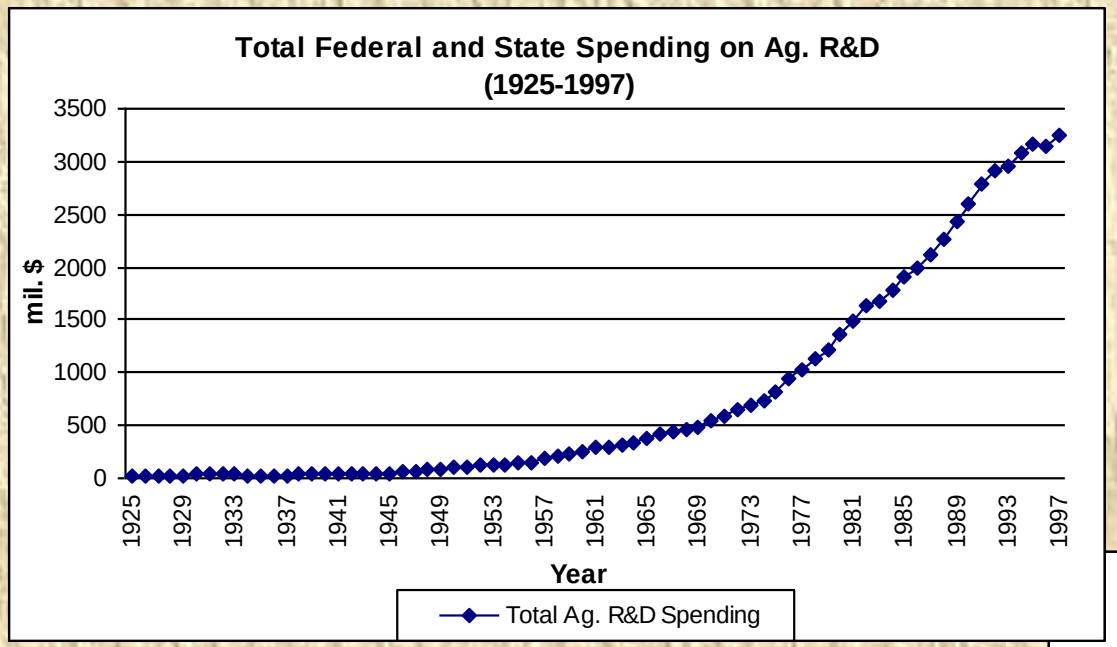


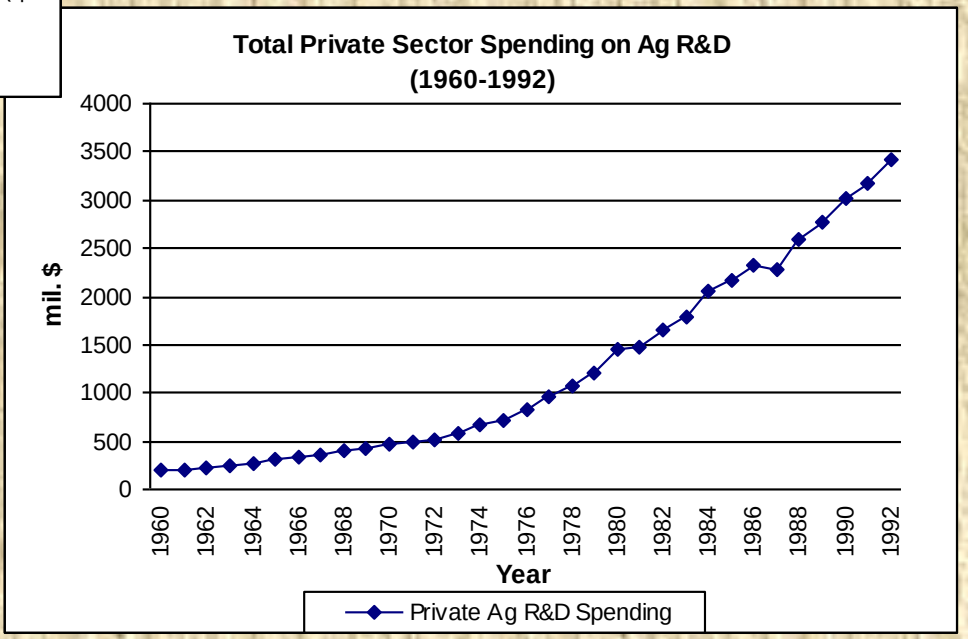




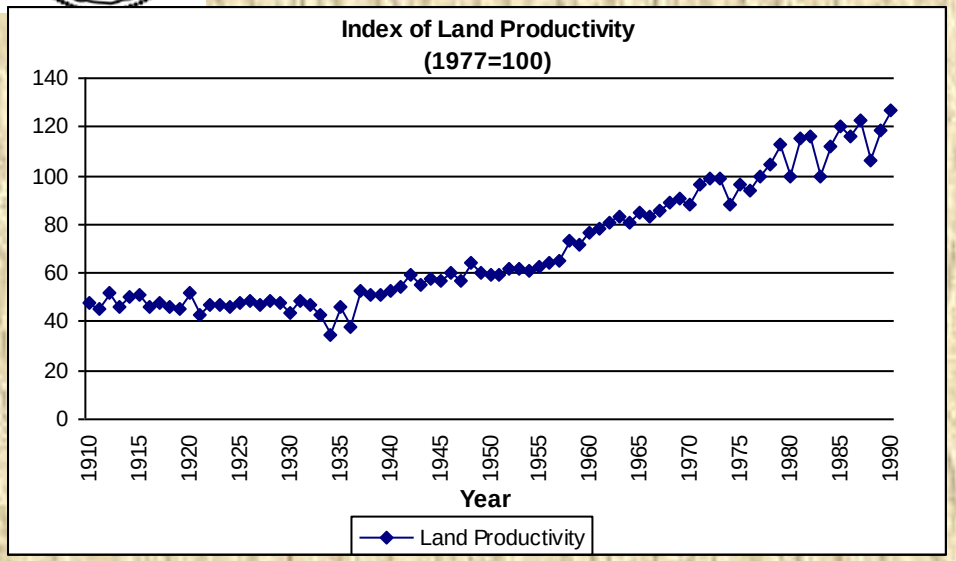


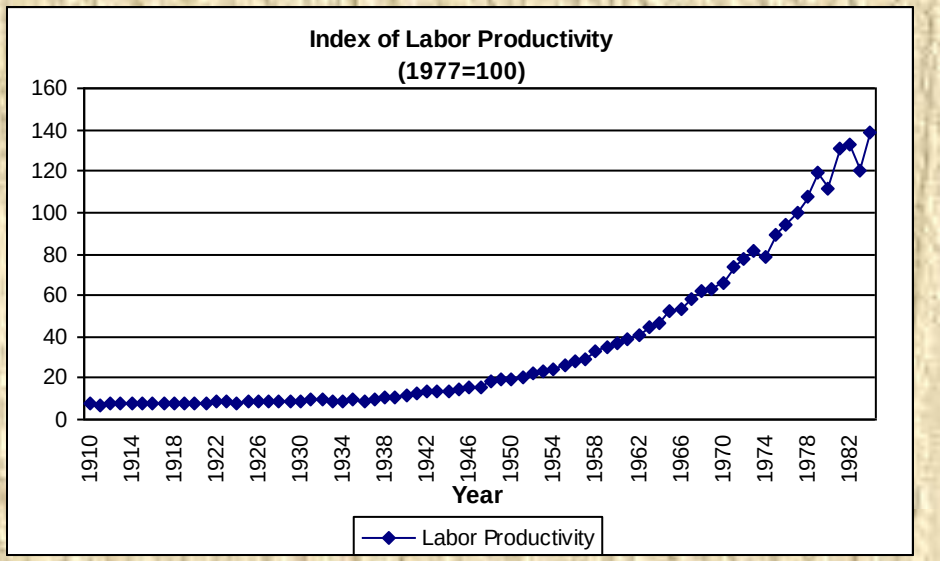
Trends in Agricultural R&D Spending

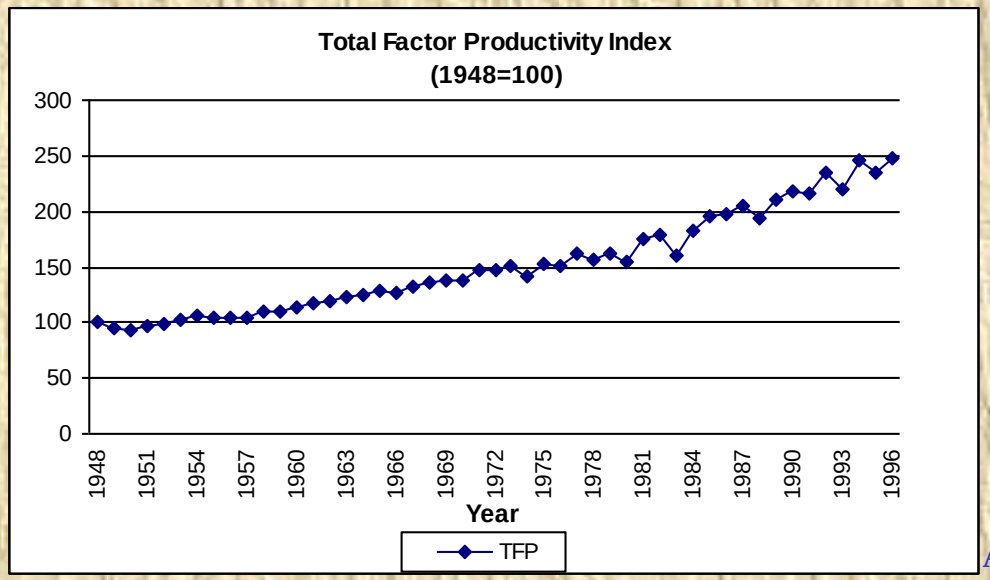




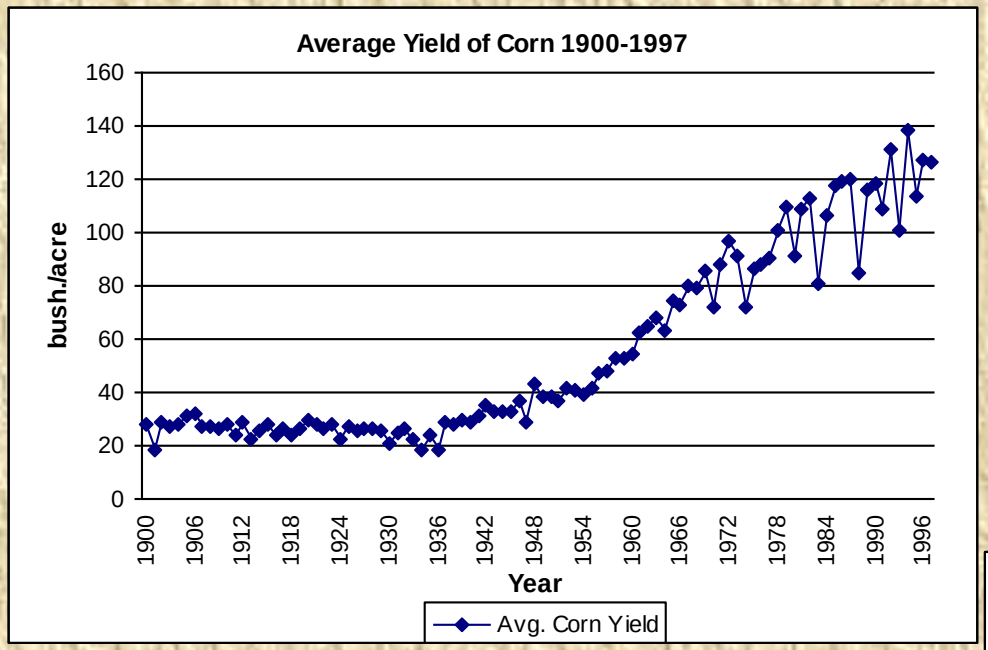
Trends in Aggregate Productivity Measures

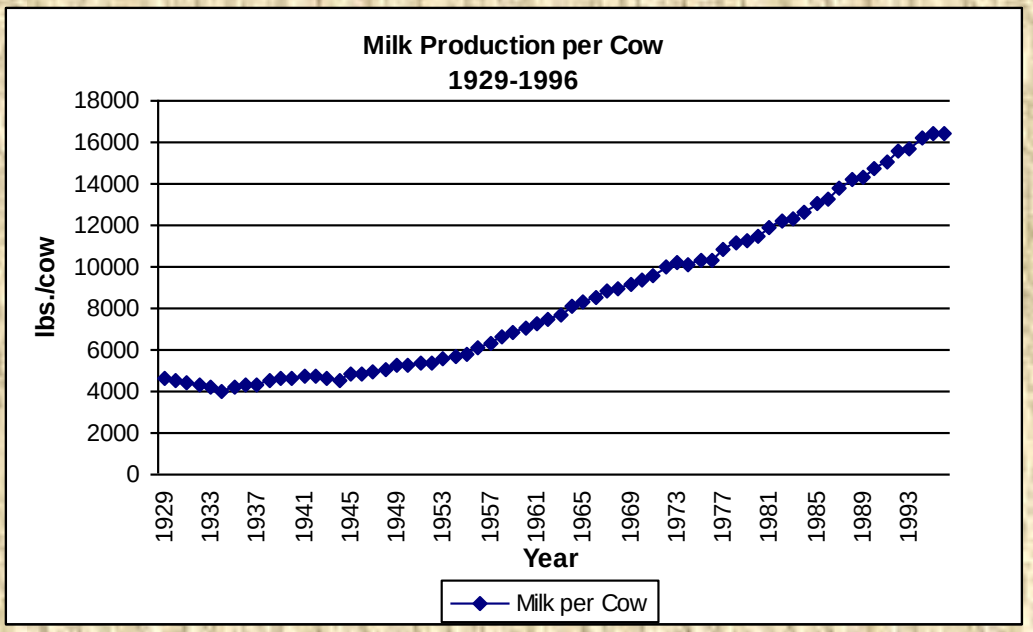






Trends in Crop/Product Productivity





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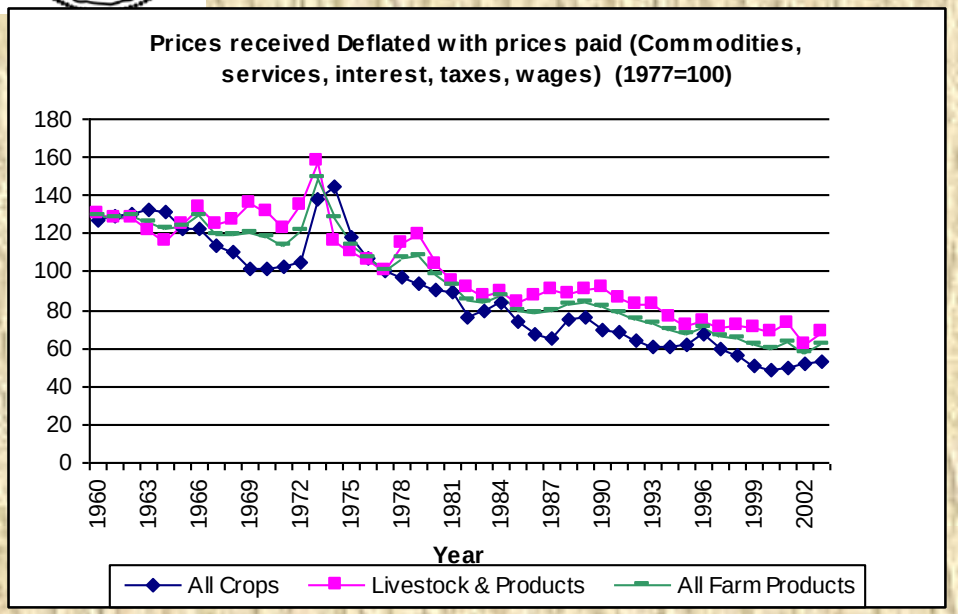
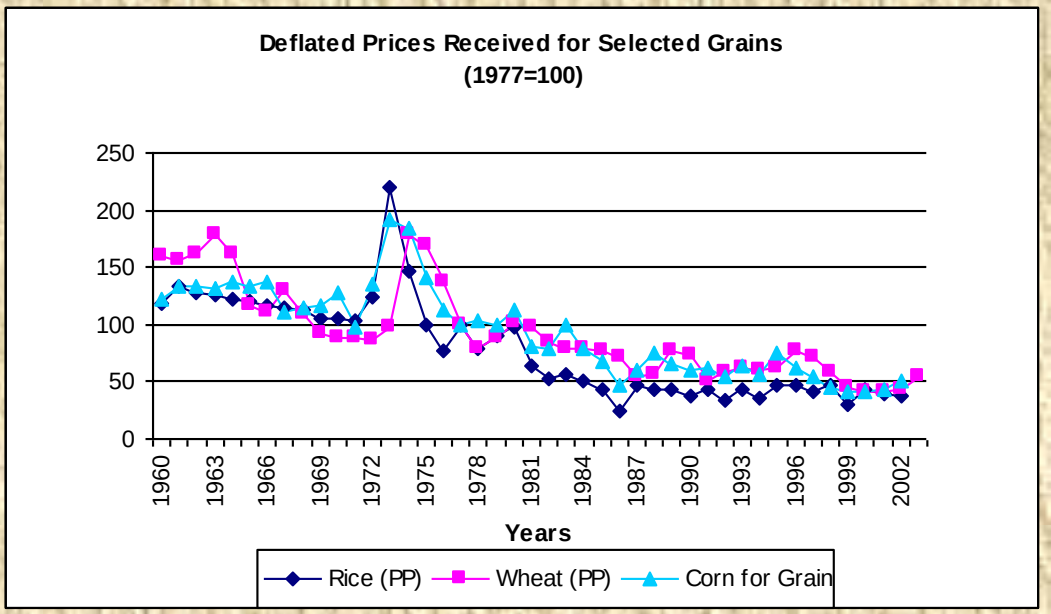
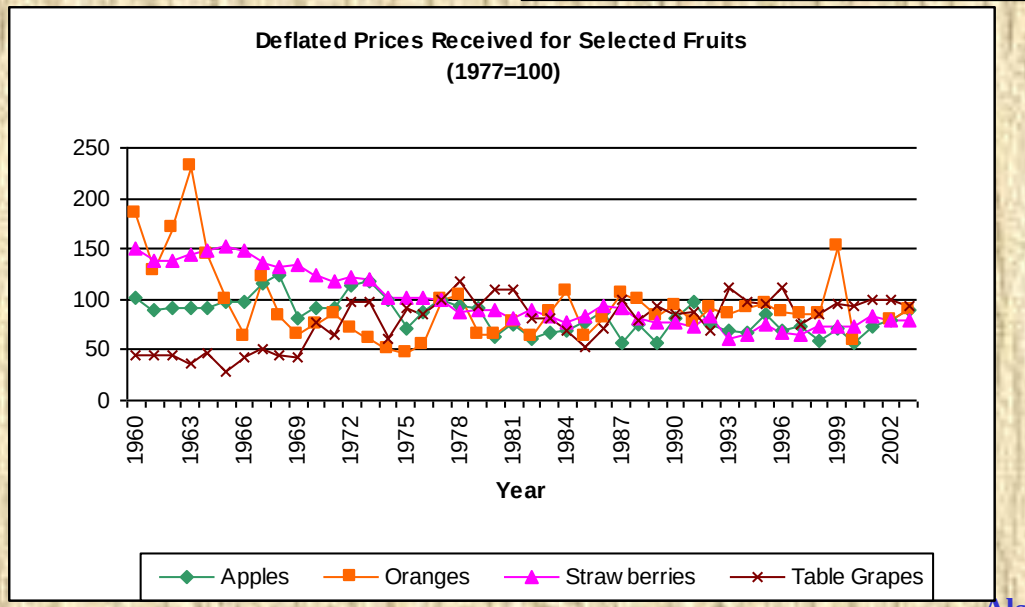
Trends in Prices Received By Farmers







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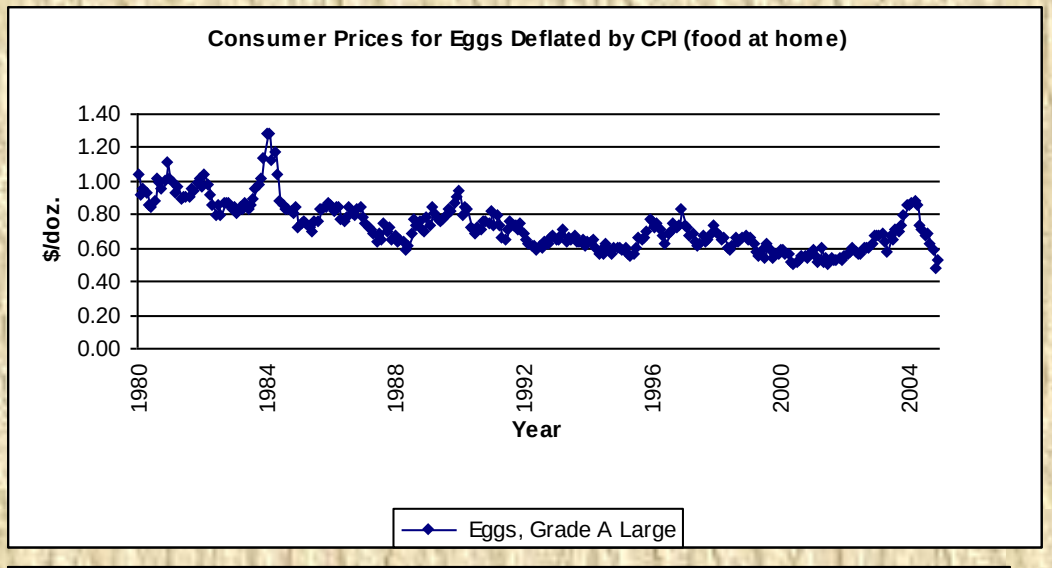
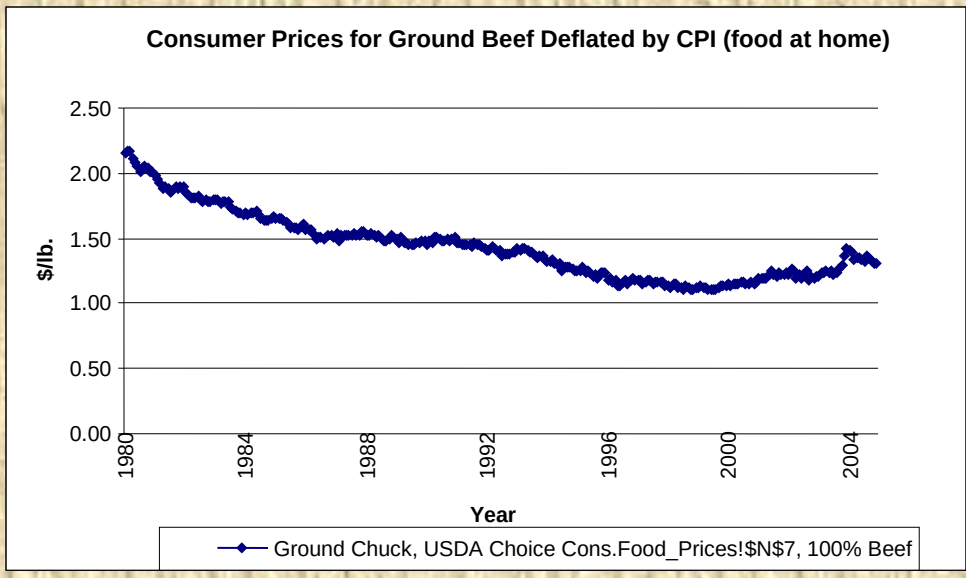
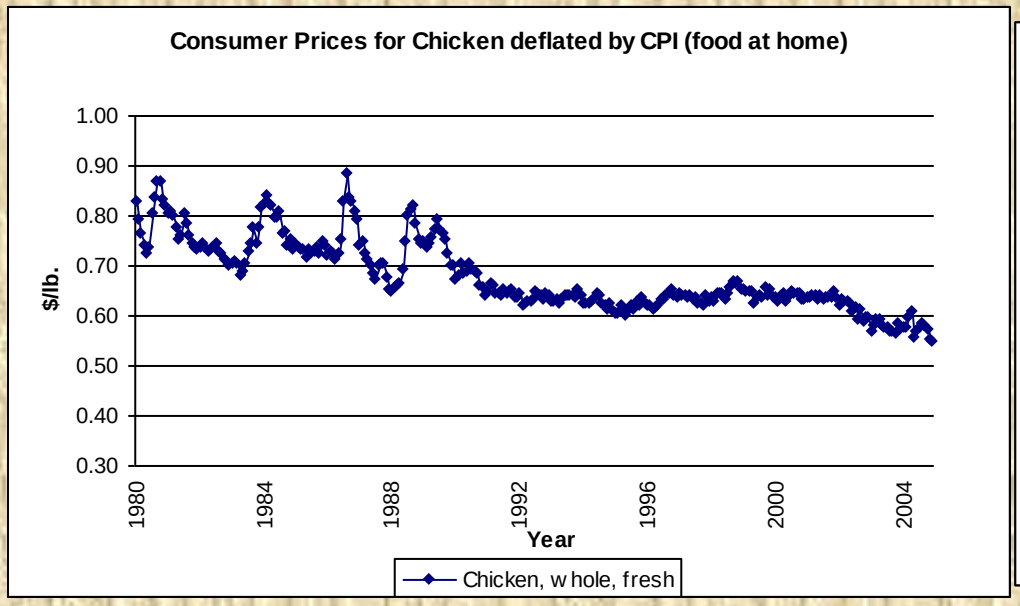
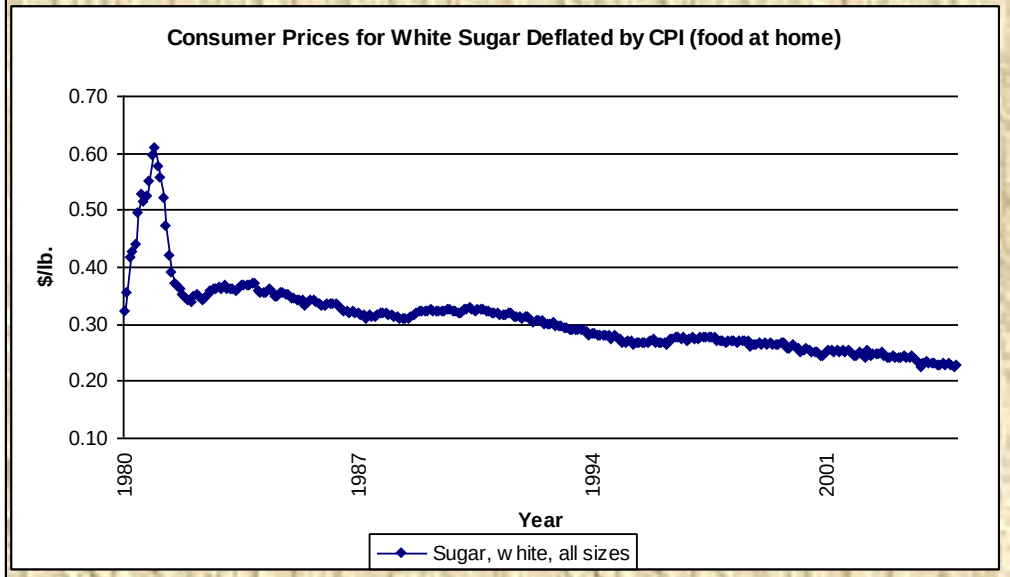
Prices Paid By Consumers – Basic Stuff









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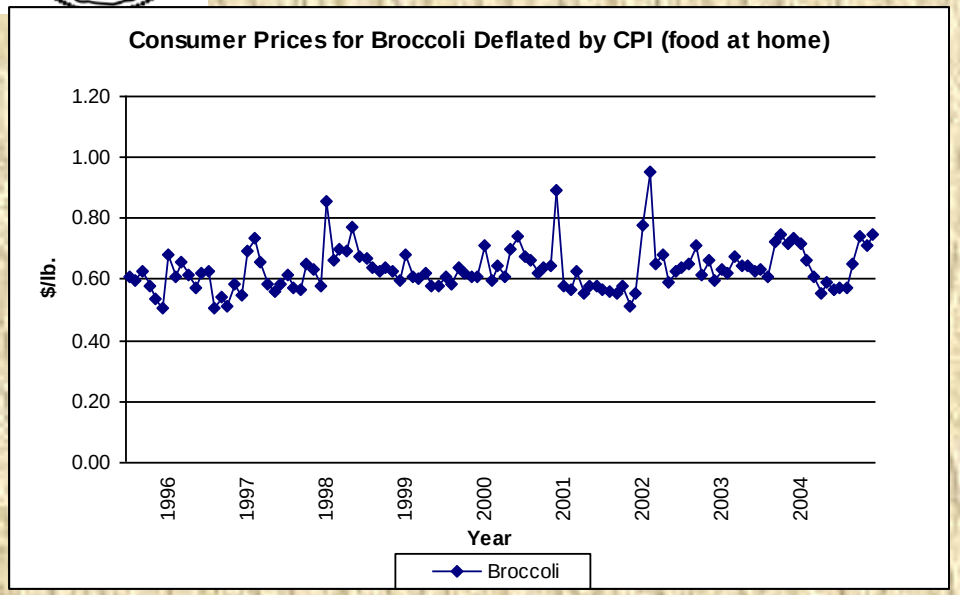
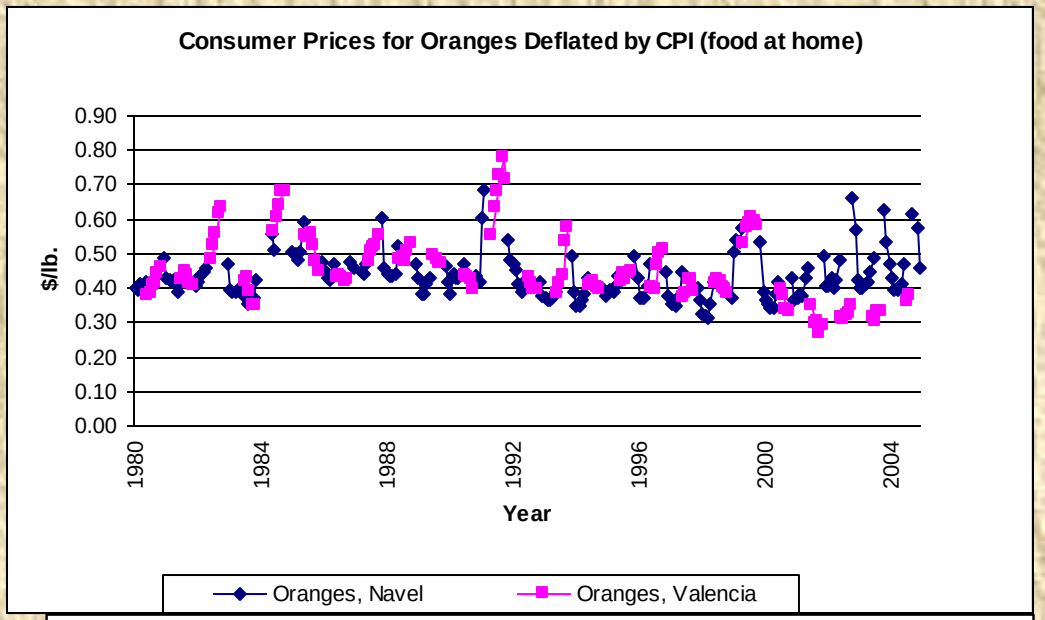
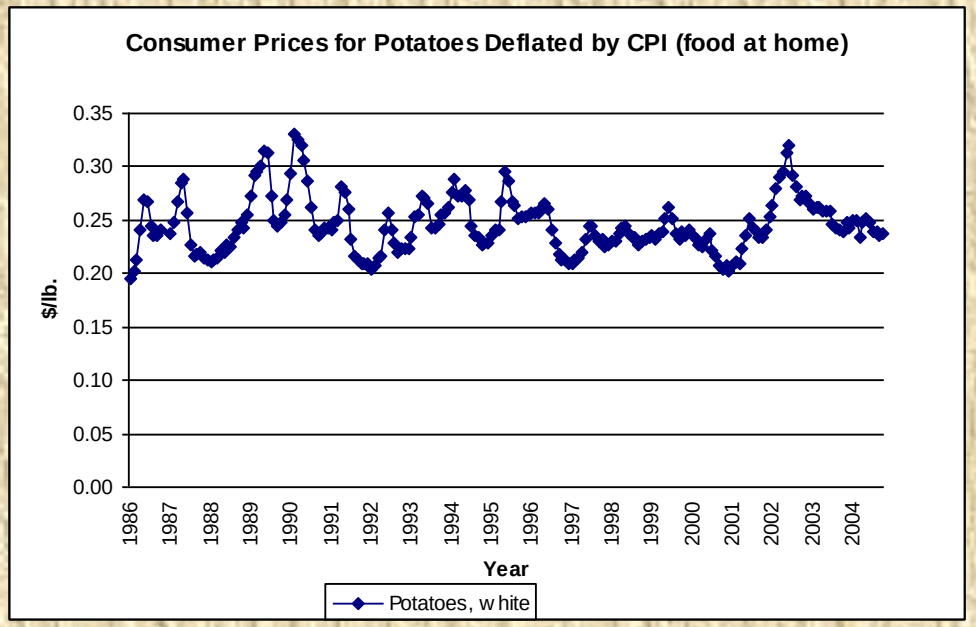
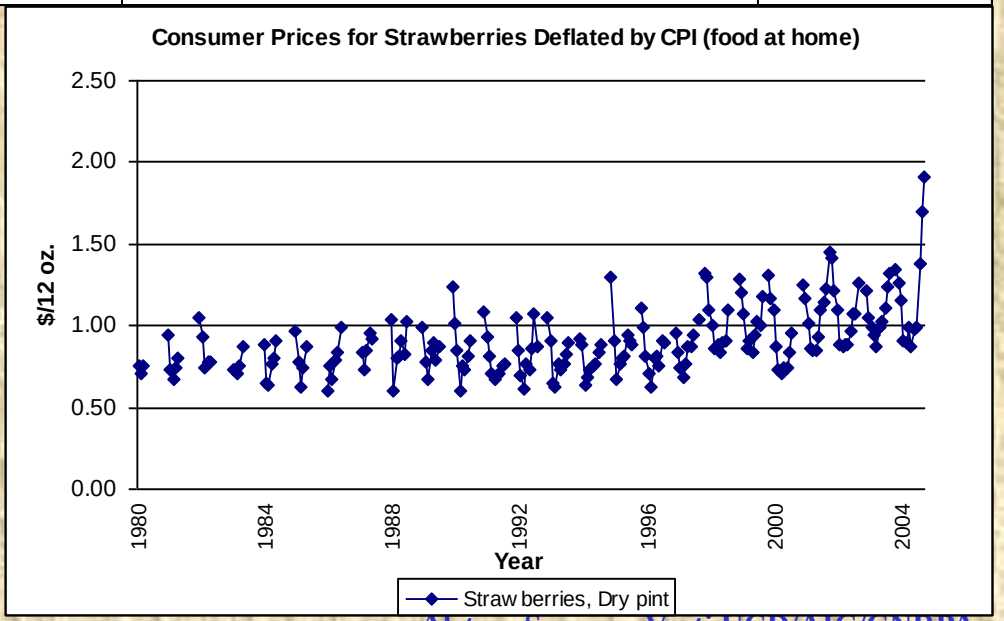
Prices Paid By Consumers – Fruits and Vegetables





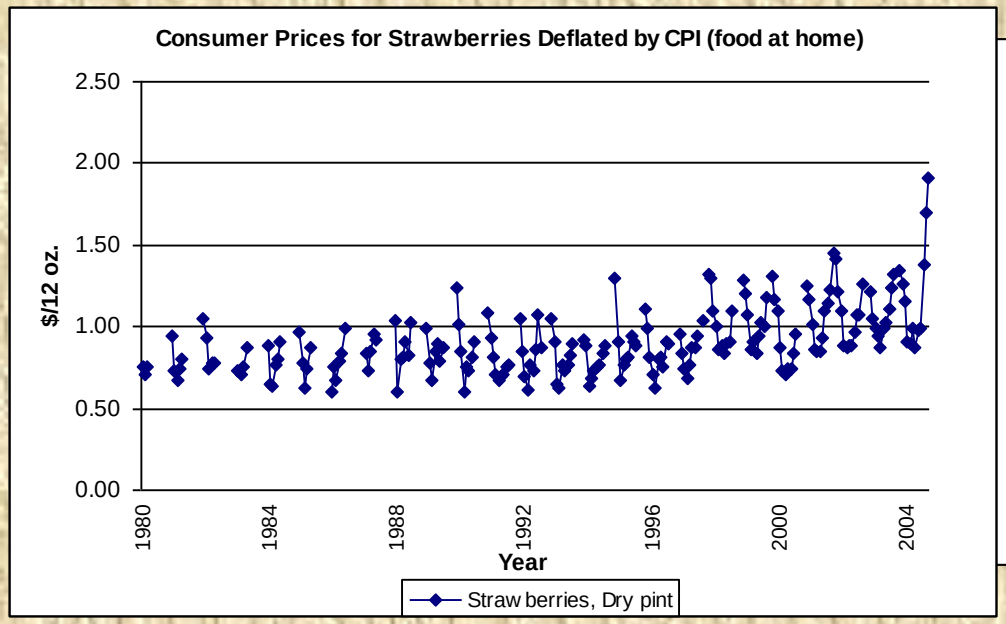


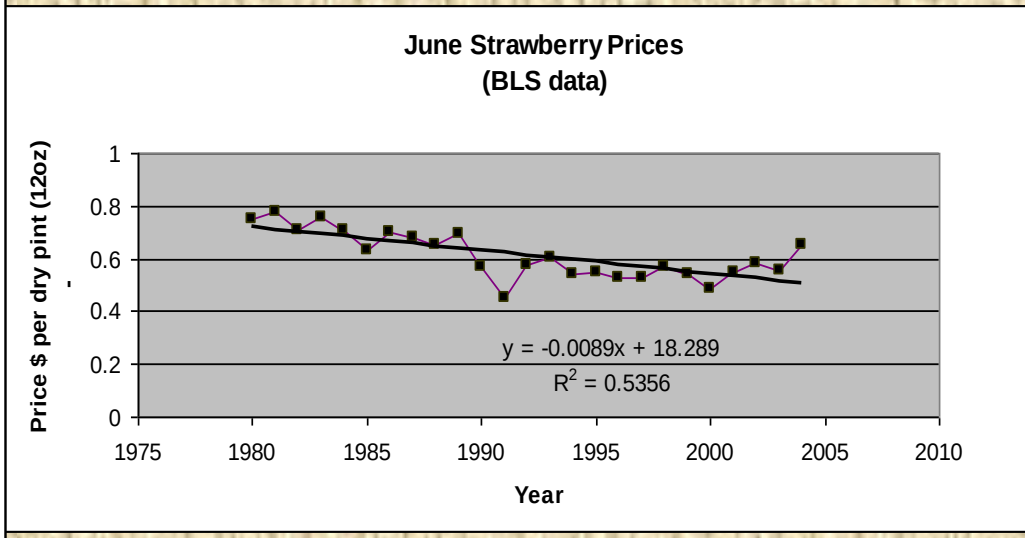


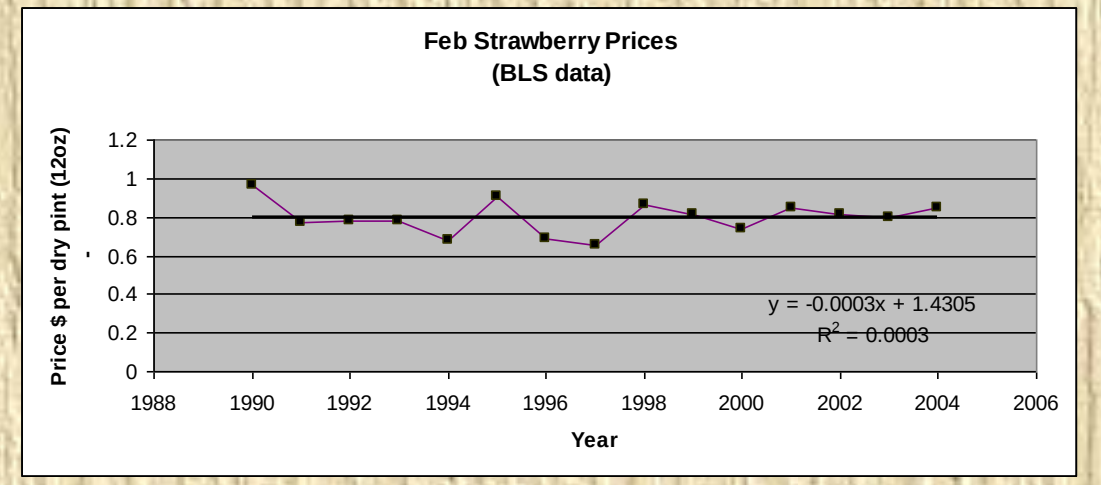
Getting the Price Story Right: Strawberries

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980				0.653	0.608	0.66						
1981			0.886	0.69	0.637	0.696	0.77					
1982			1.016	0.914	0.73	0.778	0.775					
1983				0.728	0.708	0.752	0.863					
1984			0.912	0.663	0.648	0.78	0.827	0.943				
1985			1.016	0.809	0.646	0.774	0.913					
1986			0.637	0.797	0.718	0.84	0.899	1.081				
1987				0.937	0.824	0.955	1.071	1.029				
1988			1.181	0.693	0.919	0.937	1.059	0.971	1.216			
1989			1.218	0.966	0.831	1.055	1.117	0.986	1.087			
1990		1.638	1.338	1.109	0.781	0.987	0.965	1.081	1.21			
1991		1.467	1.268	1.112	0.976	0.924	0.948	0.961	1.014	1.035		
1992		1.43	1.173	0.96	0.831	1.048	0.988	1.185	1.473	1.19		
1993		1.467	1.26	0.908	0.874	1.066	1.013	1.069	1.151	1.261		
1994		1.318	1.262	0.91	0.983	1.047	1.085	1.108	1.209	1.286		
1995		1.926	1.34	1.001	1.14	1.18	1.209	1.398	1.355	1.316		
1996	1.692	1.505	1.236	1.082	0.957	1.226	1.247	1.164	1.42	1.409		
1997		1.514	1.317	1.179	1.073	1.213	1.383	1.375	1.488		1.654	
1998	2.135	2.08	1.751	1.613	1.386	1.413	1.346	1.454	1.469	1.779		
1999		2.102	1.96	1.751	1.419	1.49	1.375	1.557	1.679	1.664	1.948	
2000	2.167	1.935	1.825	1.45	1.218	1.187	1.246	1.263	1.416	1.619		
2001		2.14	2.01	1.737	1.482	1.465	1.486	1.628	1.916	1.996	2.137	2.526
2002	2.498	2.137	1.941	1.551	1.527	1.552	1.545	1.695	1.873	1.884	2.224	
2003		2.153	1.871	1.762	1.678	1.568	1.776	1.84	1.986	2.246	2.41	
2004	2.481	2.332	2.124	1.661	1.672	1.847	1.629	1.817	1.843	2.6	3.185	3.602

A Closer Look at Strawberry Prices







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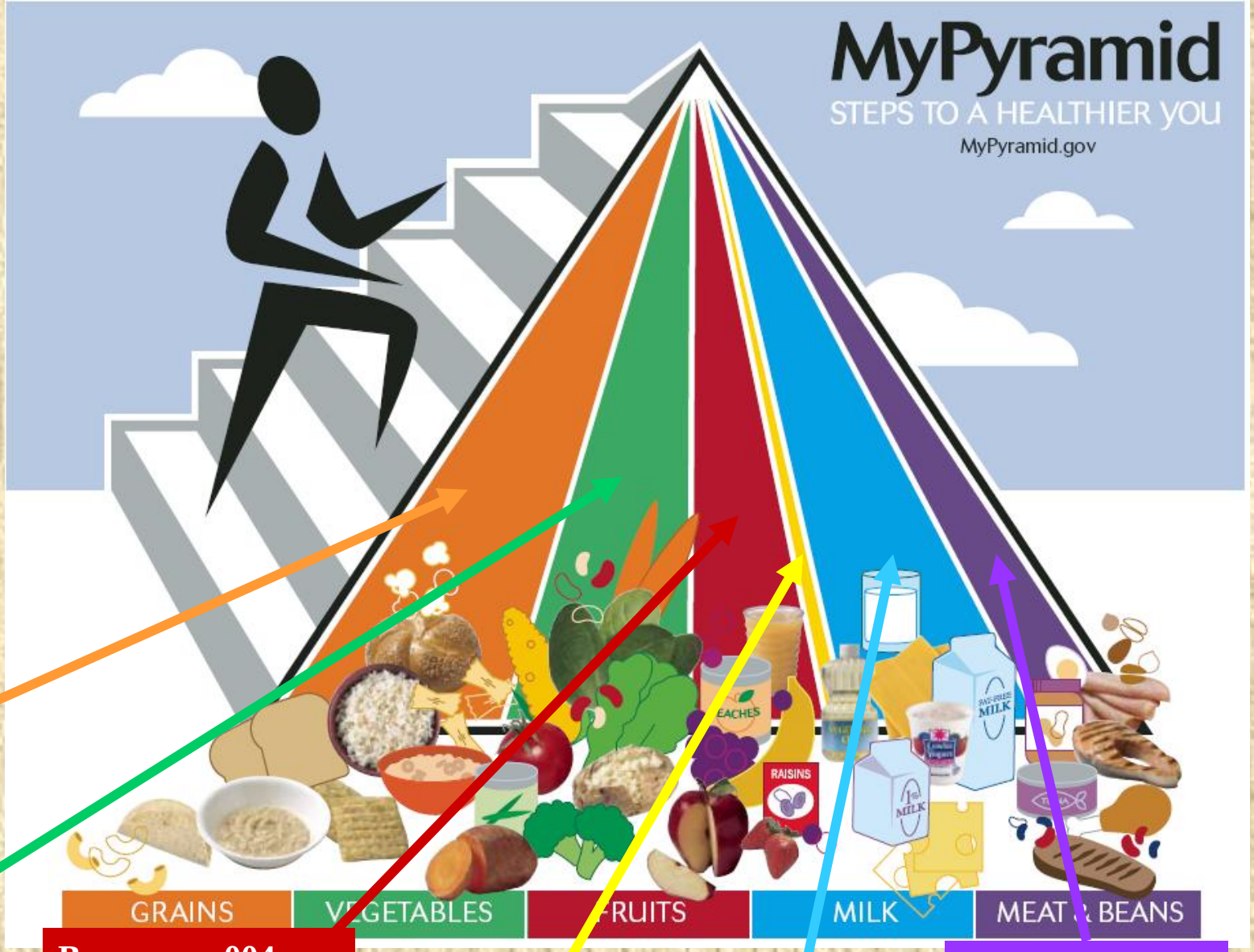
Consumer Prices for Foods



White Bread: 0.0
Rice: -.031
Pasta: -.008

Lettuce: -.004
Tomatoes: +.003
Carrots: -.003
Potatoes: 0.0

Bananas: -.004
Apples: -.006
Oranges: 0.0
Grapefruit: -.002

White Sugar: -.008
Butter: -.023

Milk: -.011
Cheese: -.033

Turkey: -.021
Chicken: -.009
Eggs: -.015
Beef: -.031

Statistics report linear trends in real prices over 1980-2003: source; http://data.bls.gov/

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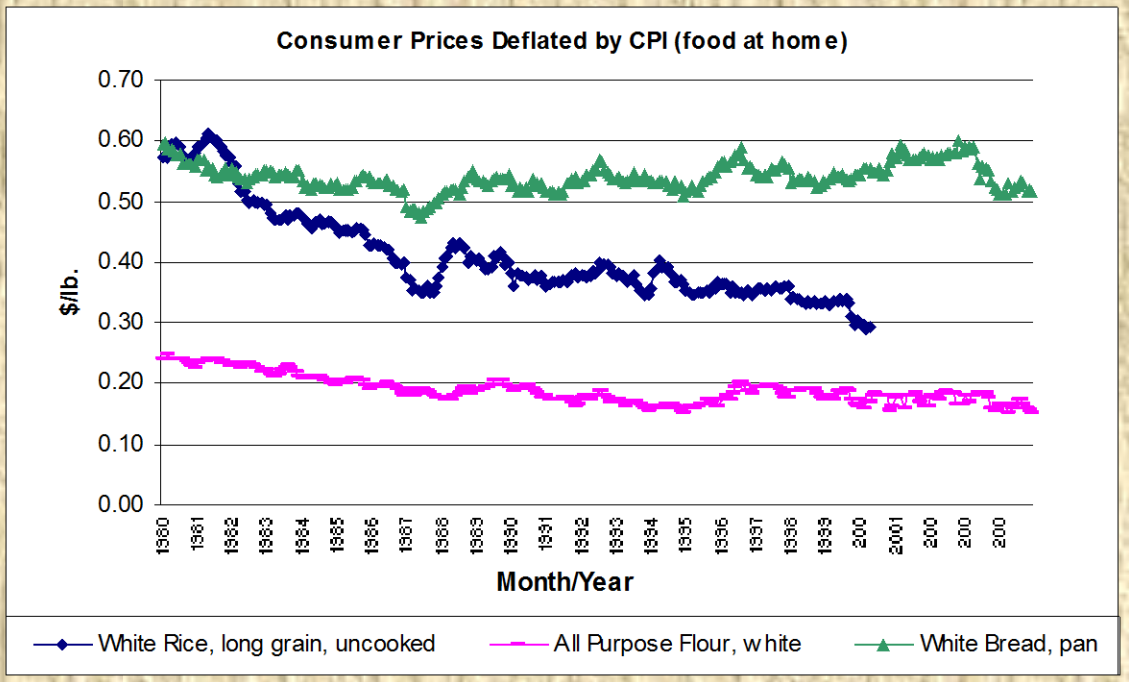
Food Prices in Terms of the Wages

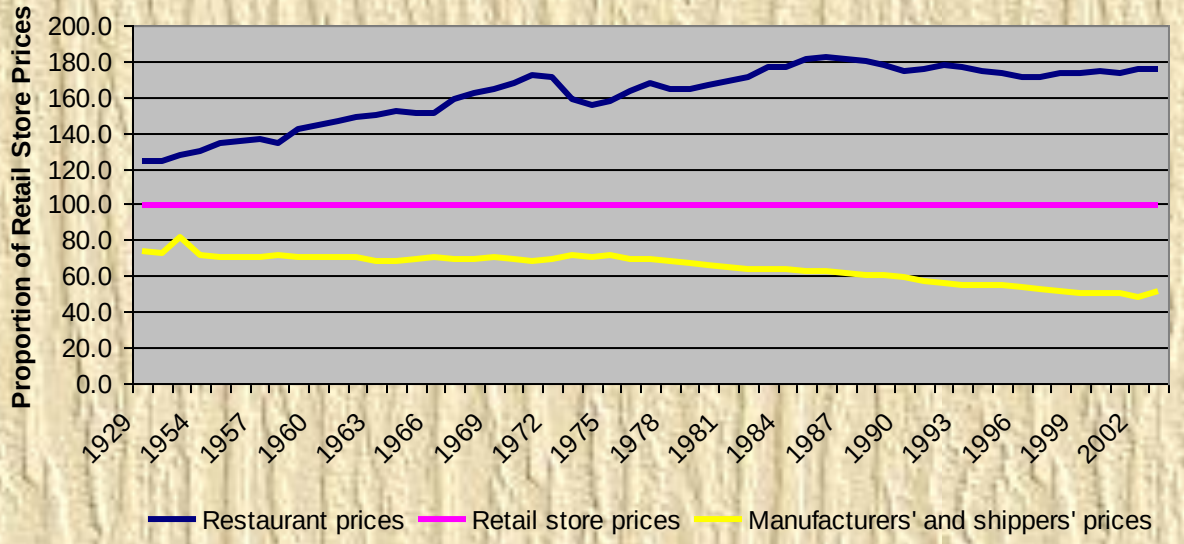
- Tomatoes (3 lbs.) (18% of the historical price today)
  - 1919: 101 minutes
  - 1997: 18 minutes
- An Orange (13% of the historical price today)
  - 1919: 68 minutes
  - 1997: 9 minutes
- 3-Pound Chicken (9% of the historical price today)
  - 1919: 2hours 37 minutes
  - 1997: 14 minutes
- Dozen Eggs (6% of the historical price today)
  - 1919: 80 minutes
  - 1997: 5 minutes
- Hamburger (33% of the historical price today)
  - 1940: 27 minutes of work
  - 1997: 9 minutes of work
- Pizza (88% of the historical price today)
  - 1958: 57 minutes
  - 1997: 50 minutes

Source: Dallas Fed

‘Disconnect’ Between Commodity & Food Prices



Divergence Between Retaurant and Shippers' Prices



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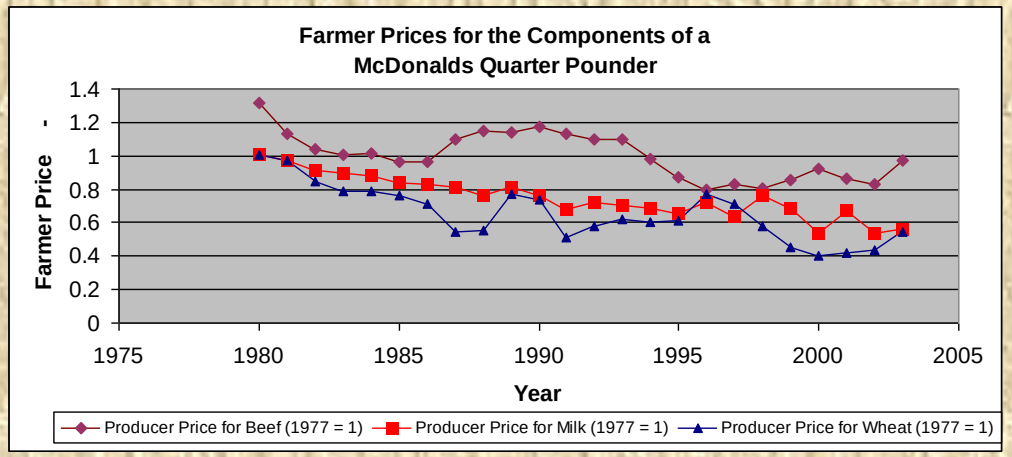
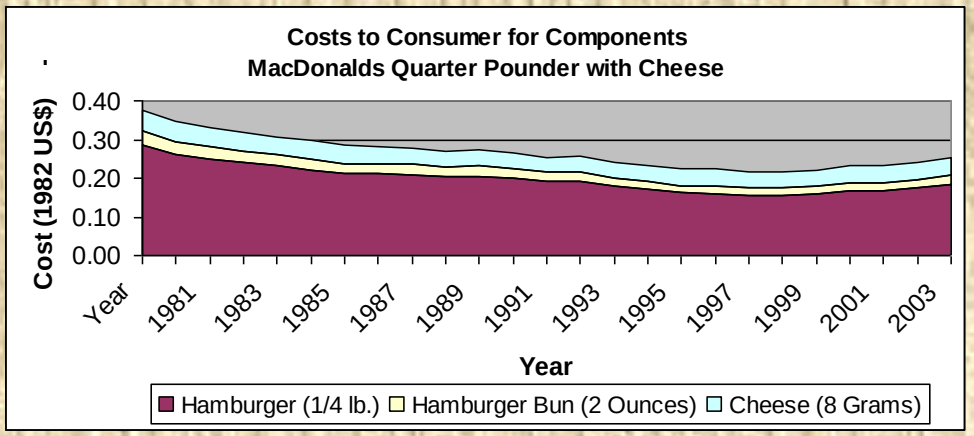
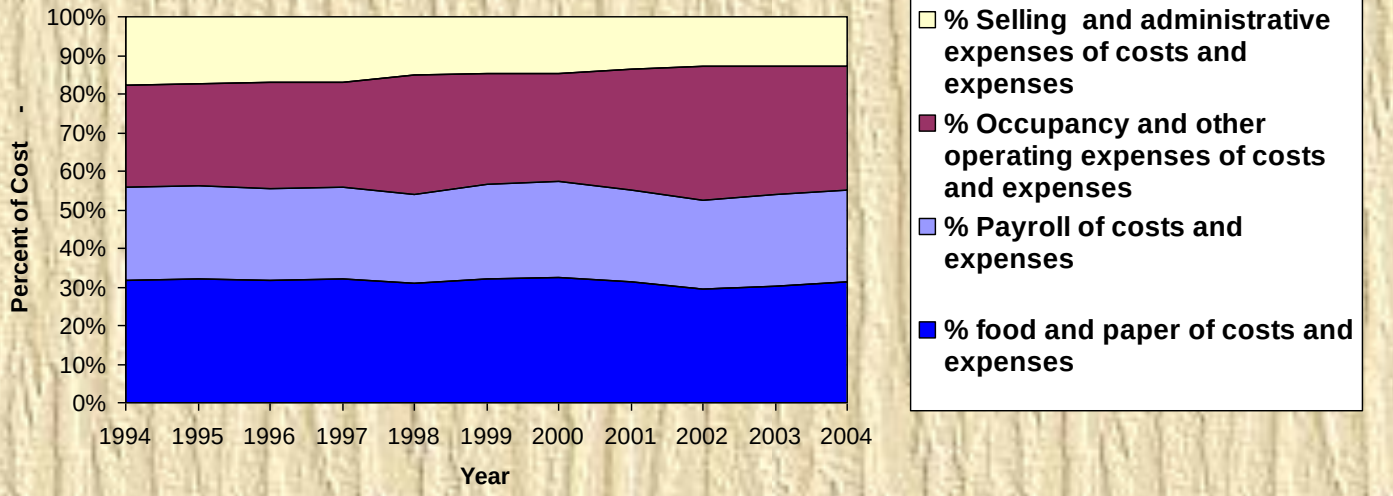
Costs of Producing Fast Foods





Pecent of Costs and Expenses
McDonalds Corporation



http://www.mcdonalds.com/corp/invest/pub.html

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Policy Instrument 'Test'

- Size of the Externality
  - Social costs associated with obesity
- Size of Behavioral Response
  - Price elasticities tend to be very low (USA)
- Implementation Costs
- Lags in Intended Effects
- Unintended Effects
- Alternative Policy Instruments

Elasticity estimates from: http://www.ers.usda.gov/Data/InternationalFoodDemand/

Preliminary Conclusions and Policy Implications

- Agricultural Policy ➔ Commodity Prices
  - Commodity Support Programs
    - Effects on farmer income are large; Effects on commodity prices are small, varied and difficult to predict
  - Publicly Sponsored Agricultural Research
    - Chiefly responsible for past yield increases and price declines
- Commodity Prices ➔ Food Prices ➔ Caloric Intake
  - Increasing 'disconnect' between commodity prices and food prices
  - Role of food industry needs to be better understood and exploited
    - Entry points for changes in food preparation technologies and portion sizes
- Managing food consumption via macro-management of commodity prices is probably a bad strategy
  - Is cheap food a bad thing?
  - Can reductions in agricultural R&D reduce obesity?
- Micro-Management of Food Prices Might Not Be Wise
  - Price responses are generally low
- Agricultural Policy for Dealing with Obesity
  - Increased yields, and improved quality and availability of fruits/vegetables
    - Large role for private sector
- Difficult to Defend the 'Increasingly Out of Reach' Hypothesis

Next Steps

- **ASSA Paper (Joint Presentation with IFPRI/FCND)**
  - Implications for developing countries of research results to date
- **USDA Small Grant**
  - Effects of agricultural policies on low-income consumers in the USA
- **USDA Large Grant (pending)**
  - Joint with Iowa State University
  - Agricultural policies, sweetener subsector, WIC
    - Research, training, outreach, curriculum development
- **Dual-Constraint Model**
  - Combined effects of income and time constraints on consumption patterns of low-income groups

Muito Obrigado!