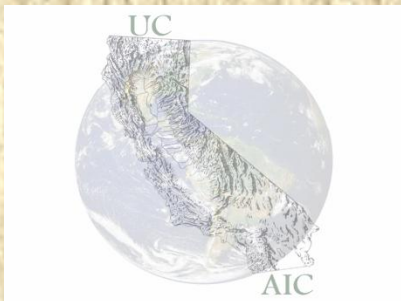




# Effects of Agricultural Research and Farm Subsidy Policies on Human Nutrition and Obesity

**Julian Alston**  
**Daniel Sumner**  
**Stephen A. Vosti**

**Agricultural  
Issues  
Center**



**Center For Natural  
Resources Policy Analysis,  
UC Davis**

**July 2005**

Alston, Sumner, Vosti UCD/AIC

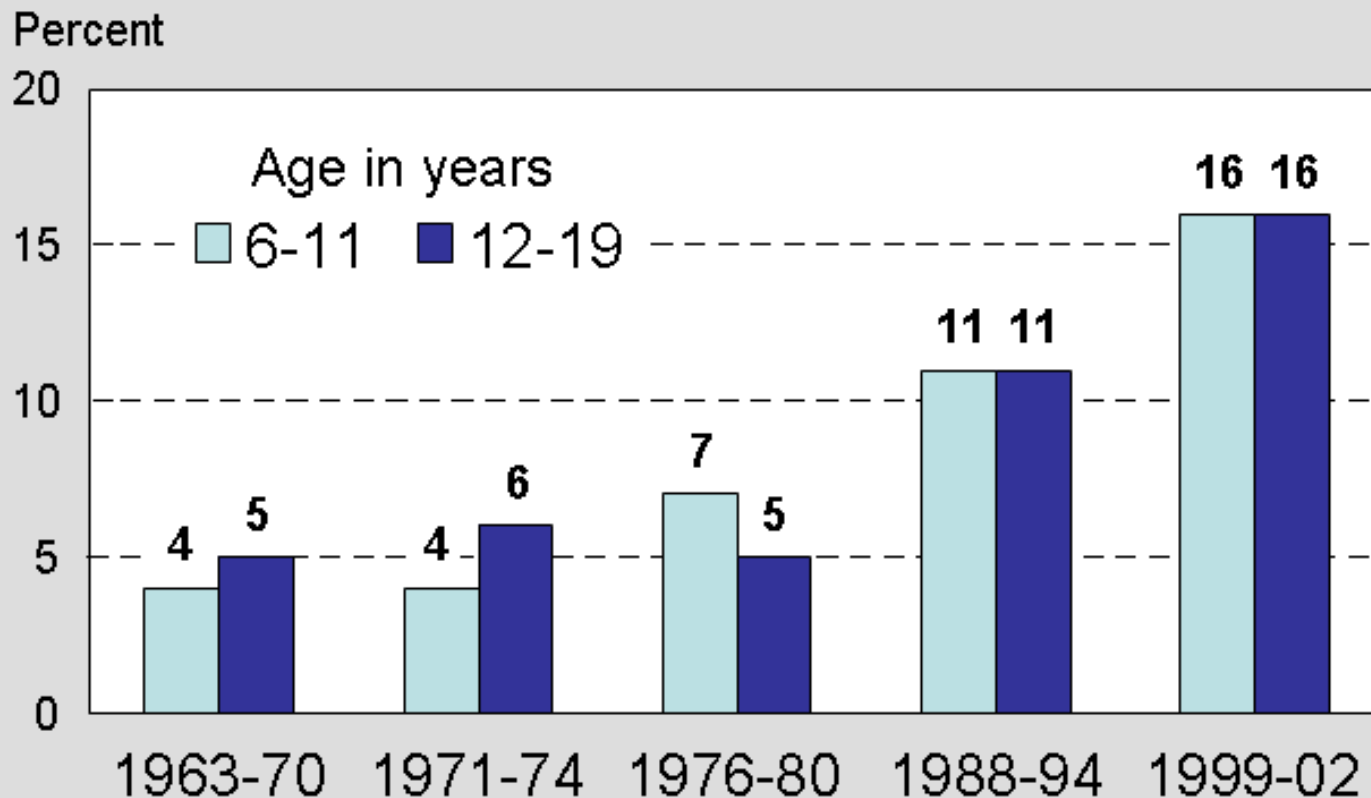


# Presentation Outline

- **Obesity in the U.S. – Trends and Presumed Causes**
- **Farm Subsidy Policy – The ‘Smoking Gun’**
- **A Broader Look at Agricultural Policy – Farm Subsidies and R&D**
- **Commodity Prices**
- **Food Prices**
- **Poverty and Food Security in the US**
- **Preliminary Conclusions and Implications for Research and Policy**



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



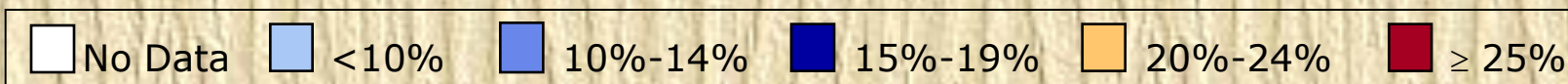
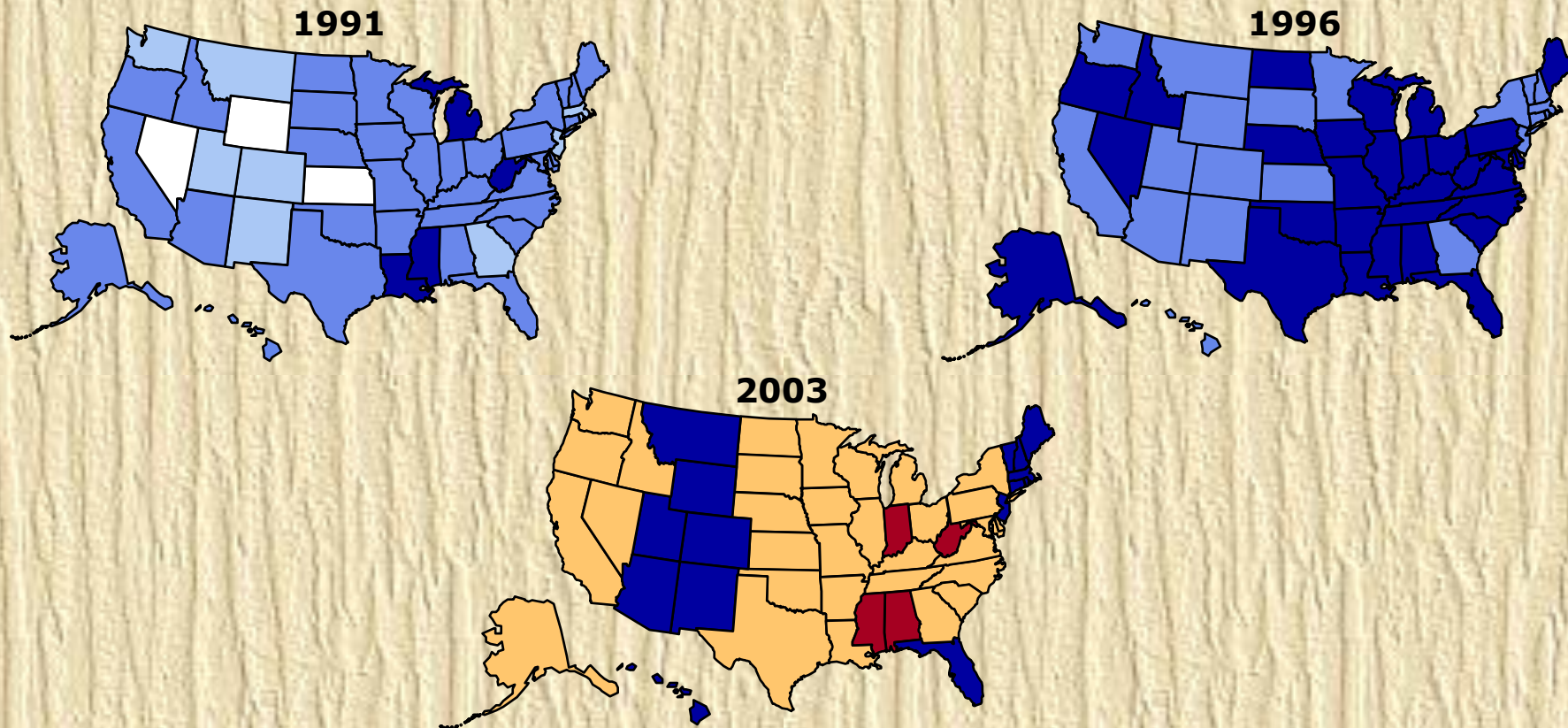
NOTE: Excludes pregnant women starting with 1971-74. Pregnancy status not available for 1963-65 and 1966-70. Data for 1963-65 are for children 6-11 years of age; data for 1966-70 are for adolescents 12-17 years of age, not 12-19 years.  
SOURCE: CDC/NCHS, NHES and NHANES

**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  $\geq 30$ , 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 This Happening?**
  - 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?



# 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)



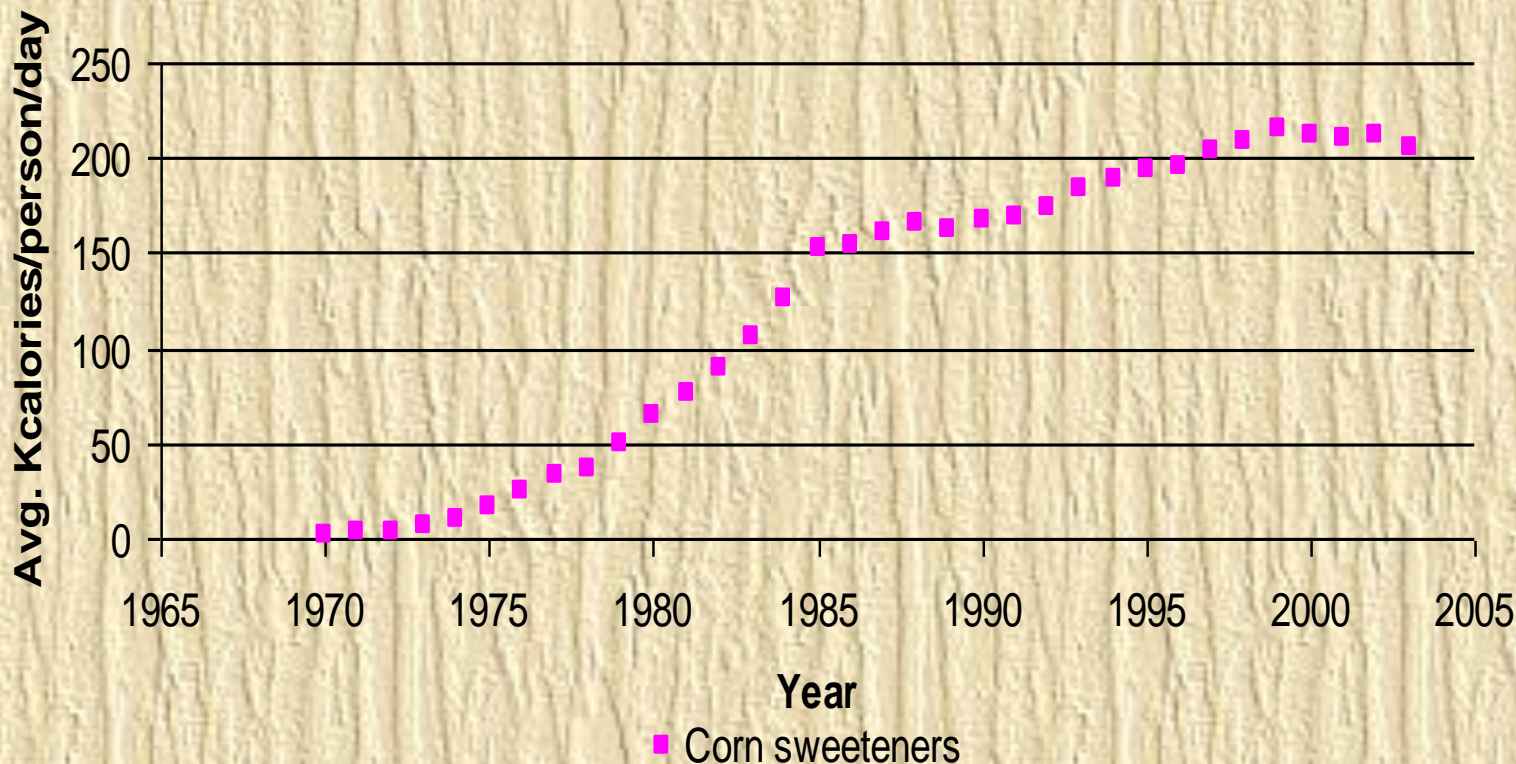
# Focus of Our Current Efforts

- **Commodity Programs**
- **Agricultural R&D**
- **Foci of Future Work**
  - **WIC**
  - **Trade Policy**



# The 'Smoking Gun'

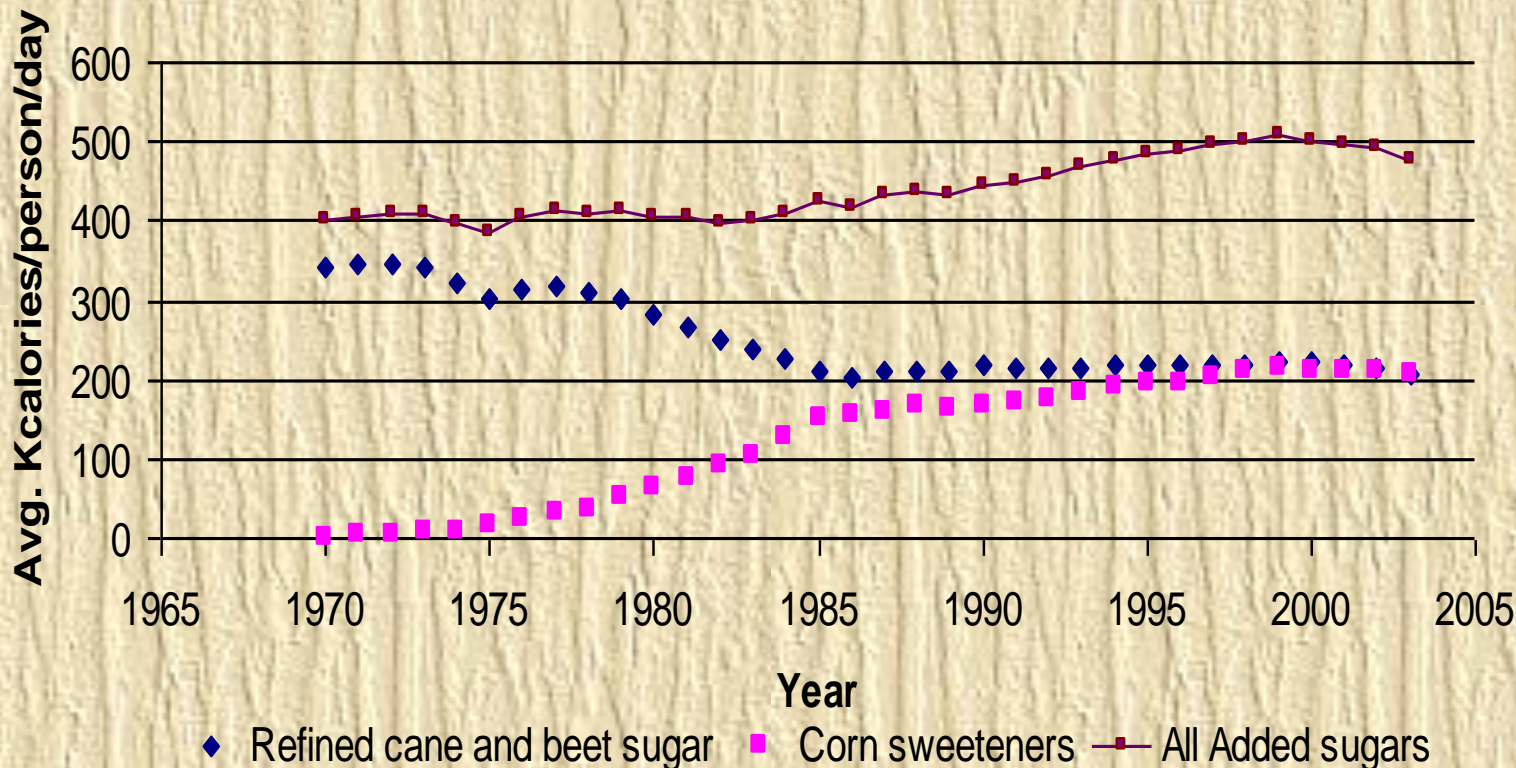
## Trends in Consumption of Corn Sweeteners





# The More Complete Story

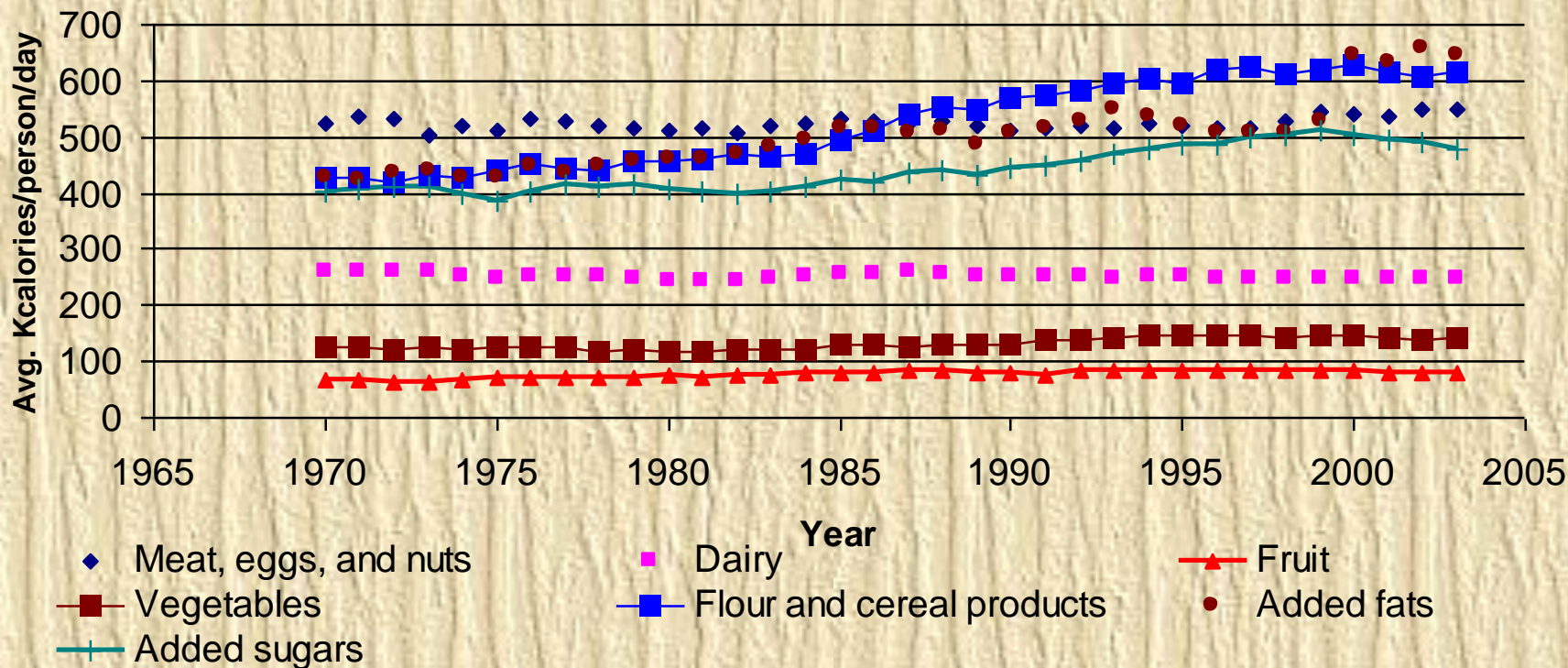
## Trends in Consumption of Selected Sweeteners





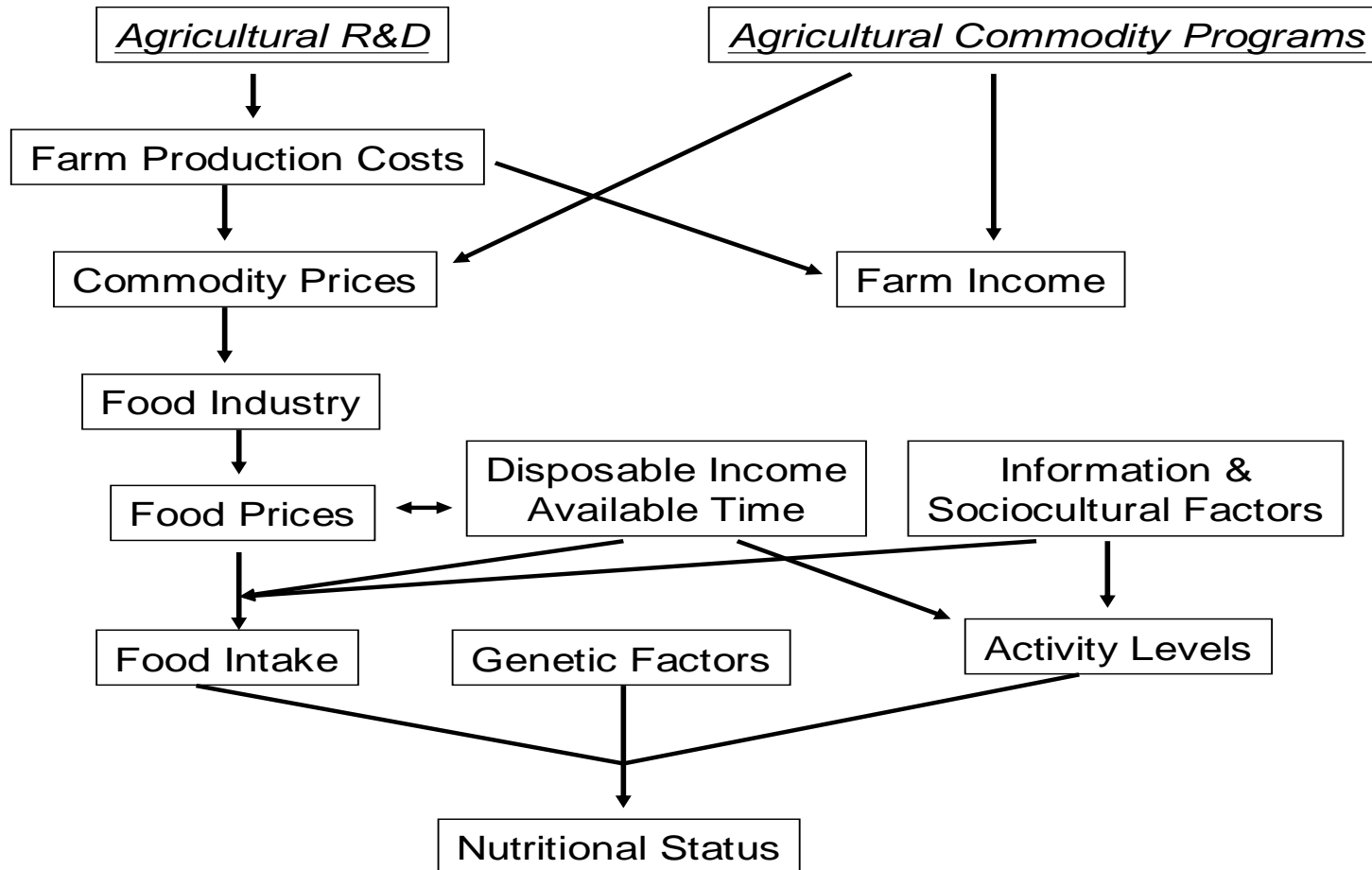
# The Much More Complete Story

## Calories from Different Food Groups





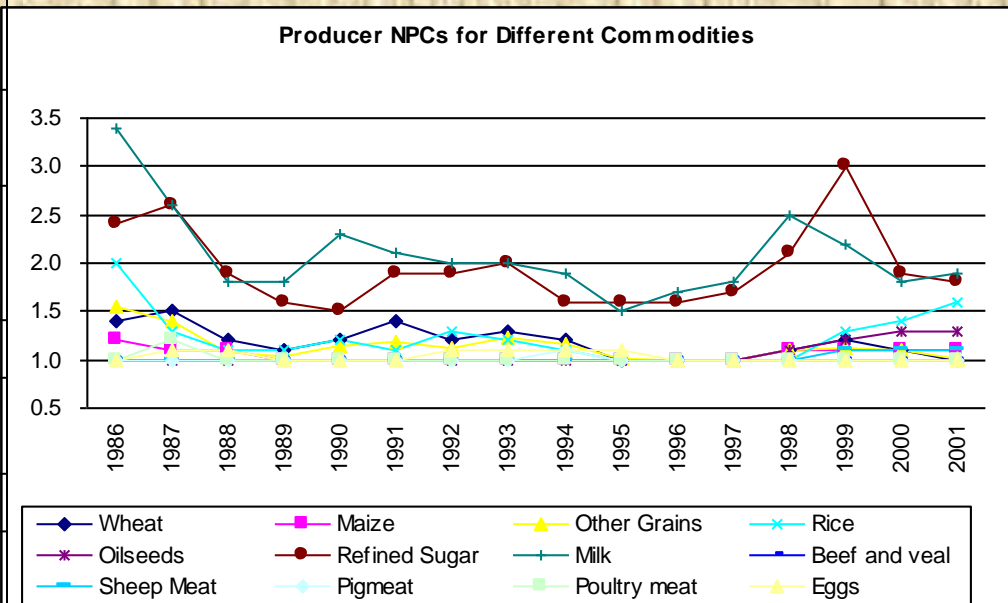
# Links Between Selected Agricultural Policies and Human Nutrition





# Types, Magnitudes and Effects of Agricultural Policies

USDA Program	Expenditure in 2004	Percent of Total
	<i>billions of dollars</i>	<i>percent</i>
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
<b>TOTAL</b>	<b>112.9</b>	<b>100.0</b>

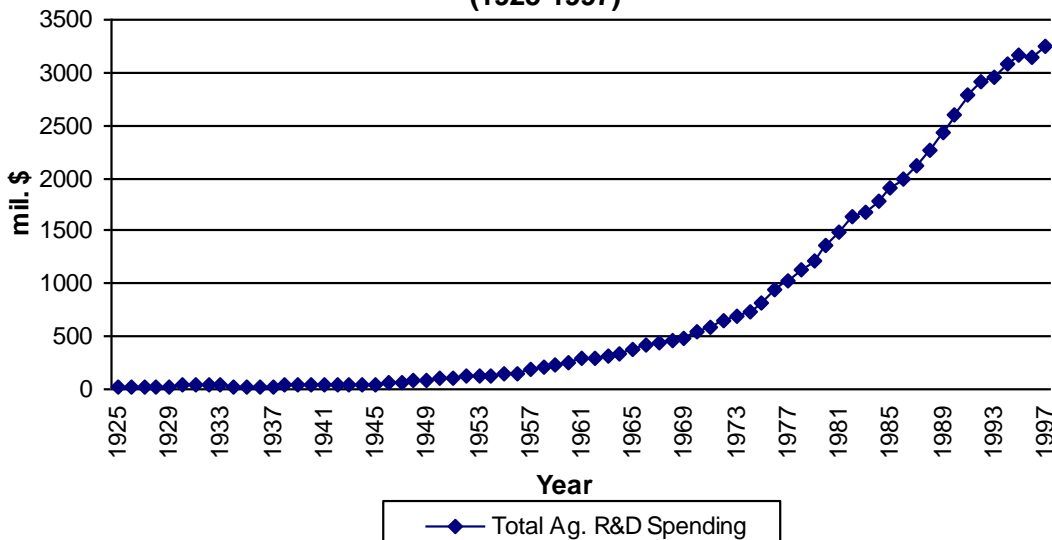


Producer NPC = [domestic price received by producers (at the farm gate) + unit payments based on output] / border price (also at the farm gate)

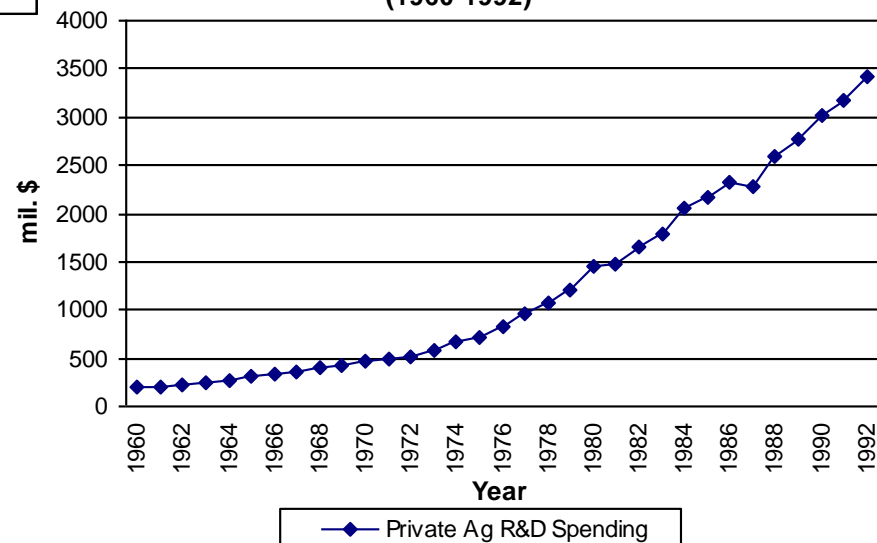


# Trends in Agricultural R&D

### Total Federal and State Spending on Ag. R&D (1925-1997)



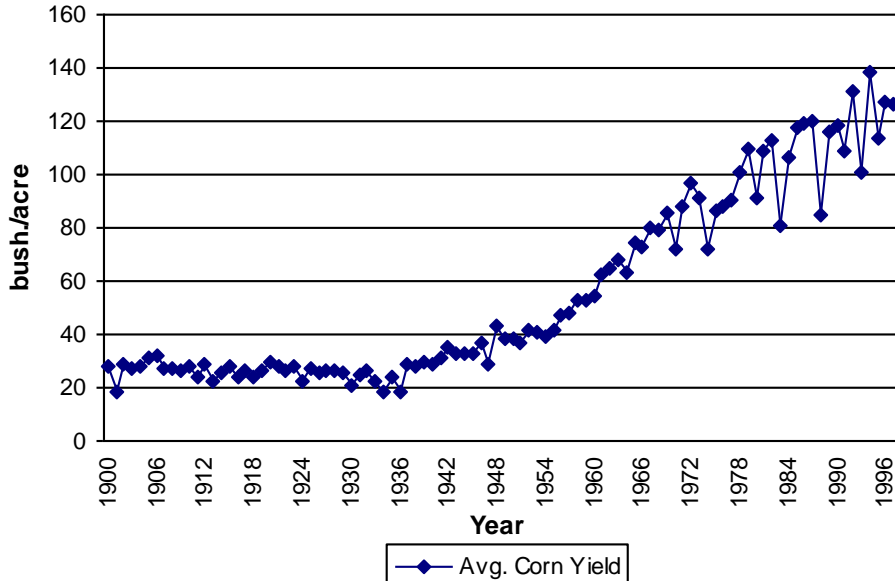
### Total Private Sector Spending on Ag R&D (1960-1992)



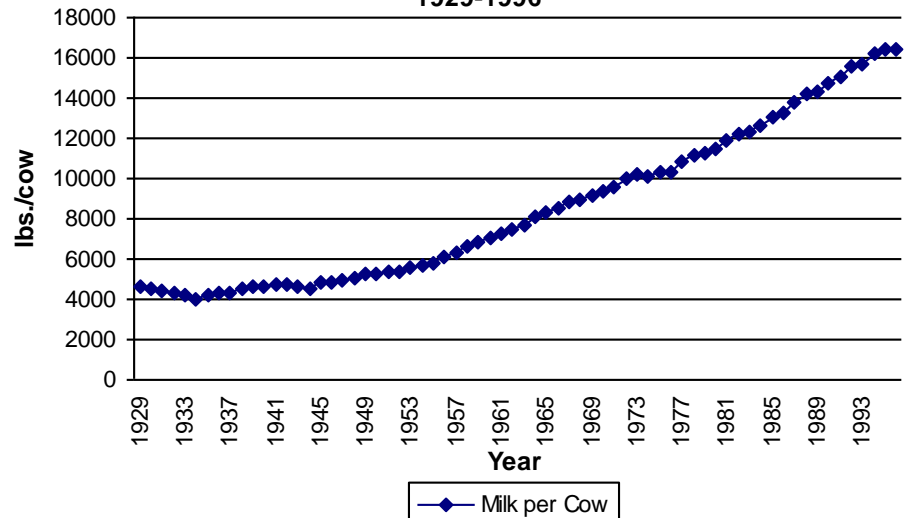


# Trends in Productivity

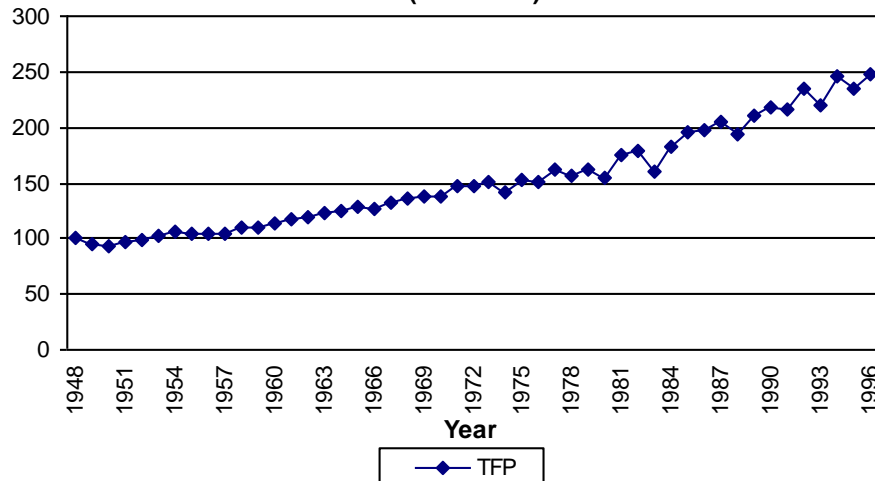
### Average Yield of Corn 1900-1997



### Milk Production per Cow 1929-1996



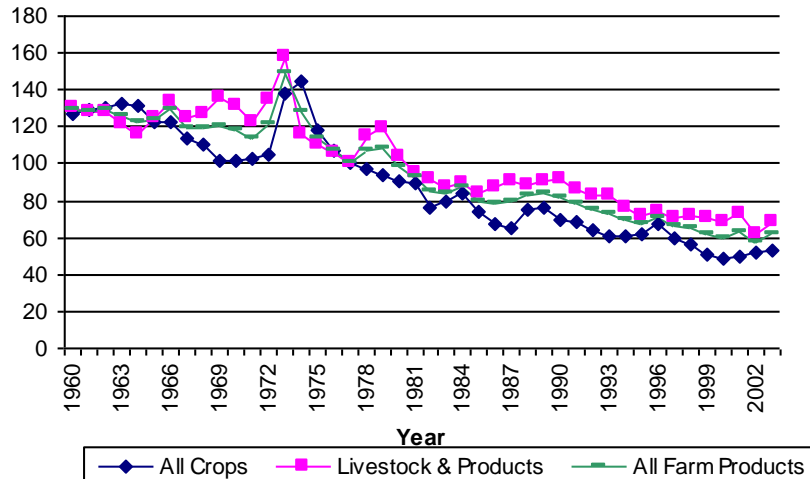
### Total Factor Productivity Index (1948=100)



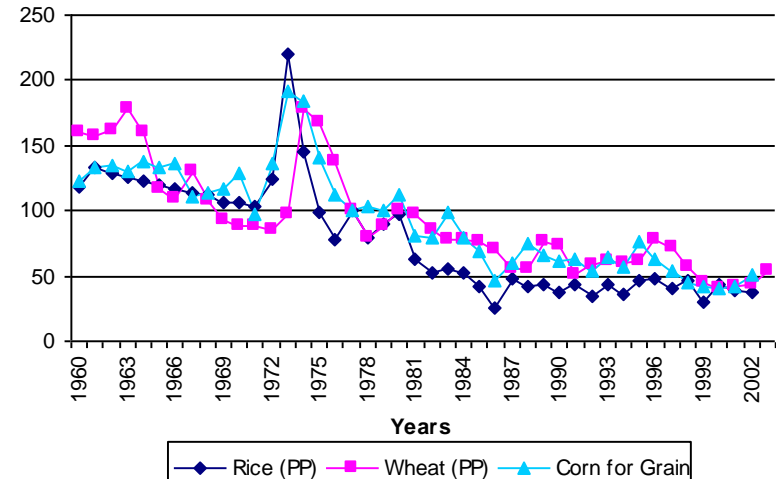


# Trends in Prices Received By Farmers

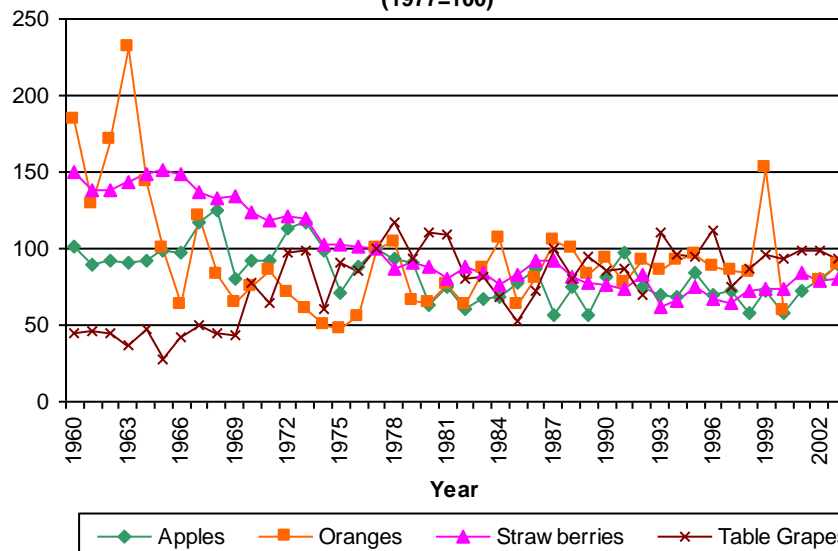
Prices received Deflated with prices paid (Commodities, services, interest, taxes, wages) (1977=100)



Deflated Prices Received for Selected Grains (1977=100)



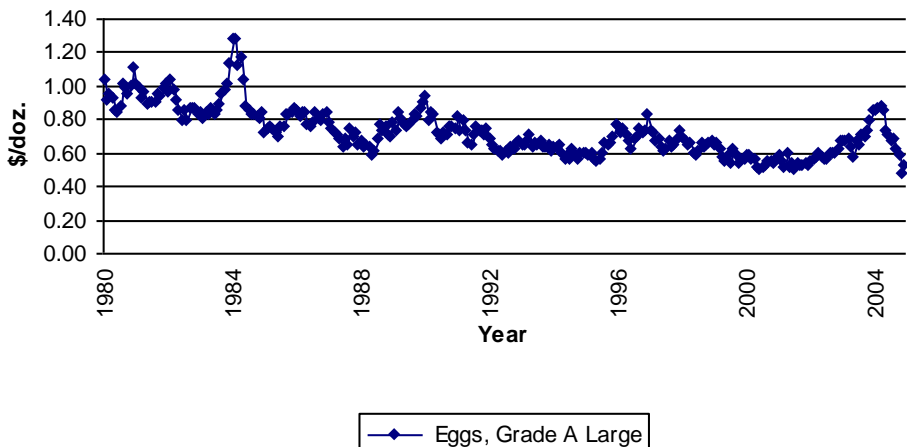
Deflated Prices Received for Selected Fruits (1977=100)



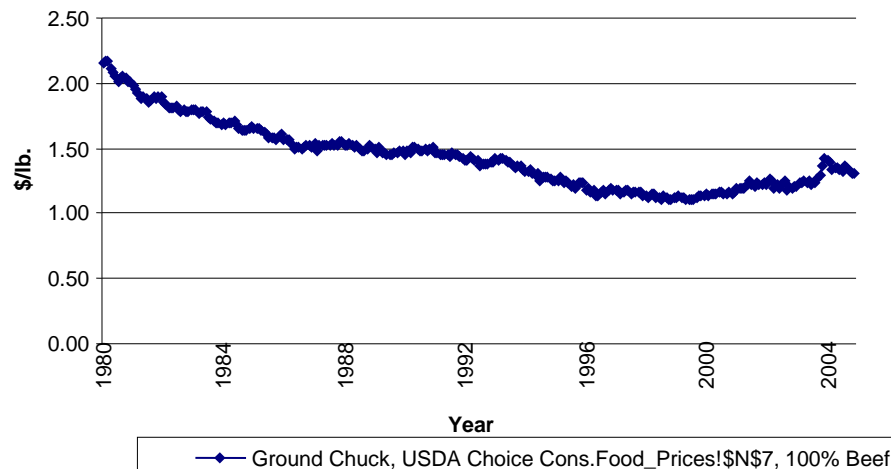


# Prices Paid By Consumers – Basic Stuff

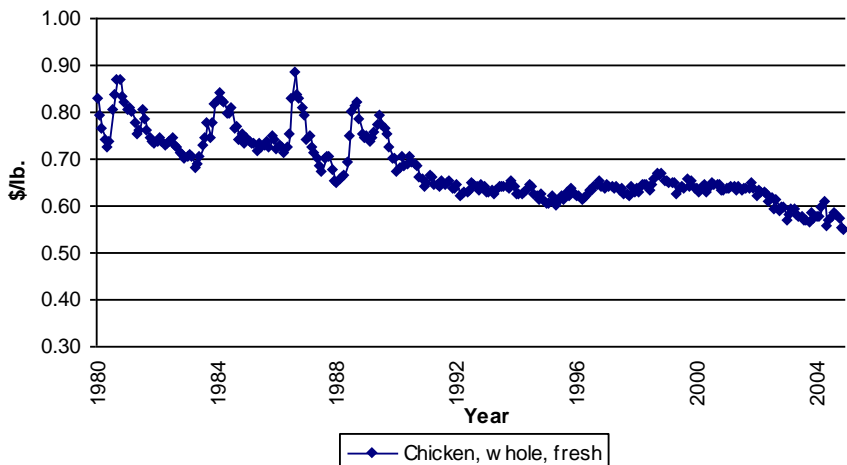
Consumer Prices for Eggs Deflated by CPI (food at home)



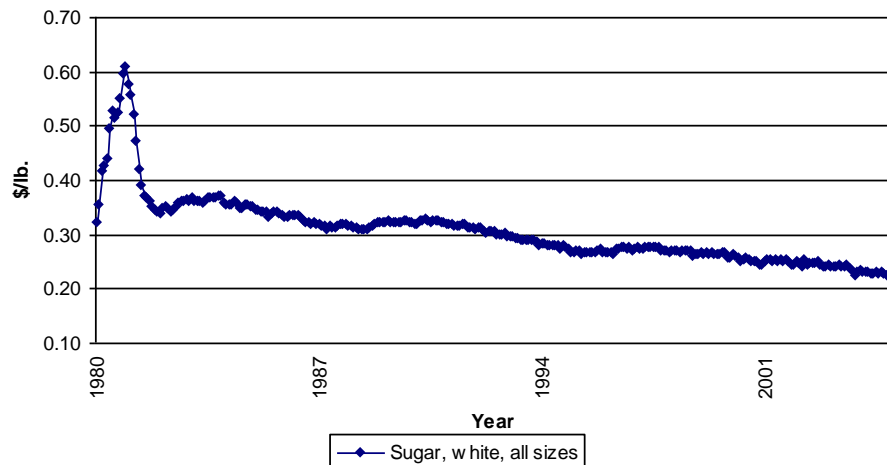
Consumer Prices for Ground Beef Deflated by CPI (food at home)



Consumer Prices for Chicken deflated by CPI (food at home)



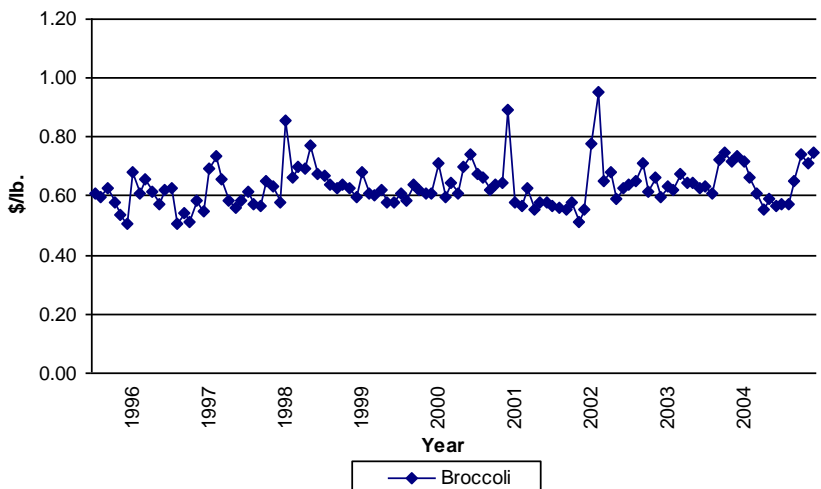
Consumer Prices for White Sugar Deflated by CPI (food at home)



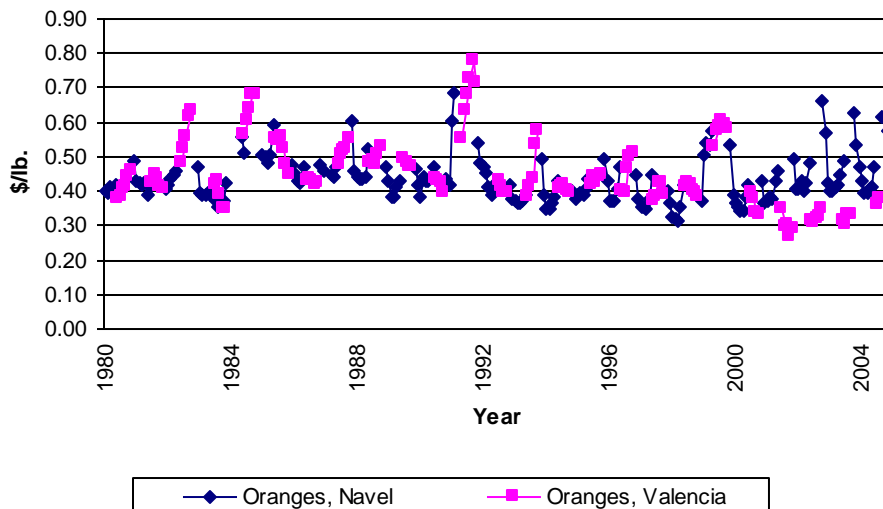


# Prices Paid By Consumers – Fruits and Vegetables

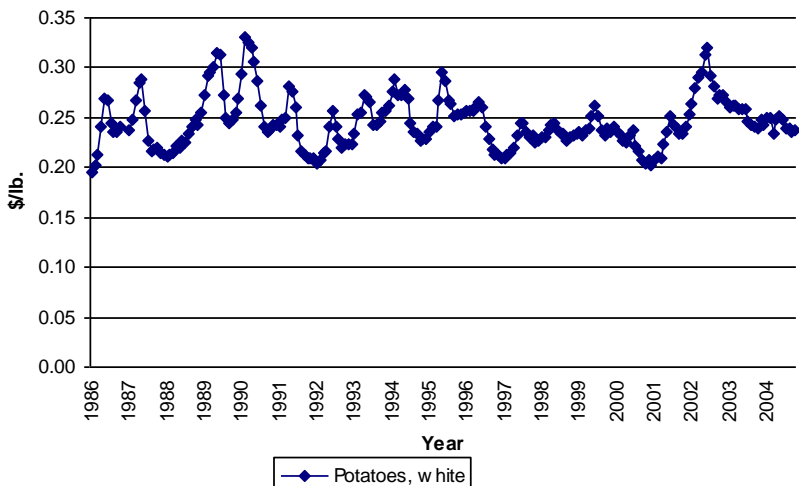
### Consumer Prices for Broccoli Deflated by CPI (food at home)



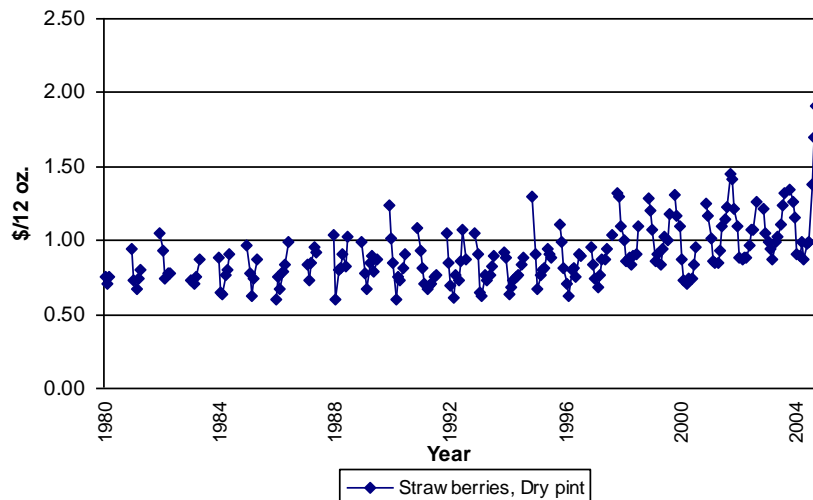
### Consumer Prices for Oranges Deflated by CPI (food at home)



### Consumer Prices for Potatoes Deflated by CPI (food at home)



### Consumer Prices for Strawberries Deflated by CPI (food at home)





# 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

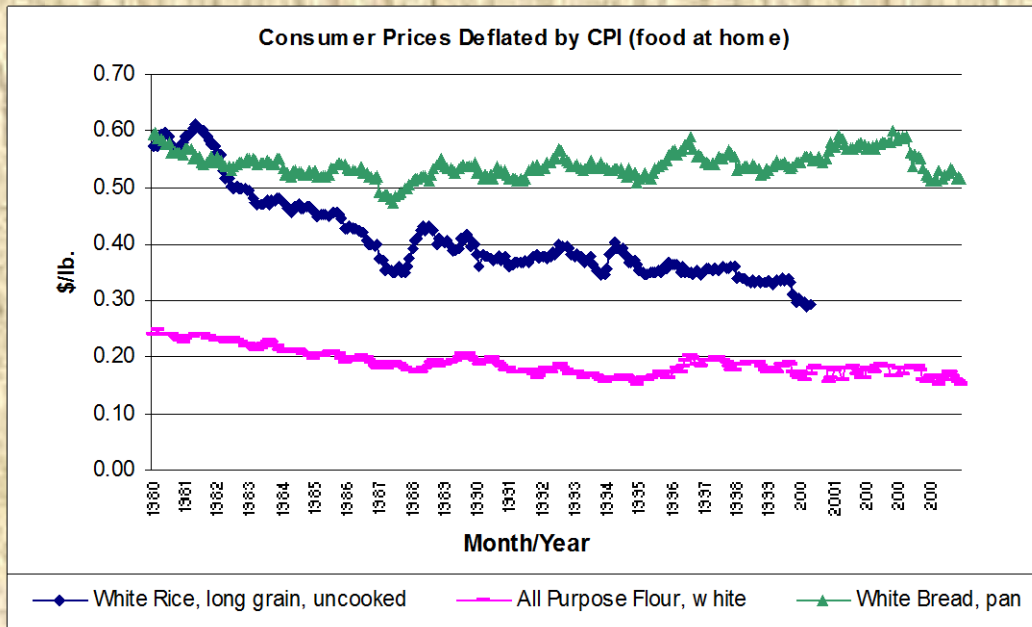


# The (Old) Food Pyramid: Consumer Prices

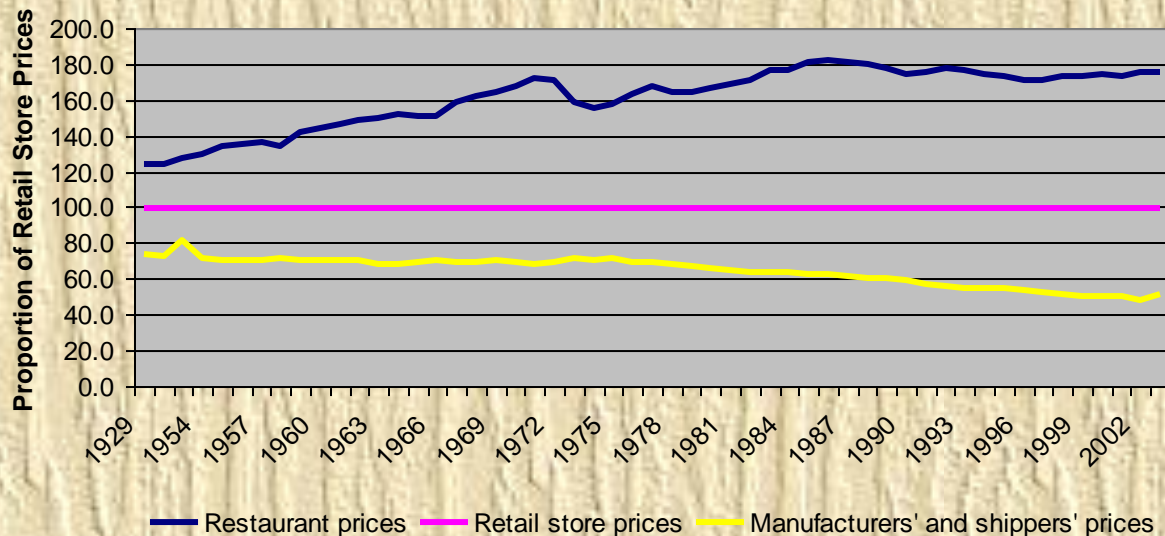




# 'Disconnect' Between Commodity & Food Prices



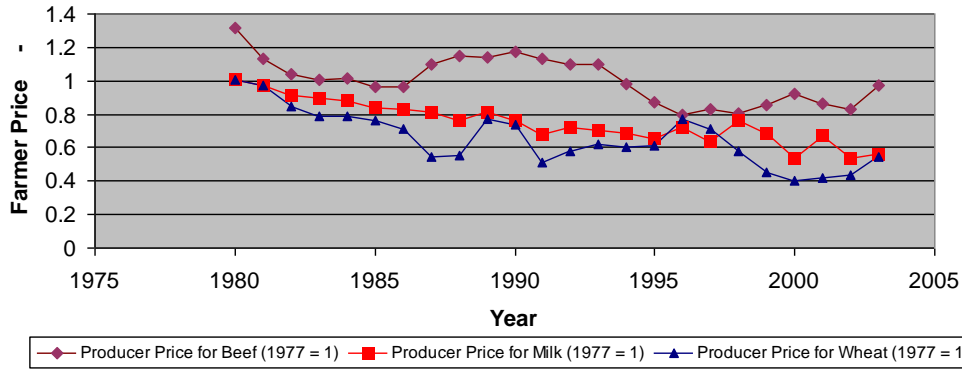
## Divergence Between Restaurant and Shippers' Prices



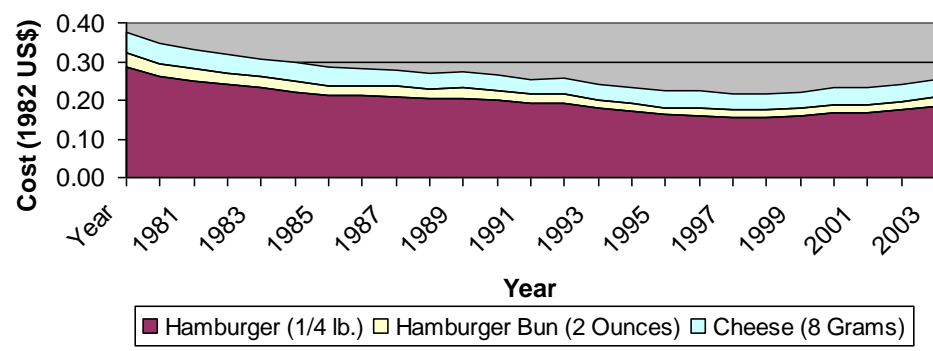


# Costs of Producing Fast Foods

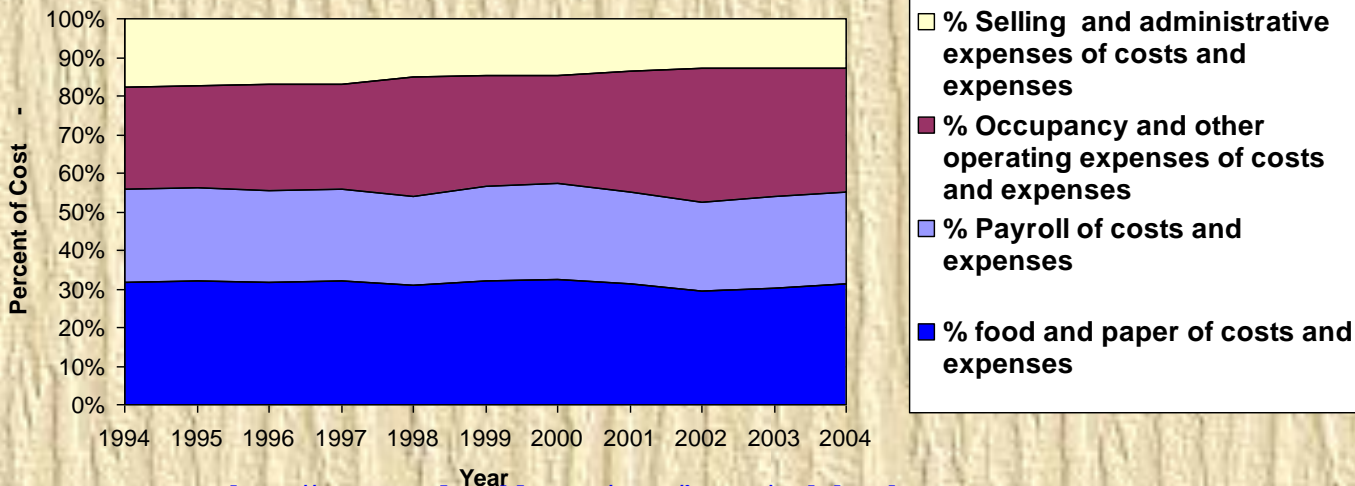
Farmer Prices for the Components of a McDonalds Quarter Pounder



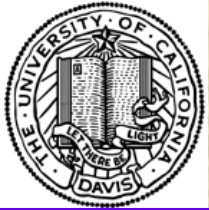
Costs to Consumer for Components MacDonaldis Quarter Pounder with Cheese



Pecent of Costs and Expenses McDonalds Corporation

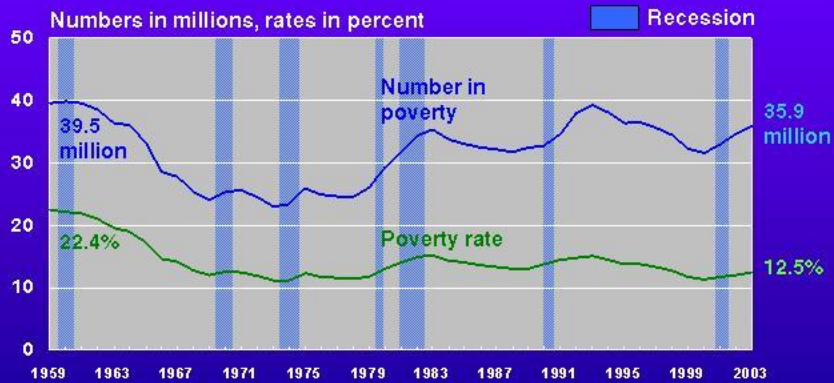


<http://www.mcdonalds.com/corp/invest/pub.html>



# The Poverty And Food Security Stories

## Poverty: 1959 to 2003



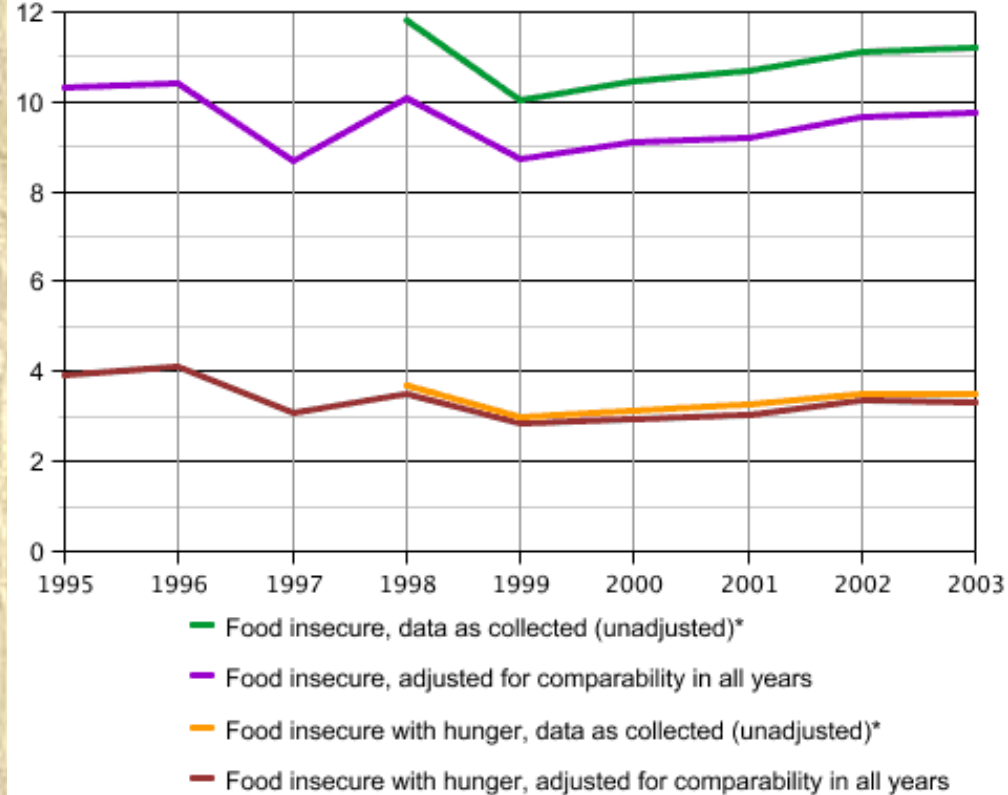
Source: U.S. Census Bureau, Current Population Survey, 1960 to 2004 Annual Social and Economic Supplements.

USCENSUSBUREAU

4

## Trends in the prevalence rates of food insecurity and food insecurity with hunger in U.S. households, 1995-2003

Percent of households



\*Data as collected in 1995-97 are not directly comparable with data collected in 1998-2003.  
Source: Calculated by ERS based on Current Population Survey Food Security Supplement data.

Alston, Sumner, Vosti UCD/AIC



# 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?
- **Agricultural Policy for Dealing with Obesity**
  - Increased yields, and improved quality and availability of fruits/vegetables
    - Large role for private sector
    - Caloric ‘catalytic converters’
- **Difficult to Defend the ‘Increasingly Out of Reach’ Hypothesis**