Sugar Policies and Added Sugars in US Diets

Have Farm Policies Made Us Consume More Sweeteners?

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Introduction

- Increase in dietary intake of sweeteners
- Shift from sugar to other sweeteners
- Factors linked to change in sweeteners
  - Farm policies that lead to “cheap” ingredient sweeteners
  - Low cost retail prices for sweetened beverages
  - Consumer demand for convenience, sweet tasting foods

Introduction

- Public health concerns
  - Health effects from high share of calories
  - High Fructose Corn Sweetener (HFCS) contributes to high intake
  - Excess calorie intake linked to obesity
- Public policy response
  - Dietary guidance
  - Limit access in food and school programs

Issues addressed

- What is the influence of farm policy on changes in added sugar in the US diet?
- Has farm policy contributed to the change in sweetener consumption and composition?
- What is its contribution today?

Figure 1. Per capita sweetener deliveries
Sugar use per capita has fallen; corn-based sweetener use has increased. Total sweetener use peaked in 1999. HFCS use explains most of the corn-based sweetener use.

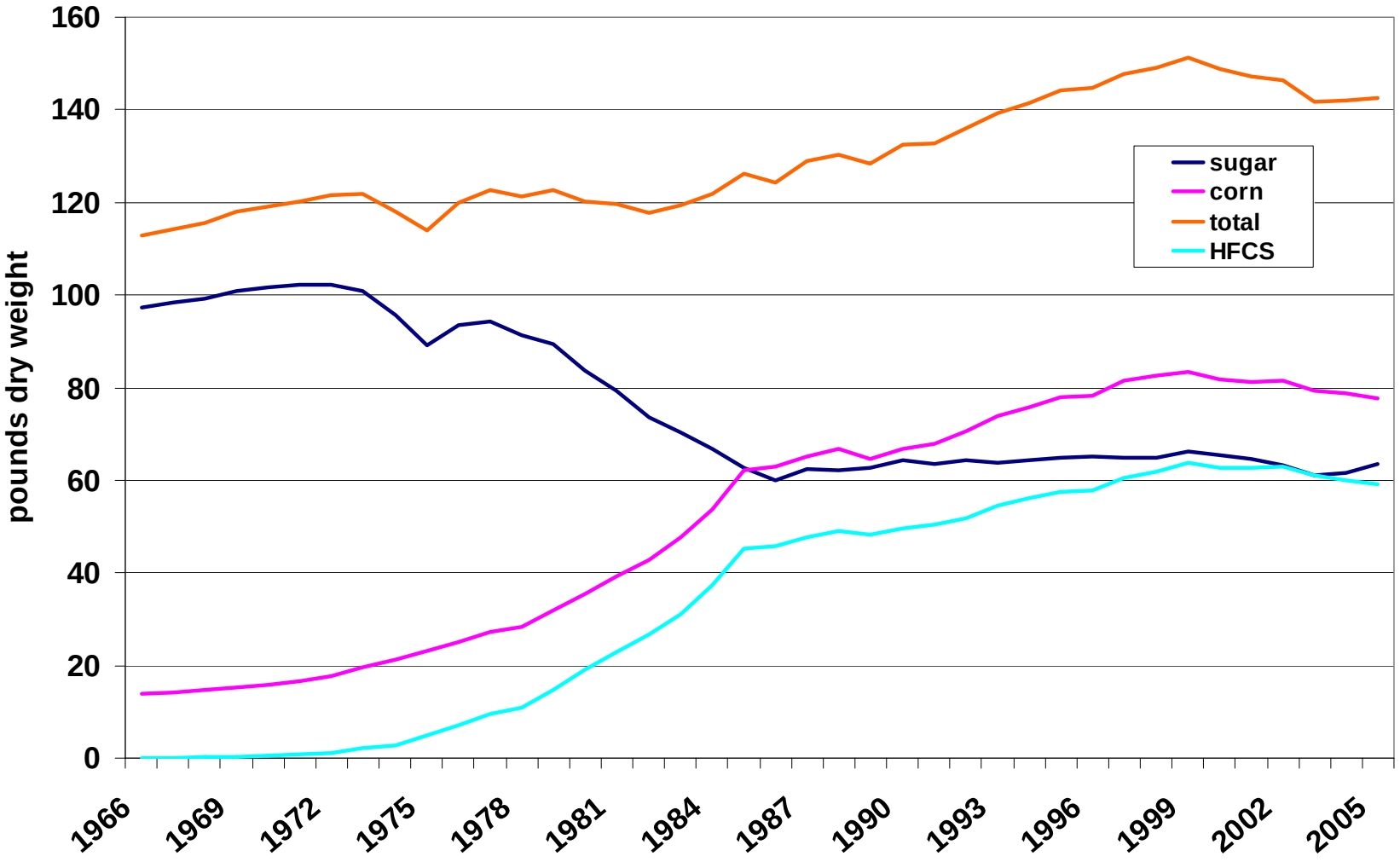
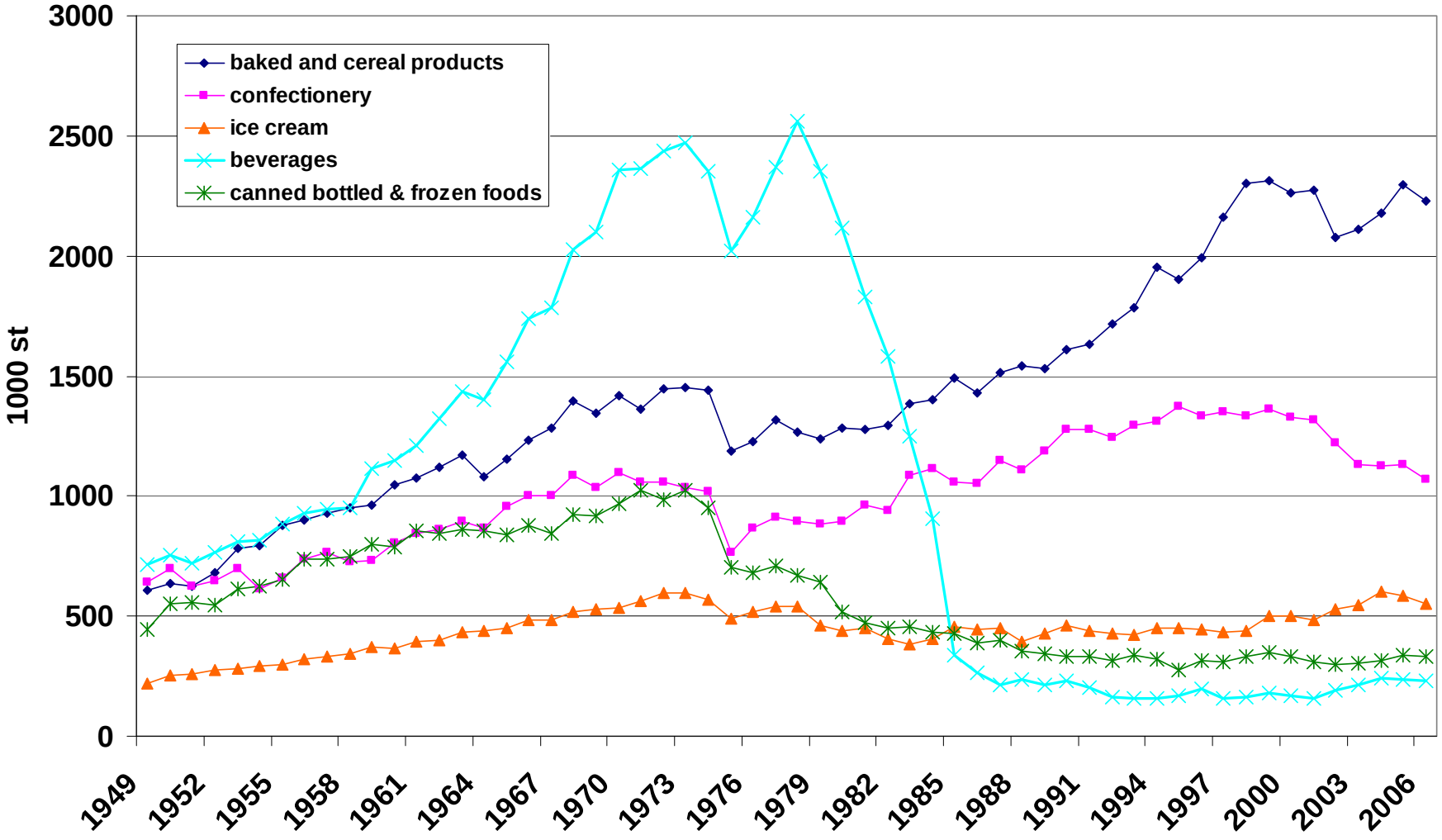


Figure 2. Industrial use of sugar by product group
Baked and cereal products have become the most important industrial users of sugar. Beverage products used to be but that use collapsed after 1978.



Changes in final demand

- Sweetening of the World's diet
  - Popkin and Nielsen, 2003
  - Increase in soft-drinks and sugared fruit drinks
  - Caloric sweeteners as increased share of calories and carbohydrates
- Rising income and urbanization
- Industry influence on serving size, convenience products (vending machines)
- Product attributes that favor HFCS

Table 1. Intake of total added sweeteners as gram-equivalents and as percentage of total energy, 1994-96

	Mean Intake of total added sweeteners	
Age-gender group	Gram-equivalents	% of total energy
2-5 y old children	60.9	15.9
6-11 y old children	90.7	18.6
12-17 y old females	97.7	20.1
12-17 y old males	141.8	20.4
18-34 y females	81.9	17.9
18-34 y old males	115.0	16.8
35-54 y old females	63.9	14.9
35-54 y old males	92.1	14.4
55-64 y old females	51.2	12.8
55-64 y old males	70.2	12.7
65+ y old females	44.9	12.4
65+ y old males	57.5	11.6
Total population, 2 y and older	82.2	15.8

Source: Guthrie and Morton, 2000

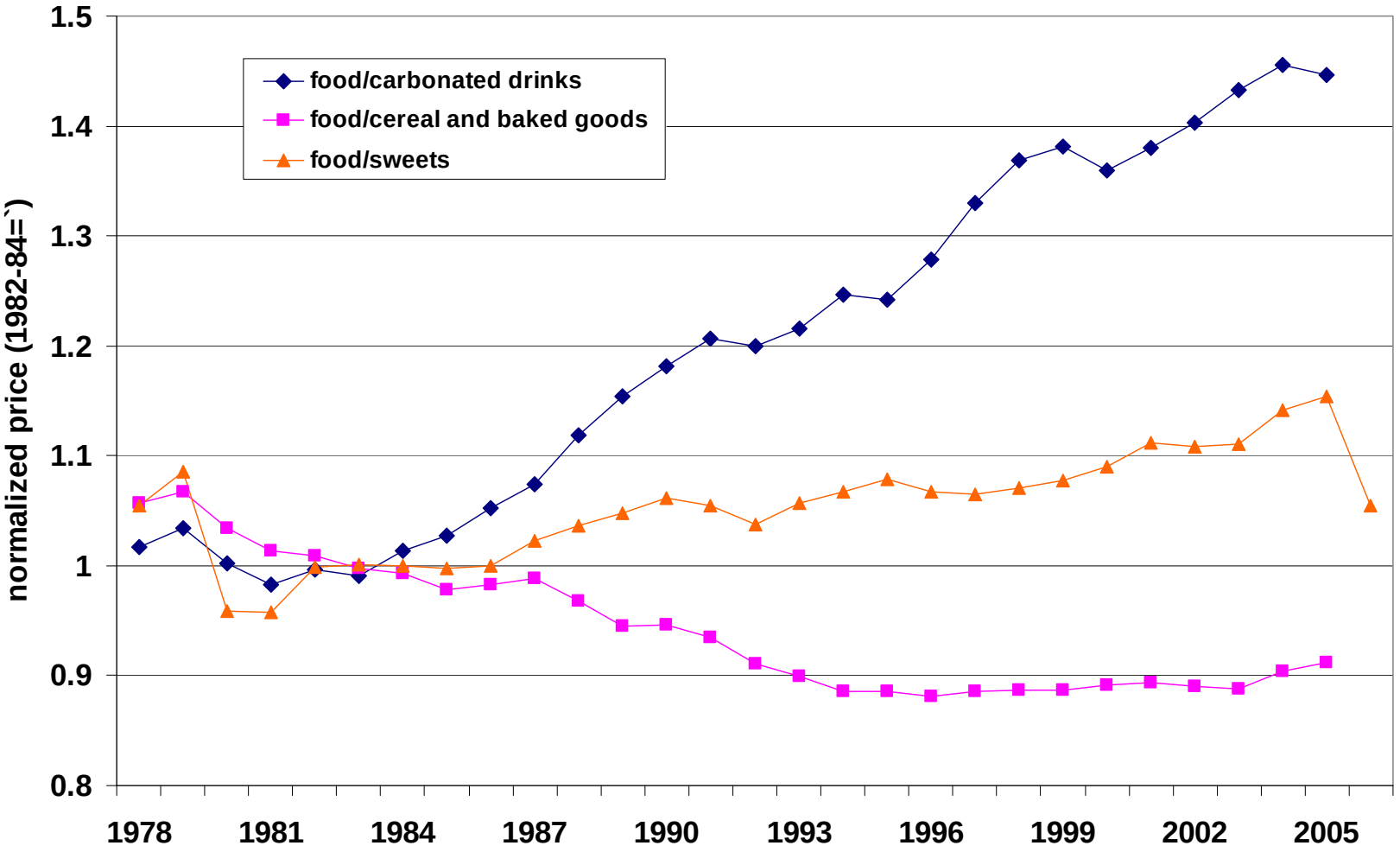
Table 2. Intake of added sweeteners by food category, people aged 2 yrs and older

Food category and examples of foods containing added sweeteners	Mean intake (gram-equiv.)*	% of total intake
Grains		
Breakfast cereals (presweetened cereals)	3.6	4.4
Sweetened grains (cookies, cakes)	10.6	12.9
Fruit/fruit juice	1.1	1.3
Vegetables (candied sweet pot., glazed carrots)	1.1	1.3
Milk/milk products	7.1	8.6
Meat, poultry, fish, dried beans, eggs	1.7	2.1
Fats/oils	0.7	0.9
Sugars, sweets, sweetened beverages		
Sugars/sweets (table sugar, honey, syrups, candies, jams, gel desserts)	13.2	16.1
Soft drinks, regular	27.1	33.0
Soft drinks, low calorie	0.1	0.1
Fruitades/drinks, regular (fruit punch, fruit juice drink)	8.0	9.7
Fruitades/drinks, low calorie	<0.1	<0.1
Other beverages	3.0	3.6

*Gram-equiv. is an amount of added sweeteners comparable in carbohydrate content to 1 g sucrose.

Source: Guthrie and Morton, 2000

Figure 3. Relative retail food prices
Aggregate food prices have risen much faster than the price of carbonated drinks, slightly more than the price of sweets, and have slightly fallen relative to the price of baked goods



Food processing

- Increase in processing share and fall in farm share of final food price
- Emergence of added sweeteners in food processing
- Rise in use of HFCS
- Less substitution in processing between HFCS and sugar
- Low price responsiveness in derived and final demand
  - Small cost share explains lower price responsiveness (Marshall's rules)

Figure 4. Food price, farm price, and farm-retail price spread evolution (1952=100)

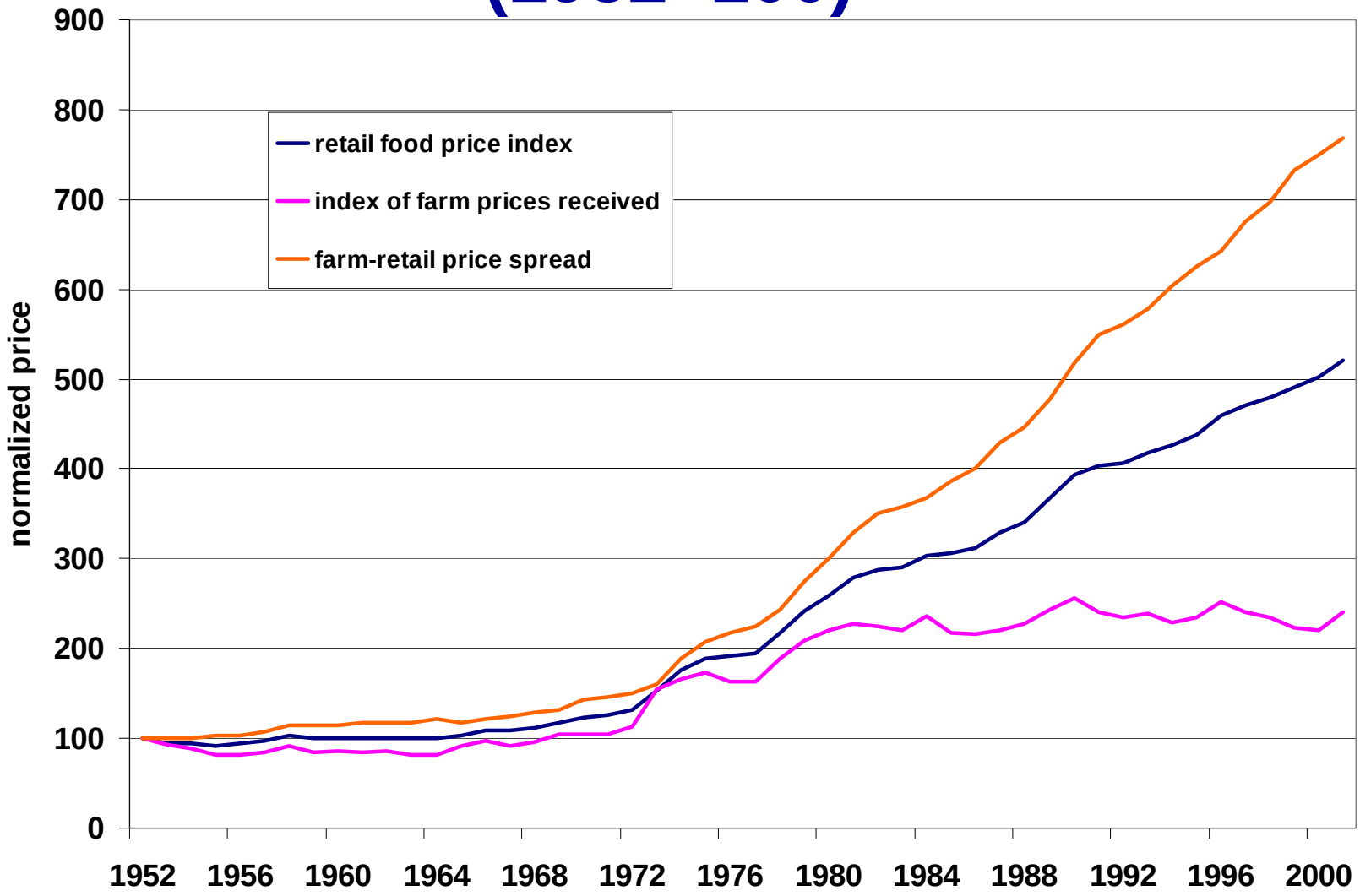
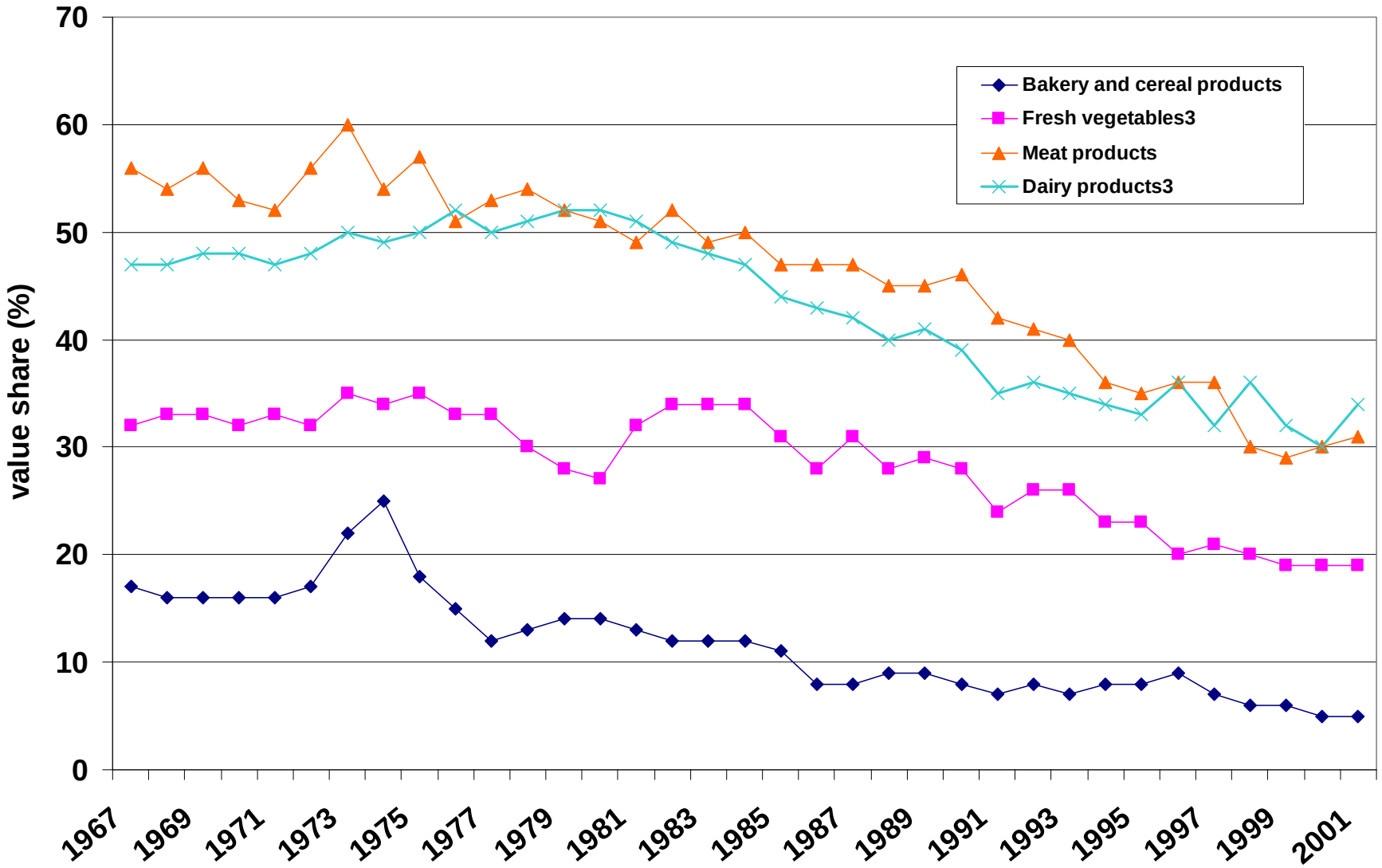


Figure 5. Farm value share in retail cost for processed food products



Correlation of US sugar prices

Time period	Retail, wholesale refined	Wholesale refined, raw	Retail, raw
1960-1981	0.97	0.99	0.94
1982-2006	0.44	0.58	0.14
1995-2006	0.60	0.65	0.01

Correlation of corn, HFCS and carbonated drinks prices

	Corn, carbonated drinks	HFCS, carbonated drinks	Corn, HFCS
1978-2006	-0.21	-0.30	0.42
1978-1992	-0.06	0.51	0.47
1993-2006	-0.28	0.07	0.33

Agricultural policies: R&D

- Ag R&D affects commodity prices
  - Price (indicator of technical change) trends down for most ag commodities
  - Corn price has fallen faster than sugar price
  - Price of HFCS has fallen over time and lowered unit cost of sweeteners
- Limited but ambiguous impact of agricultural subsidies (and tax) on food intake

Figure 6. Falling real farm prices of corn and sugar beets (nominal farm prices deflated by the index of prices paid by farmers) Corn falls more than twice as fast as beet does.

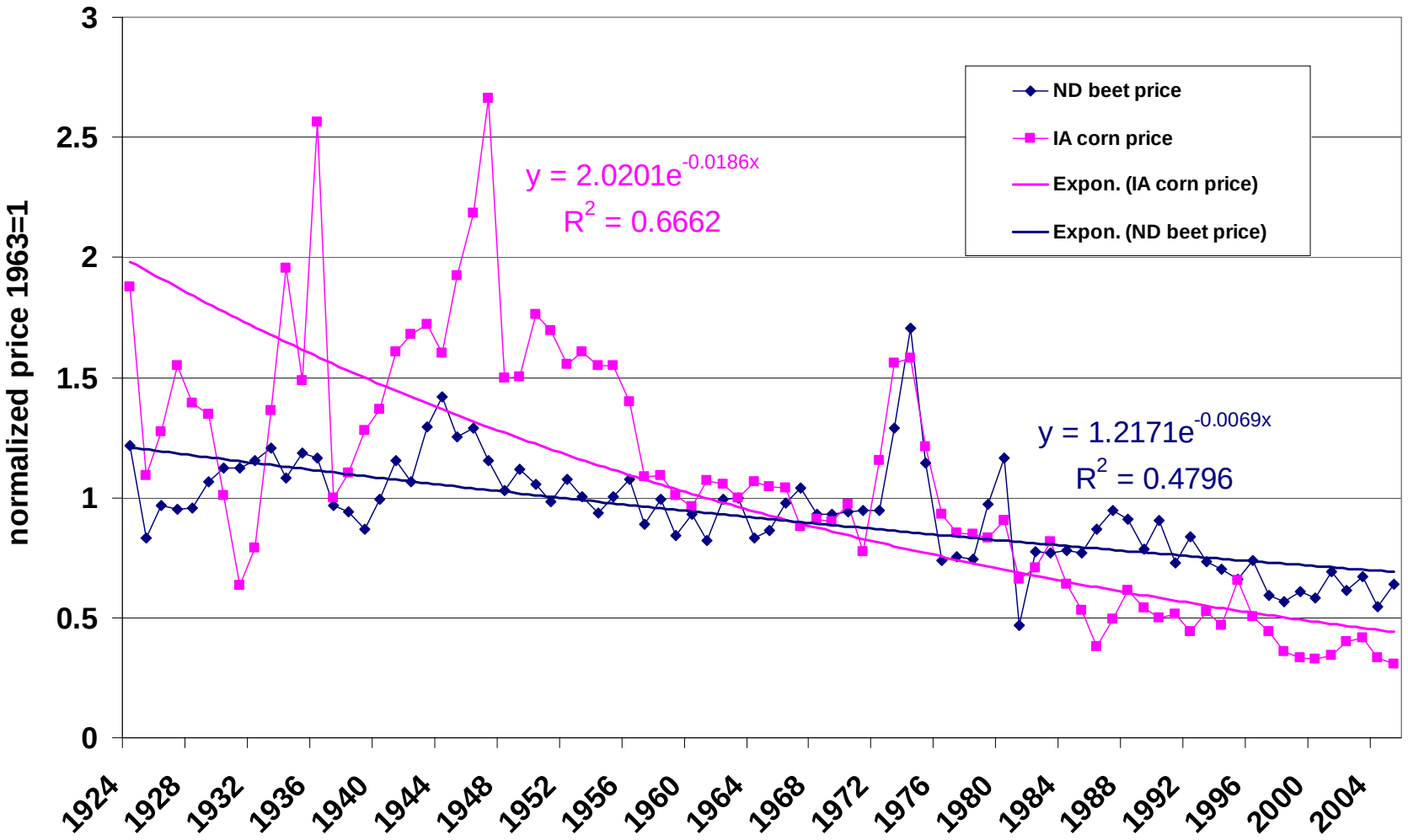
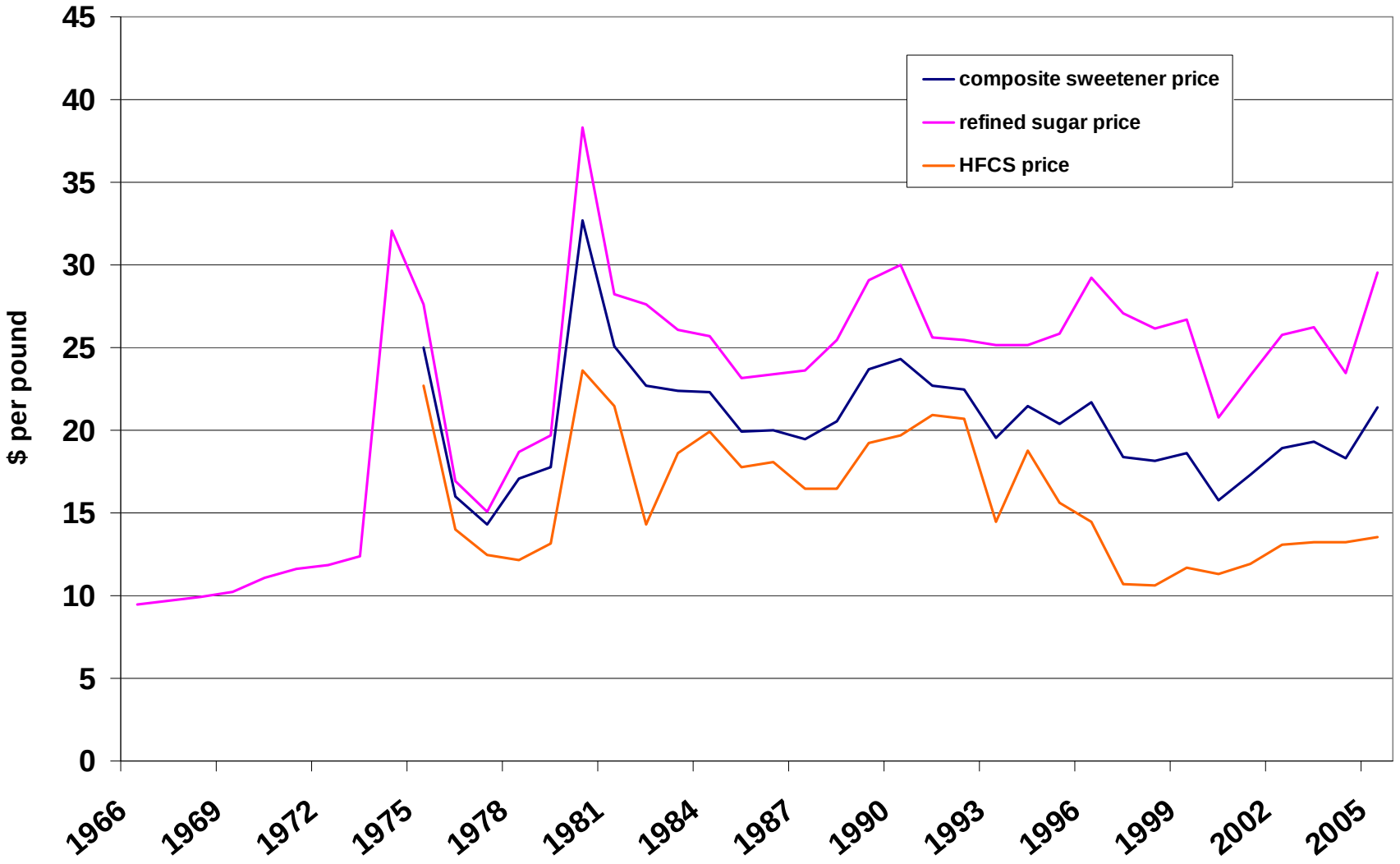


Figure 7. Nominal sweetener price faced by food processors. HFCS price has fallen over time and has lowered the unit cost of sweeteners



Agricultural policies: R&D

- Corn
  - R&D policies and costs of corn price policy have been borne by taxpayers
  - Benefits of lower corn prices mainly through lower feed costs to dairy and meat
- Sugar
  - R&D policies and price policies have maintained higher prices relative to corn
  - Price policies borne by consumers

US corn and sugar farm policy support

	1986-88	1997-99	2002-04
US corn			
Producer NAC	1.64	1.32	1.26
Consumer NAC	0.88	0.86	0.82
US sugar			
Producer NAC	2.46	2.39	2.19
Consumer NAC	2.96	2.75	2.59

Source: OECD

Food programs and policies

- Dietary Guidelines (2005)
  - "Choose and prepare foods and beverages with little added sugars or caloric sweeteners"
- National School Lunch and Breakfast Program
  - calorie but no sugar restrictions
- Food Stamps Program
  - No limits on specific foods or food types
- WIC Food Program
  - Limit on sugar content of cereals

Other countries

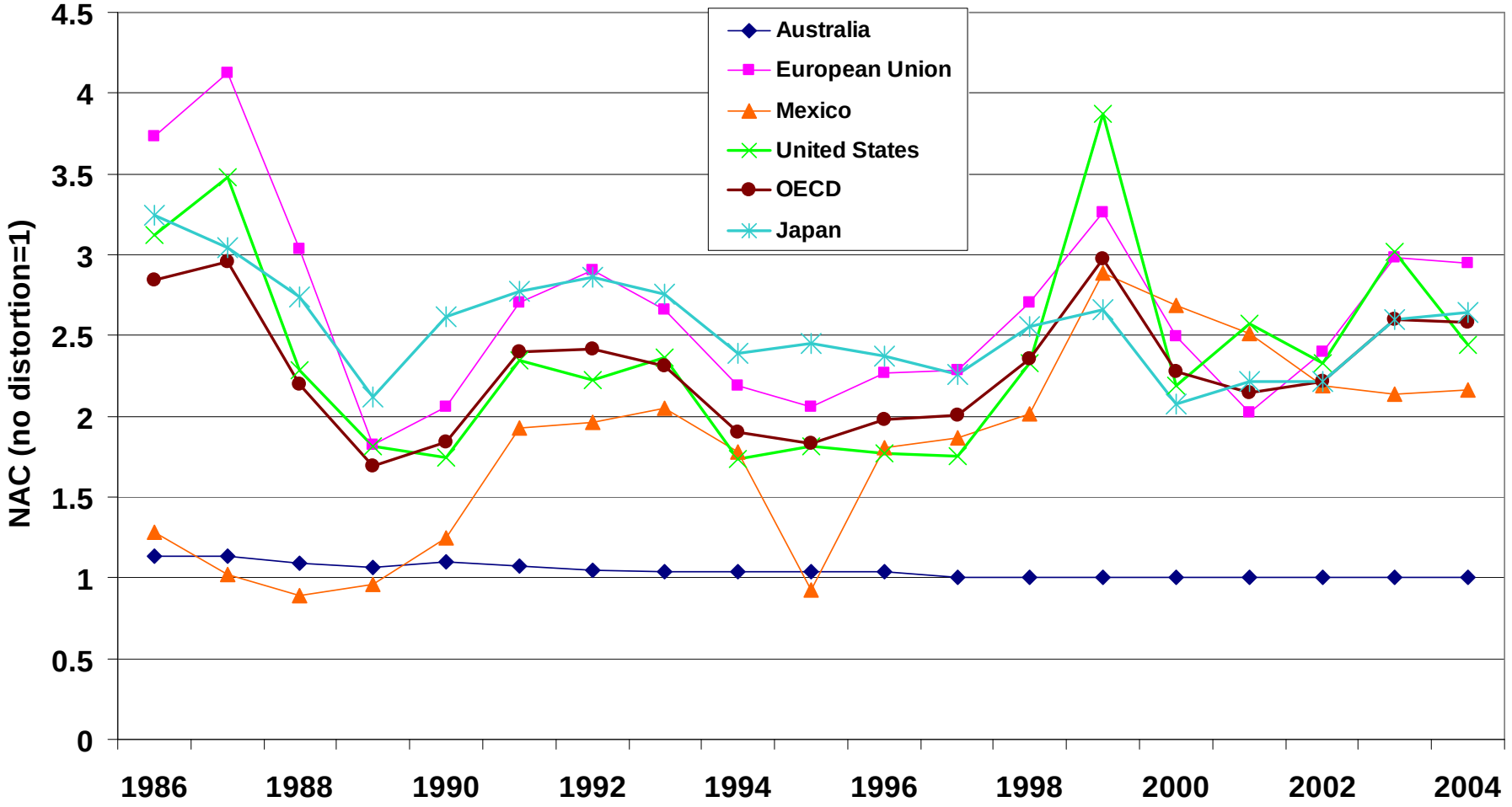
- Increase in intake of sweeteners worldwide
  - Faster increase in middle income countries
- Policy vs. culture?
  - Similar EU policy across countries and high sugar prices
  - Per capita intake varies (UK vs. France)
- Mexico
  - Rise in consumption of sweeteners
  - Soda tax on sweetener composition had sharp effect on processing use

Table 3: Changes in sweetener consumption by major regions for 1970-75 and 1999-2001

	Average 1970-75			Average 1999-2001			Percentage change 1970-75 to 1999-2001		
	(kilocalories per capita per day)								
	Total sugar[1]	Other sweeteners	Total sweeteners[2]	Total sugar	Other sweeteners	Total sweeteners	Total sugar	Other sweeteners	Total sweeteners
World	210.65	9.24	221.55	217.32	23.32	242.32	3.17	152.38	9.37
Developed	396.79	24.63	425.39	322.18	89.77	416.26	-18.8	264.47	-2.15
Developing	136.29	3.08	140.13	188.12	4.81	193.88	38.03	56.17	38.36
USA	464.34	100.74	569.1	328.77	328.6	662.3	-29.2	226.19	16.38
Mexico	383.91	1.82	388.02	439.82	28.8	471.4	14.56	1482.42	21.49

Source: FAOSTAT

Refined sugar user price distortions in some OECD countries from agricultural policies (NAC) measured at the farm gate



Summary and lessons learned

- Historically, link between agricultural policies and sweeteners was stronger than it is today
  - Until 1980, R&D led to cheaper inputs and food
  - Today, less direct effect in sweeteners market
  - Relatively large fall in corn prices (relative to sugar) allowed emergence of cheaper HFCS as a substitute for sugar
- Lesson
  - The “unintended consequences” of commodity and R&D policies on sweeteners use are small

Summary and lessons learned

- Falling farm value share at the retail level makes ag input costs inexpensive relative to other input costs in food processing
  - Today: tenuous link between farm/commodity policy and cheap food input for sweetened goods
- Lesson: Using farm policy to influence food prices or ingredient inputs is a poorly targeted policy for sweeteners

Summary and lessons learned

- Rise in sweetened beverage consumption driving change in U.S. and other countries
  - Sweetened beverages lead increase in HFCS use
- Lesson: Policies focused on consumption of foods better targeted & more effective for public health
  - Limited ability of taxes to change food demand
  - Some ability of taxes for ingredient switching
    - Nonlinear tax on food/beverages exceeding some threshold of added sugars
  - Non-price approaches more effective
    - Limit access to foods (vending machines)
    - Food program regulations
    - Nutrition education