Do Food Subsidies Cause Obesity?

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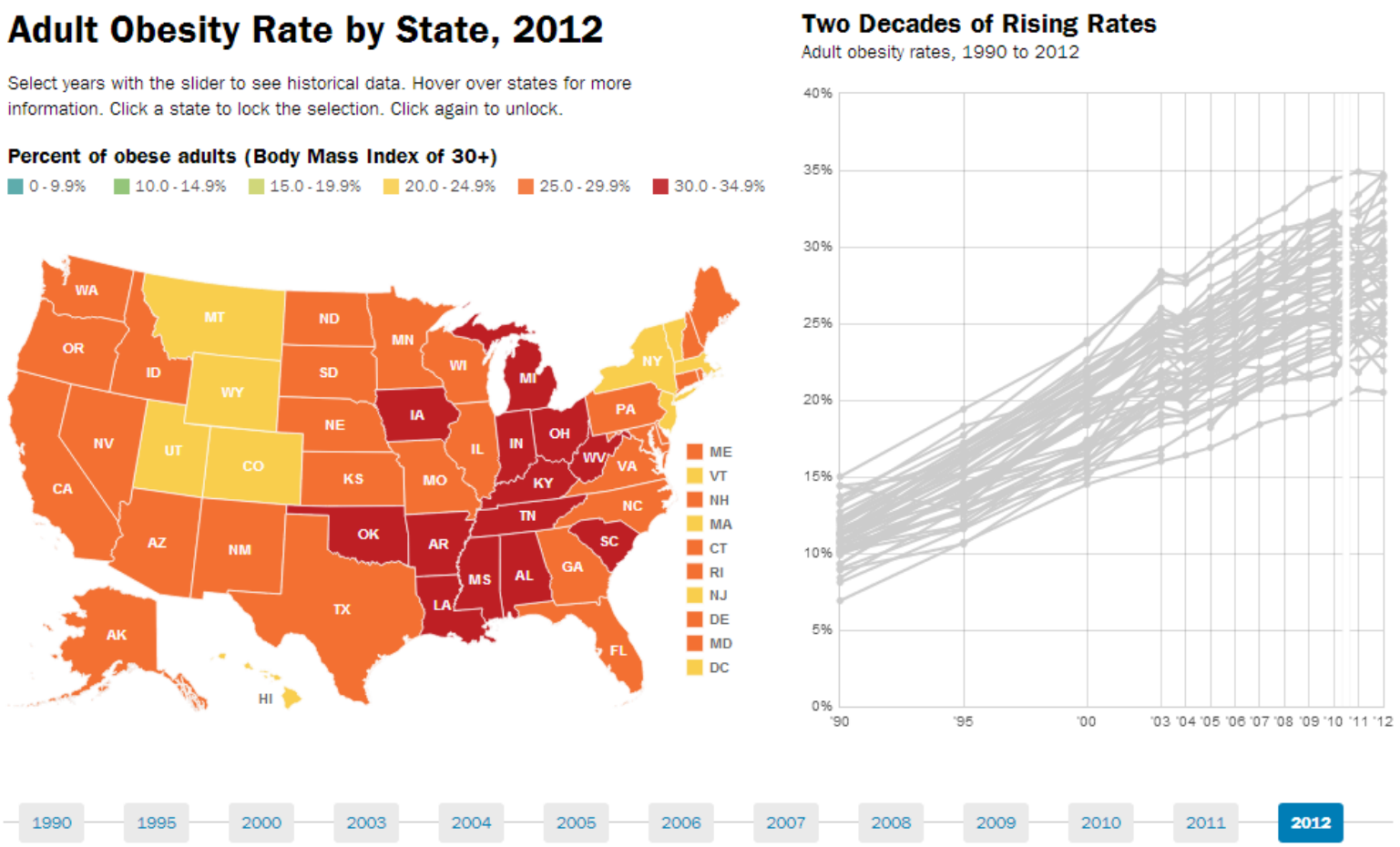
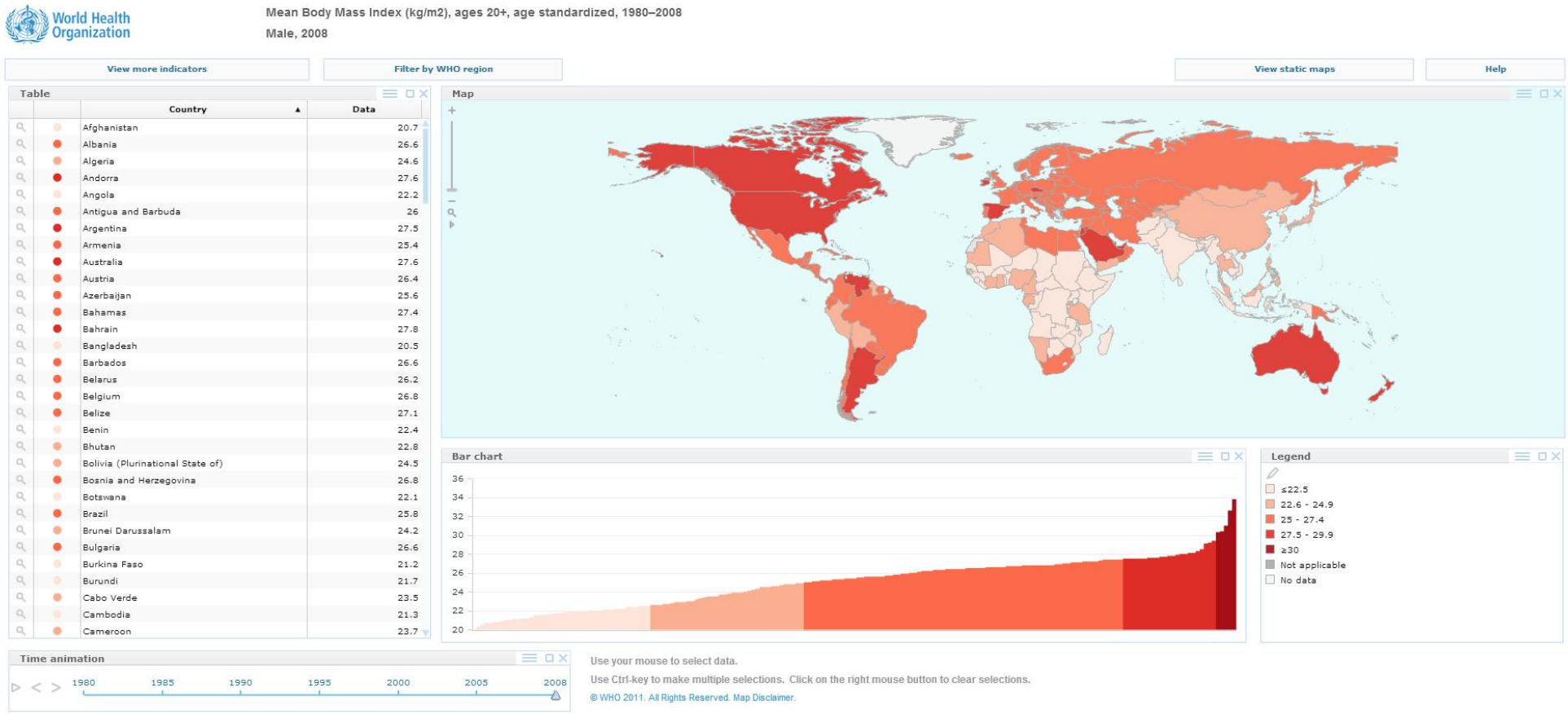
What is Obesity?

- Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. People are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight in kilograms by the square of the person's height in meters, exceeds 30 kg/m^2.

Trends in Obesity



Where does the US “fit” in?



Obesity as a Mass Balance Problem

Calories In > Calories Out = Weight Gain

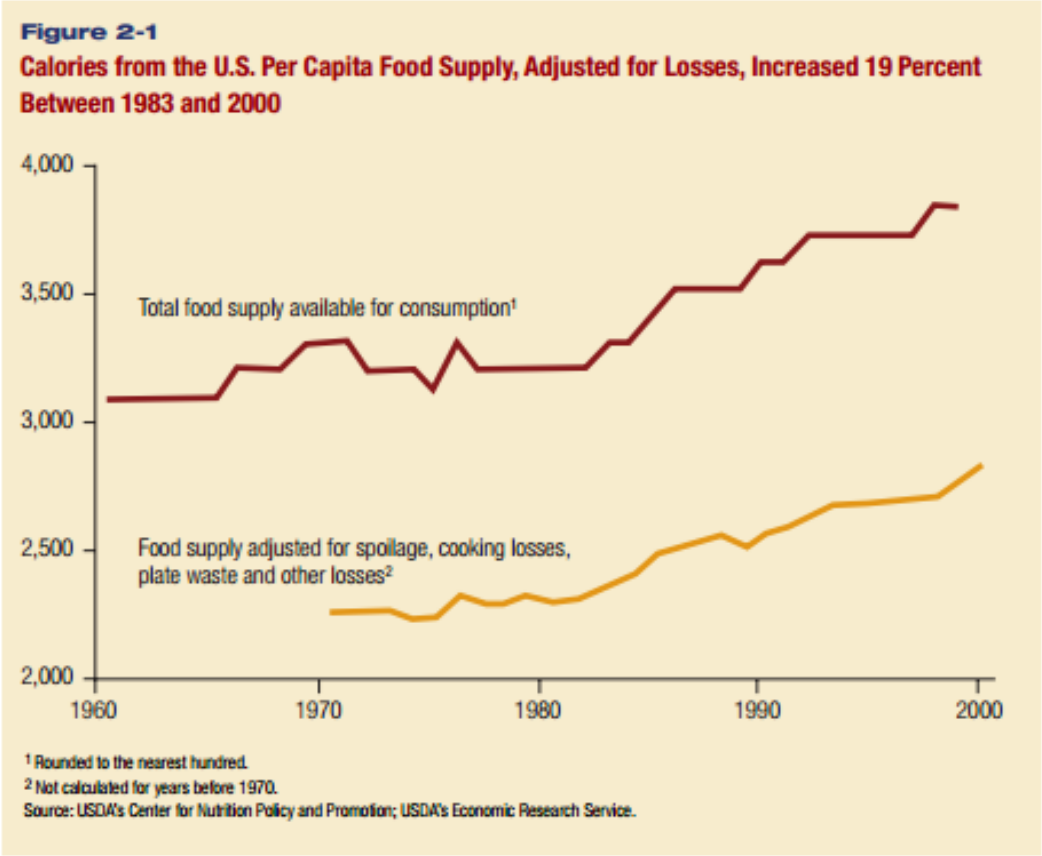
Consumption Choices
Nutritional Content
Addiction
Knowledge

Work/Exercise
Medical Issues

Caveat: Nutrition ≠ Weight

What we are eating:

If you just consider the raw caloric content of food availability *per capita*, it has risen between the 1970s and today.



What we are eating:

Table 2-1
In 2000, Americans consumed an average 57 pounds more meat than they did annually in the 1950s, and a third fewer eggs

	Annual averages					
Item	**1950-59**	**1960-69**	**1970-79**	**1980-89**	**1990-99**	**2000**
	Pounds per capita, boneless-trimmed weight					
Total meats	138.2	161.7	177.2	182.2	189.0	195.2
Red meats	106.7	122.34	129.5	121.8	112.4	113.5
Beef	52.8	69.2	80.9	71.7	63.2	64.4
Pork	45.4	46.9	45.0	47.7	47.6	47.7
Veal and lamb	8.5	6.2	3.5	2.4	1.7	1.4
Poultry	20.5	28.7	35.2	46.2	61.9	66.5
Chicken	16.4	22.7	28.4	36.3	47.9	52.9
Turkey	4.1	6.0	6.8	9.9	13.9	13.6
Fish and shellfish	10.9	10.7	12.5	14.2	14.7	15.2
	Number per capita					
Eggs	374	320	285	257	236	250

Note: Totals may not add due to rounding.
Source: USDA's Economic Research Service.

We are eating more meat, but the rise has been much higher for leaner meat (poultry) than for red meat (224% compared to 6.4%)

We are eating fewer eggs

What we are eating:

In total, we are consuming less dairy than before, although we consume much more cheese

Table 2-2
Americans are drinking less milk, eating more cheese

		Per capita annual averages					
Item	**Unit**	**1950-59**	**1960-69**	**1970-79**	**1980-89**	**1990-99**	**2000**
All dairy products[1]	lb	703	619	548	573	571	593
Cheese[2]	lb	7.7	9.5	14.4	21.5	26.7	29.8
Cottage cheese	lb	3.9	4.6	4.9	4.1	2.9	2.6
Frozen dairy products	lb	23.0	27.5	27.8	27.4	28.8	27.8
Ice cream	lb	18.1	18.3	17.7	17.7	16.0	16.5
Lowfat ice cream	lb	2.7	6.2	7.6	7.2	7.5	7.3
Sherbet	lb	1.3	1.5	1.5	1.3	1.3	1.2
Other (including frozen yogurt)	lb	1.0	1.5	1.0	1.2	4.0	3.1
Nonfat dry milk	lb	4.9	5.9	4.1	2.4	3.1	3.4
Dry whey	lb	.2	.6	2.1	3.2	3.5	3.4
Condensed and evaporated milks	lb	21.6	15.7	9.4	7.5	7.3	5.8
Cream products	1/2 pt	18.1	13.3	10.1	12.8	15.7	18.6
Yogurt	1/2 pt	0.2	0.7	3.2	6.5	8.5	9.9
Beverage milk	gal	36.4	32.6	29.8	26.5	24.3	22.6
Whole	gal	33.5	28.8	21.7	14.3	9.1	8.1
Lower fat	gal	2.9	3.7	8.1	12.2	15.3	14.5

Note: Totals may not add due to rounding.
[1]Milk-equivalent, milkfat basis; includes butter. Individual items are on a product-weight basis.
[2]Natural equivalent of cheese and cheese products; excludes full-skim American, cottage, pot, and baker's cheese. Source: USDA's Economic Research Service.

What we are eating:

But, Michael Pollan's idea that we are somehow eating less "good foods" like fruits and vegetables simply is not true.

Table 2-4
Per capita consumption of fruit and vegetables increased by one-fifth between 1970–79 and 2000

Item	Annual averages			
	1970–79	1980–89	1990–99	2000
	Pounds per capita, fresh-weight equivalent			
Total fruit and vegetables	587.5	622.1	688.3	707.7
Total fruit	248.7	269.0	280.1	279.4
Fresh fruit	99.4	113.1	123.7	126.8
Citrus	27.2	24.2	23.7	23.4
Noncitrus	72.2	88.9	100.0	103.3
Processed fruit	149.3	155.9	156.5	152.7
Frozen fruit, noncitrus	3.4	3.4	3.8	3.7
Dried fruit, noncitrus	9.9	12.2	11.7	10.5
Canned fruit, noncitrus	24.7	21.3	19.7	17.4
Fruit juices	110.7	118.6	120.8	120.6
Total vegetables	338.8	353.1	408.2	428.3
Fresh vegetables	147.9	157.2	181.9	201.7
Potatoes	52.5	48.5	48.8	47.2
Other	95.4	108.7	133.1	154.5
Processing vegetables	190.9	195.9	226.3	226.6
Vegetables for canning	101.1	98.9	109.4	104.7
Tomatoes	62.9	63.5	74.4	69.9
Other	38.2	35.4	35.0	34.8
Vegetables for freezing	52.1	61.0	76.8	79.7
Potatoes	36.1	42.8	54.9	57.8
Other	16.0	18.2	21.9	21.9
Dehydrated vegetables and chips	30.8	29.4	32.0	33.7
Pulses	7.0	6.5	8.1	8.6

Note: Totals may not add due to rounding.
Source: USDA's Economic Research Service.

What we are eating:

Table 2-5
Annual average grain consumption was 45 percent higher in 2000 than in the 1970s

	Annual averages					
Item	1950-59	1960-69	1970-79	1980-89	1990-99	2000
	Pounds per capita					
Total grain products[1]	155.4	142.5	138.2	157.4	190.6	199.9
Wheat flour	125.7	114.4	113.6	122.8	141.8	146.3
Corn products	15.4	13.8	11.0	17.3	24.5	28.4
Rice	5.3	7.1	7.3	11.3	17.5	19.7

[1] Includes oat products, barley products, and rye flour not shown separately.
Source: USDA's Economic Research Service.

Grain consumption has increased around 45%, giving rise to the "gluten" diet craze. In terms of nutrition, Americans do tend to consume less whole grain than recommended and more processed grains that recommended.

What we are eating:

Table 2-6
America's sweet tooth increased 39 percent between 1950–59 and 2000 as use of corn sweeteners octupled

	Annual averages					
Item	**1950–59**	**1960–69**	**1970–79**	**1980–89**	**1990–99**	**2000**
	Pounds per capita, dry weight					
Total caloric sweeteners	109.6	114.4	123.7	126.5	145.9	152.4
Cane and beet sugar	96.7	98.0	96.0	68.4	64.7	65.6
Corn sweeteners	11.0	14.9	26.3	56.8	79.9	85.3
High fructose corn syrup	.0	.0	5.5	37.3	56.8	63.8
Glucose	7.4	10.9	16.6	16.0	19.3	18.1
Dextrose	3.5	4.1	4.3	3.5	3.8	3.4
Other caloric sweeteners	2.0	1.5	1.4	1.3	1.3	1.5

Note: Totals may not add due to rounding.
1Edible syrups (sugarcane, sorgo, maple, and refiner's), edible molasses, and honey.
Source: USDA's Economic Research Service.

Total sweetener consumption has risen. We have a sweet tooth.

Mass Balance

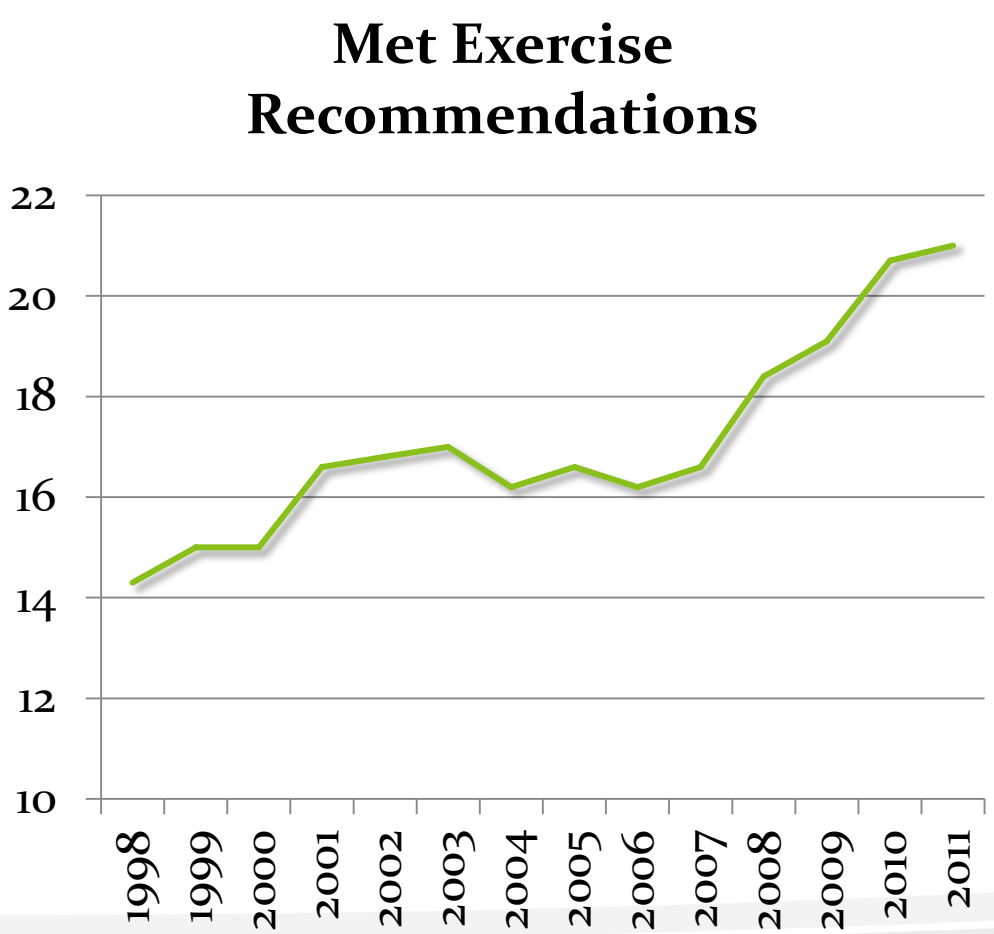
Calories In > Calories Out = Weight Gain

- Rising caloric intake, on average
- Some changes in composition of intake
- Debates about the sources, causes, and influences on caloric intake

Calorie Expenditure

- The economics of calories
  - In the industrial age, workers were ***paid*** to expend calories…work was hard.
  - In the post-industrial age, workers ***must pay*** to expend calories, either through actual payments or, at the very least, the opportunity cost of their time
- A trade-off between current income and calorie expenditure means less calorie expenditure, *ceteris paribus*.
- BUT, a recognition of the trade-off between today's opportunity cost and long-term health (and health cost) may change that calculation

Calorie Expenditure



- The percentage of the population that met weekly requirements for aerobic exercise to maintain weight has increased.

Mass Balance

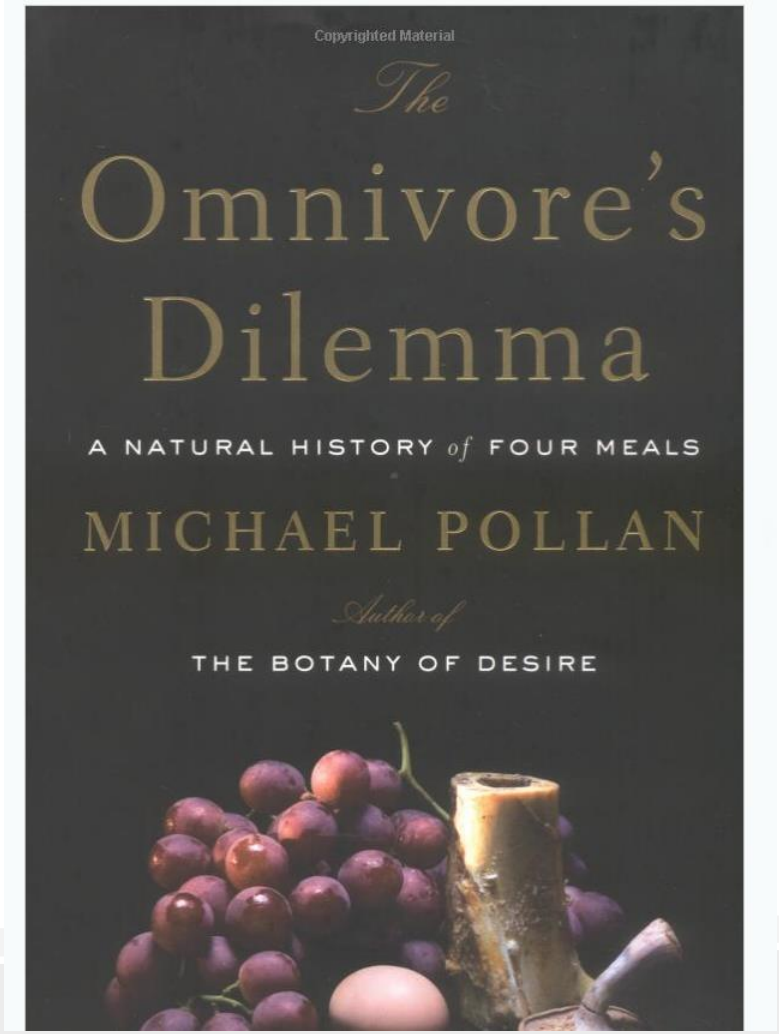
Calories In > Calories Out = Weight Gain

- Calorie expenditure changes generally lag calorie intake changes---it takes time to change habits
- That change appears to be occurring

Summary

- Obesity has been on the rise, although recent data shows that rates have substantially “flattened out.”
- General rise in caloric intake (and some changes in composition) with a delayed increase in caloric output.
- Why the rise in caloric intake? Cheap food?

The Rise of the Food Subsidy Argument

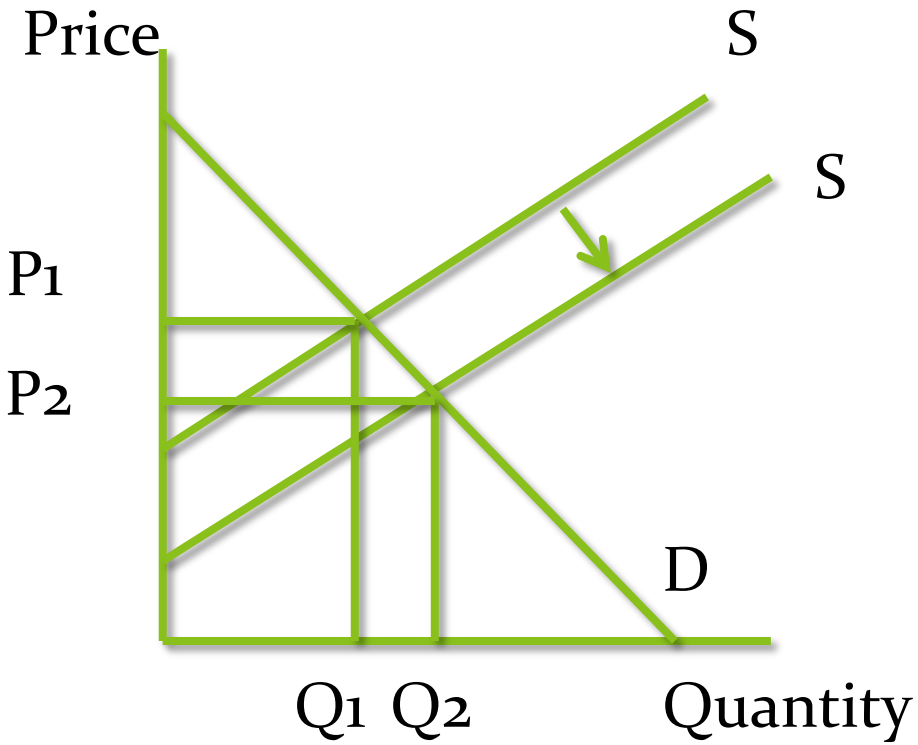


- As scientists and social commentators searched for an explanation to the rise of obesity, food subsidies became a natural target. After all, if we lower the price of food, don't we eat more?

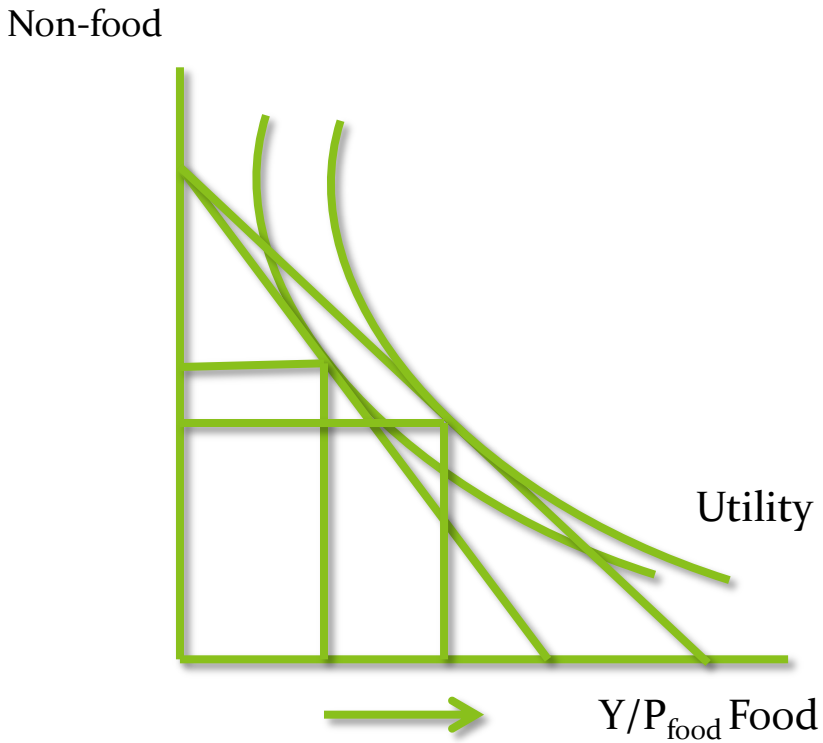
“Food” Subsidies

- Since 1933 (Great Depression), subsidies of one form or another have been provided to agricultural producers for the production of raw products (corn, wheat, etc.)
  - Livestock and fruits and vegetables are not directly subsidized
- Subsides go to enhance price/income or reduce cost, thereby increasing supply and reducing price, *ceteris paribus*.

Price Impacts



Increasing quantity of food produced leads to lower prices.



Lower food prices mean more money can be spent on food…more consumption.

Real Food Prices

Lends support to the idea that food prices have been steady-to declining in recent history despite a growing population.

Food Prices and Income

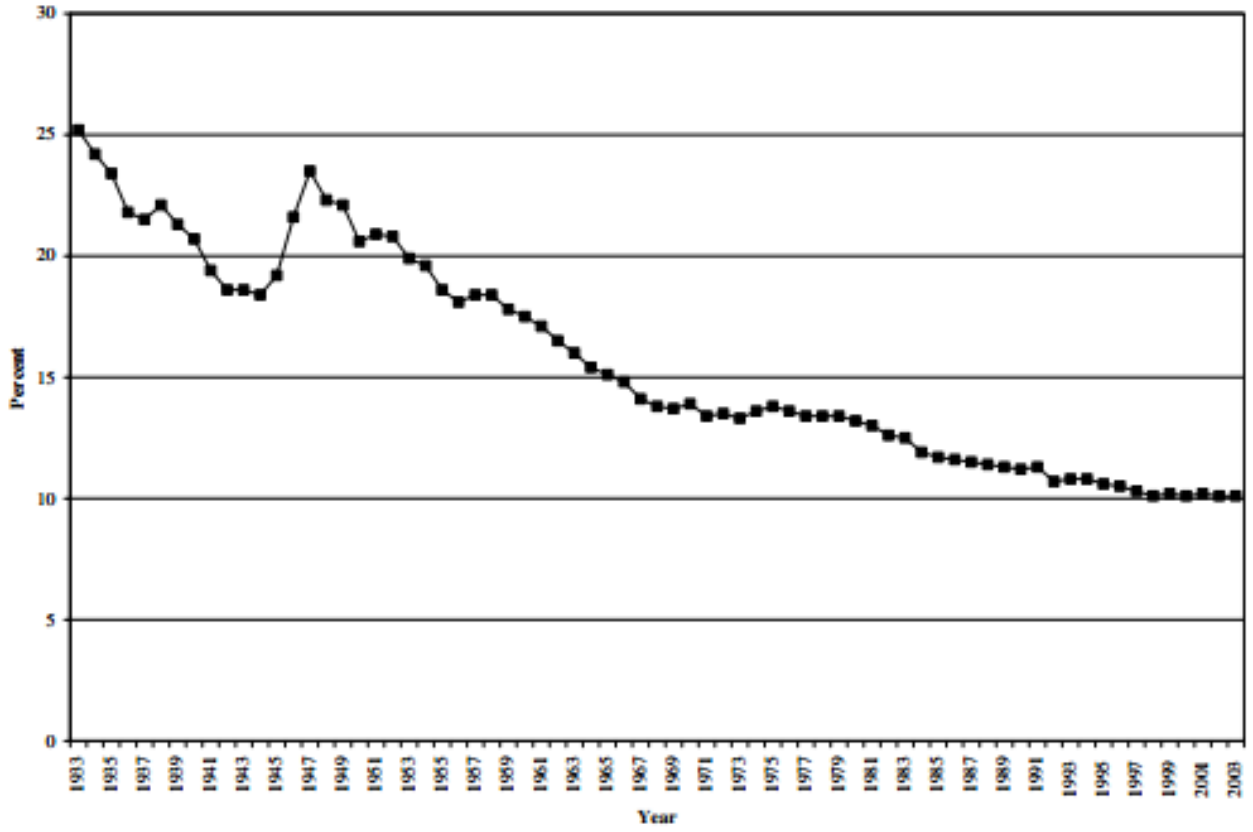


Fig. 1. Percentage of US disposable income spent on food, 1933–2003. *Source:* USDA ERS.

Income has grown faster than food prices, meaning a declining share of household income is spent on food.

So….

- Real food prices have been static (with periods of real decline)
- Food as a percentage of our income has declined
- Ergo…rising food subsidies must be to blame here, right?

The Case Against the Food Subsidy Argument

Do we spend less on food?

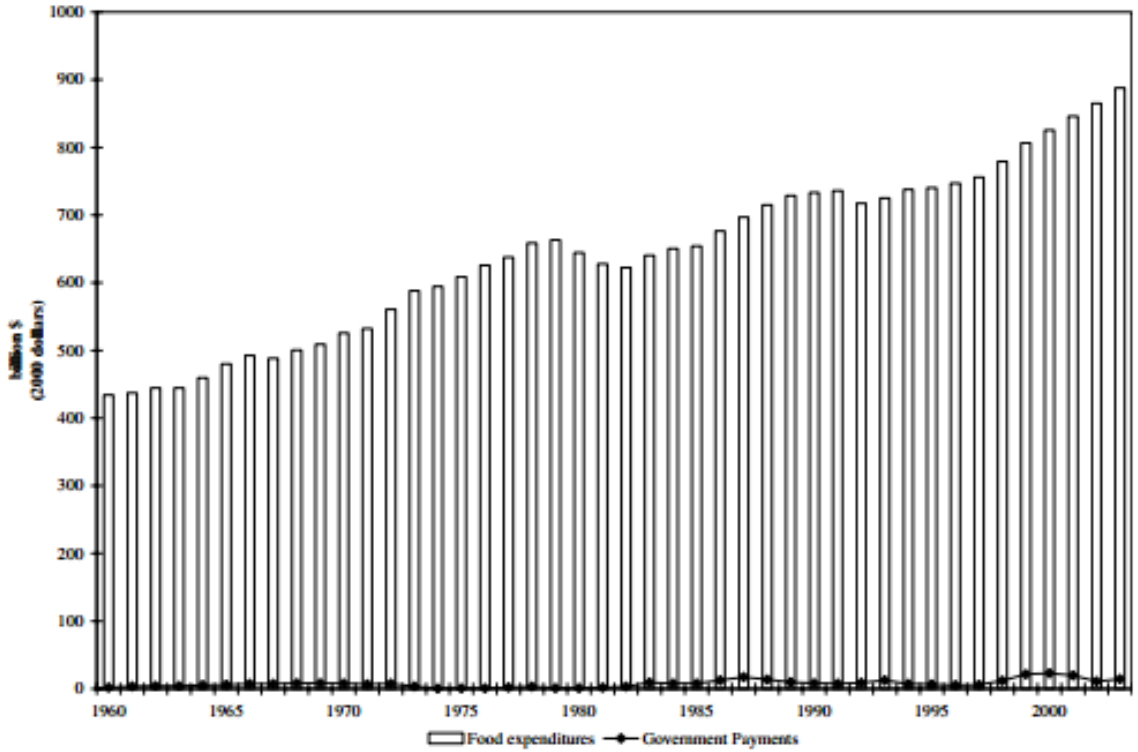
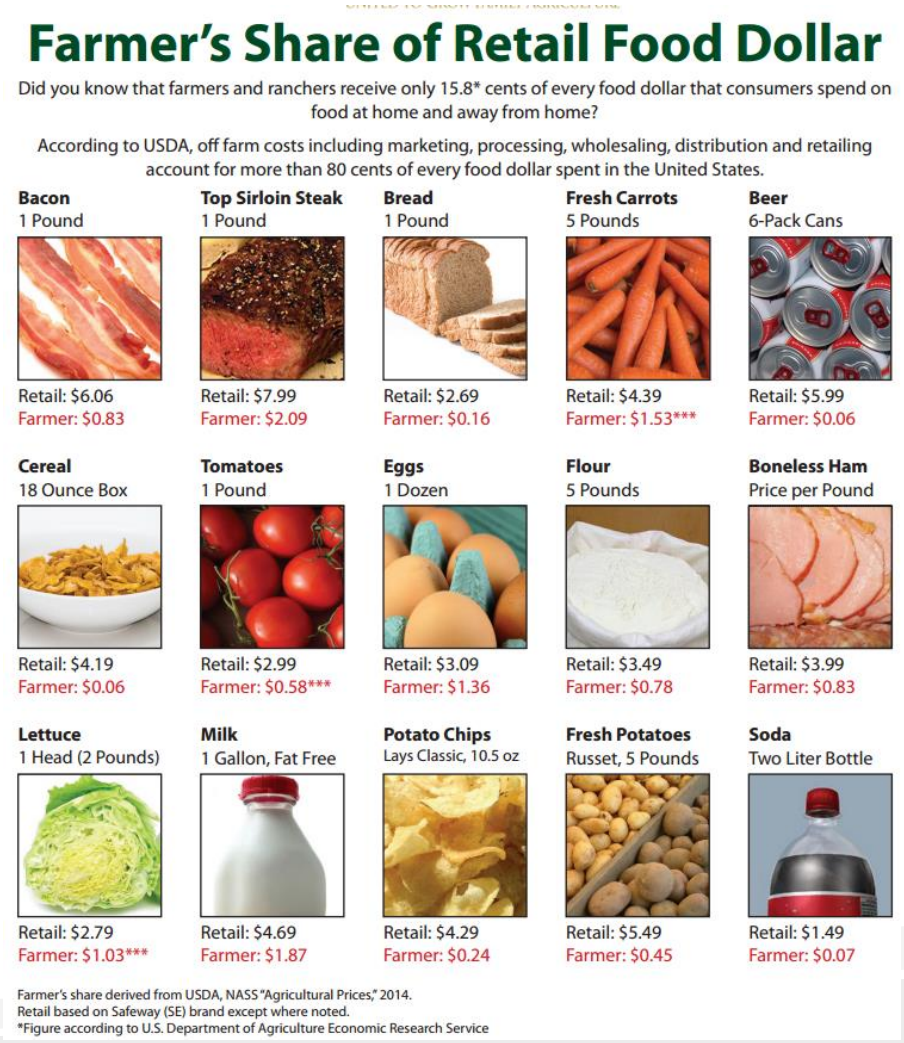


Fig. 2. Total US food expenditures and direct government payments to farmers, 1960–2003. *Source:* USDA-ERS.

In fact, no. We spend much more. BUT, we are purchasing a lot of marketing services.

How much of what you pay actually goes to the farmer?

- What you pay at the retail store is divided among the market channel
- Farmers only get a fraction—the size depends on a number of factors
- “Food subsidies” are only at the farmer level



A Thought Experiment

- Assume that subsidies lowered the price of wheat by 20% (a huge amount):

	Wheat	Bread	Consumption
Old	0.16	2.69	
New	0.13	2.66	
% Change	-20	-1.2	**0.24**

So, a 20% decline in the farm price in wheat would result in only a 1.2% decline in retail price of bread, which would result in only a 0.24% rise in bread consumption.

Implications

- The distance between farm and retail in terms of marketing costs means that even large changes in farm level prices are unlikely to have substantial changes on retail consumption.
  - Caveat: the less processed the food, the large the impact of farm level prices.
- Hard to make a case that food subsidies have made a substantial change in food consumption

But wait, haven't food subsidies skewed what we eat?

	1950-59	2000	% Change
Red Meat	106.7	113.5	6%
Poultry	20.5	66.5	224%
Fish	10.9	15.2	39%
Eggs	374	250	-33%
Cheese	**7.7**	**29.8**	**287%**
Frozen Dairy	**23**	**27.8**	**21%**
Yogurt	**0.2**	**9.9**	**4850%**
Milk	**36.4**	**22.6**	**-38%**
Fruit	248.7	279.4	12%
Vegetables	338.8	428.3	26%
Grains	**155.4**	**199.9**	**29%**
Sweetners	**109.6**	**152.4**	**39%**

The unweighted average growth of subsidized foods (excluding yogurt) is 68% while the average for non-subsidized foods is 48%, but these are not significantly different.

Conclusions

- It is a tough case to make to suggest that food subsidies have been a primary cause of obesity.
  - Countries with low subsidy rates like Australia have consistent obesity rates with the US.
  - Marketing costs separate farm and retail levels such that even large changes in farm prices are not likely to affect consumption much
  - Food subsidies have not really altered the composition of what we eat

Then why are we fat?

- Increased opportunity cost of food preparation
  - More eating out
    - More sugars/salts; bigger portion sizes
  - Less exercise
- Less recognition of trade-offs
  - Food-to-exercise; how many minutes on that treadmill for that donut?
  - Inter-temporal trade-offs; fat today, less healthy tomorrow

Some considerations

- Food intake
  - Habit formation
    - Advertising? Convenience? Cost of will-power?
  - Choices
    - Potato chips vs. baked potato?
    - Poverty and food assistance
- Caloric Output
  - Subsidizing exercise
  - Choices
    - Stairs vs. elevator