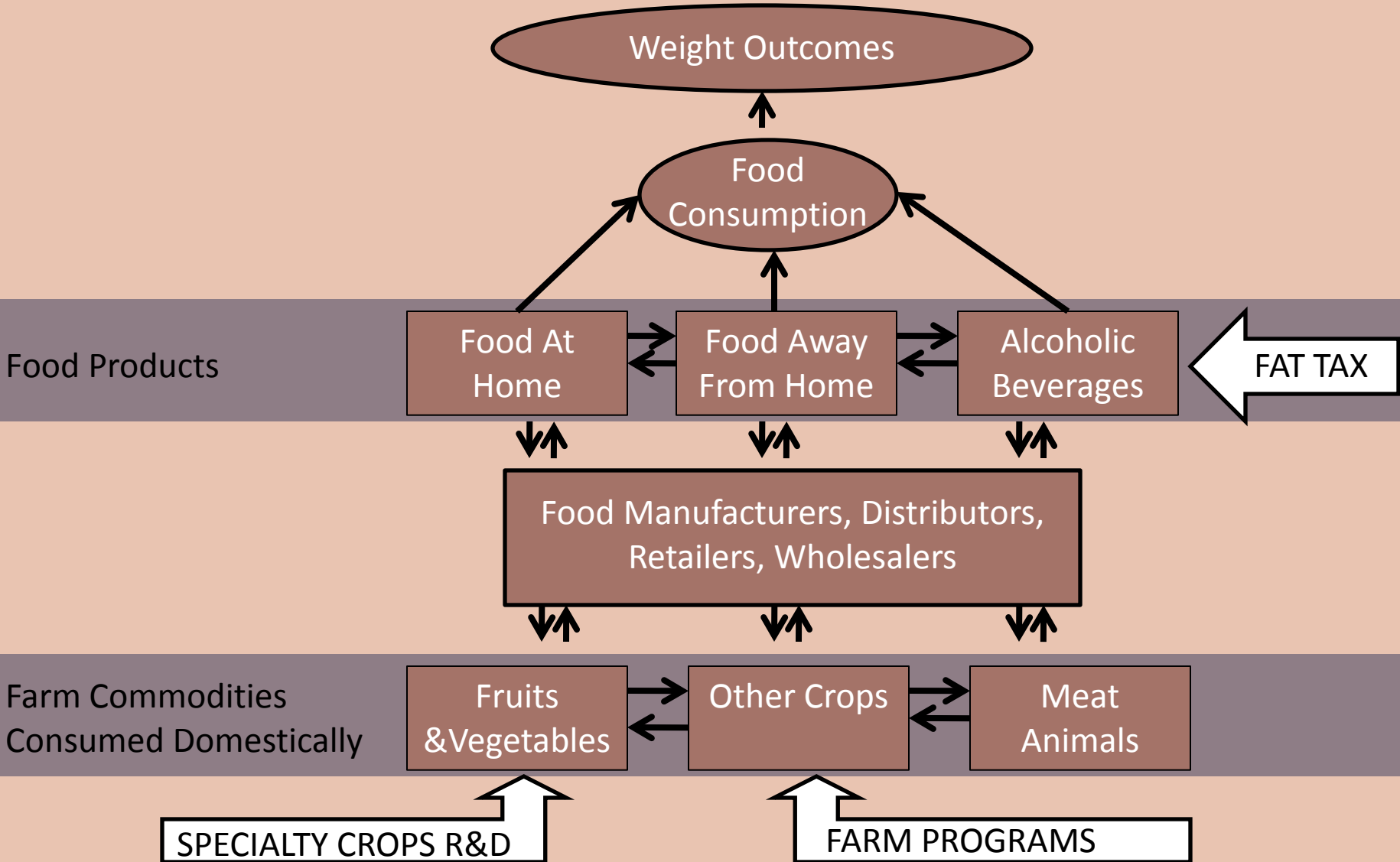


Agricultural Policies and Obesity: The Linkages Between Farm Commodities and Retail Food Products

Abigail Okrent

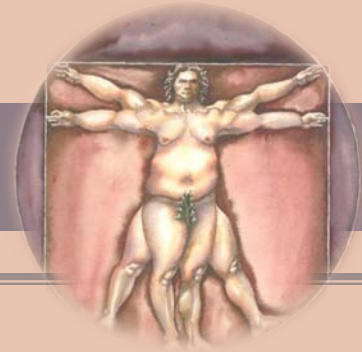
University of California, Davis
Department of Agricultural and Resource
Economics

Motivation



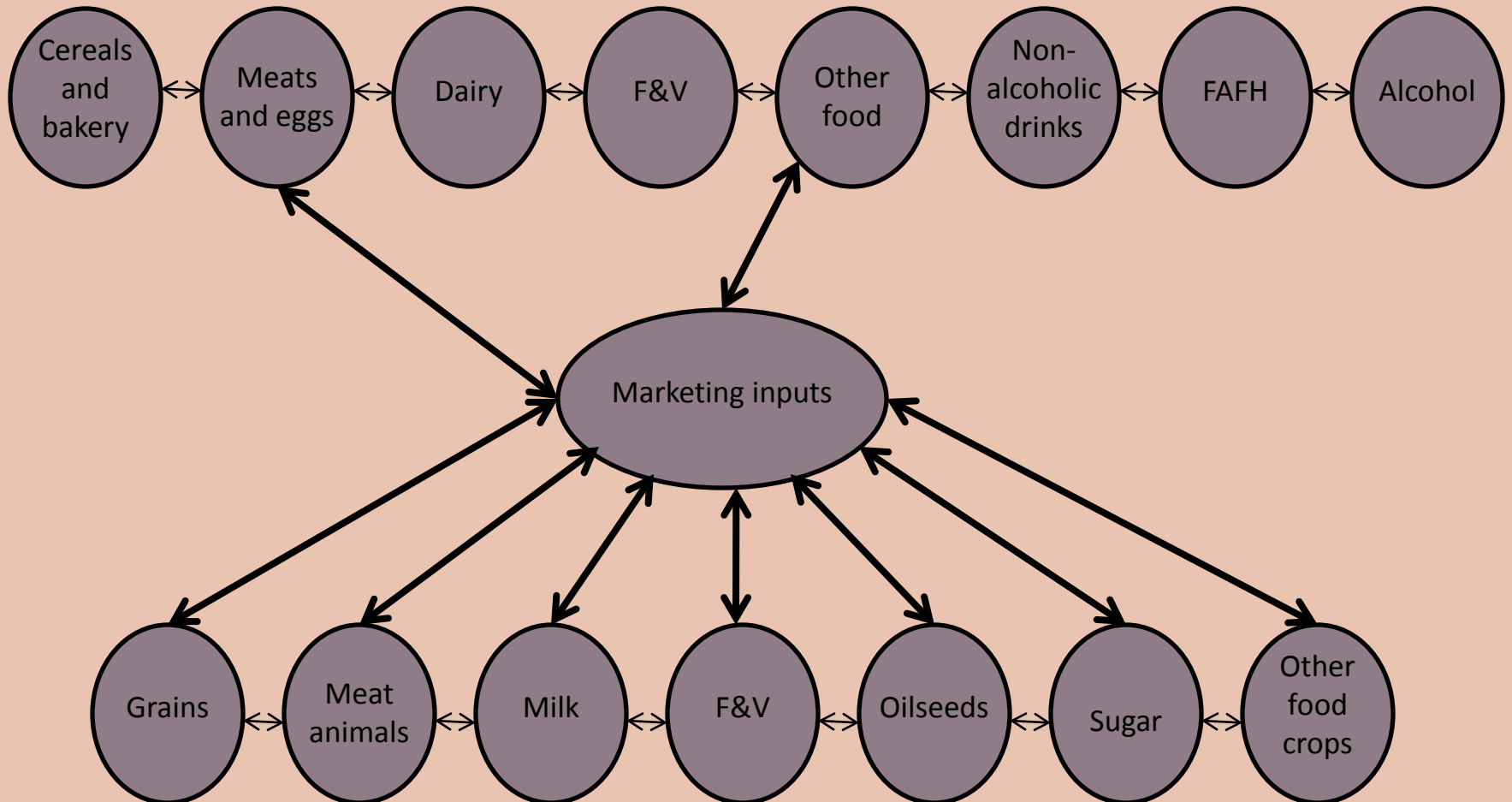
Outline of Presentation

- What is the relationship between retail food and farm commodity markets?
- What kind of data is necessary to simulate the effects of taxes and subsidies on prices and consumption?
- What is the effect of eliminating agricultural supports on commodities?
- What is the effect of a 10 percent subsidy on fruit and vegetable commodities?
- What is the effect of a 10 percent subsidy on fruit and vegetable retail food products?
- What is the effect of a fat tax on retail food products?

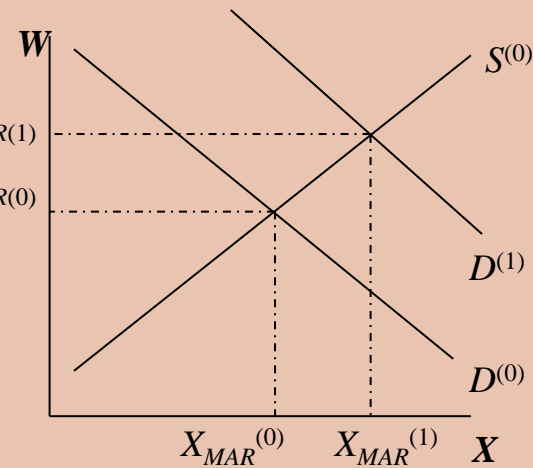
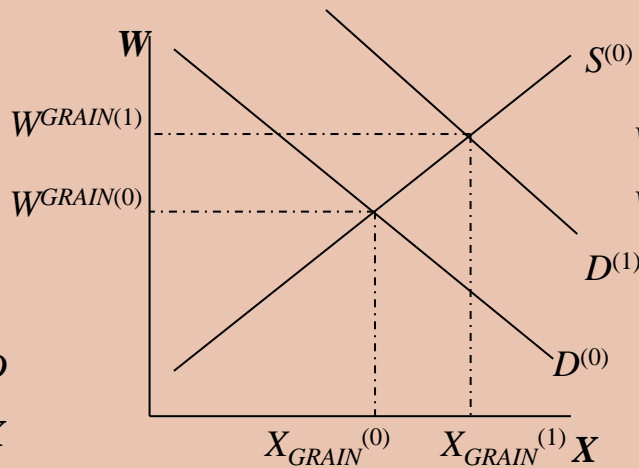
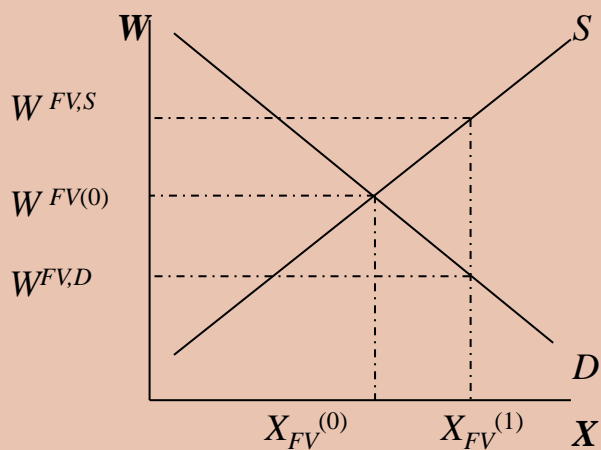
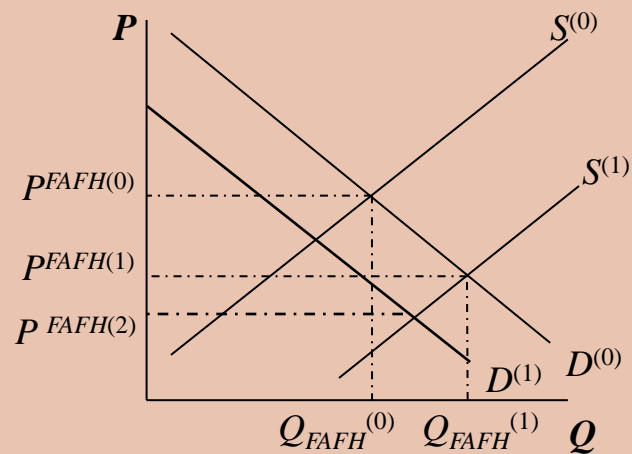
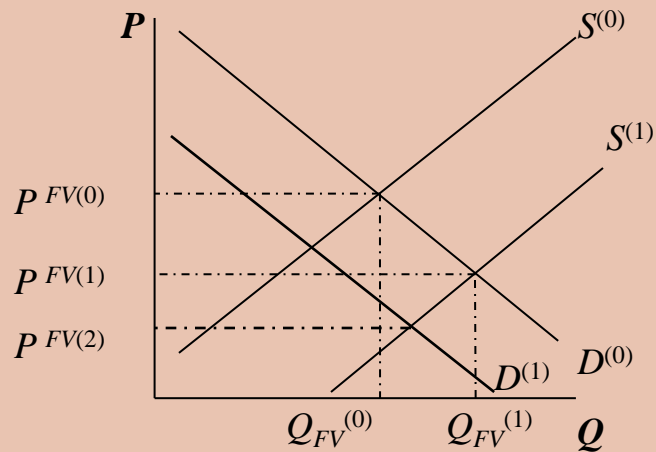


A Model of the Linkage Between Markets for Farm Commodities and Retail Food Products

Linkages Between the Farm and Retail



Effects of Commodity Subsidy



The Model

- 11 retail demand equations



- 11 zero profit equations, i.e. $P=MC$

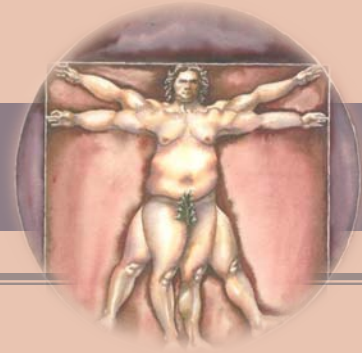
- 12 commodity demand equations

- 12 commodity supply equations



The Solutions

- Proportionate changes in consumption and prices of retail products
- Proportionate changes in quantities and prices of commodities.



Data for Simulations of Model

Marshallian Elasticities of Demand

Quantities	Prices										
	Cereals & bakery	Red meat	Poultry & eggs	Fish	Dairy	F&V	Other foods	Nonalc. beverage	FAFH	Al. beverage	Non-food
Cereals & bakery	-0.99	0.04	0.06	0.11	0.17	0.11	0.46	-0.03	-0.62	-0.03	0.54
Red meat	0.02	-0.58	0.12	0.00	0.03	0.20	-0.05	-0.13	0.35	0.29	-0.87
Poultry and eggs	0.14	0.42	-0.46	0.08	0.25	-0.13	-0.40	0.17	-0.16	-0.13	0.79
Fish	0.75	-0.07	0.22	-1.93	-0.59	-0.34	-0.95	0.25	2.68	-0.41	-1.53
Dairy	0.20	0.04	0.12	-0.10	-0.85	-0.15	0.21	0.24	-0.23	0.15	-0.52
Fruit & Veg.	0.12	0.30	-0.06	-0.05	-0.12	-0.63	-0.10	0.06	0.42	-0.07	-0.15
Other foods	0.33	-0.05	-0.13	-0.10	0.13	-0.08	-0.63	0.04	0.17	0.03	-0.54
Nonalc. beverage	-0.05	-0.23	0.08	0.05	0.25	0.07	0.08	-0.75	-0.20	0.19	-0.25
FAFH	-0.22	0.15	-0.03	0.13	-0.06	0.12	0.07	-0.05	-0.69	-0.10	-0.15
Alc. beverage	-0.03	0.27	-0.04	-0.04	0.08	-0.05	0.03	0.10	-0.20	-0.52	-0.15
Nonfood	0.00	-0.03	0.00	0.00	-0.01	-0.01	-0.02	-0.01	-0.02	-0.02	-0.95

Other Data

- Farm-retail product shares, i.e.,

$$X_{FV,FAFH} W_{FV} / Q_{FAFH} P_{FAFH}$$

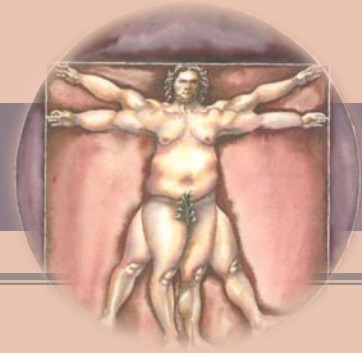
- Farm-commodity shares, i.e., X

$$X_{FV,FAFH} W_{FV} / X_{FV} W_{FV}$$

- Elasticities of supply of commodities
- Elasticities of substitution between commodities

Data to Calculate Changes in Calorie Consumption

Food	Average Daily kcal	Average Daily lbs
Cereals & bakery	332	0.265
Red meat	32	0.029
Poultry & eggs	32	0.032
Fish	10	0.013
Dairy	190	0.502
Fruit & vegetables	117	0.416
Other foods	401	0.455
Nonalcoholic beverages	147	1.675
FAFH	739	2.791
Alcoholic beverages	79	0.354



Simulation Results

Removal of 2006 Commodity-specific Consumer Support Estimates

<i>Percentage change in quantity</i>	
Cereals and bakery	-1.46%
Red meats	-0.45%
Poultry and eggs	-1.11%
Fish and seafood	5.16%
Dairy	5.80%
Fruit and vegetables	1.76%
Other food	-0.22%
Nonalcoholic beverage	-1.87%
FAFH	0.32%
Alcoholic beverage	-0.35%
<i>Annual change in kcal</i>	2473.31 kcal
<i>Annual change in weight</i>	0.71 lbs

<i>Percentage change in quantity</i>	
Oilseeds	-0.13%
Grains	-0.15%
Vegetables and melons	0.69%
Fruits and tree nuts	0.67%
Sugar	-0.19%
Other crops	-0.01%
Cattle ranching	-0.28%
Other animal ranching	0.49%
Dairy farming	3.91%
Poultry and egg farming	-0.57%
Fishing	0.86%

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10 % Subsidy on Fruit and Vegetable Commodities

<i>Percent change in quantity</i>	
Cereals and bakery	-0.36%
Red meats	-0.61%
Poultry and eggs	0.47%
Fish and seafood	0.93%
Dairy	0.37%
Fruit and vegetables	1.83%
Other food	0.36%
Nonalcoholic beverage	-0.08%
FAFH	-0.29%
Alcoholic beverage	0.16%
<i>Annual change in kcal</i>	164.46 kcal
<i>Annual change in weight</i>	0.05 lbs

10 % Subsidy on Fruit and Vegetable Commodities

<i>Percent change in quantity</i>	
Cereals and bakery	-0.36%
Red meats	-0.61%
Poultry and eggs	0.47%
Fish and seafood	0.93%
Dairy	0.37%
Fruit and vegetables	1.83%
Other food	0.36%
Nonalcoholic beverage	-0.08%
FAFH	-0.29%
Alcoholic beverage	0.16%
<i>Annual change in kcal</i>	164.46 kcal
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Other food	0.36%
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FAFH	-0.29%
Alcoholic beverage	0.16%
<i>Annual change in kcal</i>	164.46 kcal
<i>Annual change in weight</i>	0.05 lbs

10 % Subsidy on Retail Fruit and Vegetable Products Compared to a 10% Subsidy on Fruit and Vegetable Commodities

<i>% change in quantity</i>	Product subsidy	Commodity subsidy
Cereals and bakery	-1.14%	-0.36%
Red meats	-2.04%	-0.61%
Poultry and eggs	1.33%	0.47%
Fish and seafood	3.42%	0.93%
Dairy	1.51%	0.37%
Fruit and vegetables	6.34%	1.83%
Other food	0.80%	0.36%
Nonalcoholic beverage	-0.68%	-0.08%
FAFH	-1.23%	-0.29%
Alcoholic beverage	0.50%	0.16%
<i>Annual change in kcal</i>	-734.13 kcal	164.46 kcal
<i>Annual change in weight</i>	-.21 lbs	0.05 lbs

A 1/2-percent tax on the fat content of food products has about the same effect on weight as a 10 percent subsidy on fruit and vegetable products

<i>% change in quantity</i>		% total fat
Cereals and bakery	0.25%	7.09%
Red meats	-0.47%	15.88%
Poultry and eggs	0.39%	11.47%
Fish and seafood	-0.79%	6.38%
Dairy	-0.26%	3.92%
Fruit and vegetables	-0.05%	1.06%
Other food	-0.30%	9.64%
Nonalcoholic beverage	-0.14%	0.13%
FAFH	-0.08%	4.82%
Alcoholic beverage	-0.06%	0.03%
<i>Annual change in kcal</i>	-735.68 kcal	
<i>Annual change in weight</i>	-.21 lbs	

Conclusion

<i>% change in quantity</i>	10% FV product subsidy	45% FV commodity tax	½% fat tax
Cereals and bakery	-1.14%	1.63%	0.25%
Red meats	-2.04%	2.74%	-0.47%
Poultry and eggs	1.33%	-2.11%	0.39%
Fish and seafood	3.42%	-4.21%	-0.79%
Dairy	1.51%	-1.66%	-0.26%
Fruit and vegetables	6.34%	-8.24%	-0.05%
Other food	0.80%	-1.60%	-0.30%
Nonalcoholic beverage	-0.68%	0.35%	-0.14%
FAFH	-1.23%	1.32%	-0.08%
Alcoholic beverage	0.50%	-0.72%	-0.06%
<i>Annual change in kcal</i>	-734.13 kcal	-740.08 kcal	-735.68 kcal
<i>Annual change in weight</i>	-.21 lbs	-.21 lbs	-.21 lbs

Extensions

- Evaluate changes in food consumption and weight for investment in agricultural R&D versus subsidies.
- Calculate the change in health expenditures from a food price-induced change in BMI.
- Calculate changes in social welfare from different policies using model.

Thank you!

