

Fat Taxes and “Thin Subsidies”

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Overview

- Western countries are increasingly concerned about a perceived epidemic of obesity
- Taxes and increased regulation have been suggested as possible solutions
- Wish to consider the possible effects of subsidizing healthier food choices

Research Questions

- How effective would subsidies be as a health intervention?
- How do the costs of subsidy programs compare on a cost-per-life-saved basis?
- What are the distributional implications of such policies?

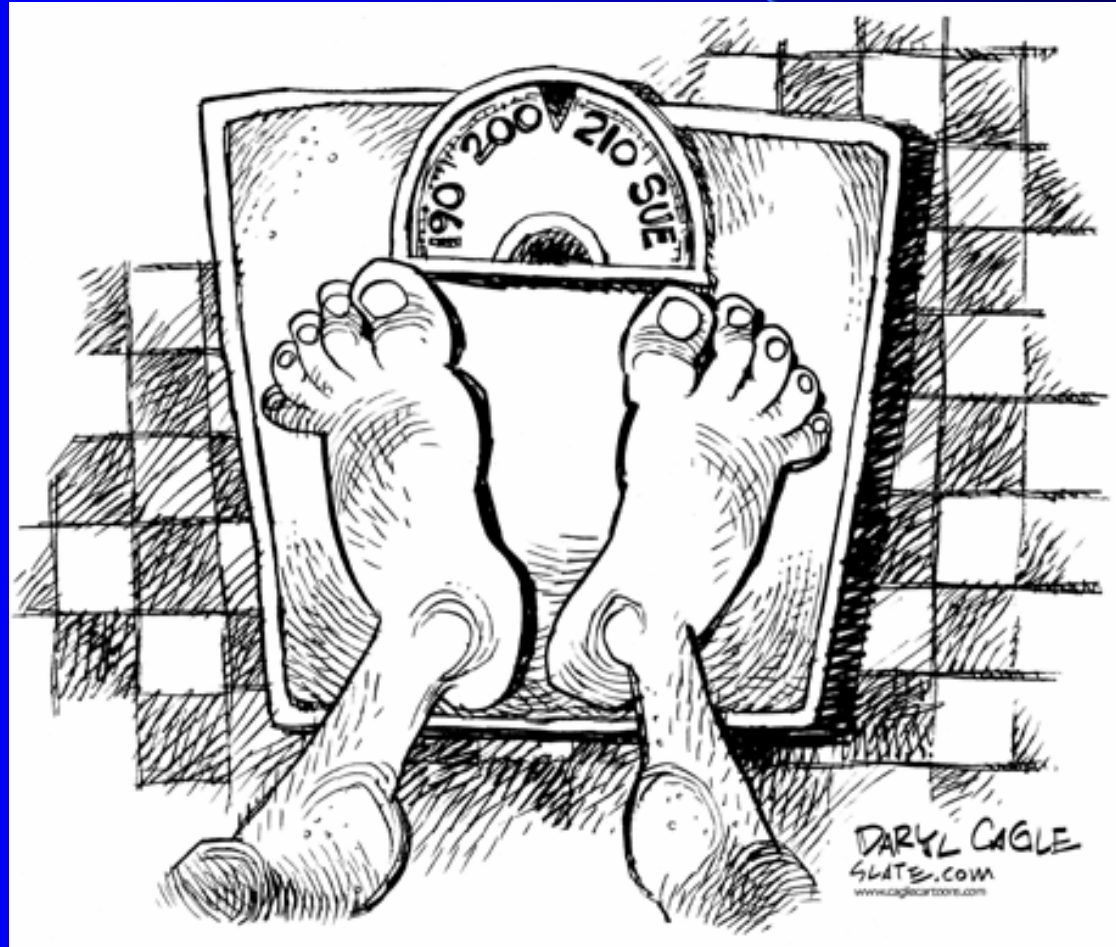
Simulations

- Regulators subsidize fruits and vegetables, causing a small decrease in retail price
- Calculate changes in fruit and vegetable intake using USDA consumption data
- Find decrease in individual health risks
- Calculate costs across relevant subpopulations

Why do we care?

- “How many more needless deaths?”
- Government agencies and other players are under pressure to respond to:
 - Increasing incidence of diet-related disease
 - Increasing health care costs
 - International initiatives
 - Popular concern

What's Motivating This?

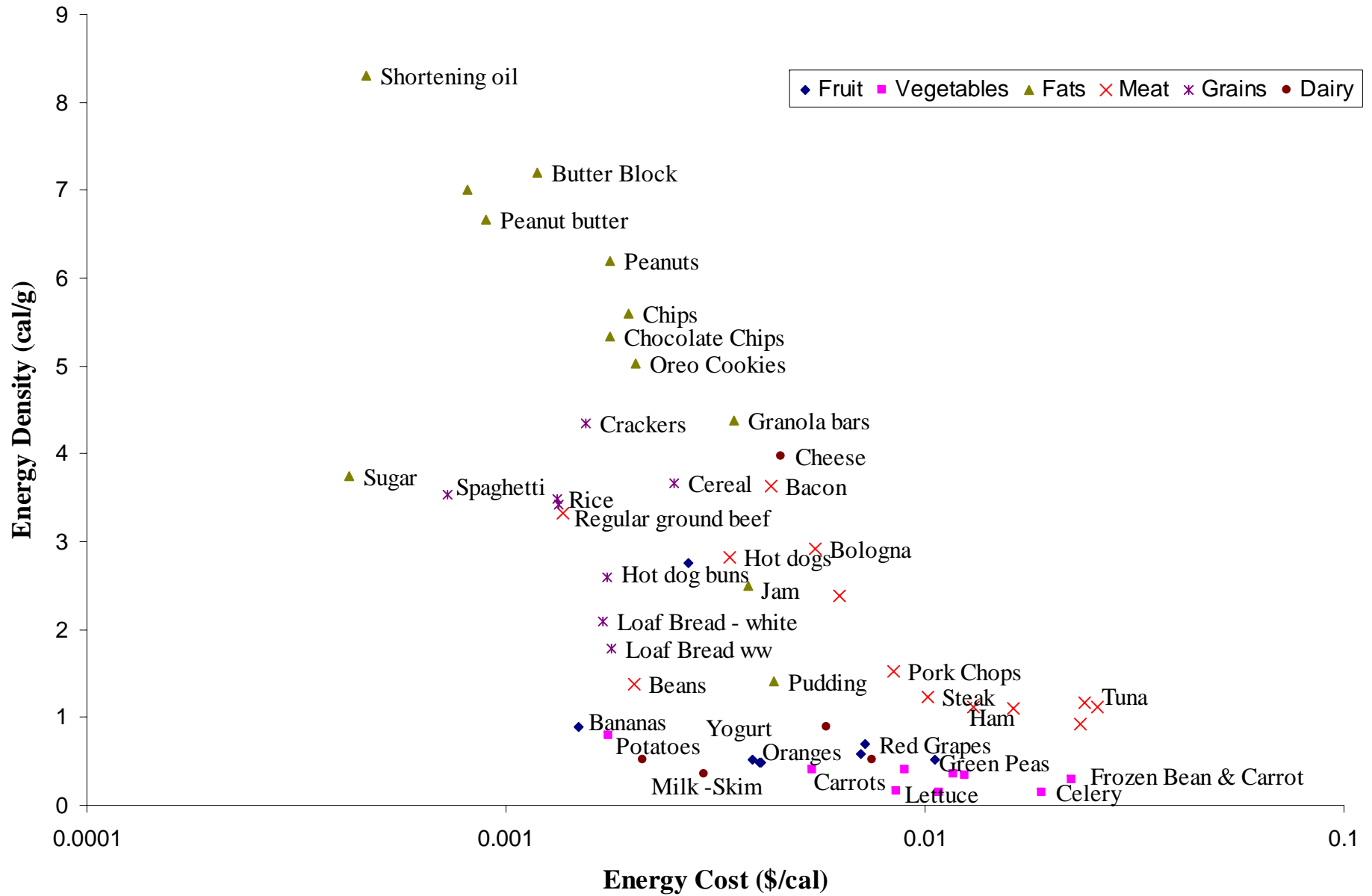


A Role for Government?

- Market failures:
 - Imperfect markets
 - Imperfect information
 - High external costs
- “Special” roles:
 - Protection of children
 - Regulation of broadcast media
 - Belief that health is an important part of societal well-being

Legislative responses

- 20 U.S. states outlawed obesity lawsuits
- North American legislatures looking at bills to
 - study obesity
 - restaurant nutrition information
 - impose new taxes
 - adjust school lunch programs
 - ban or limit junk food in schools
 - remove trans-fats from processed foods



Per calorie food prices at Edmonton supermarkets

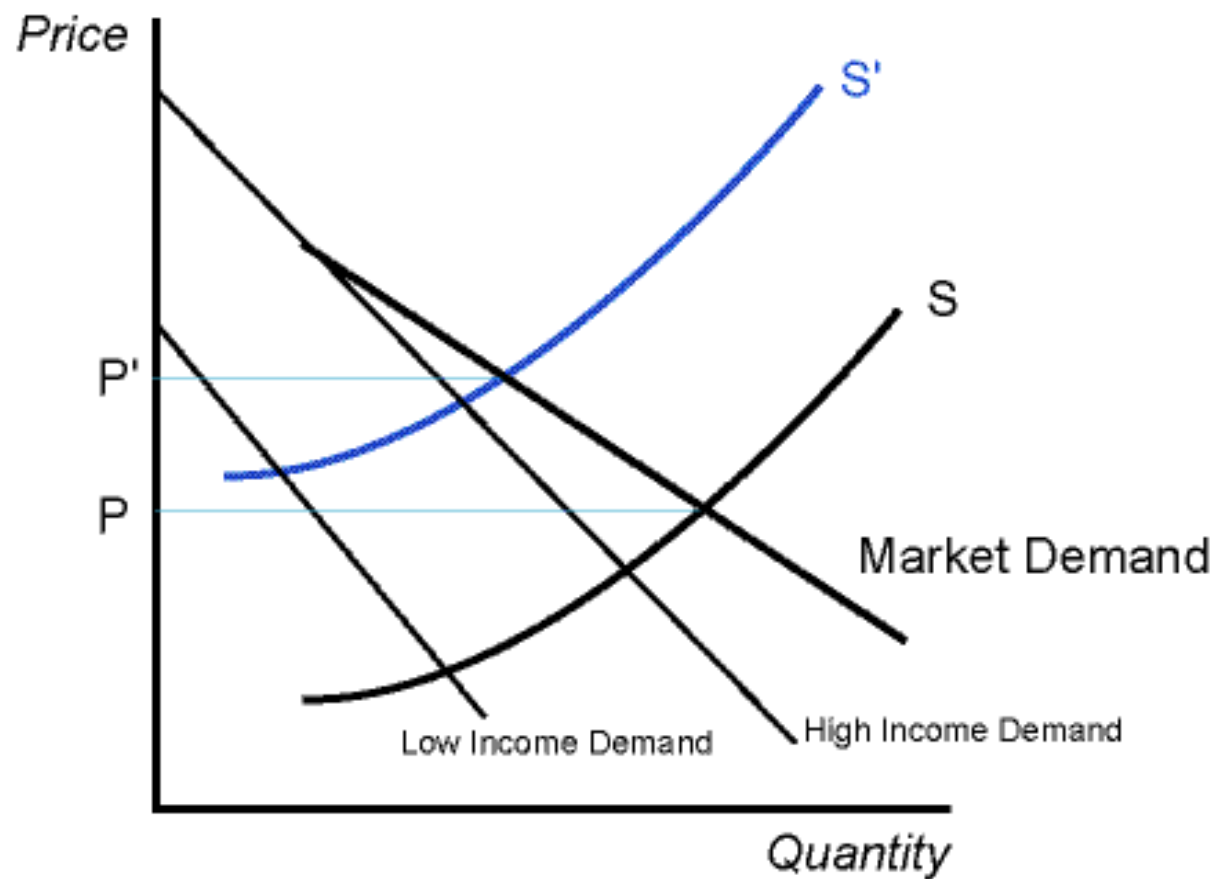
Using Tax Policy

- “Fat tax” approach
- Redistributing tax revenues
- NY “Couch Potato” tax
- Tax breaks for obesity treatments, health club membership, exercise equipment

Problems with Fat Taxes

- Consumers are responsive to price – so can indeed decrease consumption
- Unlike addictive products (e.g., nicotine), snack foods can be safely consumed in moderation
- Involves a reduction in real consumer income
- Regressive distributional effects?

Distributional Implications



“When your mother said, ‘Eat your vegetables,’ she was right. Research strongly indicates that approximately one-third of cancer deaths that occur each year in the U.S. can be prevented by eating well and being more active”

The latest in cancer prevention
from our epidemiologists,
behavioral scientists, and your mom.



When your mother said, ‘Eat your vegetables,’ she was right. Research strongly indicates that approximately one-third of cancer deaths that occur each year in the U.S. can be prevented by eating well and being more active. So we’re promoting policy decisions and community programs that encourage good nutrition and increased physical activity—to help everyone adopt healthier lifestyles. These are just a few of the many ways we’re working to prevent cancer. With your help, we can do even more. To find out how you and your organization can get involved, please contact us.

Hope. Progress. Promise. / 1-800-ACLS-2285 / www.cancer.org



Indirect Health Effects

- Individual health risk: $H_i = g(X_i, Z_i)$
- By the chain rule, the change in health risk from a change in policy Q is

$$\frac{dH_i}{dQ} = \frac{\partial h}{\partial X_i} \frac{\partial X_i}{\partial p} \frac{\partial p}{\partial Q}$$

- Decreased incidence of disease is therefore

$$\sum_{i=1}^n \frac{\partial H_i}{\partial Q}$$

In Plain Language

- Policy influences price (here, a subsidy lowers the price)
- Price influences consumption behaviour
- Consumption changes influence individual health
- Changes in individual health sum up to decreased disease incidence in the population

Policy Change

$(\partial X / \partial p)$

- The policy I'll consider here is a small across-the-board retail price subsidy on three broad categories:
 - all fruits
 - all vegetables
 - all fruits and vegetables

Consumption Changes ($\partial X/\partial p$)

- Response given by USDA elasticities for fruits and vegetables, by income group (Huang and Lin, 2000)
- Consumer baselines given by USDA Continuing Study of Food Intakes by Individuals, 1994-1996, 1998
- Each individual is a unit of observation (n=18,081)

Demand Elasticities

Commodity	All Incomes	Low Income	Medium Income	High Income
Fruit	-0.7196 (0.0282)	-0.6472 (0.0693)	-0.6614 (0.0469)	-0.7523 (0.0409)
Vegetables	-0.7238 (0.0179)	-0.6965 (0.0391)	-0.7436 (0.0301)	-0.7087 (0.0272)
Juice	-1.0109 (0.0364)	-1.0498 (0.0837)	-0.8997 (0.0591)	-1.0387 (0.0563)

Low income refers to families below 130% of the poverty income guidelines, and high income households are above 300 percent of this level. Numbers in parentheses are standard errors. Source: Huang and Lin, 2000.

Health Risk Changes ($\partial h/\partial X$)

- Medical response from findings relating fruit and vegetable intake to ischemic stroke and heart disease
- Estimate parameterized dose-response functions
- Use estimated functions to relate changes in consumption behavior to health outcomes

Health Effects of Fruits and Vegetables

Intake of Fruits and Vegetables				
	1 st Quintile	3 rd Quintile	5 th Quintile	1 serving/day
Ischemic Stroke				
Women	1.0	0.75	0.74	0.93
Men	1.0	0.70	0.61	0.96
Pooled	1.0	0.73	0.69	0.94
Coronary Heart Disease				
Women	1.0	0.88	0.80	0.97
Men	1.0	0.95	0.80	0.96
Pooled	1.0	0.92	0.80	0.96

Source: Joshipura *et al.* (1999); Joshipura *et al.* (2001). Relative risks by quintile of intake are relative to the risk for the lowest quintile of intake. One serving per day is risk reduction per one-serving increment.

Simulations

- Assume a small change in the price of fruits and vegetables
- Calculate changes in fruit and vegetable intake using CSFII consumption data
- Find decrease in individual health risks
- Calculate costs across relevant subpopulations

Results: Reduced Disease

Disease	All Fruits	All Vegetables	All Fruits and Vegetables
Coronary Heart Disease	1,442 (61.72)	2,951 (67.77)	6,903 (145.36)
Ischemic Stroke	744 (33.86)	1,482 (37.16)	3,022 (68.25)
Total	2,186 (81.54)	4,433 (94.47)	9,925 (183.52)

Cases Induced by a 1% Price Increase in all fruits and vegetables. Results reported are the simulation means and standard errors from a series of Monte Carlo trials (n=100,000). Low income refers to families below 130% of poverty line; high income households are above 300% of this level.

What would it cost?

- Positive health outcomes can be achieved by subsidizing fruits and vegetables
- If we know the average cost per serving, we can estimate the cost per life saved
- Such programs may prove to be more cost-effective than many other health interventions

Cost Per Life Saved

by Avoiding Heart Disease and Strokes through Subsidies

Health Outcome	All Incomes	Low Income	Medium Income	High Income
Fruits and Vegetables	1.29	1.02	1.19	1.45
Fruits	2.19	1.82	2.17	2.31
Vegetables	1.80	1.33	1.62	2.12

Present Value of a forty-year subsidy of one percent of retail price. Low income refers to families below 130% of the poverty income guidelines, and high income households are above 300% of this level. All numbers are in millions of U.S. dollars.

Distributional Effects

- Those who are eating fewer fruits and vegetables gain the greatest health protection
- The cost per statistical life saved is therefore lowest for those at lower incomes

Are subsidies worth it?

- A one-percent subsidy of all fruits and vegetables can save 10,000 lives for US \$1.3 million each
- Value of a statistical life estimated to be between US \$4 and \$9 million (passes benefit-cost test)
- Compare to \$65 million per cancer case for U.S. toxics and pesticide programs

In Summary

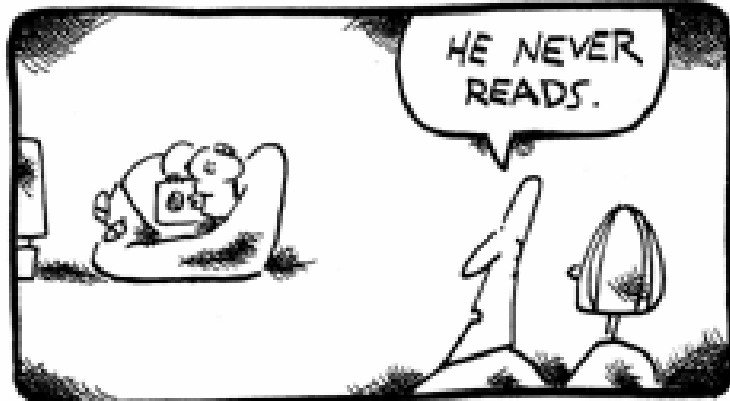
- This is a big issue in North America, and there will be policy responses
- Fat taxes may be effective, but regressive and unpopular
- “Thin Subsidies” would be
 - effective
 - progressive
 - cost effective

Toward Better Regulation

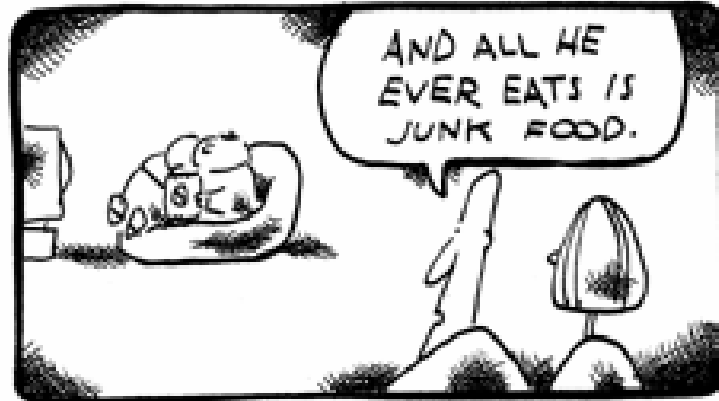
- Western governments subsidize the wrong things – why not the right things for once?
- “Sensible” health information policies likely to be winners
- Taxing in the absence of market failures causes other problems
- As we learn more about diet-health links, we should factor them into our regulatory decision-making process



ALL HE DOES IS WATCH TV.



HE NEVER READS.



AND ALL HE EVER EATS IS JUNK FOOD.



IT'S MAKING HIM FAT.



NOW THEY'RE TALKING ABOUT BETTER FOOD LABELING.



DO YOU THINK THAT WOULD HELP?

REFER BACK TO PANEL #2

THEN SHOULD HE GET UP AND TURN OFF THE TV?

HE CAN'T GET UP.

Working Paper

Can be downloaded from AgEcon search:

<http://agecon.lib.umn.edu>