



DEPARTMENT OF
**RURAL
ECONOMY**
UNIVERSITY OF ALBERTA



Public-Private Roles

Farm and Food Policy and Obesity

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Public Private

- Various actions taken by government can result in reactions by firms within a market – not clear about net nutritional outcomes
- Other players in the market include non-governmental organizations such as Heart and Stroke Foundation (HSF) in Canada (cancer = 5 a day)
- In Canada HSF tries to encourage government action – trans-fats, sodium are two examples

Tick Fact Sheet



Heart Foundation's Pick the Tick – Helping shoppers make healthier choices

Q. How does the Tick help me shop?

A. When you're racing through the supermarket, it's hard enough remembering everything you need to buy, let alone trying to understand information panels, read labels or remember what you should and shouldn't be eating.

The Heart Foundation's Pick the Tick has been helping shoppers make healthier food choices quickly and easily since 1996. The hard work of analysing and understanding food labels has already been done by independent experts.

So all you have to do is look for the Tick – whether your particular interest is the amount of saturated fat, kilojoules or salt in a food.

Q. Why should I choose products with the Tick?

A. When you choose a product carrying the Heart Foundation's Tick, you're buying a healthier product in that category. For example, bread with the Tick is a healthier choice of bread, meat with the Tick is a healthier choice of meat, etc.

Tick foods are 'healthier choices' because they have met the Program's strict nutrition standard. These standards set maximum levels of saturated fat, sodium (salt) and where relevant, maximum levels of kilojoules and minimum levels of fibre.

Q. How do companies get the Tick on their products?

A. Food companies have to work really hard to earn the Tick. All foods, without exception, must meet the Heart Foundation's strict nutrient standards and be independently tested before they can use the Tick on their labels.

If a product does not meet the guidelines, the manufacturer may work with the Heart Foundation to improve the nutritional profile of that product.

Q. Do fruit and vegetables get the Tick?

A. All fresh fruit and vegetables automatically qualify for the Tick. Additionally, more than one-third of the products in the Tick Program are fresh foods like fresh meat and chicken, unprocessed grains, legumes, nuts and seeds.



Australia

Canada

It's a gold mine of INFORMATION...

Nutrition Facts	
Valeur nutritive	
Per 250 mL (287 g) / par 250 mL (287 g)	
Amount	% Daily Value
Teneur	% valeur quotidienne
Calories / Calories 185	
Fat / Lipides 0.1 g	0 %
Saturated / saturés 0 g	0 %
Trans / trans 0 g	
Cholesterol / Cholestérol 0 mg	
Sodium / Sodium 8 mg	0 %
Carbohydrate / Glucides 40 g	13 %
Fibre / Fibre 0 g	0 %
Sugars / Sucres 38 g	
Protein / Protéines 1 g	
Vitamin A / Vitamine A	2 %
Vitamin C / Vitamine C	60 %
Calcium / Calcium	2 %
Iron / Fer	4 %

Use the Nutrition Facts table to compare products to determine which one is the healthier choice.

The ingredient list and the Nutrition Facts table on a food package can help you make healthy food choices. They help you determine what ingredients are used most and what nutrients the product provides. Another way to find a healthy choice is to look for the Health Check™ symbol.

Foods with the Health Check symbol have been reviewed by the Heart and Stroke Foundation's registered dietitians and can contribute to an overall healthy diet based on Canada's Food Guide.

- ✓ The ingredient list starts with the ingredient used most in the product.
- ✓ The Nutrition Facts table tells you how many calories and nutrients there are based on the product's Serving Size. When you compare products, make sure the Serving Sizes are similar.
- ✓ If you eat 2 times the Serving Size, you will get double the listed calories and nutrients.
- ✓ % Daily Value tells you if there is a little or a lot of a specific nutrient such as fat, sodium, or vitamin C in a product.
- ✓ Look for a higher % Daily Value for nutrients such as fibre, vitamins A and C, calcium, or iron.
- ✓ Look for a lower % Daily Value for fat, saturated and trans fats, and sodium.
- ✓ Limit the amount of saturated fats and avoid trans fats. Low saturated fat is 2 grams or less.



Health Check™
...helping you eat well!

healthcheck.org



heartandstroke.ca

U.S.



FRESH FACTS FROM THE AMERICAN HEART ASSOCIATION



The American Heart Association's heart-check mark is the most recognized and trusted food icon today.

Combining the reputation of the American Heart Association with powerful brand awareness, certification gives your product a competitive point of difference in the grocery store.



To learn more about certification, contact:
April Whitfield
(214) 706-1879
April.Whitfield@heart.org
heartcheckmark.org.

Health Check in Canada

- Food companies and restaurants can apply to HSF for approval of products – pay an application fee; if approved pay an annual fee to have the logo on their product/restaurant menu
- Question remains about how effective the strategy is in enhancing health – controversy about standards HSF (do they adjust quickly enough) uses; about the fees; about the lack of comparison across all products in outlets
- *Other questions – does the pervasiveness of the use of this logo in Canada reduce pressure to develop FOP signal?*

Types of Health Check Impact

- Assuming people understand and rely on such signalling the impact of Health Check can be on:
 - sales of individual products (increase),
 - on substitution of products (increase with the Health Check, decrease without),
 - Both within and across firms
 - on halo associated with company (retailer, processor or restaurant)
 - Increase sales of all firm's products because some have the logo

Actions/Reactions

- Firm 1 – uses Health Check on some or all products
- Firm 2 – could change price, could change advertising expenditure, could change product quality
- Net nutritional outcome from sales of product from both firms = unknown

Conceptual Background

- Lambin, Naert and Bultez (1974) –
 - Assume two firms with three decision variables price, advertising and product quality
 - Oligopolistic market structure – each firm responds to actions of other firm with reaction in one of the three decision variables (original assumption firms can only respond with the same decision variable)

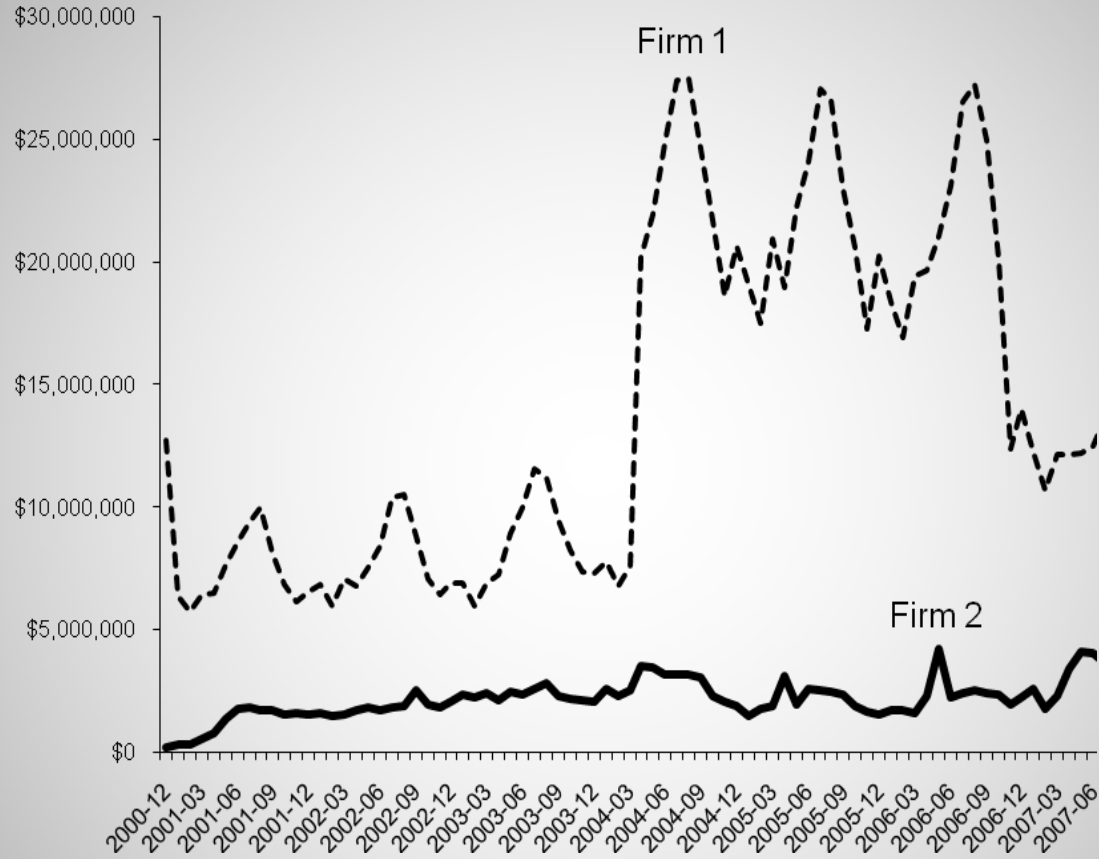
Study

- examining the impact of Health Check on grocery products through the examination of company sales – does participation in the Health Check program for even a limited number of a company's products affect sales of the company's products in total?

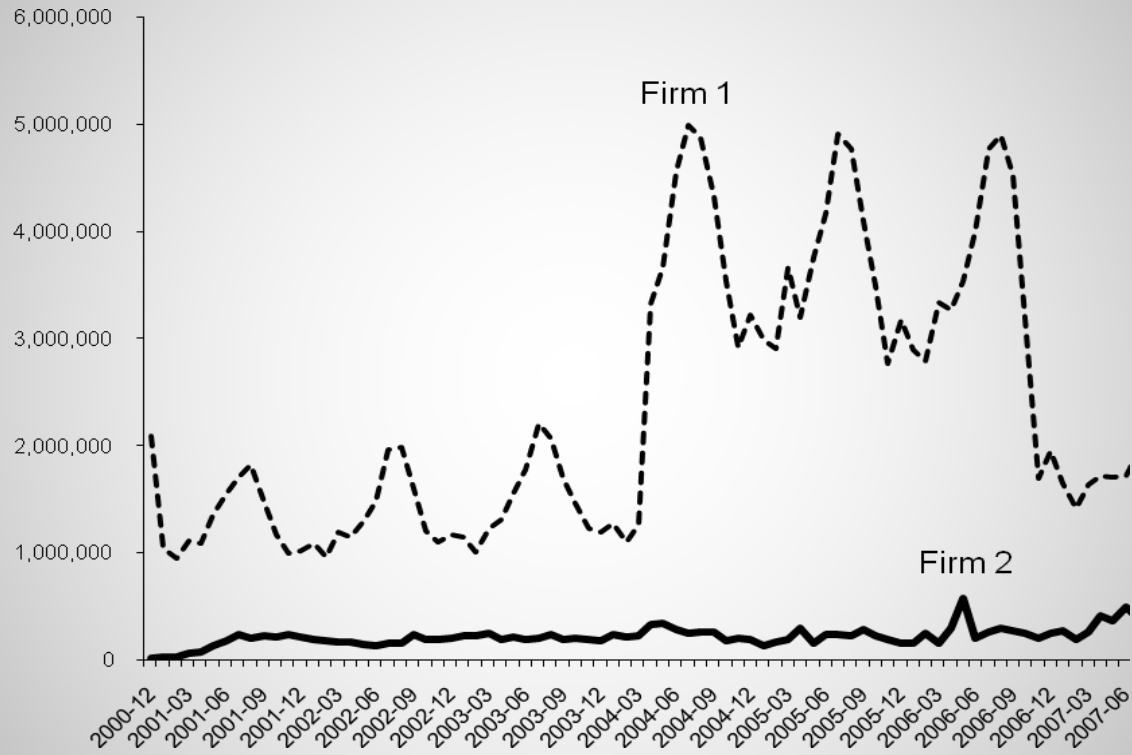
Study 1

- Using The Nielsen Group MarketTrack data on weekly sales of branded and unbranded meat products over a 7 year period examine whether or not the decision to participate in the Health Check program increased sales by the company.
- Part of a bigger project examining the impact of firm behaviour on consumer purchases and public health outcomes

**Monthly Real Revenue Sales for Firm 1's and Firm 2's
Branded Beef and Pork Products
(in Canadian Dollar)**



**Monthly Quantity Sales for Firm 1's and Firm 2's
Branded Beef and Pork Products
(in Kilogram)**



**Monthly Real Prices for Firm 1's and Firm 2's Branded Beef and Pork Products
(CA\$/Kg)**

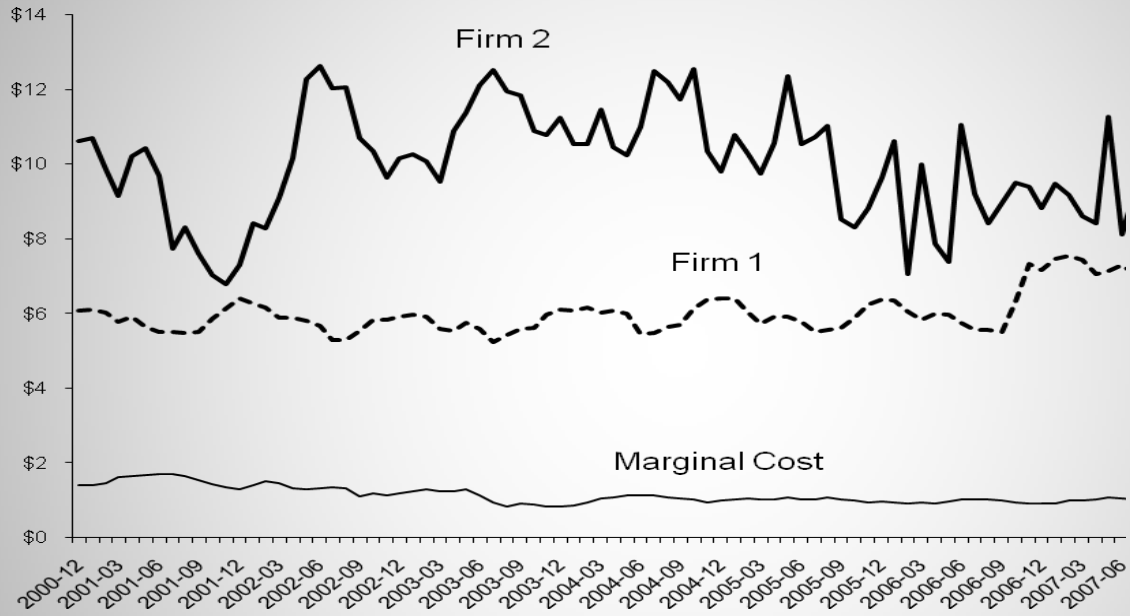
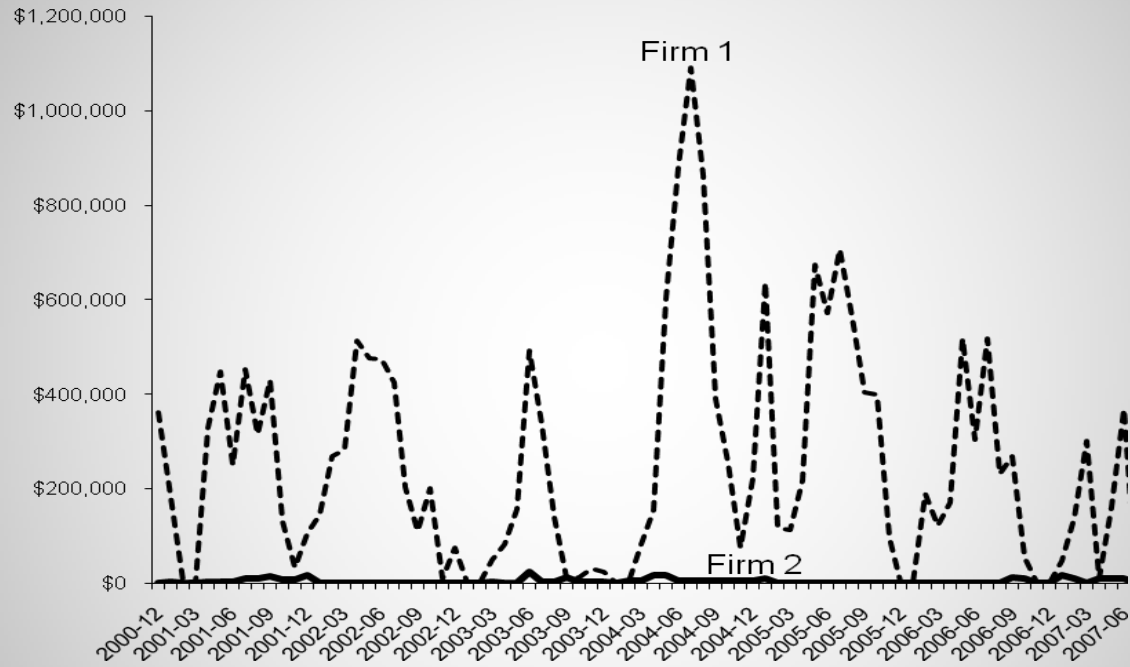


Figure 5.21 Monthly Real Advertising Expenditures for Firm 1's and Firm 2's Branded Beef and Pork Products (in Canadian Dollar)



Measurement of Nutritional Quality of Meat Products

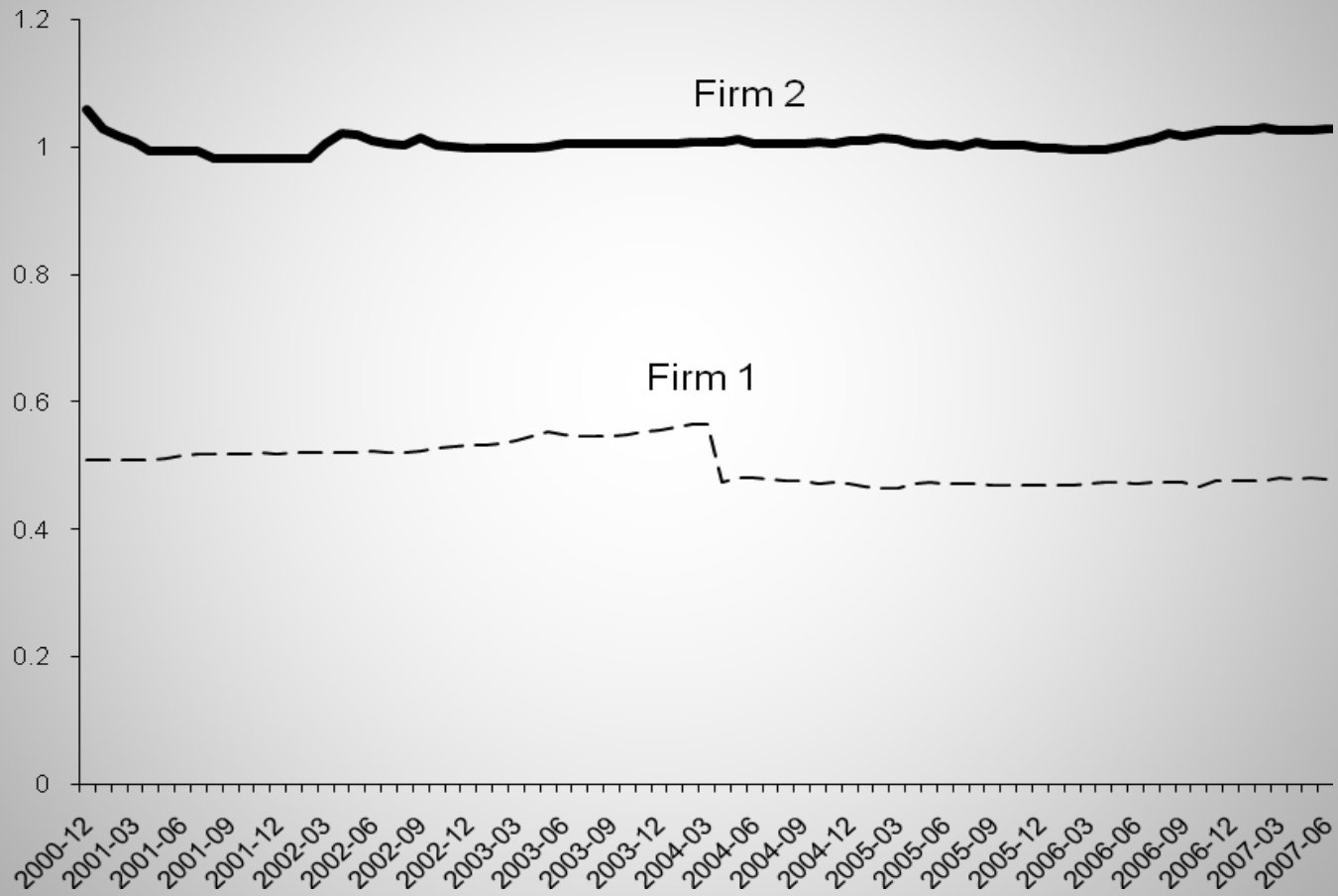
Nutrition Facts	
Per burger (130 g)	
Amount	% Daily Value
Calories 200	
Fat 9 g	14 %
Saturated Fat 2 g + Trans 1 g	15 %
Cholesterol 70 mg	
Sodium 500 mg	33 %
Carbohydrate 4 g	1 %
Fibre 0 g	0 %
Sugars 0 g	
Protein 25 g	
Vitamin A 0%	Vitamin C 0 %
Calcium 4 %	Iron 2 %

$$RRR = \frac{(\%DV_{Protein} + \%DV_{Fibre} + \%DV_{Calcium} + \%DV_{Iron} + \%DV_{Vitamin\ A} + \%DV_{Vitamin\ C})/6}{(\%DV_{Calories} + \%DV_{Sugar} + \%DV_{Cholesterol} + \%DV_{Saturated\ Fat} + \%DV_{Sodium})/5}$$

FDA/WHO Recommended Nutrient Intake

Nutrients	DV	Nutrients	DV
Protein	50 g	Cholesterol	300 mg
Fibre	25 g	Saturated Fat	20 g
Calcium	1,000 mg	Sodium	2,400 mg
Iron	18 mg	Sugar	50 g
Vitamin A	5,000 IU	DV on 2000 kcal/d	
Vitamin C	60 mg		

Monthly Quality Indices for Firm 1 and Firm 2's Branded Beef and Pork Products



Model Development

- Stackelberg Game Scenario
 - Firm 1 is the leader, Firm 2 is the follower
 - Each firm faces a firm-specific demand which is a **function of price, advertising, quality index for two firms, dummy for health check, and other exogenous variables**

Model Development (cont'd)

- Based on optimal rules, reaction functions of two firms are derived
 - Two firms, 3 strategy variables under each firm's control. Firm reacts to changes in rival's pricing, advertising and quality
 - To capture other unknown factors, an *ad hoc* intercept term is added into each reaction function
- Reaction function for each firm:
 - Price=function (intercept, rival pricing, advertising and quality)
 - Advertising=function (intercept, rival pricing, advertising and quality)
 - Quality=function (intercept, rival pricing, advertising and quality)

Model Development (cont'd)

- There are 8 equations for a simultaneous estimation: one demand equation and three reaction equations (price, advertising and quality index) for each firm
- TSP 5.0 provides maximum likelihood estimates

Variable Description	Firm 1		Firm 2	
	Estimate	t-statistics	Estimate	t-statistics
Demand Equation				
Intercept	-15.125	-29.086	-0.759	-25.107
Firm 1's Price	-0.185	-61.289		
Firm 2's Price	-0.010	-20.886	-0.007	-57.430
Firm 1's Advertising	0.060	2.235		
Firm 2's Advertising	-0.018	-9.675	0.029	1.433
Firm 1's Quality Index	19.593	61.009		
Firm 2's Quality Index	1.107	70.142	0.064	46.037
Firm 1's Health Check Dummy	-0.21	-8.99	-0.013	-10.219
Firm 2's Health Check Dummy	0.134	4.810	0.006	4.377
Canada's Food Guide Dummy	0.036	1.723	0.003	2.534
Firm 1's Merger Dummy	1.138	37.772	0.061	45.335
Firm 2's Merger Dummy	-0.01	-0.205	-0.0002	-0.137
Personal Disposable Income	0.0001	2.700	0.000002	1.432
One-Period Lagged Quantity	0.488	3.411	0.085	1.577
Time Trend	-0.008	-8.811	-0.0003	-5.573
January Dummy	-0.026	-1.316	-0.001	-0.383
February Dummy	-0.023	-1.202	-0.001	-1.134
March Dummy	-0.055	-2.858	-0.002	-2.022
April Dummy	-0.034	-1.670	0.00001	0.009
May Dummy	-0.041	-2.017	0.0004	0.312
June Dummy	-0.06	-2.89	-0.002	-1.661
July Dummy	-0.042	-1.947	-0.001	-0.757
August Dummy	-0.026	-1.122	0.001	0.387
September Dummy	-0.03	-1.259	0.00002	0.016
October Dummy	-0.049	-2.175	-0.002	-1.169
November Dummy	-0.052	-2.548	-0.003	-2.100

Long-Run Demand Elasticity Estimates

Equations	Variables	<i>Stackelberg (Firm 1 as leader)</i>
Demand Equation for Firm 1	Own-Price	-29.703***
	Own-Advertising	0.071**
	Own-Quality	185.400***
	Participating in Health Check	-3.896***
Demand Equation for Firm 2	Own-Price	-11.209***
	Own-Advertising	0.026
	Own-Quality	5.058***
	Participating in Health Check	0.294***

***, ** and * *significant at the 1% , 5% and 10% levels*

Summary for Demand Elasticity Estimates

- For both firms, demand responds negatively to own-price changes while positively to own-advertising and -quality changes
- For both firms, demand seems to be more responsive to own-quality changes than to own-price and -advertising changes
- When Firm 2 joins the Health Check program, the demand for product from Firm 2 increases; When Firm 1 joins the Health Check program, the demand for product from Firm 1 decreases.

Reaction Elasticity Estimates

Firm 1's Reaction

Firm 1 / Firm 2

Price

Advertising

Quality

Price

-0.0003***

-0.0000003***

0.001***

Advertising

0.003***

0.000003***

-0.015***

Quality

0.014***

0.00001***

-0.074***

Firm 2's Reaction

Firm 2 / Firm 1

Price

Advertising

Quality

Price

0.028***

0.0004***

-0.178***

Advertising

-0.025

-0.0003

0.162

Quality

-0.198***

-0.003***

1.258***

Summary for Reaction Elasticity Estimates

- Firm 2 more reactive in terms of price and quality strategies than Firm 1
- For both firms, quality reactions more reactive than price and advertising reactions
- Firm 2 lowers price when Firm 1 improves quality; Firm 1 lowers price when Firm 2 increases advertising investment
- Firm 1 applies a tit-for-tat advertising reaction to rival advertising changes; Firm 2 applies tit-for-tat price and quality reactions to rival price and quality changes, respectively

Simulation for a Quality Index Tax

(Sample Period: June 2001-June 2007)

<i>Endogenous Variables</i>	<i>Base</i>	<i>Shocked</i>
Firm 1's Price	5.94946	5.94931
Firm 1's Advertising	0.0075833	0.0075872
Firm 1's Quality Index	0.50082	0.50138
Firm 1's Quantity Demanded	0.073526	0.054424
Firm 2's Price	9.99578	9.99391
Firm 2's Advertising	0.00012687	0.00012690
Firm 2's Quality Index	0.99795	0.99931
Firm 2's Quantity Demanded	0.0071120	0.0065296
Overall Quality/Quantity Change	0.042677	0.032614

Simulation for No Health Check for Firm 2

(Sample Period: June 2001-June 2007)

<i>Endogenous Variables</i>	<i>Base</i>	<i>Shocked</i>
Firm 1's Price	5.94946	5.94844
Firm 1's Advertising	0.0075833	0.0076111
Firm 1's Quality Index	0.50082	0.50426
Firm 1's Quantity Demanded	0.073526	0.051154
Firm 2's Price	9.99578	9.99166
Firm 2's Advertising	0.00012687	0.00012695
Firm 2's Quality Index	0.99795	1.00131
Firm 2's Quantity Demanded	0.0071120	0.0070374
Overall Quantity/Quality	0.042677	0.031831

Summary for Simulation

- If a quality index tax is levied for each firm
 - two firms' prices and quantities demanded will go down, while two firms' advertising and quality levels will go up
 - two firms' profit levels and overall quantity/quality level for consumers will also go down
 - Interestingly similar effects if Firm 2 had not joined the Health Check
 - Example is meat – if interested in discouraging red meat consumption then Health Check?

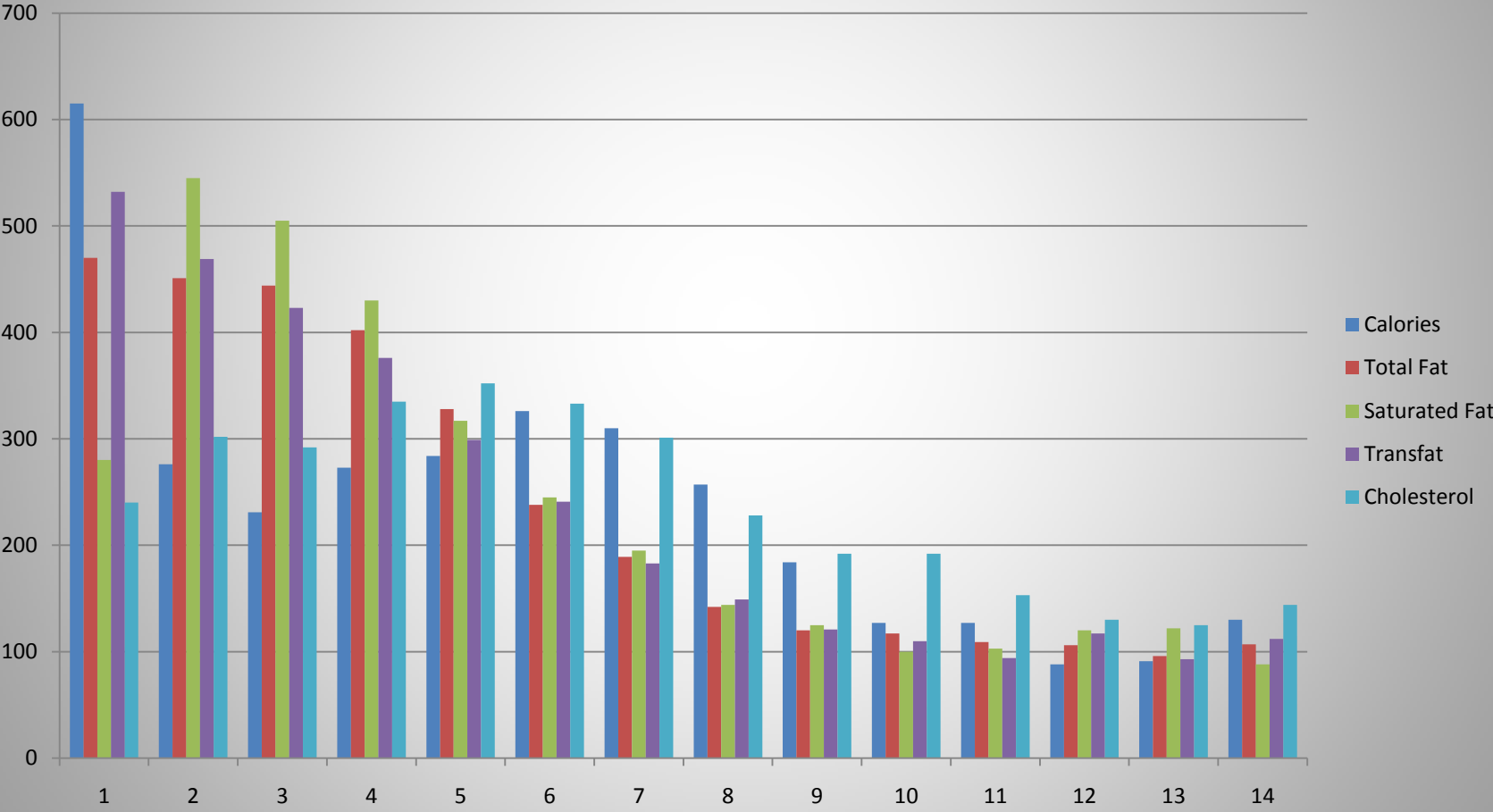
Significant Results

- Many models of firm behaviour tested and estimated
- Pattern of results across models suggest that participation in the Health Check program can move consumers from purchasing products from one company to another – the comparison is important at a company level
- Halo effects and consumer substitution/complementarity effects muddy the outcomes in terms of health

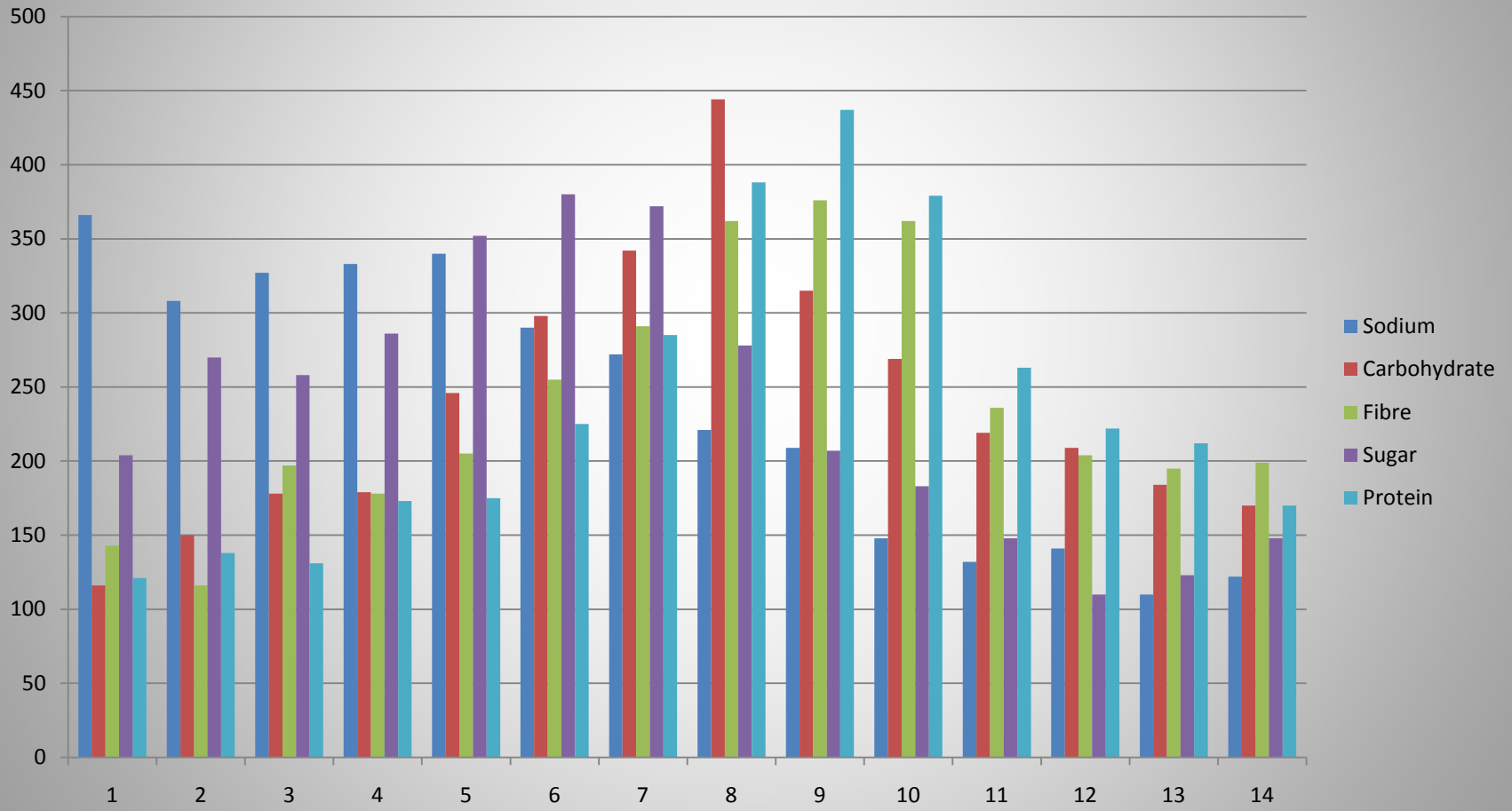
Do people respond to Health Check?

- Survey conducted in the Fall of 2009 – 3319 respondents
- Survey contained general attitude questions, basic nutrient knowledge questions and stated preference questions for a variety of turkey sandwiches with different nutrient and label characteristics

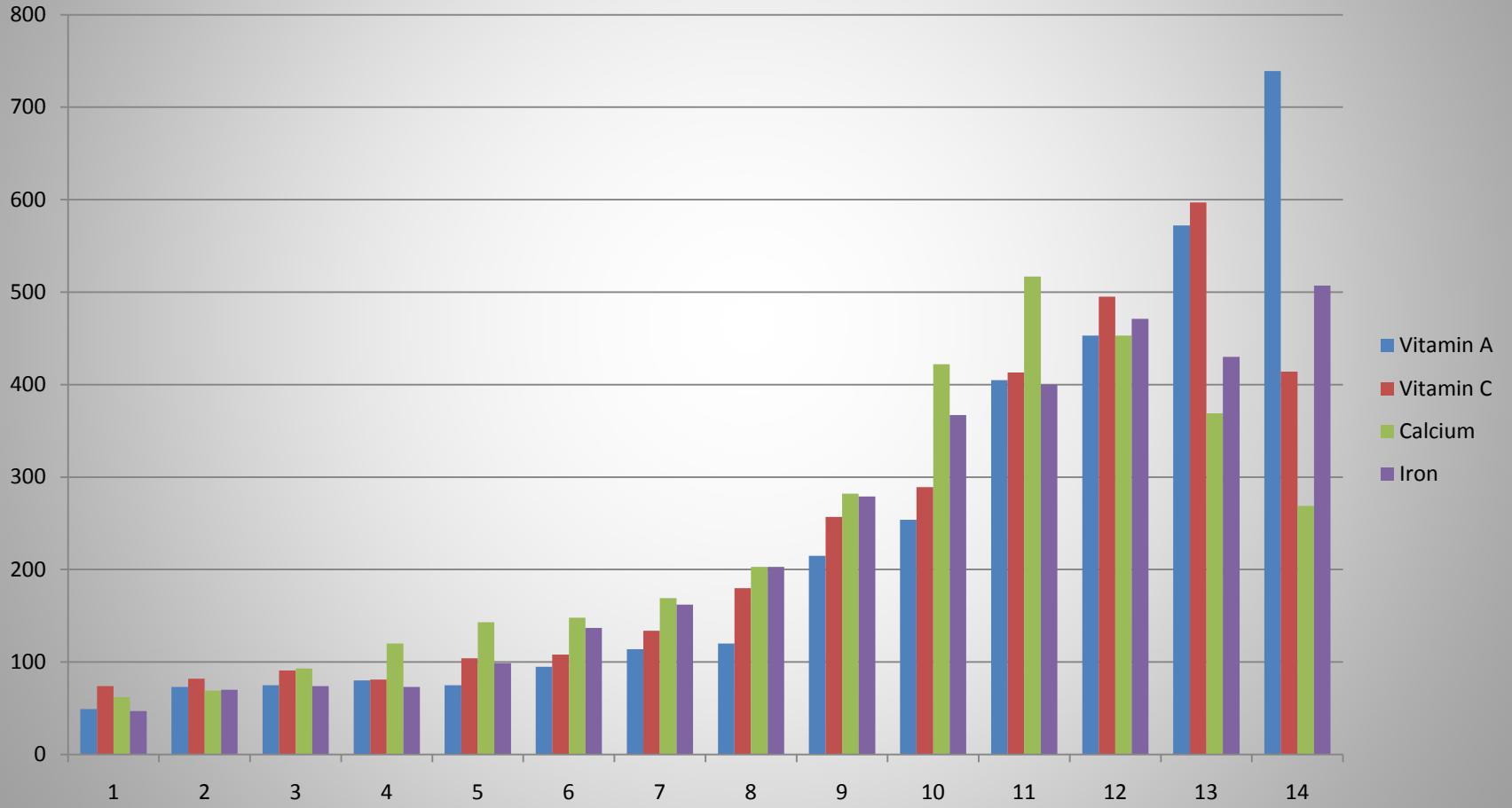
Asked to Rank 14 Nutrients in terms of importance to them in making choices at restaurants



Second set of Nutrients ranked




Ranking Last Four Nutrients



Stated Preference

- Series of explicit choice questions
 - Attributes of a turkey sandwich include
 - Price – four different levels
 - Sodium content
 - Vitamin A and C content
 - Health Check (if appropriate or not)
- Done in two groups – one group sees fat content - the other doesn't

8. During a typical visit to a restaurant when you purchase a turkey sandwich, if the following options were the only ones available, which option would you purchase?

Option A	Option B	Option C
Turkey sandwich with lettuce tomato etc. toppings		I would purchase neither of these sandwiches
Bread 2, Dressing 1 Sodium -579.81 gms – 39% DV Vitamin A – 4% DV Vitamin C – 7% DV 	Bread 2, Dressing 2 Sodium -544.69 gms – 36% DV Vitamin A – 5% DV Vitamin C – 8% DV	
\$5.00	\$5.00	

Option A

Option B

Option C

Willingness to Pay for Turkey Sandwich
with the following individual attributes
prices used - \$4.50 - \$5.50

Parameter	Estimate	t-statistic
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Regression with sodium, high and low vitamin, Health Check

WTP Vitamins	.520272	19.8000
WTP Sodium	-.489523E-02	-31.0249
WTP Health Check	.457392	17.0520

Regression with fat/sodium, high and low vitamin, Health Check

WTP Vitamins	.744011	25.9714
WTP Fat/Sodium	-2.74491	-31.7183
WTP Health Check	.478985	18.3777

Results

- Preliminary – various different types of analyses from actual sales data to stated hypothetical purchase data suggest the importance of signals – in this case Health Check – increases sales of labelled products, increases sales of products from companies who use HC – some interest in restaurant items
- To actually achieve health outcomes it is important that there is consistency in indicators of health

Acknowledgements

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