

BSE and Retail Beef Demand: Comparing Behaviour in Supermarkets vs. Restaurants

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Objectives

- Did fast food consumers in Alberta or Ontario react to media coverage of BSE by either:
 - Boycotting beef purchases
 - Or
 - Reducing beef purchases
- Did consumers behave differently in the supermarket than in fast food restaurants?
- Did behaviour change as successive BSE events occurred?



Key Dates

- **Event 1:**

May 20, 2003 – BSE reported in Alberta cow

- **Event 2:**

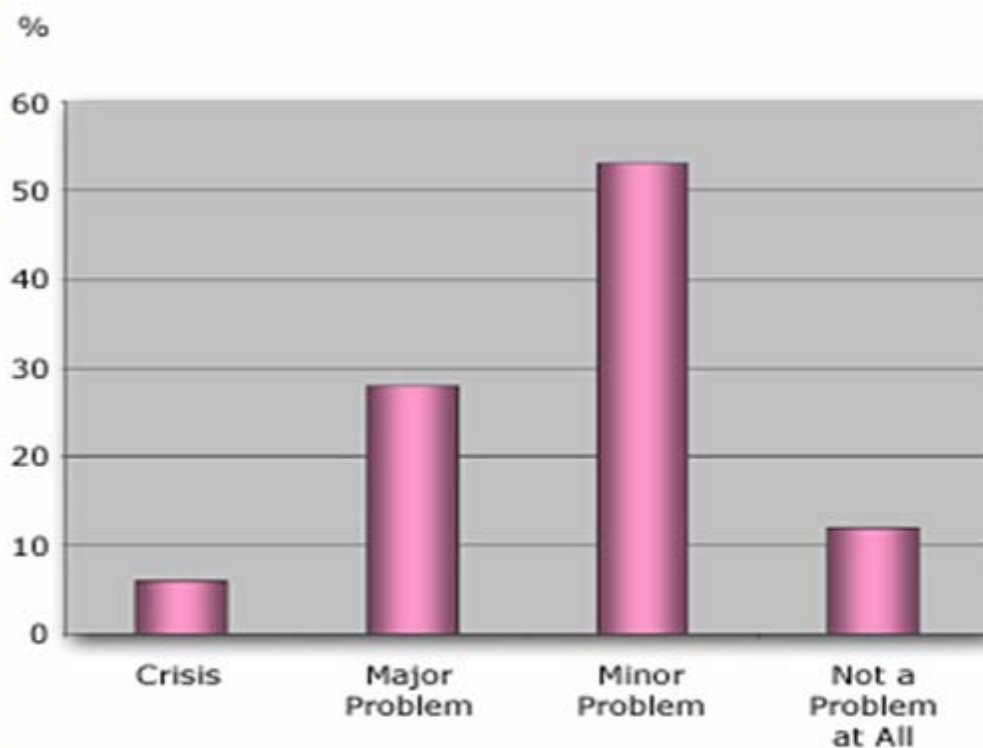
Dec. 23, 2003 – BSE reported in U.S. cow,
born in Alberta

- **Event 3:**

Dec. 30, 2004 – BSE reported in Alberta cow

Jan. 11, 2005 – BSE reported in Alberta cow

Which of these statements do you think best describes the state of mad cow disease in the United States?



Source: Gallup News Service poll of 1,029 adults, conducted Jan. 2-5, 2004. Margin of sampling error: ± 3 percentage points.



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...FOR THE BEEFED-UP SUPPORT.

Being part of the Alberta Beef industry presented its share of struggles this year, and thanks to your support we're getting through it. But our challenges aren't over yet.

We still need you.

So as we turn the page on 2003, it is with sincere appreciation that we thank you for being there for us. We'll continue to provide a safe and healthy product in addition to being a major economic contributor to our province.

For more information about the beef industry and meal ideas visit www.albertabeef.org.



ALBERTA BEEF PRODUCTS

If it ain't Alberta, it ain't Beef.



ALBERTA
2003-2004

**Meatballs come in all varieties.
Enjoy your favourite today!**



<p>1 lb (500g) 1 1/2 cup (125mL) 1/3 cup (75mL) 1/3 cup (75mL) 1 tbsp (15mL) 1/2 tsp (2mL) 1/2 tsp (2mL)</p>	<p>Lean Ground Beef egg, lightly beaten dry bread crumbs finely grated carrot shredded onion Worcestershire sauce salt pepper</p>
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1. Lightly combine all ingredients; form into about 30 1" (2.5cm) balls.
2. Bake on lightly oiled foil-lined baking tray in 400°F (200°C) oven for 15 min.

Variations - try adding the following to the basic recipe (above):

Italian: 2 tbsp (30mL) pizza sauce and 1 tsp (5mL) dried oregano. Serve with extra pizza sauce or spaghetti sauce.

Asian: 2 tbsp (30mL) hoisin sauce and 1/2 tsp (2mL) ground ginger. Serve with peanut sauce or sweet and sour sauce.

Mexican: 1 tbsp (15mL) chili powder and 2 garlic cloves (minced). Serve with salsa.

Example of press release from Canadian Food Inspection Agency

“OTTAWA, January 11, 2005 - The Canadian Food Inspection Agency (CFIA) ... detected bovine spongiform encephalopathy (BSE) in an Alberta beef cow ... No part of the animal has entered the human food or animal feed systems. Public health remains protected ...”



But, evidence exists of consumer concern about food safety and BSE in Canada

- de Jonge et al. (2006): Canadian consumers more pessimistic about food safety than Dutch consumers
- Meat products and production methods a dominant source of concern
- BSE most frequently mentioned beef issue



Behaviour in Fast Food Restaurants

Why BSE concerns might be evident in fast food buying patterns



- Consumer delegates food safety to restaurant
 - Little information about quality of beef purchased in quick-serve restaurants
 - Ground beef more likely than other cuts to contain nerve tissue
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CREST food away from home data set

- Consumer Report on Eating Share Trends (CREST) compiled by the NPD Group, Inc.
- May, 2000 – May, 2005
- 4,000 households per quarter
- All purchases by household at restaurants during 2-week period in a given quarter
- Focus on Alberta and Ontario, fast food only
- 4,194 households => 19,999 observations (each observation refers to a 2-week period for 1 household)

Detailed data available on:

- Up to 8 items purchased by each person in household (e.g., 01007=bacon cheeseburger)
 - Price paid by entire party
 - Age, income, education of household heads
 - Household composition, marital status, employment status, rent/own, language, etc.
 - Meal date, occasion (e.g., lunch), restaurant type, where indiv. was before eating, travel time to restaurant, etc.
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Selected descriptive statistics

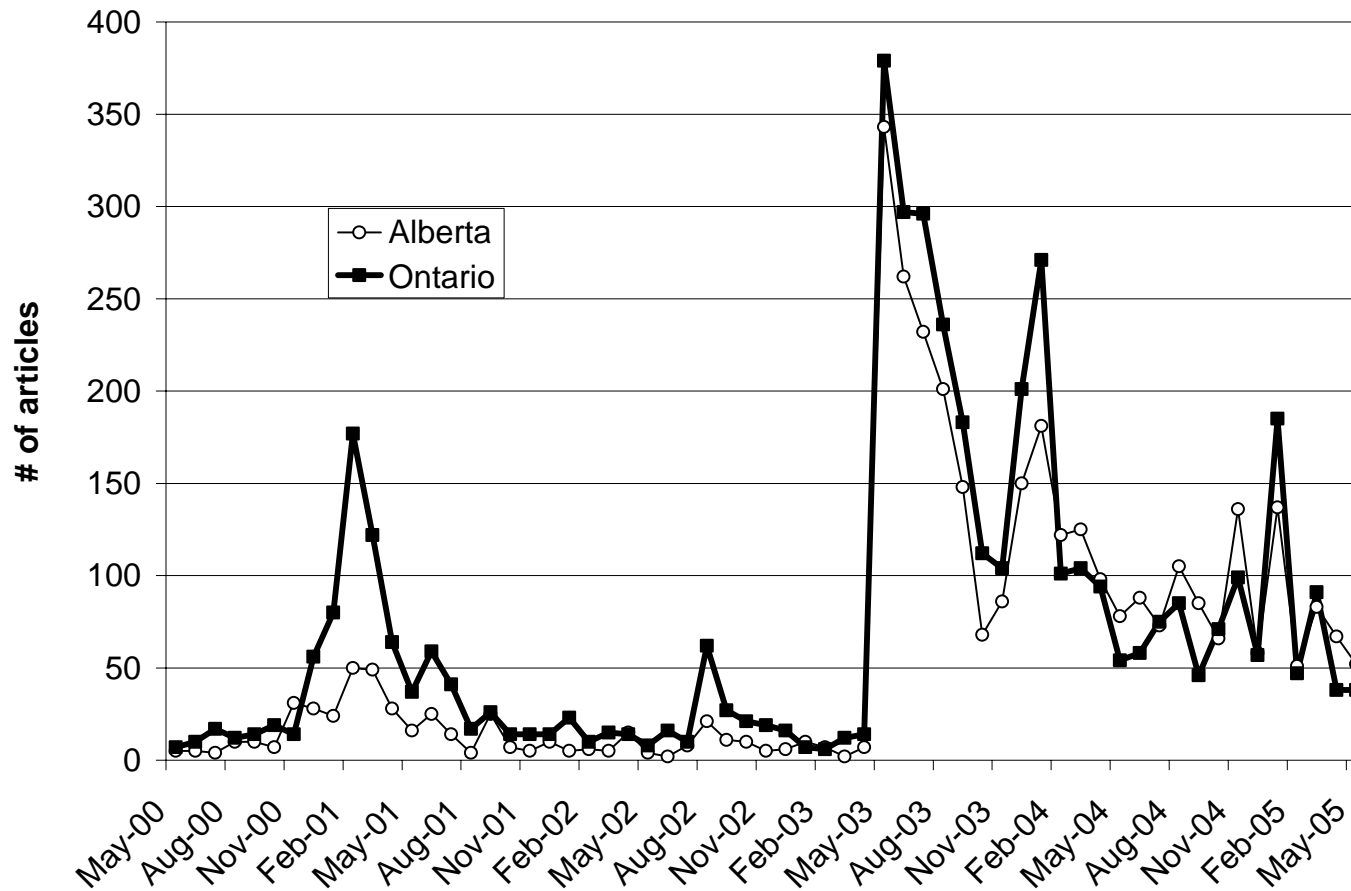
	Mean		Mean
Beef entree (0/1)	0.52	Age of household head	48.27
Chicken entree (0/1)	0.40	Married (0/1)	0.73
Pizza entree (0/1)	0.26	Children (0/1)	0.43
		College degree (0/1)	0.28
Number of beef entrees	1.39		
Number of chicken entrees	0.92		
Number of pizza entrees	0.70		
Price of beef entrée (\$)	2.33		
Price of chicken entrée (\$)	2.90		
Price of pizza entrée (\$)	5.32		

Media index

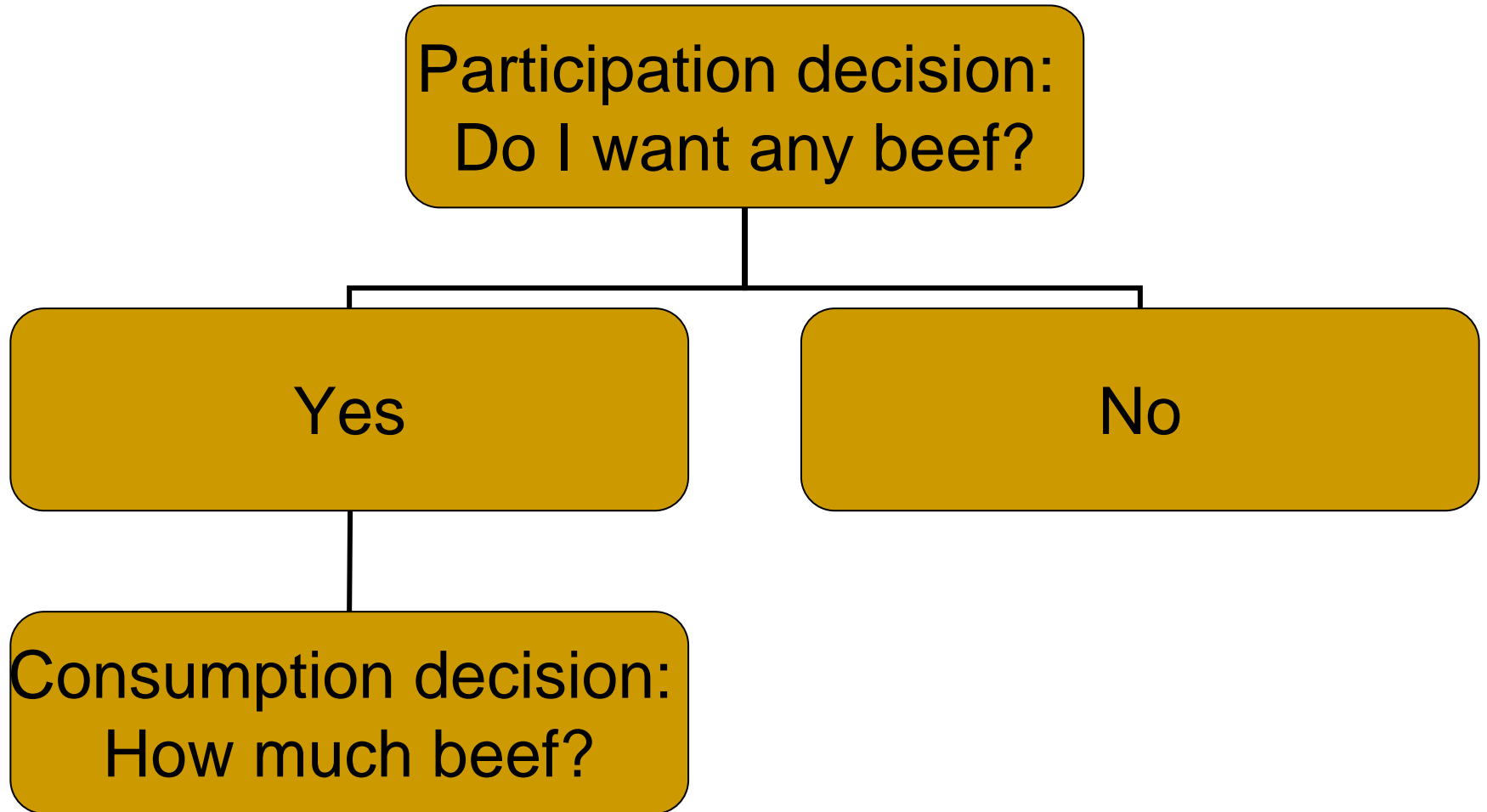
- Monthly count of articles about BSE in Alberta and Ontario newspapers with highest circulation
- Alternatives not tested: word counts, positive/negative distinction
- Alternatives that were tested:
 - BSE dummy variables and trend variables
 - 1-month and 2-month lags of media count
 - geometric lags of media count to test impact of cumulative media coverage



Number of articles about BSE in Alberta and Ontario Newspapers

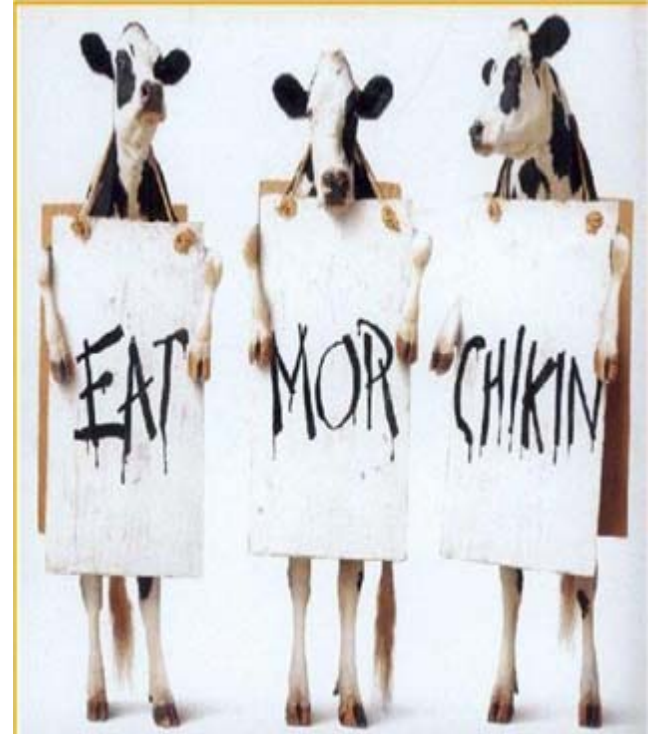


Two-Stage Decision Making Process



Double-hurdle model

- BSE could affect participation differently than consumption
- Participation => binary choice model (logit)
- Consumption => count data model (truncated Poisson)



$$L = \prod_{q_i=0} \Pr(q_i = 0) \prod_{q_i>0} [\Pr(q_i > 0) \Pr(q_i | q_i > 0)]$$

Participation model results (do you want ANY beef?)

If:

Then odds of getting beef are:

	<u>Alberta</u>	<u>Ontario</u>
You got beef before - - - - - >	1.81 : 1	1.79 : 1
You got one more beef entrée before - >	1.14 : 1	1.16 : 1
Promotional offer - - - - - >	2.13 : 1	2.01 : 1
One year older - - - - - >	0.99 : 1	0.99 : 1
Married - - - - - >	1.33 : 1	1.29 : 1
Children - - - - - >	1.24 : 1	1.21 : 1
Restaurant is 5 min. or nearer - - - - - >	0.72 : 1	0.70 : 1
Came from work - - - - - >	0.78 : 1	0.81 : 1
Came from home - - - - - >	0.70 : 1	0.67 : 1

Media index NOT statistically significant

Consumption model results (how MUCH beef?)

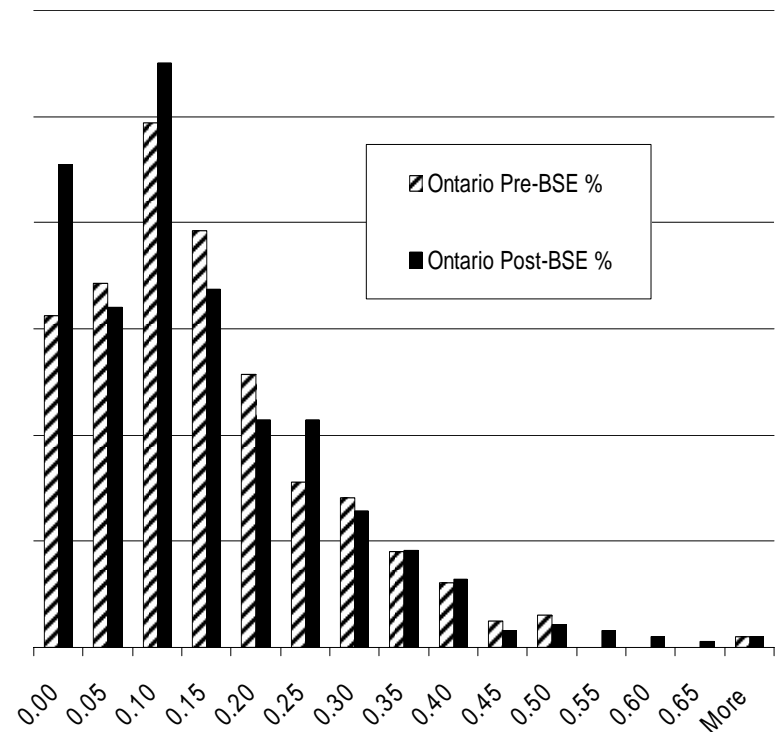
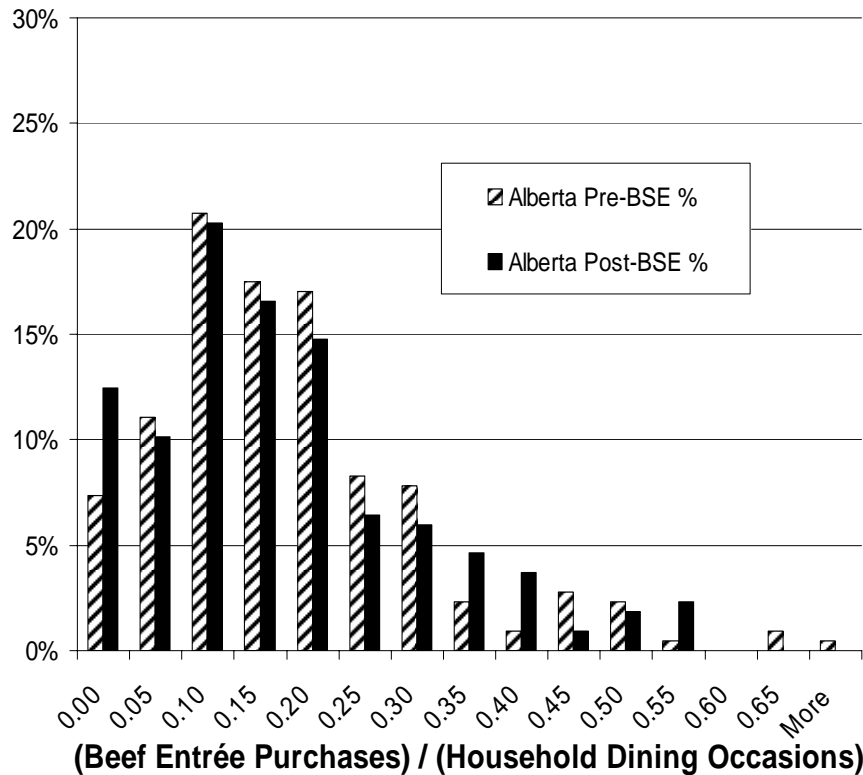
Then expected
change in number
of beef entrees is:

<u>If:</u>	<u>Alberta</u>	<u>Ontario</u>
You got one more beef entrée before - >	0.17	0.16
Promotional offer - - - - - >	0.45	0.33
Price of beef entree rises by \$1 - - - - - >	-0.61	
Price of pizza rises by \$1 - - - - - >	0.40	
One year older - - - - - >		-0.01
Married - - - - - >	0.85	0.51
Children - - - - - >	0.63	0.35
University degree - - - - - >	-0.15	
Female head works full time - - - - - >		-0.22
Restaurant is 5 min. or nearer - - - - - >		-0.13
Came from work - - - - - >	-0.29	
Media index NOT statistically significant		

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- Maybe some consumers boycotted beef, while others purchased more as a show of support
 - If so, net effect might appear to be zero



Distribution of Beef Purchases Before and After BSE



Behaviour in Supermarkets

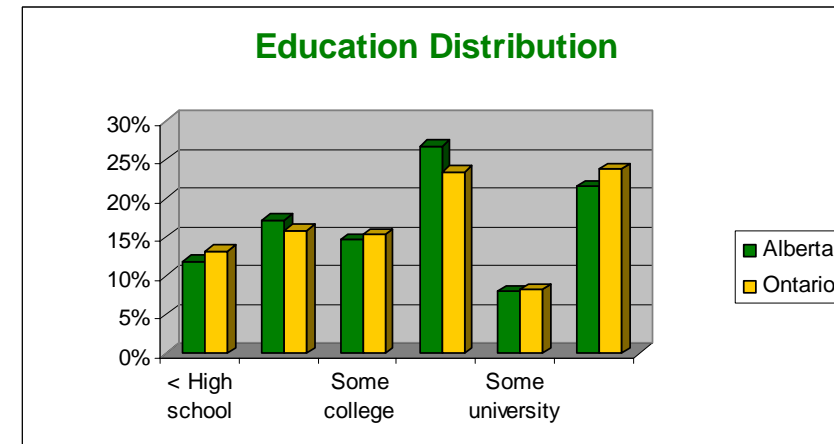
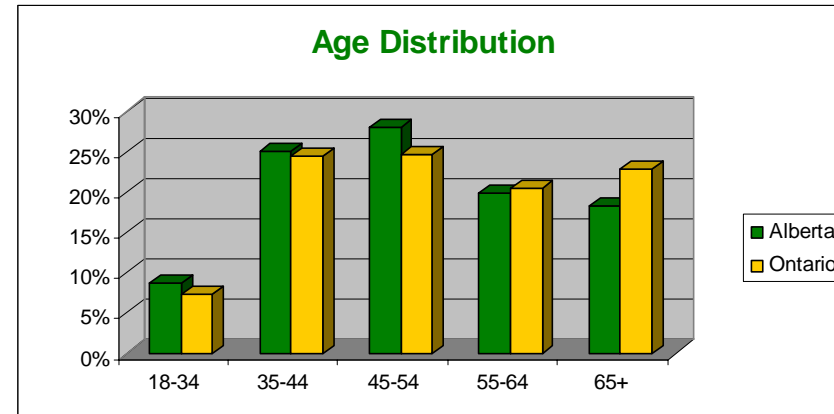


ACNielsen Homescan Data

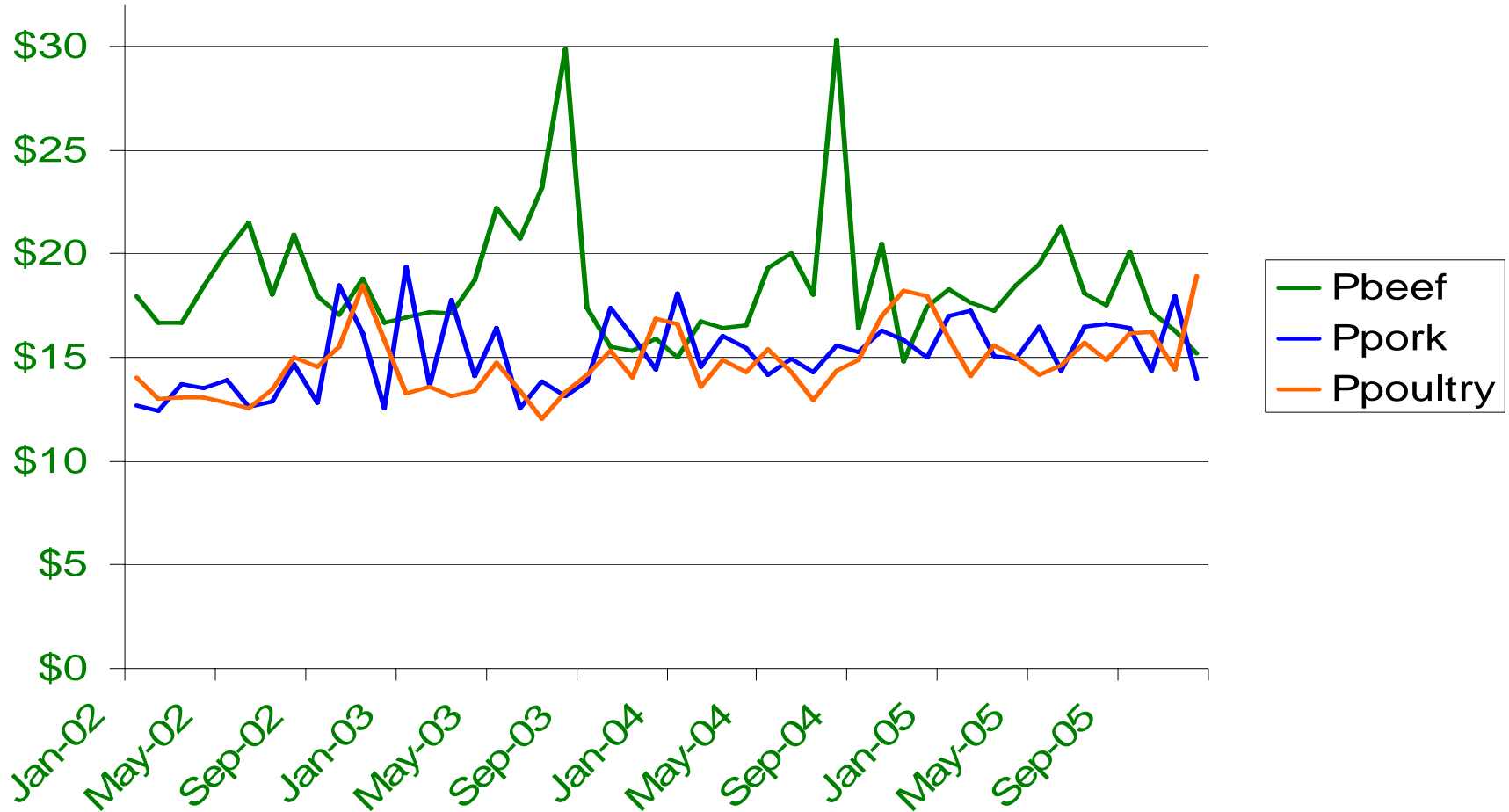
- 2002 – 2005
 - Approx. 9,000 – 10,000 households in panel
 - Each observation is a meat purchase (e.g., 2 units of beef for \$35)
 - Demographic variables (province, age, household size, income, education)
 - Purchases aggregated to monthly household level
 - Alberta and Ontario households selected
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Average values for selected variables

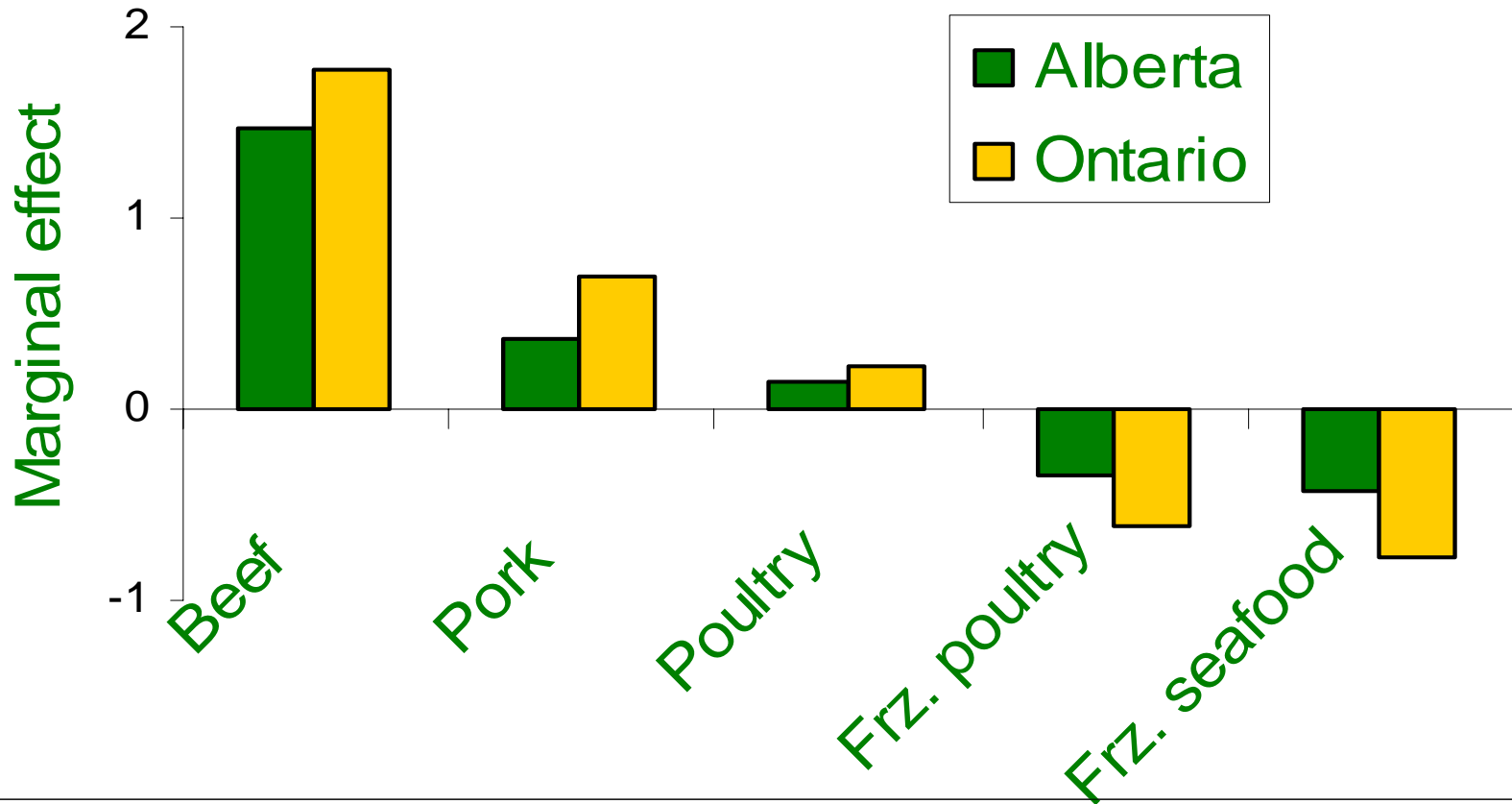
	Alberta	Ontario
# beef purchases / month	2.13	2.11
# pork purchases / month	1.18	1.25
# poultry purchases / month	1.11	1.59
Beef expenditures / month	\$39.95	\$30.27
Beef expenditure share	36%	31%
Household size	2.6	2.6



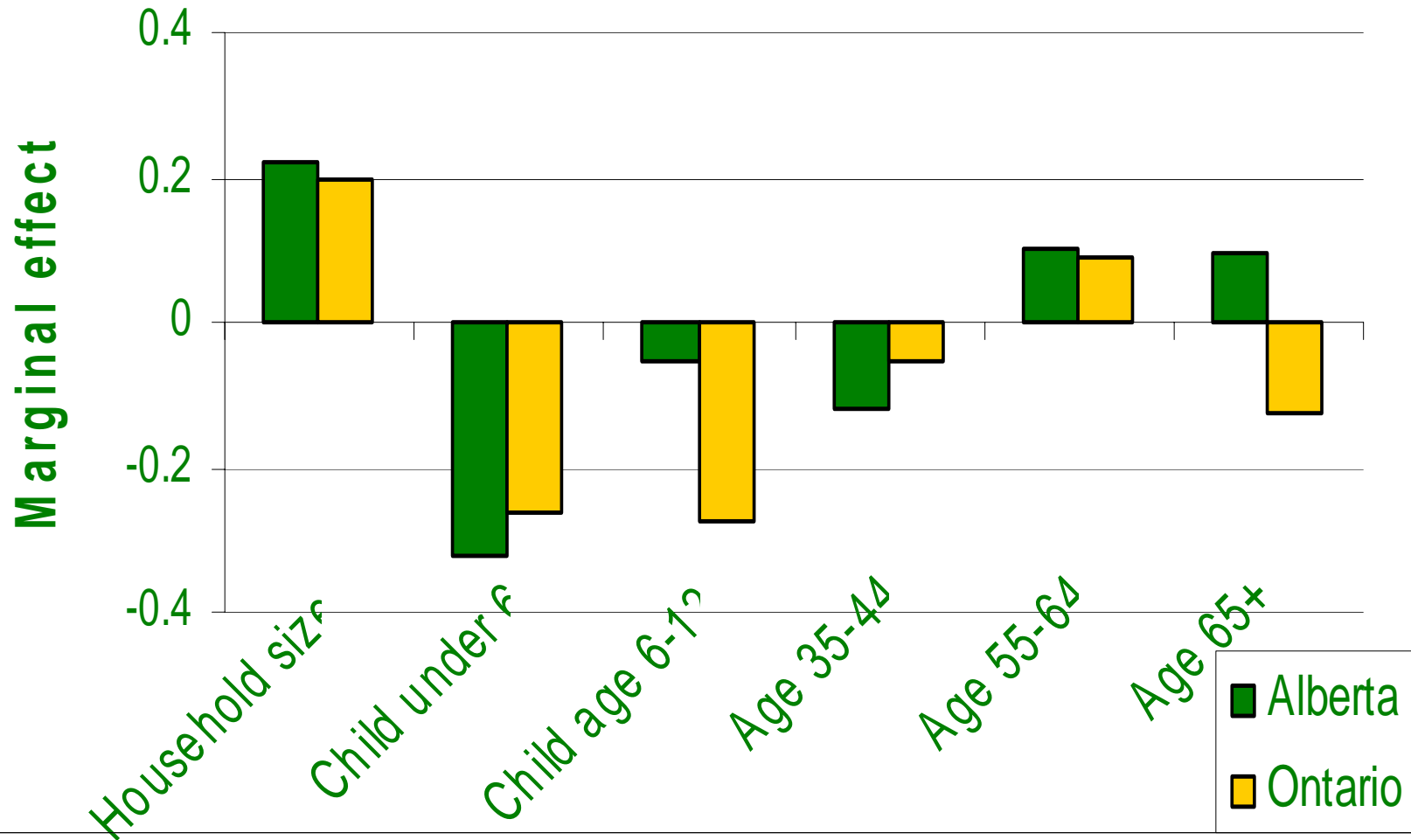
Was beef deeply discounted after Event 1? Apparently not.



Impact of lagged expenditure shares on beef quantity



Impact of household composition on beef quantity

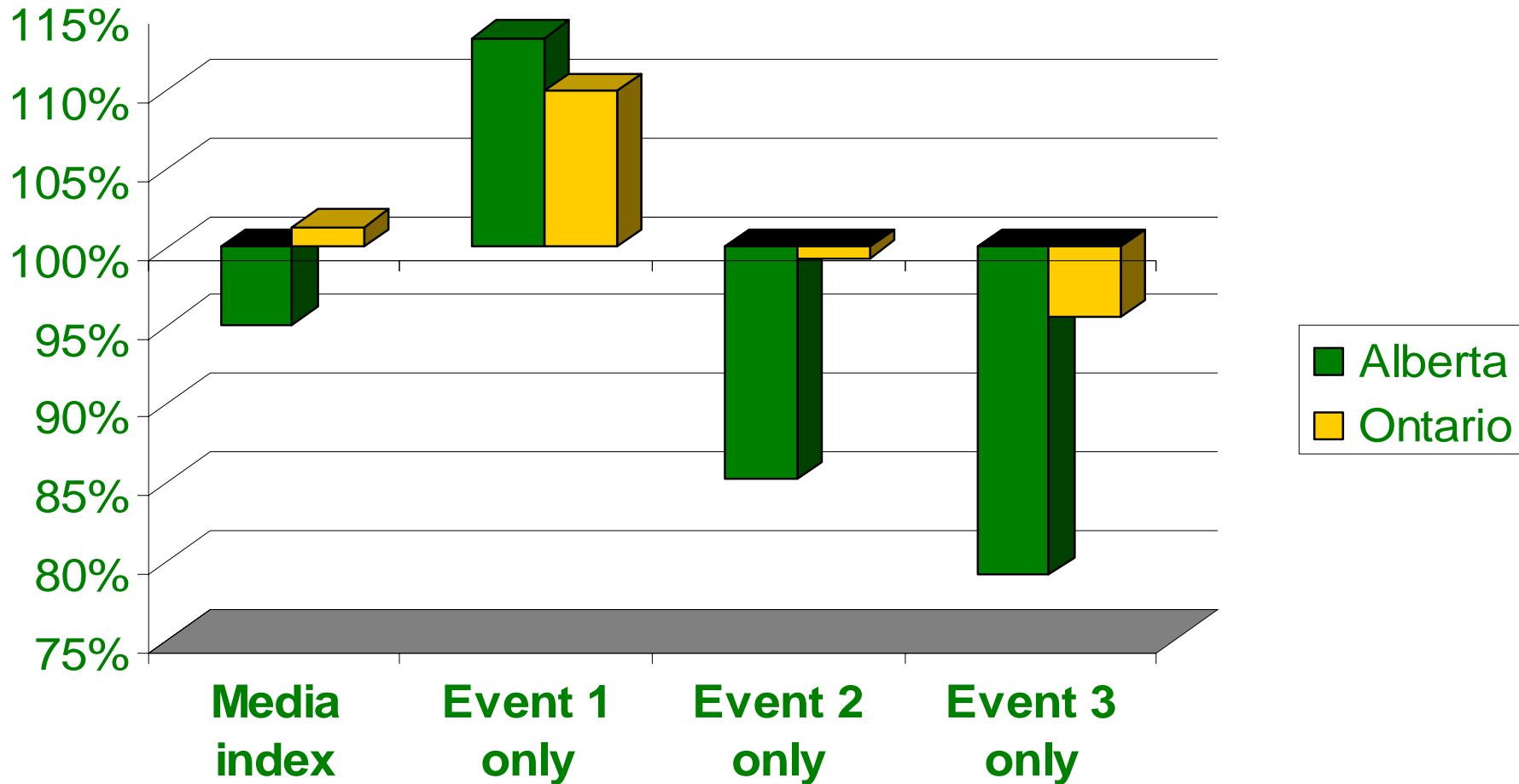


Other non-BSE impacts on beef quantity

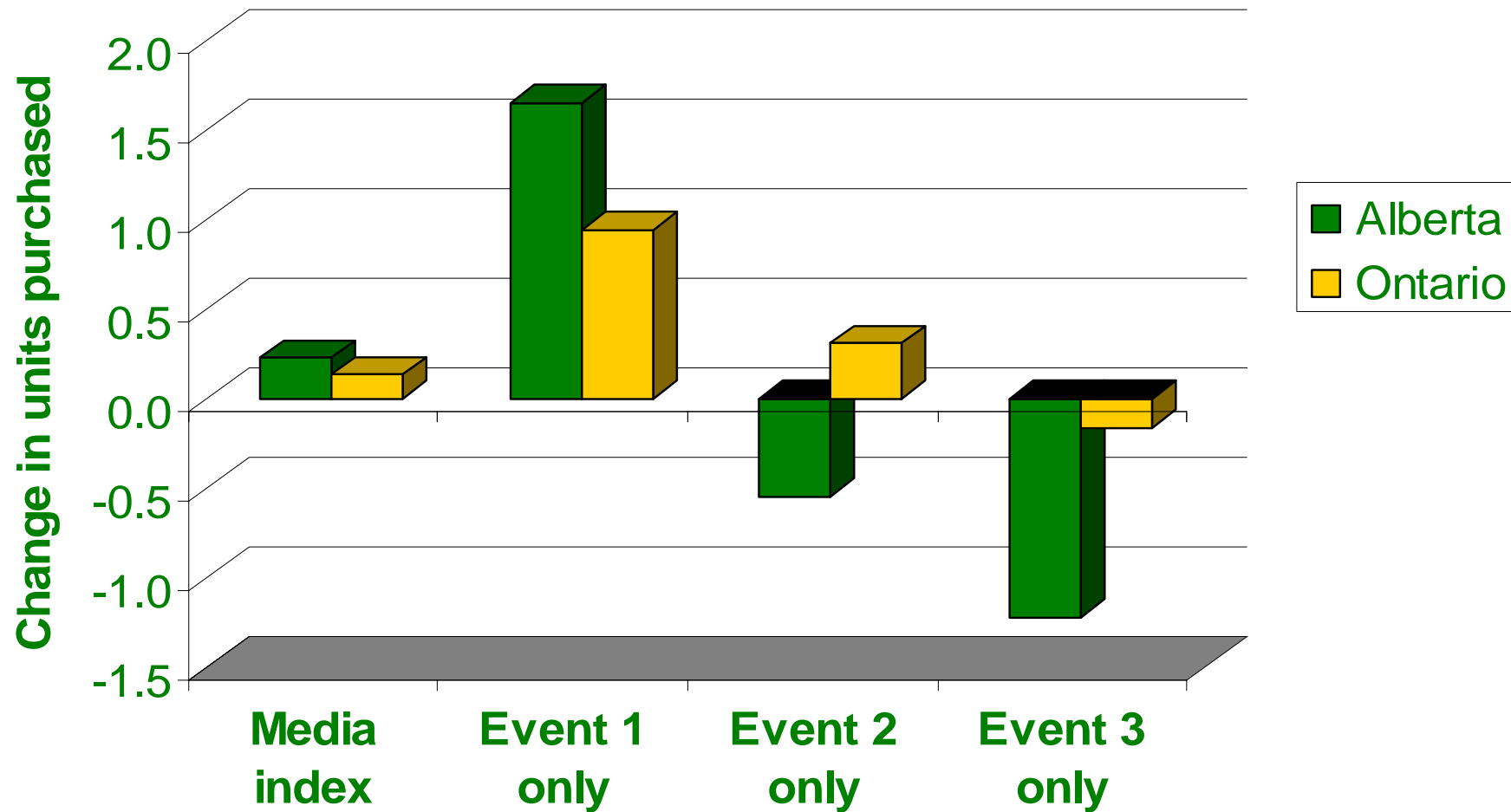
- As income rises, quantity tends to rise
- As education rises, quantity tends to decline
- Largest seasonal impacts:
 - January positive
 - May positive, esp. in Ontario (Victoria Day?)
 - December negative



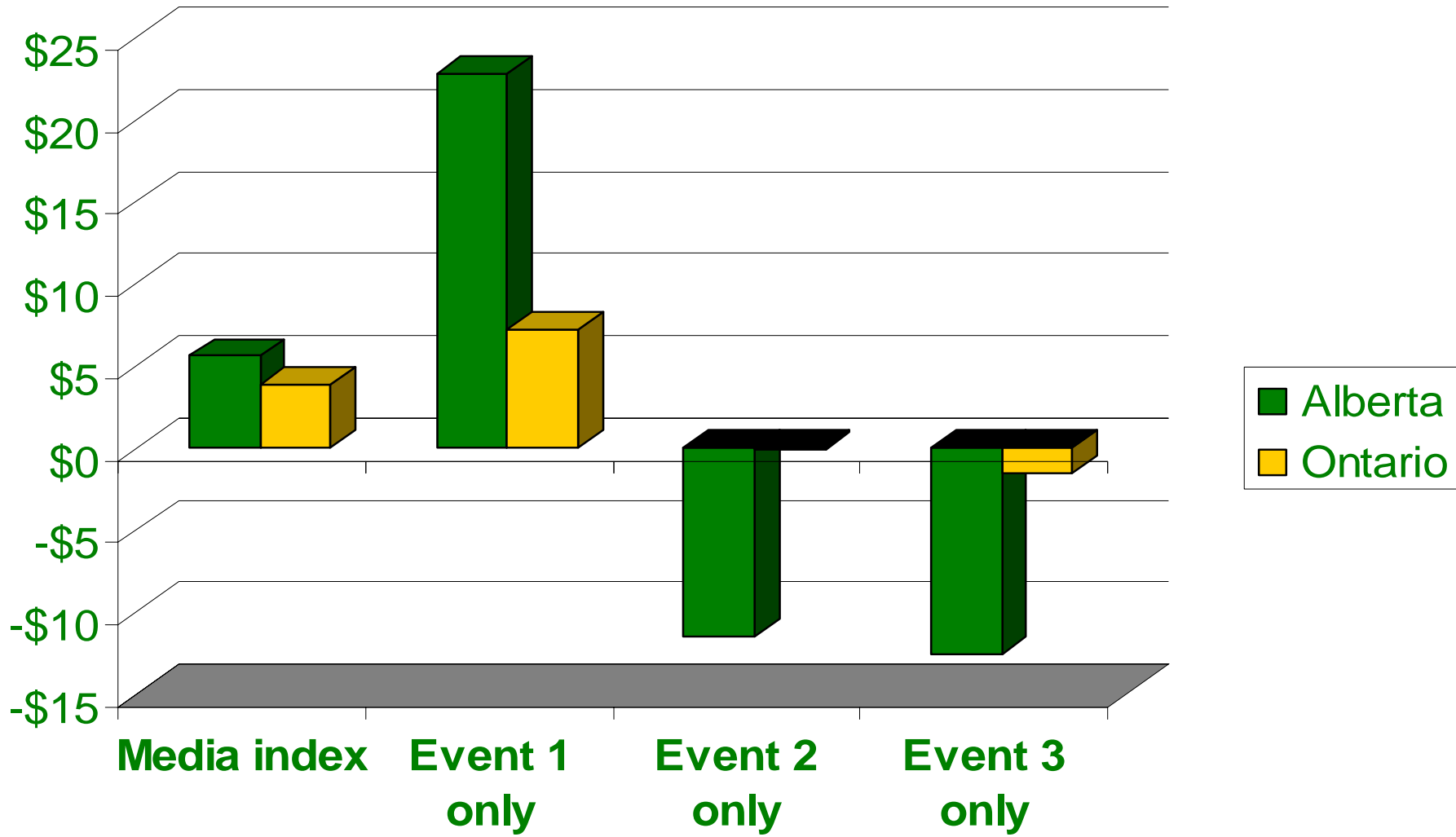
How did BSE change the likelihood of buying some beef during a given month?



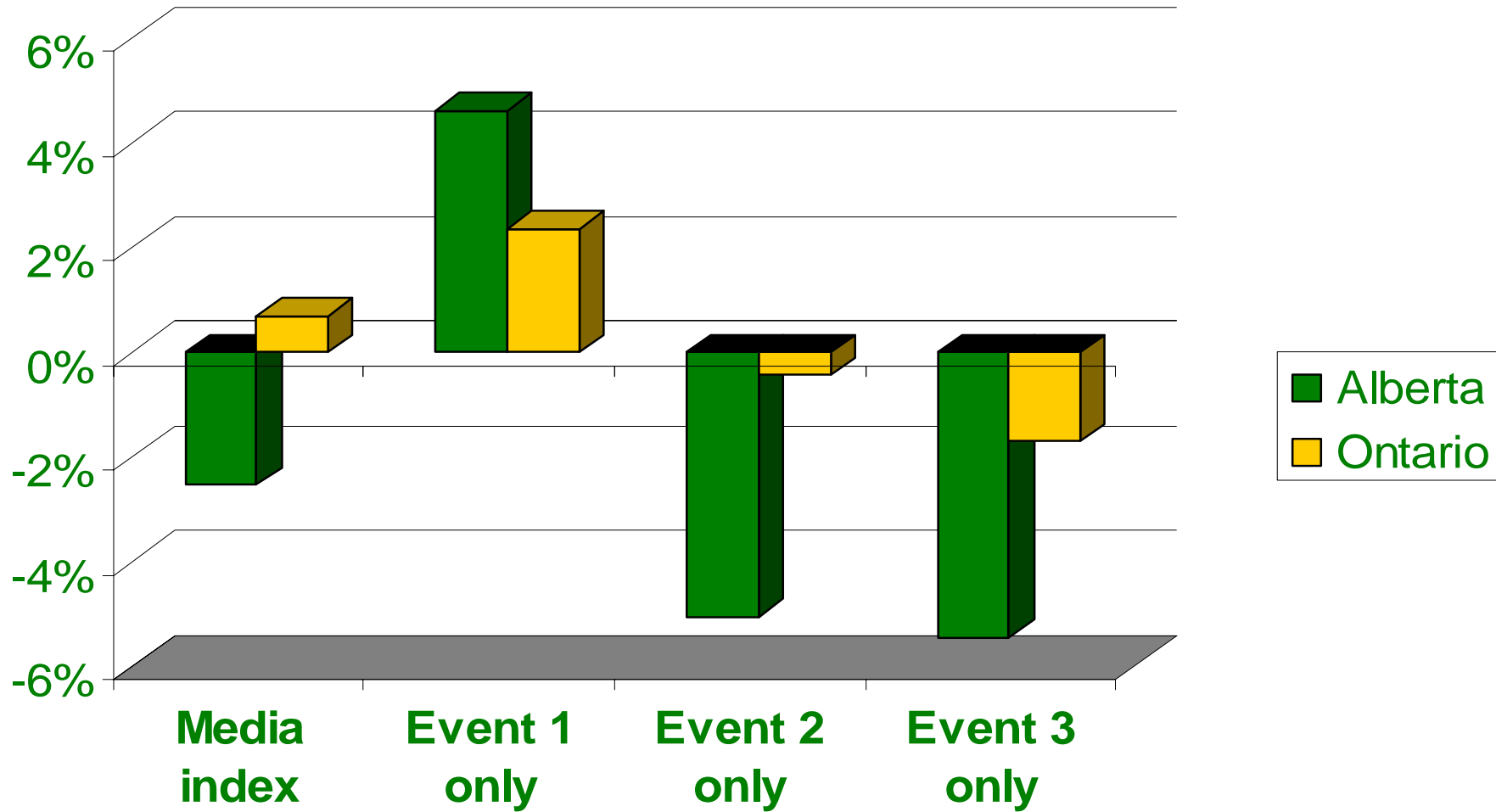
How did BSE change the quantity of monthly beef purchases?



How much did BSE affect beef expenditures?



How much did BSE affect beef's share of meat expenditures?



Conclusions

- No evidence that BSE media coverage systematically affected fast food beef purchases
 - BSE did affect supermarket purchases
 - Context of the BSE event mattered
 - Reactions stronger in Alberta than Ontario
 - Possible reasons for different response:
 - Initially perceived as trade issue, later as safety issue
 - Alberta consumers' proximity to beef industry
 - Declining salience of threat to industry
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