Consumer acceptance and valuation of beef that has been tested for BSE

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Abstract

In light of the discovery of BSE infected cattle in Canada in 2003, a number of efforts have been undertaken to ensure the safety of beef produced in Canada. Recent discussion has focused on testing live cattle for the BSE prion. This paper investigates consumer acceptance and valuation of beef from live cattle that have been tested for BSE. Using data from an internet-based survey of English speaking Canada, single bound estimates of WTP are measured. Expected WTP is 43 per cent for the entire sample, but ranges from 52 per cent for respondents with a high purchase intention to 28 per cent for those with less than a high purchase intention. Nevertheless, the proportion of respondents who were predicted to purchase a tested beef product was small, and ranged from 21 per cent for the high purchase intention respondents to eight per cent for the low/medium intention respondents. While respondents appear willing to pay for beef that has been tested for BSE, the market for such products is small.

Introduction

Since the discovery of BSE infected cattle in Canada and the U.S. in 2003, a number of efforts have been undertaken to assess the impact of BSE on the North American cattle industry. This work has focused on developing estimates of the broad economic costs associated with BSE (Klein and Le Roy 2010; Wieck and Holland 2010), trade implications arising from BSE (Carlberg et al. 2009; Weerahewa et al. 2008; Wigle et al. 2007) structural changes in the beef industry (Rude et al. 2007) and impact on prices along the value chain (Nardella 2006; March et al. 2008; Jin et al. 2008). A deeper understanding of consumer reactions to food scares has also

[1] Portions of an earlier version of this report appeared in Mussell et al. (2011). The author thanks Alan Mussell and Claudia Schmidt for constructive comments and assistance.

emerged from analysis of micro- (Peng et al 2004; Maynard et al. 2008; Wang et al. 2010) and aggregate level demand (Deng et al. 2011). In addition, some have also examined consumers' willingness to pay to avoid risk of exposure to the BSE prion (Latouche 1998; McCluskey et al. 2005; Aubeeluck 2010).

Indeed, the latter work reflects growing interesting in valuing efforts to ensure the safety of beef produced in Canada and elsewhere. In Canada, these efforts range from enhanced regulations regarding allowed feed practices and removal of specific risk material, to enhanced traceability from the retail to farm level. More recent discussion has focused on testing live cattle for the BSE prion. While the scientific community is addressing the technical aspects associated with testing for BSE, the economic aspects of testing for BSE are still relatively underexplored. The costs associated with such test can be ascertained by the agencies undertaking such tests, however, measurement of the benefits arising from such tests are less clear.

In particular, in the absence of mandatory BSE testing, consumer acceptance of beef from cattle that have been voluntarily tested for BSE is uncertain. At the same time, the degree to which consumers might substitute beef that is labelled as (and has been) tested for BSE for beef that is not labelled as being tested for BSE is also unknown. While consumers willingness to pay for beef that has been tested for BSE has been explored in Japan (McCluskey et al. 2005; Aubeeluck 2010) and France (Latouche et al. 1998), the literature on North American consumer valuation of BSE tested beef is scant (e.g. Aubeeluck 2010). This paper attempts to address these

gaps by investigating consumer acceptance and valuation of beef from live cattle that have been tested for BSE. It does so using discrete choice analysis of contingent valuation data collected using an internet survey implemented on a nationally representative sample of English speaking Canadians.

Broadly speaking, the survey builds on a previously published paper by McCluskey et al. (2005) that explored Japanese consumers' WTP for beef that has been tested for BSE. To understand better the impact of testing for BSE on consumer demand for beef, and to gauge willingness to pay for beef that has been tested for BSE, a contingent valuation question was included. Results from the estimated logit point to evidence of willingness to pay for a beef product that has been tested for BSE. The expected WTP for respondents with a high purchase intention for beef that has been tested for BSE was on the order of 50 per cent, while the expected WTP for respondents with a low or medium purchase intention equalled 28 per cent and were not statistically different from zero. Nevertheless, the market for beef that has been tested for BSE is expected to be small, with purchase probabilities ranging from 21 per cent for the high purchase intention respondents to eight per cent for the low/medium intention respondents.

Data

The survey used in this paper contained five sections containing questions related to: screening for eligibility; household beef consumption; food safety; consumer awareness and perceptions of BSE; contingent valuation/WTP; and respondent

socio-economic and demographic characteristics. Development of the survey occurred in April and May 2010, with assistance provided by a professional marketing research company (*Ipsos Forward Research*) and individuals with expertise in relation to BSE.

The target sample size for the survey was 1,000 English-speaking Canadians. The decision to exclude French-speaking Canadians was made in light of resource constraints. Given the focus on English speaking residents of Canada, and potential difficulty in obtaining responses from English speakers in Quebec, the province of Quebec was excluded from the sample frame. As well, northern regions of Canada (i.e. Yukon, Northwest Territories, and Nunavut) were also excluded. Nevertheless, the sample was stratified by province, with provincial quotas based on each province's share of the population of Canadians in the eligible provinces.

Screening questions were included to select subjects who met the eligibility requirements. Eligible subjects were required to: be 18 years of age or older; be a resident of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario or Atlantic Canada; not employed on TV/radio/press/newspaper/magazine, ad agency/public relations or marketing research/marketing; be the primary grocer shopper in the home (or share in this responsibility); and have consumed beef sometime in the last six weeks. An email invitation to members of *Ipsos*' *iSay* consumer panel was mailed on 12 May 2010. All provincial quotas were filled by 18 May 2010, with a total of 1,008 complete observations.

Table 1 shows the mean and standard deviation of demographic and socio-economic questions from the survey and, where available, comparable statistics from the 2006 Census of Canada. Respondents to the survey were disproportionately female in comparison to the Canadian population, but this is not unexpected given the exclusion of those who do not play a major role in grocery shopping for the home. On average, the sample was also older than the Canadian population, but again this is not unexpected given the exclusion of under 18 year olds from the survey. The sample does an adequate job of capturing those with education levels below a post-graduate level, but under-samples those with a post-graduate degree.

Compared to the 2006 Census of Canada, the sample under-represents households on the extreme ends of the income distribution (i.e. households with income under $25,000 (*incu25*) or over $100,000 (*inc100p*) in 2009), but over-represents the other household income classes. Given the stratified sample plan focused on per cent of population in the provinces from which we recruited, the breakdown of sample by provinces closely follows the national breakdown. Taken together, the breakdown of the sample by demographic and socio-economic dimensions closely follows the Canadian population as a whole. Our sample does an adequate job of capturing those with a high school education (*highschl*) or less (*lesshigh*), a college degree or certificate (including trades) (*college*), as well as those who have achieved a university undergraduate degree (*univdgre*). However, compared to the general population of Canadians, the sample has a lower proportion of those with a post-

graduate degree (*postgrad*). Taken together, the breakdown of the sample by demographic and socio-economic dimensions closely follows the Canadian population as a whole.

Results

The survey included questions designed to capture the factors that are relevant to respondents when making a beef purchase. Respondents were first asked to use a modified Likert scale (1=" not at all concerned", 5="very concerned") to indicate their concern about nine different aspects of beef and beef production. Exploratory factor analysis with principle component extraction was then used to identify the underlying factors of concern. The Kaiser-Meyer-Olkin (KMO) statistic for responses to these nine questions was 0.895, indicating a high degree of correlation between responses to these items. Principle component extraction with varimax rotation yielded two factors with eignevalues exceeding one. Table 2 shows the nine items in this question and associated factor loadings (loadings used to identify the dimension represented by each factor are bolded). Since the item "Cholesterol and fat" had a low factor loading, it was not included in either factor. Nevertheless, the first factor had heavily loadings on items related to production practices and food safety issues, while the second retained factor only had one item with a large factor loading (on "The price I pay for beef at retail"). As such, the first factor (which accounts for 52 per cent of the variation in responses) was named "Non-price factors", while the second factor (which accounts for 11 per cent of the variation in responses) was named "Price factor". The Cronbach alpha for the non-price factors

was 0.892, indicating a high degree of reliability for this factor. Since the price factor only included only one item, the Cronbach alpha cannot be calculated. Lastly, the mean value of the items in the non-price factor is 3.759, while the mean value of the price factor is 4.095. A t-test of the difference in these mean scores was statistically significant from zero (p-value<0.001), thus, when buying beef, respondents have a higher level of concern over the price they pay at retail than the non-price factors.

Respondents were also asked questions designed to gauge their perceptions of the food safety of various meats produced in Canada (see Table 3). Respondents had a positive perception of the safety of meats produced in Canada; at least 40 per cent of respondents believe pork, beef and chicken produced in Canada are very safe. Moreover, upwards of 90 per cent of respondents feel these three meats are at least somewhat safe. Notably for this study, beef was ranked as very safe by 50 per cent of respondents.

To help gauge respondent awareness and knowledge of BSE, they were asked to self-declare their familiarity with BSE. While 14 per cent of respondents indicated they were very familiar with BSE, the majority (62 per cent) indicated they were somewhat familiar with BSE and only three per cent say they were not at all familiar. After the familiarity with BSE question, respondents were provided with a brief information paragraph related to BSE. This passage, which was developed based on publically available information from Health Canada; Agriculture and Agri-

Food Canada; the Canadian Food Inspection Agency; and the World Organization for Animal Health, read as follows:

> *Bovine spongiform encephalopathy (BSE), or mad cow disease, is a nervous system disease of cattle. Scientific research from around the world indicates that BSE is concentrated in specific nervous system tissues, and as such these tissues are treated as hazardous and removed from the food system. Any animals found to be positive for BSE are immediately destroyed and completely removed from the food system. As such, common cuts of beef (such as roast, steaks, and ground beef) are considered safe by the Canadian Food Inspection Agency, and international agencies such as the World Organization for Animal Health. Because of this, BSE poses an extremely low risk to human health. While Canada maintains a BSE surveillance program for Canadian cattle, it does not require mandatory testing of all cattle for BSE because there is no scientific basis for doing so.*

Subjects were then asked the following purchase intention question:

> *Suppose you were shopping for a cut of beef (such as steak or a roast) in the retail store where you typically buy beef and you notice that some packages of beef have a label saying "Tested for BSE", while other packages of beef <u>do not</u> have the "Tested for BSE" label. How likely would you be to purchase a cut of beef (such as steak or a roast) that has the "Tested for BSE" label?*

Respondents were provided with a seven-point response scale that ranged from very likely (assigned a value of seven) to very unlikely (assigned a value of one). Based on the pattern of responses to this purchase intention question, three groups of were identified:

1. A low purchase intention group; this group accounted for about nine per cent of the sample.
2. A moderate purchase intention group; this group accounted for 56 per cent of the sample.

3. A high purchase intention group (this group includes only those who selected response option 7 – very likely); this group accounted for 35 per cent of the sample.

As will be seen, splitting the sample into high purchase intention and low/medium purchase intention individuals yielded important differences in estimates of willingness to pay for beef that has been tested for BSE.

To understand better the impact of testing for BSE on consumer demand for beef, and to gauge willingness to pay for beef that has been tested, a contingent valuation experiment was undertaken.[2] Respondents were asked if they would "…be willing to purchase the cut of beef [such as a steak or a roast] that has the label "Tested for BSE" when it is offered at a price that is **[INSERT PERCENTAGE PREMIUM FROM CELL MATRIX]** more expensive than the same cut of beef that does not have the "Tested for BSE" label?" and given the response options "Yes", "No" and "Don't know". Following conventional practice, "Don't know" responses were treated as "No" responses in the analysis that follows.

Respondents were assigned to one of five possible cells. Each cell had a minimum number of responses (minimum cell size was 200) and an associated percentage premium (10, 20, 30, 40 or 50%) for beef that had been tested for BSE. Figure 1

[2] The contingent valuation question was structured as a double bound contingent valuation. While the double bound contingent valuation approach does improve efficiency when estimating willingness to pay, it comes at the cost of an incompatibility bias, and an anchoring effect (see Habb and McConnell 2002 and Hanemann and Kanninen 1999 for further discussion). Consequently, in this analysis, we use only the responses to the first elicitation question for modelling choice and measurement of willingness to pay.

shows the proportion of respondents who indicated they would purchase the cut of beef at the assigned price premium (relative to the overall sample size). As one might expect, the proportion of respondents who said they would purchase the cut of beef that has been tested for BSE fell as the percentage premium increased. Overall, 16 per cent of respondents indicated they would purchase beef that had been tested for BSE (at the given percentage premium).

To understand better consumer preferences for beef that has been tested for BSE, a discrete choice model was estimated. To couch this analysis in the published literature, and following on the recent paper by McCluskey et al. (2005), a logit model of the probability of choosing the "Yes" response in the discrete choice question is estimated. Note too that the estimated logit model enables one to recover willingness to pay for beef that has been tested for BSE (see Habb and McConnell 2002 and McCluskey et al. for details).

Initially, the logit model included the following independent variables: the percentage premium (*premium*) assigned to the respondent in the discrete choice task. To control for respondent's views concerning the safety of beef currently on the market, a dummy variable was included that equalled one if the respondent indicated their belief that beef produced in Canada is very safe, zero otherwise (*beefsafe*). The non-price factor (*nonpf*) was included to control for non-price issues of concern when respondents are considering purchasing beef, while the price factor scale (*pricf*) was included to help capture any concerns respondents might

have about the price they pay for beef at retail. To control for/capture respondent's knowledge related to BSE, a dummy variable was included that equalled one if the respondent indicated they are very familiar with BSE, zero otherwise (*vfambse*).

A dummy variable (*farming*) equalling one if the respondent indicated they have a close friend or family member engaged in farming, zero otherwise was also included to control for people who may have information/knowledge about BSE that could impact their choice, likewise *ownfoag*, a dummy variable equalling one if the respondent indicated they have expertise related to, or are employed in the food or agricultural industries, was also included. To help capture broader behavioural aspects related to food and to control for level of food involvement, two other dummy variables were included; *growown* equalled one if the respondent indicated they grow any food for household consumption, zero otherwise, while *organic* equalled one if the respondent indicated they purchased any organic food products in the last three months, zero otherwise. Lastly, to help control for potential hypothetical bias a dummy variable indicating whether the respondent had a high self-declared intention to purchasing a product tested for BSE (*highpint*) was included (Norwood et al. 2006).

Early experimentation with a number complete set of socio-economic and demographic variables was also undertaken. The latter included variables capturing: gender; age; presence of children in the home; education; income; and province of residence. Almost all of these socio-economic and demographic

variables had insignificant coefficient estimates. Subsequent testing of the null (or joint null) hypothesis that these variables could be removed supported their exclusion.[3] Furthermore, removal of socio-economic and demographic variables did not affect the sign and magnitude of the estimated coefficients for the other variables. As such, these socio-economic and demographic variables were not included in the final model.

Table 4 shows estimated coefficients and z-statistics (calculated using robust standard errors) for the model estimated using the entire sample, as well as estimated on two sub-sets of the data. Focusing on the former, note that the magnitude of the Wald test statistic indicates failure to accept the null hypothesis that all estimated coefficients are jointly equal to zero at the one per cent level (p-value<0.0001), and that the estimated model has a pseudo R^2 of 0.15. While the latter may seem small, in the context of a model estimated with cross-sectional data, this is actually quite good. Also note that the predicted probability of purchase is low; only about 11 per cent of respondents are expected to purchase a beef product

[3] Coefficients on provincial dummy variables were not jointly significant (p-value=0.99), nor were coefficients on dummy variables for income (p-value=0.523) and education (p-value=0.41). Insignificant coefficients were also estimated for the gender dummy variable (p=value=0.531), the age variable (p-value=0.15) and dummy variable indicating presence of children in the home (p-value=0.412).

that has been tested for BSE (and offered at a price higher than beef that has not been tested for BSE).

Results indicate that a number of important coefficients are significant. Specifically, the coefficient on the percentage premium variable (*premium*) is significant and negative (as expected); this means that as the premium increases, the likelihood of purchasing a beef cut with a label indicating it has been tested for BSE falls.

The coefficient on the non-price factor variable (*nonpf*) is positive and significant, indicating that as respondent's concern over various non-price factors increases, the probability of purchasing beef that has been tested also increases. In contrast, the coefficient on the price factor (*pricf*) variable is negative and significant; indicating that as concern over the price paid for beef at retail rises, the probability of purchasing beef that has been tested for BSE falls. The latter could be rather important for households where affordability of beef is a concern or households where the primary grocery shopper is price sensitive.

The coefficient on the dummy variable capturing respondents who indicated they are very familiar with BSE (*vfambse*) is positive and significant. This means respondents who indicated they are very familiar with BSE are more likely to indicate they would purchase beef that has been tested for BSE (compared to respondents who indicated they have some, little or no familiarity with BSE). Such a

result points to the important role of educating consumers on the facts related to BSE and debunking myths about BSE that might otherwise lead consumers to an erroneous conclusion.

Coefficients on the variable capturing respondents who grew food for their households' consumption (*growown*), or reported purchasing organic food in the last three months (*organic*) were both significant. The coefficient on *growown* was negative, indicating that these respondents were less likely to indicate they would purchase beef that has been tested for BSE, while the coefficient on *organic* was positive, indicating these respondents were more likely to indicate they would purchase beef that has been tested for BSE. The coefficient on the variable capturing the purchase intention (*highpint*) was significant and positive (as one might naturally expect). Lastly, the intercept was negative and significant.

Similar analysis was undertaking on those respondents who indicated they would be very likely to purchase a beef product that had been tested for BSE (i.e. high purchase intention) and those who had a low/moderate purchase intentions. The third and fourth columns in Table 4 show the logit regression results for the model estimated using these two sub-sets of the data. While results for the model estimated using the high purchase intention individuals were similar to those from the model estimated with all respondents, key differences did arise. The intercept and coefficients on *growown* and *organic* were not significant, and the magnitude of the coefficient on the premium variable was smaller.

In contrast, results for the model estimated with low and medium purchase intention are different. Only coefficients on the premium, non-price factor and organic variables were significant. As well, the magnitude of the coefficient on the premium variable was larger compared to those estimated using all the data and the high purchase intention individuals.

As well, the predicted probability for the model estimated with high intention respondents equalled 21 per cent, while that for the model estimated with the low/medium intention respondents was eight per cent. This means that even for those with a high purchase intention, only one-fifth of respondents would purchase a beef product that had been tested for BSE, while less than ten per cent of those with a low/medium purchase intention would purchase the tested product. On balance, these results suggest the market for beef products that have been tested for BSE is small.

The magnitude of the coefficient in the premium variable is very important as it plays a key role in measuring willingness to pay (WTP). The larger this coefficient, the smaller the willingness to pay, all other things held equal. To explore this further the results in Table 4 are used to calculate expected WTP for beef that has been tested for BSE. WTP is calculated following standard practice illustrated in Habb and McConnell (2002) and a similar set of calculations as presented in McCluskey et al. (2005). For purposes of this analysis, WTP is calculated at the

means of the data and an associated standard error is calculated (standard errors were calculated using the delta method). The standard error is useful as it enables calculation of confidence intervals around the estimated mean WTP, and allows one to test whether the estimate of WTP is significantly different from zero.

Table 5 shows the estimates of the mean WTP, standard errors and 95 per cent confidence intervals calculated using estimates of the models reported in Table 4. Using the model estimated with all respondents, the estimated mean WTP reflects a 43 per cent premium. Based on the standard error for this estimate of WTP, the 95 per cent confidence interval ranges from 18 to 69 per cent. As the confidence interval does not include zero, it is concluded that the estimated mean WTP of 43 per cent is statistically significant from zero.

A similar scenario emerges when WTP is calculated using the model estimated with respondents with a high intention to purchase. Amongst these individuals, the estimated mean WTP equalled 52 per cent, with a 95 per cent confidence interval ranging from 13 to 92 per cent. While the WTP for high intention respondents is statistically different from zero, it the wider dispersion of this estimate (captured via the standard error) points to a less precise estimate. The estimated mean WTP for respondents with less than a high purchase intention equalled 29 per cent with a confidence interval ranging from -2 per cent to 58 per cent. Given that the confidence interval includes zero, one cannot conclude that this estimate of WTP is statistically significant from zero (at the 95 per cent level).

Conclusions

A contingent valuation survey was undertaken to measure Canadian consumer willingness to pay for beef from cattle that have been tested for BSE. Results suggest that market for beef from cattle that has been tested for BSE is small; the predicted probability of purchase for the entire sample is 11 per cent. This probability does rise when attention is focused only on those with a high purchase intention, again suggest that the market for this BSE test beef is rather small. Nevertheless, results indicate that the premium for BSE tested beef is 43 per cent for the population as a whole, but his premium is higher for those with a high purchase intention. The estimated premium is less than that reported by McCluskey et al. (2005), but is higher than Latouche et al.'s (1998) estimate. Regardless, the proportion of respondents who were predicted to purchase a tested beef product is small, and ranges from 21 per cent for the high purchase intention respondents to eight per cent for the low/medium intention respondents. So, while respondents appear willing to pay for beef that has been tested for BSE, the market for such products is small.

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Table 1. Mean and standard deviation of demographic and socio-economic information from the surveyed sample of Canadian residents (n=1,008).

Variable	Mean	Std. Dev.	Canada[a]
Male	13.19%	33.86%	49%
Age (in years)	49.75	14.55	39.5[b]
Children in the home	33.43%	47.20%	Not available
Highest level of education attained by respondent:			
Lesshigh (less than high school)	6.55%	24.75%	23.76%
Highschl (high school diploma)	46.43%	49.90%	25.54%
College (college diploma)	34.72%	47.63%	32.56%
Univdgre (undergrad degree)	10.02%	30.04%	11.62%
Postgrad (post-grad degree)	2.28%	14.94%	6.52%
Household income in 2009:			
incu25 (under $25,000)	17.56%	38.07%	20.33%
inc2545 ($25,000-$49,999)	26.69%	44.25%	21.51%
inc4570 ($45,000-$69,999)	23.02%	42.11%	21.50%
inc7099 ($70,000-$99,999)	18.06%	38.48%	17.30%
inc100p ($100,000 or higher)	14.68%	35.41%	19.36%
Province of residence:			
Atlantic Canada	9.42%	29.23%	9.53%
Ontario	51.09%	50.01%	50.74%
Man/Sask.	9.03%	28.67%	8.83%
Alberta	13.49%	34.18%	13.73%
British Columbia	16.96%	37.55%	17.16%

a. Based on the 2006 Census of Canadians
b. Median age

Table 2. Results from exploratory factor analysis on items respondents consider when purchasing beef (n=1,008).

	Factor 1 (Non-price factors)	Factor 2 (Price factor)
Whether antibiotics are used during the raising of beef cattle	**0.8697**	0.1028
Whether hormones are used during the raising the beef cattle	**0.8545**	0.1055
Whether beef is from cattle which have been raised using enhanced animal welfare production methods	**0.8365**	0.1666
Whether beef is from cattle which have been produced using certified organic production methods	**0.8129**	0.0636
Whether beef is from cattle which are raised locally (i.e. within 100 kilometers of where I live)	**0.6955**	0.0863
Risk of exposure to food borne contamination	**0.6281**	0.4611
Risk of exposure to mad cow disease/BSE	**0.5667**	0.4476
The price I pay for beef at retail	0.0063	**0.8828**
Cholesterol and fat	0.4844	0.4392
Percent variation	52.4	11.2
Cronbach Alpha	0.892	Not calculated
Mean score	3.759	4.095

Table 3. Break down of perceptions of the safety of various types of meats produced in Canada (n=1008).

	Pork	Beef	Lamb	Chicken	Fish
Very safe	442	500	325	424	375
	(44%)	(50%)	(32%)	(42%)	(37%)
Somewhat safe	454	457	324	502	452
	(45%)	(45%)	(32%)	(50%)	(45%)
Somewhat unsafe	55	32	35	57	78
	(5%)	(3%)	(3%)	(6%)	(8%)
Very unsafe	19	8	2	13	16
	(2%)	(1%)	(<1%)	(1%)	(2%)
Don't know	38	11	322	12	87
	(4%)	(1%)	(32%)	(1%)	(9%)

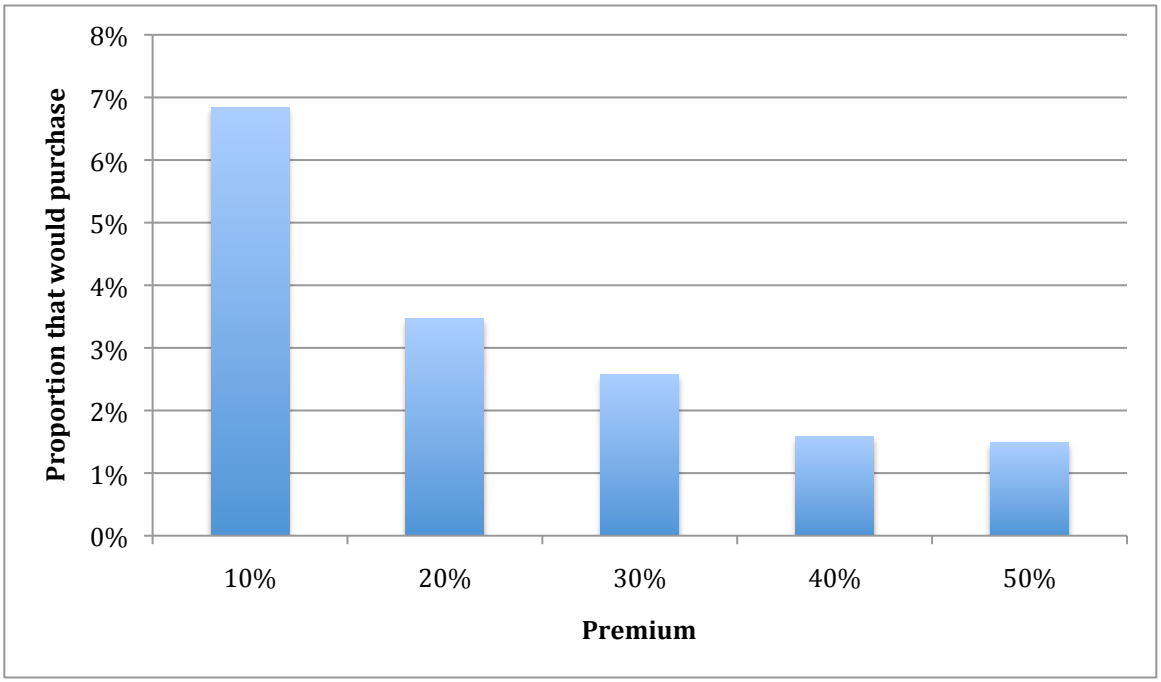

Figure 1. Proportion of respondents who indicated they would purchase the cut of beef at the assigned price premium.

Table 4. Results from the Logit regression[a]

	All respondents	High intention to purchase	Low or medium intention to purchase
premium	-5.278***	-4.898***	-5.831***
	(-7.02)	(-4.73)	(-5.16)
beefsafe	-0.306	-0.247	-0.398
	(-1.59)	(-0.90)	(-1.44)
Nonpf	0.503***	0.751***	0.301*
	(3.48)	(3.53)	(1.63)
Pricf	-0.233**	-0.355**	-0.114
	(-2.11)	(-2.14)	(-0.77)
vfambse	0.417*	0.623*	0.226
	(1.68)	(1.65)	(0.67)
farming	0.350	0.155	0.484
	(1.40)	(0.37)	(1.59)
ownfoag	-0.248	-0.607	0.056
	(-0.62)	(-0.97)	(0.12)
growown	-0.325*	-0.310	-0.378
	(-1.68)	(-1.09)	(-1.44)
organic	0.432**	0.367	0.534**
	(2.25)	(1.28)	(2.04)
highpint	0.952***		
	(5.08)		
Intercept	-1.741***	-1.386	-1.333
	(-2.68)	(-1.51)	(-1.51)
Sample size	1008	347	661
Predicted probability	0.114	0.214	0.079
Wald	102.890	39.9	39.61
p-value	<0.0001	<0.0001	<0.0001
Pseudo-R2	0.153	0.141	0.111

Notes:

a. z-statistics calculated using heteroskedastic robust standard errors are shown in parentheses.

*** denotes significantly different from zero at the one per cent level

** denotes significantly different from zero at the five per cent level

* denotes significantly different from zero at the ten per cent level

Table 5. Summary of WTP estimates

	All respondents	High intention to purchase	Low or medium intention to purchase
Mean WTP	43.14%	51.99%	27.85%
Standard error	13.04%	20.24%	15.31%
95% confidence interval	(17.57%, 68.70%)	(12.33%, 91.66%)	(-2.16%, 57.87%)