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Comparing Willingness-to-Pay Estimates from Experimental Auctions with Mailed Surveys Incorporating Cheap Talk

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Abstract: Willingness-to-pay (WTP) results from experimental auctions are compared to those from cheap-talk and conventional surveys for branded beef products in Canada. It is found that while the cheap-talk survey appears to mitigate hypothetical bias compared to the conventional survey, cheap-talk survey WTP remains higher than that in experimental auctions.

Introduction

Product brands signal consistent, uniform quality and are used extensively by consumers in making purchasing decisions. In the U.S., there are a considerable number of fresh[1] beef brands, including but not limited to breed specific brands such as "Certified Angus Beef", company specific brands like Cargill's "Sterling Silver Beef", and store-branded beef like Kroger's "Cattlemen's Collection". However, despite similarities in the structure of the two countries' supply chains, Canada has by comparison very few such brands.

Most fresh beef sold by Canadian grocers is unbranded, bearing only a label containing weight, grade and pricing information, though there is a modest amount of branded fresh beef available (Froehlich and Carlberg). A trip to a typical grocer's meat counter will see a shopper select from case-ready or store-wrapped fresh beef that is quite homogeneous and thus the quality of the beef products is typically associated with the name of the grocer only.

Several potential reasons exist for the dearth of fresh branded beef in Canada. Among possible reasons are a lack of alignment in the supply chain and unwillingness of consumers to pay premiums associated with branded over generic products. Such premiums are needed to cover the extra expenses associated with the branding itself, as well as costs of monitoring product to ensure presence of branded attributes.

The purpose of this paper is to calculate the levels of willingness-to-pay (WTP) for branded beef in Canada, in order to eliminate a lack thereof as a potential reason for the slow evolution of such products. Data from experimental auctions are compared to those from a mailout survey with and without "cheap talk". Results demonstrate that

[1] "Fresh" beef refers to muscle cuts & ground beef that has not been previously frozen.

WTP is lowest when experimental auctions are used and highest when conventional survey methods are used. The cheap-talk survey appears to reduce hypothetical bias among respondents, but does not eliminate it to the same extent as experimental auctions.

Brands

In order to assess WTP for branded fresh beef in Canada, it was necessary to hypothesize brands representing product attributes similar to those being marketed in the U.S. and elsewhere, and between which consumers might reasonably be expected to distinguish. Willingness to pay for the non-hypothetical Canada AAA grade of beef was also measured, in order to provide a benchmark for comparison to the hypothetical brands. The following descriptions are identical to the ones provided to experimental auction participants and survey recipients. Logos for the hypothetical brands were created by a professional graphic artist, and are shown in Figure 1.

Canada AAA: Canada's second highest beef grade. Only 2% of beef production in Canada is higher than AAA.

Prairie Prime: Prairie Prime is Canada's premium beef offering.

"For a taste that is truly Canadian choose Prairie Prime every time".

Cattle were born and raised in the Canadian prairies to certify you get consistent premium beef every time. All beef branded as Prairie Prime is graded at least Canada AAA or higher to ensure you enjoy some of the most flavourful, tender and juicy beef in the world. Cattle are grain fed and aged 14 days so you get that premium prairie taste every time. "For Beef as Beautiful as a Prairie Sunset Choose Prairie Prime".

Tender Grill: Tender Grill beef is guaranteed tender every single time because tenderness is what consumers like you are demanding. Tender Grill beef is the only beef in Canada

tested using Warner-Bratzler shear force values so you get guaranteed perfectly tender beef every time. Tender Grill is grain fed and aged 21 days to ensure the utmost in tenderness, juiciness and flavour. “Every Tender Grill beef product comes with a double your money back guarantee so if you are not happy with the tenderness of Tender Grill we’ll double your money back”.

Original Angus: Original Angus beef is Canada’s premiere Angus product. Only Canada Prime and the top 33% of Canada AAA black and red Angus cattle qualify to be branded as Original Angus. Original Angus beef is always flavourful, juicy and tender because of its high standards. Angus cattle are always evaluated by independent government agents, not by in-house graders or plant employees, to ensure that only the best red and black Angus cattle become Original Angus beef. Because the integrity of Original Angus beef is so important, Original Angus beef is monitored all the way from producers, to packers and distributors, to supermarkets by the non-profit Canadian Angus Association. Original Angus is grain fed, aged 14 days and Angus in origin so you can always expect consistent quality when you choose Original Angus beef.

Nature’s Diamond: No added hormones, No antibiotics, Cattle are fed an ALL VEGETARIAN diet, No animal by-products, All feed tested to be free of chemical residues, Pasture fed from birth to 15 months, Grain fed 120 days to ensure tender beef, Animal welfare practices are followed to ensure Low stress Friendly animal surroundings Clean water Natural feed, Environmental practices are followed to respect land

Experimental Auctions & Surveys

An experimental auction is a tool that can be used to elicit a participant's private willingness to pay values in a truthful manner. Willingness to pay is determined by having participants bid for a product or certain attributes, using real money at the time of the auction as opposed to a hypothetical situation that is simply presented in a survey (Lusk et al. 2001). Experimental auctions have particularly fallen into favour with agricultural economists because they provide incentives for participants to accurately reveal their true WTP (Lusk et al. 2001; Umberger and Feuz).

Experimental auctions were conducted during June and July 2006 in and around Winnipeg, Manitoba. The Becker-Degroot-Marshack (BDM) Experimental Auction mechanism was used, similar as to that used in Lusk et al. (2001); Feldkamp et al.; and Lusk and Fox. The BDM auction mechanism was chosen because the auction was conducted in a retail setting as opposed to many types of auctions which are conducted in a laboratory setting.

There are several advantages of the BDM auction. First, it is easy to explain to participants how the auction works and it is easy for them to understand compared to other auction designs (Lusk et al. 2001).The BDM auction does not require repeated practice rounds for participants to learn how the auction works. Secondly, BDM auctions tend to have less non-response and thus less non-response bias than other auction mechanisms and certainly less than conjoint analysis (Lusk et al. 2001). The BDM design has less non-response because participants do not have to go out of their way on another day and drive to a location where another type of experimental auction would be conducted in a group setting (Feldkamp et al.). In other words, there is less opportunity cost for the participants to partake in the study than in other experimental auction procedures. The BDM auction mechanism usually does not have to remunerate its participants as much as other auctions for

participating because participants do not have to go out of their way to participate (Lusk et al. 2001; Feldkamp et al.). If remuneration is too large it may have some affect on how participants behave.

BDM auctions are usually conducted in the field. One could argue that this translates into higher external validity (McDaniel and Gates). In other words, results from the auction would be more applicable to the real world because participants actually act like real Canadian consumers. Since BDM auctions may be conducted in the field, it is possible to target the population of interest (Lusk et al. 2001).

The BDM auction is not a typical (English) auction where participants bid against one another; rather, subjects participate in the auction individually. In a BDM auction, participants are presented with the product(s) in question and are queried as to their maximum WTP for a particular good with certain attributes. If their bid is higher than a randomly generated price, they 'win' the auction and must pay for the product. The participant does not pay the most they were willing-to-pay; instead they pay the randomly drawn price.[2] This procedure ensures that the auction is incentive compatible. In other words, the participant has the incentive to reveal their true willingness-to-pay. If the participant bids more than her true willingness-to-pay she may have to purchase the good at a price higher than she were actually willing-to-pay. If the participant bids less than her true willingness-to-pay, she may miss out on purchasing the product that is of good value to her.

A total of 274 people participated in the auctions at seven stores from two major grocery chains. Approximately thirty-nine people participated at each store. Auctions were conducted near the beef counter in each grocery store, on weekdays and weekends

[2] The randomly drawn price represents the market price for the good.

during various times of the day from store opening to meat department closing. Each customer who approached the meat department was asked to participate. For participating, each customer was endowed with a twelve-ounce (340 gram) generic ribeye steak. Participants then bid to exchange their generic steak for each of the steaks bearing brand names created for the purpose of this research (Prairie Prime, Tender Grill, Nature's Diamond, and Original Angus), as well as for a Canada AAA steak. Endowing each participant with a generic steak allows the value of the brand to be isolated.

Participants were told that a zero bid indicated to the researcher that they forfeit the chance of "winning" a value added product but any positive bid had a chance of winning. Participants were also informed that they would only have to pay the randomly drawn price which would be less than their bid price if they "won" the auction. It was then explained to participants that it was their best interests to not over-or-underbid to exchange for the steaks.

Prior to bidding for each of the value added steaks, participants were asked to read a two-page fact sheet of promotional material containing information about each of the brand name steaks. Participants were then asked to submit sealed bids of their highest willingness-to-pay for each of the steaks, and were told that they would randomly draw one of the steak names and a random price between $0 and $10 out of a hat after they submitted their sealed bids. The values between $0 and $10 were chosen because it is desirable to greatly exceed the realistic market price during such an auction (Feldkamp et al.). One random steak was chosen as binding to prevent wealth effects. If a person's bid for the randomly drawn steak exceeded the value of the randomly drawn price for that steak, they would exchange their generic steak for that randomly drawn steak and pay the randomly drawn price at the checkout counter.

When the participants completed the auction they were asked to complete a short questionnaire outlining their beef preferences and demographic characteristics. This information is analyzed using econometric methods (below) to help understand the factors that affect a consumer's WTP for branded beef.

A total of 5100 surveys (the survey was designed to be as similar to the BDM auction as possible) were mailed out in October, 2006 to a random sample (purchased from a reputable mailing list company) of Canadian consumers excluding Quebec and the three Canadian territories to determine WTP for several (hypothetical) brand name steaks. Quebec was excluded for several reasons. Firstly, mailing the English survey to Quebec residents may introduce bias. Those who cannot speak English may not fill out the survey (or may fill it out incorrectly due to comprehension issues). Mailing an English survey to the English parts of Quebec would not represent the entire province and thus it may not be clear who the sampling frame was. Second, translating our survey into French would add costs from both a time and money perspective and could still introduce bias because a direct translation of the English survey to French would not be equivalent. In other words, entirely new French brands would have had to been created. The three territories were also excluded because most grocery stores in northern communities only carry frozen beef. Half of the surveys were mailed to residents of Manitoba (to provide similar numbers of respondents to each type of survey that were procured via the experimental auctions) and the other half to the remaining included provinces.

Five hundred surveys were returned undeliverable and 1,240 surveys were returned completed. This yielded a response rate of 26.96%, an excellent number for a survey using a "cold" mailing list. A number of techniques were used to aid in obtaining this high response rate. Firstly, the University of Manitoba logo was clearly visible

throughout the survey package. Specifically, the logo was included on the mail-out envelope, business return envelope, cover letter, information sheet, and survey instrument. It is believed that respondents are more likely to volunteer for research involving a public institution. Real stamps mail were also used as opposed to bulk on the outgoing envelopes to discourage survey recipients from tossing the survey in the garbage before opening the package. Sometimes recipients of a mail survey believe they are getting a mass mailing if postage is printed on the envelope or metered, resulting in a portion of recipients throwing out the envelope before it is opened.

As previously mentioned, business reply envelopes were included in each recipient's survey package so that the respondent would not need to use their own stamp and envelope. Each recipients' name was printed on their cover letter to aid in personalizing the survey package. Perhaps most importantly, a monetary incentive was included: a Canadian one-dollar coin was taped to the cover letter of each survey, thanking participants for completing and returning the questionnaire. As well, since a large amount of material was mailed out in each package, the actual survey instrument of the package was printed on green paper to distinguish it from all the other material. Finally, a reminder postcard was mailed to recipients three weeks following the original survey mailing.

In the cover letter that accompanied the survey, recipients were asked to take a minute to examine the "Steak Fact Sheet" which described the hypothetical brand name beef steaks. They were also asked to fill out the two page questionnaire and mail it back in the prepaid postage envelope provided.

Two separate treatments of the survey were used. The first survey treatment was given in addition to their survey package (cover letter, business reply envelope, steak fact sheet and survey instrument), an information sheet discussing how people tend to overstate their willingness-to-pay for products and services in a hypothetical setting. This information sheet will hereinafter be referred to as a "cheap talk script". This cheap talk script was identical to the one used in Lusk (2003), who had made slight modifications to the original cheap talk script used by Cummings and Taylor (1999). Cheap talk is based on game theory principles and involves non-binding communication by two or more players (Cummings and Taylor). Recipients of the cheap talk treatment were asked to read the information sheet (cheap talk script) prior to completing the survey. The cheap talk script simply tells the survey recipient in plain English about the problem of hypothetical bias, discusses why it may occur and requests that the respondent avoid hypothetical bias when completing the survey. The conventional survey treatment simply received no cheap talk script.

As noted by Cummings, Harrison, and Rutstrom; Neill et al. and others, hypothetical bias is an issue in nearly all surveys that ask participants their willingness-to-pay for a product or service. Hypothetical bias occurs when participants in a study respond in a manner that is inconsistent with how they would respond if they actually had to back up their choices or were held responsible with real money (Umberger and Feuz). The cheap talk script was included in one treatment of the survey package to try and provide a correction for the problem of hypothetical bias *ex ante* by educating people about the problem and thus encouraging people to reveal their true willingness-to-pay.

Cheap talk has been shown to be effective in eliminating hypothetical bias in several situations using different kinds of experimental auctions and contingent valuation. Cummings and Taylor found cheap talk to be successful in removing hypothetical bias from a contingent valuation study involving public goods. List found that cheap talk was successful in eliminating hypothetical bias from the valuation of private goods in several field experiments except with experienced market participants. Shorter cheap talk scripts have generally been found to be unsuccessful (Aadland and Caplan). To date the use of cheap talk in mass mail-out surveys has been very limited. Lusk found that cheap talk likely effectively removed hypothetical bias in a mass mail-out survey; however he could not be conclusive because no non-hypothetical treatment was conducted. Results from that study suggested that cheap talk significantly reduced willingness-to-pay for inexperienced consumers and did not for those more experienced consumers.

Since a limited number of studies using cheap talk have been employed to date, a control treatment survey was required to determine if there was a significant difference between the survey treatment with cheap talk, the survey treatment without cheap talk and the experimental auction. If no significant difference is found between any of the treatments, all results may be pooled to determine willingness-to-pay for the various beef brands. If there is a significant difference between one or more of the treatments, results from one or both of the survey treatments must be calibrated to co-ordinate with our auction results.

If it is found that the cheap talk treatment yields the same results as the experimental auction, in the future it may suffice to conduct the more cost effective, representative survey as opposed to an expensive experimental auction. The survey also

allows researchers to access a more broad range of consumers geographically than the auction otherwise would.

The willingness-to-pay questions used in this survey were also very similar to those used in Lusk (2003); however, they were modified to be an open-ended question to correspond with our BDM auction. An example of the opened ended question in both treatments of the survey was asked as follows:

> Imagine you are purchasing a ribeye steak in your local grocery store. You can choose between ***two*** different ribeye steak products. One is a generic ribeye steak with no brand name. The other ribeye steak option is a **Prairie Prime** ribeye steak, with the attributes as described in the above fact sheet.
>
> What is *the most money* you would be willing-to-pay for a **Prairie Prime** ribeye steak ***over and above*** the price of a generic ribeye steak? $_____

An open-ended willingness-to-pay question was chosen as opposed to some of the other types of contingent valuation questions because it more closely corresponds with the BDM auction than dichotomous choice questions, rating and ranking questions, or choice experiment type questions. In addition to the willingness-to-pay questions at the beginning of the survey, recipients were asked the same host of beef preference and demographic characteristic questions as in the experimental auction.

Results

Figures 2 through 4 show mean WTP values for each of the brand name and Canada AAA steaks in the experimental auction, cheap-talk survey and conventional

survey respectively. In the experimental auction, Tender Grill had the highest mean WTP—although only once cent higher than Nature's Diamond and Original Angus—but in both survey treatments, Original Angus had the highest mean WTP followed by Nature's Diamond. One possible explanation for the discrepancies is that in the experimental auction, participants were able to ask the researcher questions regarding each of the brands. The researcher responded to the participants' questions with standardized answers ensuring each participant got the same information. It is possible participants who asked for additional information for one or more of the brands modified their opinion in favour of Tender Grill in the experimental auction.

Also noteworthy about Figures 2, 3 and 4 is that in the experimental auction, the Canada AAA steak had the lowest mean WTP of all the steaks tested. Although this is not surprising, the same was not the case for either of the survey treatments. In both, the Canada AAA steak had a mean WTP nearly equal to or slightly higher than Prairie Prime and Tender Grill, which may imply one of two possibilities. First, that creating brands such as those may not be warranted given additional production and processing costs associated with those brands. However, it is clear from the figures that respondents in each of the three treatments are willing-to-pay more on average for Original Angus and Nature's Diamond. The other possibility is that AAA is recognized as a premium grade of beef, and the stated attributes of Prairie Prime and Tender Grill, while earning significant premiums over generic steak, are not impressive enough to warrant premiums over favourably-perceived AAA steak.

Given that the BDM auction procedure has been demonstrated to elicit true consumer WTP, results demonstrate that while cheap-talk does help mitigate hypothetical

bias in the results, it does not completely eliminate it. This, of course, assumes that the discrepancy between WTP obtained from the experimental auctions and cheap-talk survey does not come from some other source.

Summary and Conclusions

The goal of this paper was to determine Canadian consumers' willingness-to-pay (WTP) for branded fresh beef products. Such products have not become as widely available in Canada as they are in the United States; one of the potential reasons for this discrepancy was thought to be a lack of WTP for fresh branded beef in Canada. WTP levels were calculated using three methods: experimental auctions conducted in and around the city of Winnipeg, Manitoba, as well as both conventional and cheap-talk surveys that were mailed out on an approximately nationwide basis.

It was found that WTP for branded beef products are not insignificant, ranging from $1.12 to $1.83 per steak depending upon the treatment type and brand of steak. It was further found that the cheap-talk survey yielded consistently lower WTP than conventional surveys, as expected, by reducing hypothetical bias. Experimental auction procedures lowered WTP measures even more, perhaps indicating a complete elimination of hypothetical bias. This may mean that even cheap-talk surveys, while enjoying a clear advantage over conventional surveys in terms of eliciting WTP that is closer to true levels, may still lag behind experimental auctions in that regard. However, given the several-times greater expense associated with experimental auctions vs. survey methods, the researcher has a choice to make in terms of cost versus precision in eliciting WTP estimates.

In order to determine whether branded beef can be profitably marketed to Canadian consumers, a logical next step is to measure the extra costs that would be associated with branded beef. Given the modest premiums indicated by experimental auction participants and survey respondents, detailed analysis of outlays required to develop brands, stimulate demand, segregate processing, and monitor quality is required. In the event that such outlays do not outmeasure available premiums, opportunities for marketing branded beef should be explored by Canadian producer groups, processors and retailers, or by alliances consisting of members of one or more of those supply chain participants.

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Figure 1. Logos for Hypothetical Brands

Figure 2. Mean Willingness-to-Pay Premiums for Beef Brands: Experimental Auction Results

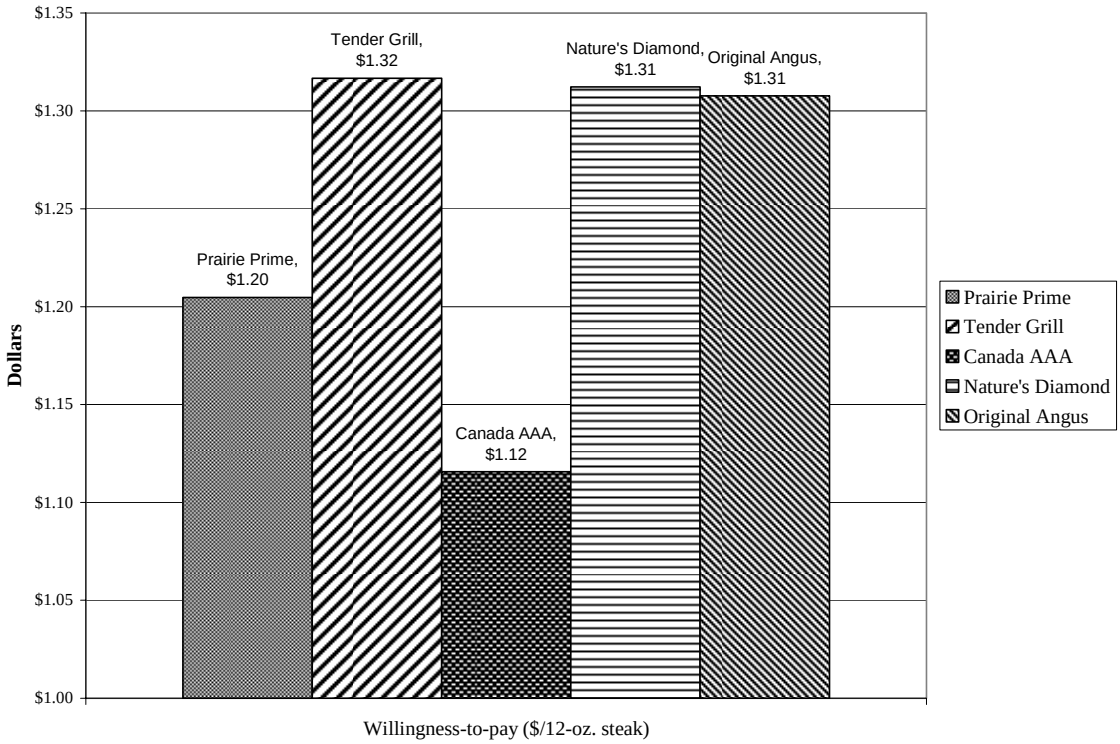

Figure 3. Mean Willingness-to-Pay Premiums for Beef Brands: Cheap Talk Survey Results

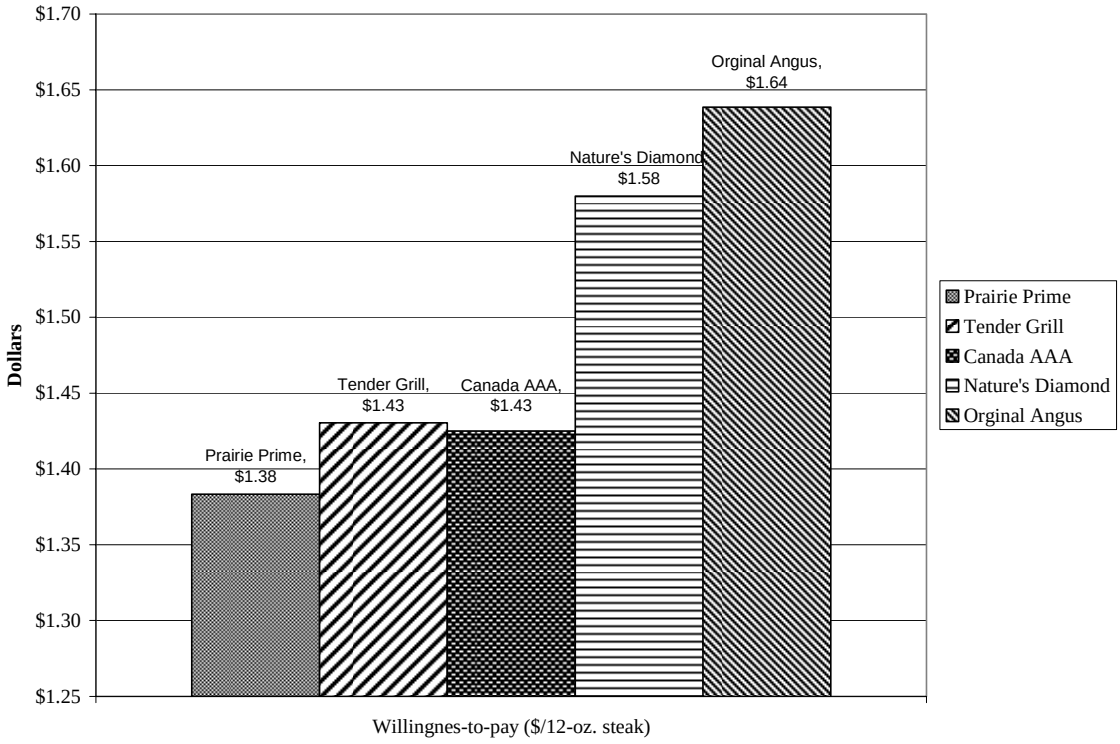

Figure 4. Mean Willingness-to-Pay Premiums for Beef Brands: Conventional Survey Results