CONSUMER WILLINGNESS TO PAY FOR FOOD SAFETY: EVIDENCE FROM AN EXPERIMENTAL MARKET

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SUMMARY

Pathogen contamination of food leads to illness and economic loss to society. Estimated costs are generally based on direct losses to individuals and have not included morbidity costs such as consumers' willingness to pay (WTP) to reduce their chance of a foodborne sickness. This report focuses on the value of consumer's WTP for safer food and avoiding morbidity or mortality caused from foodborne illness, such as salmonellosis. Additionally, consumer perceptions of the level of food safety are evaluated. The non-hypothetical laboratory experiments to obtain these values is conducted by using Vickrey second-price sealed-bid auctions. In the experiment respondents were, on average, willing to pay 55 cents more per meal for safer food. Estimates of WTP provides policymakers with information for improved evaluation of food safety policies and impacts on reducing public health risks. The veterinary profession can have a direct impact on pathogens in food as livestock management and production practices can impact pathogen levels entering the food chain.

INTRODUCTION

Pathogenic microbiological agents have been shown to be a major contributor to outbreaks of foodborne illnesses in the United States (CDC, 1990). Economic loss to society has been significant (Roberts, 1989). The primary focus of this study is to evaluate consumers' WTP for safer food and reduced morbidity. These morbidity costs have not been included in previous cost estimates of foodborne illness. Additionally, consumer perceptions of the level of food safety are evaluated.

Information on consumers' WTP for food safety are obtained through a laboratory experiment approach. Participants were provided the opportunity to have a meat food product free of charge or they could bid by auction for a product that is free of salmonella. A Vickrey second-price sealed bid auction is used to elicit consumers' WTP for reduced pathogen risks. The Vickrey auction has been shown to accurately reveal preferences for other goods [see Coursey (1987)].

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EXPERIMENTAL DESIGN

There are two methods to generate data on unobservable goods such as consumer WTP for safer food; survey and experimental. In this study the experimental method is used. The consumers' WTP is obtained through observing the preference or the value of the unpriced goods within Vickrey's (1961) second price sealed-bid auction setting. As long as the individual prefers more money to less, this laboratory experiment can elicit consumer values of unpriced goods such as safer food. There are two stages in the experiment. Stage one is an exercise to familiarize the subjects with the auction procedure by using Vickrey's second price sealed-bid auction for a highly familiar food item which the subjects have some idea of its value.

In stage two, an initial $15 income was provided to each participant. Two types of food items were shown to the subjects with a description of each. One is food purchased from a local source with a typical chance of being contaminated with salmonella. This product was provided free to every participant. The other was 'stringently screened' food which had been subjected to stringent screening for salmonella and had a low chance (1/100 million chance) of risk from salmonellosis. Participants were asked their maximum WTP to replace the typical food with the screened food.

The first ten 'naive' trials were based on participants prior perceptions of salmonellosis risks. After the tenth trial, the monitor provided additional information about salmonella. Information provided was the chance (one in 137,000) of infection by salmonella from one time consumption of the typical product, and the chance of death (one in 1,000) of those who get sick (Bennett et.al., 1987). The symptoms (Acha and Szyfres, 1980) and average medical cost of a mild case infection, $220 (Roberts, 1989) were also provided. Participants then bid in ten more 'informed' trials. After twenty trials, a computer randomly selected one binding trial to decide who purchased the screened food. The highest bidder paid the displayed second highest bidding price and then ate the screened food. The other participants ate the typical product food and received their take-home pay.

EXPERIMENTAL RESULTS

Results are shown in Figure 1. The first trial, an inexperienced one-shot bid, is analogous to contingent valuation methods. The average WTP in the first trial is 61 cents. After 6 trials, the mean WTP bid stabilized. The WTP means of trials 7-10, subjects' naive information, range from 43 cents to 46 cents; the average value is 44 cents.

The actual probability of illness and severity was provided before trial 11. This information caused the subjects to initially increase their WTP value to 60 cents from 44 cents. For trial 17-20, the mean WTP was 55 cents. The prior subjective probability was 1/212,000 which was lower than the actual, thus bids increased. Table 1 presents information on the difference between the mean of trials 7-10 and trials 17-20. The hypothesis test by t-test and signed-rank test indicates that the WTP difference between naive and experienced bids, 11 cents, is statistically significant; 1 percent significance level.

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Figure 1. WTP for reduced salmonella

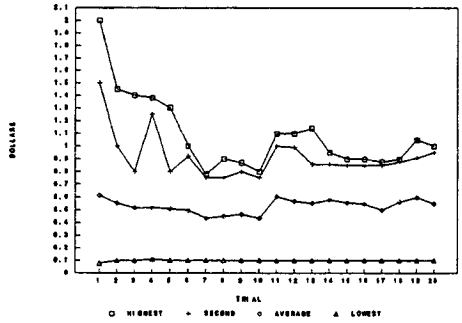

Table 1. Statistics of salmonella experiment

$H_0 : WTP^{17-20} = WTP^{7-10}$ $H_1 : WTP^{17-20} > WTP^{7-10}$	
Mean	0.1075 (0.1008)[a]
t-test[b]	4.1286**
Signed-rank[c] test	39**

[a] Sample standard deviations.
[b] One-tail t-test.
[c] Wilcoxon signed-rank test.
** denotes rejection of H_0 at the 0.01 significance level.

The actual information had an impact on the WTP value.

CONCLUSION

Overall, the results of experiment indicate that the subjects were willing to pay more for safer food. In the first trial, that equivalent to a field survey method, subjects WTP was higher than the bid with repeated market exposure. Subjects evaluated their prior subjective probability of illness lower than the actual. With naive information bids converged to lower WTP values. With full information bids were increased by 25 percent. Consumers are willing to pay for safer food products. This willingness to pay has been overlooked in previous estimates of food safety costs and needs consideration when establishing food safety regulations. The veterinary profession can directly impact management systems leading to improved food safety.

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