

## Can Advertising Alleviate Consumer Concerns Over Food Scares?

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Food safety scares are a major concern to the food industry and to consumers. Such incidents can result in the loss of millions of dollars of sales. Consumers want complete trust that the food they eat is safe. If that trust is breached, long-lasting negative perceptions of the product can result. In the past, practically all major food commodities, including fruit, vegetables, grains, meat, and dairy products, have experienced a food safety scare.

Bovine spongiform encephalopathy (BSE)—mad cow disease as it is more commonly known—poses a particularly severe potential for a food safety scare because it has been linked, through consumption of beef, to new variant Creutzfeldt-Jakob disease (nvCJD), a fatal and incurable neurological disorder in people. Both bovine BSE and human nvCJD are caused by abnormal proteins called “prions” and result in degeneration of the brain.

The largest outbreak of mad cow disease occurred in Great Britain in the early 1990s. At the peak of the outbreak in 1992, 7,200 cows were infected with BSE and approximately 150 people had died of the disease. The consequences of this outbreak crippled Great Britain’s beef industry. BSE was discovered

in Canada in May 2003 and resulted in dire consequences for the Canadian market. The price of beef plummeted from \$1.10 to \$0.35 per pound. Prior to the outbreak, 60% of Canadian beef was exported to the United States, which placed a ban on Canadian beef in response to the outbreak.

The United States was free of BSE until December 2003, when a dairy cow in Mabton, Washington, was discovered to have the disease. Almost immediately after that discovery, 10,000 pounds of beef were recalled from eight Western states. The price of cattle futures fell 19% immediately after the discovery and the price for live cattle dropped 14.3%—from \$0.91 per pound on December 22 to \$0.78 per pound on December 26. Interestingly, the price shock was short-lived. While the cow in Washington state was found to have originated in Canada, cattle infected with mad cow disease were subsequently discovered in Texas (June 2005) and Alabama (March 2006). Testing for BSE occurs in only a small fraction of U.S. herds, especially relative to herds in Europe, where up to one in four cows are tested, and in Japan, where every cow is tested. Given the potentially long incubation period for nvCJD and the

number of recent cases, a significant BSE-related food scare in the future remains possible.

The economic impact of BSE can be very severe for the beef industry. After the 2003 outbreak in Washington, 65 countries banned U.S. beef imports, including Japan, South Korea, Mexico, and Canada. Collectively, that meant that 90% of the U.S. export market, worth \$3.5 billion, was closed. U.S. beef exports, which comprise about 10% of the total market, fell from 2.5 billion pounds in 2003 to 0.5 billion pounds in 2004. Estimates of total damage to the U.S. beef industry due to this outbreak of BSE are as high as \$2 billion for the cattle industry and \$2 billion for the beef industry (Henderson, 2003).

Given the high stakes involved with a food scare, an industry’s response to a crisis is critical to the degree of damage suffered. After the 2003 BSE outbreak, the incident received significant media coverage and most of it was negative. The U.S. beef industry chose to respond by emphasizing the multiple “firewalls” in place to assure the safety of the U.S. beef supply. The industry also sped up the release of a new advertising campaign and increased its funding by \$1.3 million. Generic advertising is often aimed at raising

consumers' general awareness and positive impressions of the product. According to subsequent industry research, the consumer response after the 2003 outbreak was not as bad as initially feared—surveys showed that the percentage of consumers who were confident that U.S. beef was safe did not decrease. Indeed, U.S. beef consumption rose 1.8% from 2003 to 2004, in part, due to the increasing popular Atkins diet which emphasized beef consumption.

The purpose of this research is to investigate the impact of both media information about BSE and generic industry advertising on consumer demand for beef. Specifically, using experimental economics, we measure consumers' willingness-to-pay (WTP) for beef and their level of food safety concerns, after they view one of four treatments that vary the type of media information. The four treatments are (i) negative media information alone, (ii) generic advertising along, (iii) the combination of both media information, and (iv) a control that has no media information.

The study involved 227 people of various backgrounds, aged between 18 and 63. Participants were shown different information designed to assess the effects of negative media reports and industry advertising on consumers' willingness-to-pay (WTP) for potentially risky foods. After earning up to \$15 from a series of experimental activities, participants watched different multi-media presentations. Some participants watched one of two five-minute videos, some

participants watched both videos, and as a control, some did not watch either video. Finally, all participants were shown a freshly-cooked hamburger and asked how much they would pay for it.

One of the two videos that had been presented contained information about mad cow disease including its potential existence in the US food supply and the deadly consequences of contracting new variant Creutzfeldt-Jakob disease from eating infected beef. The other video was comprised of a series of television and radio advertisements by the National Cattlemen's Beef Association, which emphasized the slogan "*Beef, It's What's for Dinner.*"

Using standard elicitation techniques which reward participants for honest answers, participants were asked for the highest amount of money they would pay to buy a hamburger that they would be able to eat immediately.

The results of the study are shown in Figure 1, which plots the percentage of participants who indicated that their WTP for the hamburger exceeded a given dollar amount. Participants' WTP bids can be displayed as a downwardly sloped demand curve in which the price of the hamburger is represented by the vertical axis and the horizontal axis represents the percentage of subjects who expressed a willingness to purchase the hamburger at the given price. Figure 1 shows that WTP values for approximately 20% of the participants in the Beef

Advertising treatment were higher than for the participants in the Control treatment. Participants who watched only the advertising video had the highest average WTP for the hamburger, \$2.52. This was greater than the WTP of \$2.14 from the control group, which did not view any media information. However, this \$0.37 difference was not statistically significant.

Figure 1 also shows that BSE information treatment shifts demand downward relative to the Control treatment as the WTP values are consistently lower and only approximately 40% of subjects submitted a bid greater than zero. Average WTP for participants who saw the video regarding mad cow disease was significantly lower, just \$0.88. The biggest drop was from the frequent beef consumers who lowered their WTP for the hamburger from \$2.44 to just \$1.39. In contrast, the \$0.68 decrease in WTP from infrequent beef consumers was only marginally significant.

The most striking result: participants who watched both the positive media message *and* the negative media message had an average WTP of \$2.07—just 3.3% less than the control group that watched no videos. Figure 1 shows the demand curves for the Control and Both Media Types treatments are essentially indistinguishable. These findings suggest that advertising may have a powerful effect in offsetting consumer concerns that can arise from media coverage of food safety concerns. Furthermore, it appears that from an industry perspective the benefit of advertising are

greatest in situations with a possible food scare since WTP increased 135% (from 0.88 to \$2.07) from when consumers were exposed to generic advertising promotion as well as the negative product information. This compares to an 18% increase in WTP when consumers watched only product advertising as opposed to watching nothing at all. This \$1.19 increase was statistically significant. This increase in WTP was evident in both infrequent and frequent consumers of beef.

Note that in the treatment that included both positive and negative media information, there was no statistically significant difference in WTP when the video with advertising was shown before or after the video with the information about mad cow disease.

The general characteristics of the sample were distributed roughly equally across treatments with the exception of gender—there were more men in the control group than in the other treatments. To control for this potential difference and any demographic effects on the WTP, a statistical model was employed. The results confirmed that watching the video about mad cow disease significantly lowered participants' WTP. In contrast, watching the video of beef advertisements had a positive but not significant impact on WTP. As suggested in Figure 1, subjects that watched both BSE information and beef advertisements had WTP that was not different from the Control group. This suggests that advertising appears to offset the negative influence of

BSE information to a large extent.

The age of the participants had a positive effect on the WTP for the hamburger while being a vegetarian, as expected, had a strong negative effect on participants' WTP. An individual's frequency of beef consumption was measured by self-reports to the question about how many times the participant had eaten beef in the past week, and this had a positive and significant impact on WTP. The only other variable that was statistically significant was the survey question that asked participants to evaluate their risk exposure from eating beef on a scale of one to nine where one represented "not much risk" and nine represented "much risk". The coefficient for this variable is intuitive as those who rated beef as risky reported a lower WTP for the hamburger.

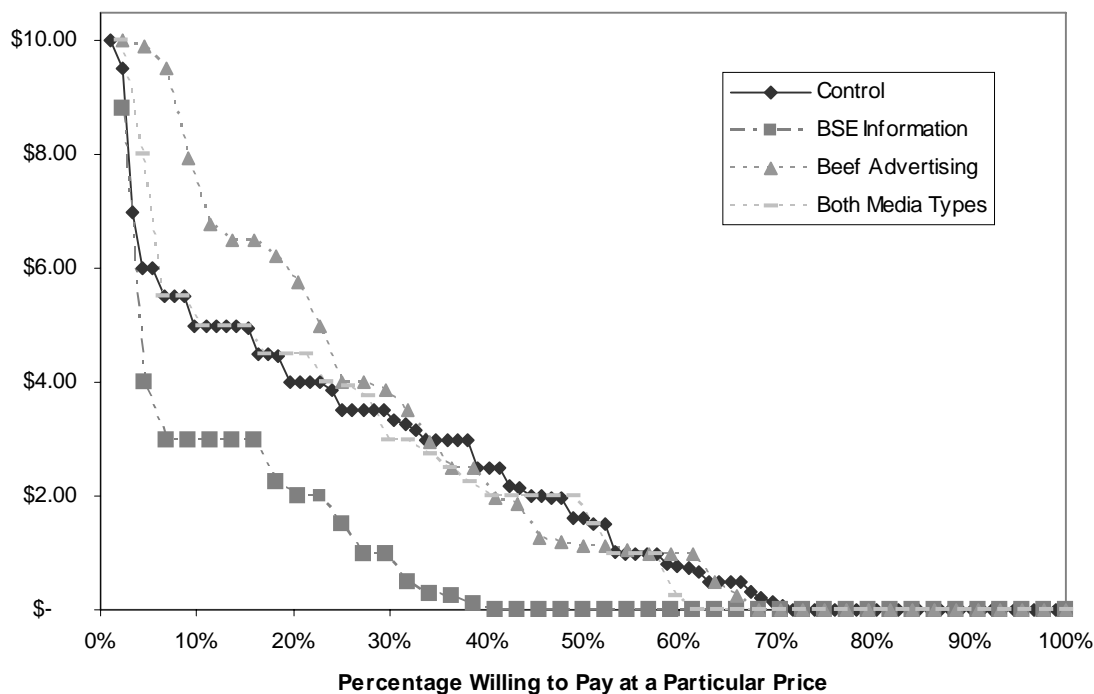
These results indicate that advertising can be a powerful tool in offsetting negative messages by the media. The average WTP for a hamburger decreased by more than 58.9% from the control group once consumers were shown information about mad cow disease. When exposed to both the negative BSE information and generic beef advertising, the average WTP fell only 3.3% relative to the control group.

We theorize that positive "news" from generic advertising could overcome some or all of the damaging economic consequences of negative news about a food safety problem by helping both frequent and infrequent consumers invoke

psychological coping mechanisms to mitigate the feelings of fear. Positive generic advertising appears to be a surprisingly immediate response that is capable of boosting WTP for food that has been the subject of negative media attention, especially if these concerns end up being isolated and relatively short lived.

Finally, it is interesting to recall the beef industry's response in wake of the December 2003 discovery of the U.S.'s first cow infected with mad cow disease. Less than a month after the discovery, the National Cattlemen's Beef Association accelerated its release of a new campaign and increased its funding for advertising by \$1.3 million. Subsequent research by the beef industry indicated that the percentage of consumers who remained confident that U.S. beef was safe from mad cow disease did not decline. Thus, from the beef industry's perspective, the decision to increase advertising at that time appears to have been an optimal response. This finding may be especially valuable to industries in situation, where the food scare ends up being false, such as in the case of California strawberries. In these cases, the ability of advertising to alleviate consumers' fears would be an affect that would improve aggregate social welfare.

Figure 1. Percentage of Subjects WTP for a Hamburger at a Particular Price by Treatment



*NEC-63  
Spring 2008*

*March 14-15, 2008  
Hilton Head, SC*

*Economics of  
Commodity  
Checkoff Programs*

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