Consumer Response to and Trust of Information about Food-Safety Events in the Chicken and Beef Markets in Kentucky

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Recently there have been many highly publicized food-safety events affecting marketing and policy channels of agricultural products. This research examines the impact of food-safety events on consumers' behavior and trust of information in the chicken and beef markets using the Theory of Planned Behavior (TPB) developed by Ajzen (1991). Of particular interest is to determine whom consumers trust regarding information concerning food-safety events. These results are compared to those of an EU study on perceived risks of chicken consumption to see if generalizations can be made across different countries, regions, products, and consumers.

Recent food-safety events are challenging policy and marketing aspects of agricultural products today. Widely publicized food-safety events have occurred in recent decades. Recently, *E. coli* outbreaks in the fresh produce and meat markets have received substantial attention from media and consumers. A meat recall of 21.7 million pounds of processed beef was issued in 2007, resulting in the second-largest recall of this type in U.S. history. Prior to these concerns, *Bovine Spongiform Encephalopathy* (BSE) and avian influenza received worldwide attention after discoveries in the U.S. and Canada in 2003 and 2004 (CDC 2006). This study uses the Theory of Planned Behavior (TPB) approach, developed by Ajzen (1991), to analyze consumers' actions in the chicken and beef markets prior to and following a hypothetical food-safety event. The results of this study are compared to those of a similar study by Lobb, Mazzocchi, and Traill (2006a) in the European Union (EU) concerning perceived risks of chicken consumption. Understanding consumers' actions in the wake of food-safety events is of paramount importance, as better understanding is a cornerstone of confidence-restoration strategies. Governmental and regulatory agencies can use this information as a basis for effective communication of food-safety events.

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Background

Economic theory suggests recent food-safety events in the US will cause a demand shock, effectively lowering demand in the short run. Long-run effects are unclear; as society's distrust in food safety grows, people may turn to other, products that are perceived as being safer (McCluskey et al. 2005). Complicating the issue is the virtual impossibility of having an absolute reduction in risk with regards to food because eating is essential for everyone (Frewer et al. 1998).

After the BSE outbreak in the EU in the mid 1990s, the beef market experienced a decline in demand as a whole, though some individuals increased their demands (Henson and Northern 2000). This exception shows that consumers have different perceptions of risk in food. It also emphasizes that governments and producers need to understand how society perceives risk in the food industry in order to have effective policies (Lobb, Mazzocchi, Traill 2006b).

Part of the problem consumers face is that food-safety aspects of agricultural products are credence goods. A credence good is a type of good where the attributes cannot be determined before or after a product is purchased (Caswell and Mojduszka 1996). This is in contrast to search and experience goods, where attributes can be determined before purchasing or experienced after purchasing the product (Nelson 1974). Credence goods result in consumers relying on aspects such as brands, labels, and perceptions (Buzby et al. 1998). Furthermore, food-risk outbreaks are not foreseen, often unclear, and as more and more information is relayed about

a risk, the coinciding stories from the media can become contradictory due to large time lapses in follow-up information (Caswell 2006).

There is uncertainty about how society perceives risk. Frewer et al. (2003) concluded that public knowledge of uncertainty could result in society distrusting science as a whole, explaining why uncertainty is not often revealed. It is also unclear how much trust society has in regulatory agencies. For example, after an incident of heptachlor contamination of milk in Hawaii, the government informed the public about which milk was safe to consume. However, results show that the people of Hawaii were relatively unaffected by this declaration because the safe milk was not purchased (Smith, van Ravenswaaye, and Thompson 1988).

Method

TPB is an extension of the Theory of Reasoned Action developed by Ajzen. TPB links attitude and beliefs to actions through intentions (Ajzen 1991). This approach has been used in several studies, including one relating to the meat market in the UK (McEachern and Shroder 2004), an evaluation of food choices of adolescents (Dennison and Shepherd 1995), and the perceived risks of chicken consumption if the EU (Lobb, Mazzocchi and Traill 2006b). Lobb, Mazzocchi, and Traill (2006a), found that socio-demographic factors do affect perceived risks, so specific regions or countries may be in need of different policies.

The survey instrument used was developed by Lobb, Mazzocchi, and Traill under TPB with some changes made to better fit our targeted markets and population. For this research, a random sample of 2,000 Kentucky households was obtained from the counties containing the five largest cities, with each county receiving an equal share of surveys. Surveys were conducted via U.S. mail and targeted the "head of household." In an attempt to assure a higher response rate, a "token of appreciation" of $2.00 was offered upon completion of the survey. Almost all questions were measured on a seven-point Likert scale.

Results

Sample Description

Two hundred twenty-four completed surveys were received, an 11.2-percent response rate. Fifty-eight percent of the responses were completed by females; a result of this magnitude was expected, as in many households females are still the principle food purchasers (Lobb, Mazzocchi, and Traill 2006a). Lobb, Mazzocchi, and Traill (2006a) also had a high female response rate, 60 percent.

The number of people in the household ranged from a minimum of one to a maximum of seven, with an average of 2.38. The average age of the respondents was 54.45 years, with a minimum age of 20 and a maximum age of 97. Sixty-nine percent of respondents indicated at least some college education. This is as expected, as we hypothesize that people who have a higher level of education are more likely to respond to a survey, as they understand the necessity of such studies. Lobb, Mazzocchi, and Traill (2006a) found a slightly higher percentage, roughly 72 percent.

Survey Indications

Respondents were asked to state their level of agreement with statements that influenced their decision to purchase chicken and/or beef the following week. When prompted with the statement "Chicken and/or beef is a safe food," almost 52 percent of respondents chose 7 (complete agreement) or 6. All responses greater than 4 (neither) account for almost 71 percent of respondents. A follow-up question asked respondents to rate the risk of chicken and/or beef consumption. A small percentage reported the risk was "very high" with the majority of the respondents choosing "not at all risky." This illustrates that recent meat scares have not had a significant impact on overall risk ratings of consumers and sheds light on long-run effects of food-safety events.

Thirty-one point three percent of respondents stated that it was extremely likely that they would purchase chicken and/or beef to be consumed within their homes in the next week. Forty point six percent reported that it would be extremely unlikely that they would purchase chicken and/or beef next week if they had read an article in the newspaper that high

rates of *E. coli/salmonella* in chicken and/or beef had been found in their area with the result of several people being hospitalized. In the EU study, this figure was about 43.7 percent (Lobb, Mazzocchi, and Traill 2006a). These results uphold extensive results in the literature about the short-run effects of a food-safety event.

Respondents were prompted with a statement concerning their actions such as proper food storage, handling and preparations, choice of place of purchase, and purchasing higher-quality products with regards to reducing the risks associated with food safety events. Fifty point five percent of respondents stated their actions would reduce food risk by a large extent (7) and all values above 4 (neither) account for 93.8 percent. This should be of interest to food firms and the Centers for Disease Control in their attempts to provide information to consumers about the consumer's part in reducing food-safety risks. Respondents were also asked to indicate their level of agreement with a list of statements after being prompted with, "In general, how important are each of the following to your household." Sixty-six point six percent stated food safety was extremely important. With food safety being of concern to most consumers, food-safety events likely will have an impact on affected markets (Table 1).

To elicit trust of information concerning food-safety events, respondents were prompted with a hypothetical situation: the respondent was preparing chicken and/or beef for dinner when they suddenly remembered an article in the newspaper the day before that reported high rates of *E. coli/salmonella* found in chicken and/or beef in the respondent's area. The survey went on to explain that several people had been hospitalized as a result. Furthermore, in the hypothetical situation, the respondent could not remember what type of chicken and/or beef the article was referring to (i.e. ground beef, whole broilers, etc.). The question then asked where respondents would turn for more information concerning this event. The majority of respondents chose standard forms of information: television (64.3 percent), newspaper (67.9 percent), and internet (74.1 percent) (Table 2). Interestingly, relatively few respondents chose radio as a source for further information. This shows that radio is not considered a viable source of follow-up information by consumers. It also indicates that a commonly available,

Table 1. Percentages of Respondents' Agreement to the Importance of Each Statement Influencing Food-Purchasing Decisions.

	Extremely unimportant			Neither			Extremely important
	1	**2**	**3**	**4**	**5**	**6**	**7**
Tasty food	2.7	0.00	0.00	1.8	10.7	26.3	58.5
Value for money	1.5	2.2	0.9	6.3	21.0	25.5	42.7
Ease of preparation	1.3	1.3	1.8	6.7	25.9	38.8	24.2
Food safety	2.2	0.9	0.5	1.3	8.0	20.5	66.5
Food everyone likes	2.2	0.9	0.00	6.3	13.4	29.9	47.3
Food variety	1.3	0.9	3.1	6.7	22.3	30.4	35.3
Fat content	2.7	0.9	2.7	9.4	26.3	25.5	32.6
Cholesterol content	2.7	1.3	3.6	11.6	26.8	26.3	27.7
Ethical food production methods	9.4	8.0	6.7	26.3	20.1	11.2	18.3
Local community livelihood	5.8	7.6	4.0	27.2	20.5	17.9	17.0
Animal welfare	14.7	10.8	6.3	25.5	16.5	15.2	11.1

Table 2. Where Respondents Would Turn for More Information after Hearing About a Hypothetical Food-Safety Event.

Television	64.3%
Newspaper	67.9%
Internet	74.1%
Radio	23.7%
Magazines	10.7%
Your supermarket/store	24.1%
Consumer organization	24.1%
Family/friends	45.5%
Would not bother to find more information	4.0%

free-access form of information is not being fully utilized for food-safety communication.

Respondents were asked to report their level of trust of 20 entities that had hypothetically provided information about potential risks associated with *E. coli/salmonella* in food. This was another measure of trust of information. Political groups had the highest percentage of "completely distrust," 17.4 percent of respondents. The next highest percentage of "completely distrust" was given to animal-welfare organizations, 13.8 percent. Under "completely trust" (7), doctors and health authority received the highest percentage, 47.8 percent. University scientists and the United States Department of Agriculture (USDA) also received a relatively high percentage in the same category, 33.0 percent and 35.7 percent, respectively (Table 3). Animal-welfare organizations and political groups are often promoting an agenda that is not always transparent to consumers, and this can lead to distrust. On the other hand, university scientists, doctors, and public authorities are viewed by consumers as being unbiased sources of information.

There were striking similarities in simple averages of the above categories between this study and the EU study. Specifically, farmers, doctors, government, television news, magazines, and Internet were all within 0.10 of each other. The most drastic difference between the two areas concerned organic shops, with an average value of 4.14 in Kentucky and 5.21 in the EU. This means that overall, the EU respondents indicated a higher rate of trust in organic shops than did respondents in Kentucky. Shopkeepers, university scientists, the national food authority (e.g., USDA), political groups, television documentaries, radio, and product labels were all trusted more in the EU than in the U.S., with the differences ranging between 0.10 and 0.60. In only four of the 20 categories (supermarkets, processors, doctors, and magazines) did Kentucky respondents indicate more trust than participants in the EU study (Lobb, Mazzocchi, and Traill 2006a). These results show clear differences in the perceptions of trust of food-safety information between the two areas surveyed.

The survey instrument had pairs of information sources and the respondents were asked whom in each pair they trusted more with regards to hearing rumors about food-safety information. Seventy-five point nine percent reported they trusted university scientists over media and 74.1 percent reported they trusted university scientists over producers. Seventy point five percent reported trusting public authorities more than producers (Table 4). This implies that following a food-safety event, university scientists or public authorities could be employed by the affected industry or firm to communicate risks associated with the event in an attempt to accelerate the restoration of confidence in the market.

Survey respondents were also given the prompt "Chicken and/or beef that is safe is:" and were asked to give their level of agreement to statements which finished that sentence. Under "produced in the United States" the majority of the selections

Table 3. Percentage of Responses to Entities that had Hypothetically Provided Information about *E. coli/salmonella* in Food.

	Completely distrust			Neither			Completely trust	Don't know
	1	2	3	4	5	6	7	0
Shopkeepers	2.2	2.7	4.9	21.9	23.2	19.2	14.3	11.6
Supermarkets	0.9	0.9	6.3	15.6	24.1	27.2	20.5	4.5
Organic shop	2.2	3.1	6.3	19.6	17.4	22.3	12.5	16.5
Farmers	1.3	1.8	4.0	15.6	21.0	25.4	21.9	8.9
Processors	2.2	6.3	16.5	19.2	17.4	18.8	8.9	10.7
Doctors/health authority	0.9	1.3	0.4	3.6	11.2	33.0	47.8	1.8
University scientists	0.9	0.4	3.1	9.8	15.6	30.8	33.0	6.3
USDA	1.8	1.8	4.0	11.1	13.4	28.1	35.7	4.0
State government	3.1	3.6	5.4	16.1	23.2	23.7	19.2	5.8
Political groups	17.4	12.5	19.2	23.7	8.0	6.7	4.5	8.0
Environmental groups	9.4	7.1	12.9	21.4	13.4	17.9	10.3	7.6
Animal welfare organizations	13.8	9.4	17.9	20.1	12.1	12.1	5.8	8.9
Federal government	4.9	6.7	9.4	18.3	16.5	23.2	15.2	5.8
Television documentary	2.2	4.0	11.1	18.8	25.4	18.3	14.7	5.4
Television news	1.8	1.8	7.1	15.6	23.2	29.0	18.8	2.7
Newspapers	0.9	2.7	4.9	13.4	27.7	30.0	15.2	5.4
Internet	1.8	3.6	7.6	16.5	24.1	27.2	8.9	10.3
Radio	0.9	2.7	6.7	20.5	23.7	25.9	10.3	9.4
Magazines	0.0	3.6	8.9	26.3	26.3	18.8	6.7	9.5
Product label	3.1	2.7	9.4	21.0	24.6	21.9	12.1	5.4

Table 4. Comparative Trust Concerning Food-Safety Rumors.

Family more than university scientist	33.0%
Family more than public authorities	38.8%
Family more than media	52.7%
Family more than producers	54.9%
University scientist more than public authorities	60.7%
University scientist more than media	75.9%
University scientist more than producers	74.1%
Public authorities more than media	67.0%
Public authorities more than producers	70.5%
Media more than producers	52.2%

were "completely agree." We can best explain this as a result of the United States having relatively few highly publicized food-safety events that received as much attention as did those in other countries. Furthermore, with regards to chicken, the U.S. has not seen the same level of media attention to the avian influenza as have other parts of the world. Under "produced in Mexico and Canada," the majority of respondents choose neither. We attribute this to relatively little media coverage concerning food-safety events in either of these countries, little imports of chicken and/or beef from these countries, and/or lack of consumer knowledge concerning chicken and/or beef imports from these countries.

Only 14 percent of respondents indicated they had actively searched for food-safety information in the past two weeks. This may be because there was not a significant reason for respondents to search for food-safety information, or it may be that consumers are depending on information concerning food-safety events to be made available to them through common information sources (television, newspaper, etc.). If it is assumed that consumers are expecting to be informed of such situations as opposed to actively searching for the information themselves, then there is an imperative obligation by policy and decision makers to evaluate and establish effective communication measures.

Conclusion

The descriptive statistics obtained from this survey offer interesting insights into the behavior of consumers with regards to chicken and/or beef and hypothetical food-safety events occurring in these markets. However, it is important to remember that these figures are merely descriptive in nature and have not been used in a model to distinguish consumer behavior under hypothetical food-safety events when all factors are considered. Interesting conclusions can be drawn between the results of this survey and those of Lobb, Mazzocchi, and Traill EU. These preliminary results suggest that different communication strategies are needed for different regions. There is also evidence of the sources of information that consumers trust concerning food-safety events. Further, these results uphold extensive literature concerning short-run effects of food-safety events while shedding light on long-run effects. Even though similarities and contradictions can be seen between the Kentucky study and the EU study, confident statements can be made only after more research is conducted in this area and a model is used to determine if consumers across regions and countries perceive food-safety risk in the same manner. To fully understand the differences, socio-demographic variables need to be included. Empirical results are forthcoming.

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