



Consumer preferences before and after a food safety scare: An experimental analysis of the 2010 egg recall



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ABSTRACT

In August 2010, more than half a billion eggs were recalled in the U.S. because of a Salmonella outbreak. This study examines the effect of the recall with a unique pair of auction experiments investigating willingness to pay (WTP) for conventional and organic eggs, one conducted shortly before and one right after the recall with the same participants. In addition to the before and after bids, participants bid again after a negative information or balanced information treatment about the event. Accompanying surveys showed consumers had a high level of awareness of the recall but less knowledge of specific details, and viewed information on egg farm conditions as very important in their WTP. While there were no significant before and after differences, WTP for organic eggs significantly increased in the negative information treatment, and balanced information had a positive effect on consumer WTP for conventional eggs.

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1. Introduction

Foodborne illness is a serious public health problem in the United States. Each year, approximately 48 million Americans contract a foodborne illness, resulting in 128,000 related hospitalizations and 3000 deaths ([Centers for Disease Control and Prevention, 2016](#)). One of the most commonly used approaches to deal with foodborne illness is a product recall. Recalls are important as they attempt to remove the source of the problem to prevent further illnesses. However, recalls can also inflict serious damage on an industry through stigmatizing all like-products, including ones that are safe. Accordingly, the purpose of this research is to examine how food recalls impact consumer demand for both the product being recalled and a closely related version of the product.

A useful measure of consumers' reaction to a food recall is its effect on consumer willingness to pay (WTP) for the product ([Roberts, 2007](#)). Ultimately, understanding these effects can improve the effectiveness of future food recalls in terms of preserving both consumers' welfare and the economic well-being of the

food industry. Economists commonly use experiments to elicit WTP, but experiments that test the impacts of a food recall usually rely on a laboratory setting and hypothetical food-safety risks ([Kaiser et al., 1992](#); [Maruyama and Kikuchi, 2004](#)). Thus, the treatment used to test the impact of a food recall is purely hypothetical or provides information about a 'potential' risk unless the experiment can somehow include an actual recall. The study presented here benefits from an experiment on food preferences that was conducted shortly before one of the largest egg recalls in U.S. history and that allowed us to design a follow-up experiment to examine the effects of an actual recall.

On August 13, 2010, Wright County Egg Farms of Iowa initiated a voluntary recall of eggs, which it expanded on August 18, 2010. Two days later, the recall was again expanded to include Hillendale Farms of Iowa. In total, more than 550 million eggs distributed throughout the United States (see [Fig. 1](#)) were identified as presenting a potential risk of *Salmonella* contamination. Naturally, the recall received extensive attention by local and national media outlets ([Laestadius et al., 2012](#)). We take advantage of this actual food-safety event to examine consumer behavior in the midst of a situation in which the long-term health consequences of the recall were uncertain during the time of the experiment sessions.

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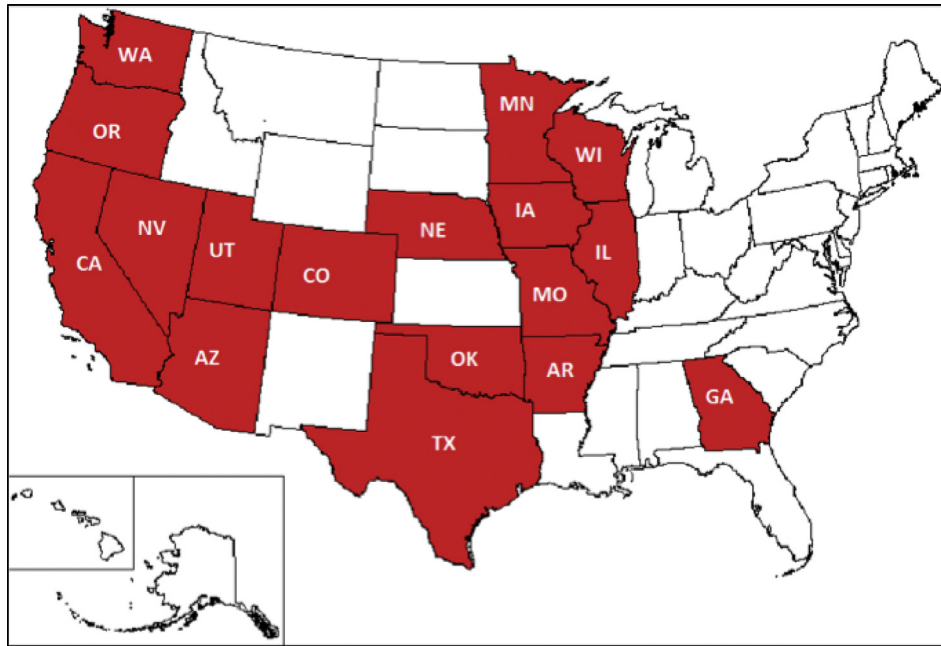


Fig. 1. Map of states affected by the 2010 shell egg recall. Source: <http://am.blogs.cnn.com/2010/08/24/> (Retrieved April 2016).

Just prior to the recall, we had conducted an experiment involving adult participants in the mid-Atlantic region of the United States, which was not significantly affected by the subsequent recall, to investigate consumers' WTP for conventional and organic food products, including eggs. After the recall was announced, we contacted the participants from that study about their willingness to participate in a follow-up study, without mentioning the motivating factor of the recall. Of the original 117 participants, 74 (63.24%) took part in the follow-up study, which was conducted during the first two weeks of September 2010.¹

Both the initial and the follow-up study used a Vickrey fourth-price auction to analyze the impact of the recall on consumer WTP for eggs. The post-recall study included two parts. In the first part, all participants answered questions about their demographic characteristics, food consumer habits, and attitudes about food before bidding on several food products, including eggs. The experiments collected WTP for both conventional eggs (as were the ones recalled) and organic eggs, enabling us to examine if consumers' reaction to the recall would vary by egg type. In the second part, the participants were split into two groups. The first group was given negative information obtained from a media source consisting of then-current information about the recall. The second group was given a more balanced set of information as it contained both the negative information and additional positive information about the recall that could potentially mitigate decreases in WTP caused by their receiving the negative information. To gauge the participants' knowledge of the recall, several questions about it were asked before the information treatments. In addition, at the end participants were asked to rate the importance of each piece of information about the recall in terms of its influence on their WTP.

The primary objective of this study was thus to determine if consumer WTP for eggs was affected by the recall. Part of this was to examine if reaction to the recall varies between conventional and organic eggs. Specifically, for each egg type did participants react heterogeneously to the recall, and, if so, what factors

contributed to any such difference? The second objective was to look at the possible influence on WTP of negative or balanced information about the recall on the two egg types. An included goal here was to see which pieces of information most influenced consumer responses.

2. Literature review

There have been two broad approaches to studying the impacts of food safety scares, in general, and food recalls specifically. The first approach has used observational market-wide data to discern any impact of a food safety event on either market demand or price. The second approach has used data collected directly from consumers through surveys or economic experiments, with the latter primarily limited to assessing whether hypothetical food safety treatments impact consumer WTP. This section reviews the results of some of these previous studies.

There have been several significant outbreaks of foodborne illness in the United States in recent years. In 2006 when an outbreak of *Escherichia coli* was linked to spinach, the U.S. Food and Drug Administration (FDA) issued a warning to advise consumers not to consume bagged spinach. Arnade et al. (2009) constructed a retail demand model that measured the impact of the announcement on sales of fresh spinach over 68 weeks following the advisory. Based on evidence from market-level data, they concluded that overall retail expenditures for bagged spinach declined 20% while retail expenditures for all leafy greens fell by only 1%. Using empirical models, Thomsen et al. (2006) found a similar result after studying a series of brand-specific recalls of frankfurters and luncheon meats due to an outbreak of *Listeria monocytogenes*. As expected, sales of the impacted brand declined roughly 22% while other brands experienced no significant decline in sales. Taylor et al. (2016) used a panel selection model to estimate the impact of ground beef recalls after the 2003 Bovine Spongiform Encephalopathy (BSE) event. They found that, on average, a recall caused 0.26 lb per person reduction in retail purchases of ground beef. These studies provide evidence that recalls influence consumers' behavior so that they stop consuming potentially contam-

¹ The original recruitment of the participants made no mention of possible future experiment sessions as they were planned only after the *Salmonella* outbreak occurred.

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