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Is Food and Drug Administration policy governing artisan cheese consistent with consumers' preferences?

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ABSTRACT

United States government policy prohibits the sale of cheese made from unpasteurized milk aged less than 60 days despite contested science behind the policy. We use experimental auctions for artisan cheese to estimate the value of pasteurization and age as food safety attributes, which is the rationale for the policy. We also look at consumers' perception of the tradeoff between safety and quality. A survey was conducted with participants at farmers markets including experimental auctions and sensory analysis of pasteurized and unpasteurized cheese and questions concerning attitudes about food safety. There is no evidence of positive demand for pasteurization and there is no evidence of a tradeoff between safety and quality. On average artisan cheese consumers make purchasing decisions based on taste, not their attitude toward food safety. The results of this study raise questions about the possible extension of a minimum aging period for cheese made from unpasteurized milk.

Introduction

There is little consensus on the safety or risk of various food products and production processes and how to achieve a safer food system through government action or inaction. One reason for the lack of consensus is that scientists often disagree about the safety and risk involved (Millstone, 2009). This is illustrated by recent studies illuminating the differences of opinion on the safety of conventional versus organic foods (Brandt et al., 2011; Smith-Spangler et al., 2012). Another reason is that factors such as the underreporting of illness, difficulty in tracing outbreaks, and the changing nature of pathogens complicate the measurement of foodborne illness (Mead et al., 1999). It is also increasingly understood that decisions about the acceptability of risk in the food system involve perceptions, opinions and values as well as science (Nestle, 2010; Paxson, 2008). The lack of scientific consensus about food safety and risk, the lack of documentation on food safety outbreaks, and the range of opinions and values toward food safety make designing food safety policy particularly challenging.

The debate in the United States over whether or not the milk used in cheese making should be pasteurized is contentious. Federal regulation currently requires that cheesemakers using unpasteurized milk (also called raw milk) age the cheese for a minimum of 60 days before sale (Cheese from Unpasteurized Milk, 2011). The aging aspect of the regulation is based on scientific research that has found that beneficial bacteria can outcompete harmful or pathogenic bacteria as cheese ages (see discussion in D'Amico, 2008). In contrast, in Europe there is no aging requirement for unpasteurized cheese and some of the most expensive cheeses are made from unpasteurized milk without aging. Numerous cheese varieties such as Camembert de Normandie, Brie de Meaux, and Brie de Melun are required by law to be made only with unpasteurized milk and aged less than 60 days.

The US Food and Drug Administration (FDA) is considering tightening restrictions on raw milk cheese by lengthening the required aging period to 90 or 120 days, or banning unpasteurized milk cheese altogether (Neuman, 2011; Layton, 2011; Huffstutter, 2011). This regulation would further limit artisan cheesemakers' ability to produce certain types of cheeses without pasteurizing the milk first, and it would further limit the import of cheese made from unpasteurized milk that does not meet the standard. Pasteurization requires expensive equipment and eradicates the beneficial bacterial cultures that many artisan cheesemakers rely on for the flavor development that allows them to garner a premium in the marketplace (Paxson, 2008). In the United States, on average unpasteurized cheese sells for more money than pasteurized cheese (see Table 1). This difference is particularly pronounced for cheeses aged at least 60 days, for which direct price comparisons can be made for otherwise equivalent pasteurized and unpasteurized cheeses.

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Table 1
Average retail prices of pasteurized and unpasteurized cheese[*].

	All observations			Aged > 60 days only		
	Mean	St. dev	*N*	Mean	St. dev	*N*
Unpasteurized	$25.54	6.43	82	$25.54	6.43	82
Pasteurized	$23.59	10.95	145	$19.45	7.43	86
All Cheese[a]	**$24.29**	**9.60**	**227**	**$22.42**	**7.58**	**168**
Mann–Whitney[†]	Prob > |z| = 0.0141			Prob > |z| = 0.0000		

[*] Price data collected form the two largest online artisan cheese retailers in the U.S., March, 2013.
[a] Total refers to the average of all cheeses in the sample, both pasteurized and unpasteurized.
[†] Note: *P*-value for a two-sample Wilcoxon rank-sum (Mann–Whitney) test of equivalency between the price of pasteurized and unpasteurized cheese.

The debate over the use of unpasteurized milk in cheese production has recently revived. Artisan cheese consumption is on the rise and the number of artisan cheesemakers in the US has doubled since 2000 to more than 400, with seventy-five percent of them using unpasteurized milk for at least some of their products (Roberts, 2007). The debate is part of a growing fissure between the burgeoning artisan food movement and the more traditional industrial food system that became apparent during the passing of the Food Safety Modernization Act of 2010 (H.R. 2751).

Central to the discussion about the safety of products or processes is the role of risk assessment and the assumptions or 'framing' required in assessing risk (Millstone, 2009). Assumptions made in risk assessments can reflect societal or personal values and preferences as much as empirical evidence (Vaughan and Seifert, 1992). The artisan cheese trade group, the American Cheese Society (ACS) criticized the recent FDA risk assessment of soft ripened cheese (FDA, 2012) for relying heavily on personal values as well as parameters derived from controversial sources (ACS, 2013). The debate over the degree of regulation of production practices and specifically the pasteurization requirements of artisan cheese is ultimately a debate about the tradeoff between consumer sovereignty and consumer protection.

Given that values and preferences are so critical in defining risk and safety it is unfortunate that a rigorous treatment of consumer preferences is often excluded from the policymaking process. This paper addresses two research questions regarding the debate over the safety of cheese made from unpasteurized milk: (1) To what extent do artisan cheese consumers perceive pasteurization and aging to be food safety attributes? (2) How do they perceive tradeoffs between safety and quality? We explore these questions using experimental data, which allows us to create context and isolate causality. We can elicit values for real goods in an experimental setting to understand not only how much consumers will pay, but also what characterizes those consumers and what motivates their decisions. By combining an experimental auction with sensory experiments and a survey measuring consumer attitudes about food safety and demographics, we gain a lot more insight into why the transactions occurred than we do from simply analyzing retail prices.

Hedonic price analysis is commonly used to analyze the housing market and estimate the value of attributes such as the number of rooms, proximity to public transportation, or the quality of the school system (e.g. Sheppard, 1999). Under hedonic price theory, a good is defined by a set of attributes and the good's market price is the sum of the marginal implicit prices of each of those attributes, as estimated when the good's price is regressed on its attributes (Lancaster, 1966). We use hedonic price analysis of experimental data to estimate and explain the willingness to pay attributes that are related to the safety of artisan cheese (aging and pasteurization). We follow the example of Melton et al. (1996) in analyzing experimental auction bids in a hedonic framework in order to isolate the value of the cheese attributes (pasteurization and age) as well as the underlying characteristics of the participants in the auctions. We also explicitly look at consumers' choices of pasteurized and aged cheese and examine the relationship of these choices to their sensory ratings for each cheese and their attitudes about risk to gain a deeper understanding of the tradeoff consumers perceive between safety and quality.

Melton's work is situated within a broader literature that uses experimental auctions to estimate demand for food product attributes. Many of these studies use multiple methodological approaches for comparison of the value of an attribute estimated from experimental auction data. For example, there are studies that investigate the link between sensory evaluations and auction bids by comparing objective measurements of a given product attribute with subjects' bids or evaluations (e.g. Lusk et al., 2001; Feuz et al., 2004; and Platter et al., 2005). Other studies compare auction bids with hedonic ratings for an attribute and find that subjects bid more for products they think have that attribute (e.g. Umberger and Feuz, 2004; Melton et al., 1996; Platter et al., 2005). Still other studies compare experimental auction bids with hedonic ratings for an attribute through post-auction surveys (Lusk et al., 2001) or with risk tolerance by constructing an index based on answers to questions about risk (Brown et al., 2005).

Previous studies using experimental auctions to estimate demand for food safety have focused on consumer acceptance of a controversial product and the value of communicating product information to consumers. One approach to valuing food safety using experimental auctions is to endow participants with a product and ask the subject's WTP to upgrade an endowed product to a safer one (e.g. Hayes et al., 1995). Other experimental auction studies frame food safety in terms of willingness to accept a potentially riskier product (e.g. Lusk et al., 2001). Still other studies look specifically at the impact of knowledge and information about risk on food safety valuation (Fox et al., 2002; Nayga et al., 2006). We build on this literature by using a product where the safety is intrinsically *and perhaps inversely related* to the sensory quality of the product.

Methods

Sample

The hedonic price analysis of experimental auctions relies on auctions bids, sensory evaluations, and a short demographic survey with consumers at farmers' markets in multiple locations in Michigan, New York and Vermont. The experiments took place in June and July, 2013. Our target population for the experimental auctions included consumers likely to purchase artisan cheese since we are interested in consumers most affected by regulation of artisan cheese. The sampling approach does not include non-consumers of artisan cheese since they would not contribute information relevant to the research question and would present problems with interpretation. We would not be able to determine if a bid is censored at zero because the participant is not a