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Does media influence consumer demand? The case of lean finely textured beef in the United States

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ABSTRACT

In 2012, the media paid extra attention to lean finely textured beef (LFTB), an inexpensive lean beef product extracted from low-valued fatty trim. The media's negative portrayal of LFTB as an unnecessary and unsavory additive to ground beef products corresponded with a spike in reports over a 6-month period. Since LFTB is often used in ground beef, it is likely that consumption of LFTB-based ground beef products and other meats could be affected. This paper used weekly meat production and sales data to assess how media depictions of LFTB affect consumer demand. We used a Central Bureau of Statistics model to test whether media portrayal affects the consumption of aggregate meats and beef cuts: pork, chicken, turkey, Choice beef, Prime beef, Select beef and ground beef. Results indicate that media portrayal of LFTB, measured by the number of articles on the subject weighted by consumer readership, did not lead to significant changes in consumer demand across meats or within the beef category immediately. However, consumer purchases of pork, turkey and Prime beef were affected two weeks or greater after news reports of LFTB surfaced. Nevertheless, those effects were temporary and waned or disappeared during later weeks. Our look at the LFTB controversy informs food policy by studying the media sources from which consumers obtain their information. As the temporary effects of news media on consumer demand for aggregate meats and disaggregate beef cuts suggest, consumers may benefit from receiving their news from industry and government sources instead.

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Introduction

Since the turn of the millennium, food safety concerns in the United States and globally have increased. Concerns in meat products range from contaminates such a E.coli, Salmonella, bovine spongiform encephalopathy (BSE) and lean finely textured beef (LFTB). Media impacts of these food safety events on consumers' demand for meats affect not only the contaminated meat in question but also other meats that may serve as substitutes to the affected meat. Former USDA scientist, Gerald Zirnstein, indicated in March 2012 that 70% of the ground beef sold in supermarkets contained lean finely textured beef (LFTB). Following Zirnstein's announcement, social media began heavily publicizing LFTB as an unnecessary and unsavory additive to ground beef products. LFTB, which is used in ground beef products, is comprised of various components. Fifty-percent lean beef trimmings, which come from fed cattle, are blended with leaner processing beef and used to produce LFTB, commonly known as pink slime. Leaner processing beef comes mostly from cows, bulls, imported processing beef, and a small portion comes from fed cattle. It was reported on March 21, 2012 that Safeway, SuperValu and Food Lion would stop buying ground beef with LFTB because of questions, perceptions, and concerns of the beef product (Avila, 2012). Concerns with LFTB continued as large grocery chains such as Kroger, BILO/Winn Dixie, Giant and Hy-Vee announced soon after that they would discontinue stock of ground beef containing LFTB. Other supermarkets such as Walmart stated it would give consumers the option to purchase ground beef with or without LFTB (Greene, 2012).

As a result of the negative media attention, some manufacturing plants were also shuttered and production declined. Beef Products Inc., the manufacturer of LFTB, shuttered three of its four plants (located in Garden City, Kansas; Amarillo, Texas; and Waterloo, Iowa) and laid off 650 workers in response to waning demand for LFTB. Cargill announced shortly thereafter that it would cut production of FTB, a finely textured beef similar to LFTB, as its customers began asking for ground beef without FTB (Greene, 2012).

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AFA Foods, a Pennsylvania ground beef processor that had five facilities and the capacity to process 800 million pounds of ground beef annually, was also affected and filed for bankruptcy in April 2012 (Davis and Stern, 2012). CTI Foods acquired AFA Foods shortly thereafter.

The American Meat Institute estimates that an additional 1.5 million head of cattle would be needed annually to produce the beef necessary to replace the use of LFTB and FTB. Prior to the LFTB controversy, the US cattle inventory was at its smallest since the early 1970s, based on the Meat Animals Production, Disposition, and Income Annual Summaries from the National Agricultural Statistics Service (NASS). Low supply has caused beef prices to remain high. The average annual retail price of all fresh beef was $4.44 per pound in 2011 compared with the average monthly value of $4.63 per pound in February 2012 (Greene, 2012).

This paper examines the effect of news media portrayal of LFTB on consumer demand using a switching regime Central Bureau of Statistics (CBS) demand system. We contribute to the existing literature on consumer meat demand systems by using a quality-adjusted approach to construct a media index based not only on the quantity of media coverage but also on the consumer readership. Most previous studies have used a media index based purely on the quantity of media coverage (e.g., Brown and Schrader, 1990; Verbeke and Ward, 2001). The association of various beef products with LFTB means that any news controversies surrounding one beef category may affect other beef and aggregate meat categories. Therefore, we tested whether consumers substitute within or across meats, as research points to both (Eales and Unnevehr, 1988; Heien and Pompelli, 1988; Kinnucan et al., 1997; Mangen and Burrell, 2001; Verbeke and Ward, 2001; Hahn and Mathews, 2007). We are particularly interested in examining the effect of media portrayal before and after the heightened period of consumer concerns over LFTB. Structural change in this manner has been tested for or introduced to demand systems previously (Chavas, 1983; Dahlgran, 1987; Moschini and Meilke, 1989; Eales and Unnevehr, 1988; Mangen and Burrell, 2001; Peterson and Chen, 2005).

We combined aggregate meat (pork, chicken and turkey) and disaggregated beef products (Choice, Prime, Select and ground beef) in one demand system to analyze the impact of news media coverage of LFTB on meat demand. Using a switching regime demand system, we found that structural change does not occur across meats and beef cuts. Furthermore, we found that media portrayal of LFTB did not lead to significant changes in consumer demand across meats or within the beef category immediately. However, consumer purchases of pork, turkey and Prime beef were affected two weeks or greater after news reports of LFTB surfaced. Nevertheless, those effects were temporary and waned or disappeared during later periods. Consumers clearly rely on news media to make informed food purchase decisions, as evidenced by changes to pork, turkey and Prime beef purchases over time. However, consumers receive only part of the information, of which they pay particular attention to reports with negative intent. Our research advances the dialog on consumer attainment of quick but accurate information, as consumers often depend on news media to guide their purchase behaviors.

The paper is arranged as follows: Literature relevant to consumer demand systems is discussed in section 'Background'. Data and methodology are described in section 'Research design'. Section ''Estimation results and discussion' describes empirical results and provides a discussion. Section 'Conclusion' presents the conclusion.

Background

Consumer food demand has been researched in numerous capacities and different nations (Canada: Goddard and Amuah, 1989; Australia: Piggott et al., 1996; Norway: Rickertsen, 1998; Spain: Kaabia et al., 2001; Amsterdam: Mangen and Burrell, 2001; Belgium: Verbeke and Ward, 2001; Japan: Peterson and Chen, 2005; US: i.e., Brester and Schroeder, 1995; Piggott and Marsh, 2004) over the past few decades. Of particular interest in these studies has been the effect of media publicity and advertising on consumers' decisions to consume certain foods.

Consumers often rely on the mass media for relevant information, and the media affects their purchase decisions (Just, 2001). Advertising and media publicity have been found to affect consumers' reallocations of expenditure across different food groups. Advertising often conveys a positive effect on certain food purchases (Brester and Schroeder, 1995; Ward and Lambert, 1993; Coulibaly and Brorsen, 1999; Capps and Park, 2002). Brester and Schroeder (1995), for example, found that branded beef and poultry advertising positively influences total meat consumption, and Capps and Park (2002) found that branded and generic advertising of pork positively affect consumers' decisions to consume pork and determine how much to intake.

However, media publicity is not always positive. For example, the 1970–1990s were wrought with media reports about cholesterol, which shaped consumer concerns and affected their consumption behaviors. Capps and Schmitz (1991) found that cholesterol information not only decreases pork consumption but also increases poultry and fish consumption. Despite media's shift from cholesterol-controlled to low-carbohydrate diets, Adhikari (2006) revisited the impact of cholesterol information on meat demand under the notion that cholesterol concerns continue to prevail among consumers and obtained a similar result to Capps and Schmitz. Others have likewise tackled media publicity of health concerns (Dahlgran, 1987; Kinnucan et al., 1997; Flake and Patterson, 1999; Kaabia et al., 2001; Tonsor et al., 2010). Kalaitzandonakes et al. (2004) stated that news reporters have tried to link biotechnology to food hazards but interestingly found that consumers do not respond to media coverage of biotech foods.

Many studies have similarly examined the impact of news media on meat demand in the wake of food safety concerns (Verbeke and Viaene, 1999; Verbeke and Ward, 2001; Dahlgran and Fairchild, 2002; Peng et al., 2004; Piggott and Marsh, 2004; Marsh et al., 2004; Conley and Wade, 2007; Mutondo and Henneberry, 2007). Verbeke and Ward (2001), for example, found that Belgian consumers exposed to television publicity of bovine spongiform encephalopathy (BSE) shifted their demand away from beef/veal towards pork. Marsh et al. (2004), on the other hand, found that meat recall events reported by newspapers do not significantly impact consumer behavior. Similarly, Piggott and Marsh (2004) found the magnitude and duration of the impact of publicized food safety concerns on consumer meat demand was ''small and short-lived.''.

Ample research on the demand for eggs (Schmit and Kaiser, 1998; Brown and Schrader, 1990) and for fluid milk and dairy products likewise exists (Chern and Zuo, 1995; Kaiser and Carlos Reberte, 1996; Kaiser, 1997; Kaiser and Liu, 1998; Chung and Kaiser, 2000; Schmit and Kaiser, 2004). While these studies generally contend that advertising positively impacts food markets, they argue that media publicity of food safety hazards negatively impacts them. For example, Kaiser and Carlos Reberte (1996) found that while generic fluid milk advertising positively affects consumer demand for whole, low-fat and skim milks, health concerns for body shape and weight negatively affect demand for whole milk. As an alternative to the often used consumer demand framework, recent studies have examined consumer response to food safety through willingness to pay (Payne et al., 2009; Dillaway, 2011; Messer et al., 2011). For example, Dillaway (2011), in an experimental setting, provided adult participants with information on contamination of leading brands of chicken