



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Consumer Awareness and Response to Produce Food Safety Issues

Dawn Thilmany McFadden, Sara Blandon, Marisa Bunning, Pat Kendall, Heather Troxell-Alrich, Jennifer Bruning, and Sharon Yeh

Various factors motivate consumers to "Buy Local," and food safety issues may play an important role in fresh produce purchasing decisions. There is a belief that recent increases in the number of food-borne illness outbreaks associated with fruits and vegetables has had a negative influence on consumer attitudes and purchasing behavior. With organic labeling requirements and the recent implementation of county-of-origin labeling for fruits and vegetables, more information is available to consumers today at the point of purchase regarding agricultural methods and growing location. This information can be useful to consumers concerned about pesticide use since production method often impacts pesticide choices by producers. To develop food safety messages regarding fresh produce and to effectively target communication that strengthens consumer confidence, we need to understand consumer perceptions, attitudes, and purchase behavior. Utilizing a cross-disciplinary team approach, food safety and agriculture economics researchers used focus groups, farmers market surveys, and a national on-line survey to gather information regarding perceptions of food safety issues associated with fresh produce and consumer response to recent high-profile food safety events.

Background

Health benefits associated with fruits and vegetables continue to gain recognition as more studies link their consumption with protective effects. Reports indicate fruit and vegetable purchases have in-

Thilmany is Professor and Blandon is a graduate student, Department of Agricultural and Resource Economics; Bunning is Assistant Professor, Kendall is Professor, and Troxell-Alrich, Bruning, and Yeh are Graduate Students, Department of Food Science and Human Nutrition; Colorado State University, Fort Collins.

This study was funded by the USDA NRI Small and Midsize Farms and Agricultural Markets and Trade grant programs administered by the NIFA (formerly CSREES) as well as support from the Colorado Experiment Station and CSU Extension.

creased in recent years (Blisard and Stewart 2007) and fresh produce represents both a fast growing and increasingly trade-dependent sector of the food system. There is evidence that more produce is being sold directly to consumers at farmers markets and through community supported agriculture subscriptions (USDA-AMS 2008; Thilmany and Thomas 2009).

Highly publicized outbreaks associated with spinach (FDA 2007), melons (FDA 2008b) tomatoes (FDA 2008a) and peppers (CDC 2008; Jungk et al. 2008) may have helped raise the awareness of fresh produce food safety issues in recent years. As an example, five of the top ten foods regulated by FDA and associated with outbreaks between 1990 and 2006 were identified in an October 9 press release: leafy greens, potatoes, tomatoes, sprouts, and berries (Center for Science in the Public Interest 2009). Food safety problems associated with a particular food product usually lead to an immediate drop in demand followed by a slow recovery to previous levels (Liu et al. 1998; Böcker and Hanf 2000). A weakening of consumer confidence in food safety can counteract health messages regarding the benefits associated with fresh produce consumption. Unfortunately, subsequent dietary changes that lead to inadequate fruit and vegetable intake can have consequences for both public health outcomes and health care costs (Bazzano 2006). Still, little information is available about how the food safety problems linked to particular types or sources of fresh produce are influencing consumer attitudes and impacting purchasing decisions.

Given the number of high-profile food safety events with significant media coverage in recent years, we seek to explore the changes in consumer perceptions, food shopping behavior, and confidence in the food system. How consumers shop for produce, differences in how they perceive fresh produce "quality" with respect to food safety, and relationships between market choices and perceptions are examined.

Data and Methods

Focus groups, farmers market surveys, and a nationwide web-based survey were used to help assess the influence of food safety concerns, production method (organic or conventional), production location (local and non-local), and other factors on produce purchasing choices.

Focus groups ($n = 60$) were conducted in 2005 and 2007 with two different sets of consumers expected to have a special interest in produce quality (three with farmers market shoppers and three with shoppers of a supermarket specializing in organic foods). There were a total of four female ($n = 9, 7, 12, 11$) and two male groups ($n = 9, 12$). Potential participants were recruited by asking Fort Collins's farmers market patrons and shoppers who frequented a natural foods store to participate. Twenty-five dollars cash was used as an incentive. (CSU Human Research Committee guidelines were followed in all recruitment and subsequent stages of the focus groups). All participants completed demographic and produce-selection questionnaires. Each focus-group session lasted approximately 90 minutes and was facilitated by a trained moderator following a prepared question guideline. The researcher-facilitated discussions addressed identification and importance of produce-selection factors, attitudes toward conventional and organic production methods, and willingness to pay for varieties proven to demonstrate elevated nutritional qualities. Discussions were analyzed for common themes.

Customers were recruited from three local farmers markets in 2007 to participate in consumer surveys ($n = 100$). All survey participants were self-selected. An interviewer approached consumers and asked if they had a few minutes to participate in a brief survey. Survey questions were asked in a manner that allowed participants to disclose their own answer. The interviewer proceeded to record gender, approximate age, participant number, and verbal responses.

In addition, a nationwide web-based survey was conducted in October/November of 2008 ($n = 1052$) by Colorado State University to further investigate factors influencing a larger set of consumers' behaviors and purchase decisions regarding fruits and vegetables (Blandon, McFadden, and Bunning 2009). The survey was conducted by Knowledge Networks using surveys distributed to a nationally

representative sample of primary grocery shoppers with an oversample of residents in Colorado, New Mexico, and Salt Lake City metro areas. Only those who purchased fresh produce—specifically, tomatoes and apples—were eligible for the study. The survey was designed to assess consumer attitudes toward fresh produce purchases in the aftermath of high-profile outbreaks, and specifically to explore recent changes in purchasing decisions.

Results

Focus Groups

Among all focus groups, quality, freshness, and flavor were top-rated factors (Figure 1), while appearance tended to be a low-ranked factor. Price and being locally grown were both rated higher in 2007 than in 2005. The source and context of information about the safety of produce appears to be critical to consumers. Key findings (Bunning et al. 2007) of focus groups included:

- Awareness of benefits associated with organic produce was high in this sample of consumers, and participants acknowledged that growing method frequently influenced their purchase decisions.
- University Extension staff, dieticians, and other health professionals and trusted media organizations were the preferred sources of nutritional information.
- Most participants favored computer kiosks, point-of-purchase signs, or online sources as methods of obtaining commodity- and cultivar-specific nutrition information.

Farmers Market Surveys

Only eight percent of participants indicated safety of market produce was a concern but pesticide treatment was the primary concern listed. Fifty-eight percent of consumers stated that locally grown produce was more important (not surprising, given the site of surveying), while 19 percent reported that it was more important to them that produce be organically grown and 15 percent felt being organically or locally grown was of equal importance.

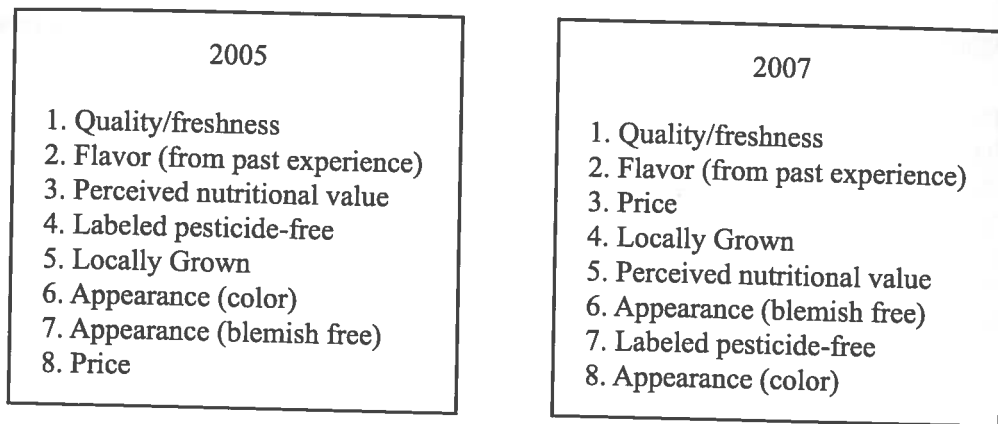


Figure 1. Rank of Focus Group Produce Selection Factors (n = 60).

On-Line Consumer Survey

Participants in this national survey reported that the total household average food expenditure was about \$94 per week, or approximately \$5,000 per year. Fresh produce items accounted for an average of 16.9 percent of total household grocery expenses, but 34 percent of primary shoppers responded that they spent more than 20 percent of their household food expenses in this category.

Surveyed participants were also asked about pesticide use. Nearly half of respondents (39 percent) considered pesticide use to be of great importance in their fresh produce purchase decision (Thilmany McFadden, Thomas, and Onozaka 2009). Survey respondents were asked a series of questions regarding their perceptions of the safety of local produce compared to produce grown in the U.S. but grown outside the local area. Figures 2 and 3 show that the majority of respondents who placed great importance on pesticide-free products also preferred local fresh products. In short, it appears that those consumers who value pesticide-free products the most also believe that, overall, local fresh produce is superior to domestic products, and similarly, that domestic produce is superior to imported products.

Before exploring changes in perceptions of food safety across food-system stakeholders, the survey assessed general awareness regarding food safety

events. Consumer cognition, which may be impacted by media coverage of food-recall incidents, may influence the confidence consumers have with respect to food safety. Therefore, in order to explore consumer awareness, we asked if they were aware of any occurrence of food safety alerts since the beginning of 2008. It should be noted that the survey was distributed soon after a significant fresh produce food safety event, an outbreak of *Salmonella* Saintpaul associated with tomatoes (FDA 2008a) and peppers (FDA 2008c; Jungk et al. 2008). This provided an opportunity to measure awareness and changes in confidence related to major food-system stakeholders. Overall, the survey showed consumers were well informed with respect to the nature of food safety concerns (Figure 4). Sixty percent of survey respondents were aware that there had been an event, and over 50 percent correctly recalled awareness of recent food safety problems associated with spinach, tomatoes, pet food, and hot peppers. Given the events that occurred in summer 2008, and the subsequent media coverage, it is not surprising that over 80 percent of respondents were aware of a tomato food safety issue. As a control, we asked about unaffected products as well. From 2006 to 2008, there were no large outbreaks of food-borne illness or food recalls associated with berries, apples, or shrimp, and consistent with this information, 95–97 percent of respondents reported they were not aware of food safety problems linked

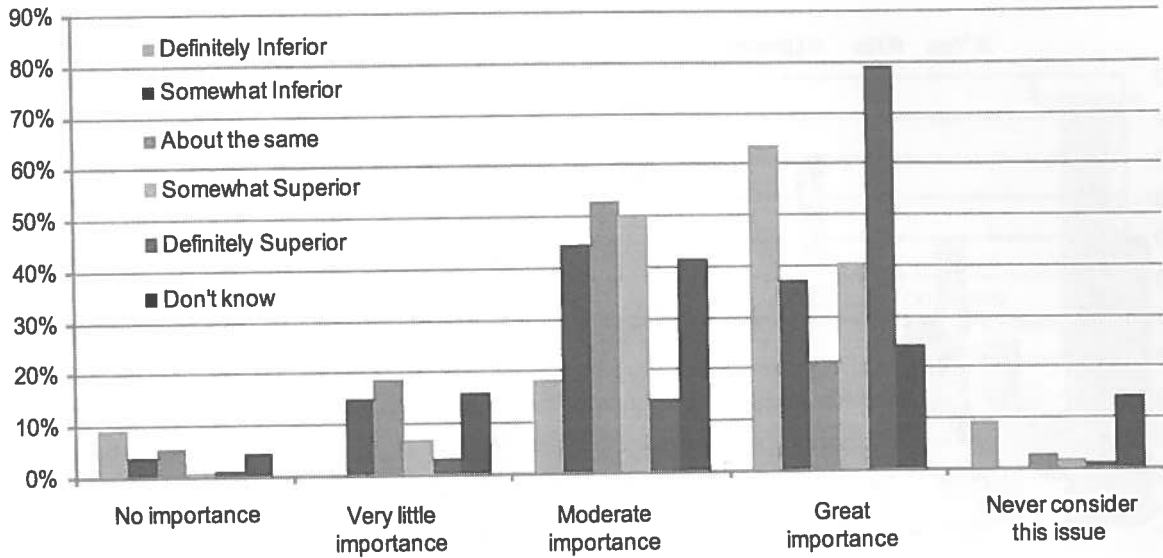


Figure 2. Perceptions of Local Produce (Sorted by Importance Placed on Pesticide-Free).

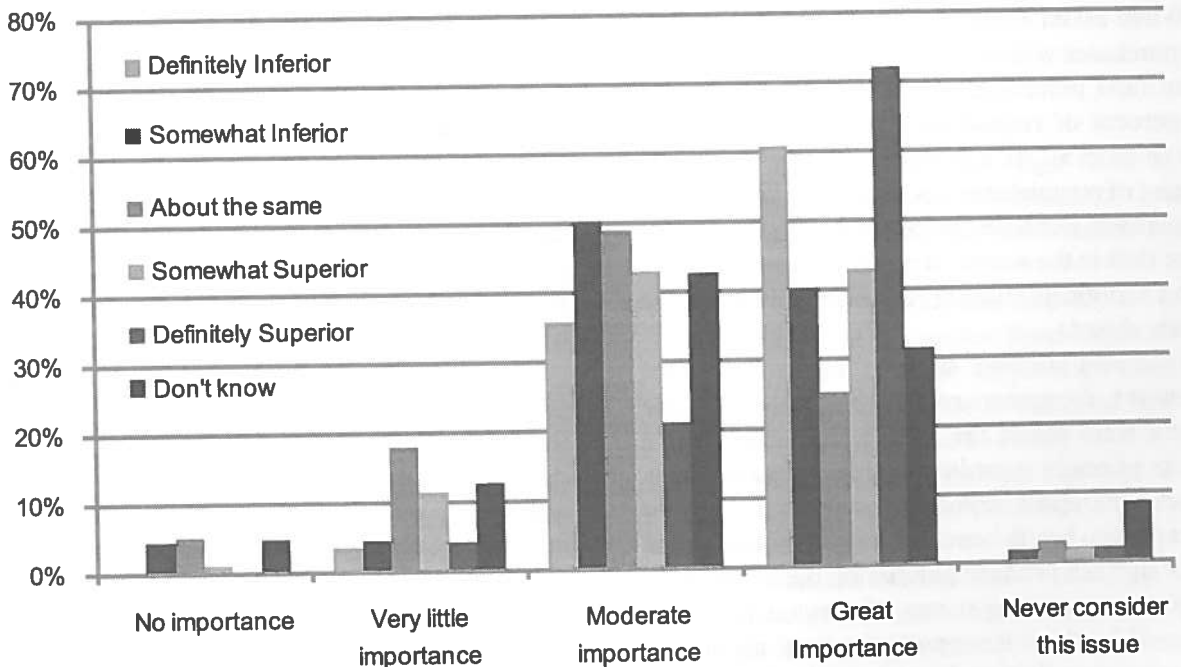


Figure 3. Perceptions of U.S. Produce (Sorted by Importance Placed on Pesticide-Free).

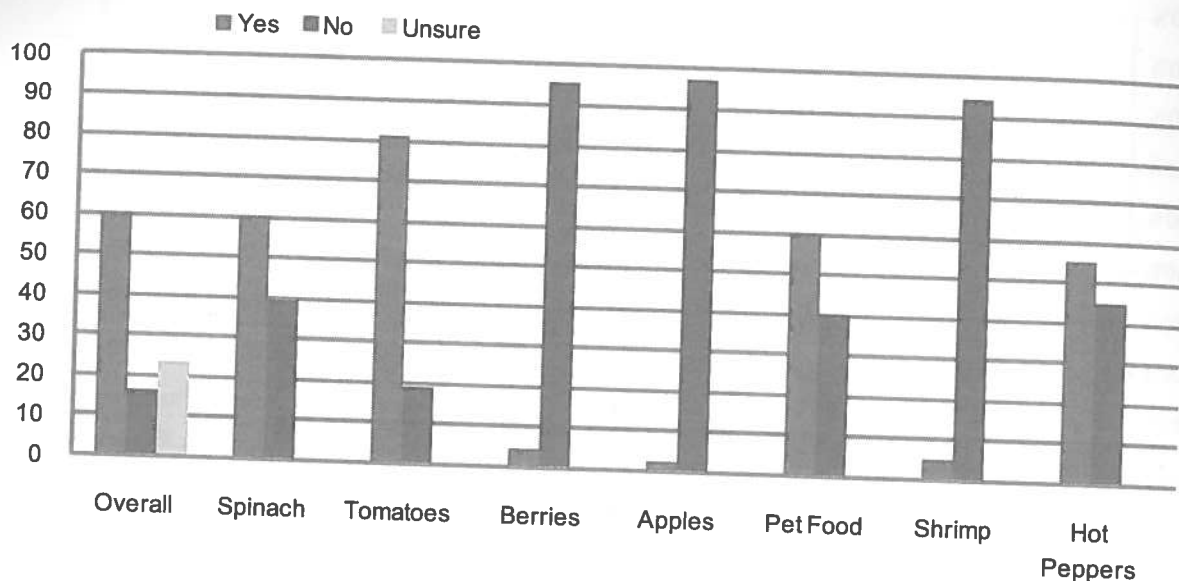


Figure 4. Awareness of Food-Safety Issues Associated with the Food Supply.

Note: For specific foods, yes and no were the only choices given.

with these food items during 2008.

When asked about changes in tomato and pepper purchases within the two months following the event (and preceding the fall 2008 survey), over 30 percent of respondents reported purchasing less (Figure 5). As a substitute supply, 20 and 29 percent of respondents reported growing their own peppers and tomatoes, respectively. There was also some shift in the source of purchases, most notably with a significant share of respondents switching to buying direct.

To assess attitudes surrounding fresh produce purchases, consumers participating in the on-line survey were asked the relative importance of a variety of issues regarding their fresh produce purchases. Among all respondents, the statement "that it has proven health benefits" was the highest-rated factor in fresh produce purchasing decisions, with 60 percent reporting it was of great importance, followed by "that it supports the local economy" (49 percent) and "that farmers received fair share of economic returns" (46 percent).

Marketing Implications and Conclusions

Consumer attitudes and beliefs influence purchasing patterns and can be used to predict behavior. The use of focus groups, in-person surveys, and on-line surveys provided insight into issues relevant to produce purchasing patterns with special attention to how they may influence preferences for particular production methods and growing location. Although this research on consumers primarily sought to explore what motivations were fueling growth in local food systems, the food safety events of recent years provided an interesting context to explore how food safety issues influenced consumer behavior. It appears that consumer perceptions of the food system, and specifically food safety, do have some role in determining those who have started to seek out more local sources of fresh produce.

Some potential conclusions and implications for the food system include:

- Consumers are aware of food safety issues. Recent increases in the number of food recalls may have lowered consumer confidence. Given

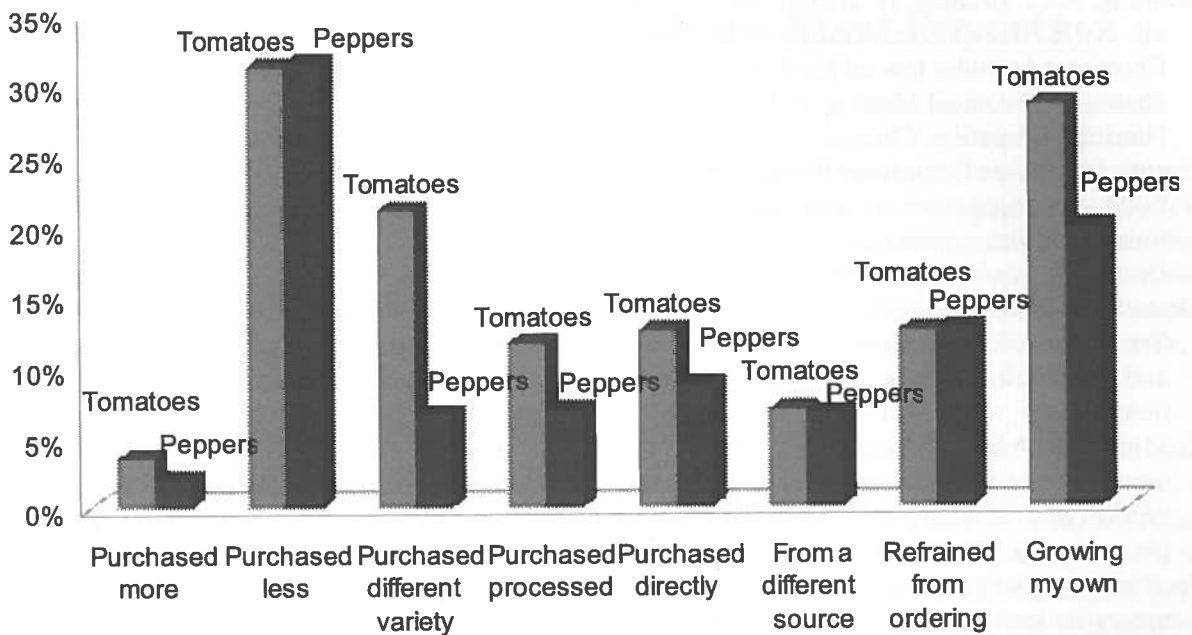


Figure 5. Changes in Respondents' Purchases of Tomatoes and Peppers in the Two Months Preceding the Oct./Nov. 2008 Survey.

particularly significant drops in confidence for international trade partners, the USDA's new oversight of country-of-origin labeling is likely to be valued by U.S. consumers.

- As a specific example, these results show that 30 percent of consumers purchased fewer tomatoes after the summer 2008 food safety incident, and a similar proportion of consumers sought to purchase tomatoes from an alternative source. Therefore the economic cost from lower consumer confidence is potentially high, but may be mitigated by strengthening local food systems and labeling programs.

- The source of fresh produce appears to be important to consumers: local produce was considered superior when considering the pesticide-free attribute relative to domestically produced items, which were themselves perceived as superior to imported produce.

References

- Bazzano, L.A. 2006. "The High Cost of Not Consuming Fruits and Vegetables." *Journal of the American Dietetic Association* 106(9): 1364–1368.
- Blandon, S., D. McFadden, and M. Bunning. 2009. "Impacts of Produce Food Safety Events on Consumer Behavior: Exploring Public Perceptions and Confidence in the Food System." Agricultural and Resource Policy Report. Dept. of Agricultural and Resource Economics, Fort Collins, CO <http://dare.colostate.edu/pubs/arpr09-02.pdf>.
- Blisard, N. and H. Stewart. 2007. "Food Spending by American households 2003–2–4." U. S. Department of Agriculture-Economic Research Service *ERS Report Summary*.
- Böcker, A. and C. Hanf. 2000. "Confidence lost and—partially—regained: consumer response to food scares." *Journal of Economic Behavior*

- & *Organization* 43:471–485.
- Bunning, M., J. Bruning, H. Troxell, and P. Kendall. 2007. "Use of Focus Groups to Determine Consumer Attitudes toward Fresh Produce Purchases." 40th Annual Meeting of the Society for Nutrition Education. Chicago.
- Centers for Disease Control and Prevention (CDC). 2008. "Investigation of outbreak of Infections Caused by *Salmonella* Saintpaul." <http://www.cdc.gov/salmonella/saintpaul/jalapeno/>
- Center for Science in the Public Interest. 2009. "The Ten Riskiest Foods Regulated by the U.S. Food and Drug Administration." http://cspinet.org/new/pdf/cspi_top_10_fda.pdf
- Food and Drug Administration (FDA). 2008a. "FDA warns consumers nationwide not to eat certain types of raw red tomatoes." <http://www.fda.gov/bbs/topics/NEWS/2008/NEW01848.html>.
- Food and Drug Administration (FDA). 2008b. "Voluntary nationwide recall of Honduran Cantaloupes Grown by Agropecuaria Montelibano, San Lorenzo Valle, Honduras." http://www.fda.gov/oc/po/firmrecalls/centralamerican03_08.html.
- Food and Drug Administration (FDA). 2008c. "Warnings on raw jalapeno and serrano peppers from Mexico." <http://www.fda.gov/consumer/updates/pepperwarnings073108.html>.
- Food and Drug Administration (FDA). 2007. "FDA Finalizes Report on 2006 Spinach Outbreak." U.S. Department of Health and Human Services. Washington DC. <http://www.fda.gov/bbs/topics/NEWS/2007/NEW01593.html>.
- Jungk, J., J. Baumbach, M. Landen, L. Gaul, L. Alaniz, T. Dang, E. A. Miller, J. Weiss, E. Hedin, K. Smith, F. Grant, T. Beauregard, D. Bergmire-Sweat, D. Griffin, J. Engel, S. Cosgrove, S. Gossack, A. Roanhorse, H. Shorty, J. Cheek, J. Redd, and I. Vigil. 2008. "Outbreak of *Salmonella* Serotype *Saintpaul* Infections Associated with Multiple Raw Produce Items—United States, 2008." *Morbidity and Mortality Weekly Report* 57(34):929–934.
- Liu, S. P., J. C. Huang, and G. L. Brown. 1998. "Information and Risk Perception: A Dynamic Adjustment Process." *Risk Analysis* 18(6): 689–699.
- Thilmany, D. and C. Thomas. 2009. "Farmers Markets and Direct Marketing for Colorado Producers." Fort Collins: University of Colorado, Department of Agricultural and Resource Economics. <http://dare.colostat.edu/pubs>.
- Thilmany McFadden, D., C. Thomas, and Y. Onozaka. 2009. "Who are the Locavores and Where Do They Shop? An Analysis of Fresh Produce Market Choices in the United States." Colorado State University Ag Marketing Report. 09-02. June. 13 pp.
- USDA Agricultural Marketing Service. 2008. "Numbers of Farmers Markets Continues to Rise in U.S." <http://www.ams.usda.gov>.
- Yeh, S. 2008. "Food Safety at Colorado Farmers Markets: Follow-Up Survey and Consumer Education Materials." M.S. Thesis. Department of Food Science and Human Nutrition, Colorado State University.