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Economic Research in Food Safety— Putting the Puzzle Together: Discussion

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Food safety research is a new field of endeavor for most of us. The three papers focusing on this topic (Buzby et al.; Jensen, Unnevehr, and Gómez; and Golan, Ralston, and Frenzen) merit our attention, as each adds something unique to our research efforts in this important area. While it is difficult to identify specific common threads, I think there is one aspect that is universal: information is largely lacking for food safety research. There are some valid reasons for this paucity of data, and I think it is critical that we attempt to develop a better understanding of this issue, and perhaps even consider new institutional designs that may resolve the data problem. I will discuss this further in my closing remarks.

While these papers all raise new issues and demonstrate progress in food safety research, it is also clear that we have a long way to go. To my knowledge, few studies examine the cost structure of various technologies in such detail as provided by Jensen, Unnevehr, and Gómez. More work of this nature is critical to the industry and to regulators who are trying to understand the cost structure of new technologies. The other two papers demonstrate a stark difference in methods for valuing food safety. While both may be viewed as gallant attempts, neither can be viewed as the final word. Buzby et al. explore three valuation techniques that place a monetary value on risk reductions for food safety. Golan, Ralston, and Frenzen take a totally different approach at valuing food safety by examining economic activity beyond the direct and immediate im-

pacts of medical expenditures. Although this approach has some attractive dimensions, the results are counterintuitive. Each paper has relative strengths and weaknesses.

Cost of Improving Food Safety

The Jensen, Unnevehr, and Gómez paper does a nice job of systematically working through the cost structure of some emerging technologies for reducing pathogen counts on beef carcasses. As theory suggests, these cost curves demonstrate that the costs increase at an increasing rate when attempting to reduce the pathogen count beyond some point. Complete elimination of pathogens is simply not going to happen. Complete safety is not a reality for this world.

Technologies that reduce pathogen counts on carcasses have merit, and it is encouraging that positive reductions can occur within a range that is relatively low in cost. What is missing from the Jensen, Unnevehr, and Gómez paper is a clarification of the marginal benefit of reducing pathogen counts. Further research is needed that links pathogen counts on carcasses and the risk of pathogen-borne illness. Food preparation is also an important component in the complex food safety system. Even low levels of pathogens can be deadly if preparation is poorly done.

When we understand more about the relationship between pathogen counts on carcasses and the risk of pathogen-borne illness, it may be possible to put market incentives into the system that reward food processors for adopting technologies that reduce pathogen counts. The dairy industry successfully introduced

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such an incentive system by paying farmers more for milk that has lower counts of somatic cells or antibiotics ("Here's What's Being Paid . . .," *Hoard's Dairyman*). Given the introduction of the Hazard Analysis and Critical Control Point (HACCP) system, and the fact that more information will be collected on pathogens, it may be possible to introduce such a system within the meat processing arena. Branded products may make it possible to market safer meat products to consumers (Caswell, Roberts, and Lin).

Valuing Food Safety

The two papers on valuing food safety (Buzby et al.; and Golan, Ralston, and Frenzen) demonstrate the problems in researching a complex system where data are largely incomplete or missing. Buzby et al. use a mail survey to create a scenario for consumers to judge their willingness to pay for safer food. While their scenario should represent risk of about one in 1 million, the authors' procedures suggest that survey respondents place the number at about 43 in 1 million. As they summarize, "Most respondents believe the risk to be larger than expert assessments." This finding is consistent with the emerging literature on the psychology of risk. Individuals tend to underestimate the risk from natural disasters (Kunreuther) and overestimate the risk from man-made activities (Camerer and Kunreuther). Improved methods for obtaining information about the perceptions of risk are important. However, economists had better prepare themselves. It is likely this research will demonstrate that decision makers violate some of our basic assumptions about rational decision making and ranking of risk. Why would the same consumer who refuses to reduce risk by wearing a seatbelt also be unwilling to accept the much lower risk of consuming a vegetable that may have been sprayed with a pesticide? These are troublesome questions for those working to develop a theory of risk behavior. They take us to the very heart of the questions about willingness to accept risk. Could it be that we are willing to accept more risk if death comes

quickly, and less risk if death comes from a prolonged illness?

Differences in the types of risk we are willing to accept are also at the core of my concerns with the Golan, Ralston, and Frenzen paper. Though it is interesting to identify the secondary medical impacts via a Social Accounting Model, one is left confused, at best, with the conclusion that there may be a positive economic effect in the economy due to foodborne illnesses. The results are similar to the Exxon Valdez event. Some have argued that economic activity of cleaning up the environment after this major oil spill in the Alaskan waters generated a positive benefit/cost number. Economic activity is not always good. Environmental economists have rightly raised questions about this result, wondering how we could develop improved methods for "green accounting" that would value natural resources at levels that might reflect longer run benefits of protecting the environment. The Golan, Ralston, and Frenzen paper suffers from a similar problem . . . maybe we are lacking in our "suffering accounting." Consider again the findings of Buzby et al. where, with both the contingent valuation techniques and the experimental markets procedures, consumers appear to place a higher value on food safety than the risk may warrant. People don't want to die of cancer. Our attempts to measure and value this disutility are feeble at best. Golan, Ralston, and Frenzen do contribute to our understanding of who suffers the most from foodborne illnesses. However, I would prefer not to see input-output models used to value food safety until we have further sorted out the philosophical underpinnings of these models and how they add to our knowledge about food safety.

Improving Information in Food Safety

Government regulates food safety for some very good reasons. First, there are asymmetries in the information between consumers and producers of food regarding the safety characteristics of food. Second, it has been impossible to price food safety because of these information shortcomings. Finally, there are

significant transaction costs associated with attempts to overcome the information asymmetries. Antle develops a nice argument for the principles for efficient food safety regulation. Recognition of the information asymmetries is at the core of his arguments.

Information shortcomings are also at the core of the problems encountered by the researchers of these papers. The industry will always know more about the safety characteristics of the food supply than will government regulators or consumers. A few years ago, I was visiting with an industry representative about HACCP. When we begin discussing the data collection on pathogen counts, I commented that this would be an ideal opportunity to learn more about the linkage between pathogen counts and risk. This discussion made the industry representative very nervous. He indicated that there would be no desire to keep these records for such purposes. This left a strong impression on me. While I fully understood this degree of paranoia in a world of lawsuits and litigation, I also began to reflect about how the institutions could be restructured to change the incentives for the industry to be more forthcoming with important information that would benefit both the industry and consumers. If there were systems that could be put in place to ease the concerns of the industry about litigation, then perhaps it would be more willing to share information. Further sorting of the best performers in the processing industry could have some positive benefits as well.

One innovation that may change the incentives is insurance. If the processing firm were insured against individual litigation and against the business interruption that would come from bad publicity due to a pathogen problem, then maybe the incentives for sharing information would change. HACCP offers the opportunity to underwrite such risk, as the government is now requiring that firms adopt

this system. The meat inspection system will reduce the transaction cost of learning which processing firms are a better risk. This would allow insurers to reduce rates and access to food safety insurance products. Putting the tensions within the industry to reward good performers and highlight those processing firms that are having problems is important. Kosty investigates this possibility in an M.S. thesis that I directed. These ideas raise new questions about the extent to which government regulators could be replaced by insurance underwriters.

One must also consider the findings from the Buzby et al. study and my discussion about the psychology of risk. Maybe it is time that the industry attempts to capitalize on the willingness to pay for safer food. If consumers perceive the risks to be greater than they actually are, how well might branded products work in a world where HACCP offers an opportunity to collect information in a more systematic fashion on pathogen counts?

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