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Emerging Issues in Food Safety

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We live in a country that has a globalized food market and high consumer expectations for safety and product innovation. Fifty years ago, fresh California spinach served on plates in New York in November would be a luxury. Now it's common place. Forty years ago, most areas had local slaughter houses and small scale butchers were common. Thirty years ago, fresh peaches from Chile on Minnesota grocery shelves in January were a rarity. Even fifteen years ago, few would expect that the United States would today import over 40% of its fruit, 15% of its vegetables and 80% of its fish and seafood.

We also live in a world that no longer takes food safety for granted. The European BSE incidents of 1990s led to reorganization of food safety authorities across Canada, Europe, Australia, and New Zealand, though not here in the United States. Highly publicized outbreaks of foodborne disease from more commonplace pathogens, like *Salmonella* and *E. coli* as well as international supply chain failures due to product adulteration are putting pressure on the U.S. Congress for major reform. In the United States, another response has been efforts to promote locally produced food, in part, based on safety. But these remain small scale efforts. Most Americans are likely to continue to get most of the food they eat from large scale, commercial suppliers.

Given data limitations, we may never know whether food today is safer or more hazardous than it was in the past. One thing is certain, the system is different. Problems that were once local are now increasingly national or international and they are increasingly visible. Distance, increased diversity of sources and products, and consumer demand for minimally processed ready-to-eat foods—all of these factors contribute to the complexity and challenge of keeping the food supply safe.

The papers in this *Choices* theme identify and examine some of the impacts of this increased complexity on consumers and producers. They also review efforts the government and industry are making to respond. In the background of many of these responses lie large scale institutional reforms to develop governance structures which can manage safety in our increasingly complex food supply system.

In the public sector, there has been what may be an unparalleled level of international coordination and technical cooperation. Under the umbrella of the United Nations Food and Agricultural Organization and the World Health Organization (*Codex Alimentarius* Commission), governments and their technical experts are making progress toward a consensus on the basic elements of a modern risk management framework for food safety. Such a consensus is critical to safety in a world of globalized food supply markets. Several of the articles in this issue discuss specific actions that are part of the U.S. effort to build such a risk-based food safety system consistent with its trade commitments through the World Trade Organization Sanitary and

Articles in this Theme:

Phytosanitary Agreement.

Market incentives have also pushed industry to develop innovative governance mechanisms. European food markets are increasingly dominated by large retailers whose extensive international supply chains are governed by contractual relationships with specific safety requirements. Wal-Mart and other food retailers are developing similar structures in the United States. The companies that lead these large supply chains, as well as smaller firms who supply particular products, are increasingly turning to new information technology to help tighten control over inventory *and* safety. Several of the articles in this issue of *Choices* look to such new information technologies and how they can assist decision makers.

In the first article, Hoffmann explains the challenges faced by public health authorities in estimating the level of foodborne illness in the United States and identifying its sources. She describes some of the innovative efforts underway to establish better systems of tracking foodborne illness and the ways this information can be used to develop more effective and efficient food safety policy. This is a challenging process, requiring a detailed exploration of federal, state and local data aided by expert elicitation to help fill in gaps. Such ranking exercises can highlight those target pathogens, foods, consumer populations or institutions that are most in need of additional innovation.

Buzby and Regmi examine FDA import retention data to assess what available evidence can tell us about distribution of food safety problems across importing countries and products. Their study highlights a necessary feature of this sort of analysis—that proxies or indirect indicators of food safety risk are often the best or only information available. Though practical as a regulatory approach, decisions made based on these proxies must be validated against actual risks to ensure public health goals are attained.

Nganje and his coauthors explore one example of this approach—the use of electronic sensors and Threat, Vulnerability, and Consequence Prevention (TVCP) assessment in an effort to improve U.S.-Mexican border produce inspection practices. The authors provide evidence of how food safety and defense priorities may be jointly addressed by a suite of public-private programs.

The final two papers assess consumer issues surrounding responses to food safety information. Cutie and Hallman describe two sets of survey data assessing knowledge and behavior changes in response to the 2006 spinach and 2008 tomato and pepper advisories. They find that while consumers appeared to be well informed about the events, they were confused about key details and some chose to disregard the advice. Fahs, Mittelhammer and McCluskey use scanner data from food retailers in 10 western states to assess the impact of the 2006 advisory on sales of spinach, substitute and complementary products. They find that consumers substituted other products for spinach during, and even after, the advisory. Subsequent produce events had similar effects on demand.

Several themes can be drawn from this set of studies of emerging food safety issues. Both government and the private sector have a pressing need for greater precision of data to help them meet the risk management challenges of an increasingly complex food supply. This information should be detailed by product associated with the contamination, by contaminant, by stage of the supply chain, and by affected population. The articles also point to promising contributions that can be made by life sciences and information technology in meeting these information needs. Additional research is needed to better characterize where vulnerabilities tend to arise in the food system so that private management and public policy can be tailored to focus control efforts more efficiently.

Our increasingly global food supply requires trans-national efforts to better coordinate standards and inspection protocols. The data collected through audits are of great value and efforts to share such among supply chain partners and regulatory agencies should be pursued. This leads to a perennial concern—the interaction between voluntary and mandatory systems. Recent efforts to better understand the role of coregulation in the control of food safety risks, particularly within this international trade environment, have great potential, but need additional analysis. Finally, we need to better understand, and when necessary know how to change, consumer food safety behaviors. This is a nascent field but one that is vital, for the best designed risk mitigation strategies will not be effective without an appreciation of how consumers respond.

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