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Symposium: Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law

Colloquy: Towards Progress in Food Protection and Defense

Julie Ostrowsky, Editor*

INTRODUCTION

The terrorist threat of deliberate contamination of the U.S. food supply is real. Given the breadth of the farm-to-table food system, encompassing agricultural production through processing, distribution, and retail sale to the consumer, the system is vulnerable to intentional contamination in a virtually infinite number of ways.¹ Evidence discovered in Afghanistan

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* Julie Ostrowsky, MSc, is the Senior Program Analyst at the National Center for Food Protection and Defense (a Homeland Security Center of Excellence based at the University of Minnesota.) This colloquy is based largely on discussions at a national conference on *Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law* held at the University of Minnesota in April 2006, co-sponsored by the Consortium on Law and Values in Health, Environment & the Life Sciences; Joint Degree Program in Law, Health & the Life Sciences; National Center for Food Protection and Defense; Center for Animal Health & Food Safety; and Center for Infectious Disease Research & Policy. Panelists participating in the roundtable were Gale Prince, Director, Corporate Regulatory Affairs, The Kroger Company and Vice Chair, International Association for Food Protection; Prof. Francis F. Busta, PhD, Director, National Center for Food Protection and Defense, University of Minnesota; Arthur P. Liang, MD, MPH, Director, Food Safety Office, National Center for Infectious Diseases, Centers for Disease Control and Prevention; Mark Wilson, PhD, Biology Program Manager, Chemical/Biological Sciences Unit, Federal Bureau of Investigation; John Hoffman, Senior Research Fellow, National Center for Food Protection and Defense and Center for Animal Health and Food Safety, University of

that Al-Qaeda had considered attacks on U.S. agriculture using various pathogens and toxins highlights the importance for the United States to step up food protection and defense efforts.² The current worldwide outbreak of avian influenza adds further urgency to the need for strengthening our capabilities for preparedness and response in relation to major disruptions in the nation's economy, particularly the food supply chain.³ Of critical importance in this dialogue will be the role of government and industry to anticipate risks, assess safety, and respond to threats and outbreaks; as well as the role of each in maintaining public trust and recognizing ethical and legal issues that arise.

Routine food safety measures, in place throughout the food system, are not designed to prevent or mitigate deliberate contamination of food. Food safety and food defense are related but distinct activities. *Food protection and defense* refers specifically to initiatives aimed at reducing the threat of intentional, rather than accidental, food contamination, including measures such as identifying vulnerabilities, engaging specific countermeasures, improving capabilities for foodborne outbreak investigation, and increasing supply chain resilience.⁴ *Food safety* activities, by contrast, encompass

Minnesota; Jeffrey P. Kahn, PhD, MPH, Director, Center for Bioethics, University of Minnesota; and Shaun Kennedy (Moderator), Deputy Director, National Center for Food Protection and Defense and Associate Director, Center for Animal Health & Food Safety, University of Minnesota. Full video of the conference available at <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>

1. Arthur Liang, Director, Food Safety Office, Nat'l Center for Infectious Diseases, Centers for Disease Control and Prevention, Panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota's national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

2. John Hoffman, Senior Research Fellow, Nat'l Center for Food Protection and Defense; Center for Animal Health and Food Safety, Panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota's national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

3. *Id.*

4. Marc L. Ostfield, Senior Advisor for Bioterrorism, Biodefense, and Health Security, U.S. Dep't of State, Food Defense: International Collaboration in a Critical Area of Biodefense, Remarks to the European Institute: Transatlantic Dimensions of Biodefense Cooperation and Collaboration Event (Nov. 30, 2006), available at <http://www.state.gov/g/oes/rls/rm/2006/77206.htm>.

standards and procedures used routinely in food production and processing to prevent accidental (unintentional) food contamination, such as Hazard Analysis and Critical Control Point (HACCP) systems, Good Manufacturing Principles, and Sanitation Standard Operating Procedures.⁵ *Food security* is a term used internationally by the World Health Organization in reference to famine and the adequacy of food supplies in developing countries.⁶

THE ROLE OF GOVERNMENT

Effective responses to crisis events are often stymied by competing and overlapping jurisdictions among and between federal government agencies and state and local governments. The federal government's 2004 National Response Plan (NRP) addresses many aspects of the coordination of response efforts during crisis to reduce confusion and inaction.⁷ The premise of the NRP is that the federal government's responsibility is to provide resources, such as troops, aircraft, and funding to the states, especially in a multi-state crisis, while the states provide first-responder teams and emergency equipment.⁸ Coordination of federal, state and local agencies, private sector companies, and non-governmental organizations (e.g., the American Red Cross) will be addressed in the forthcoming annexes to the NRP.⁹ Since September 11, 2001, planning and coordination for preparedness and response activities have been critically evaluated. Although progress has been made, comprehensive solutions are not yet worked out.

THE FEDERAL GOVERNMENT

There are a number of federal agencies involved in food defense, preparedness, and response, including the Federal Bureau of Investigation (FBI), the U.S. Department of Agriculture (USDA), the Food & Drug Administration (FDA), and the Department of Homeland Security (DHS). One of the main goals of the federal government's Strategic Partnership Program Agroterrorism (SPPA) Initiative is to prospectively

5. *Id.*

6. *Id.*

7. U.S. DEPT OF HOMELAND SEC., NATIONAL RESPONSE PLAN (2004), available at http://www.dhs.gov/xprepresp/committees/editorial_0566.shtm.

8. *Id.*

9. *Id.*

identify vulnerabilities across the food system.¹⁰ The DHS Office of Infrastructure Protection organized the Food and Agriculture Sector Coordinating Council, a group of food industry representatives that meets regularly with the Government Coordinating Council to share information relevant to food defense, enhance communication between industry and government, and coordinate preparedness and response plans.¹¹ Homeland Security Presidential Directive-9 provides overall strategic guidance to government and industry for food protection and defense.¹²

The federal government analyzes risks and identifies priorities in critical infrastructure protection at various levels.¹³ The main components are *threat*, *vulnerability*, and *consequence*; each involving some degree of uncertainty.¹⁴ For example, the anticipated consequences of food contamination or food system disruption typically focus on immediate effects to the portion of the supply chain that is directly involved.¹⁵ There is, however, also a need to anticipate and prepare for the potentially large second-, third-, and fourth-order effects across the food system and the economy in general. This anticipation should not only be done on the federal level, but also by private players in the food industry.¹⁶

The capability to trace the precise origins of specific food products would greatly facilitate the investigation of foodborne outbreaks after they occur. For foods regulated by the FDA, the 2004 Final Rule on Establishment and Maintenance of Records regarding record maintenance and notification covers

10. STRATEGIC PARTNERSHIP PROGRAM AGROTERRORISM (SPPA) INITIATIVE, A JOINT EFFORT OF THE FBI, DHS, USDA, AND FDA TO HELP SECURE THE NATION'S FOOD SUPPLY: EXECUTIVE SUMMARY (2005), <http://www.cfsan.fda.gov/~dms/agroterr.html>.

11. Food and Agriculture Sector Coordinating Council, <http://www.pcis.org/fascc/> (last visited Jan. 20, 2007).

12. Press Release, The White House, Homeland Security Presidential Directive 9 (HSPD-9): Defense of United States Agriculture and Food (Jan. 30, 2004), *available at* <http://www.whitehouse.gov/news/releases/2004/02/print/20040203-2.html>.

13. Press Release, The White House, Homeland Security Presidential Directive 7 (HSPD-7): Critical Infrastructure Identification, Prioritization, and Protection, (Dec. 17, 2003), *available at* <http://www.whitehouse.gov/news/releases/2003/12/20031217-5.html>.

14. Hoffman, *supra* note 2.

15. *Id.*

16. *Id.*

some, but not all, of the traceability issue.¹⁷ The USDA is currently working on the development of an identification system to facilitate traceability in animal agriculture.¹⁸ In parallel to federal activity, many private sector companies are implementing traceability systems voluntarily, suggesting increased recognition of its potential benefits (e.g., international trade requirements, reduction of liability, and marketing advantages).

Complicating tracking efforts is the fact that outbreak investigations are forensic rather than preventive due to the length of time it takes to collect and investigate case reports of foodborne illness and the short time that it takes to move food products from the farm or manufacturing site to the consumer. By the time the source of contamination is discovered, most of the affected products have been consumed. A key element in combating this complication is improving the process of case reporting and follow-up, including the collection of consumer complaints at the local level.

Another complicating factor is that there is no standard indicator from the outset to differentiate an intentional food contamination from an unintentional food contamination. A number of considerations that may raise suspicions of intentional contamination include: the nature of the contaminant, such as whether it is unlikely to occur naturally or accidentally in the food supply; the level of the contaminant, such as whether it is found in higher concentrations than could be accounted for naturally; the pattern of contaminated products, such as whether there is evidence for coordinated incidents at multiple sites; and the information from production records, such as whether there are control samples available for testing.

The optimal approach to food defense may be to use intelligence sources to set priorities for reducing or eliminating vulnerabilities and for identifying potential targets, shifting the

17. Final Rule on Establishment and Maintenance of Records, 69 Fed. Reg. 71m561 (Dec. 9, 2005). FOOD AND DRUG ADMIN., SUMMARY REPORT OF THE U.S. FOOD AND DRUG ADMINISTRATION'S INITIAL TEST OF THE ACCURACY OF THE EMERGENCY CONTACT/U.S. AGENT DATA IN THE FOOD FACILITIES REGISTRATION DATABASE (2006), *available at* <http://www.cfsan.fda.gov/~furl/ffregacc.html>.

18. U.S. Dep't. of Agric. Animal and Plant Health Inspection Serv., National Animal Identification System (NAIS), <http://animalid.aphis.usda.gov/nais/index.shtml> (last modified Mar. 7, 2007).

focus from vulnerability assessment to threat assessment.¹⁹ Threat assessment is used by the FBI and other agencies to more effectively protect the food system. Threat assessment focuses on three main elements: the terrorists' intent, their capability to follow through on those goals, and the targeted vulnerability.²⁰ The first two issues, intent and capability, are in the realm of national intelligence agencies and law enforcement.²¹ For food defense, the third issue, vulnerability, resides primarily with the private sector, although the federal government can facilitate the process of information sharing and vulnerability assessment.²²

After September 11, the FBI shifted some of its focus from multifaceted criminal investigations to counterterrorism investigations.²³ The premise of law enforcement, particularly the FBI's counterterrorism operations, is that rapid identification and prosecution of the perpetrator(s) will provide an effective deterrent.²⁴ In the longer term, research and education in food defense is aimed at making the food system an unattractive target for terrorist activity.²⁵ The FBI works with the Centers for Disease Control (CDC), the Department of Defense, academia, and the national laboratories to develop techniques for counterterrorism investigation and to direct testing to the most appropriate facilities when needed.²⁶ Preparedness exercises should include laboratory analysis with surrogate agents in order to test the laboratory system and identify potential pitfalls in analysis and reporting.²⁷

Analytical processes used by the FBI for threat assessment have changed accordingly, since counterterrorism investigation

19. Liang, *supra* note 1.

20. Hoffman, *supra* note 2.

21. Mark Wilson, Program Manager, Chem./Biological Scis. Unit, Fed. Bureau of Investigation, panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota's national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

22. *Id.*

23. *Id.*

24. *Id.*

25. See The National Center for Food Protection and Defense: A Homeland Security Center of Excellence, <http://www.ncfpd.umn.edu/> (last visited Jan. 20, 2007).

26. Wilson, *supra* note 21.

27. *Id.*

often involves the analysis of *unknown* samples, lacking information on where they came from, what they contain, how they were produced, and what can be inferred about the expertise of those who produced them.²⁸ As a result, laboratory analyses now include deoxyribonucleic acid (DNA) tests for a wide range of plant and animal pathogens, as well as human pathogens.²⁹ A wide range of validated analytical techniques are needed because there are increasing instances of foodborne pathogenic bacteria that have never before been associated with food.³⁰ Given the expansion in testing methods and the use of new techniques, the admissibility of data resulting from these methods has become an important legal issue.³¹ By current standards for legally admissible evidence in federal court, techniques used to analyze samples must be testable; they must be subject to peer review; they must have a known error rate; and they must be generally accepted in the scientific community.³²

STATE AND LOCAL GOVERNMENT

At the state and local level, public health systems play a large role in identifying foodborne illness resulting from intentional contamination.³³ However, recent funding aimed at augmenting public health capabilities has not necessarily improved training and resources at the local (county) level, which is the critical point where the first cases of foodborne illness are reported and where outbreak investigations usually begin.³⁴ Insufficient capabilities at the local health department level could significantly slow the pace of investigation and interfere with efforts to identify the cause of illness and limit the spread of disease.³⁵ Recent CDC data indicates a wide variation among states (and even among counties within states) in the reported rate of foodborne illness outbreaks per million population, ranging from zero or one outbreak per million residents in many states to ten to thirteen in others and thirty-five in Hawaii.³⁶ Expanding the availability of education

28. *Id.*

29. *Id.*

30. *Id.*

31. *Id.*

32. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

33. Liang, *supra* note 1.

34. *Id.*

35. *Id.*

36. *Id.*

and training for public health practitioners is urgently needed to improve public health preparedness and response to foodborne illness at the local level.³⁷

THE ROLE OF INDUSTRY

Post-September 11, there is a tremendous need for increased attention to security issues within the food industry itself. While there is no industry-wide “corporate code of ethics” governing business practice that exceeds compliance with state and federal laws, regulations, and food safety programs, many companies have adopted explicit corporate philosophies that place consumer safety as the top priority.³⁸ Various large grocery retailers across the United States have begun implementing increased protections. For example, initiatives are in place at The Kroger Company to protect the products they sell to consumers.³⁹ Operational changes designed to enhance security at Kroger’s food manufacturing plants, distribution centers, and retail stores focus on three major components: *people*, through employee background checks;⁴⁰ *product*, such as ingredient safety; and *physical site*, such as the movement of products into, within, and out of facilities.⁴¹ The Kroger Company maintains a close watch over a wide range of information from government agencies, health organizations, and intelligence sources concerning potential risks that may have a direct impact on industry operations, particularly small issues that could result in major problems.⁴² Addressing issues beyond the scope of individual companies, such as monitoring the security of milk tankers in transit and setting standards for pasteurization of milk, often require

37. *Id.*

38. Gale Prince, Director, Corporate Regulatory Affairs, The Kroger Company and Vice Chair, International Association for Food Protection, panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota’s national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

39. *Id.*

40. It should be noted that it is not feasible under current conditions to prohibit the involvement of all potentially undocumented (immigrant) workers, who form a large part of the agricultural production sector’s workforce; the key issue is that protections against the risk of intentional contamination need to be in place regardless of workers’ status.

41. Prince, *supra* note 38.

42. *Id.*

cooperative efforts among companies, trade associations, and food regulatory agencies.⁴³

Programs to implement product recalls are also part of the enhanced security framework, since companies need to be able to take quick corrective action to deal with potentially contaminated products in the marketplace (e.g., in cases of potential tampering or unintentional contamination).⁴⁴ Although the additional costs incurred from adoption of increased measures to prevent contamination of the food and water supply can be substantial, stepping up protections for consumers will ultimately be far outweighed by long-term gains in terms of a company's image and its economic survival.⁴⁵ The food industry has considerable crisis response and disaster relief experience which can be integrated into the overall plan for recovery in the event of terrorism to the food supply. The Kroger Company, for example, operates a command center in an earthquake-prone part of the country, redistributing food products according to need and providing back-up to their retail operations.⁴⁶ It is a routine practice for the private sector to provide logistics support on a rapid turnaround basis, such as delivering food and water to disaster areas as needed.⁴⁷

ETHICAL AND LEGAL CONSIDERATIONS

Developments in food protection and defense should be, and are being, driven by scientific research, providing the necessary knowledge and tools to effectuate change.⁴⁸ While this research is challenging, in part because it requires collaborative efforts across not only a wide range of academic disciplines but also across expertise in industry, government, and academia, it is achievable.⁴⁹ As this research progresses, significant challenges with no immediate solutions are beginning to emerge at the intersection of food defense, ethics, and law. Understanding the factors that contribute to

43. *Id.*

44. *Id.*

45. *Id.*

46. *Id.*

47. *Id.*

48. Frank Busta, panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota's national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

49. *Id.*

terrorism, and specifically to an attack on the food system, raise ethical issues regarding the degree to which scientific researchers may need to contemplate extremely malicious motives and methods in order to design protective measures.⁵⁰

In addition, balancing the need to secure sensitive research data with the need to promote academic freedom to ensure high-quality research outcomes raises legal and policy issues that are only beginning to be addressed.⁵¹ The capacity to deal with future threats to the food system will require high-quality education and training programs in order to expand the availability of expertise and to generate a new cadre of professionals in food defense whose knowledge and expertise span not only the science, but also the ethical and legal areas, as well.⁵²

Overarching issues of public trust are also closely intertwined. When considering costs of interventions, safety of food products, threats to the food system, risk and crisis communication, and public confidence, the issue of trust underlies all of them.⁵³ For example, in food protection and defense, “costs” have different meanings for government (e.g., allocation of resources among sectors), industry (e.g., security interventions in the supply chain), and consumers (e.g., retail prices).⁵⁴ Each type of cost ultimately relates to consumers’ trust in the safety of the food supply and what the government and the industry is doing or not doing to protect the health and

50. *Id.*

51. Nat’l Acad. of Sci., The Government-University Research Partnership: Balancing National Security and Open Scientific Communication Post September 11th, <http://www.nationalacademies.org/gateway/pga/3376.html> (last visited Jan. 20, 2007).

52. One of the aims of the University of Minnesota’s National Center for Food Protection and Defense (NCFPD) is to implement a variety of strategies to address the educational needs of public and private sector stakeholders. NCFPD currently supports a large group of graduate students and postdoctoral fellows in its research program. The DHS Scholars and Fellows Program and other DHS-sponsored activities provide other avenues for high-quality training. See Department of Homeland Security, Student & Alumni Network, <http://www.dhsnetwork.org/> (last visited Jan. 20, 2007).

53. Jeffrey Kahn, Director, Center for Bioethics, Univ. of Minn., panel participant on Moving Forward in Food Protection and Defense, at the University of Minnesota’s national conference on Terrorist Threats to our Food Supply: Food Protection and Defense—Science, Ethics & Law (Apr. 19, 2006), <http://www.lifesci.consortium.umn.edu/conferences/foodsafety.php?s=0>.

54. *Id.*

safety of consumers.⁵⁵ When considering the value of protecting against deliberate food contamination, we cannot underestimate the value of maintaining trust in the food system.⁵⁶

CONCLUSION

Intentional contamination poses a real and potentially catastrophic threat to the nation's food supply. Because of the nature and efficiency of the farm-to-table supply chain, food can provide the means to rapidly deliver harmful agents to large numbers of people or to specific populations. As a result, severe and far-reaching effects are possible, including morbidity and/or mortality, food shortages, loss of consumer confidence in the food supply, business failures, trade restrictions, and ripple effects on the national economy.

Efforts to minimize or eliminate vulnerabilities and to improve supply chain resiliency are central to a strong food defense capability. Collaborative research aimed at enhancing the ability to rapidly identify, contain, respond, and recover from intentional contamination, both real and threatened, is underway, although the field is new and basic research is needed to provide a scientific foundation for meaningful progress. Companies in the food industry, as well as federal, state and local food regulatory agencies, play an integral role in the development of a strong food defense. As illustrated in this roundtable discussion, many technical, logistic, legal, and ethical issues remain unresolved, although real progress has been made in developing awareness and reducing the risk of terrorist threats to the nation through the food system.

55. *Id.*

56. *Id.*