

# Traceability in the U.S. Food Supply: Economic Theory and Industry Studies

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## I. Introduction and Methodology

Traceability systems are recordkeeping systems designed to track the flow of product or product attributes through the production process or supply chain. Recently, policymakers have begun weighing the usefulness of making such systems mandatory so as to address issues ranging from food safety and bioterrorism to consumers' right to know. For example, policymakers in many countries have proposed or adopted mandatory systems to track animal feed to control the risk of mad cow disease and to improve meat safety. Other proposals involve mandatory tracking of food transportation systems to reduce the risk of tampering. Numerous proposals involve mandating traceability to help provide consumers with information on a variety of food attributes including country of origin, animal welfare, and genetic engineering.

Food producers, manufacturers, and retailers have many of the same concerns as government policymakers and in fact already keep traceability records for a wide range of foods and food attributes. The questions before policymakers are, does the private sector provide enough traceability to meet social objectives? If not, what policy tools are best targeted to increasing the supply of traceability?

The objective of this study is to provide a framework to answer those questions. To do that, we first needed an accurate description of the extent and type of traceability maintained by private firms, that is, the traceability baseline. We could not begin to assess the adequacy of private sector traceability systems without a clear understanding of how typical it is for firms to establish these systems, why they establish them, and how they function. We began our investigation by reviewing market studies, interviewing government officials, and talking with industry associations. Next, we conducted telephone interviews with a wide range of food industry representatives, including grain and food processors, fast-food retailers, safety auditors, and food distributors. We conducted several site visits in each of the three major food sectors: fresh produce, grains, and livestock. During these visits, we interviewed owners, plant supervisors,

and/or quality control managers in fruit and vegetable packing and processing plants, beef slaughter plants, grain elevators, mills and food manufacturing plants, and food distribution centers.

In each interview, we asked about the company's traceability system, including its bookkeeping records, lot or batch sizing, computer use, and tracking technologies. We asked about the cost of the traceability system and about how long it had been in use. We received a high level of voluntary cooperation from these firms, sometimes getting a tour of their facilities. However, our discussions were informal and we generally did not review firms' records to confirm the information provided. Our discussions were often broad based about the firm's recordkeeping systems and we did not systematically collect specific data about a firm's traceability system.

A number of our site interviews were with firms that are eligible to submit bids for U.S. procurement programs. We received access to these firms by accompanying USDA auditors on their inspections to ensure that the firms were complying with procurement regulations and guidelines. We asked the firms' managers whether they thought the firms' traceability systems were typical for their industries. While most indicated that their systems were characteristic for their industry, some pointed out their innovative and state-of-the-art approaches to traceability. Our site-visit sample, thus, may be skewed to firms that are at least average or better in their use of good manufacturing practices, although we are confident that our conclusions hold for the majority of firms in each sector.

Our investigations led us to conclude that 1) traceability is an objective-specific concept; 2) the private sector in the United States has developed a significant capacity to trace; and 3) industry/product characteristics lead to systematic variation in traceability systems. We found that efficient traceability systems vary across industries and over time as firms balance costs and benefits to deter-

mine the efficient breadth, depth, and precision of their traceability systems. We examine the evidence leading to these conclusions in the second section of the report, where we look at the factors that influence the costs and benefits of traceability. The three chapters in Section III provide further elaboration of these conclusions by describing in detail the supply chain and traceability systems characterizing the fresh produce, grains and oilseeds, and cattle/beef sectors.

While private sector traceability systems are extensive, gaps may nevertheless exist. Some gaps are the result of an efficient balancing of traceability costs and benefits. Others, however, are the result of market failures and may warrant government intervention. To examine the possibility that market failure has resulted in gaps in the

supply of traceability, we qualitatively analyzed and compared social and private costs and benefits of traceability. We found that asymmetric information problems have the potential to dampen firms' supply of traceability for food safety and for product differentiation. Section IV contains our analysis of market failure in the provision of food traceability and our investigation into the types of government policy tools that may correct market failure and encourage the development of private traceability systems. We also consider the characteristics of a government-mandated traceability system that would most efficiently mesh with private systems. The appendix to this section lists selected mandatory traceability laws in the United States. In section V, we provide some concluding thoughts.