

## What do Traceability and Information Systems Have To Do With Competition and the Changing Structure of Agriculture?\*

The agricultural food supply chain is represented by a complex array of transactions between input suppliers, farmers, processors, manufacturers and retailers to the final consumer. Historically, food products were viewed as commodities – apples were apples and pork chops were pork chops with little differentiation. The supply chain aggregated, distributed and transformed raw commodity inputs into food products and because of this commodity products were easily priced and transferred from stage to stage.

Over the past few decades, however, there have been increasing demands by consumers for an increasing array of attributes – these include production attributes such as cage free eggs, organic milk, locally raised foods and even demands for improved safety. The commonality of these attributes is that they are not observable at the time of purchase and so they require that the supply chain maintain the integrity of product identification throughout the chain.



This has implications for ownership and structure of the agricultural and food supply chain, ultimately affecting competition. For example, maintenance of product integrity through the supply chain is a primary incentive for vertical integration by firms. This allows improved coordination of the product in the supply chain because the product does not change hands and it is more easily identified through the chain. Further it reduces transactions costs of price discovery and transfer. However, this also has the potential to lead to market exclusion reducing open market competition as a key concern being addressed now by the USDA.

New information technologies embodied in new methods of measurement and identification (bar codes, radio frequency tags, embedded microchips, genetic markers), data warehouses and improved communications technology lead to the potential for improved transfer between stages of the supply chain. Improved communication can reduce the incentives for vertical integration, potentially leading to greater open market transactions. This overview will describe how traceability not only has implications for tracking products themselves (the direct physical benefit of traceability) but also how traceability can lead to innovation in market formation improving competition and impacting the structure of agricultural markets.



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The research connections made with this topic provide an explicit demonstration of not only the direct impacts of federally funded competitive research but also the spillover effect of this research. The original research funded to analyze traceability lead to broader research to address the more fundamental issues of market performance and to leverage additional resources. This helped fund graduate students, developing the next generation of researchers. This research is also supported by

federal base funding through the agricultural experiment stations which provides the base capacity upon which competitive grants are built. Both sources have been critical to research demonstrated in this presentation.

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The U.S. agricultural sector has sustained a high rate of productivity growth, estimated a medium rate of return of \$.45 on the dollar for investment in agricultural research. According to a recent report from USDA ERS<sup>1</sup>, “economic analysis finds strong and consistent evidence that investment in agricultural research has yielded high returns per dollar spent. These returns include benefits not only to the farm sector but also to the food industry and consumers in the form of more abundant commodities at lower prices.”

<sup>1</sup> February 2008 Amber Waves. Information in this article was drawn from Economic Returns to Public Agricultural Research, by Keith O. Fuglie and Paul W. Heisev. EB-10. USDA. Economic Research Service. September 2007. available at: [www.ers.usda.gov/publications/eb10/](http://www.ers.usda.gov/publications/eb10/)