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Traceability and Assurance: What Are the Major Issues Facing the US Food System?

A Report from the Farm Foundation Traceability and Assurance Roundtable

Introduction

On January 23-24, 2003, Farm Foundation sponsored a Traceability and Assurance (TA) Roundtable in Kansas City. Industry leaders from most segments of the grain and meat marketing chains discussed the impact the emerging issues of traceability and assurance in food supplies are having on the US food system. The meeting was organized for Farm Foundation by Dr. Eluned Jones, Texas A&M University, and Dr. DeVon Bailey, Utah State University.

Roundtable participants reviewed different potential effects traceability and assurance might have at each level of the marketing chain and then prioritized the broad range of potential issues according to their perceived importance. The group ultimately identified five primary areas of interest.

1. How TA contribute to the value and cost of food products.
2. Responsibilities of the public and private sectors regarding the implementation of TA food systems.
3. How TA affect the risks and potential liability faced by participants in the food marketing chain.
4. Technical issues and emerging technologies that facilitate or are barriers to TA.

5. How TA might affect the structure of the US food industry.

This paper addresses these five issues as they relate to the potential impacts that TA may have on participants in the marketing chain, regulatory agencies, and the public. This paper aims to focus the efforts of the public and private sectors on the most pressing needs for information and cooperation relating to these issues.

The term traceability assumed here means the ability to track the primary inputs used to produce a food product backward and forward in the marketing chain. The level of traceability may vary, but indicates an ability to track from and to the farm level and retail. Assurance may be thought of as procedures and protocols beyond traditional government food requirements and inspections that are undertaken to either enhance food safety or to provide other types of desirable “extrinsic” characteristics in food products. Traceability and assurance (TA) are than just methods to enhance food safety. They may be used for other purposes including quickly identifying problems in the marketing chain, tracking input efficiencies in the marketing chain, preserving brand equity, and to verify and certify to consumers processes and procedures used in food production.

This paper synthesizes the principal points and conclusions from the Roundtable meeting, provides additional background about the topics of traceability and assurance including current research that addresses some of the questions raised, and suggests some possible next steps that can be taken toward solving some of the issues and questions raised by the panel.

Background

Developed economies have developed agri-food markets that take into account aspects of geographic space, time relating to production cycles, storability and ‘windows’

of market opportunity. They rely on inspection of the product according to physical characteristics to ensure that the delivered product meets minimum standards of identification and functionality. While much of the world's population is primarily concerned with ingesting sufficient calories for survival, the western democracies and emerging market economies have experienced two decades of increasing disposable income paralleled with advances in health and medical science. The result is a significant market population that is focused on food as a source of nutrition, health and lifestyle with a continued expectation that the food they consume is safe.

However, not all food systems in the western, democratic economies have evolved at the same speed or even in the same way. Recent research suggests the US food system is falling behind many of its major competitors and trading partners in terms of traceability and other quality assurances, and food certification protocols (Liddell and Bailey; Capmany et al.). For example, Liddell and Bailey ranked the US pork system last when compared to the United Kingdom (UK), Denmark, Canada, Japan, Australia, and New Zealand for TA. Perhaps the primary reason the US food system is lagging others in this regard is that the US food inspection system is designed principally to control pathogens while some competitors' inspection systems are designed not only to control pathogens but to also trace back food products to the origin of the inputs used in the products and to provide information on other "extrinsic" characteristics which neither affect food safety nor traditional government grading but which are still valued by some consumers. Examples include assurances about animal welfare, social responsibility or environmental responsibility.

A broad definition of food quality assurance encompasses three key elements: 1) managing hygiene to ensure food safety, 2) ensuring quality through grading and other measurements, and 3) providing mechanisms for product recalls (Early; Baines). For example, the processes for ensuring hygiene in the European Union (EU) food system have focused on Hazard Analysis Critical Control Point (HACCP) systems beginning at the farm level. This is a fundamental difference from the US food system where inspections and process control typically do not begin until after the farm gate.

Ensuring quality in food systems includes measuring the intrinsic quality of a food product (tenderness, back fat, curing, etc.). Intrinsic quality measurements are common to most government grading systems including the United States, its trading partners, and competitors. However, the EU system also provides measures of the extrinsic qualities of food products, such as assurances of the absence of genetically modified organisms (GMOs) in a food product. TA is different than typical quality assurances and standardization in its scope (tracing throughout the market chain) and focus (certifies more than just food safety).

Understanding the evolution of the food inspection system and process protocols in the EU in recent years is essential to understanding why TA is an important issue, since the US and EU systems perhaps offer the starkest contrast with regard to different approaches to TA. The emphasis on TA in the EU evolved in response to the perceived regulatory failure of EU governments to provide adequate information to consumers during the EU *Bovine Spongiform Encephalopathy* (BSE or “Mad-cow” disease) crisis (Baines and Davies (1998)). As a result, the EU has developed systems enhancing the credibility of assurances about certain attributes such as animal welfare and even food

safety issues such as *BSE* by filling the perceived information void inherent in standard government grading practices with TA. The EU demands accountability at all stages of the marketing chain, not only for red meat but also for other products (Jones). However, red meat has probably been the most economically important, or at least the most politically important, application of TA because of the *BSE* issue.

The StarLink crisis is another example of the huge problems that can arise when food inputs and products are co-mingled without regard for their origin. StarLink gave a “wake-up” call about how difficult it would be to track and extract contaminated grain from the US supply chain (Jones (2002a)). It’s estimated that it cost Aventis, the company that developed StarLink, was as much as \$500 million to track and extract it from the human food system once it had entered that system (*Food Traceability Report*).

Strong economic incentives have existed for sometime in Europe for agricultural producers to implement quality assurance protocols. However, even in the United States some private supply chains are moving toward similar systems. For example, General Foods claims that by 2005 all of their food ingredients will be sourced via supply chain alliances and partnerships in order to control their risk exposure and to realize the profit opportunities from value enhanced products (Jones (2002a)).

Several early versions of different TA protocols were initiated in the UK and the European Union (EU), including the Scottish Quality Beef and Lamb Assurance (SQBLA) and the Farm Assured Welsh Lamb (FAWL) protocols. However, consumer confusion ensued when it appeared that multiple acronyms representing basically the same assurance were being marketed by different groups. In response to this, the National Farmers Union (NFU) in the UK created the ‘little red tractor’ label. This label

was first introduced at the retail level in 2000 and had gained recognition by 60% of consumers surveyed in a 2001 survey. These types of “umbrella” programs are also being adopted by the EU in their EUREP or EUREPGAP approach to developing an umbrella for EU TA protocols (Jones (2002a)). These EU programs also represent partnerships between the public and private sectors to implement TA-based protocols in the marketing chain.

Because TA systems in the EU were implemented primarily in response to the *BSE* crisis, TA was not used directly as a value-adding marketing strategy.

Consequently, willingness-to-pay (WTP) for characteristics like traceability was not a primary consideration when requirements for providing traceability were imposed on market participants, but rather became a requirement to gain access to markets.

Conversely, discussions in the US about TA have focused on consumers’ WTP. For example, at a recent conference discussing genetically modified crops, sponsored by the Pew Initiative on Food and Biotechnology and the USDA, Economic Research Service, WTP was identified as one of the primary issues involved in identity preservation.

Value and Cost of Traceability and Assurance

While Roundtable participants understand that TA issues are an important source of friction between the US and other food systems, especially the EU food system, domestic demand and supply issues relating to TA still are surrounded by many questions. Since TA is not a regulatory mandate in the US, US food companies must make economic decisions about implementing TA protocols knowing that other domestic competitors may not follow suit. Investment in TA systems in individual supply chains is expensive. For example, Buhr estimated that the cost for one meat supply chain in

Europe to implement TA was approximately \$14 million. Since economies of size almost certainly exist in the implementation of TA, this suggests that relatively large firms might be the first to consider installing TA systems. However, all firms engaging in TA systems need to consider the economic return that can or might be realized as a result.

Roundtable participants were quite sure that TA has become an important issue but, in some cases, were unclear where the pressure to implement TA has come from in the supply chain. Is pressure coming from consumers, retailers, international buyers, or others in the supply chain? Participants believe that when discussing the issue of TA, a major focus must be consumer demand for TA. However, Roundtable participants indicate that other considerations, besides consumer demand and WTPP, are also important and need to be considered.

Roundtable members reported that cost as well as information about consumer WTP for TA are central issues when considering the implementation of these systems. To determine WTP, information is needed about what types of characteristics that can be certified with TA that can add value for consumers. At present, there seems to be no consensus about whether many US consumers are willing to pay for TA or not. However, Roundtable members see TA as an international issue and as an emerging domestic issue that cannot be ignored if the US food system expects to proactively address emerging consumer demands.

Some economic literature is surfacing that suggests US and foreign consumers are willing to pay for TA characteristics. For example, Lusk, Roosen, and Fox have examined consumer willingness to pay for beef products not treated with growth

hormones nor fed genetically modified grain. Lusk and Fox also investigated the effect mandatory labeling of hormone-treated beef or beef that had been produced with genetically modified grains on beef products. Other work by Grannis, Hooker, and Thilmany measured consumer preferences for selected characteristics in beef marketed as being “natural.”

Dickinson and Bailey (2002 and 2003) used economic experiments to examine WTP for traceability and other enhanced characteristics in beef and ham and found, on the average, that both domestic and international consumers (Canada, UK, and Japan) are willing to pay at least some positive amount for traceability. However, many consumers (often the majority) were not found to be willing to pay for traceability. More consumers were found to be willing to pay for enhanced characteristics that could be verified using traceability (e.g., enhanced food safety assurances or animal welfare) than were willing to pay for traceability alone.

The level of traceability that makes economic sense was also a matter of discussion. Tracking costs increase as the number of inputs and levels within the marketing chain being tracked grows. For example, is it important to know the tree from which the paper was produced to make the carton in which a product was sold? From an economic perspective, one would expect to implement a tracking system whose marginal cost of supplying information on traceability is equal to the marginal additional cost (revenue) consumers are willing to pay for the tracking. While efforts have been made to establish costs associated with implementing traceability and consumer willingness to pay for traceability, no comprehensive study has examined the level of traceability that will match most closely with consumer WTP.

Roundtable participants also wondered about the best methods for communicating TA characteristics to consumers. That is, what should be communicated (traceability at what level, what characteristics (e.g., genetics, animal welfare, environmental or social responsibility, or enhanced food safety)) and how should it be communicated (labeling, point of sale, etc.)?

Roundtable participants remain skeptical of consumer WTP for TA. This opinion is based on the past experiences of Roundtable members who have been required to meet new product specifications for which they have received no additional compensation. Consequently, there is concern about how benefits and costs in the supply chain will be shared if TA is implemented. Consumers clearly benefit if they are interested in additional information about their food. Retailers might be benefited if consumers are indeed willing to pay for additional information about their food. But, Roundtable participants who are producers, suppliers, and manufacturers upstream from consumers are less certain about how their own revenue streams will be directly enhanced as a result of implementing TA programs. There are also concerned that regulatory mandates could increase costs in supply chains and make food less affordable.

But Roundtable participants identified other potential benefits that could be achieved by TA that could justify its implementation even without a clear WTP signal from consumers. These include enhancing the firm's competitive position if it is able to provide TA while competitors are not. TA can also facilitate rapid and limited food recalls, thus limiting damage to brand equity. Firms can identify efficiencies and inefficiencies within their marketing chain with TA that can help them reduce costs or increase value. For example, when problems arise in the supply chain, customers can be

reassured that the problem can be identified and corrected quickly because the source of the problem can be tracked. Or, if particular procedures or processes in the supply chain that contribute to higher quality or more efficient operation can be identified, these procedures or practices can be used to improve the rest of the supply chain.

If TA is implemented, how can its costs be minimized while still providing the information needed in the marketing chain? Roundtable participants supported the idea that flexibility (one size doesn't fit all) should be a guiding principle so that individual marketing chains may develop systems best suited for their own needs. However, some standardization could help facilitate these systems. For example, global identifiers would make communication within and across marketing chains much more efficient.

Identifiers specific to individual supply chains make this type of communication much more difficult. Questions from the group included whether or not the UPC code system could be extended to provide every farmer an individual UPC code. This could facilitate product recalls, provide a system that would be more transparent, and enable reaction to different situations when they arise.

Public/Private Sector Responsibilities

Defining the role of regulatory agencies in US-based TA systems is a matter of great interest. TA systems in the EU developed as partnerships between the public and private sectors because they were designed to restore consumer confidence in the safety of EU food systems following the *BSE* crisis. When *BSE* first became a matter of public concern in Europe, some European governments assured the public that there was no evidence that *BSE* was transmissible to humans. This led to a collapse of public confidence when strong, scientific evidence began to emerge linking the consumption of

BSE-contaminated beef with the human disease, new variant Creutzfeld-Jacobs Disease (vCJD). European consumers perceived that their governments undertook inadequate measures to protect the public once a danger to consumers was acknowledged. This left European consumers with little confidence in their government's ability to assure the EU food supply was safe (Baines and Davies (1998)).

To counter this collapse in confidence, private companies and producer associations in some EU countries attempted develop brand names that gave private certifications regarding food safety and quality assurance including TA (e.g., Assured British Meat (ABM) and Swedish Farm-Assured).

Some researchers have argued (e.g., Baines and Davies (1997 and 2000)) that both public and private sector involvement are necessary for effective TA programs. They cite the initial efforts in the UK to provide private assurances, especially about enhanced food safety, which resulted in confusion at all levels of the marketing chain about what was being assured, and by whom. This led to the establishment of ABM and other umbrella assurance programs as a method to consolidate apparently conflicting programs. The result was basically a new set of minimum standards for food safety, environmental preservation, animal welfare, and traceability (Fearne; Baines and Davies (2000); Early).

Conversely in the US, issues relating to TA have been driven principally by concerns about the costs and benefits of implementing such systems. This represents a fundamental difference between the US and the EU since in the EU consumers have demanded that agri-food firms initiate TA systems as a prerequisite to selling food products.

As the EU has implemented its TA programs, it has raised concerns on a number of different fronts in the US. First, since food items imported into the EU must meet the same standards as food products produced in the EU, TA standards can be seen as non-tariff trade barriers by US firms. Second, products can be differentiated based on TA, and non-TA products might then be viewed in a second-class status by some consumers. Third, some believe that implementing TA systems will unnecessarily raise consumer concerns about food safety in the US. Finally, some marketing chain participants in the US, especially farmers, believe TA systems expose them to more product liability.

In any of these cases, implementing broad-based, EU-style TA programs in the US that are partnerships between the public and private sectors would likely be difficult because they are unlikely to have wide-spread political support. This could change dramatically if a *BSE* or other major food crisis such as a food-based, bio-terrorist attack occurred in the US. It is prudent to consider what could or should be done if such a catastrophe did occur, or to consider what more needs to be done to avoid such an adverse occurrence.

Roundtable participants believe that a prerequisite to defining the different roles of the public and private sectors in TA is to determine precisely what information the system should provide to market participants and consumers. The EU-style TA systems established to reinstate public confidence during a severe food safety crisis provide information to consumers not only about the absence of pathogens, but also information about the inputs and processes used to produce food products.

American food companies see the role of TA in a much more “market-oriented” sense than do their counterparts in the EU. That is, the issues for US agri-food

companies regarding TA are related mostly to market barriers presented by TA and the costs and benefits of providing TA-based products. This makes the role of regulatory agencies much less clear in the US than in the EU since TA is not currently viewed as a “public” good in the US but rather as a “market” good.

Roundtable participant comments and attitudes indicate that, at present, American food companies see TA primarily as a method to provide additional reassurance to consumers that the food supply is safe. At the same time, participants perceive that TA also presents significant challenges to the current production and marketing system and that the potential costs and benefits of these systems are still not fully known.

TA was seen clearly by Roundtable participants as a trade issue. This directly affects the role of the public sector since general trade policy and regulations are usually negotiated between governments either bilaterally or within the World Trade Organization. Roundtable participants were generally opposed to general (EU-style) regulation regarding the implementation of TA protocols. Rather, participants see the role of government in trade as facilitating markets. This suggests that US agri-food companies wish a limited role of government in implementing TA systems in the US. Some government involvement is seen as desirable. For example, Roundtable participants believe the government could establish a global identifier for agricultural producers and agribusiness and food companies to facilitate TA systems.

Participants wonder how government regulatory systems would need to evolve to deal with TA. That is a myriad of different market structures exist, so precisely what oversight is needed and what is the feasibility of the government providing that

oversight?. In general, the implementation of TA systems will need to address what information and certifications are public goods (government functions) and which are private goods (private functions).

Roundtable participants want to control the definition and extent of TA between farm and retail. They would like to define the level of information and documentation that would be required at each level of the marketing chain to achieve TA and would like this to be based on consumer demand rather than government mandates. For example, establishing whether products or processes will be certified is an important consideration. Product certification verifies that the product has met a certain set of minimum requirements, but individual firms are able to decide how best to meet these requirements. Process certification requires that specific (standardized) processes be used to produce a food product. In general, Roundtable participants were concerned about how threshold standards/protocols would be determined, especially in a regulated environment, because of what they termed a disconnect between consumer perceptions, technical reality, and regulation. For example, participants worry that some regulated thresholds (e.g., zero tolerances) may be technically impossible or extremely costly to achieve.

Another important issue identified by Roundtable participants was the role of public and private information in TA system. TA systems require that a significant amount of information be passed along the marketing chain about products and inputs. This could be problematic for firms competing at the same level but selling into a common marketing chain. Precisely how integrity can be maintained in markets when information is revealed to others outside the firm but within the marketing channel is a

question that needs to be addressed. At least one economic theory suggests that firms would prefer to integrate rather than to reveal potentially damaging information to competitors or potential competitors (Williamson). This implies that a new set of rules of conduct and integrity would need to be defined, possibly legally, or that individual food marketing chains will integrate rather than revealing too much information to other firms.

Issues relating to information gathering and intellectual property are also concerns if firms are required to share more information along the marketing chain in TA systems than they currently share in traditional marketing chains. Who has the “right to know” becomes an important issue within and without of the marketing chain in these types of systems.

In general, the Roundtable participants would like a market-oriented TA system in the US rather than a regulated system such as exists in the EU. They see the role of the public sector as market facilitation in trade and in perhaps standardizing identification systems. However, there are many important questions yet to be answered that may require government involvement to fully address (e.g., legal questions).

Risk/Liability

From the perspective of business, TA is viewed as a potential method to manage risk in the food marketing chain. In theory, TA can track problems quickly, minimize recalls and damage to brand equity, and provide documentation that appropriate methods and testing have been used to avoid food contamination. However, Roundtable participants expressed concern about how this works in actual practice. Specifically, participants wondered if risk is actually transferred in a TA-based system. For example,

one participant indicated that all the tracking and testing his/her company does can all be “trumped” by tests performed at a foreign port.

Consequently, Roundtable members are still attempting to understand how they can use TA systems to minimize liability. Part of this is related to the ability to establish credible TA systems that are trusted by consumers and accepted on a global basis. Concerns are also related to strict liability and the inability to transfer liability even if all TA requirements and procedures are followed and documented. This is especially problematic for agricultural producers who, in the past, have been mostly immunized from liability once their commodity/product has been sold. As a result, producer view traceability as potentially exposing them to liabilities they did not need to address before.

In summary, Roundtable participants have important questions about how TA can help them manage risk/liability. Participants want clearer definitions relating to the transfer of liability and are also seeking credible systems that have global recognition and acceptance.

Technical Issues/Technology

In general, Roundtable participants believe that significant technical issues need to be addressed to develop TA systems that can freely share information within and across marketing chains and are accepted on a global basis. They fall into three broad categories: 1) risk assessment (tolerances, testing, etc.), 2) documentation (i.e., data gathering and sharing), and 3) establishing global identifiers.

Risk assessment was a primary concern expressed by participants since it determines the intensity and, consequently, the investment that must be made in TA systems. Many of the points discussed relative to this area dealt with the issue of what

tolerance levels are technically and economically feasible to attain compared to the levels that are actually of concern for human health. Consumers may not be aware of the trade off between tolerance levels and costs, and that technical realities may not allow extremely small levels of tolerance. Roundtable members would like a balance between tracing and testing. If testing is available that is reliable and meets the goals for the system, say tolerance levels, is tracing as necessary as in cases where inadequate testing is all that is available? Roundtable members believe that actual threats to human health and technical realities must be accounted for when establishing TA systems. They want protocols based on scientific methods that would be universally recognized and accepted.

Methods for documentation were discussed principally from the point of view of how information is gathered and shared within TA systems. One concern is about how separate systems, such as exist in the US and the EU, can be reconciled. This is especially important for exported commodities/products, such as wheat, where barriers to trade can be established based on TA issues.

A great deal of data can be generated by TA systems. Managing these data into creditable and auditable systems is challenging. This is especially true when one considers that different marketing chains are developing independent systems that make it difficult for those outside the chain to compare different methods for gathering and presenting information.

Other issues relate to how data sharing within the chain can affect the competitive positions of different firms and/or intellectual property that has been developed to gather and provide information to the chain. Each level of the chain will not find it equally as easy to provide information to a TA system. For example, agricultural producers may

have more difficulty than other participants in the chain since they would need to establish tracking and data systems from scratch in most cases. Problems associated with human error also arise in TA systems since honest mistakes can be made that lead to breakdowns in the system. New technologies, such as global positioning satellite (GPS) technology, were also cited as possible methods for providing documentation within a TA system.

The need for globally accepted standards was mentioned. For example, participants were concerned about the impasse with the EU relating to GMOs and hope that TA systems will be a method for helping to resolve this issue. This might begin with the development of global identifiers for agricultural producers and other firms participating in food marketing chains. Participants see the frictions that exist between different systems as a threat, especially to trade. They would like to see more universally recognized standards, but want these standards to be established based on science and what is technically and economically feasible to achieve.

Structure of the Industry

Market structure is defined somewhat differently by economists and businesspeople. Economists typically view structure as the number and size of firms in an industry and the amount of product differentiation that exists. Conversely, businesspeople view market structure as the types of customers, suppliers, and products that exist within a marketing chain. These definitions are not mutually exclusive since they both deal with how firms and products are organized within marketing chains. However, it is important to note the difference since it can aid in understanding different

approaches and comments made by Roundtable participants relative to this area of interest.

Regardless of definition, participants believe that TA systems will have significant impacts on market structure in the US. One element of this relates to economies of size. Since TA systems are likely costly and because economies of size almost certainly exist in providing TA, movement to these types of systems may disadvantage some small companies and agricultural producers. On the other hand, TA can make product attributes more specific and targeted. Consequently, TA may offer more access to particular market niches that could enhance the competitiveness of some small marketing chains. In either case, TA would seem to indicate that many food products will become more specific in their characteristics. For example, supply chains may be developed to produce food with characteristics wanted by one major retailer or restaurant chain. The overall effect on the number and size of firms in the US food industry is not fully known. But, it suggests further narrow and closely tied supply chains which is a movement away from the broad commodity market that currently exists, but is a trend underway in today's supply chain.

The exploitation of economies of size has been a central strategy in the US food marketing system and TA systems currently run counter to many US food marketing chains that are "built to blend." Consequently, TA represents a significant paradigm shift in the US food industry, especially at the processing and handling levels. Significant costs will need to be incurred to adjust current systems so that tracking can take place. Agri-food companies feel squeezed by the need to serve two different markets. One where outside demands being placed on them in export markets for TA products and the

other in the US where TA has not yet become an overriding issue and where questions about whether or not US consumers are willing to pay for the additional costs TA exist. Participants see the definition of a supply chain as a system being able to deliver a total value that is greater the value of the sum of the parts of the chain. Being able to identify and share costs and benefits within a TA supply chain is a primary goal according to participants.

Food manufacturers have typically been the supply chain “captains” in the US food industry and these firms have traditionally made most product and promotion decisions (Bailey, Jones, and Dickinson). However, power within the US food marketing system appears to be shifting toward large retailers. TA systems would appear to fit well into a marketing system dominated by retailers since characteristics and certifications demanded by retailers could be verified and audited using TA systems. This is certainly the case in the EU where retailer brands are seen as superior because the retailer specifies and controls the inputs and processes going into products carrying their own brand name.

Roundtable members also indicated that the US food system is not a closed system and wondered if suppliers in developing countries would be able to meet the requirements of TA systems. Some good examples of how this is being accomplished in developing countries exist in countries that either traditionally export or are attempting to export agricultural and food products to the EU, including South Africa and Uruguay.

Participants agreed that a major educational effort will be needed to help marketing chain participants understand the need for and the methods for implementing TA systems. They believe this is especially true for agricultural producers who, to this point, have generally resisted the idea of TA systems.

Roundtable members see potential opportunities and problems associated with TA systems. Regardless of the definition of structure, the US food system will be impacted and change as a result of TA. Participants want to be able to identify the most profitable ways to implement this change both in the export as well as the domestic market.

Conclusions

Traceability and assurance programs will have a significant impact on the US food system. Many questions remain about how best to implement these systems in the US. The purpose of the Roundtable was to identify the most pressing issues relating to TA. Clearly, participants would prefer that TA systems and protocols be established in an environment as free of government regulation as possible. However, participants also believe that government can play a critical role in facilitating trade, especially in export markets, and in establishing a global identification system of some sort.

Marketing chains are likely to become more focused on specific characteristics demanded by different markets (both broad and niche). The organization of marketing chains and the sharing of both costs and benefits of TA systems was a central concern for participants in the Roundtable. Consumer willingness to pay for TA characteristics is seen as a primary consideration in developing TA systems, but other considerations such as being able to identify and track problems, limit recall, protect brand equity, and to identify efficiencies within marketing chains were seen a potential benefits from TA systems.

The Roundtable believes that issues relating to TA should be studied and that significant educational efforts should be made to help market participants understand what TA is, why it is an issue, and how it could be implemented. The Roundtable

meeting in Kansas City offers an initial step in identifying major issues relating to TA and helping to start this educational process.