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## Traceability and Assurance Protocols in the Global Food System

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### Abstract

In the 21st century, the food supply chain has become a complex, interconnected system with strategies that are aimed at creating improved products to satisfy consumers' demand for safer foods. To stay competitive and ensure consumer confidence, agribusiness firms develop and implement strategies that take into account not only traditional economic factors driving the food demand, but also issues such as food safety and quality. Traceability and assurance protocols help agribusiness companies improve and refine their production processes, thus providing better control over, and transparency of, food quality and safety throughout the food supply chain. This paper reports on the empirical results of focus interviews conducted during the 2004 IAMA conference to determine the current implemented levels of traceability and assurance protocols and considers some of the issues regarding the benefits, costs and constraints of implementing those protocols.

**Keywords:** food, safety, quality, traceability, assurance

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## Introduction

In the last decade, a series of related events caused a paradigm shift in the food industry, in which the complex relationship between public and private sectors has been seriously affected, especially in Europe.

The starting point was the link between Bovine Spongiform Encephalopathy (BSE), which was discovered in cattle for the first time in 1986, and a new departure of Cruetzfeldt Jacob Disease (vCJD) that was reported in the U.K. news at the beginning of 1996. Between 1996 and 2003, approximately 130 people died of vCJD, most of them from the U.K. (Goldberg and Hogan, 2003). It has been identified that the number of cattle identified with BSE reached a peak of over 100 cases per week in 1993 (Anders, 1999).

In 1998, a woman died in Denmark as a result of consuming *Salmonella* infected pork. In January 1999, two persons die in France because of *Listeria* contaminated cheese. In May 1999, fear of dioxin contamination of Belgian chicken meat and eggs resulted in withdrawal of those products from all E.U. markets. Moreover, after 34 years free of foot-and-mouth disease (FMD) in Europe, an outbreak in 2001 in the U.K. put the whole farming industry into a severe crisis (Goldberg and Hogan, 2003).

Following the BSE and other crises, beef consumption in Western Europe dropped drastically, as well as consumer trust in government to provide oversight of food safety issues (Bredahl, 2001). Because of the lack of transparency and miscommunication, the E.U. government was subsequently classified as not trustworthy by consumer groups (Goldberg and Hogan, 2003). The U.K. industry still tries to restore consumer confidence, however only supermarket chains have retained the trust of the public (Hobbs et al, 1999).

Those events made consumers ambivalent about the safety of the food they are consuming, resulting in demand for new systems to assure the improved quality of food products. In order to satisfy consumers' demand, the food industry needed to increase transparency from the producer to the retail and restaurant chains. This was the main motivation towards creating, developing and implementing food safety programs, such as traceability and assurance protocols. For example, the lack of confidence in the public sector (government and scientific communities) by consumers was the incentive for the private sector (industry) to implement "passport" traceability and assurance protocols in the U.K. (Jones and Bailey, 2004).

Each country is unique and, hence, their industries have different priorities and business strategies. Therefore, their driving force to implement food safety protocols vary according to their past experiences and focus on external or internal markets. According to Anders et al (1999) the driving forces for implementation of food safety

standards in the U.S. agricultural sector are: a) the need for better margins; b) market access; c) product liability; and d) regulatory demands. Anders also identifies more driving forces, such as export of products (Netherlands), protection of markets (U.K.), international competitiveness and consumers' confidence (Australia) (Anders et al, 1999).

The basic difference between the U.S. and the E.U. approaches can be explained by their past experiences in food safety issues, as well as their economic and political environments. Anders (1999) identified the most important characteristics of the European environment: a) political trend to the left; b) food safety scares; c) major retailers merchandising food with extrinsic, as well as intrinsic, labeling (traceability, organics, animal welfare, food safety). In the E.U. legislation the word "reasonable" in the definition of due diligence is very vague. As a consequence, extra measures have been taken to ensure food safety by the retailers and also required from their suppliers (Spriggs, 1999). According to Bredahl (2001) the difference between U.K. and U.S. protocols is the tendency of the latter to have less stringent requirements, focusing mostly on health characteristics, and not often on extrinsic products characteristics such as animal welfare and environmentally friendly production.

The consequences of implementing food safety schemes in international trade became obvious when the U.S. food ingredient supply chain was challenged by the U.K. and E.U. paradigm shift to process-driven oversight (Jones and Bailey, 2004). In comparison, a possible competitive advantage has been given to those firms with the ability to deliver "transparent" foods (Hobbs et al, 1999).

However, there are some barriers to having food safety protocols implemented. One of the main barriers to the adoption of the protocols has been, and is, the cost of implementation. Jones and Bailey (2004) discuss that the cost should not be passed to the consumer when (a) there are clear public welfare benefits or (b) when competitive advantage accrues within the supply chain rather than to the final consumer. Hobbs et al (1999) think that: "the challenge lies in measuring the relative cost and benefits of government intervention and in identifying the "social optimal" level of food safety".

In an industry that is trying to regain consumers' trust and loyalty, the participants of the food chain should put increasing emphasis on producing safer and higher quality products. Multinational companies and retailers spend millions of dollars on creating and developing their brands and protecting their image and reputation. The recent events around the food safety issues and consumers' greater awareness of potential food borne illnesses have increased companies' realization that a single food related incident associated with their products could destroy their entire investment, and even cause bankruptcy. Therefore, the task for any agribusiness entity today is to develop and implement such business strategies that would allow

for the highest degree of food safety and quality control throughout the food supply chain.

Many agribusiness companies have already developed and implemented food quality and safety programs, such as traceability and assurance protocols, to help protect their brands and ensure continued consumer confidence. The main objective of this project was to determine the implemented levels of traceability and assurance protocols by the representatives of different sectors in the food supply chain at the IAMA conference in Montreux, and to discover the factors that encouraged those agribusiness entities to implement these protocols.

## **Methodology and Data**

This survey was designed to address several questions on traceability and assurance protocols with the representatives of 17 industry members who participated in the focus interviews conducted during the 2004 IAMA World Forum and Symposium conference in Montreux, Switzerland. Dr. Eluned Jones along with the recipients of the IAMA student travel grants developed an interview guideline. The industry members represented international agribusiness corporations from Argentina, Australia, Germany, the Netherlands, South Africa, Switzerland, Zambia, the U.K., and the U.S. They were involved in sectors such as farm production, handling, processing, manufacturing (including farm input supply), wholesale, retail, food service, as well as R&D and consulting.

### *Question 1*

The interview was designed to determine the implemented levels of traceability and assurance protocols, which were:

1. No specification at all (low level/ degree of protocols implementation)
2. Sector grades and standards (intermediate level/degree of protocol implementation)
3. Product specification, including non-audited and audited (the highest level/degree of protocols implementation)

The highest possible level of implementation of those protocols were the fully integrated safe, quality, 3<sup>rd</sup> party audited protocols, e.g. SQF 2000 (ISO+HACCP).

### *Question 2*

The second interview question included factors affecting the company's motivations to implement traceability and assurance protocols. Respondents were asked to

indicate which of the reasons given in Table 1 influenced their decision to implement traceability protocols.

**Table 1: Factors Affecting the Company's Motivations to Implement Traceability and Assurance Protocols**

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Economic:
a. Increased supply chain management efficiency
b. Increased efficiency of meeting quality targets
c. Increased efficiency in meeting food safety targets
d. Risk and liability management
e. Meet regulatory requirements more efficiently
Market:
a. Competitive advantage
b. Market access
c. Market share
Consumer:
a. Perceived quality
b. Perceived food safety
c. Food credence (environment, welfare, social responsibility)

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### *Question 3*

The interview included questions relating to the issue of who should handle the costs associated with the implementation of the abovementioned protocols. Two possible answers were provided for discussion purposes:

1. Corporations pass associated costs on to the buyer or final consumer.
2. Corporations use the information obtained from the process of protocol implementation to gain cost efficiencies, thereby covering added costs.

### *Question 4*

A further set of questions was devoted to the issues constraining the implementation of traceability and assurance protocols. In particular three constraints were provided to the interviewees:

1. Lack of harmonization of protocols internationally.
2. Lack of political consensus across leading market economies regarding labeling with respect to protocols implemented, genetic modifications, and country of origin labeling.

3. Lack of Government subsidies in underwriting all or part of the implementation costs.

#### *Question 5*

The last question focused on perceptions of whether the public or private sector should have primary oversight responsibility with regard to food safety and food quality.

In order to analyze the survey, the results were summarized using a “content analysis” of open-ended questions and “measures of central tendency” for multiple-choice questions.

### **Results of the Interview Questions**

#### *Question 1*

Most of the interviewees indicated that their company had at least moderate to high levels of implemented traceability and assurance protocols. However, the tendency was that the producers and handlers were somewhat behind the manufacturer implemented levels of traceability and assurance protocols.

#### *Question 2*

Motivations to implement traceability and assurance protocols differ across the food chain from economic, to market and consumer standpoint. The interviewees indicated that all 3 motivations were perceived to have significant impact on industry members’ decision-making processes, however, each of the motivations were justified for the following reasons:

1. Economic motivation helps the company to:
  - more efficiently manage the supply chain through traceable processes and procedures in the corporation,
  - increase the efficiency of meeting food quality targets,
  - reduce risks and liabilities by improving their operations,
  - comply with regulatory requirements.
2. Market motivation – the majority of interviewees determined that having traceability and assurance protocols in place would provide competitive advantage and better market access. Traceability has become a pre-condition to entrance to many international markets.

3. Consumer motivation – participating industry leaders considered this motivation to play a bigger role in consumers' perceived food quality and safety than in food credence (environment, welfare, social responsibility, etc.). Through traceability, companies ensure consumer confidence and protect their brand image.

### *Question 3*

The overall opinion of the industry representatives indicated that costs of implementing traceability and assurance protocols should be the responsibility of the food chain players as in a long run those costs will be offset by the benefits of improved production systems and technologies, recall cost savings and protected brands. Currently consumers are not well educated about traceability and its benefits and would not be willing to pay for it. Several reasons supported this opinion:

- The foremost important benefit that traceability provides is the ability to have well-understood and repeatable processes that lead to product and process improvements, decreasing the costs of production, thus actually generating higher profits.
- A brand is the most valuable asset that companies create and develop over time, investing hundreds of millions of dollars. Protecting the brand by diminishing risks of food recalls and incidents is the motive worth the costs of implementing traceability and assurance protocols.
- Designing and implementing food traceability and assurance protocols can entail some costs that vary throughout different industries, sectors and countries depending on the size, type and other measures of a given operation.
- In comparison, when traceability programs are implemented, the company better protects its reputation by providing improved quality products, and the consumer receives high quality, safe food for consumption.

### *Question 4*

Because of food safety concerns, participants of the international agribusiness industry design and introduce a range of food safety and traceability programs, and new laws and regulations in order to have access to international markets. Global suppliers are challenged to comply with evolving regulations that vary country-by-country. The issue is becoming even more complicated because of non-harmonized standards and norms internationally, which can become barriers for some agribusiness companies to participate in markets, at the same time opening market access for others. Therefore, the issues regarding the lack of harmonization of

protocols internationally, lack of political consensus and government subsidies as they relate to the implementation of protocols were discussed by respondents, indicating that the lack of synchronization of traceability and assurance protocols globally was a significant constraint preventing companies from implementing the protocols. The majority of interviewees pointed out that the lack of political consensus regarding labeling of protocols implemented across leading market economies was a significant constraining issue. Lack of political consensus regarding genetic modifications was equally 'not critical' and 'significantly critical' for respondents. Country-of-origin-labeling was not perceived to be a significant constraint to business. Interviewees did not consider the lack of Government subsidies to underwrite all or part of the costs associated with implementation of traceability and assurance protocols, to be a constraining issue.

### *Question 5*

The final set of questions was dedicated to the issue of who should be responsible for food quality and safety (public sector, private sector or both). The results of the study show that the majority of participants considered the public sector (the Government) to hold the primary oversight responsibility with regard to providing a legal framework for food safety (standards and measures), and the private side ensures the quality of foods as they should be interested in providing a better quality product. Thus, the public sector defines safety standards to comply and be fulfilled by the private sector. However, when public oversight is weak, the private sector collaborates to define food safety and quality specifications.

### **Summary**

The results of this survey illustrate that most of the companies that participated had at least some traceability and assurance protocols implemented within their operations to both meet the new food safety regulations and to give better market access internationally. Outcomes also indicated that the lack of synchronization of traceability and assurance protocols globally was a significant constraint deterring companies from implementing the protocols. The majority of participants considered the private sector to hold the primary responsibility over food quality, and the public sector to provide oversight responsibility with regard to a legal framework, standards, specifications and measures for food safety.

In the 21<sup>st</sup> century, the food supply chain has become a complex, interconnected system, where consumers play a influential role. Development strategies and initiatives must now focus not only on traditional economic measures of food demand, but also on issues such as food safety that require traceability and assurance protocols. The findings of this study have important implications for the managers of food and agribusiness firms who are in the process of implementing

food safety protocols, and for food industry decision makers and government officials who provide primary oversight for food safety laws and regulations.

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