



Executive Summary - Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective

Global Food Traceability Center

www.globalfoodtraceability.org

March 11, 2015



Introduction

The Global Food Traceability Center (GFTC) conducted a year-long investigation of traceability practices and systems in 9 global seafood value chains as part of an evaluation of that food system from catch to the consumer. The purpose of the project was to gain insights and provide knowledge about the impact of traceability on improving seafood industry business performance, including reducing waste, and enhancing consumer trust. The full report is entitled *Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective*.

Based on interviews of over 80 individuals in 48 companies across these 9 global value chains, the research revealed that traceability is more highly valued by businesses, regardless of their size, if they have a culture of cooperation and engage in highly collaborative activities with their suppliers and customers.

The research also examined consumer perceptions about seafood, and how traceability influences purchasing decisions. In a survey of consumer buying influences in 5 nations (Canada, China, Germany, The Netherlands, and the United States), the investigation scrutinized factors shaping consumer purchasing decisions and provides insight into the discrete choices that consumers make when buying seafood. The survey results were incorporated into a 'Discrete Choice Simulator'¹ that can compare and contrast the preferences of consumers in those 5 countries in order to better understand how specific traceability factors influence seafood buying decisions.

Moreover, the project delivered a software application that can be used by those seeking to better understand their return on investment (ROI) from implementing traceability practices and solutions.² This tool is available online and has already demonstrated its value to dozens of businesses.

The research concludes with specific recommendations regarding seafood traceability for businesses, governments, and non-government organizations.

¹ Discrete Choice Simulator may be accessed at <https://seafoodtraceability.org/>

² Seafood Traceability Financial Tool may be accessed at <https://seafoodtraceability.org/>

Executive Summary

The purpose of this project was to gain insights and provide knowledge about the impact of traceability on improving seafood industry business performance, including reducing waste, and on enhancing consumer trust. Additionally, the project developed and delivered a software tool that can be used by stakeholders seeking to better understand the return on investment (ROI) in implementation of traceability practices and solutions.

The project began with an extensive literature review³, the results of which highlighted that effective seafood traceability is an outcome from businesses taking a strategic, professionally managed approach to data gathering, retention, sharing, analysis, and collaboration with partners; and they perform these practices at key points along the value chain. This strategic approach to traceability enables creation of financially and environmentally sustainable businesses and value chains, and provides opportunities for businesses to create competitive advantage.

Based on the extensive review of existing literature, the definition of traceability that subsequently guided the research is *the ability to access any or all information relating to that which is under consideration, throughout its entire life cycle, by means of recorded identifications* (Olsen and Borit 2013).

The GFTC-led team conducted this research and identified the case for traceability amongst businesses in global seafood value chains, including those involved in the capture/production, processing, and distribution levels, as well as in retail and foodservice. The research was conducted through direct interviews with individuals in 48 separate businesses around the world in order to assess how inter-party (between businesses) traceability was used to strengthen business performance and the impact of its implementation.

Benefits of Traceability

Individual businesses were split when they conveyed the greatest benefits from improved traceability practices and systems. Some argued that the benefits to safety and public health are the most notable. Others maintained that by applying traceability to management of value chains, more significant business and industry-

³ *Enhancing Seafood Traceability Issues Brief* summarizes the literature review and may be accessed at <http://info.ift.org/download-the-seafood-traceability-issues-brief-and-comments>



wide benefits are achieved. These business benefits included the ability to recall products more effectively, increase access to new markets, add value through improved supply/value chain management, and substantiate sustainability claims (Nga 2010; Sparling and others 2011, McEntire and Bhatt 2012).

The costs versus benefits issue is of particular concern to smaller operations, many of whom do not have the resources required to purchase and implement a full traceability system (Greene 2010). While larger operations may see the cost of implementing traceability systems as future investment, smaller operations may view it as a financial liability (McMorris 2010). However, simple and effective business-case tools can help these smaller businesses develop their own payback (return on investment) calculations. However, the research found that the benefits realized from traceability are not dependent on the size of the business. Smaller businesses arguably were able to achieve benefits more quickly than their larger competitors.

The project delivered a software tool that assists any company in calculating the return on investment and creating their own business case for investment in traceability. The application was developed with the assistance of business owners and managers and is readily available online.⁴

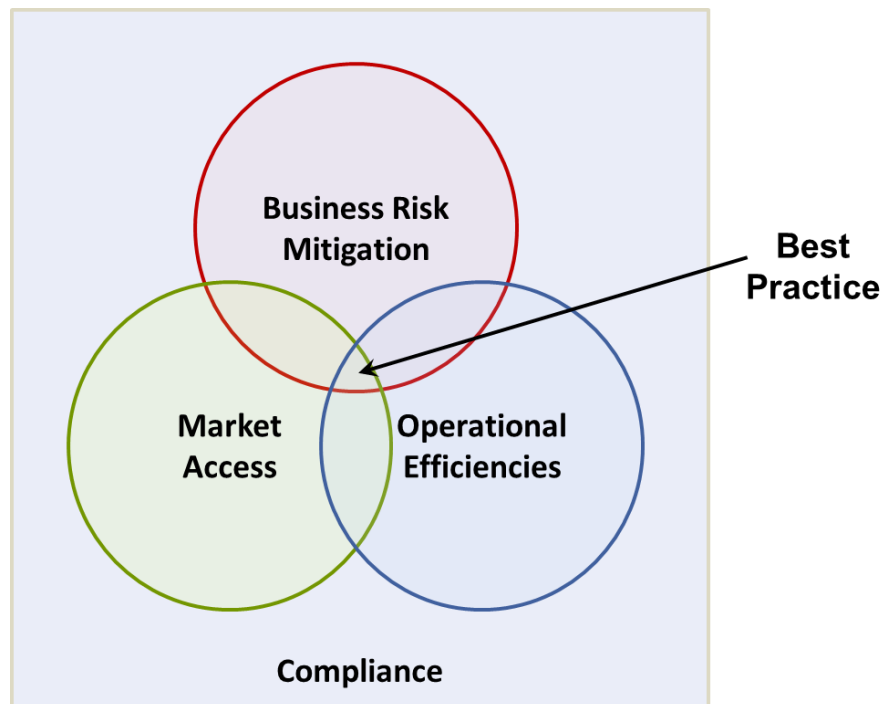
A key point many businesses overlook, when assessing traceability costs, is that many of the systems, practices, and data necessary for traceability are already in place. Firms may use them for other purposes such as food safety, quality management, and production efficiency. The research found that successful businesses leverage the data and these practices and systems to provide traceability.

As shown in Figure 1, the 3 key areas of benefits that companies usually associated with effective traceability are:

1. Delivering operational and production efficiencies that lower costs
2. Strengthening competitive advantage to access new markets or new customers to gain revenue or margins
3. Mitigating market and operational risks to contain costs

⁴ Seafood Traceability Financial Tool may be accessed at <https://seafoodtraceability.org/>

Figure 1: Key Benefits and Best Practice



The research found that best practice in seafood traceability produce benefits in all 3 areas, as well as deliver compliance with regulations. Best practice is the ‘sweet-spot’ where the most value can be achieved.

Traceability and Business Success are linked

Historically, the aim of traceability has been to prevent or restrict the spread of food safety incidents (Pang and others 2012). As such, traceability was usually part of a reactive process and not used much to address business opportunities, nor to identify and manage business issues beyond compliance with regulations. Innovative technologies can be used to make traceability faster, more reliable, more-cost effective, and to capture data for commercial advantage (Huang and Yang 2009; Gooch and Sterling 2013). The researchers found that successful seafood businesses know that traceability practices and systems are critical to the success of their firms.

This was a consistent and strong message that the researchers heard and it transcended company size and its products. While traceability is of similar importance to all firms studied, its significance with downstream firms (those closer to the consumer) was ranked higher when particular fish species and the source of production or catch was considered.

For example, distributors and retailers were particularly concerned about the ability to know more about seafood that is sourced far from the final market destination (for example, tuna and shrimp sourced from Southeast Asia and sold to European and North American markets). Reflecting this concern was the data that these firms required as part of their routine practices. Catch/process *date* and catch/process *identification* were the 2 most important data elements from a traceability perspective, with approximately 70% and 60% of firms respectively indicating this information was critical to their business.

The highest scoring categories of business benefits included increasing product quality, responding to consumer demand, and verifying product characteristics such as catch date and location. More than 80% of participants ranked the ability of their traceability system to generate these benefits as high (4 or 5 on a 5-point scale). Ninety-five percent of upstream businesses and 78% of downstream businesses stated that their traceability system allowed them to effectively improve product quality.

According to many of the companies studied, implementing traceability practices and systems was seen as an external change management challenge. Approximately 35% of respondents reported that no significant challenges were faced during implementation of their traceability initiatives. While a comparable percentage did report challenges arising from their immediate business environment (such as budgetary or technical issues), the most common challenges were caused by complications arising from *other* businesses in the value chain (44% of respondents indicated this). The research therefore found that traceability benefits are likely to be higher when members of a value chain are more closely aligned, rather than fragmented.

Collaborative Value Chains achieve Higher Performance

A framework for evaluating the capabilities and determining factors of value chains was developed (adapted from Value Chain Management Centre, 2012). Four categories of seafood chains were delineated based on the degree of partnership that exists between the businesses. The research examined the results of interviews of those in the 9 value chains, to look for evidence of:

- Alignment / misalignment. In particular, what was the orientation of businesses in the value chain to strategically adopting an entire chain perspective? What was the nature of their market orientation, their experience and approach to addressing operational barriers (data integrity, different requirements from multiple suppliers and

customers)? And what was the extent to which they jointly pursued the opportunities afforded by traceability?

- Behavior. In what manner did businesses build and reflect trust, commitment, and sharing of benefits with their partners?
- Objectives and outcomes. How did businesses view traceability, especially regarding legal compliance, risk mitigation, driving performance, and increasing competitive advantage?

The 4 categories were:

Fragmented Value Chain Transactional focus comprising a series of short-term, distinct interactions. Price, volume, and quality are the only factors used in decisions because other information is withheld. Relationships are more adversarial and distrustful. Without the ability to pool inter-company knowledge and resources, the chain struggles to adapt to changing market demands. None of the value chains displayed all the characteristics of a fragmented chain.

Figure 2: Fragmented Value Chain



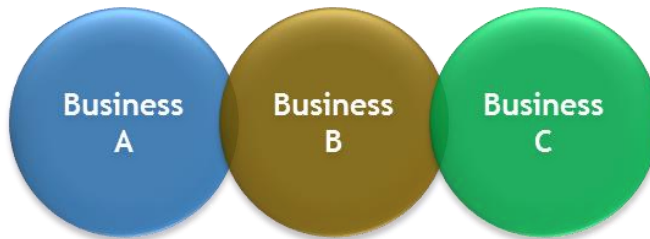
Cooperative Value Chain Businesses pursue medium-term operational support. The extent to which this evolves into strategic coordination depends upon the compatibility of the culture of the businesses, as well as external market factors. Two of the 9 value chains fell into this category.

Figure 3: Cooperative Value Chain



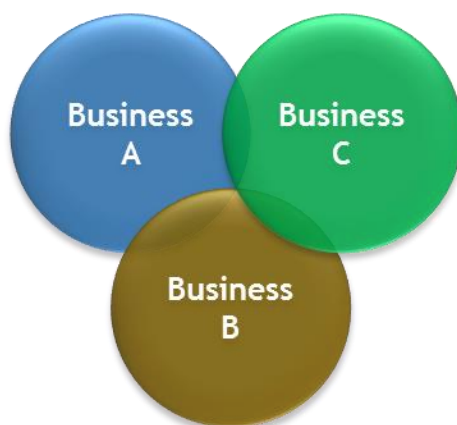
Coordinated Value Chain: Businesses share complementary objectives, attitudes, and leadership styles. The benefits of mutual commitment to each other are recognized. This leads some businesses to adopt strategically aligned structures and perspectives. Five of the 9 value chains investigated were in this category.

Figure 4: Coordinated Value Chain



Collaborative Value Chain: Long-term strategic alignment, based on sharing resources and developing capabilities which deliver mutual benefits. This requires transparency and compatible cultures, vision, and leadership. The relationships foster conditions for investment in specific products, services and assets. While this type of chain demonstrated substantial benefits from traceability, there were concerns expressed about risks associated with the degree of inter-dependence. The level of trust required for a Collaborative approach was a commonly cited source of this concern. Two of the 9 value chains studied were designated as collaborative.

Figure 5: Collaborative Value Chain





Need for a Common Architecture

The research uncovered systemic concern about the lack of uniform requirements and standards for gathering, storing, accessing, and sharing the information used for traceability. There was a widespread view among respondents that the absence of standardized international requirements and interoperability hamper traceability investment. These gaps were usually considered as stemming from government policies and regulations, along with an unwillingness and/or inability to collaborate with other nations.

At the business level, companies may form one-to-one data exchanges with suppliers and customers. The number and complexity of managing these point-to-point relationships increases their costs and the risk of errors. This causes food industry sectors, like seafood, to develop traceability requirements that are different from other sectors (for example produce or dairy). Participants told us this adds complexity, risks, and costs for traceability.

This lack of interoperability is a significant concern and an inhibitor to the collaboration of businesses along the seafood chain and degrades the effectiveness of individual firms. A deficiency of interoperability weakens a firm's ability to collaborate with other members of their value chain so they can each reduce waste, implement sustainable business practices, innovate quickly to meet changing market demands, and ultimately increase their competitiveness. It results in increased costs for a business, and raises real risks in the event of recall or other emergency by inhibiting rapid, reliable response.

In other words, lack of harmonized requirements leads to absence of interoperability, which causes ineffectiveness along the entire seafood value chain from the fisherman to the consumer. The outcome is lower productivity and profitability, reduced industry viability, and diminished decision-making capacity, all of which impact long-term sustainability and consumer choices.

Influences on Consumer Seafood Purchases

The consumer research portion of the project was aimed at assessing the influence of attributes, such as specific species and seafood products, on consumer attitudes towards seafood; it probed the impact these attributes have on purchasing decisions. This included evaluating for which attributes associated with traceability consumers would be willing to pay. The primary research was conducted in 5 national markets with consumers in Canada, China, Germany, The Netherlands, and the United States.

The investigation produced insights into the significant shifts that are affecting the seafood industry and what underlying factors are driving change. For example, aquaculture and wild-caught are 2 different sectors of the seafood industry, and the success of each continues to be impacted by distinctive challenges and transitions. The differences are predicted to influence the extent to which traceability will be used to differentiate seafood businesses and the products they provide to the market. The consumer surveys bore out these and other findings.

The rapid growth of aquaculture products and where farmed seafood businesses are located, along with rising demand for seafood and other proteins in developing nations, are notable drivers affecting the entire industry. The aquaculture sector of the industry also illustrated the effects of uncoordinated and non-harmonized policies and regulations mentioned previously. Consumer attitudes to aquaculture are also markedly different in the countries studied.

The research found differences in the consumption habits of consumers residing in each of the 5 nations. While consumers in different countries exhibited substantially similar attitudes towards the seafood species investigated (tuna, salmon, shrimp, and mahi-mahi), the most popular packaging formats and purchasing channels vary significantly. Differences were also found in the relative importance of sustainability claims and verification programs.

The overall findings suggest that consumers are concerned foremost about quality in all its forms, especially freshness. They seek “simple indicators” about quality to help guide their purchasing decisions. The research suggests that a majority of consumers do not possess detailed knowledge about seafood and they use simple proxies, such as ‘best-by’ and ‘use-by’ dates, to give them indicators of quality and freshness. The trend of some retailers to provide sourcing information for their customers (such as catch location, catch date, and ship’s name) is one response to this consumer demand; but it was not clear from the research that the broader industry understands what consumers are seeking or how to shape buying decisions.

Another significant finding was that consumers view species authentication (the fish is actually what is advertised or labelled) as comparatively less important than verification that a seafood product was produced or harvested in a sustainable manner. This key discovery suggests that there may be a sizeable opportunity for businesses to capture value by differentiating their seafood products from other brands by overtly using traceability to verify sustainability-related attributes.

The implication of these findings is that consumers are not entirely clear about what traceability is, but they intuitively understand that the industry can do better in demonstrating diligence with respect to providing accurate information about seafood quality and sustainable practices. The desire amongst consumers for transparency shows no signs of diminishing as an important market driver.

Recommendations

The research results reflect that there are a number of common factors related to traceability and how it impacts competitive advantage. This led to 7 project recommendations on how stakeholders can act. These included 3 directed at businesses and the industry, 3 at how governments could respond and balance the needs of the public good with those of business, and one concerning non-government organizations (NGOs) and what they can do.

For businesses, the recommendations are:

1. View Traceability from a Strategic Perspective

The research identified that the benefits of traceability are greater when businesses more tightly integrate traceability into their respective value chains, and their practices and systems. More collaboration is better for your business.

2. Establish Purpose and Objectives before Selecting Technology

Knowing why traceability is needed and the specific benefits being sought helps decide which system is best suited to a particular business environment. It reinforces a company's ability to build on existing capabilities and resources - for itself and its partners across the value chain.

3. Approach Traceability with Big Vision, Small Steps

Technology cannot offset processes that are performed incorrectly. Therefore, it would not be wise to try to accomplish everything at once, or assume that the technology being implemented will produce the desired outcomes without changes also occurring among management and staff. Plan for the management of change.



For governments, the recommendations are:

1. Enforce Legislation that Exists

A common theme that emerged from the research is that governments tend to develop new legislation and regulations to address issues, sometimes ahead of enforcing existing guidelines and rules. Enforcing existing requirements is a first step.

2. Ensure Legislation Produces the Intended Outcomes

Legal requirements and enforcement include ensuring that regulations and legislation deliver the results intended, so that businesses are encouraged to make sound decisions. Recognizing and helping companies leverage traceability for business benefits supports more informed decision making that can impact on public good in times of emergency, and should be encouraged.

3. Pursue Consistency and Harmonization

The lack of harmonization on policies and regulations creates gaps, weaknesses, and limitations that are extremely difficult for individual businesses to address. This deficiency weakens interoperability and increases the costs of traceability and risks for businesses and consumers.

For NGOs, the recommendation is:

1. Engage in Constructive Dialogue

The attitudes that consumers express often differ from their actual shopping behavior. NGO's are encouraged to work with industry to influence changes in consumer behavior, as this is the most effective means of enabling and motivating changes in business behavior. Education and awareness are important, but so is understanding how to influence behavior.



Conclusion

The seafood industry has traditionally viewed traceability as a means to more efficiently managing a recall or other food-related emergency. The current research identified that leading businesses now view traceability from a more strategic perspective.

As has occurred before in industries like aerospace, automotive, and pharmaceuticals, traceability is increasingly seen as an outcome of a strategic, professionally managed approach to the gathering, retention, and analysis of key data elements at critical tracking events along the value chain. Much like the “quality is free” notion that drove improvements in the automotive and aerospace industries, many seafood businesses are now intentionally embedding traceability into the design of their business partnerships, information systems, and management practices.

The research demonstrated that adopting this strategic approach helps businesses profit from trust and transparency throughout the entire chain. With commercial transparency, businesses are able to make more rapid and assured management decisions, and monitor their effectiveness in relation to measurable targets that deliver real value to the consumer.

By using traceability to strengthen their ability to identify and manage the root causes that affect performance, companies are able to more effectively manage two of the most important influences on business performance and competitiveness: predictability and consistency. This research shows that leading global seafood businesses design and implement innovative traceability practices and systems from an entire value chain perspective.

For More Information

Global Food Traceability Center

Institute of Food Technologists
1025 Connecticut Avenue NW, Suite 503,
Washington, DC 20036 USA

Website: <http://www.globalfoodtraceability.org>