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Cost of Compliance with SPS Standards

# **Changing European Public and Private Food Safety and Quality Requirements**

*Challenges for Developing Country Fresh Produce and Fish Exporters*

**European Union Buyers Survey**



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## FOREWORD

Food and agricultural trade is the vital link in the mutual dependency of the global trade system and developing countries. Developing countries derive a substantial portion of their income from food and agricultural trade. The emergence of food safety and agricultural health issues and the related tightening of market requirements form challenges to further gains from trade due to the lack of technical and financial capacities of many developing economies.

As part of a joint program between the World Bank's Agriculture and Rural Development Department (ARD) and International Trade Department (PRMTR), a survey on the Cost of Compliance of exporting developing countries was undertaken. The survey was focused on the supply chains of high-value food products (horticulture, fish, meat, spices, and nuts). The study quantified the costs incurred by both the public and private sectors; identified the coping strategies employed by the various stakeholders in the supply chains; determined the constraints that hinder compliance; examined the structural changes in the supply chain resulting from compliance with the safety standards; and evaluated the impact of these standards on small-scale enterprises and producers. The survey included Ethiopia (animal products), India (fish and spices), Jamaica (nontraditional agricultural exports), Kenya (fish and horticulture), Latin America Southern Cone (animal products), Morocco (fruits and vegetables), Nicaragua (shrimp), Senegal (fish and groundnuts), and Thailand (shrimp and horticulture).

A complementary perspective is provided by the companion series of buyer surveys involving representative importers, brokers, retailers, and distributors in the European Union, Japan, and United States. This series, in turn, discusses the buyers' perception of the strengths and weaknesses of their suppliers and describes the assistance and/or interventions offered by the buyers to their developing country suppliers.

This working paper is one of a series of such buyer surveys. These surveys examined the strategies of suppliers from the buyers' perspective and the costs of intervention to assist the various developing country stakeholders to comply with international agro-food standards. This paper was prepared by Jan van Roekel and Sabine Willems of the Agri Chain Competence Centre, the Netherlands, and Eva Roth of the University of Southern Denmark with guidance from Kees van der Meer (ARD).

The findings and conclusions derived from these country studies are discussed in a synthesis report that seeks to identify possible points of intervention by the World Bank and other donor agencies and to determine the types of technical assistance that would be most efficient and appropriate. It is hoped that the experiences of these exporter and importer countries will provide useful insights to practitioners in the field, and to national and international policymakers in both the public and private sectors.

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## ACRONYMS AND ABBREVIATIONS

ACC	Aquaculture Certification Council
ACP	African Caribbean Pacific
ADI	Acceptable Daily Intakes
AOZ	Amino Oxazolidinone
ASM	Associated Marketing Service
BRC	British Retail Consortium
BSE	Bovine Spongiform Encephalopathy
CEC	Commission of the European Community
CIRAD	Centre de coopération Internationale en Recherche Agronomique pour le Développement
DG	Directorate General, Director General
DSP	Diarretic Shellfish Poison
EAN-UCC	European Article Numbering–United Code Council
EC	European Commission
EFTA/EEA	European Free Trade Association–European Economic Area
EU	European Union
EUREP-GAP	Euro-Retailer Produce Working Group for Good Agricultural Practices
EU-SANCO	European Union–Santé et protection des Consommateurs
FAO	Food and Agriculture Organization of the United Nations
FCD	French Federation du Commerce et de la Distribution
FDA	U.S. Food and Drug Administration
FPT	Fresh Produce Traceability
GAA	Global Aquaculture Alliance
GFSI	Global Food Safety Initiative
HACCP	Hazard analysis and critical control points
HAN	Heidelberg Appeal Nederland
ICPM	Interim Commission on Phytosanitary Measures
IFS	International Food Standard
IFS-FCD	International Food Standard - Federation des Entreprises du Commerce et de la Distribution
IPPC	International Plant Protection Convention
ISO	International Standards Organization
ISPM	International Standards for Phytosanitary Measures
MISSFISH	Market-driven incentive structures for sustainable fisheries management
MRL	Maximum Residue Limit /Level
MRM	Multi-Residue Method
MSC	Marine Stewardship Council
NOAEL	No Observable Adverse Effects Level
OECD	Organisation for Economic Co-operation and Development
PPA	Precautionary principle approach
PSD	Pesticide Safety Directorate (UK)
RASFF	Rapid Alert System for Food and Feed

SANCO	See EU-SANCO
SIPA	Seafood Importers and Processors Alliance
SPS	Sanitary and Phytosanitary
SQF	Safe and Quality Food
Tracefish	Traceability of Fish Products
WAS	World Aquaculture Society
WHO	World Health Organization
WTO	World Trade Organization



## EXECUTIVE SUMMARY

*The World Bank* has initiated surveys on Cost of Compliance for Standards on Trade to identify barriers, particularly those related to food safety aspects that developing countries face when exporting fresh perishable agricultural and fisheries products to the OECD countries. Nine surveys in the series focus on producers and exporters in developing countries, and three focus on buyers in importing countries. This survey focuses on the views of European buyers.

*European buyers* of selected fruits and vegetables (mango, pineapple, avocado, green bean, and tomato), and buyers of selected fish and fish products (tilapia, Nile Perch and shrimp) follow different strategies on sourcing these goods in developing countries. This study looks at the cost of compliance with food safety standards within this context.

Food safety has become a top priority for governments and the private sector in Europe. *The development of both public and private food safety standards* has been driven by the numerous food scandals that occurred during the last 5 to 10 years. Consumers have become concerned about the safety of the food they consume. Governments are reacting by imposing tighter food safety requirements and the private sector is, increasingly, using food safety as a competitive variable in commercial strategies. Private food safety standards (EUREP-GAP, HACCP, BRC, SQF, and ISO 9000) have been developed for the production, handling, and distribution of fresh fruits and vegetables. Similar private standards are being developed for fish products.

During the past decade, both the number and complexity of EU *public regulations* for food safety have increased. In turn, EU member states have developed food safety regulations and monitoring procedures. Although the European Commission (EC) aims at harmonizing food safety regulations and monitoring by member states, differences among national systems still exist. These differences include the number of samples taken for testing, technical capabilities for detection, and action taken by inspection services upon the rejection of goods, such as destroying or returning goods. However, for fish inspection services, a new EC directive has been passed to fully harmonize monitoring and control procedures in all member states.

The food safety issue has been developed into a “core competency” by the major market players whereby the bundle of skills and technologies required enable companies to provide a special, non-product-specific benefit to their consumers. The *private food safety guidelines and standards* imposed by importers and retailers exceed the public food safety requirements. Most retailers have developed their own specifications for imported fresh fruits and vegetables, including a range of organoleptic criteria, appearance, grading, ripening, maximum residue limits/levels (MRLs), packing, labeling, and phytosanitary specifications. Private protocols for fish and fish products are being developed. The Euro-Retailer Produce Working Group for Good Agricultural Practices (EUREP-GAP) certification is expected to dominate the market in the near future for all producers supplying fresh produce, including fish products, to the major European

retailers. It is widely believed that the number of private standards will not decrease in the future but will be expanded to include other specific requirements such as ethical and environmental issues. Furthermore, tracking and tracing of products in the supply chain will become a private and a public requirement. These developments tend to exclude small-scale producers from large market segments.

Food safety forces *supply chain* actors to collaborate to obtain transparency in the supply chains that will guarantee a safe product for consumption. Within the different types of supply chains, food safety issues are implemented differently:

- *Transnational companies* coordinate and control all chain activities in a vertically integrated supply chain and guarantee a safe product of high quality under a private label.
- Producers and companies operating in a *collaborative* supply chain are supported by buyers in the implementation of private standards. Information about public and private food safety and quality requirements (such as issues related to phytosanitary requirements and pesticides) are communicated by the buyers.
- A large number of small-scale producers and companies are involved in *transaction-oriented or importer-driven* supply chains. These producers and companies trade their produce through intermediaries and, therefore, are disconnected from the European market. The collaboration of chain partners is limited to transaction processes. These producers and companies are not regularly informed about food safety and quality requirements and run the risk of noncompliance with these requirements.

The types of supply chains identified in the two fresh products segments show great differences in *who* takes the responsibility for the food safety, *how* they deal with problems encountered in their sourcing procedure, and *where* in the supply chain they focus the monitoring and control procedures. The information flow among the players is of utmost importance and differs among products and countries. Retailers have transferred the responsibility for the safety of food to their preferred suppliers.

*Food safety problems* encountered for fish and fish products are microbiological contaminants due to lack of hygiene in the production process, residues from use of prohibited antibiotics, metal contaminants, parasites, and a broken cold chain. Food safety problems encountered for fruits and vegetables are primarily residues of pesticides and phytosanitary. Reasons for changing suppliers include food safety problems; problems related to the availability of volume; reliability of supply; a decent price; quality and packaging problems; social and ethical issues, including labor conditions; and political conditions.

*Qualitatively, the costs of compliance* with food safety can be summarized to unavoidable *direct costs*, which are tied mainly to heavy investments and higher operating costs. *Indirect cost* tied to the loss of opportunity has been pinpointed. *Risk assessment* is a crucial parameter in the economic decision making of private companies buying for the European market. The more

intangible *hidden costs* are reported to be substantial. These include costs encountered due to lack of information, innovation, and learning.

*Remedial actions and assistance of the international community*, preferably through collective action by the World Bank and other donor agencies, are greatly needed. The companies in developing countries often are left in limbo for lack of information on performance indicators, rules, and regulations; poorly performing national authorities; lack of infrastructure for transport of goods; and lack of knowledge on changing demand patterns of European consumers.

The remedial actions recommended in the interviews are improvement of technology; implementation of tracking and tracing systems; standardization of registration and documentation; organizing small-scale farmers, aquaculture farmers, and fishermen in developing countries; training small-scale producers; accredited auditing agencies; local offices specialized in private standards; creating enabling export environments by national governments in developing countries, and investment in health and social care of employees in the agricultural sector.

The role of donor agencies is to support the *public sector* in developing countries by strengthening the public institutions, specifically, the competent authority and inspection agencies. Assistance to the *private sector* can be in the form of *investments and organizational support*. Major support should be extended to the small-scale enterprises, which are at risk of being cut off from the supply chain due to their lack of knowledge of the food safety and quality requirements of the buyers and/or the lack of capacity to comply with these requirements. Assistance should focus on their inclusion in coordinated supply chains.



# 1. INTRODUCTION AND BACKGROUND

The export of fresh agricultural and fishery products from developing countries to markets in OECD countries is increasing in response to consumer demand for year-round delivery of fresh produce. At the same time, concern about the safety of food has increased rapidly, and governments and leading businesses are responding by strengthening food safety control. Developing countries must meet tightening market requirements.

The 1995 World Trade Organization Sanitary and Phytosanitary (WTO SPS) agreement was expected to improve developing countries' opportunities to expand their agricultural export to OECD countries. However, it appears that many countries, in particular the poorest countries, have major problems in meeting food safety and other market requirements of importing countries. The 2001 Genoa G8 and the 2001 Doha Declaration ask for more attention to the needs of poor countries for support in meeting trade standards.

The World Bank has initiated a project to identify difficulties that exporters from developing countries are facing in meeting food safety standards in OECD markets.

The project consists of surveys in producing and importing countries and focuses mainly on supply chains for fresh produce. As part of this project, this report looks at the experience of European buyers who are importing from developing countries.<sup>1</sup>

## SURVEY OBJECTIVES

The objectives of the European buyer survey are to:

Identify public regulations and legislation and private standards (EUREP-GAP, BRC, HACCP) related to food safety and quality in the importing EU countries

Assess trends in managing food safety and quality regulations and standards in the public and private sectors

Assess to what extent these regulations and standards create barriers for producers and exporters from developing countries

Identify relationships between developing country producers and EU buyers.

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<sup>1</sup> The authors gratefully acknowledge the time, information, publications, and documents given to us by private companies, public authorities, interest organizations, individual researchers, and scientists.

## DELIMITATION AND METHODOLOGY

This European buyers survey focuses on the import of selected fish products, fruits, and vegetables. The fish survey covers shrimp and two species of African lake fish: tilapia and Nile Perch. Shrimp is selected as it is the fish product with the highest trade value in the world market. Tilapia and Nile Perch are selected because they are caught primarily in African countries. The fruits and vegetables survey included pineapple, mango, avocado, tomato, and green bean. All products have had occasional problems with food safety and phytosanitary compliance.

The fish survey concentrated on the import from selected developing countries (table 1). The fruits and vegetables survey includes all developing countries from which these products are imported.

**Table 1. Selection of targeted countries per product**

<i>Shrimp</i>	<i>African lake fish</i>	<i>Fruits and vegetables</i>
Kerala, India	Kenya	All developing countries
Nicaragua	Zimbabwe	
Thailand	Other African countries*	
Venezuela		
Vietnam		

\*Note: Countries that share waters from lakes fished primarily by Kenya and Zimbabwe.

Due to their significant roles in importing, re-exporting and processing, the following countries have been selected for this survey: Denmark (fish only), France, Germany, the Netherlands, and the United Kingdom.

Most information was obtained from interviews and from published information and references to key publications received from the interviewees. A detailed questionnaire was used for guidance during the interviews and additional phone conversations. The buyer survey included interviews with major retailers, wholesalers, importers, fish processors, branch organizations of retailers and importers, and national and EU policymakers and public control officers. Table 2 lists the number of interviews.

Secondary information was gathered on regulatory systems, reported problems, and noncompliance with food safety and quality regulations and standards in the fish and fruit/vegetables sector.

### OUTLINE OF THE REPORT

This report covers the following material:

- Chapter 2 provides an

**Table 2. Overview of conducted interviews**

<i>Actors/agencies interviewed</i>	<i>Number of interviews</i>
Retailers	4
Importer/wholesaler	10
Processors of imported fish and shrimp	2
National and international policymakers	6
National public control officers	3
Overall retail/importer branch organizations	5
Others (knowledge institutes)	2
<b>Total</b>	<b>32</b>

overview of the driving forces for general market trends and food safety control in the EU.

- Chapter 3 outlines the different types of supply chains for exports of fresh fish and fruits and vegetables from developing countries to the European market.
- Chapter 4 describes the major public and private food safety regulations and their enforcement. The views of the private sector on food safety and quality standards also are included.
- Chapter 5 indicates the problems encountered with the import of fish and fruits and vegetables. Buyers' reasons for changing suppliers are discussed.
- Chapter 6 indicates the various types of costs and benefits associated with the compliance with food safety and quality requirements.
- Chapter 7 presents the remedial actions suggested in the interviews to improve the safety and quality of food. The possible role of donor agencies in supporting improved food safety and quality compliance are outlined.

## **2. DRIVING FORCES, TRENDS, AND EUROPEAN UNION MARKET PLAYERS**

### **DRIVING FORCES FOR FOOD SAFETY CONTROL**

Over the past 5 to 10 years, numerous food scandals occurred in Europe. European consumers, generally already sensitive to food safety, were especially alarmed by Bovine Spongiform Encephalopathy (BSE) and dioxin problems and scared by, among others, salmonella, listeria, and cholera threats. The European Union and governments responded by imposing tighter food safety requirements, including higher standards, use of HACCP, increased monitoring, product liability, and labeling. The White Paper on Food Safety of January 2000 (CEC 2000) sets out plans for a proactive new food policy. The EU General Food Law, which will be put in place in 2005, will outline requirements for tracking and tracing in the supply chain. EU member states tightened their own food safety control systems and implemented the European Commission's new food safety legislation and monitoring requirements in their national systems.

Private companies, individually as well as collectively, also implemented measures to prevent food safety scandals. The retail sectors in the United Kingdom and the Netherlands have developed their own private standards for food safety and quality, some of which exceeded the public food safety regulations. In 1998, UK retailers cooperating in the British Retail Consortium (BRC) took the initiative to formulate common standards to inspect food suppliers. The BRC

standard and other private “codes of practice” and standards, such as EUREP-GAP and SQF, are now applied by supermarkets and importers all over the world to coordinate supply chain activities and control food safety.

Most interviewees see food safety control as one of the highest priorities within the fresh produce sector. Retailers in particular are held directly responsible by their customers for the safety of food. However, retailers, in turn, pass this responsibility on to their importers and processors by developing strict food safety and quality protocols. When major food safety issues arise, both retailers and importers will be affected by any recall, even if they themselves are not directly to blame for the problem.

According to the interviewees, consumers increasingly are willing to pay a price for safe products. The number of fresh products labeled or branded by retailers is growing, such as Tesko’s “Nature’s Choice” and Edeka’s “Rio Grande”. Labeled or branded products are differentiated from other products and guarantee food safety and quality. In case of private labels or brands, retailers are directly responsible for food safety and keep close contact with all actors in the supply chain.

Developing countries that want to benefit from global food markets must adapt to the stringent quality and safety requirements in these markets. They need to harmonize their legal frameworks, monitoring, and control procedures on food safety with their buyers. Importing companies must gain better control over production and trade to guarantee traceability of the products. Supply chain collaboration is required not only for food safety control and transparency but also for operating and competing effectively in the global market.

### **TRENDS IN THE FRESH PRODUCE SECTOR**

Consumers demand year-round delivery of fresh produce. This requires sourcing from producers in other climatic regions and in the Southern hemisphere. Due to improved technology, fresh produce can be shipped more easily and faster than in years past from half-way across the world at competitive prices.

Supermarkets have attracted consumers away from wet markets and greengrocers in European markets. With a market share of approximately 80 percent of total fresh produce retail sales, supermarkets account for the majority of fruit and vegetable retail sales in Western Europe (Rabobank 2002). Although the main market outlet for fish is still the wholesale market, retailers are expanding the fish sections in their shops in response to growing consumer demand.



**Box 1. “Race to the Top” Initiative**

The “Race to the Top” collaborative initiative is based on constructive engagement between an alliance of organizations and the major UK retailers. “Race to the Top” aims to track and measure what UK supermarkets are doing across a broad range of social, environmental, and ethical issues; and to catalyze change within the UK agrifood sector and beyond. An alliance of farming, conservation, labor, animal welfare, and sustainable development organizations has developed several indicators of supermarket performance. These indicators will provide comparative data to track progress toward fairer and greener food over the next five years.

Source: [www.racetothetop.org](http://www.racetothetop.org).

The consolidation of retailer power in the supply chain will result in more coordination of supply chain activities to control and guarantee food safety, quality, and price. This will, in particular, be the case for private labeled or branded products. Retailers are developing specific food safety and quality protocols (codes of practice) with which suppliers must comply.

Due to changing lifestyles, social trends (for example, increased number of single heads of households), and rise of income, demand for convenience food (ready-to-eat meals, fresh-cut fruit and vegetables, fresh salads) has increased. Consumers also are paying more attention to their health. Finally, consumers

increasingly attribute great importance to the use of environmentally friendly and ethically correct production systems. Because citizens are interacting more and more with the supply chains, most of the private retail standards have expanded to include social, ethical, and environmental issues (box 1).

### EUROPEAN UNION MARKET PLAYERS

There are numerous importers of fruits and vegetables in Europe. Most importers supply fruits and vegetables directly to retailers (75 percent–80 percent) (Grievink and others 2001, Park and McLaughlin 1999). These importers source tropical fruit and vegetables from producers in developing countries, often on a contractual basis. Most retailers choose to deal with preferred suppliers (importers and producers) who follow the retailers’ specifications for production, handling, and packaging. The share of imported product sold to wholesalers is approximately 15 percent–20 percent (restaurants, ethical markets, local supermarkets) while 5 percent–10 percent is re-exported (to Central and Eastern Europe, for example).

Producers from developing countries export a significant amount of tropical fruits and vegetables to the EU. FAO data show that in 2000 the value of imports of fresh vegetables from developing countries to the EU was approximately US\$950 million. The interviewed retailers and importers indicate that, at the moment [2003], there is an oversupply of tropical fruits and vegetables. Thus, retailers and importers can choose their preferred suppliers from a large number of fruit and vegetable suppliers. Most retailer-importer-producer relationships are based on long-term trade relations.

Europe buys the fruits and vegetables included in this survey from many developing countries, including Brazil, Costa Rica, Cote d’Ivoire, Egypt, Kenya, Mexico, Morocco, and South Africa. According to importers of fruit and vegetables, customers in South Europe prefer large sizes of tropical fruits (such as pineapples, melons, papayas, and mango) whereas customers in North Europe prefer smaller fruits.

The total import of fish by Europe in 2001 was valued at US\$23 billion; the total world import value was US\$59.3 billion (Vannuccini 2003). Shrimp is the largest commodity in world fish exports with a value share of almost 19 percent. The share of freshwater fish (carp, tilapia, Nile Perch) is only 1.3 percent (Vannuccini 2003).

Wild tilapia is mainly sourced from Lake Victoria and farmed tilapia is from different countries such as China, Costa Rica, Indonesia, Jamaica, Malaysia, Taiwan, Thailand, United States, and Vietnam, and recently Uganda and Zimbabwe (Globefish 2001). Different species of tilapia are preferred by different markets. Germany prefers Nile tilapia, the UK red tilapia from Jamaica. The larger part of the imports is the wild-caught tilapia. Tilapia and Nile Perch are imported as whole frozen fish or as fresh and chilled fillets.

In 2003 in the EU there are only approximately five importers of tilapia and very few of Nile Perch. Even though small traders may include imported tilapia and Nile Perch in their assortment, these importers most often are intermediaries in the supply chain and have bought the fish from one of the large importers/processors.

Demand from European consumers includes small shrimp, primarily sourced from wild catches, and large tropical shrimp from both freshwater aquaculture and marine culture. Major shrimp producers are China, India, Indonesia, Malaysia, Thailand, and Vietnam. The number of European importers of shrimp from South East Asian sources is not known. However, only a few importers account for the bulk of the trade. The EU market for tropical shrimp follows price trends in Japan and the United States. For coldwater shrimp, on the other hand, the EU is the price-setter, since it imports some 90 percent of the total supply in the world market.

## **SUMMARY AND CONCLUSIONS**

Numerous food scandals have obliged the public and private sectors to impose tighter food safety requirements. The EU and member states have introduced new legislation and strengthened food safety control measures.

Food safety concerns force producers, traders, and retailers to collaborate to provide transparency in the supply chain, to guarantee the safety of food, and to react directly to incidents when they occur.

Control of food safety for fresh produce has become the top priority for retailers. Innovations in the supply chains are needed to fulfill consumers' demand for year-round supply of safe tropical fresh produce. Some retailers have developed their own private labels for fresh produce that guarantee quality and safety. Ethical and environmental concerns urge retailers to include these aspects in their private standards. Collectively, retailers cooperating in BRC and EUREP-GAP have developed protocols for controlling food safety by tracking, tracing, and certification.

There are numerous European importers of fruits and vegetables from developing countries, but only a few who import fresh tilapia, Nile Perch, and shrimp. Approximately 80 percent of fruits, vegetables, and fish from developing countries are sold in European supermarkets.

### 3. SUPPLY CHAINS FOR FISH AND FOR FRUITS AND VEGETABLES

The chapter provides an overview of the fresh produce supply chains and the tracking and tracing initiatives in them. The supply chains for fresh fish from developing countries to the markets of the EU countries selected for this survey are different from the supply chains for fruits and vegetables. Differences in the organizational structures of supply chains result in differences in the implementation of food safety and quality control systems

#### SUPPLY CHAINS FOR FISH

Exporting countries of the selected fish products mentioned in the interviews are:

**Shrimp** Bangladesh, Ecuador, India (Kerala, Tamilnadu), Indonesia (Java, Kalimantan, Sulawesi, Sumatra), Myanmar, Pakistan, Thailand, and Vietnam

**Tilapia** Kenya, Tanzania, Zimbabwe

**Nile Perch** Kenya, Tanzania, Uganda.

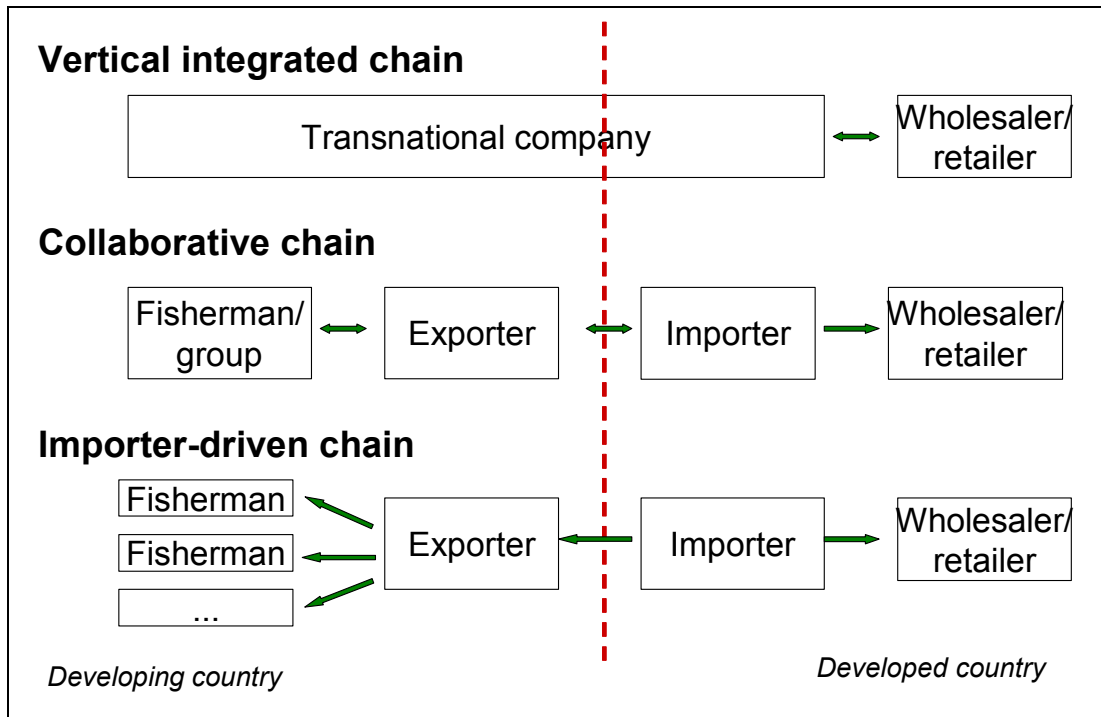
Only companies that have obtained an EU approval number are able to supply fish from developing countries to EU buyers. There are two main types of suppliers:

Local intermediaries who buy wild-caught shrimp, Nile Perch, and tilapia from a large number of local fishermen and companies

Local and foreign producers that supply farmed shrimp and tilapia. Only two major companies that supply farmed tilapia are known to export to the European market.

There are three types of supply chains for fish (figure 1):

Figure 1. Three types of supply chains for fish



### Vertically integrated supply chain

In the vertically integrated supply chain, the chain activities of fish farming, processing, and transportation to the European wholesaler/retailer are fully under the control of one transnational company (in most cases, of Western origin). This type of supply chain deals with farmed fish, fishing/freezing vessels, and factory ships. Because of the full coordination of the chain activities, food safety can be optimized in all successive operations from hatching the fish larvae to selling the fish to a European wholesaler or retailer. These companies train their staff well, use modern equipment, and comply with European food safety and quality regulations. The companies are HACCP certified, and some are even BRC certified. Employees of a transnational company are working in the developing countries in which the fish is farmed. The information flow between this company and the European buyers include the private protocols issued by the buyers. Most transnational companies are in contact with the public authorities. One such vertically integrated company of farmed tilapia explained that it is assisting the national authorities of Zimbabwe with the harmonization policy of food safety for fish.

### Collaborative supply chain

Within a collaborative supply chain, the chain actors are in contact with one another and exchange information on quantity, food safety, quality, and marketing aspects. This type of supply chain deals, in particular, with companies of farmed fish or local intermediaries (all have approval numbers to export to Europe) who have established relationships with European importers (especially with regard to wild tilapia and Nile Perch). Most European importers who source fish from a particular country or from selected traders have established local offices in the developing countries to coordinate activities in the supply chain (processing, transportation,

quality control, export papers). The local office of the importer is in close contact with all chain actors and the national public authorities in the developing country. When needed, the importer will advise the chain actors about the implementation of food safety and quality requirements.

### **Importer-driven supply chain**

The European buyers of shrimp from developing countries are faced with a much larger and more differentiated market situation than buyers of tilapia and Nile Perch. The shrimp buyers source from a wide range of suppliers (all suppliers have obtained approval numbers to export to Europe). These suppliers/importers, in turn, deal only with intermediaries. The intermediaries are in direct contact with the shrimp fishermen. Because of the differentiated supply of shrimp, the risk of encountering food safety problems is very high.

Importers rely extensively on food safety and quality checks of the products at the European entry point. Most importers have computer systems that accumulate information with regard to the purchase from each single supplier. Feedback related to food safety findings and organoleptic properties, price, and quantity is sent back to the local intermediary in the developing country. The local intermediary who is responsible to the European importer runs the risk of a bad reputation in case of noncompliance with food safety. This type of supply chain has also been identified in the tilapia and Nile Perch sector (albeit on a smaller scale than in the shrimp sector).

## **SUPPLY CHAINS FOR FRUITS AND VEGETABLES**

These are the exporting countries of the selected fruits and vegetables that were mentioned in the interviews:

**Avocado:** Kenya, Mexico, Peru, South Africa

**Mango:** Brazil, Cote d'Ivoire, Guatemala, Kenya, Mexico, Peru,  
Puerto Rico, Senegal, South Africa

**Pineapple:** Costa Rica, Cote d'Ivoire, Dominican Republic, Ghana, Honduras

**Green beans:** Egypt, Ethiopia, Guatemala, Jordan, Kenya, Morocco, Senegal, South  
Africa, Zambia

**Tomatoes<sup>2</sup>:** Egypt, Morocco

Fruits and vegetables are obtained from different sources in the developing countries:

- Producers (local or foreign) who have established long-term trade relations with the importers and retailers (some relationships may date as far back as 25 years).

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<sup>2</sup> Tomatoes are sourced primarily from European countries including the Canary Islands, the Netherlands, Spain, and the United Kingdom.

Importers and retailers pointed out that these long-term trade relations are valued highly as these producers (often large-scale) are well aware of the importers' and retailers' specific demands and have proven to be reliable. Regular visits of the importer or retailer to these farms take place.

- Plantations of the importer.
- Producers' cooperatives or groups.
- Local traders who export products from small-scale producers.

In some cases, retailers and importers participate in the investments in the production facilities of these producers with whom they have a long-term relation so that they are guaranteed a regular supply of safe and high quality products. Some European importers have invested in plantations in developing countries to ensure the supply of high quality products and to be able to track and trace products within the supply chain (box 2).

#### **Box 2. Plantations of European importers in developing countries**

At the beginning of the 1990s, a Dutch importer established a green bean farm and packing station in Egypt. The packing station is now BRC certified, and the farm EUREP-GAP certified. Since an employee of the importer manages the farm activities and organizes the transport of the beans by plane to the Netherlands, the importer controls the supply chain and is, according to a retailer, a reliable supplier of beans.

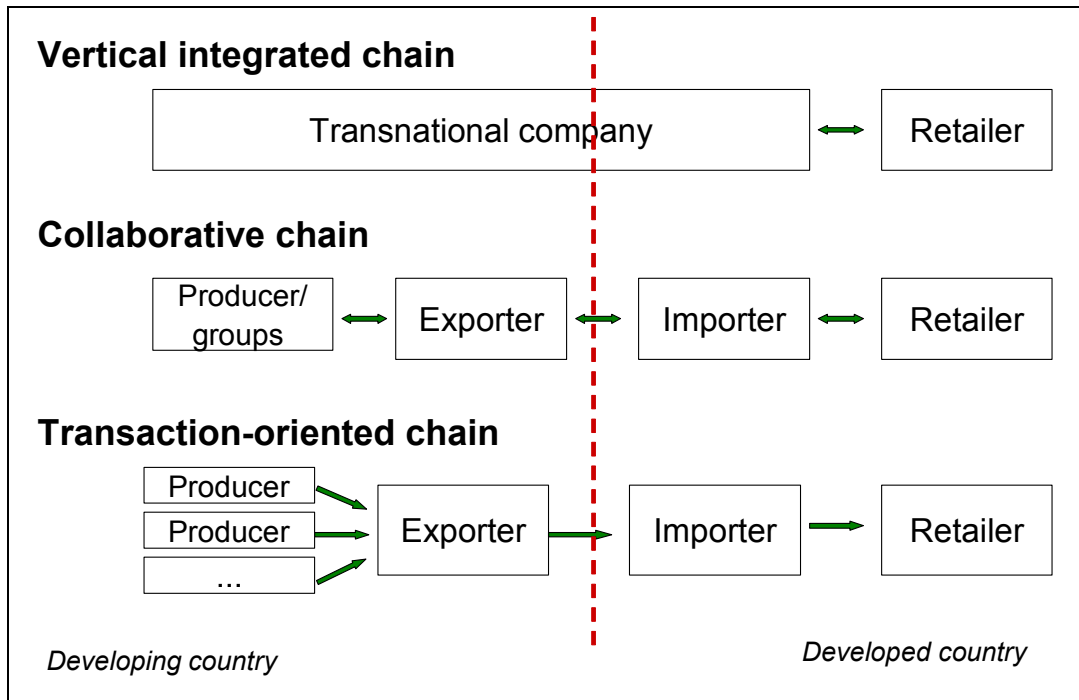
A French importer who holds shares in a pineapple plantation in Cote d'Ivoire has placed a countryman at the farm who is responsible for the supply of high quality pineapples and organizes the transport of pineapples by boat to France.

Another importer in France realized that, to operate in the market 10 years from now, he would have to control the quality of the product. This importer invested in a pineapple and banana plantation in Cameroon and Cote d'Ivoire, respectively, and controls the production, transport, and import activities. A small laboratory has been built at these plantations to conduct tests, analyze problems, and execute experiments with new plant material. The importer has set up a partnership with the French research institute, CIRAD, for technical support. In case problems arise, CIRAD scientists are flown to visit the plantations.

#### **Vertically integrated supply chains**

Importers or multinationals that control most of the fruit and vegetable supply chain activities (production, export, and distribution) operate in a vertically integrated supply chain (figure 2). These companies also are called transnational companies. Food safety and quality issues can be controlled and monitored well since the different chain activities are under the responsibility of one corporation. The safety and quality of the products is, therefore, very high. Most of these companies cultivate products of top quality. Some companies even guarantee quality in a private label. To avoid the food safety and quality requirements of differing private retail standards (different registration systems), most companies have developed their own private food safety and quality specifications that exceed most of the private retail requirements. They train their staff to conduct specific handling and to conduct quality inspections. The companies are in close contact with the European buyers.

Figure 2. Three types of supply chains for fruits and vegetables



### Collaborative supply chain

Within the collaborative supply chain, the chain partners are in close contact with one another. The major European supermarkets have established long-term relationships with a limited number of large-scale importers for the supply of fresh fruits and vegetables. Some importers have even obtained exclusive trade relations. The importers have adjusted their organizational structures to match the retailer's demand. They source fresh produce from preferred producers from different countries, including many developing countries. Often they also process fruits and vegetables into salads. The number of producers supplying certain fruits or vegetables is very limited. For example, for tomatoes, pineapple, and green beans there often are only one or two producers.

The retailer communicates his specific requirements regarding food safety and quality to the importer and the producers. The importer also informs the producers about the public food safety (such as phytosanitary and MRL regulations) and quality requirements, (such as grading and packaging requirements) of the importing country and the specific demands of the retailer.

To control and monitor the quality and safety of the products, the importer visits the producer on a periodic basis, often together with the quality manager of the retailer; sends product samples to the laboratory (once or twice a year per product per supplier); and samples the visual quality of each shipment. Some importers audit the farms of the producers according to the retailer's specifications. The retailer checks only the quality of the products briefly at arrival, in the distribution centers, and in the stores; and sends samples to the laboratory on a periodic basis.

## Transaction-oriented supply chains

Approximately 80 percent of small-scale producers are still involved in transaction-oriented supply chains. These producers often sell their products without knowing the final market destination. Local traders, cooperatives, and large-scale producers buy the products of these producers at the farm gate and export the products to Europe. In many cases, these products are sold to various outlets such as supermarkets, wholesalers, specialist shops, or traders who re-export the products in fresh or semi-processed form. In this supply chain type, collaboration of chain partners is limited to transaction processes; therefore, information related to food safety and quality is hardly communicated. As a result, producers often are not aware of public and private requirements and, therefore, risk noncompliance with these requirements.

### TRACKING AND TRACING IN THE SUPPLY CHAIN

More and more, tracking and tracing within the supply chain is becoming a requirement of retailers and importers, especially for retailers and importers who give highest priority to food safety. Many retailers and importers have established close contact with preferred producers and are able to track and trace the products in the supply chain. Some retailers do require a full tracking and tracing system for their products. One retailer explained that it expected the importer to be able to trace the origin of the product to the field plot level and have information about the exact date and time the product was harvested. The importer is able to provide this information only if s/he is in close contact with the producer or producers' group.

Most of the interviewees expect that tracking and tracing systems will become not only a private requirement in the future but also a public requirement. Some expect the General Food Law of the EU, which will be in place in 2005, to cover tracking and tracing fruits and vegetables. Tracking and tracing from the processing factory downstream through the supply chain is a legal requirement for fish and fishery products. Many activities are being undertaken to develop, exchange, and disseminate information related to food safety, quality, and tracking and tracing food in supply chains. Box 3 describes the case of an importer who invested in a tracking and tracing system.

Public-private partnership initiatives have been established to exchange and disseminate information related to food safety and to develop tracking and tracing in supply chains (box 4).

#### **Box 3. Tracking and tracing table grapes**

An importer recently introduced a bar code tracking and tracing system in the table grape supply chain from a farm in Namibia. This bar code system provides information about the production plot, the grower, and the date of export. The importer expects that, in the near future, this bar code system might even provide information about the number of hours of sunshine that the grapes have received, which is an important parameter for the taste. The importer has close contacts with the Namibian grower of table grapes and has invested in upgrading the farm, the packing station, and plant material to improve the quality of the product. The importer has a long-term agreement with the farm for the supply of grapes.



#### **Box 4. Public-private initiatives of supply chain information**

The EU project, “Global Food Network–High Quality and Safe International Food Chains,” is a concerted action of partners in 12 countries. It includes public and private partners from Africa, the Caribbean, Europe, and Latin America. The project aims to establish an international research and knowledge network on cross-border food supply chains and networks of public and private parties, including producers, exporters, processors, importers, sector branch organizations, research institutes, and governmental agencies. Food safety and quality in the fruit, fish, and beef sectors are the main focus areas. The project started in September 2002 and will be finalized in August 2005. (see [www.globalfoodnetwork.org](http://www.globalfoodnetwork.org))

Another EU-funded research project, “Impact of European private safety and quality standards on fresh produce exports from Mediterranean countries,” evaluated the regulatory and compliance gaps of three selected Mediterranean countries with international standards and the private sector requirements imposed by international buyers. The project ran from 2001 to 2003. (see [www.wye.ic.ac.uk/AgEcon/FIM/projects/medprod/index.htm](http://www.wye.ic.ac.uk/AgEcon/FIM/projects/medprod/index.htm))

Tracefish, or “Traceability of Fish Products,” was another EU concerted action project in 2000–02. The Tracefish consortium includes 24 companies and institutes (fish exporters, processors, importers, and research institutes). Because of the increased demand for information by consumers, Tracefish brought together companies and research institutes to identify which data should follow a fish product through the chain from catch/farming to consumers. The project also came up with recommendations for common European standards for traceability of farmed fish. (See also [www.tracefish.org](http://www.tracefish.org).)

A consortium of Greek, Irish, Portuguese, and Scottish companies recently started the EU project, “European Seafood Processing Internet Portal–Website.” Its aim is to compile a comprehensive information database detailing certified fish processors and premises for Britain, Greece, Ireland, and Portugal. Furthermore, the project has developed a multilingual website of certified European Fish Processors searchable by location, size, and products, which provides rapid information. This database and website improves the traceability and transparency of the international seafood trade sector. (see also [www.euseafood.com](http://www.euseafood.com))

Some initiatives are developing and implementing information systems for the exchange of data on logistical and quality issues to track and trace products in the supply chain. One such initiative is the public-private partnership project, “Integrated Supply Chain Information System for Fruit Produce between South Africa and the Netherlands” ([www.inro.tno.nl/fruitful](http://www.inro.tno.nl/fruitful)). This collaboration between public and private parties has resulted in the design of an information system that can be used by all supply chain partners to track and trace products in the chain.

Another EU initiative, the “Fresh Produce Traceability (FPT) for the South Africa Fruit Industry” project, recommends the implementation of the EAN-UCC standard to locate pallets in the supply chain. The FPT project is recognized by organizations such as the European Association of Fresh Produce Importers, EUREP Working Group, European Union of the Fruit and Vegetable Wholesale Import and Export Trade, Eurohandelsinstituut, and Southern Hemisphere Association of Fresh Fruit Exporters. Together with these organizations, a Fresh Produce Traceability Guideline has been developed (to be downloaded at [www.ean-int.org](http://www.ean-int.org)).

## 4. PUBLIC AND PRIVATE FOOD SAFETY REGULATIONS, LEGISLATION, STANDARDS, AND INSPECTION

### PUBLIC FOOD SAFETY REGULATIONS AND LEGISLATION

#### International public food safety regulations and legislation

As trade tariffs are decreasing and the use of other traditional trade barriers are being disciplined by the agreements of the WTO, the focus of governments on sanitary and phytosanitary (SPS) measures for international trade of agricultural products is intensifying. These measures are implemented to ensure that food is safe for consumers, and to prevent the spread of pests and/or diseases among animals and plants. Although many argue that these measures also may be used as protectionist devices to keep foreign competitors out, food safety has become a top priority. Developing countries that are not able to comply with these measures will not be able to import to the EU.

Henson and Loader (1998) argue that the SPS Agreement apparently does not allow equal access to all potential participants, particularly developing countries, due to the complex science involved in many of the negotiations. Consequently, developing countries face relative greater difficulties in participating in international agricultural trade. Their argument may be true. Nevertheless, the overall opinion of the public and private sectors in the EU is that food should be safe, regardless its source.

Different international regulations and legislations are developed to protect the safety of consumers, to ensure fair trade practices in food trade, and to promote coordination of all food standards undertaken by international governments and nongovernmental organizations (table 3).<sup>3</sup>

**Table 3. Most common international food safety regulations and legislation**

<i>Name</i>	<i>Body</i>	<i>System</i>	<i>Obligation for parties</i>
Codex Alimentarius	FAO/WHO	HACCP-based codex	No
SPS Agreement	WTO	No technical codex	Yes, for WTO members
EU législation	EU	HACCP Good hygiene practice based	Yes

The International Standards for Phytosanitary Measures (ISPMs) are developed through the work program of the Interim Commission on Phytosanitary Measures (ICPM). The International Plant Protection Convention (IPPC, New Revised Text 1997) and the WTO Agreement on the Application of Phytosanitary and Sanitary Measures (SPS Agreement) provide the legal framework under which the ISPMs are developed. The ISPMs are adopted by the ICPM after

<sup>3</sup> The details of the various regulations and legislation may be found at <ftp://ftp.fao.org/codex/standard> and [http://www.codexalimentarius.net/standard\\_list.asp](http://www.codexalimentarius.net/standard_list.asp).

development through a defined and agreed process of preparation and country consultation. The ISPM describes the structure and operation of a phytosanitary import regulatory system and the rights, obligations, and responsibilities that should be considered in establishing, operating, and revising such a system.

### **National public food safety regulations and legislation**

Food safety has become a top priority for the public and private sectors. During the last decade, there has been a proliferation of EU regulations in the field of food safety and quality as well as an increase in the complexity of public regulations due to their numerous extensions and specifications. EU member states have their own national food safety policies. Thus, in addition to the EU regulations, a thorough knowledge of the different national requirements is necessary for importers and retailers.

The EU's DG Health and Consumer Protection (DG SANCO) has the overall responsibility to protect the health, safety, and economic interests of consumers as well as public health.<sup>4</sup> Public food safety standards for imports of fish and fruits and vegetables from non-EU member countries have been driven by EU rules and regulations. Each EU member state has developed food safety regulations, packaging and labeling requirements, and inspection systems for cross-border agricultural chains following the EU food safety regulations and monitoring practices.

Although the European Commission's goal is that all EU member states harmonize their food safety regulations and monitoring practices, most interviewees reported that differences among the national regulations and monitoring systems still exist. Problems arising from these differences of standards and requirements were mentioned by nearly all interviewees in the fruit and vegetable sector (box 5).

For imported fish food safety regulations are harmonized within the EU. The EU has developed a procedure to verify the adequacy of food safety regulations and monitoring of non-European countries that export fish to EU markets. Inspectors of the EU (DG SANCO) audit both public and private performance indicators after application, and renewed inspections are carried out especially in countries that have experienced major food safety problems. The EU has established a list of non-member countries that match EU food safety regulations and monitoring practices (List I) and a list of countries that meet EU standards but have not harmonized their food safety regulations yet (List II).<sup>5</sup> Countries mentioned on these lists grant approval numbers to fish companies (fishing/freezer vessel, processing company) certifying that the companies adhere to the harmonized food safety rules and, therefore, are allowed to export to the European

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<sup>4</sup> The details of the various regulations and legislations may be found at <http://www.europa.eu.int/eur-lex/en/index.html> (all regulations and directives).

<sup>5</sup> Council Directive of July 22, 1991. The list was drawn up and applied from July 1, 1997 onward and last updated on October 29, 2002. It should be noted that, according to SANCO, List II was only temporary and was valid up to January 1, 2004, in case the EU had decided not to extend the period.

Union. The approval number makes it possible to trace the fish to a company or fishing/freezer vessel.

**Box 5. Problems with maximum residue level regulations in the European Union**

A large importer of fruit and vegetables explained that a container of tomatoes cultivated by producers in North Africa was accepted by a South European country, but a container of tomatoes of the same harvest was rejected by another European country because the product contained the residue of a particular pesticide at a level that exceeded the maximum residue level. According to the importer, the two countries used a different MRL for the same pesticide.

Governments examine only samples of shipments of fruits and vegetables on MRL. As a result, many shipments are imported without testing and may contain pesticides that exceed the MRL.

No MRL is specified for pesticides whose use is not allowed in any of the EU countries. This lack of a specific level implies that the country (or countries) implements a zero tolerance for residue traces of these pesticides on products. Producers in developing countries who use these pesticides face problems when residues of these pesticides are found on the products during inspections at the border of the importing country. An importer described the problem of mango growers who have used such pesticides that have no specified MRL. Residues were found on these products, and the shipment was rejected.

In the fruits and vegetables sector, DG SANCO is aiming at a harmonized framework for the authorization, use, and control of plant protection products; monitoring pesticide residues; phytosanitary inspection; and quality inspection.

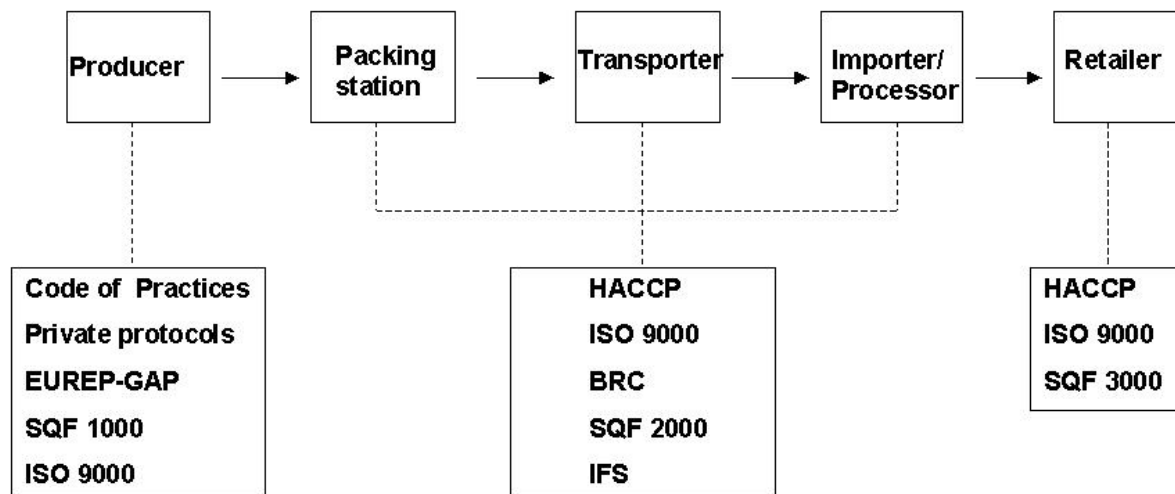
There are profound differences in food safety management among EU members. The United Kingdom has placed the responsibility for the control of food safety into the private sector's hands and insists that the UK food industry take "all reasonable precautions" to ensure the safety of the food sold at the UK markets (Food Safety Act 1990). As a consequence, the UK food industry developed and implemented traceability and control systems and strict specifications. The British Pesticide Safety Directorate (PSD) publishes the monitoring results of MRL examinations ("naming and shaming" policy) of retailers and importers selling and importing fresh produce. In addition, the PSD is considering publishing the monitoring results of the different British fruits and vegetables wholesale markets in the near future. Other EU countries, notably Germany and the Nordic countries, rely on public monitoring and control procedures.

**INTERNATIONAL PRIVATE FOOD SAFETY AND QUALITY STANDARDS**

Private companies are prompted by the increasing concerns of consumers with regard to the safety and quality of food, as well as ethical and environmental issues, to develop private standards including production protocols and traceability across the supply chain. Large-scale players of the retailing sector are important drivers of the emergence of private sector protocols and the development of private standards. A large number of private players in the production, processing, and distribution in the fresh produce market have adopted these standards during the past years. Some of these standards (such as the HACCP and Good Agricultural Practices) have been adopted by international public institutes (for example, EU Directive on Hygiene for Foodstuffs, 93/43/EC). Some interviewees expect that the private and public sectors will collaborate more with regard to food safety and quality specifications and standards in the near

future. The most common existing private food safety and quality standards are shown in figure 3.<sup>6</sup>

**Figure 3. Private safety and quality standards**



Regarding the fruits and vegetables sector, most retailers have developed their own specifications or private “codes of practice” including Good Agricultural Practices and specifications related to phytosanitary, MRL, visual appearance, grading, packing, and labeling. These private specifications are based on national and EU food safety and quality regulations and, in most cases, exceed these regulations. The specifications are treated as confidential. However, the different requirements for private “codes of practice” look very similar. The major retailers also have included ethical issues (child labor, labor conditions, animal welfare) and environmental rules in their “codes of practice.” Although none of the interviewees have developed a private “code of practice” for fish products, it can be expected that the British retailers soon will do this.

Because of the growing pressure from retailers to guarantee safe products and the increasing obligation to trace the origin of the products, importers tend to develop their own specifications. They base them on national and EU regulations and customers’ requirements. The strict contracts signed between the

<sup>6</sup> The following are sources of information on some private standards:

The Food Business Forum - [www.ciesnet.com](http://www.ciesnet.com)

Global Food Safety Initiative (GFSI) - [www.globalfoodsafety.com](http://www.globalfoodsafety.com)

International Standards Organization - [www.iso.org](http://www.iso.org)

Safe Quality Food Initiative - [www.sqfi.com](http://www.sqfi.com)

Hazard analysis and critical control points (HACCP) system and guidelines for its application. Annex to CAC/RCP 1-1969, Rev. 3 (1997), FAO/WHO

Requirements for a HACCP-based Food Safety System, National Board of Experts, 2002

British Retail Consortium - [www.brc.org.uk](http://www.brc.org.uk)

EUREP-GAP - [www.eurep.org](http://www.eurep.org).

supermarket and the supplier often ensure that any failure can be blamed on the importer. Nevertheless, failure to supply the quality and safety advertised would impair the retailer's image among consumers.

The major European retailers have recently adopted EUREP-GAP (Euro-Retailer Produce Working Group for Good Agricultural Practices) as the "Guide of Agricultural Practices" for producers of fruit and vegetables. These retailers request their suppliers (including suppliers from developing countries) to be (or shortly become) EUREP-GAP certified. As one retailer put it, "EUREP-GAP is the license to produce." Two retailers indicated that EUREP-GAP should be a basic requirement but that, nevertheless, their private "code of practice" will be their main guideline. At this moment, EUREP-GAP is enforced mainly on producers of fruit and vegetables.

For the fish sector, retailers have fewer private guidelines for food safety and quality. Instead national public regulations are used as a guide for safe and high-quality food. The reason is that the retail market share of fish is still much lower than that of fruit and vegetables. However, the interviewed retailers expect further growth of the fish section within their supermarkets as the demand for health products is growing. Consequently, an increase of private guidelines and standards for fish products is expected, especially with regard to aquaculture. The British retailers are developing a EUREP-GAP certification standard for fish (starting with farmed fish). Box 6 shows some private initiatives for food safety certification in the fish sector.

**Box 6. Private food safety initiatives in the fish sector**

The new Aquaculture Certification Council (ACC, based in Missouri, United States) builds on the voluntary Global Aquaculture Alliance Responsible Aquaculture Program. It has developed a "Certification of Aquaculture Production Processes for Seafood Buyers" that "combines site inspections and effluent sampling with sanitary controls, therapeutic controls and traceability". This certification is targeted toward the seafood buyers and shrimp producers and processors. Other species of fish are expected to be included at a later stage of development. The certification seal developed "is not to be used on seafood product packaging at the retail level" since at present the certification only targets the seafood buyers/importers. ([www.aquaculturecertification.org](http://www.aquaculturecertification.org))

Furthermore, the Marine Stewardship Council (MSC) is developing a sustainability certification to cater specifications for the fish sector.

Importers do foresee problems for developing country small-scale producers who are not able to be EUREP-GAP certified. Retailers accept the EUREP-GAP certification of a producers' cooperative or group instead of a certification of each individual producer. The cooperative then is responsible for the accurate registration and record-keeping of the supply of each producer. Private companies can play important roles in enabling this process. This mechanism may allow many small-scale producers to continue their export to European markets. However, the expectation is that many small-scale producers will not be able to organize themselves adequately and, consequently, be disqualified to supply to retailers. Box 7 provides examples of small producers who have failed to comply.

Supermarkets claim that EUREP-GAP should not be used as a competitive tool but as a guarantee of the food safety and quality of their products. Nevertheless, some interviewees note that certain supermarkets use food safety certification for publicity purposes, for example, in product labels, leaflets, and posters in shops.

### **Box 7. Effects of private food standards on growers in developing countries**

As a result of the requirement of a major retailer for growers to implement EUREP-GAP as of January 1 2003, 60 local growers of sugar snaps and green beans in Kenya were not allowed to supply anymore since they were not EUREP-GAP certified. Previously, the growers had sold their products to a large-scale certified Kenyan company, which then forwarded their products to the importer of the retailer.

This retailer expected the same problem to happen for the cherry suppliers from Greece. Most of the cherry suppliers are family farms that export their cherries via a local cooperative to the importer of the retailer. The family farms are not EUREP-GAP certified. Although the retailer realizes that it is impossible to certify these family farms, the retailer will not accept their supply anymore.

The cost for certification is high because producers must be audited by an accredited third party to obtain the EUREP-GAP certificate. Because of the lack of accredited third parties in many developing countries, producers are forced to fly expensive auditors over from Europe.

From the interviews it became clear that supermarkets, in particular, are concerned about the safety and quality of fresh produce sold under their own brands. The safety and quality of labeled products from multinationals such as Del Monte or Dole are solely the responsibility of these companies. The director of the national office of one of the multinationals argued that its safety and quality requirements go beyond the requirements of the supermarkets. The company is well aware that consumers buy its products because they link its brand with food quality and safety. To assure the confidence of consumers in their brand, food safety and quality issues are the company's highest priority. The company controls the whole supply chain and can, therefore, guarantee safe and high quality products.

In France, importers are more involved in the development of private specifications than supermarkets are. In general, French supermarkets require compliance with the national and EU regulations on food safety. However, some major French supermarkets have understood the importance of quality assurance (QA) and are developing QA schemes for their own brands ("Terre et Saveur" of Casino, "Filière Agriculture Raisonnée" of Auchan, "Filière Qualité" of Carrefour). These private brands are limited to French-grown produce. Importers are, to a large extent, responsible for the quality and safety of products imported from developing countries.

French importers expect that retailers will change their attitudes toward food safety issues in the near future by imposing private specifications, codes of practice, or EUREP-GAP. Many French importers are becoming more focused on food safety requirements since it has shown increasing importance in the rest of Europe.

As in France, most German retailers demand compliance with the national and EU food safety regulations. Importers often prepare deliveries based on their own knowledge of a customer's requirements. Although most German retailers have no private specifications for food safety and quality issues, the food safety debate is increasing in Germany. During the survey, it was reported that only one German retailer has developed private specifications for food safety and quality and one other retailer has just decided to use EUREP-GAP as a requirement.

The emergence of private retail standards has profound impacts on the supply chains and provokes many concerns and suspicions. If each retailer develops its own standards, producers

and traders must follow multiple administrative requirements (box 8). Box 9 outlines the concerns of the interviewees about the impact of private standards on exclusion and market power.

#### **Box 8. Proliferation of private “codes of practice”**

A French importer explained that, for certain particular fresh products such as bananas, the major French retailers have developed their own “cahier des charges.” Although these private codes of practice look very similar, each retailer requires a separate registration system. As a consequence, importers deal with a number of different registration systems.

A British importer who faces similar problems is even considering setting up a computer system to register the different retail codes of practice. The costs to develop this computer system is estimated at 25,000 British pounds.

Compliance with HACCP (hygiene regulations) is mandatory for all food processing operators. However, in practice, not all retailers check whether the processing parties in the chain are HACCP certified. These retailers require their importers to assume responsibility for safety and quality products and to verify whether their local suppliers are HACCP certified. Although importers aim to visit their suppliers on a periodic basis, in practice they are not able to visit all their suppliers because they deal with many different producers, fishermen, and processing firms in many different countries. Importers give priority to visits to suppliers who export large volumes and cultivate/catch products of great importance to the importer and retailer, and suppliers who are having food safety and quality problems.

#### **Box 9. Reported concerns about private standards**

Producers in developing countries may not be able to be EUREP-GAP certified either because of the high auditing costs or because they can not comply with the EUREP-GAP standards. As a consequence, these producers will not be able to export their produce to the retailers.

A few importers argued that many aspects of EUREP-GAP are not relevant for small-scale producers in developing countries and require many investments. They believe that these standards are made from a European point of view without considering the local situation, culture, and habits. An example is the requirements of toilet-blocks. Small-scale producers have to invest a great deal to implement these private standards.

A few companies pointed out that, through the implementation of EUREP-GAP, sensitive information of private companies will become available to others. Examples are (1) the information about plant reproduction material, which is of great importance for the final quality of the fruit; and (2) the usage and the timing of application of fertilizers, which influence the final fruit quality. This is sensitive information—which falls under “trade secrets,” or intellectual property—which can become available to competitors that supply to the same retailer.

One importer expressed concern that the EUREP-GAP organization aims to have a database of its suppliers in order to control chain activities.

Some importers and importers’ organizations that were interviewed mentioned that, due to the required implementation of the private retail standards, retailers increase their chain power. Some importers fear that the retailers will cut out the role of the importers and shorten the supply chains.



The British Retail Consortium (BRC), which represents all UK retailers, was the first to harmonize retail standards for companies engaged in processing and transport of fruits, vegetables, and fish. In the Netherlands, Albert Heijn was the main driver behind the use of HACCP. Dutch manufacturers usually combine HACCP with ISO 9000. The BRC standard spread its wings over the continent and, eventually, Dutch retailers switched from HACCP and ISO 9000 to BRC. Supermarkets in France and Germany are hesitant to adopt a foreign standard. The German International Food Standard (IFS) and the French Federation des Entreprises du Commerce et de la Distribution (FCD) were merged as IFS-FCD (Joppen 2003). One interviewee indicated that the private standards are very much alike, for instance, the BRC and IFS cover for 80 percent of the same issues. Although most retailers demand of their importers and processing firms to be certified, it has been reported that some retailers have yet not implemented the private standards in some of their shops.

In April 2000, a group of international retailers established the Global Food Safety Initiative (GFSI) to enhance food safety, ensure consumers' protection, strengthen consumer confidence, set requirements for food safety schemes, and improve cost efficiency throughout the food supply chain<sup>7</sup>. According to GFSI, food safety is a noncompetitive issue because any potential problem arising may cause repercussions in the whole sector. GFSI has defined key priorities to realize its objectives. A Task Force, comprising of 50 retail representatives, was formed to work out one, preferably, global standard.

Some of the interviewees questioned the GFSI's objectives. They argue that the GFSI is rather expensive, slow, and time-consuming for retailers. These interviewees indicated that GFSI should not spend too much time in benchmarking standards but acknowledge a few private standards as equivalent. Currently, some processing companies deal with retailers that require one or more of the following: BRC certification (mainly European retailers), HACCP and ISO certification (Dutch retailers), IFS certification (German retailers) or SQF 2000 certification (mainly retailers in Australia and the United States) (box 10). Many of the interviewees argue that to increase export opportunities, companies that are BRC certified should also be allowed to export to supermarkets that require SQF or IFS-FCD certification, and vice versa. They do not believe in one global private standard for processing firms or producers.

The interviewees pointed out that producers and processing companies operating in a collaborative supply chain (chapter 3) are supported by cooperatives or importers in the implementation of private standards and guidelines. Importers or transnational companies coordinate most of the chain activities, implement strict food safety and quality measurements, and employ well-trained quality inspectors within the vertically integrated supply chains. Many of these companies trade fresh produce under their own brand names and, therefore, are very much focused on the safety and quality of their products. Producers exporting their products through a transaction-oriented supply chain or an importer-driven supply chain deal with intermediaries who do not inform them about the safety issues and often are neither aware nor well-informed about the food safety

**Box 10. One outcome of multiple food safety standards**

A Belgian manufacturer is ISO 9001-, HACCP-, and BRC-certified. However, German retailers do not accept this package. The company is considering becoming IFS-compliant as well. As a consequence, the company will need four audits a year (Joppen 2003).

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<sup>7</sup> Global Food Safety Initiative (GFSI) - [www.globalfoodsafety.com](http://www.globalfoodsafety.com).

and quality demands of buyers. Consequently, these producers have not implemented private standards and, therefore, do not comply with private food safety and quality requirements.

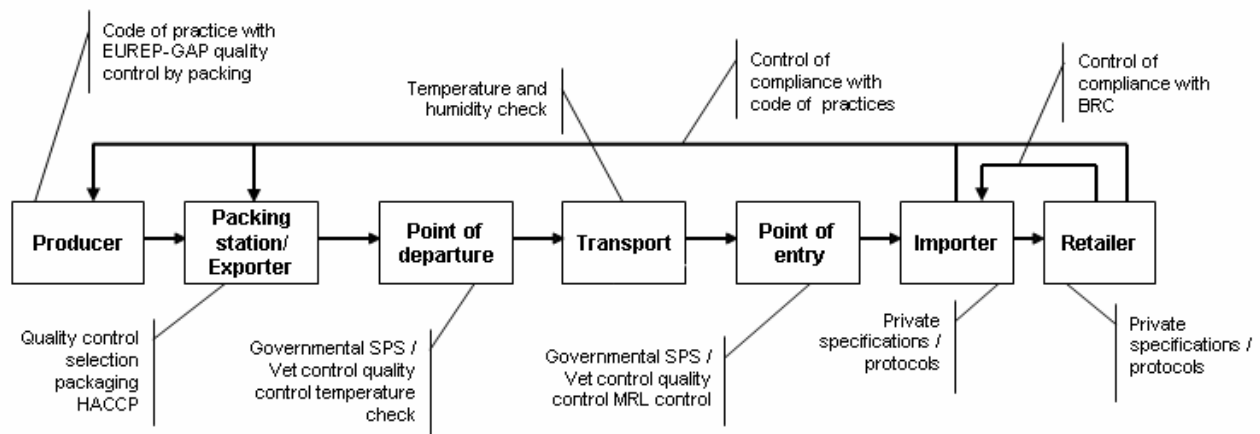
For the near future, it is expected that the number of private food safety and quality standards will not decrease. Although many retailers are talking about a harmonization of private standards, most interviewees do not expect that this will happen soon due to “retailer politics” and power relations. Instead, the interviewees expect that the private standards will be expanded to include other specific requirements such as ethical and environmental issues. As a consequence, producers and processing companies will have to implement multiple differing private standards. This has implications for the management of a company and farm (registration) and the costs for the certification of the different standards.

Furthermore, the interviewees predict that producers will be required to register more activities in the near future and that more samples will have to be tested by accredited laboratories. Some interviewees also foresee that retailers will demand more from transport companies to guarantee an effective cold chain.

### FOOD SAFETY AND QUALITY INSPECTIONS

The quality and safety of fresh produce are controlled by different public and private entities (producers, exporters, national control agencies, importers, and retailers) at different points in the supply chain. Furthermore, food safety and quality inspections take place at different levels in the food supply chain (figure 4).

**Figure 4. Food safety and quality control in the fruits and vegetables and the fish supply chains**



### Public inspections

Before the products leave a developing country, the public authorities issue a *phytosanitary* certificate for fresh fruits and vegetables and a *health certificate* for fish. The validity of these two certificates has been questioned in some interviews. When the products arrive at the point of entry in Europe, national agencies control the products on phytosanitary and veterinary aspects. In case a problem appears during the phytosanitary control, the whole shipment is rejected (box 11).

The importing country usually also controls the *quality* of the fruits and vegetables. The agents check whether the labels on the pallets of the carton boxes correspond with the contents of the pallets/boxes. In case the class of the products does not correspond with the class indicated on the pallets, that product is reduced to a lower quality class. The customs authorities review the control agency's release and other relevant papers.

Regarding fish products, the national inspection service samples and checks the entries and rejects those lots that do not comply with the standards. These lots are either destroyed or returned/re-exported to other markets. A "rapid alert system" of the European Commission provides cross-country information on problems encountered.<sup>8</sup> The information collected is passed on to the private sector through the national inspection services.

#### **Box 11. Interviewees' responses about public inspections**

Different interviewees in the fruits and vegetables sector indicated that, in many cases, only the phytosanitary papers of the products are reviewed by the national control agencies.

Some of the interviewees argued that products that are imported for local consumption are well examined, while products meant for re-export often are not examined by control agencies.

An inspector explained that each EU member state selects a number of products that will be examined for MRL on a sample basis during a particular year. Products that are not selected, therefore, are not or barely examined for MRL.

Another inspector pinpointed that due to the limited number of inspectors and the high number of imported products, only a limited number of products can be examined on MRL; in particular, products that are known to be sensitive for pests and insects, and products from countries that are known to have problems are checked.

The EU countries annually prepare their national plans for the control of *residues of pesticide* on fruits and vegetables. Their plans indicate selected products that are subject to control during that year and the number of controls per product (including the number of controls per selected product category cultivated in other EU-countries, non-EU countries, and domestic production). The selected products may differ on a yearly basis, depending on the scale of consumption, problems reported, and the EU list of selected products. The number of controls per product category is also indicated; it also depends on the scale of consumption and problems reported before. About 10 pieces of fruit per product category are taken per control to analyze the residues of pesticides. Box 12 shows the Dutch MRL monitoring.

#### **Private inspections**

Producers, producers' cooperatives, and exporters in developing countries check the quality (visual appearance) of the products before they export. The producers must comply with the private quality and safety standards of the retailers and importers (including size, color, sugar level, firmness, MRL, absence of spots, packing material). Regarding fish products, the local private firms, as well as the importers, take

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<sup>8</sup>Appendix 1 lists the 2002 notifications on fish and shrimp. The following section discusses the Rapid Alert System.

samples to inspect the microbiological contaminants, metals, toxic algae, and residues. The local firms take into account the varying levels of sensitivity of the different product groups. Mussels, oysters, and fresh and chilled fish are considered very sensitive to contamination. Many fish trading companies address food safety problems by establishing local offices or making direct investments in production facilities abroad.

For fruits and vegetables, in many cases, accredited quality organizations conduct quality controls before the products are exported to Europe. These organizations place inspection stickers on the pallets when the products and the packing material are checked and approved. An example is the accredited quality organization, Veritas, in Cote d'Ivoire. Some governmental agencies in developing countries conduct quality controls before the products are exported. For instance, the Perishable Products Export Control Board in South Africa performs such controls.

**Box 12. Dutch maximum residue level monitoring**

In 2001, 2,894 controls (analyses) of the maximum residue levels (MRLs) of pesticides were conducted in the Netherlands. Of this total, 28 percent of the products were cultivated in non-EU countries, 27 percent in other EU countries, and 44 percent in the Netherlands.

The Dutch national agency uses a multiresidue method (MRM) to analyze the residue levels of selected pesticides on products (Inspectorate of Health, Protection, Commodities and Veterinary Public Health 2002).

The controls are taken either from samples in the ports or from the stores of the importers. Most of the importers reported that periodic (once or twice a year) food safety controls are conducted by the national agencies in their stores. The samples are sent to the laboratories. The results of the laboratory tests often take about three weeks but sometimes are delayed for several months. As a consequence, most products already have been sold and even consumed by the time the results are known. In case a severe problem has been detected, more controls by the national control agencies will follow. The number of samples taken of some of the selected products and the number of samples exceeding the MRL for certain pesticides during inspections by the Dutch government in 2001 are shown in the table below.

<i>Product/samples</i>	<i>No of samples taken</i>	<i>Exceeding MRL</i>
Mango	19	5
Pineapple	22	9
Avocado	16	0
Green bean	109	7

*Source:* van der Schee 2002.

The importer checks the packing material and visual appearance of the products at arrival, takes samples of the products, and sends these to a laboratory on a periodic basis or in case problems have occurred. For fruits and vegetables, samples are taken once or twice a year per product per supplier. For fish products, the smell often will give away any decomposition.

All companies interviewed state that all shipments undergo either external or internal laboratory control. The importer sometimes checks the internal condition of the fruit and the sugar content by cutting the fruit. In case problems occur, the importer reports to the exporter/grower and sends digital photos by internet. Most importers interviewed inform their suppliers about the European SPS measurements, national MRL regulations, and packing requirements. Some large-scale exporters, such as export

organizations in Chile and South Africa, have employees working in the ports in Europe to oversee the shipments at arrival and to report back to their export company.

The supermarket also inspects the visual appearance of the products briefly at arrival in the distribution centers. The supermarket sometimes examines the taste of the products and measures the temperature of the fish. Employees of the supermarket check the visual appearance of the products in the stores and measure the temperature of the fish on a daily basis.

The interviewed importers and retailers claim that, in most cases, the quality and safety of products from producers who operate in a vertically integrated supply chain or in a collaborative supply chain are good. The serious quality and safety problems occur with the products of producers who are not aware of the specific quality and safety requirements of the buyer and sell their products to local traders without knowing the final destination. According to these interviewees, most of these producers are small-scale and lack resources (technology, trained people) and information.

### **NOTIFICATIONS, RAPID ALERT, AND EARLY WARNING SYSTEMS**

Various public and private initiatives have been established to inform the sector about problems with the safety and quality of fresh agricultural products.

#### **Public notification system**

The EU has developed a public notification system. It receives and distributes notifications to the food and feed inspection services of all member states as well as to EFTA/EEA countries. The notification reports problems with specific product groups in specific countries. National services (public or branch organizations) make use of this information and publish it on their website and newsletter or send e-mail messages to private companies.<sup>9</sup> The interviewed importers and retailers indicated that national and international retail and importer branch organizations, such as Freshfel for fruit and vegetables, are important sources for actual up-to-date information on food safety problems in the sector.

Most interviewees of the fruits and vegetables sector state that the number of MRL controls (analyses) are limited and that the elapsed time between taking the samples and reporting the results can be a couple of weeks, or even months. No direct action can be undertaken until the results of the tests are known. At times, by the time the results are reported, the fruits and vegetables already have been sold and consumed. DG SANCO publishes an overall statistical presentation of the total Rapid Alert System for Food and Feed (RASFF) including the alert notifications related to products which are on the market and which present a risk to the consumer.

Table 4 shows the number of alert notifications in the EU for the different fresh produce categories during 2000–02. There is an exponential increase in the number of notifications in

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<sup>9</sup> Not all countries are allowed to publish the full information to the public. In Germany, the information relating to private companies (names and approval numbers) are deleted since it is illegal to publish this information. These deletions decrease the value of the information to the private German companies compared to other European companies.

fish, crustaceans and mollusks, fruits and vegetables, as well as in meat and meat products, game, and poultry during the past three years. The increases in notifications are related to an increase in the number of inspection tests.

**Table 4. Public notifications according to product categories in EU, 2000-02**

<i>Year and number of notifications</i>	<i>Fish, crustaceans, and mollusks</i>	<i>Fruits and vegetables</i>	<i>Meat and meat products, game, and poultry</i>	<i>Dairy products</i>
2000 - Total	165	65	52	25
- Alerts	32	12	27	19
2001 - Total	232	76	53	15
- Alerts	87	25	38	7
2002 - Total	480	212	234	45
- Alerts	112	59	98	19

Source: SANCO 2002.

Table 5 presents the percentages of chemical and microbiological reasons for alert notifications in 2002.

It must be noted that about one-third of the notifications have their origin within European Union (414) and the rest of Europe (84). Brazil, China, Thailand, and Turkey have been recorded (in 2002) with the highest number of notifications, with over 100 each. Germany has issued the highest number of notifications (455). Italy has issued 214, while the Netherlands, Spain, and the UK have issued about 150 notifications each (2002).

**Table 5. Chemical and microbiological reasons for alert notifications, 2002**

<i>Chemical reasons</i>	<i>%</i>	<i>Microbiological reasons</i>	<i>%</i>
Veterinary drug residues	38	Salmonella	56
Pesticides residues	20	Listeria	17
PAH	13	Vibrios	9
Mycotoxins	10	Others	18
Marine biotoxins	3	Total	100
Dioxins	3		
Heavy metals	3		
Others	10		
Total	100		
	0		

Source: SANCO 2002.

### **Private early warning system**

Different private initiatives have been established for the distribution of information on problems related to food safety and quality. As earlier mentioned, the Global Food Safety Initiative (GFSI) aims to implement an intranet-based early warning system for the exchange of food safety information among retailers. Besides this GFSI initiative, retailers in France, Germany, the Netherlands, and UK set up an Associated Marketing Service (ASM) for the exchange of information. Specific information from the monitoring of the retailers on food safety and quality aspects of products from particular producers are exchanged. In this way, retailers are updated about the performance of the producers and are warned about problems that have occurred. As a result, retailers pay more attention to the quality and safety of the products of these producers at arrival or by informing their preferred importers to control the activities of these producers.

## 5. PROBLEMS, BUYERS' PRIORITIES, AND CHANGING SUPPLIERS

This chapter outlines the main problems related to food safety and quality of fish, and fruits and vegetables imported from developing countries. The first part describes the relative priorities of food safety, and quality requirements by European buyers. This is followed by a discussion of why buyers change suppliers.

### FOOD SAFETY AND QUALITY PROBLEMS

#### Fish sector

The major food safety problems encountered for fish and fish products are microbiological contaminants due to lack of hygiene in the production process, residues of antibiotics, metal contaminants, parasites, and problems due to temperature changes caused by a broken cold chain.

Prohibited use of antibiotics has caused major problems in recent years. Antibiotics are available for the treatment of diseases in shrimp and often are used in fish farms in China, India, Thailand, and Vietnam. However, chloramphenicol and nitrofurans are prohibited in Europe and, consequently, a zero-level tolerance has been enforced.<sup>10</sup> At present, in particular, the zero tolerance policy applied by the EU creates a difficult market climate, creates social and economic problems for the producers and exporters, and greatly increases the risk of rejections of whole product groups (shrimp and shrimp products) from selected countries.

A number of organizations, that is, Seafood Importers and Processors Alliance (SIPA), Global Aquaculture Alliance (GAA), and Bundesmarktverband der Fischwirtschaft e.V., and scientists are debating which issues should be taken into consideration in a European re-evaluation of the level of tolerance for the residuals. The issues are:

- Technology has made it possible to detect substances of antibiotics at ever diminishing levels. Information from the industry specifies that the U.S. Food and Drug Administration (FDA) defines the technical zero-level tolerance for chloramphenicol at 5.0 ppb, while Japan, in practice, uses the definition of zero-tolerance level as 50 ppb.
- The mere detection of a substance does not in itself establish the toxicity of the substance. With the increased analytical capability of detection, it is unrealistic to

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<sup>10</sup> "Chloramphenicol and nitrofurans are broad-spectrum antibiotics that pose a high risk of toxicity to human beings. Chloramphenicol can cause potentially fatal aplastic anemia and leukemia, and nitrofurans are carcinogenic. The use of these antibiotics in animal food production has been banned for at least a decade in most countries. The seafood industry fully supports the regulations that ensure wholesome foods" (Anonymous 2002). Today all EU member states are obliged to have in place national veterinary services inspections at every EU entry point. These inspections use methods of analysis capable of detecting levels of chloramphenicol at 0.3 mygram/kg and Nitrofuransmetaboliten (Furazolidon, Furaltadon, Nitrofurantoin, and Nitrofurantol) at 1 mygram/kg.

expect that food will be completely free of any detectable level of particular substances. The developed maximum residue limits (MRLs) based on acceptable daily intakes (ADIs), which in turn are based on no observable adverse effects levels (NOAELs), should be applied to a renewed evaluation of the present zero-level tolerance, which has been passed as a consequence of the adaptation of the precautionary principle approach (PPA) to food safety.

- The detection of antibiotics in shrimp indicates environmental contamination. A regulatory precedent exists for this type of situation, as dioxin regulations are based on achievable limits (MRLs).
- Today the EU obliges its member-states to have methods of analysis capable of detecting levels of chloramphenicol at 0.3 mygram/kg.
- Nitrofurantolone (Nitrofurantoin, Nitrofurantoin, and Nitrofurantoin) at one mygram/kg. These thresholds for technological detection differ among importing countries in the world.

The major reported problems with shrimp are the frequent rejections due to the detection of residues by the national authorities. The practice of some European member states, notably Germany and the Netherlands, of destroying the rejected products has caused concerns among the private European importers. The foreign exporter loses the option to redirect the goods to other markets that have different monitoring procedures. The destruction of products can result in serious economic losses for exporters from developing countries, as well as for European importers.

The unequal treatment by different national inspection controls at ports of entry in the EU led importers to redirect products to European ports of entry with less sophisticated detection equipment for chloramphenicol and nitrofurantolone. However, the interviewed private companies do not see this as a permanent solution since they expect food safety measures to become tighter and harmonized across nations.

The highest risk of contamination of tilapia and Nile Perch from African lakes results from microbiological contamination due to low hygienic standards of producers, processors, and transporters; bad water quality in the processing industry; and lack of care and lack of understanding of European public and private food safety and quality requirements. Additional problems are contamination from runoff of pesticides from land and water pollution from densely human populated areas.

### **Fruits and vegetables sector**

Most of the interviewees indicated that products from their preferred importers and producers are, in almost all cases, of high quality and are safe for consumption. The major retailers also require their producers to comply with their private codes of practice or EUREP-GAP. Some importers and retailers pinpoint that the quality and safety of products of certain producers from developing countries are better than those of products from some producers in Southern Europe.



Most of the interviewees argued that food safety and quality problems occur especially with imports from producers who have no long-term relationships with the importers and retailers or from small-scale producers. According to them, the reasons for this are:

- *Lack of knowledge* regarding quality and safety requirements. Many producers, especially small-scale producers, have no access to information and, therefore, are not well informed about requirements such as caliber, sugar content, and homogeneity of shape of the products; use of certain pesticides and levels of residues; post-harvest handling; and packaging. Products that do not meet the quality requirements are sold for a lower price or are destroyed. Importers do not reject the whole shipment with these problems but select the produce that have the appropriate requirements and re-package the products.
- *Lack of training*. Many producers or workers at the plantations have not received training to cultivate and handle the products properly. As a result, they do not use the right fertilizers or pesticides, and the products may be harvested too early and/or handled roughly.
- *Lack of capital to invest in technology*. A significant part of exported tropical fruits are still produced by large numbers of small-scale producers who have limited access to capital to invest in production techniques, cooling, transportation facilities, and communication equipment.
- *Short-term trade strategy*. The interviewees argued that they often deal with producers who have a short-term trade strategy so are not willing to invest for the long term.

The residue level of pesticides on products seems to be the biggest concern of importers and retailers. Most of the food safety problems with products imported from developing countries are related to pesticide residues. The interviewed importers and retailers complain about the differences in the acceptable MRL levels of pesticides by the various governments within Europe. A French importer explained that, for a number of pesticides used in citrus production, the MRLs in the United States are higher than, for instance, in France. A Florida grapefruit grower faced problems in exporting to France because the products exceeded the level of certain MRLs while these same levels were accepted by the US government.

An interviewee explained that some pesticides are allowed to be applied on particular crops but not on other crops. It may, therefore, happen that products that contain a certain level of residue of a pesticide are approved to be imported while other products containing the same level of residues of that particular pesticide are rejected.

With regard to phytosanitary problems, the interviewed importers and retailers did not report many problems. Some of the interviewees argued that for competitive agricultural products, such as grapes and citrus, the EU phytosanitary measurements seem to be more extensive and stricter than for other products. Table 6 shows the phytosanitary and pesticide problems in fruits and vegetables that were reported during the interviews. The national inspection agencies rejected the whole shipment when a phytosanitary problem was found.

**Table 6. Phytosanitary and pesticide problems in fruits and vegetables**

<i>Country of origin</i>	<i>Product</i>	<i>Problem</i>
Costa Rica	Pineapples	Pesticides: triadimefon, triadimenol
Different countries	Fruit	Fruit fly
Different countries	Fruit	Residues of pesticides
Egypt	Green beans	Helico verpa (caterpillar)
Egypt	Strawberries	Fungus
India	Grapes	Pesticides
Thailand	Aubergine	Thrips
Thailand	Hot peppers	Pesticides: Methamidophos, cypermethrin

*Sources:* Various interviewees.

Most interviewees indicated that they face quality problems more frequently than food safety problems (box 13). Shipments from small-scale producers who export their products through local traders show more problems with the quality of products, grading, and packaging than shipments from producers that have been coordinated by cooperatives or importers (a collaborative supply chain) and from companies operating in a vertically integrated supply chain.

### **Box 13. Quality problems**

The following quality problems were mentioned several times during the interviews:

- *Bad quality of the cartons.* Boxes often are damaged due to rough handling during the transport. Lack of good packaging material (including cartons) is a problem in many developing countries.
- *Incorrect information on the labels* on the carton boxes. This is a frequently mentioned problem. The buyers complain about incorrect information on the number, size, or variety of products.
- *Damaged pallets* due to rough transportation and poor material.
- *Rotten products.* The products are, in many cases, transported in nonrefrigerated trucks in which temperatures may go up. Rough handling of the products also results in rotten products.
- *Spots on the skin of the products* due to insects, fungus.
- *Heterogeneous caliber size and shape of products in one carton.* Producers like to export as many products as possible and tend to mix different caliber sizes to fill up the boxes. Lack of information regarding the packaging demands of the buyer also may be a reason.
- *Unripe or overripe products.* Some producers tend to harvest too early or too late. In many cases, these patterns result from lack of training and advice on cultivation and harvest activities.
- *Low sugar content of fruits.* This lack of sweetness may be a consequence of a lack of, or wrong use of, fertilizers. In addition, there is no internal control of the quality of the fruit before export.

Most of the importers inform producers by email, fax, or telephone about any food safety and quality problems and indicate how to improve their shipments. Often digital photographs are sent to show the problems detected.

The importers and retailers do visit producers to verify the quality of the products in the field and to discuss quality and safety issues. The number of visits depends on the trade relationship with the producer, the quality of the products and the market importance of the product. Most interviewees emphasized the importance of these visits because the face-to-face contacts with the producers build a trust relationship and enable direct feedback to questions and problems. One retailer explained that s/he visited his/her preferred tomato suppliers quite regularly (twice or three times during a production season) since this is an important product for the retailer whereas s/he has not yet visited the supplier of avocado, a less important product for this retailer. Some importers mentioned that they aim to visit their preferred producers at least once a year.

One importer explained that s/he sometimes invites the employee of the retailer who is in charge of food safety and quality to come along on visits to producers. This importer argued that it is important that the retailer get to know the producers and their plantations, and, especially, to have knowledge of the context in which they work. The context includes local weather conditions, local infrastructure, national institutional support, and the absence of national quality control officers in the port, laboratories, and agricultural industries. Moreover, the importer's relationship with the retailer is often strengthened during such a trip.

#### **RELATIVE PRIORITY OF FOOD SAFETY AND QUALITY REQUIREMENTS TO EUROPEAN BUYERS**

The interviewed importers and retailers ranked factors in the following order in terms of their importance to the imports of fish, and fruits and vegetables from developing countries:

- Volume
- Reliability of supply
- Price
- Organoleptic properties
- Maximum Residue Level of residuals from antibiotics and pesticides
- Metals, Listeria, and cholera in fish; and insects and fungus in fruits and vegetables
- Compliance with environmental/sustainability requirements
- Compliance with social responsibility requirements.

These listed properties are tied to the multiple objectives of the companies, and considerable trade-off is evident among the different objectives. The availability of volume, a reliable supply and the price of the products are the most important aspects for a buyer. The risk assessment

conducted by the company is tied to food safety. The risk of noncompliance is a direct economic loss. “Bad publicity” may be a result of this noncompliance and may reduce sales. High-profile companies have built up a certain reputation regarding food safety and quality, social responsibility, sustainability, and the environment and, therefore, are more vulnerable to “bad publicity.” These companies pay special attention to the risk of noncompliance with requirements for these various issues.

### **REASONS TO CHANGE SUPPLIERS**

Almost all interviewed importers and retailers indicated that they prefer to establish long-term relations with producers of fruits and vegetables. Retailers and importers like to keep track of, and even to coordinate, the activities of the producers to ensure the safety and quality of the products. Producers must adhere to private specifications or protocols of organoleptic properties and food safety issues.

However, some buyers have no direct contact with the producers but deal with intermediary or producer groups. These buyers argue that so long as the safety and the quality of the products they receive is satisfactory, they do not think that they need to know the producers and get involved on the production side of the supply chain. An importer who imports a variety of different tropical fresh fruits and vegetables from developing countries explained that some specific exotic products (such as hot pepper) are cultivated only by small-scale growers (especially in Asia), often in their home garden. Traders buy these products at the local markets and sell it to European buyers. Neither the trader nor the buyer knows the producer. In case food safety or quality problems occur, the buyer may decide to change the trader, but the probability is high that the same problems will occur with other traders since the product may have been bought from the same local market.

Buyers prefer large volumes at a negotiated price. Importers, especially in the fish sector, select their suppliers based on this. The following are some of the reasons why retailers and importers change suppliers (see also box 14):

- Noncompliance with private food safety and quality standard/label
- Repeated cases of pesticide residues on products
- Price
- Insufficient volume, quality
- Price expectations too high at supplier level
- Social reasons (child labor, labor conditions)
- Political situation in a country.

**Box 14. Examples of buyers changing suppliers**

One retailer in the UK referred to a recent situation in which a newspaper published a story about the use of child labor in the agricultural sector in Kenya. Although the newspaper did not mention names of supermarkets that import agricultural products from Kenya, this particular retailer received telephone calls from NGOs about this topic. To avoid media scandals, the retailer decided to temporarily stop importing agricultural products from Kenya and imported products from other countries instead.

Other retailers and importers stated that social aspects are becoming more and more important. They investigate the labor conditions at the farms during their visits.

A retailer reported that it shifted the importation of fresh produce from a supplier in Zimbabwe to a supplier in Zambia because of logistical problems in Zimbabwe due to the political situation. An importer mentioned the political problems in Cote d'Ivoire and the consequent logistical obstacles as reasons to stop sourcing mangoes from northern Cote d'Ivoire.

A fish importer stopped dealing with certain fish suppliers because the price expectations of these suppliers were too high.

## SUMMARY AND CONCLUSIONS

The major reported food safety problems are residues of antibiotics in the fish sector and residues of pesticides in the fruits and vegetables sector. The number of reported phytosanitary problems is limited. According to most interviewees of the fruits and vegetables sector, quality problems occur more frequently than safety problems.

The availability of volume, the reliability of supply, and a decent price are the three most important criteria of retailers and importers in sourcing products.

Besides noncompliance with private food safety and quality standards, the other factors that caused the interviewees to change suppliers (from developing countries) of fruits and vegetables, and fish were the price of the products, insufficient volume, labor conditions, and political conditions.

## 6. COSTS AND BENEFITS

This chapter discusses the different types of costs and benefits for producers, importers, and retailers to comply with food safety and quality requirements. The exact costs for companies to comply with food safety and quality requirements, however, cannot be indicated from this survey. Companies either have no exact information on these costs or do not want to divulge this information; or the cost of food safety and quality aspects can not be determined separately as these costs are incorporated in the total quality system of a company. Companies that market their products as high quality and safe products, in general,

consider the costs to comply with safety and quality aspects as an integral part of their business strategies. Some importers reported that the costs incurred by complying with the special private protocols of retailers are, in most instances, passed directly on to retailers, and, eventually, to the consumer sales price.

### DIFFERENT TYPES OF COSTS AND BENEFITS

The interviews identified different types of costs related to compliance with public and private food safety and quality requirements, namely: direct costs, indirect costs, risk, and hidden costs. Table 7 indicates which costs producers, importers and retailers bear in relation to food safety and quality issues only and the details of these costs.

**Table 7. Costs related to food safety and quality issues in the supply chain**

<i>Type of costs</i>	<i>Producer</i>	<i>Importer</i>	<i>Retailer</i>
<b>Direct costs</b>	<ul style="list-style-type: none"> <li>▪ Implementation of standards (technology)*</li> <li>▪ Auditing of standards</li> <li>▪ Training and education staff</li> <li>▪ Food safety/quality staff</li> <li>▪ Export health certificate</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implementation of standards (technology)</li> <li>▪ Auditing of standards</li> <li>▪ Quality system</li> <li>▪ Training and education staff</li> <li>▪ Food safety/quality staff</li> <li>▪ External laboratory costs</li> <li>▪ Import health certificate</li> <li>▪ - Visits of producers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implementation of standards (technology)</li> <li>▪ Auditing of standards</li> <li>▪ Quality system</li> <li>▪ Training and education staff</li> <li>▪ External laboratory costs</li> <li>▪ Food safety/quality staff</li> <li>▪ Visits of producers</li> </ul>
<b>Indirect costs</b>	<ul style="list-style-type: none"> <li>▪ Quality system</li> <li>▪ Laboratory</li> <li>▪ Maintenance of systems</li> <li>▪ Relationship management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of systems</li> <li>▪ Laboratory</li> <li>▪ Relationship management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of systems</li> <li>▪ Laboratory</li> <li>▪ Relationship management</li> </ul>
<b>Risk</b>	<ul style="list-style-type: none"> <li>▪ Rejection of shipment</li> <li>▪ Diminished chance to export due to problems with a country</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reputation problem</li> <li>▪ Import problems due to problems with a country</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reputation problem</li> <li>▪ Import problems due to problems with a country</li> </ul>
<b>Hidden costs</b>	<ul style="list-style-type: none"> <li>▪ Trial and error</li> <li>▪ Loss of opportunities to export due to problems with a country</li> <li>▪ Lack of innovation</li> <li>▪ Loss during transport (weather)</li> <li>▪ Strike of chain actors</li> <li>▪ Loss of export opportunities because of lack of knowledge and reliable information</li> <li>▪ Maintenance of knowledge</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of opportunities to import due to problems with a country</li> <li>▪ Strike of chain actors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of opportunities to sell products from a particular country due to problems with that country</li> <li>▪ Strike of chain actors</li> </ul>

\*Note: Among producers, large differences exist with regard to costs. In particular, small-scale producers are not able to invest in technology, quality systems, laboratories, specialized staff, and training and education and depend on traders or cooperatives.

## Direct costs

These are the direct investments and the (subsequent) operating costs incurred by companies to implement food safety and quality standards in their business.

*Implementation of standards.* Producers and companies must invest in *technology* to comply with regulations, private standards, and codes of practice. These investments are production equipment, production units, cooling facilities, management registration system, and tracking and tracing systems. Producers and the companies that invest in these technologies bear the costs of these investments.

The benefits for these producers and companies are high since these investments add value to the product quality and improve the safety of food. Management registration systems and tracking and tracing systems improve the transparency of the supply chain. This transparency may result in a better trust relation between the supplier and the buyer. Producers and companies of the vertically integrated supply chain and the collaborative supply chains have the capital and financial support to invest in technology. However, small-scale producers often do not see the need to invest in technology or lack the capital to invest.

*Auditing of standards.* Most retailers require producers and processing firms must be audited by an accredited third party (such as EUREP-GAP, BRC, SQF, HACCP) to obtain private certifications. Auditing costs are high, and most of the audits must be repeated each year (table 8). The first auditing of a standard after it has been implemented is the most expensive since the auditors spend a couple of days to learn the plantation/firm and to make a thorough investigation of the actual situation. Producers and companies in developing countries often must pay to fly in auditors of accredited companies from Europe or the United States since there is a lack of accredited audit companies in most developing countries. Small-scale producers may not have the capital to fly in auditors.

In the case in which different buyers require compliance with different private standards, producers and companies face difficulties in choosing the right standard to implement. As a consequence, some producers and companies implement more than one standard and must pay the costs of auditing each standard. The cost of multiple audits can be mitigated since some auditing companies audit different standards in one visit.

Auditing standards has benefits as well, since it increases the market opportunities for such services. Buyers prefer to deal with audited companies for the supply of their products.

In many companies, especially importers, retailers, and companies in the vertically integrated supply chain, food safety and quality issues are incorporated in the companies' *quality system*. The interviewees were unable to specify the costs pertaining to food safety and quality aspects. Quality systems make the activities of the business transparent; therefore, tracking and tracing products are assured. The safety and quality of food can be assessed and controlled at each step of the company process.

**Table 8. Costs of auditing standards for fruits and vegetables sector**

<i>EUREP-GAP Certification</i>	<i>BRC Certification</i>
<b>Direct costs</b>	<b>Direct costs</b>
External advisory cost (one-time) €800	External advisory cost (one-time) €6,000– €8,000 (depending on company size)
Annual Certification €500 (first year is the most expensive)	Annual Certification €850–1,200 (first year is the most expensive)
<b>Indirect costs</b>	<b>Indirect costs</b>
Time spent by producer to implement (approx. 40 hours)	Time spent by company management to implement (approx. 150–200 hours)
<b>Cost of material</b>	<b>Cost of material</b>
Cost to invest in toilets, drip, cleaning equipment	Cost to adjust the interior (for example, proper lighting)
Tests of samples (residues) €100–250/sample	Tests of samples—greater than €250/sample Annual water sample tests Training quality managers—€500/training

Source: Q-point 2003.

*Private quality and safety control* practices are executed by producers, exporters, importers, and retailers. They have special staff to conduct quality and safety controls. These controls are conducted in the field, packing stations, and storage and distribution centers. However, some of the interviewees experienced problems with the quality of the products, grading, and packaging shipped by small-scale producers, who export directly. Farmers' groups also may be unsuccessful in offering advice or training about market conditions and requirements.

In case there are serious quality problems that can not be solved by local experts, large-scale producers fly in experts from overseas. Importers, retailers, and multinationals (and some large-scale producers) have quality and food technology departments that examine, and control the safety and quality of, the products. Samples of shipments also are sent to external laboratories on a periodic basis.

Importers and retailers *visit producers and processing firms* in the developing countries to verify the quality of the products in the field. During such visits, the importer might also *audit* the producers and processors. These travel costs are charged to the importer's account. Some importers invite and pay the quality manager of a retailer to visit their producers in a developing country.

The interviewees could not determine the direct costs of compliance with food safety standards. The best estimate of the direct operating cost of compliance to food safety provided by the buyers in the fish sector ranges between 1 percent–3 percent of the company's total sales value. Box 15 presents examples of the direct costs of compliance with food safety and quality standards.



### **Box 15. Direct costs related to food safety and quality issues**

A large importer in the UK estimated the following direct investment costs on food safety and quality control practices for all fresh produce (in 2002, a total sales of £269million):

- Technical quality and safety department - £1,400,000/year (including salaries, travel, samples, testing)
- Auditing producers (visits and audit costs) - £252,000/year
- Developing a computer program to enter data for the different standards and codes of practice of their retailers - £17,000 for the first year; £12,000 for following years.

A major British retailer had the following direct costs on food safety and quality of its fresh produce department (total turnover of £16 billion a year of food produce):

- Employment of 50 food technologists and 6 microbiologists; of which 12 persons deal with fruits and vegetables, and 1 to 5 persons with fish.
- Cost of the total safety and quality department - £8 million/year, of which £2 million/year is for all fresh produce.
- Costs of samples and testing - approximately £500,000/year.

The news of the first certified shrimp farm of the Aquaculture Certification Council was documented in [www.aquamedia.org/news](http://www.aquamedia.org/news). The production of this farm is 1000 tons/year. The direct costs of certification were:

- US\$400 to file an application
- US\$1,200–2,400 for a typical 3-day inspection
- US\$2,000 annual licensing fee (US\$0.002/kg of annual output of whole shrimp).

Total outlay: US\$3,600–4,800

Re-inspection is required after 1 year and then every 2 years.

*Source:* [www.aquamedia.org/news](http://www.aquamedia.org/news).

Costs of *public quality and safety control* at point of departure of goods (origin) and at EU arrival of goods are shared. Producers pay the costs of the public control in the country of origin, and importers pay the costs of this control in the country of arrival. The official health certificate and phytosanitary certificate of the country of origin are required to gain entry into the European market.

Producers, processing companies, importers, and retailers may send their staff on their account to *training and courses* related to food safety and quality issues to upgrade their knowledge.

Direct costs to *public authorities* include investment for accessing rights to market entry. The magnitude of the investments and operating costs in developing countries to harmonize food safety regulations with the buying countries are not readily known, but these costs include parts of a legal framework, veterinary service, and laboratory facilities.

### **Indirect costs**

Indirect costs are costs that cannot be specifically classified under food safety and quality issues.

*Maintenance costs of systems.* Most companies have implemented different systems for quality assurance, communication, tracking and tracing, and financing. These systems need to be maintained, updated, and operated.

Producers—in particular large-scale producers—may rent a *Total Quality Management* system for their operation.

Many large importers and retailers have *laboratory* equipment to examine the safety and quality of food. However, other examinations, such as water quality and fertilizer tests, also are performed in these laboratories. Thus, laboratory costs cannot be totally classified under food safety and quality. According to the interviewees, some large-scale producers have established their own laboratories.

*Relationships management.* Interviewees emphasized the importance of maintaining relationships and networks with regard to food safety and quality aspects. Good communication between the importer/retailer and the producer about the required product quality and safety and about changes in public regulations is important. Furthermore, branch organizations of importers and retailers play an important role in keeping track of and communicating developments of EU and national food safety and quality regulations and legislations. Each of the interviewed importers and supermarkets is a member of at least one branch organization. The support, advice, lobbying, and meetings of these branch organizations are valued highly by the importers and supermarkets. The major European retailers are members of the Global Food Safety Initiative. They all agreed that the time and cost spent on these relationships and meetings are important for their companies.

## **Risk**

Risks include the estimated risks and calculated costs of risks related to food safety and quality issues.

- *Rejection* of shipment at EU entry point due to the detection of food safety problems.
- A company faces the risk that another company in the same country *ruins* the chances for the former to export through mismanagement and noncompliance with food safety and quality issues. If an EU country bans imports of a certain product from a particular developing country, *all* exporters of that product from that country may suffer. This ban may affect all parties in the chain: producers, importers, and retailers. A Dutch company with investment in catching and exporting shrimp from an African country reported an expensive insurance against such a ban of trade by the EU. The ban of imports of shrimp from East and Southeast Asian countries because of the detection of forbidden antibiotics resulted in major losses to importers in the EU because of loss of trade and products.
- Problems during the *transportation* of the products that affect the safety and quality of products (broken cold chain facilities, broken trucks, capsized boats).

- Articles in the media (scandals, “naming and shaming” policy in the UK) and other food safety and quality scandals that hurt the *reputation* of a company or the whole sector (box 16).

**Box 16. Article in the French media about food safety problems**

An article about pesticide residues on green beans and bananas from developing countries in the French journal *Que Choisir* of February 2003 resulted in a public debate about the danger and acceptability of pesticide residues on imported fresh produce. The interviewed French importer realized that this article could have great impact on the purchasing behavior of its clients. This importer felt the need to inform its clients (supermarkets) the day after the article appeared concerning the accepted national public maximum residue levels of particular pesticides on these two products (as these MRLs were not mentioned in the article) and the private monitoring practices (testing) of the importer. The importer stated that because it communicated immediately, its trade in bananas and green beans was not affected.

**Hidden costs**

Hidden costs are the costs to start up an activity related to food safety and quality issues; the costs as a consequence of lack of knowledge, information, and innovation with regard to food safety and quality; and the costs of the impacts of unforeseeable events on the safety and quality of food.

*Trial and error.* The implementation of a system or operation (tracking and tracing system, total quality management, good agricultural practice registration) may result in start-up losses.

- *Loss of opportunities to export* to the EU due to problems (for example, the ban on the import of a particular product of a particular country into the EU because of noncompliance with food safety regulations of a company from that country). This ban also results in the *loss of opportunities to import and to sell* of the products by the importer and retailer, respectively.
- The *lack of innovation* may result in noncompliance with food safety and quality requirements because of the lack of technology and systems necessary to upgrade practices that improve the food safety and quality of products.
- *Loss of opportunities due to lack of knowledge and reliable information.* Obtaining right and reliable information is time consuming and may turn out to be costly, for example, payment to access certain databases. Incompatible information that does not precisely match the needs of a company has to be adjusted to the situation, or to be acquired from different sources.
- *Maintenance of knowledge.* The lack of knowledge of fishermen/growers/processors in developing countries of European buyers’ demands and/or lack of understanding of the market situation is a hidden cost. A lack of staff may lead to inefficient information processing because there is not enough personnel to deal with all the many aspects of management of the farm/company. There is no specific person to handle food safety and quality matters.

- Unforeseeable events that have impact on food safety and quality aspects are, for instance, *losses* during transportation due to bad weather conditions, on transport (bad roads), and broken cooling facilities. Actors at any point in the supply chain, for example, harbor employees or transporters, may *go on strike* and affect food safety and quality in the entire supply chain.

### DIFFERENCES IN THE COSTS OF COMPLIANCE

The number of food safety problems in the fish sector mentioned by the interviewees is significantly higher than the problems in the fruits and vegetables sector. Fish products are very sensitive to safety and quality problems (handling, contamination, cooling). Investments in technology (processing, cooling, traceability, and handling) are necessary to diminish food safety and quality problems. Although fruits and vegetables are perishable products as well, the interviewees acknowledged that fish requires more attention.

However, because of the economical significance of fruits and vegetables, retailers tend to focus their attention mainly to this sector. A major British retailer explained that from the 50 food technologists they employ, 12 persons handle the fruits and vegetables and only 1 to 5 persons work on the fish. More private standards exist for the fruits and vegetables sector; thus, the investments by producers and companies to comply with these standards are higher in the fruits and vegetables sector than in the fish sector. There are even producers and companies that are certified for more than one standard.

According to the interviewees, producers and companies operating in the different types of supply chains (see also chapter 3) face different costs of compliance due to different levels of organization and operation. Transnational companies of a vertically integrated supply chain coordinate and control the chain activities from production to distribution. They, therefore, include the total cost of compliance with food safety and quality requirements in the final product price for the supermarket. Because many of these companies trade their fresh produce under private labels that guarantee high quality and safety, investments in food safety and quality issues are high at each chain level (standards, laboratories, and trained staff).

Producers and companies in a collaborative supply chain receive advice from the importers and retailers on how to comply with food safety and quality requirements. Importers and retailers invest in producers and companies that have proved to be reliable suppliers by visiting them, auditing their farms and firms, exchanging information with regard to public and private food safety and quality requirements, and in some cases, even investing in tracking and tracing systems or equipment. The producers and companies are requested to invest and implement private standards to be able to comply with the food safety and quality requirements of the buyer. To comply with these standards, staff need to be trained, and samples need to be sent to external laboratories. Compliance with private standards increases the market opportunities of a producer because the buyers have confidence in the products of the producer. In case problems occur with safety or quality in the source country or during transportation (weather condition, problems with transportation, strike of other chain partners), the producers or exporters face high losses since the buyers, in almost all cases, do not compensate them for these misfortunes.

Producers operating in a transaction-oriented supply chain or an importer-driven supply chain are not in contact with the buyers but deal with intermediaries, who generally do not invest much in systems of quality and safety control.

## 7. REMEDIAL ACTIONS, FUTURE DEVELOPMENTS, AND ROLE OF DONORS

### REMEDIAL ACTIONS

The interviewees have the following recommendations:

- Improve *technology*. Good plant material and the implementation of good agricultural practices have great influences on the product quality. The pesticides and chemicals used should correspond with the accepted products and accepted MRLs of the country of import. Similar improvements are needed especially for fish farmers to adopt safe aquaculture practices and preventive farming practices, decreasing the need for the use of antibiotics and other chemicals.
- Implement *tracking and tracing systems* in the supply chain. According to the interviewed importers and retailers, tracking and tracing systems in supply chains are essential components of compliance. Private standards such as BRC, EUREP-GAP, HACCP, and ISO can provide good control of the activities of the supply chain, with the farmer as the starting point of the chain. Although the Codex Alimentarius does not require tracking and tracing system in supply chains, intensive discussions are taking place about the *Draft Code of Practice for the Primary Production and Packing of Fresh Fruits and Vegetables*. This draft code indicates “adequate record keeping” and “written procedures, controls, limits, monitoring results, ...” (Q-point 2003).
- At present, the tracking and tracing in the fish supply chain is required for companies with an approval number for export to the European market. For the future, this requirement is expected to include reporting further upstream in the fish supply chain.
- *Standardize registration and documentation* of production, processing, and handling of fresh produce. Currently, there is no standardization for the registration of activities required by the different private standards. Producers and companies, therefore, go through a great deal of work completing the different registration requirements when they must implement more than one private standard.

- *Organize small-scale farmers* in developing countries. The challenge for small-scale farmers to export to OECD countries is increasing. The required implementation of private standards and certification, the mandatory tracking and tracing, and getting access to information are too costly for small farmers individually and require organization. The organization of farmers could be in the form of cooperatives, or contract farming with a large-scale plantation or packing station. Cooperatives can be EUREP-GAP certified and be responsible for their members instead of each individual farmer being certified.
- *Train* small-scale farmers, and fish farmers on good agriculture/aquaculture practices, post-harvest practices, quality control, selection and packing, and implementation of private standards can help improve their export opportunities to OECD countries.
- *Create an enabling export environment* by the national government in developing countries. The lack of proper extension services, quality and safety controls of national control agencies, laboratories, nonharmonized regulations and monitoring practices, research institutes, transportation and communication infrastructure, the absence of qualified providers of inputs agri-industry (fertilizers, chemical, carton boxes), and the lack of incentives to invest in innovations result in local exporters' noncompliance with the food safety and quality requirements of EU buyers. The support for national governments to upgrade their services to their export sectors will benefit not only the private sector but these countries as a whole through employment creation, investments, and foreign currency earnings.
- *Accredit auditing agencies* in developing countries. Many developing countries still lack accredited auditing agencies to audit the implemented food safety and quality standards. Consequently, companies must fly over auditors from abroad. Since these audits must take place each year—and for some companies even more often since they implement more standards—the costs of auditing standards are high. It is expected that the increase in demand for audits will result in local supply of auditing services, resulting in decreased cost.
- *Local offices specialized in private standards* in developing countries assist producers and companies with the implementation of private standards and keep track of the private standard developments in OECD countries.
- Companies and the government interact and cooperate to invest in the *health and social care* of the employees at the plantations/fish processing companies. The productivity of the people employed is of great importance for the economic output of companies and reduces human-transmitted pathogens to the products. Medical care, sanitation, clean water sources, and education should be basic conditions for employees and their families.

## **FUTURE DEVELOPMENTS AFFECTING CAPACITY TO COMPLY**

The most important capability in developing countries' future production of food will be the ability to adapt to frequent changes in market demand and to public and private food safety and quality rules, including tracking and tracing requirements. Some public agencies in developing countries indicated that their tightening requirements are a result of technological developments in the detection of food contaminants.

Consumers' demand and concerns will become more and more important. Most importers and retailers interviewed expect that EUREP-GAP will become the basic requirement for producers of fresh produce, including fish. A few retailers required their producers to be EUREP-GAP certified as of January 1, 2003, while other retailers required their producers to be EUREP-GAP certified by January 1, 2004 or 2005. Although most retailers believe that EUREP-GAP covers all important food safety and quality aspects, it is expected that they will require producers to implement their own specifications as well to differentiate themselves in the market.

Incentives to comply with quality and food safety standards are necessary. These incentives may be in the form of governmental incentives for investments in technology and support for building of institutions. Retailers and importers can provide support for implementing private standards and can pay a fair price for high-quality products.

## **POSSIBLE ROLE OF THE WORLD BANK AND DONOR AGENCIES**

*Remedial actions and assistance by the international community*, preferably through collective action by the World Bank and other donor agencies, are greatly needed. Producers and companies in developing countries often are left in limbo due to:

- Lack of information on factual performance indicators and rules and regulations
- Poorly performing national authorities
- Lack of infrastructure for transport of goods
- Lack of knowledge on the demand pattern of European consumers.

Upgrading the public sector in developing countries is of great importance. Remedial action for the *public sector* therefore must include *institutional strengthening* of the competent authority/inspection agencies through training. National governments should be assisted with the harmonization of food safety and quality regulations and monitoring practices to comply with EU regulations. EU-SANCO already assists national governments with the fish sector. Furthermore, technical and research institutions need to be strengthened, and laboratories for testing and capacities for monitoring residues of antibiotics and pesticides need to be upgraded. Governmental support to farmer groups/cooperatives will increase the export opportunities of small-scale producers.

Remedial action for *private sector* development can be pinpointed as *investments and organizational support*. Producers are facing tight and extended private requirements and

assistance from the international community. Investments by buyers in the implementation of private standards and tracking and tracing systems will distribute the cost among the chain partners in the supply chain. Chain partners, particularly those operating in a collaborative supply chain, should strive to share costs. The private sector also can support the organization of farmers in cooperatives or encourage contract farming with large-scale producers. Similarly, private companies can help organize primary producers in fisheries and fish farming.

Producers and companies operating in a vertically integrated supply chain or in a collaborative supply chain are supported by the chain partners through information exchange, regular visits of buyers, and investment chain partners. They do not require the support of donor agencies, other than by a good investment climate and perhaps one-time support for set-up costs.

Donor support should be given to producers and companies that operate in either an importer-driven supply chain or a transaction-oriented supply chain. These often are small-scale enterprises that are, in most cases, disconnected from the European markets and their buyers and, therefore, are not aware of specific food safety and quality demands. Support should aim at the inclusion of these groups in collaborative supply chains.



## APPENDIX 1. NOTIFICATIONS ON SHRIMP AND FISH PRODUCTS FROM THIRD COUNTRIES, 2002

Data relates to the year 2002 (January 1–December 31). The number of notifications is shown in parentheses.

<i>Country of origin</i>	<i>Product (fish and shrimp only)</i>	<i>Source of contamination</i>	<i>Danger</i>
Algeria	<ul style="list-style-type: none"> <li>▪ Sardines in oil (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Polycyclic aromatic hydrocarbons</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Angola	<ul style="list-style-type: none"> <li>▪ Tuna (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Histamine</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Argentina	<ul style="list-style-type: none"> <li>▪ Shrimp (2)</li> <li>▪ (Hymenopenaeas mulleri)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sulphur dioxide</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
“Asia”	<ul style="list-style-type: none"> <li>▪ Shrimp (Black tiger) (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Nitrofurans, Furazolidone, AOZ</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Bangladesh	<ul style="list-style-type: none"> <li>▪ Shrimp (Black tiger), Prawns (3)</li> <li>▪ Shrimp freshwater (king prawn) (6)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibro Cholera/ parahaemolyticus</li> <li>▪ Nitrofurans</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> <li>▪ Chemical</li> </ul>
Benin	<ul style="list-style-type: none"> <li>▪ Prawn, frozen (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Aerobic mesophiles Enterobacteriaceae</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Brazil	<ul style="list-style-type: none"> <li>▪ Monkfish tails</li> <li>▪ (Lophius piscatorius) (1)</li> <li>▪ Fish (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Aerobic mesophiles</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Chile	<ul style="list-style-type: none"> <li>▪ Mussels (Mytilius chilensis) (3)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Coliforms, Escherichia coli,</li> <li>▪ Bacterial inhibitor</li> <li>▪ Aerobic mesophiles</li> <li>▪ Enterobacteriaceae</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>

<i>Country of origin</i>	<i>Product (fish and shrimp only)</i>	<i>Source of contamination</i>	<i>Danger</i>
China	<ul style="list-style-type: none"> <li>▪ Shrimp (33)</li> <li>▪ Shrimp (1)</li> <li>▪ Shrimp (1)</li> <li>▪ Prawn and crab (1)</li> <li>▪ Prawns (1)</li> <li>▪ Prawns (1)</li> <li>▪ Other fish products (17)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> <li>▪ Aerobic mesophiles</li> <li>▪ Vibrio parahaemolyticus</li> <li>▪ Cadmium</li> <li>▪ Incorrect labeling</li> <li>▪ Fraud</li> <li>▪ Vibrio cholera/parahaemolyticus/ Vulnificus, Salmonella, nitrofuran, chloramphenicol, veterinary drug residual</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li> <li>▪ Microbiological</li> <li>▪ Chemical</li> <li>▪ Labeling</li> <li>▪ Not determined</li> <li>▪ Multiple</li> </ul>
Cote d'Ivoire	<ul style="list-style-type: none"> <li>▪ Tuna (1)</li> <li>▪ Fish - smoked (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Histamine</li> <li>▪ Moulds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li> </ul>
Ecuador	<ul style="list-style-type: none"> <li>▪ Shrimp (penaeus Vannamei) (2)</li> <li>▪ Shrimp (2)</li> <li>▪ Shrimp (1)</li> <li>▪ Tuna (2)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sulphites</li> <li>▪ Vibrio parahaemolyticus</li> <li>▪ Nitrofuran</li> <li>▪ Staphylococcus aureus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li> <li>▪ Chemical</li> <li>▪ Microbiological</li> </ul>
Gambia	<ul style="list-style-type: none"> <li>▪ Fish maws - dried (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Insufficient labeling,</li> <li>▪ parasites Insects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Labeling,</li> <li>▪ Parasites</li> </ul>
India	<ul style="list-style-type: none"> <li>▪ Shrimp (4)</li> <li>▪ Shrimp (8)</li> <li>▪ Shrimp (2)</li> <li>▪ Shrimp (13)</li> <li>▪ Shrimp (12)</li> <li>▪ Other fish products (10)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> <li>▪ Nitrofuran</li> <li>▪ Antibiotics</li> <li>▪ Bacterial inhibitor</li> <li>▪ Vibrio cholera/ parahaemolyticus, Salmonella</li> <li>▪ Salmonella, Vibrio cholera/ parahaemolyticus, Aerobic</li> <li>▪ mesophiles, Cadmium,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Chemical</li> <li>▪ Chemical</li> <li>▪ Chemical</li> <li>▪ Microbiological</li> <li>▪ Mostly microbiological</li> </ul>
Japan	<ul style="list-style-type: none"> <li>▪ Shark (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mercury</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Latvia	<ul style="list-style-type: none"> <li>▪ Sprat in oil (5)</li> <li>▪ Sprat paste - smoked (1)</li> <li>▪ Herring smoked in vegetable oil (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Benzo(a)pyrene</li> <li>▪ Polycyclic aromatic hydrocarbons</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Malaysia	<ul style="list-style-type: none"> <li>▪ Shrimp (13)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibrio parahaemolyticus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>

<i>Country of origin</i>	<i>Product (fish and shrimp only)</i>	<i>Source of contamination</i>	<i>Danger</i>
Mauritania	<ul style="list-style-type: none"> <li>▪ Shark + various fishery products</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibro parahaemolyticus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Morocco	<ul style="list-style-type: none"> <li>▪ Shrimp (1)</li> <li>▪ Fish products (11)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sulphites</li> <li>▪ Aerobic mesophiles</li> <li>▪ Enterobacteriaceae total,</li> <li>▪ histamine, vibio,</li> <li>▪ Polycyclic aromatic hydrocarbons</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ And</li> <li>▪ Microbiological</li> </ul>
Myanmar	<ul style="list-style-type: none"> <li>▪ Shrimp (1)</li> <li>▪ (Penaeus indicus, penaeus affinis)</li> <li>▪ Hake fillets (6)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> <li>▪ Enterobacteriaceae total</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li> </ul>
Nigeria	<ul style="list-style-type: none"> <li>▪ Shrimp (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibro parahaemolyticus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Pakistan	<ul style="list-style-type: none"> <li>▪ Shrimp (4)</li> <li>▪ Fishery products (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> <li>▪ Deterioration</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Chemical</li> </ul>
Panama	<ul style="list-style-type: none"> <li>▪ Tuna and shark (6)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mercury</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Peru	<ul style="list-style-type: none"> <li>▪ Squid (2)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cadmium</li> <li>▪ Enterobacteriaceae total</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li> </ul>
Polen	<ul style="list-style-type: none"> <li>▪ Shrimp shells dried (2)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dioxin</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Senegal	<ul style="list-style-type: none"> <li>▪ Fish products (3)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Aerobic mesophiles, lead</li> <li>▪ parasites</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Parasites</li> </ul>
Seychelles	<ul style="list-style-type: none"> <li>▪ Swordfish and tuna (2)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parasites</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parasites</li> </ul>
Singapore	<ul style="list-style-type: none"> <li>▪ Swordfish and marlin (4)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mercury, cadmium</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
South East Asian countries	<ul style="list-style-type: none"> <li>▪ Shrimp (3)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> </ul>
Sri Lanka	<ul style="list-style-type: none"> <li>▪ Swordfish (5)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parasites</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parasites</li> </ul>
Tanzania	<ul style="list-style-type: none"> <li>▪ Nile Perch fillets</li> </ul>	<ul style="list-style-type: none"> <li>▪ Salmonella spp</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>

<i>Country of origin</i>	<i>Product (fish and shrimp only)</i>	<i>Source of contamination</i>	<i>Danger</i>
Thailand	<ul style="list-style-type: none"> <li>▪ Shrimp (40)</li> <li>▪ Shrimp (4)</li>   <li>▪ Shrimp (1)</li> <li>▪ Fish products (13)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Nitrofurantoin</li> <li>▪ Vibrio parahaemolyticus/ cholera/ vulnificus</li> <li>▪ Bacterial inhibitor</li> <li>▪ Aerobic mesophiles,</li> <li>▪ Nitrofurantoin, Cadmium,</li> <li>▪ Salmonella</li> <li>▪ Schwarzengrund,</li> <li>▪ Vibrio cholerae</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Microbiological</li>   <li>▪ Chemical</li> <li>▪ Chemical</li> <li>▪ Microbiological parahaemolyticus</li> </ul>
Togo	<ul style="list-style-type: none"> <li>▪ Eels, catfish, + sardines (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Polycyclic aromatic hydrocarbons</li> </ul>	<ul style="list-style-type: none"> <li>▪</li> </ul>
Tunisia	<ul style="list-style-type: none"> <li>▪ Bivalves mollusks (1)</li> <li>▪ Swordfish (1)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Diarrhetic Shellfish Poison (DSP)</li> <li>▪ Mercury</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Chemical</li> </ul>
U.S.A.	<ul style="list-style-type: none"> <li>▪ Scallops (<i>Placopecten magellanicus</i>)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibrio parahaemolyticus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Uruguay	<ul style="list-style-type: none"> <li>▪ Scallops</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vibrio parahaemolyticus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microbiological</li> </ul>
Vietnam	<ul style="list-style-type: none"> <li>▪ Shrimp (31)</li> <li>▪ Shrimp (15)</li> <li>▪ Shrimp (2)</li>   <li>▪ Other fish products (7)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chloramphenicol</li> <li>▪ Nitrofurantoin</li> <li>▪ Vibrio cholera/ parahaemolyticus/ salmonella</li> <li>▪ Salmonella, Nitrofurantoin</li> <li>▪ Chloramphenicol,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chemical</li> <li>▪ Chemical</li> <li>▪ Microbiological</li>   <li>▪ Microbiological</li> <li>▪ Chemical</li> </ul>
<i>Source:</i> Established from individual notifications kindly made available by private industry.			

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## **RELATED LINKS**

FAO FTP site to download CODEX Standards  
<ftp://ftp.fao.org/codex/standard>

Auburn University, Department of Fisheries and Allied Aquaculture [www.ag.auburn.edu//dept/faa/tilap.html](http://www.ag.auburn.edu//dept/faa/tilap.html)

Aquaculture Certification Council  
[www.aquaculturecertification.org/](http://www.aquaculturecertification.org/)

Aquamedia

[www.aquamedia.org/](http://www.aquamedia.org/)

British Retail Consortium

[www.brc.org.uk](http://www.brc.org.uk)

The Food Business Forum

[www.ciesnet.com](http://www.ciesnet.com)

Codex Alimentarius, Current Official Standards

[www.codexalimentarius.net/standard\\_list.asp](http://www.codexalimentarius.net/standard_list.asp)

[www.ean-int.org](http://www.ean-int.org)

[www.eurep.org](http://www.eurep.org)

[www.europa.eu.int/eur-lex/en/index.html](http://www.europa.eu.int/eur-lex/en/index.html)

[www.euseafood.com](http://www.euseafood.com)

[www.fao.org/DOCREP/003/X8002E/x8002e07.htm#P6](http://www.fao.org/DOCREP/003/X8002E/x8002e07.htm#P6)

[www.fao.org/fi/fcp/FICP\\_GHA\\_E.asp](http://www.fao.org/fi/fcp/FICP_GHA_E.asp)

[www.fishfarming.com/tilapia.html](http://www.fishfarming.com/tilapia.html)

[www.food.gov.uk/foodindustry/regulation/foodlawguidebranch/foodlawguidech01/](http://www.food.gov.uk/foodindustry/regulation/foodlawguidebranch/foodlawguidech01/)

[www.forum.europa.eu.int/irc/sanco/vets/info/data/listes/ffp.htm](http://www.forum.europa.eu.int/irc/sanco/vets/info/data/listes/ffp.htm)

[www.globalfoodsafety.com](http://www.globalfoodsafety.com)

[www.globalfoodnetwork.org](http://www.globalfoodnetwork.org)

[www.globefish.org/marketreports/Shrimp](http://www.globefish.org/marketreports/Shrimp)

FAO Globefish (Fish Info Network)

[www.globefish.org/presentations/vantilapia/sld021.htm](http://www.globefish.org/presentations/vantilapia/sld021.htm)

Knowledge for Business, Fruitful Project Web site

[www.inro.tno.nl/fruitful](http://www.inro.tno.nl/fruitful)

International Organization for Standardization (ISO)

[www.iso.org](http://www.iso.org)

Race to the Top (Tracking supermarket progress towards a greener and fairer food system)

[www.racetothetop.org](http://www.racetothetop.org)

Safe Quality Food Institute

[www.sqfi.com](http://www.sqfi.com)

Traceability of Fish Products Web site  
[www.tracefish.org](http://www.tracefish.org)

World Trade Organization, Sanitary and Phytosanitary Measures  
[www.wto.org/english/tratop\\_e/sps\\_e/sps\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/sps_e.htm)

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