Food Safety in Agricultural International Trade: The Spanish experience in Mediterranean products

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Food Safety in International Trade: The Spanish experience in Mediterranean products

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Summary

Food international trade between developed and developing countries is increasing as a consequence of the worldwide liberalization movement. Tariffs and technical barriers are decreasing and many exporters in developing countries are ready to supply to developed markets. However there are non-tariff barriers, some of them related to food safety. The goal of this paper is to analyse how some food safety and quality control measures may be overcome by Less Developed Countries following some indications, such as a benchmarking analysis. The identification of "best practice" in operating firms may be useful to others. We describe the evolution of international trade, the situation at destination and origin markets through the international channel. It is important to identify the role of food safety and traceability in food international relations. A case study is mentioned with the analysis of the fresh food export supply in Spain.

KEYWORDS: international trade, food safety, benchmarking, Spanish export supply chain, traceability

1. Introduction

Increasing the agricultural trade between EU and LDC is a challenge as a first step to interact economic and social relations at long run. Besides marketing strategies oriented to consumer behaviour and other elements as liberalization of commercial barriers, there are important factors in order to get efficient import-export relations.

The goal of this paper is to call the attention that quality control and traceability are not discriminatory against developing countries, as they are compulsory for all the products in the EU market. Therefore, agro food exporters towards EU market should be prepared to apply adequate measures of quality control and traceability in their food products.

A short review of food international trade between DC and LDC is presented, with discussion on the problematic points in the food chain. A long-term solution for developing countries to sustain an international demand for their products lies in building up the trust and confidence of importers in the quality and safety of their food supply systems. This requires improvements within national food control systems and within industry food quality and safety programmes.

In this paper we analyse the food safety and quality control with the Spanish fresh food exporting sector as a reference in a benchmarking analysis. As one of the fruit and vegetable leader exporting countries in the world it is of interest to identify some of the main activities in the supply chain. Thus, a field work was carried on regarding both the citrus and tomatoes sectors, and the main results are shown. The study focuses the attention in the identification of key no-compliance areas in food safety and quality, through the benchmarking and traceability.

In order to know the "best practice" for fresh produce safety and quality in food exports chain, it is necessary to implement inspections and certifications.
Summarizing, we describe the situation of the Spanish Export Supply Chain, the characteristics of the benchmarking for safety and quality in the agricultural foreign trade relations. Finally, we include some of the main results and conclusions of the EU project "The impact of international safety and quality standards of the competitiveness of Mediterranean products" (E 01022208), whose research program was developed by the authors altogether with other colleagues from several countries.

2. Characteristics of food international trade between developed countries (DC) and less developed countries (LDC)

The evolution of International Trade (Figure 1), during the last decades, shows us how agricultural products are less dynamic than manufactures or energy, and yearly variations (Figure 2) are in general lower than the others. However, even agricultural trade is about 10 per cent of the total international trade, it has a strategic position and the negotiations in WTO, are quite often dependent upon the agreement on agriculture.

Less Developed Countries and the non-Governmental Organizations on Development (NGOD) are making a special emphasis in opening the borders of the rich countries and allow the entrance of products coming from them, with the conviction that it will impel the development. Even though is a good starting point, (and could be considered necessary), it does not guarantee that a desirable economic development would be reached. Other requirements, frequently forgotten, must be fulfilled.

Thus, it has to be taken into account the efficiency of the commercial chain which goes from the producer of underdeveloped areas to the consumer of rich countries (Camps, T. 2004). Any failure in its steps can imply a discontinuity in the supply or an abuse of dominant position of brokers who take great part of the benefit. Thus, the experience shows that even in Developed Countries a collapse in the prices perceived by farmers is not automatically reflected in the equivalent fall in consumers' price. For that reason, we must consider the scenario as a whole and consider that the added value generated by the possible liberalization of markets in rich countries must be addressed essentially to help marginal areas and needed population. Otherwise, with a mere agreement on reduction of tariffs we have only covered the first stage.

We will focus our attention on three scenes: the destination market of the product, the origin market and the union channel of both (Briz J., Trueba I., 2006).

Destination market

In a market liberalized of quotas and tariffs, the products from LDC will find several problems, (e.g., Non Tariff Barriers, NTB) derived from exigencies in quality and food safety required by consumers. This type of barriers cannot be considered discriminating since the demand is the same for national producers and foreigners. It is the case of traceability requirements that came into effect in January 2005 in the European Union (EU). A different matter is the regulation of bio terrorism in the U.S.A., where the exigencies are applied only to imported products. In the case of the EU, it provides support on equipment and education of experts, so if there are qualified experts in the LDC they can fulfil the controls of quality and traceability in the exports directed to the EU.

Another aspect to consider is the distribution system used. Until now, some products from LDC are sold through Fair Trade logo. This is a good initiative that is consolidating, oriented to a sensible public within the Third World. “It is an alternative trade that offers producers’ routes to commercialize their products according to ethical criteria which integrate economic, social and environmental criteria” (Alvarez, D., 2005). Nevertheless, if the imports increase in volume, is necessary to think about the use of regular trade channels able to absorb those amounts in a good relation quality/price. Multinational companies related to retailers may develop a good role, given their commercial agility. It is necessary to consider the participation in traditional channels of wholesalers and retailers to support this initiative.

Origin market of products from LDC

Since the goal is to help small farmers improve their income, they must be the receivers of a great part of the added value obtained by the liberalization of markets in DC. Trade circuits in underdeveloped areas are usually inefficient, with lack of transparency and abuse of dominant position of certain economic agents. For that reason, a good proportion of the benefits may be lost in the way or with fraudulent practices or corruption, which would produce frustration and discrimination.

In addition, farmers oriented to export products are usually the richest ones, whereas the marginal ones are centred in self-consumption or, in the best case scenario, in the domestic market. Consequently, it is necessary to evaluate the opportunity of those poor ones to receive the benefit, for which there are to design support policies, among them: proper distribution of land and other productive factors, the search of market windows, infrastructure improvement in origin markets, transports, storage, in addition to the traditional agricultural extension services.

International trade channels

The logistic, financial and administrative complexity of the agricultural exports, limits the participation of Small and Medium Enterprises (SME´s) that in the best of the cases are centred in very specific fields where they have evident comparative advantages. For that reason, this commercial link could perceive great part of the added value, without being perceived by the link of the chain, the farmer. Therefore, it is necessary to impel competitiveness, transparency and application of ethics codes in the companies like the one established on the OECD. Citizens’ position can reach success, as it happened with the pharmacists releasing the rights of property for medicines against AIDS in the LDC.

Another aspect to consider in marketing channels is the customs bureaucracy which faces the international trade relations. The discretion of the Administration, slowness of the operations, bureaucratic overlapping and lack of coordination between civil employees and industrialists is added to the existing lack of transparency.

As an example and according to the "United Nations Conference of Tariff and Trade" (the UNCTAD) (WTO, December 2005) a normal transaction in border requires the participation of about 25 agents, 40 documents, 200 data items (a third of which are repeated 30 times).The temporary delay, cost and errors made, are a big weight to carry for the companies, forced to give the merchandise in a determine place and time. According to the WTO, the agility in this transaction could generate up to 0.26% of the GIP of the countries, which almost counts double of the benefits derived from tariff liberalization. The situation is still more serious in the SME’s that operate with small volumes, where unitary effects are greater. It all affects to competitiveness in the international scene, mainly to the LDC.

It is important to take into account the importance of food trade in the economic development of LDC, since many programs and plans depend on the income from exports, mainly agricultural.

International trade is associated to globalization and it was analyzed by Prof. J.E Stigliz, a Nobel Prize of Economy, with great teaching experience, researcher and professional at international organisms. He considers that for Developing Countries, especially Asian ones, the commercial liberalization was being done slowly and gradually. The reduction of its protectionist barriers was implemented after having a competitive national sector, with the capacity to create jobs that absorbed those weaker sectors. The success of globalization is obtained when new markets are created, for those products in which investment and innovation have taken place, making them strongly competitive.

Nevertheless, we have witnessed the problems faced by many Developing Countries, which opened their borders following indications (or almost impositions) of international organisms like the International Monetary Found (IMF), and carried the bankruptcy of companies, destruction of jobs, and weakening of their socio-political systems. As the mentioned author says, some of the most important factors have been the speculative financial movements in short term.

He indicates there is hypocrisy of the western world encouraging the liberalization of their exporting products, but maintaining protectionism of products where they are more vulnerable. As a consequence it has been created a hostile atmosphere towards the globalization in favour of the national sovereignty in economic, cultural and political field, without consideration of the positive aspects.

Food security in the food exporting chain: Basic approach

It is important to distinguish between food security, food safety and integral food security that it includes both.

The *Food Security* responds to the need to have the available food amount at any moment and place for the survival of people. In this area, organisms such as FAO have a relevant role. *Food Safety* has complementary problems, especially concerning developed countries that have preoccupation in health and hygienic (Briz et al., 2003).
Market economy shows that, in a certain way, its operation acts as a safeguard to maintain a certain level of food safety, since companies need to have the confidence of their clients (consumers). Nevertheless, the market does not guarantee enough levels of food safety. On one hand, consumers cannot define exactly their needs and have difficulties in identifying the degree of food safety they demand. On the other hand they do not respond to the enterprise's efforts in food safety, by paying higher prices.

Some firms in Food Industry face unfair competition from other companies that do not respect safety discipline, so they have lower costs. This problem repels to all the companies supplying similar products. It is interesting to highlight that food safety has a wider range, concerning possible negligence. There are social costs derived from the attention of public services, loss of working hours, minor labour yields and global distrust that may cause asymmetric movements in the markets and deviation of natural resources.

Public powers must be involved through regulations, inspection and actions, that guarantee innocuous foods to their citizens. Within these regulations those of the foreign trade are fitted.

In the international field the concerns for the Sanitary and Phytosanitary measures (SFS) has a greater dimension and displays greater problems. On one hand there is a greater heterogeneity in food supply and the regulations vary depending on the country; on the other hand consumers have different socioeconomic characteristics and different levels of communication and information.

That is why it is not uncommon to face problems related with food safety. There are several solutions, from the total cease of trade flows until the problem is solved, direct negotiations between the affected countries, the intervention of international organisms like the WTO and the World Health Organization (WHO), or the improvement of productive and elaboration processes that have caused the conflict.

The process of increasing globalization forces the companies to get involved in the markets of other countries, taking care of the sanitary – hygienic - legislations and of quality in order to attend different consumers segments. Besides the international regulations, companies oriented to foreign countries usually have their own quality regulations, frequently more demanding, if they are positioned with known marks, since any problem is quickly transmitted to other countries.

The operating system and consequent sanitary quality controls in the international relations (Mitchell, L.J., 2003) can follow diverse modalities according to the participation degree and enterprise responsibility. There is the possibility of exporting directly the finished product to its destiny markets or establishing their own factories in other countries.

When an investment is made in facilities and manufactured in foreign countries, companies have the advantage that products are already within the destiny market and do not face commercial barriers. However, in addition to their own hygienic and quality regulations, must fulfil the regulations established by the corresponding governments with respect to processing and manufacturing.

Food sanitary requirements in developing countries

International trade implies an extension of the commercial chain, supplying distant markets at more competitive prices and greater variety of products, with more opportunities for the LDC. Great efforts are being made to open the borders of rich countries through tariff disarmament, without paying attention to the subject of sanitary security and control.
It is important to consider that globalization implies sanitary and quality risks that can interfere in any of the links of the chain. In order to avoid these risks, the opportune controls are required, which means a greater operative cost. Normally, the disagreements in this field are usually solved through the World Trade Organization (WTO) by a group of experts on sanitary and phytosanitary measures without greater consequences. The regulations on quality and food safety are considered to be trade barriers. However, controls and certifications may be an intensification of exchange flows because of the greater confidence of consumers.

Therefore, it is necessary to strengthen international cooperation, where rich countries facilitate to the LDC the economic and human resources that allow the improvement of their control equipment and systems. The EU is aware of this subject and especially in these last years when it has established cooperation projects and studies to identify the main problems and search solutions.

Quality and food safety controls are going to cause discrimination in the market, being fomented by that companies which obtain products adapted for consumption. The effects in the LDC may be important, since companies oriented to exportable products will constitute groups, providing the entrance of foreign currencies, and advantages on those oriented exclusively towards the domestic market. The distortion can be harmful if food production diminishes for basic feeding and affects imports. Therefore a degree of food sovereignty would be lost, depending on the international market with the inherent risks.

In this case, the public powers and the private sector must reach an agreement to obtain the balance between the self-supply and exports. Each country has its own peculiarities and, in any case, a frame must be contemplated including broad, viable and sustainable geo-economic areas that surpass national borders. Also, in destiny markets of developed countries there is an increasing preoccupation for food safety, trying to improve control and information systems (Buzby, J.C., 2003). Previously, food scandals had local dimensions and passed unnoticed for mass media. Nowadays, the complexity of food chains and its amplitude, multiply the risks at world level, quickly spread by the New Technologies of Information and Communication (NTIC).

3. The role of food safety and traceability in agro food international trade

Food safety regulation has undergone significant changes in many developed economies during the last decade. Due to the recent developments, some countries have increased their national efforts in maintaining high quality standards and ensuring the safety of food supply for both domestic consumption and export. However, it is recognised that Developing Countries have difficulties in meeting certain requirements associated with the implementation of sanitary or phytosanitary measures and which come in connection with technical regulations, standards and conformity tests (IMF/World Bank, 2002). As more sophisticated governments and industry introduce regulations, there is the risk that new regulatory barriers will be erected. This is of particular concern for Developing Countries, where existing infrastructure may not allow for the adjustments needed to meet new requirements.

In exporting countries with established and organised supply lines, the co-ordination of safety and quality through private retailer supply relationships or through a centralised organisation is possible. Traceability systems for food safety may represent a technological barrier to exporting firms in Less Developed Countries. The process is much more problematic where there are fragmented supply chains, less direct multi-producer relationships with exporters, and less vertical integration in the supply chain. Food systems in developing countries are not always as well organised and developed as in the industrialised world, and moreover, knowledge of standards is often lacking.
Food safety is more likely to be a concern in fresh food product international trade than in other types of agricultural trade (Unnevehr, L.J., 2000). Firstly, since fresh products are transported and consumed in fresh form, handling throughout the entire supply chain can influence food safety and quality (Zepp, G. et al., 1998). In addition, it is the relatively high perishability of fresh produce and the susceptibility to damage and disease pre- and post harvest that imposes high requirement levels for quality assurance. Secondly, standards in Developed Countries tend to be significantly higher than those in developing countries; hence compliance with those standards may require greater initial investment in quality control and health system in Developing Countries. Thirdly, fresh commodities are subject to increasing scrutiny and regulation in Developed Countries where food safety hazards are better understood and more often traced to their sources.

The long-term solution for Developing Countries to sustain an international demand for their products lies in building up the trust and confidence of importers in the quality and safety of their food supply systems. This requires improvements within national food control systems and within industry food quality and safety programmes (FAO, 1999). 'Farm to table' process control to manage both quality and safety is increasingly in demand in developed countries, and new institutions are evolving to certify production practices (Unnevehr, L.J., Jensen, H.H., 1999). Hence, there are market incentives for developing exporters' countries to adapt these management practices, and to co-ordinate safety and quality management more closely with importers.

A key to product quality and safety management throughout the fresh produce supply chain is *traceability*, enabling product tracking and accountability at each stage. Nowadays, the facility to trace fresh produce production and handling practices is required by the importer/retailer complex, and all major operations, from planting to export, must be documented. This approach ensures a better understanding of the steps and conditions to which fresh produce have been subject (Ait-Oubahou, A. and El-Otmani, A. 2000). Traceability requires the identification of all physical entities (locations) from where fresh produce originates and where it is packed and stored.

Due to the globalisation of the fresh produce supply chain and because of the diversity of international produce supply chain practices, the fresh produce sector in March 2001 agreed upon *Fresh Produce Traceability Guidelines* (FPT guidelines). The FPT Guidelines were developed together with the Euro-Handels-Institute (EHI), the European Association of Fresh Produce Importers (CIMO), the Euro Retailer Produce Working Group (EUREP), the European Union of the Fruit and Vegetable Wholesale, Import and Export Trade (EUCOFEL) and the Southern Hemisphere Association of Fresh Fruit Exporters (SHAFFE) to provide a common approach to tracking and tracing of fresh produce by means of an internationally accepted numbering and bar coding system – the EAN•UCC system (EAN International, 2001). The adoption of the guidelines is voluntary and the degree to which companies will implement them may vary because of differences in commercial operations. However, the use of common identification and communication standards will significantly improve the accuracy and speed of access to information about the provenance of fresh produce. Therefore, it is likely that this traceability model will be a requirement for fresh produce exporters in the near future.

As a final word in this section, it must not be assumed that there is an easier commercial option in domestic markets for firms who do not wish to meet the challenges of more sophisticated export markets. There are many reasons besides the ethical and moral imperatives why firms must strive to achieve high levels of performance in respect of safety and quality. Social and economic losses due to poor food safety and quality are probably as serious, if not more serious in developing economies where standards and systems are lower, than are losses in advanced economies (Poole, N. et al, 2002). Improvements in the health and safety of poor people are fundamental to international efforts to achieve the Millennium Development Goals for poverty reduction, as is the development of vibrant food systems where the sector is, or has the potential to be, a major source of employment, export earnings and other macro-multiplier effects.

4. Case study: Fresh agro food export supply in Spain

Spain is the second largest European fresh produce producer after Italy and the largest world exporter. The fresh produce sector represents around 45% of total agricultural production in Spain. It generates over 450,000 jobs, and in several Autonomic

Communities the activity of the sector is fundamental to rural employment (M. Garcia et al, 2003).

During the last years, production and market performance has been very positive but producers are facing internal and external problems. The competitive advantages of Spanish vegetable production are focused on low production costs and out of season production that effectively out-competed nearby community competitors (France, Holland and Italy).

However, these competitive factors have shown themselves to be fragile, in that low prices are important but are not the only determinant element of the consumer's choice and the European markets have been opened increasingly to competition with third countries. In the last decade, the Spanish horticultural sector has been losing competitiveness through an improper modernization of the production and marketing structures.

One of the major problems for the fresh produce sector is the fragmented and small scale production. Within the context of third countries' competition and the concentration of demand (with increasing requirements) there is an urgent need for producer organisations and vertical integration. With this objective the European Common Agricultural Policy (CAP) in fresh produce has imposed the formation of Producer Organisations (OPFH) in order to receive subsidies. In the year 2000 there were 675 OPFH in Spain, with 582 having processing plants, and representing half of the total production value. 100% of banana and tomato firms are organised in OPFH, with 30% in Citrus, 20% in fruits and 7% in vegetables (MAPA 2005). As a consequence, the analysis of the marketing channel and traceability it's important

The Spanish export chain with a long tradition and socio-economic importance may be of interest for entrepreneurs either in other exporting sectors or developing countries.
In order to know the "best practice" for fresh produce safety and quality in food export chain, it is necessary to implement inspections and certifications.

Food marketing systems can be viewed as a chain of individuals and firms, who produce, deliver and consume food products. The food chain does not just concern the supply of products but should be viewed as a series of interactive and interconnected flows of goods, services, incentives and information between the different participants in the market chain (Poole, N. et al, 2002).

Notable in this complex model is the concept of feedback effects that tend to make the chain more responsive and efficient. As feedback between firms and individuals occurs, individual decisions to produce, sell and buy become better coordinated. Information flows are the key to firm interaction, and the focus of the methodology presented in this paper has much to do with information exchange throughout the supply chain (i.e., from producers, exporters, importers, to retailers) about standards and compliance. In highly coordinated food markets, it is the creation of information and responsiveness to information that results in the food system delivering to consumers the products that satisfy their preferences. These preferences are influenced by many exogenous factors as well as the subjective influences of the individual decision makers.

The number, size and functions of firms within the food chain, access to market and the competitiveness of the system are structural features. The way firms interrelate and their individual strategies make up the conduct of the system. The outcomes in terms of efficiency and effectiveness are performance characteristics. Efficiency in terms of interstage margins and value addition and firm profitability are common indicators of performance in agrifood systems; of primary importance, however, is the safety of food

products themselves. Improved market coordination is most likely to be one of the tools to improve market performance in respect of food safety and traceability.

Generally, there is high efficiency in the organisation of Spanish exports. Direct connection of exporters with distribution companies give more flexibility and better information through the marketing chain than is seen in other countries. This is one of the arguments that places an integrated marketing process in a better position than wholesale or "veiled marketing" where there is not a continuous producer-retailer experience.

In the last few years in Spain there has been an increasingly concentrated demand in the food distribution chain. Along with the fragmented nature of supply, this causes serious imbalances in the markets, giving exporting companies a weak position in the market. The consequences of fragmented supply to Spanish exporting companies are multiple: it prevents the enterprises from incorporating added value, inadequate design and promotion; it does not permit the exporting enterprises to acquire large commitments; and marketing costs are high which weakens the position of the professional associations and limits their capacity to press the national and EU administration in order to defend their interest and position in the CAP.

In relation to the structure of the Spanish exporter companies, strong fragmentation and spatial concentration are important factors. Thus, enterprises dealing with more than 25,000 tonnes of exports are concentrated in Andalusia, Murcia, Valencia and the Canary Islands. In this last region, the cooperative system has major participation in export.

The cooperative sector in Spain is responsible for about 30% of exports and involvement in the domestic market is probably greater. The cooperative sector includes Sociedades Agricolas de Transformación (SATs) as well as traditional cooperative organisations. SATs differ from traditional cooperatives in that their membership and business is not restricted to a specific geographical area. Figure 3 summarises the main relationships in the fresh produce supply chain for exports.

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If we consider the bigger exporter enterprises, some of their characteristics are:

- Great concentration on marketing activities. There are group of enterprises that have joined activities in the marketing channels through some joint-ventures, either in origin or in destination. There are also groups of family enterprises that maintain a joined marketing management's functions. Thus, export companies have a great capacity to adapt to market conditions, either to the slow growth of consumption in some markets or to big changes in production and export of new products, such as Iceberg lettuce, broccoli, and Galia melon.
- In general, many enterprises are simultaneously producers and exporters, regardless of the juridical structures. Perhaps, the only exception is Almeria. This kind of integration is one of the most relevant strengths in the foreign trade.
- Strong participation in the regional production of export enterprises, especially in the Canary Islands, Alicante, Huelva, Seville, Cadiz, Almeria and Murcia, in products like tomatoes, lettuces, melon, peaches and strawberry.

- Many export enterprises are trying to orient their activity to greater distribution enterprises. For that reason, they pay special attention to homogeneity, quality, and regularity in the quantities supply, during a long period of time. Simultaneously, they have been able to create alliances with wholesalers and importers in destination countries.
- In the future, we foresee a continuation in the concentration process of the producer-exporter companies, especially in the marketing area, trying to provide adequate logistic and commercial services.

5. Best practice and benchmarking in a more efficient export supply chain

An export supply chain showing 'best practice' for fresh produce safety and quality involves many inspections and certifications. Some of these controls will be carried out by government authorities, both at exporting and importing countries, based on public standards and regulations, while others will be undertaken by private organisations (i.e., third party certification) on behalf of importers/retailers and based on private specifications.

In exporting countries with more established and organised supply lines, the co-ordination of safety and quality through private retailer-supplier relationships, or through a centralised organisation is made possible. The process is much problematic in developing countries when there are fragmented supply chains, more indirect multi-producer relationships with exporters, and less vertical integration in the supply chain.

We have to outline the different stages of the fresh produce export supply chain. Given the scope of this report, the analysis will focus on the control activities carried out in exporting countries, leaving out of the study those activities undertaken by importing authorities in country destinations.

Exporters will receive the produce from their suppliers in an unsorted or partially sorted conditions and requiring further processing (i.e., washing, grading, selection, etc.), and/or packaging. It is essential at this stage that the raw material is safe, legal and meets the standards laid down by the packer/exporter/importer/retailer.

At this stage a number of quality and safety checks will be carried out:

- Produce quality, weight and labels checked for conformance with specifications
- Produce inspected for physical contaminants and mechanical damage, including chill damage
- Need for ripening assessed
- Produce sampling for quality testing specific to product (e.g., sugar content in citrus)
- Produce sampling for phytosanitary purposes
- Produce sampling for pesticide residue checks

Traceability depends basically upon accurate and timely record keeping. The EAN system includes the transmission of traceability data by electronic means, a technology that is not available to all the firms interviewed in this study. The EAN standard bar-coding system allows the identification of all locations where the fresh produce originates from and where it has been packed and stored. Some firms in this study are able to track produce units around the pack house itself using barcode recognition apparatus. Hence a more simplified scheme for best practice could be that followed by ANECOOP, the largest second-tier co-operative in Spain in the fresh produce sector

Carrying out a benchmarking exercise will enable the comparison of the level of implementation of food safety and quality practices, across countries, across sectors and across different sizes and ages of firms, with the identification of key non-compliance areas for exporting companies in the countries under study. The process involves working with those operators considered to be examples of 'best practice' in the industry and those firms with less market share.

In UK industry, a study by the Food and Drink National Training Organisation also used a scoring system in a benchmarking process for the food and drink manufacturing industry. The objectives of this research were to set a benchmark for UK food and drink manufacturing companies to identify and promote world class manufacturing activities, to establish a set of benchmarking criteria founded on international best practice for UK companies to measure themselves and identify areas for continuous improvement and to produce an industry action plan. The key areas looked at were:

- business measures
- personnel and training measures (statistical data)
- skills profiles.

The benchmarking process involved a questionnaire on Business Measures and Personnel and Training Techniques, explored with senior management team during a visit to company and then assessing the skills of personnel on visits to manufacturing operations (García, M. et al. 2003).

Some of the key strengths of the benchmarking process in previous studies, has been the bringing together of participants from companies in various sectors and of various sizes, providing a forum for exchanging information and experiences to help resolve problems (e.g. Andersen *et al*, 1999). In this study, the objective of using benchmarking was to increase the knowledge about the supply chain management process, to identify best practices in the industry and to enable the industrial project partners to learn from the best practice. Studies such as Prado (2001) focus on the face-to-face interaction and teamwork between participants in the benchmarking process, highlighting the importance of the information sharing or dissemination stage of benchmarking. The benchmarking process usually results in the development of a series of actions within each company involved in the exercise.

Thus, benchmarking involves:

- Identification and examination of specific key areas or performance areas in the process under study
- Identification of firms with best practice in the area
- Exchange of information and experiences
- Production of an action plan

A benchmarking framework is given by Shah, J. & Singh, N. (2001):

- Stage 1: Selection of performance measures, depending on the firm's competitive focus, market niche and strategy
- Stage 2: Benchmarking exercise on the firms in the industry, using the selected performance measures. This enables the identification of firms with "best performance" in terms of the selected measures.
- Stage3: Information about specific strategies of the "best performance" firms to be obtained from sources in the public domain. This information can be related to the specific performance measures of the firms.

- Stage 4: Leveraging this knowledge to find what bearing the firms' performance measures have on their specific practices and policies.

For this study, specific performance measures were identified for application across the sectors. By carrying out case studies of exporting firms, the relationship between producers and exporters was examined and a comparison with existing best practice in infrastructure and management practices carried out. In this benchmarking exercise, a qualitative rather than quantitative approach is used to explore each Key Performance Indicators (KPI). This is due to the difficulty of assigning quantitative measures to the supply chain characteristic indicators which are being examined here.
Benchmarking is a tool for improving performance by learning from best practice and understanding the process by which they are achieved. This project in particular focuses on 'process benchmarking' by comparing operations, work practices and business processes in the fresh produce exporting industry in Morocco and Turkey, with those in Spain.

Specific performance measures (KPI) were identified for application across industries. The indicators were decided upon through an examination of the supply chains for each target sector and a study of the areas and levels in which safety and quality systems could be controlled through the supply chain. (Some indicators were also based on EUREPGAP (2001) and Güngor & Güngor (2000)).
Each KPI was explored using questions, which made up a questionnaire for use as a discussion guide during visits and interviews with exporters. A qualitative rather than quantitative approach was initially used to compute each KPI due to the difficulty of assigning quantitative measures to the supply chain characteristic indicators examined in the study. Qualitative data was then classified into three levels. The different elements within each of the three levels in the framework aim to characterise that level, indicating the firm's policies and practices in this aspect, rather than specifying certain criteria, which they must meet. Some points of the framework depended upon a combination of answers in the questionnaire.
The benchmarking project considers several areas for the analysis of food safety and quality management (Table 1). For each area, a number of KPIs were developed comparison in the benchmarking process.

In order to compare the firms involved qualitatively, a framework was developed. This framework followed the structure of the questionnaire, and classified the information gained from each firm into three levels. Some points of the framework depended upon a combination of answers in the questionnaire. For example, "Production flexibility" was based upon the producer's ability to change crops/varieties grown in response to market demands as well as the exporters' ability to source from different producers with different product bases, in order to meet different market requirements. This, itself, is dependent on the producer-exporter relationship, and the nature of the contract between them.

The different elements within each of the three levels in the framework aim to characterise that level, indicating the firms' policies and practices in this aspect, rather than specifying certain criteria which they must meet. For example, classification of production practices in terms of safety and quality management depends firstly upon the actual production practices that take place and, importantly for this study, the exporter's knowledge about these production practices and ability to control them or gather information about them.

6. Final remarks

Evolution of international trade will rely, beside the traditional factors (comparative advantage, cost, price policies) in other less traditional elements, such as food safety and

traceability. Consumers in developed countries, especially in the EU, are very much concerned upon quality control and food scandals. Therefore new strategies should be applied by potential exporters from LDC, in order to get into the EU market.

In the case study we include traceability in the Spanish fresh product export trade as a new strategy in the coming future. Food safety and quality control may allow to get an adequate traceability and thus to get consumer and retailer confidence in the competitive markets. We show in this paper the results of the benchmarking analysis carried on in exporting companies. The identification of "best practice" in leading enterprises may help a better performance to others and facilitate indirectly the traceability of the products

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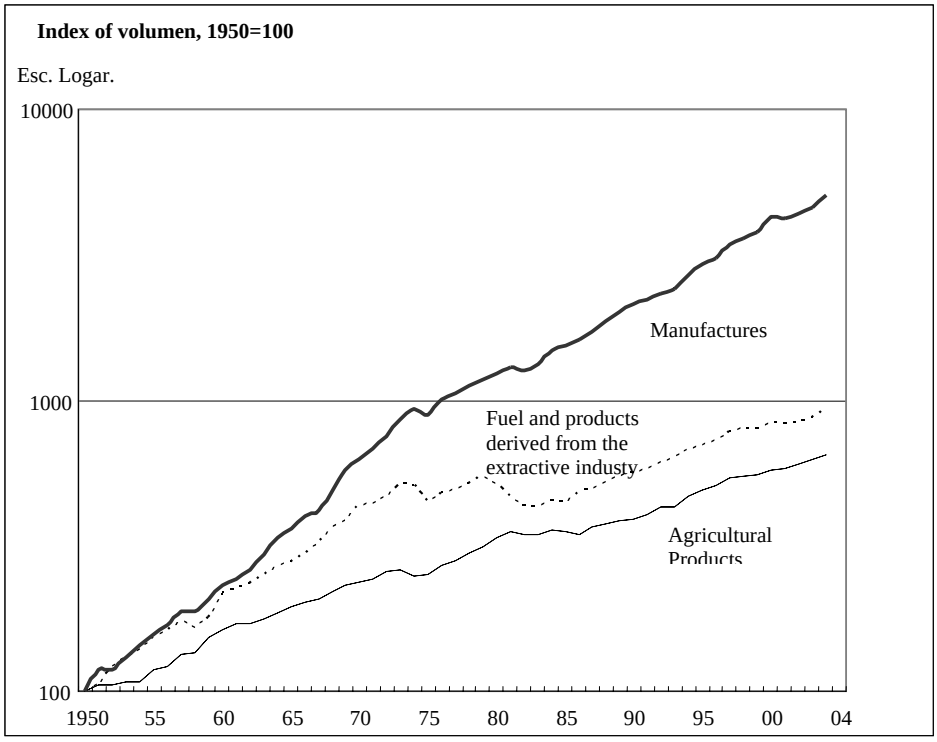
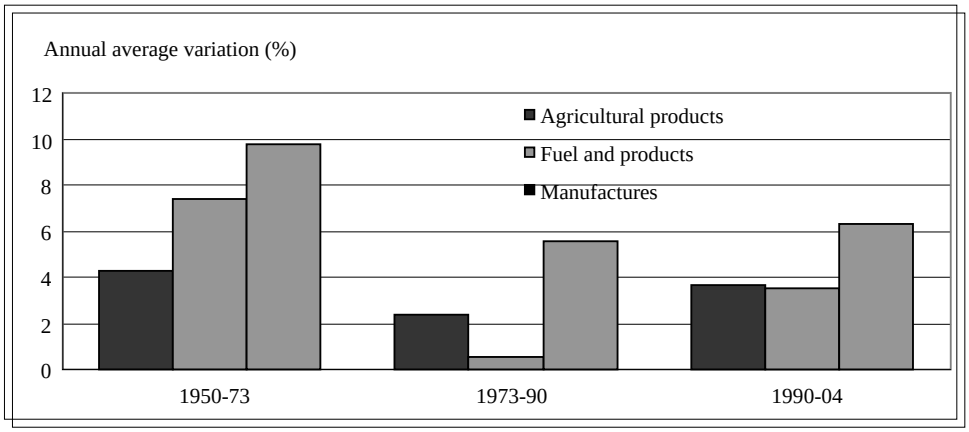
Graphs and Diagrams

Figure 1: Evolution of International Trade



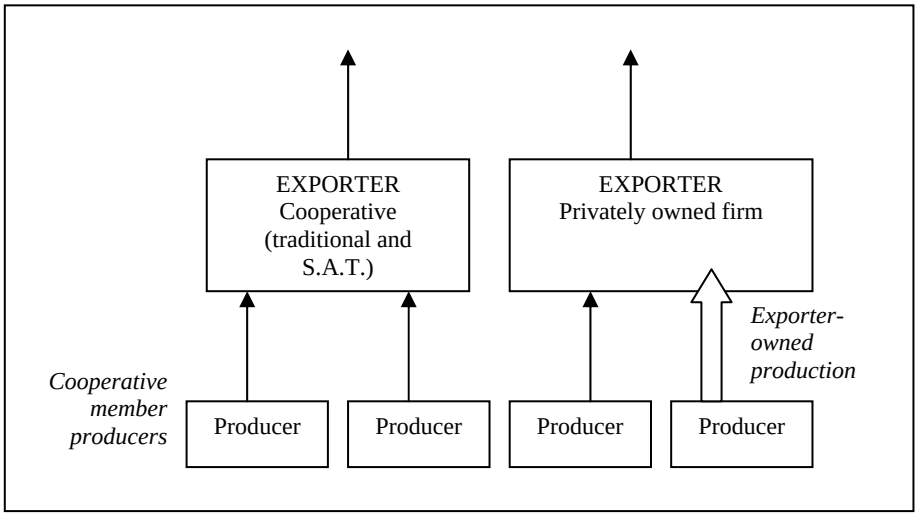
Source: WTO.

Figure 2: Annual Variation of International Trade



Source: WTO.

Figure 3: Spanish fresh produce export supply chain



Source: García M. et al.

Table 1: Key Performance Indicators

Areas of Analysis	KPI for comparison in benchmarking framework
1. Supply base	1.1. Degree of specialisation
	1.2. Export volume
	1.3. Number of producers and fragmentation of supply
	1.4. Varieties
	1.5. Forecasting systems
	1.6. Production flexibility
2. Supply chain management	2.1. Producer-exporter relationship (Type of producer-exporter relationship, e.g. co-operative, private firm)
	2.2. Vertical integration
	2.3. Degree of co-ordination of operations
	2.4. IT infrastructure and integration for supply chain management
	2.5. Customers: Countries exported to
	2.6. Customer contracts
	2.7. Customer visits
3. Traceability and tracking	3.1. Traceability systems
	3.2. Segregation
4. Crop protection	4.1. Producer practices
	4.2. Exporter communication
5. Harvesting	5.1. Harvest hygiene
	5.2. Harvest quality (Product homogeneity, effect of climate, consistency in production)
6. Processing and packaging	6.1. P&P technology
	6.2. P&P quality
	6.3. Labelling
7. Storage & Transport	7.1. Exporter storage knowledge
	7.2. Storage capacity
	7.3. Storage quality
	7.4. Transport quality
8. Export Quality Control (QC) Process	8.1. Quality Certification
	8.2. QC staff
	8.3. Worker knowledge
	8.4. Product sampling for QC
	8.5. Laboratory access
9. Packhouse worker health, safety and welfare	9.1. Training
	9.2. Worker welfare, health and safety
10. Environmental management	10.1. Environmental management

Source: García M. et al.

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