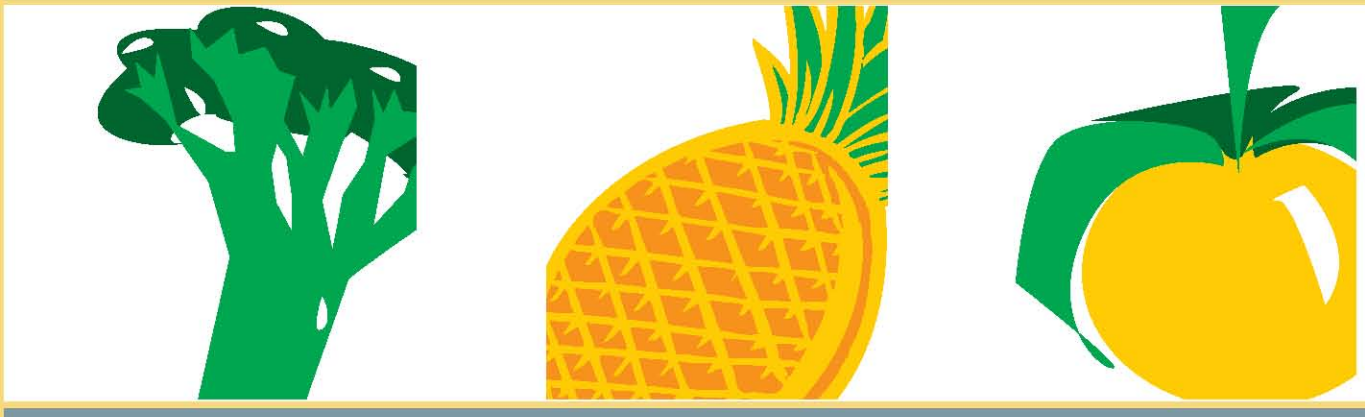
Implementing programmes to improve safety and quality in fruit and vegetable supply chains: benefits and drawbacks

Latin American case studies



Implementing programmes to improve safety and quality in fruit and vegetable supply chains: benefits and drawbacks

Latin American case studies

Prepared by:
Maya Piñeiro
(Senior Officer)
Luz B. Díaz Ríos
(Consultant)

Food Quality and Standards Service
Nutrition and Consumer Protection Division

Food and Agriculture Organization of the United Nations
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For further information, please contact:

Food Quality and Standards Service
Nutrition and Consumer Protection Division
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla, 00153, Rome, Italy
Fax: (+39) 06 57054593
E-mail: food-quality@fao.org
Web site: http://www.fao.org/ag/agn/agns/

Executive summary

While many developing countries are making efforts to develop competitive advantages so that they can participate in the world fruit and vegetable trade, recent developments in import markets concerning strict safety and quality requirements are posing fresh challenges to such countries to improve their production, marketing and control systems in order to meet these requirements, or even anticipate them.

The possibility of carrying out the required improvements will depend to a large extent on the technical, administrative and financial capacities already existing within the sector and within institutions supporting the various commodity sectors. In this connection, there is a fairly widely-held view in developing countries, especially in the small-scale horticultural sector, that improvements in safety and quality to meet the demands of import markets generate high costs and few benefits, inasmuch as they do not have any direct effect on price. These high costs then reduce small producers' chances of entering export markets.

This negative view springs from a poor understanding, both in the institutional sphere and also among those involved in the sector, of the benefits and drawbacks of implementing safety and quality improvement programmes. With a view to improving this understanding, FAO provided support for three case studies of export fruit and vegetable sectors in Latin America – cape gooseberry in Colombia, broccoli in Ecuador and fresh pineapple in Costa Rica. These studies encompass an effort to identify and assess the benefits and drawbacks of carrying out improvements in safety and quality in order to meet market requirements.

The case studies were carried out by experts from institutions with functions concerned with safety and quality within the countries, using the following general methodology: i) identification of the point of departure or the gap to be made up between the present situation and the desired one in terms of the capacity to provide the safety and quality guarantees required by the target market; ii) analysis of the various changes or practices required in order to improve safety and quality, taking into account the capacities and limitations of producers, particularly small-scale ones; iii) analysis of the benefits and drawbacks linked to implementation of the improvements; iv) formulation of a proposed intervention, identifying the institutional support needed in order to carry out the improvements or changes identified.

The results of the case studies indicate that the benefits and drawbacks of making improvements in production and marketing processes in order to meet the demands of the target market are directly related to the point of departure or the size of the gap to be closed in order to move from the present situation to the desired one. In this regard, capacities to make safety and quality improvements vary among the sectors studied and also within the category of small producers. Sectors where the actors are more technically advanced, organized and coordinated have greater possibilities of meeting – or even anticipating – market demands, as is seen in the cases of pineapple and broccoli. In the case of cape gooseberry, the technological problems of cultivation and the lack of coordination among the actors are aspects that have to be resolved if safety and quality improvement programmes are to be successful.

In terms of the capacities of producers in the three sectors studied, small producers generally face technical, financial and management constraints that impede the implementation of safety and quality improvements. Their low educational level hampers their ability to keep proper records and the other documents needed to comply with safety programmes or to serve as instruments for farm management and planning. From the technical point of view, the present level of capacities with regard to appropriate pest and disease control systems and appropriate production practices is limited, resulting in low efficiency in the use of production resources (excessive applications of pesticides, low efficiency in the use of fertilizer etc.) and high risks for produce safety.

Analysis of all the recommendations/practices to be implemented to meet safety and quality objectives indicates that the largest improvements concern the implementation of programmes to reduce

chemical residue hazards, investment in building health infrastructure, produce storage facilities and chemical storage facilities, payment for soil and water analysis, and the general optimization of production practices.

What are the advantages and disadvantages for small producers of making the required improvements? In this connection, the case studies highlight the fact that the costs connected with making improvements in safety and quality are considerable, mainly in connection with the building of health infrastructure and storage facilities, and payment for technical advisory services and soil and water analysis. The amount of these costs varies depending on how sophisticated the sector is, the production technology applied, the type of producer etc. In the case of small pineapple growers, for example, the results indicate that the improvements needed to meet the safety requirements of the EurepGAP Protocol account for between 36 and 55 percent of the costs of implementing good practices programmes.

Do the costs connected with implementing the programmes represent a real obstacle to small producers' participation in export sectors? The study results indicate that costs will hamper the implementation of improvements, depending on various factors:

- small producers' access to economic resources (funding, subsidies etc.) in order to carry out the improvements needed in terms of infrastructure construction, payment for services (advice, laboratory analysis etc.), purchase of equipment etc.;
- the public and private infrastructure available to support and facilitate the implementation of programmes by small producers;
- careful analysis of the *drawbacks and benefits* of the practices to be implemented: an analysis that considers solely the drawbacks will very probably define the costs as an obstacle to implementation of the required improvements and will thus act as a disincentive for the implementation of such programmes on the part of small producers.

In terms of benefits, the major benefit of making improvements in safety and quality is connected with the possibility of supplying a lucrative market. However, as in the case of costs, the size of the benefits derived from implementing safety and quality programmes will depend to a large extent on the point of departure in terms of the producers' levels of technical advancement and technical and administrative abilities. The case studies illustrate major benefits connected not only with improved productivity (yields per hectare) and the percentage of produce meeting export demands and thus marketed at a higher price, but also with the reduction in variable costs as a result of more efficient use of agricultural inputs (pesticides, fertilizers etc.). Since small producers work under traditional systems (as in the case of broccoli and cape gooseberry), improvements in the production process are clearly reflected in improvements in yields and other production variables. These benefits are less evident in the case of producers working under more technically advanced production systems (as in the case of pineapple). In this category of producer, improvements to meet market requirements are centred on the construction of support infrastructure and other investments to ensure the safety of produce, and also on keeping records of the practices adopted and setting up tracking processes – activities with less clear benefits for producers because they do not affect production variables. The creation of incentives, for example financial support to carry out the required investments, are therefore needed in order to encourage small producers to take part in these programmes.

Analysis of the benefits and drawbacks connected with the implementation of safety and quality improvement programmes indicates a positive relationship. Producers in the broccoli and cape gooseberry sectors appear to draw benefits from the increased income resulting from improvements in quality, the reduction in variable costs and higher yields per hectare. However, if small producers are to secure these benefits, they need institutional support in order to strengthen and/or develop the technical and administrative capacities needed to implement the recommended practices.

In this regard, capacity-building concerning safety and quality must be seen as a gradual, ongoing

process, allowing specific improvements to be made while taking into account the *existing capacities* and the identified needs. When building small producers' capacities in this sphere in order to facilitate their participation in export sectors, it is therefore important to consider the amount of public and private effort needed and also to define realistic short, medium and long-term objectives.

The existing capacities to implement safety and quality programmes obviously vary depending on the category of producer, as is seen in the case studies. Different levels of institutional support or intervention are therefore needed in order to bring about safety and quality improvements to meet export market requirements. In this connection, institutional efforts could have greater impact if they focused on identifying and rectifying the specific constraints of the various categories of producer, first optimizing the opportunities of the small producers with the most possibilities of carrying out the required improvements.

In conclusion, it is clear that the approach to promoting safety and quality improvements must take an over-all view in analysing the various sectors. Producers' possibilities of meeting market requirements with regard to safety and quality depend on a number of factors (technological elements, structure of the sector, coordination of the actors, international and national competition, economic benefits, actors' technical, economic and administrative capacities, etc.). In the three sectors analysed, institutional efforts, both public and private, have focused mainly on: i) strengthening the various "resources" external to the producer – creating an appropriate regulatory framework, providing support for research, establishing laboratories etc.; ii) strengthening small producers' *technical and administrative capacities* through training and advice, the promotion of links or forms of coordination among producers etc. However, if small producers are to secure the benefits of adopting practices to improve safety and quality, they must have the *financial capacity* to adopt these practices and make the investments required. Public and private interventions that combine the above-mentioned elements with the creation of incentives by increasing farmers' financial capacities will therefore have a greater chance of success. Examples of this type of incentive are the granting of subsidies for certain services (low charges for soil and water analysis), financial support to pay for certification, the construction of infrastructure and the purchase of equipment, and the supply of advice and other support. These aspects represent the main costs involved in implementing safety programmes and have a major effect on total production costs, as is seen in the cases studied.

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Acronyms and abbreviations

AGN	Nutrition and Consumer Protection Division, FAO
AGNS	Food Quality and Standards Service, FAO
BRC	British Retail Consortium
CORPEI	Ecuadorian Export and Investment Promotion Corporation
EU	European Union
EUREP	Euro-Retailer Produce Working Group
EUREPGAP	EUREP Good Agricultural Practices
FAO	Food and Agriculture Organization of the United Nations
FBD	Food-Borne Disease
FDA	Food and Drug Administration, United States
GAP	Good Agricultural Practice
GDP	Gross Domestic Product
GHP	Good Hygiene Practice
GMP	Good Manufacturing Practice
g	Gram
ha	Hectare
HACCP	Hazard Analysis and Critical Control Point System
IPDM	Integrated Pest and Disease Management
IQF	Individual Quick Frozen process
ISO	International Organization for Standardization
km	Kilometer
LOD	Level Of Determination
MRL	Maximum Residue Level
msl	Metres above Sea Level
PROCOMER	Costa Rican Foreign Trade Promotion Agency
PROEXPORT	Colombian Export Promotion Agency
t	Metric tonne
WTO	World Trade Organization

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Work team in Colombia
Coordinators from national institutions:

- Anita Torrado. Coordinator of the Agricultural Agrofood Sector Safety Group
- Colombian Agricultural and Livestock Institute
- Germán Sánchez, Research Expert, Integrated Pest Control Programme, Colombian Agricultural and Livestock Research Corporation
- Jesús María Pedraza, Coordinator, National Good Agricultural Practices Programme, National Training Service
- Myriam Saavedra, Expert, Technological Development Directorate, Ministry of Agriculture and Rural Development

Research experts:

- Luz Mireya Pinzón
- Arley Almanza
- René Escobar

Work team in Ecuador
Coordinators from national institutions:

- Susan Espín Mayorga, Autonomous National Institute for Agricultural and Livestock Research
- Hipatia Nogales, Ecuadorian Plant and Animal Health Service
- Jorge Daniel Montalvo Espinosa, National Coordinator, Special Food Safety Programme, Ministry of Agriculture and Livestock
- Wilfrido Salazar Naranjo, Ministry of Agriculture and Livestock
- María Enriqueta Dávalos Velasco, Ecuadorian Standards Institute

Research experts:

- Nancy Medina Carranco
- Lizardo Maldonado
- Hernán Naranjo Mejía

Work team in Costa Rica

Coordinators from national institutions:

- Francisco Marin Thiele, National Production Centre
- Rafael Ángel Mena Villavicencio, Ministry of Agriculture and Livestock
- Víctor Hugo Ruiz Obando, National Training Institute

Research experts:

- Martín Parada Gómez
- Pablo Peralta Quesada
- Karla Meneses Bucheli

Supervision and technical direction:

- Maya Piñeiro, Oficial Superior
- Luz B. Díaz Ríos, Consultora

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Introduction

As part of its efforts to build institutional, public and private capacities for the implementation of safety and quality improvement programmes in the fruit and vegetable sector, between 2004 and 2005 the Food Quality and Standards Service (AGNS) of FAO's Nutrition and Consumer Protection Division (AGN) provided support for three case studies concerning the implementation of safety and quality improvement programmes in the sphere of primary production in fruit and vegetable export sectors in Latin America and the Caribbean.

In this context, the exercise proposed by FAO – and carried out by a group of experts from institutions involved with safety and quality in the various countries – entailed an effort to identify the benefits and drawbacks of implementing safety and quality improvement programmes, and then, on the basis of this identification, to propose incentives and strategies to encourage the actors, mainly small producers, to take part in such programmes. The case studies do not involve any complex economic analysis to identify and quantify the benefits and drawbacks of implementing such programmes. Analysis is confined to exploring the economic feasibility of growing the crops under production systems that incorporate good practices in order to meet safety and quality objectives, and also the impact of such practices on the various cost variables and other production variables.

It is hoped that the work carried out, with its results as presented in the present document, will help to improve understanding of the factors that facilitate and/or hamper the implementation of safety and quality improvements on the part of fruit and vegetable producers, especially small-scale ones, and also of the need to propose integrated solutions that take account of the producers' technical, administrative and economic capacities, together with the amount of institutional support needed in order to develop and/or strengthen these capacities.

The present document gives the detailed results of the exercise and is made up as follows:

- section 1 gives an overview of the background and general context in which the case studies were carried out;
- section 2 gives details of the regulatory and policy framework with regard to the safety and quality standards required by the main countries that import fresh fruits and vegetables from Latin America and the Caribbean; such requirements are the main incentive for implementing safety and quality improvement programmes in the region;
- section 3 gives a general description of the methodology recommended by FAO for the present exercise;
- sections 4, 5, 6 and 7 give the detailed results of the case studies;
- section 8 gives a general overview of the aspects of the studies that should be highlighted;
- lastly, there is a short section (9) on the conclusions to be drawn and lessons to be learned from the whole exercise.

1. Background

Various international organizations and governments are carrying out campaigns to increase fruit and vegetable consumption, since this is a fundamental element in a healthy diet. In view of the importance of these items in nutrition and health, their safety should be a foregone conclusion and hence a non-negotiable consumer right.

However, recent data support the view that food-borne diseases (FBDs) are increasingly connected with the contamination of fruits and vegetables, particularly fresh produce. For example, the consolidated data of the Center for Food Safety and Applied Nutrition of the United States Food and Drug Administration (FDA) report a total of 8 039 cases of illness caused by fresh fruits and vegetables for the 1996-2005 period,[1] with the following cases standing out in particular: the contamination of raspberries with *Ciclospora cayetanensis* in 1996 and 1997, with 2 489 people affected; the contamination of tomatoes with *Salmonella nitrica serotype Newport*, in 2002, with 512 people affected; the contamination of onions with Hepatitis A virus in 2003, with 950 people affected; and, more recently, the contamination of spinach with E. Coli O157:H7 in 2006, leading to the deaths of 3 people and affecting about 204 others. In 1996, Japan saw the largest outbreak linked to contamination of fruits and vegetables, in this case radishes, affecting about 4 000 children and causing one death. The figures are based on reported cases where a direct link with the contamination of fruits and vegetables has been proved, but they would be much higher if they included estimates of unreported cases and those where there was a suspected but unproved link with the consumption of fruits and vegetables.

In developing countries there is a lack of detailed figures showing the extent of health problems linked to the consumption of contaminated fruits and vegetables. However, in view of the production methods used in some of these countries and the deficiencies in terms of infrastructure to handle, transport and distribute the produce, it is very probable that there are considerable numbers of diseases linked to the consumption of fresh fruits and vegetables.

Along with recent outbreaks of FBDs linked to the consumption of fresh fruits and vegetables, the expansion of the world trade in such produce has increased consumers' awareness of safety issues, leading in turn to the application – on the part of governments or the industry – of increasingly strict safety and quality requirements.

For many developing countries, the growth of the world fruit and vegetable trade is fundamental to the diversification of their traditional exports and the generation of foreign exchange. At the same time, however, consumers' awareness of the safety risks associated with this growth has raised huge challenges in terms of the need to adapt production and marketing systems to comply with the strict safety and quality requirements of importing markets.

The challenge for the governments of developed and developing countries, and for the industry as a whole, is to make sure that the benefits derived from the increased consumption of fruits and vegetables and increased world trade in these products are not undermined by consumers' negative perception regarding the safety risks associated with their consumption.

In this regard, FAO has been collaborating for a number of years with international bodies and associations of developing countries on the issue of the safety and quality of fresh fruits and vegetables as a way of improving public health and promoting economic development. In 2002, as part of these efforts, the Food Quality and Standards Service of FAO's Nutrition and Consumer Protection Division launched its *"Programme to improve the safety and quality of fresh fruits and vegetables",* which stresses the adoption of practices at appropriate points or stages in the chain "from farm to plate" to prevent dangers of contamination of fresh fruits and vegetables. The programme is based on two types of strategy, *capacity-building* and *information-sharing,* as a basis for improving the safety and quality of fresh fruits and vegetables.

As part of the first component, the programme supported the carrying out of *three case studies* on the

[1] These data are given by L. Zink, Opportunities for Food CGMP Modernization, Food Safety Magazine (August-September, 2006).

implementation of programmes to ensure safety and quality in Latin American countries, the scope and results of which are discussed in detail in the present document. The FAO *Programme to improve the safety and quality of fresh fruits and vegetables* is described below in general terms, together with the initiative that led to the case studies.

-Building regional, national and local capacities concerning safety

Training has been the central element in activities to build safety and quality capacities under this FAO programme, and the training component of the programme was based on the following principles:

i) the importance of fruits and vegetables as value-generating sectors in the economies of developing countries, with a market orientation as the fundamental characteristic of value sectors;

ii) the need to adopt a chain approach to safety and quality issues, based on the understanding that all those involved in the production, handling and distribution of fruits and vegetables share the responsibility for supplying safe produce;

iii) the adoption of a preventive approach to controlling hazards critical for the safety and quality of the produce;

iv) the importance of taking environmental and social considerations into account in programmes to improve safety and quality;

v) recognition of the multidisciplinary and interinstitutional nature of programmes to ensure safety and quality.

These principles define the structure and content of the training programme, which has a strategy based on "training multipliers" or "pyramid training". In this strategy, a group of participants representing various institutions with functions concerning safety and quality within each country, takes part in regional and/or subregional courses. These multipliers or trainers are then responsible for carrying out training activities within their respective countries.

With a view to supporting implementation of the training programme, FAO's Food Quality and Standards Service produced a manual for trainers, which was issued in printed form and also on CD-ROM. This manual provides key information required by multipliers in order to hold similar workshops within their countries. Complementary information and reference material on the subject is provided through a global database containing approximately 800 entries concerning the safety and quality of fresh fruits and vegetables. The approach of the training programme was based on a process of **information-sharing** and **capacity-building**, taking account of **existing regional and national capacities**. The regional and subregional workshops are a unique opportunity for the sharing of experience on initiatives implemented in the various countries with regard to the safety and quality of fresh fruits and vegetables.

Although the programme's activities focused initially on Latin America and the Caribbean, the programme has now expanded to other regions. Since 2003, a total of nine regional and subregional workshops have been held in Latin America, the Caribbean, Africa, Asia and the Middle East. Further information on the activities, scope and results of the programme can be found at http://www.fao.org/ag/agn/foodproducts_fresh_en.asp

During the subregional workshops held in Latin America, the participants carried out a SWOT (strengths, weaknesses, opportunities and threats) analysis, which allowed them to identify the positive or favourable factors (the strengths) and the negative factors or constraints (the weaknesses), and also the threats and opportunities connected with initiatives regarding the safety and quality of fresh fruits and vegetables in the context of each country. One aspect that was repeatedly identified by the participants as a constraint on implementing initiatives in this regard is the actors' (producers', exporters', support institutions' etc.) poor grasp of the benefits and costs associated with implementing such

programmes in the primary production sphere. There was also the almost unanimous view that the frame of application of these programmes is confined to fruit and vegetable sectors that supply export markets.

This situation led to the proposal to carry out **case studies** with the aim of *identifying the advantages, disadvantages, and economic, technical and administrative implications of implementing programmes to ensure safety and quality in specific fruit and vegetable sectors. The results of such studies will make it possible to focus institutional, public and private efforts on building capacities that will ensure improvements in safety and quality, and also to identify incentives and strategies to encourage the actors – mainly small producers – to take part in such programmes.*

2. Safety and quality requirements with regard to fresh fruits and vegetables

2.1 Ensuring safety and quality in fruit and vegetable sectors

The approach promoted by FAO with regard to the supply of safe and high-quality foodstuffs is based on risk management throughout the whole food chain, a process involving the implementation of regulatory and non-regulatory measures at appropriate points in the chain, ranging from preproduction practices up to the point of sale or distribution to consumers, so that the product meets current norms (FAO, 2005[a]).

Although the approach entails the identification and evaluation of risks all along the chain, interventions in this regard should focus on the point or points where they are most effective. Inasmuch as fruits and vegetables are often consumed raw or only lightly cooked, washing prior to consumption does not completely eliminate possible pathogens. This fact has led to the appearance of a series of interventions of a regulatory and non-regulatory nature (obligatory and voluntary standards, training, advice etc.) on the part of the public and private sectors, resulting in improvements in production, handling and distribution methods intended to ensure the safety and quality of fresh fruits and vegetables the whole length of the chain.

At the international level, the Codex Alimentarius is the intergovernmental body responsible for establishing international standards governing food safety. The International Organization for Standardization (ISO) has recently expanded its activities into formulating private food safety standards, with publication of the ISO 22000 standard. These international organizations convene national governments, experts and observers in order to develop standards, recommendations, codes of practice etc., which can then be used by countries to support regulatory initiatives. The Codex Alimentarius is the reference text for food safety and quality in the Sanitary and Phytosanitary Measures Agreement of the World Trade Organization (WTO), so that national regulations based on the Codex Alimentarius standards comply with WTO requirements with regard to international trade.

However, although the final aim of the standards established by countries, chiefly in the form of regulations, is to protect consumers' health and facilitate trade, they are set up in the framework of a whole collection of interests on the part of the industry, consumers, producers etc. Differences in income, in the perception of risks associated with the consumption of certain products and in preferences etc. increasingly shape national regulations, which in many cases incorporate stricter requirements than those accepted at the international level (Josling *et al*, 2004).

Interventions with regard to standards – with the way being led by developed countries, where consumer awareness of safety and quality factors is greater – have had a major impact on fruit and vegetable production systems in developing countries. In the case of Latin America, initiatives with regard to standards of both an obligatory and voluntary type carried out in Europe and the United States – the main target countries for fruit and vegetable exports – have provided the motor for implementation of programmes to improve safety and quality all along the fresh fruit and vegetable chain in the main countries supplying these markets.

In the European Union (EU), there have been various major initiatives with regard to food safety regulations, and these have had and will have a major impact on fruit and vegetable sectors in exporting countries. Regulation 852/2004 on the hygiene of foodstuffs lays down general rules for all businesses involved with foodstuffs, including those devoted to **primary production**, stating that establishments producing food within the EU or importing such products must comply with general and specific hygiene requirements, and also register their operations with the relevant European authorities. With regard to initiatives concerning pesticides, the EU has started to review all the active substances used in crop protection, determining the inclusion or exclusion of each from the list of substances whose use is permitted in the EU or in imports. The process of evaluating all the registered substances should be completed in 2008. The EU is also carrying out a process to establish common maximum residue levels (MRLs) for pesticides, and in 2005 it adopted Regulation 396/05, establishing the mechanisms to determine and control MRLs in foodstuffs. With a view to establishing a common MRL in the EU,

the interested parties must provide data giving the results of residue analyses in line with good agricultural practices (GAPs) and the evaluation of safety criteria for the consumer. If no results of such evaluations are presented, the MRL is fixed at the level of determination (LOD), which is in fact close to zero (Jaffee, 2003).

In the United States, public initiatives concerning the safety of imported fresh fruits and vegetables are carried out mainly by the FDA under the national programme entitled *Produce and Import Safety Initiatives*, which is applied in coordination with the Department of Agriculture and the Center for Food Safety and Applied Nutrition. These bodies promote the implementation of good practices in the production of fresh agricultural produce, basing themselves on the *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables* published by the FDA in 1998. This guide, which is voluntary in application, is intended to help farmers, packers and others to improve the safety of fresh agricultural produce, whether national or imported. With regard to pesticides, MRLs are established by the Environmental Protection Agency and are applied both to domestically produced foodstuffs and imports. The FDA carries out inspections of domestic and imported produce to ensure that these limits are observed.

Other regulations, albeit not focusing directly on safety objectives, but undoubtedly contributing to the success of measures applied for this purpose, are concerned with the adoption of tools making it possible to assure the traceability of products, for example article 18 of the EU's Regulation CE 178/2002 on traceability, in force since January 2005, and the regulation concerning the establishment and keeping of records in connection with article 306 of the 2002 law on public health safety and the prevention of bioterrorism in the United States, published officially by the FDA in December 2004.

2.2 Private-sector interventions with regard to standards

Initiatives carried out by the private sector in Europe – in response to developments regarding regulations or as a way of anticipating such developments – with the aim of ensuring the safety and quality of fresh fruits and vegetables are marked by the emergence of protocols that are used by third parties as the basis for granting certification. A notable example is EurepGAP, an initiative of the Euro-Retailer Produce Working Group (EUREP), under which certification is granted following compliance with GAPs in primary production. With regard to packing operators, there are various types of standard or protocol used as the basis for certification, depending on the European target country, for example, the British Retail Consortium Global Standard—Food, promoted by a group of retailers in the United Kingdom, and the International Food Standard promoted by retailers in Germany and France. These standards are generally based on application of the principles of the hazard analysis and critical control point (HACCP) system and the hygiene principles established by the Codex Alimentarius. European legislation (regulation 178/2002) delegates direct responsibility for the safety of foodstuffs to food companies, which has undoubtedly fostered the appearance of private initiatives.

In the case of the United States, although the direct responsibility of the food sector is less explicit, the FDA's Federal Food, Drug and Cosmetic Act prohibits the sale of adulterated foodstuffs or those with misleading labels, taking the term "adulterated" as encompassing safety considerations. With regard to microbiological contamination of fresh fruits and vegetables, whether domestically produced or imported, there are no specific regulations on the practices or measures that are to be adopted, and application of the FDA's recommendations is basically voluntary.

On the other hand, the emergence of private initiatives concerning third-party certification as to safety and quality in primary production are uncommon in the United States. In this connection, the Food Marketing Institute grants certification of compliance with the requirements of the SQF 1000 Code, which concerns the implementation of good practices but does not include check lists or specifications regarding the good practices to be applied in the sphere of primary production.

Public or private programmes are basically monitoring and verification programmes based on the

implementation of good practices as found in the FDA's guide, and inspections to verify implementation of good manufacturing practices (GMPs) in packing plants for fresh fruits and vegetables. These include inspections carried out by Primuslabs, Davis's Fresh Technologies and the Government itself under the programme implemented by the Department of Agriculture through its Agricultural Marketing Service.[1] Some retailers require their suppliers, whether local or in exporting countries, to show a certificate guaranteeing that the merchandise has undergone such inspections. In the specific case of good practices, companies that supply inspection services have their own check and verification lists and criteria according to which the merchandise is accepted or rejected. The frequency of such inspections varies, but they are normally annual. In some cases, a producer who supplies two or more buyers will have to request inspections from different companies depending on the various buyers' preferences or demands. The recent outbreaks of disease connected with the contamination of fresh produce is likely to have a considerable impact in terms of regulations and/or the promotion of certification initiatives by the private sector.

2.3 Initiatives concerning the safety and quality of fresh fruits and vegetables in Latin America

-What are good practices, and is there a generally agreed understanding of the concept?

The concept of good practices in the agricultural sphere is not new. Agricultural colleges throughout the world have been promoting application of the principles of good practices for a number of decades as a way of promoting the environmental and economic sustainability of production systems. However, the concept has taken on a new dimension as a result of the links established between primary production and the final safety of the product within the chain approach. These links are much more critical in the case of produce that is consumed raw, for example fresh fruits and vegetables.

FAO has been working on a draft conceptual framework for good practices based on four GAP principles applicable to all scales of farming (COAG, 2003):

- economic and efficient production of sufficient, safe and nutritious food;
- maintenance and enhancement of the natural resource base;
- maintenance of viable farming enterprises and contribution to sustainable livelihoods;
- satisfaction of the cultural and social demands of society.

In practice, the protocols, codes of practice, guidelines and standards concerned with good practices for fresh fruits and vegetables, as promoted by the private sector and/or governments and international bodies, vary in the objectives they seek to meet or promote. Some stress the prevention and control of hazards to product safety and others promote the adoption of production systems or practices aimed at environmental and economic sustainability, while others seek to combine various principles of good practices in the pursuit of objectives of environmental protection, safety, quality, and improvement in social aspects connected with workers' safety and protection. There are also differences in approach within good practices initiatives focusing on safety objectives in order to comply with regulations or market requirements. In some cases, stress is laid on various aspects of the prevention of contamination by microbiological agents, with little or no stress on the prevention of chemical contamination, while other programmes stress correct pesticide handling as a way of reducing chemical contamination. Other initiatives seek to apply an integrated approach to the prevention of risks linked to microbiological, physical and chemical hazards during the production and handling phases of fruits and vegetables in the field and during post-harvest phases.

Developments with regard to good practices in markets importing fresh fruits and vegetables, particularly the initiative carried out by the FDA in the United States to promote the implementation of good practices in order to prevent microbiological hazards, and the EurepGAP initiative of the European

[1] With regard to primary production, the Agricultural Marketing Service carries out inspections only at the domestic level.

retail sector, have to a large extent been responsible for the boom in good practices initiatives in the fresh fruit and vegetable export sector in Latin America, promoted by both the private and public sectors.

In Chile, the Fruit Development Foundation has been carrying out initiatives to promote good practices in the fruit and vegetable export sector since 2000. The foundation is currently responsible for the Technical Secretariat of ChileGAP, a protocol through which certification can be obtained to meet the GAP and food safety requirements of purchasers in Europe and the United States.

In Mexico, the Mexico Supreme Quality Programme is a certification system that uses a seal (the property of the Federal Government, the Secretariat for the Economy, the Ministry of Agriculture and Bancomex) to generate added value for Mexican agrofood products that have been produced according to quality, hygiene and safety standards. This programme has developed its own GAP standards, which include all the requirements of the EurepGAP system for fruits and vegetables.

In Brazil, the Ministry of Agriculture is implementing an Integrated Fruit Production Programme, which originated towards the end of the 1990s with the aim of adopting technology with a reduced impact on the environment and human health, pursuing food safety and quality, environmental quality, profitability and social equity. With regard to safety, the programme's stress is on rationalizing the use of agrochemical products.

In Guatemala, the Ministry of Agriculture and the Association of Non-traditional Export Trade Groups are implementing an Integrated Agricultural and Environmental Protection Programme, under which a seal of safety can be issued.

With regard to standards, various government initiatives have promoted the development of national standards for specific good practices for fruits and vegetables, as is seen for example in Peru and Colombia. The public sector in the countries of the region supports the development of guides to GAPs and is working together with the private sector to promote such practices, for example through the establishment of national commissions.

Moreover, the market for certification by third parties and verification inspections has grown considerably in fruit and vegetable exporting countries in Latin America. The same companies that provide inspection services for domestic production in the United States carry out operations in exporting countries. Various companies throughout Latin America provide inspection services for certification, for example according to EurepGAP and SQF 1000 principles. Safety and quality demands have also given rise, albeit gradually, to a whole market in services in terms of laboratories, technical advice and other services needed to demonstrate safe practices in the production and handling of fresh fruits and vegetables.

2.4 Incentives and constraints for the application of measures to ensure the safety and quality of fresh fruits and vegetables

As mentioned earlier, initiatives to adopt GAPs with a view to sustainability objectives have been in force for a number of decades. However, the growing importance of good practices programmes in the past ten years has been a result mainly of the market demand for safety and quality guarantees, and the recognition that the type of intervention that can be carried out in the sphere of primary production in order to meet such requirements is based on the implementation of preventive or good practices.

The main incentive for implementing safety and quality improvement programmes on the part of the fresh fruit and vegetable export sector in Latin America has therefore come from the need to meet the safety and quality demands of importing markets. The export sector in Latin American countries has been gradually modifying production and management systems in order to comply with these demands (FAO, 2005b). Díaz (2006) says that asparagus producers in Peru, for example, have made investments of about US$1 million in safety and quality improvements.

Inasmuch as the diversification of traditional exports – with products of high added value, including fruits and vegetables – is a priority for governments in various countries in the region as a way of promoting development and economic growth, there is growing concern over the negative effects that these strict safety and quality demands could have on the countries' export sectors, restricting their possibilities (especially in the case of small and medium producers) of taking advantage of market opportunities and/or maintaining their participation in the export markets they currently supply. On the other hand, in view of the absence of strict requirements on the part of purchasers within the country, there is a growing concern that the benefits generated by the implementation of such programmes will not reach local consumers.

The support of the public and private sectors and international cooperation bodies for improvements in the actors' understanding of the benefits and drawbacks of implementing safety and quality programmes, for the creation and building of institutional capacities and, in the sphere of production, for the required changes, is a necessary condition if these programmes are to have the desired impact on the production sector that supplies domestic and export markets, as is discussed in the following sections of the present document.

3.

The methodology adopted for the case studies

3.1 Objectives

Various individuals, groups and organizations help to build capacity with regard to safety and quality in the fruit and vegetable sector. Producers, workers in packing plants, handlers, distributors, consumers, inspectors, laboratories and various centralized and decentralized government bodies (ministries and departments of agriculture, health, trade, standards, extension services etc.) all play a role with regard to the safety and quality of fresh fruits and vegetables.

In view of the complexity of the subject, it is therefore clearly important to carry out coordinated work with the actors involved in order to improve understanding of the incentives and constraints on implementing safety and quality programmes. This coordinated work should also identify the institutional support required to overcome the technical, administrative and financial constraints encountered.

FAO therefore proposed that the multidisciplinary and interinstitutional teams taking part in the subregional workshops on "Improving the quality and safety of fresh fruits and vegetables: a practical approach" held in Latin America in 2003 and 2004, should carry out an application exercise (or case study) for each country in order to assess the technical, administrative and financial capacities required by producers, mainly small growers, if they were to implement programmes to improve safety and quality in local, regional and/or national fresh fruit and vegetable sectors. This exercise would provide the basis for drafting a joint *Plan of action* to overcome the constraints identified.

The sectors selected should be of major economic and social importance in the local, regional and/or national contexts, with a high participation of small and medium producers, and should be sectors where the implementation of safety and quality programmes is particularly appropriate or necessary in order to meet market requirements and/or national or international standards. Three case studies were thus carried out:

Table 1. Case studies carried out in Latin America

	Case	Bodies taking part:
1	Implementation of good practices in the cape gooseberry sector: case study of small producers in Granada Municipality, Colombia.	The Ministry of Agriculture and Rural Development, the Colombian Agricultural and Livestock Institute, the National Training Service and the Colombian Agricultural and Livestock Research Corporation.
2	Implementation of good practices in the broccoli sector: case study of the Huertos Gatazo Zambrano enterprise, Ecuador.	The Ecuadorian Plant and Animal Health Service, the Autonomous National Institute for Agricultural and Livestock Research, the Ministry of Agriculture and Livestock, and the Ecuadorian Standards Institute.
3	Implementation of good practices in the pineapple sector: case study of the Huerta Norte Region, Costa Rica.	The National Production Centre, the Ministry of Agriculture, and the National Training Institute.

Questions to be addressed in the course of the studies

The case studies sought to provide answers to the following questions:

- What is the gap between present production systems and the situation required to meet market requirements or current standards regarding the safety and quality of fresh fruits and vegetables?
- What steps have been taken to comply with the safety and quality requirements of the target market or the standards currently in force?
- What measures need to be taken to bring about a transition from the present production and management systems to systems based on the implementation of good practices with a view to meeting safety and quality objectives?
- How are the necessary changes to be carried out? What was the point of departure? What institutional, public and private infrastructure is required to support the changes? How have producers been encouraged or how could they be encouraged to adopt good practices?
- What is or should be the role of the private sector and public institutions in this transition, and how are these roles coordinated?
- In cases where processes to implement good practices have already been launched, where did such initiatives arise? What roles have the public and private sectors played in the success of these initiatives?
- What type of producer and exporter is involved in such programmes? Who takes part?
- What are the benefits – for the various actors in the sector – of carrying out the required changes?
- What are the general costs of implementing these practices, and who meets them?
- What are the main constraints hampering the success of programmes and how can they be overcome?
- What are some of the possible impacts, both positive and negative, of implementing programmes to improve product safety and quality?

3.2 Stages in the studies

The Food Quality and Standards Service of FAO's Nutrition and Consumer Protection Division designed a reference methodology for the case studies, which was supplied to each working group. This methodology was composed of four stages, which are summarized below:

Stage 1- Description of the present situation of production systems in the study zone in terms of good practices, with a view to meeting safety and quality objectives

How far are current production systems from being able to offer the safety and quality guarantees required by the target market or the standards in force?

Through a general analysis of the sector, an effort is made to identify the context in which the actors interact, the size of the sector, the technological problems, the type of producer involved, the regulatory context, the competition to be faced etc. An analysis of the sector is then carried out through a detailed description of present production systems, identifying what is done, in other words, the various phases in the production and post-harvest management process, analysing how such operations are carried out, identifying problems connected with product safety and quality, and examining these

in the context of standards or market requirements.

Stage 2- Identification of the changes required for the transition to production systems based on good practices in order to meet safety and quality objectives

Analysis of all the changes required in order to make the transition from current production systems to systems based on the adoption of good practices

In this stage, workshops are held in order to reach a joint definition – with producers and other actors – of the changes required in order to make the transition from the current production systems to systems based on the implementation of good practices, taking as a reference point the practices or recommendations contained in a code of practice, market protocol or national or international set of standards. The constraints/difficulties are identified, and also the strengths and opportunities for producers and other actors in the sector, resulting from implementation of the good practices recommended, and a consensus is reached on a set of practices that will allow the safety and quality objectives laid out in the protocol or standards to be met.

Stage 3- Implications of implementing the programmes: benefits and less positive aspects (drawbacks)

General evaluation of the benefits and drawbacks connected with the implementation of good practices

This stage involves a general evaluation of the benefits and drawbacks connected with the implementation of good practices. A set of indicators is defined that will allow quantitative and qualitative evaluation of the benefits and drawbacks of compliance with standards or market requirements.

With regard to data collection, in the four stages of the case studies, appraisals and studies carried out by various national institutions – for example the Ministry of Agriculture, export promotion bodies (the Colombian Export Promotion Agency [PROEXPORT], the Costa Rican Foreign Trade Promotion Agency [PROCOMER], CCI etc.) and research institutions – are reviewed, along with statistics available for the sector and the product, and other available reference material. Information is also gathered from primary sources through workshops with producers and exporters, interviews, and field visits to farms and packing plants.

Stage 4- Formulation of the proposed intervention

Prioritization of the measures to be taken and analysis of the institutional support required in order to carry out the proposed changes

On the basis of a prioritization of practices to be adopted in the short, medium and long terms, a joint action plan is agreed, indicating what is to be done, how it will be done, who will be responsible, and the time and resources needed in order to implement the plan. The type of necessary institutional, public and private support is also analysed, together with the roles of the various actors (who is to do what) and the strategies needed in order to encourage actors to undertake the changes.

3.3 Anticipated results

It is anticipated that the results of the case studies will provide elements that will help in:

- identification of future challenges and opportunities for producers, farmers, support institutions and other actors wishing to initiate and implement programmes to ensure the safety and quality of fresh fruits and vegetables;
- improved understanding of the various actors in the sector as to the economic, technical and administrative implications of implementing such programmes;
- proposal of strategies to improve the relevance and effectiveness of training programmes in this connection;

- identification of strategies that could be implemented to encourage producers, particularly small growers, to adopt programmes to ensure the safety and quality of fresh fruits and vegetables.

The reference methodology proposed by FAO was adapted by the working groups on the basis not only of the particular conditions of the sectors being studied, but also of the experience of the experts who were to carry out the work. The results are presented in the following sections of this document.

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